

Section Three

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

This section details the social, economic, and natural resources in the study area, such as historic structures, parks, other land uses, woodlands, wetlands, and other water resources that may be affected by implementation of the Preferred Alternative. Direct impacts (both adverse and beneficial) on each resource are discussed. When applicable, indirect and cumulative effects are also discussed. For those resources where adverse impacts are anticipated, mitigation measures are also described.

3.1 PHYSICAL ENVIRONMENT

Geology and Topography

In the study area, US-12 traverses a flat region between two northeast-southwest trending ridges. These geological features can be traced to soil and rock (moraines and outwash) deposited by four major glaciers, ranging from approximately 1.8 million to 11,000 years ago. The most recent glacier advanced and retreated at variable rates. The generally hilly, uneven topography north and west of the US-12 study area reflects this variable glacial activity. The low, flat topography south of US-12 is a result of glacial erosion and deposition.

In the western and central portion of the study area, bedrock consists of Bedford shale. A small inclusion of Antrim shale forms the bedrock near the US-12/US-23 intersection, and the bedrock consists of Berea sandstone in the eastern portion of the study area.

The topography along the US-12 study area is flat to gently sloping, with elevations ranging from approximately 800 feet above mean sea level (MSL) at the western and eastern study limits, to approximately 850 feet above MSL near the center of the study area at the US-12/Warner Road intersection.

Direct Impacts

No adverse environmental consequences to geologic resources are expected to result from the No-Build Alternative or implementation of the Preferred Alternative. Topographic changes associated with the Preferred Alternative will be limited to cut and fill activities necessary to prepare and construct the new roadbed. Little change in roadbed elevation is proposed; therefore these changes are considered minor.

Surface Water Quality

There are three stream crossings located within the study area, all designated as Washtenaw County Drains. These include the Pittsfield No. 5 Drain, the Koch-Warner Drain, and the

Hertler-Nissley Drain (see Figure 3.1). The two major drains, the Pittsfield No. 5 and the Koch-Warner Drains, flow southwesterly joining just south of Willis Road and discharging to the Saline River south of Saline. The Hertler-Nissley Drain is a third, minor drain located in the study area. Water quality was evaluated in 2002 at two locations in the Pittsfield No. 5 Drain (Sites B and C) and one location in the Koch-Warner Drain (Site A).

Water quality was not evaluated at the Hertler-Nissley Drain due to recent construction activities associated with development of the Saline Community School campus. This construction has included opening a formerly enclosed section of drain immediately north of US-12. It is assumed that water quality sampling at this time would not be representative of the standard condition in this drain.

Analytical results were compared to historical data and State of Michigan Surface Water Quality Standards, including Rule 57(2) Guidelines and Michigan Water Standards as amended in 1986 (MDNR 1990). All of the surface water quality measurements meet State of Michigan Water Quality guidelines for warm water streams. Levels of dissolved oxygen were above 5.0 mg/L, which is the level required to support a healthy community of warm water organisms. Measurements of conductivity indicate elevated ion concentrations, which are typically found in aquatic systems draining urban and suburban landscapes. The surface water quality for each drain is described in the following text and summarized in Table 3.1.

Pittsfield No. 5 Drain

The Pittsfield No. 5 Drain is channelized for sections north and south of US-12, but it meanders through a large, primarily emergent wetland system in the study area. USGS maps indicate this drain is intermittent, although field inspections indicate flow is permanent during most years. A sediment basin associated with this drain was installed north of US-12 in 1993 and provides flood storage functions.

Water quality was evaluated in two locations, one immediately north of US-12 and one south of US-12 at the Fosdick Road crossing (Sites B and C). Water quality in this drain is typical of a headwater stream and is strongly influenced by the surrounding wetland complex and groundwater discharge. The wetland system contributes substantial quantities of organic matter to the channel, which, due to decomposition processes, results in elevated nutrients and fluctuating levels of dissolved oxygen. A growth of filamentous green algae was observed on rocks, plants, and woody debris at the Fosdick Road crossing. This is often an indicator of excessive nutrient loading into the stream. Based on field observation and water quality analysis, water quality is rated as acceptable.

Koch-Warner Drain

The Koch-Warner Drain is a channelized, intermittent watercourse that originates in several small, wet depressions north of US-12. This drain joins with the Pittsfield No. 5 Drain approximately 5,500 feet south of US-12. It receives drainage from both agricultural and urban areas, as well as runoff from adjacent roads. Water quality evaluations (Site A) indicate that water quality is generally degraded from stormwater runoff and lack of a riparian buffer.



US-12

IMPROVEMENT STUDY

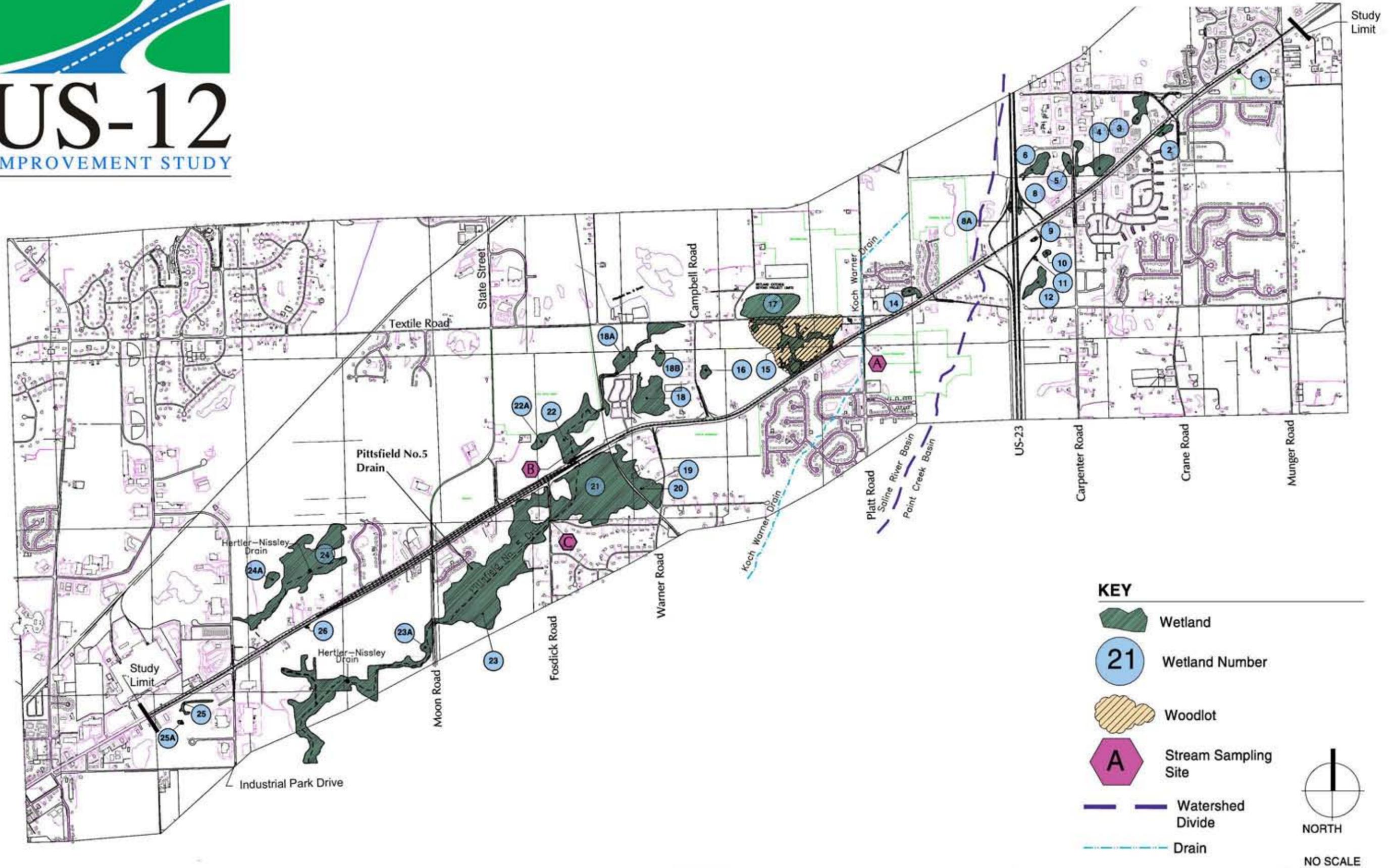


FIGURE 3.1
STUDY AREA NATURAL FEATURES

Table 3.1
Surface Water Quality Measurements

Parameter	Site A	Site B	Site C	State of Michigan Surface Water Quality Standards
Dissolved Oxygen (mg/L)	5.6	7.9	7.1	5.00
Conductivity (microsiemens)	770.0	610.0	570.0	NA
pH	7.3	7.1	7.3	6.5 to 9.0
Temperature (° F)	58.0	61.3	62.8	< 67.0

*Source: Surface water quality survey, SmithGroup JJR, (10 a.m. – 12:00 p.m.) April 4 and 29, 2002.
NA - State of Michigan Surface Water Quality Standards are not available for this parameter.*

Hertler-Nissley Drain

The Hertler-Nissley Drain is a channelized drain that flows south under US-12 and discharges to the Pittsfield No. 5 Drain approximately 2,000 feet south of US-12. This drain, which was previously enclosed immediately north of US-12, has recently been opened as part of the Saline Area Schools' site development.

As noted above, water quality was not evaluated in the Hertler-Nissley Drain during the current study. However, according to water quality data collected during prior studies of this drain at two locations, north and south of US-12 (Smith Group JJR, 1993), the north reach of the drain had degraded water quality, which is typical of agricultural runoff. In this section of the drain, the channel had little riparian cover, resulting in elevated summer water temperatures despite some groundwater input. Nutrient levels were elevated, resulting in excessive aquatic vegetation in the channel.

Agricultural runoff was also noted in the south reach of the drain. However, a steady discharge of groundwater to the stream maintained flow and flushed the channel, sustaining moderate to good water quality throughout the year. Cool water temperatures in the south reach were a reflection of both groundwater input and the presence of vegetative riparian cover for the channel.

Direct Effects

The No-Build Alternative is not expected to affect surface water quality within the three drains. Construction of the Preferred Alternative will have a minimal impact on all three of the drains currently crossed. Increased turbidity and sedimentation from stormwater runoff would temporarily impair surface water quality during construction. Long-term impacts

would result from discharges of oils and grease from accidental spills along the right-of-way and discharges of stormwater containing highway contaminants. Although the three drains in the study area generally meet the water quality standards for warm water streams, all currently exhibit degraded water quality due to excessive nutrient loading. Construction of the Preferred Alternative will have minimal impact on the existing surface water quality of these streams. A permit from the Washtenaw County Drain Commissioner's office will be required for any work in these county drains. A permit will also be required from the MDEQ under the Natural Resources and Environmental Protection Act (P.A. 451 of 1994), Part 301 – Inland Lakes and Streams.

Mitigation Measures

Storm water management for highway runoff will require innovative practices that combine the strategies and objectives for both surface and groundwater protection. Capacity of storm water management facilities will be provided for the first flush, the first 15 to 30 minutes of storm runoff, which typically contains the highest percentage of pollutants. These facilities will include a treatment train utilizing detention basins, grassed channels or swales with check dams, constructed wetlands and overland sheet flow. Incorporation of grassy swales with native vegetation, check dams, and detention basins will reduce the concentrations of contaminants in highway runoff. Detention basins will be located in the clay layer at locations where it is thick enough to provide adequate containment. Road runoff would be directed to these management facilities avoiding direct discharge to surface waters. A combination of grassy swales and overland flow in the boulevard median could be used to accommodate this plan. Storm water management will be incorporated into the final design of the Recommended Alternative.

Hydrology and Floodplains

The study area lies within the 1,072-square-mile River Raisin watershed and includes two major basins: the Saline River basin to the west, and the Paint Creek basin to the east (see Figure 3.1) with US-23 as the approximate surface water divide. The Saline River basin contains three subbasins that drain to three streams crossed by US-12: the Hertler-Nissley Drain, the Pittsfield No. 5 Drain, and the Koch-Warner Drain. These three watercourses have been designated as county drains by the Washtenaw County Drain Commissioner. The Paint Creek basin contains one subbasin that drains to Chicken Creek, which originates southeast of the study area and is a tributary of Paint Creek. A participation agreement will need to be obtained from the Washtenaw County Drain Commissioner for the Hertler-Nissley, Pittsfield No. 5, and Koch-Warner drains.

Drainage Features

The study area traverses the headwater region of the subbasins identified above. Surface water flow is to the south and the contributing drainage basins are located north of US-12. Table 3.2 indicates the drainage area of the subbasins and the existing and future 100-year peak flows of the major streams. Existing and future discharge rates for each outlet were calculated following the guidelines within the October 2001, Michigan Department of Environmental Quality's (MDEQ) Computing Flood Discharges For Small Ungaged

Watersheds. Peak flows are not included for Chicken Creek subbasin because the creek does not cross the highway.

The Hertler-Nissley Drain encompasses approximately 582 acres and crosses US-12 at 5 separate locations. The Pittsfield #5 Drain encompasses approximately 1,113 acres and crosses US-12 at one location. The Koch-Warner Drain encompasses approximately 1,297 acres and crosses US-12 at one location. See Table 3.2 for the existing and proposed culvert conditions for the crossings of the three drains.

Direct Impacts

The study area crosses the headwater region of four subbasins associated with individual drainages. The headwater regions of these streams typically have low flow for much of the year. Long-term impacts to stream hydrology are associated with an increase in impervious area and loss of wetlands that function as natural storm water detention areas resulting in increased runoff.

No direct impacts would be expected for the No-Build Alternative. For the Hertler-Nissley and Pittsfield No. 5 drains, no direct or backwater impacts to floodplains are expected for the Preferred Alternative. The anticipated increase in impervious area for the Preferred Alternative will be approximately double the existing paved area. This increase is minor compared to the size of the adjacent watersheds. Wetland loss also impacts stream hydrology due to a loss of wetland flood storage capacity. These impacts are expected to be minor due to the large size of the existing wetlands associated with Hertler-Nissley and Pittsfield No. 5 Drain.

For the Koch-Warner Drain, minor backwater impacts may occur as a result of implementing the Preferred Alternative. These impacts are expected to be minor and will be mitigated for during construction. Exact mitigation measures will be finalized at the end of this study when a detailed hydraulic analysis will be completed. The following planning efforts have been incorporated into the design of the Preferred Alternative to assure opportunities for mitigation have been considered and will be incorporated during construction.

Mitigation Measures

MDOT will prepare a storm water management plan that will provide for increased flood storage to accommodate highway runoff. Eleven storm water detention ponds are proposed totaling 22 acres in additional right-of-way along US-12 (see Figure 2.6).

The increase in impervious area and subsequent increased storm water runoff will be offset by the use of detention ponds along the US-12 corridor. The detention ponds will be designed to accommodate the proposed discharge from the storm sewer system. The ponds will be designed to discharge back into the county drain system no greater volume than currently exists with the open ditch system. The discharge rate for each pond will be determined during the final design phase of the project and would be included as part of the hydraulic analysis report.

**Table 3.2
Summary of Stream Crossing Culvert Improvements**

Stream	Hertler-Nissley Drain					Pittsfield No. 5 Drain	Koch-Warner Drain
<i>Drainage Area:</i>	582 Acres (.91 square miles)					1113 Acres (1.74 sq. mi.)	(<2.0 sq. mi.)**
<i>Existing 100 Year Flow:</i>	14 CFS	68 CFS	11 CFS	12 CFS	35 CFS	119 CFS	100 CFS
<i>Closest Cross-Street:</i>	Industrial Park Drive	Industrial Park Drive	Industrial Park Drive	Wapiti Way	Moon/State Road	Fosdick Road	Platt Road
<i>Existing Culvert Type:</i>	CMP	CMP	CMP	CMP	CMP	RCP	Concrete Box
<i>Existing Culvert Length:</i>	40'	40'	40'	40'	40'	2 @ 185'	80'
<i>Existing Culvert Size:</i>	12" Dia	12" Dia	12" Dia	12" Dia	24" Dia	2 @ 84" Dia	8' x 6'
<i>Proposed 100 Year Flow:</i>	16 CFS	66 CFS	15 CFS	15 CFS	35 CFS	135 CFS	175 CFS
<i>Proposed Culvert Type:</i>	RCP	RCP	RCP	RCP	RCP	RCP	Concrete Box
<i>Proposed Culvert Length:</i>	112'	130'	260'	185'	220'	2 @ 230'	255'
<i>Proposed Culvert Size*:</i>	24" Dia	48" Dia	24" Dia	24" Dia	36" Dia	2 @ 84" Dia	12' x 6'
<i>Total Change in Length:</i>	72'	90'	220'	145'	180'	2 @ 45'	175'

* Culverts increasing stream enclosure by more than 24 feet require additional review by the MDEQ during the permit application stage.

**The Michigan Department of Environmental Quality (MDEQ) has calculated the drainage area for the Koch-Warner drain at less than 2.0 square miles.

CFS-Cubic Feet Per Second

CMP-Corrugated Metal Pipe

RCP-Reinforced Concrete Pipe

Note: During final design a detailed hydraulic analysis will be completed for each drainage course that crosses US-12. Each future crossing will conform to Washtenaw County Drain Commission as well as Michigan Department of Environmental Quality standards. The 100 year peak-flows shown in the table above are preliminary estimates based on existing and future land uses.

Regarding backwater impacts, the final design for each US-12 crossing will incorporate a zero backwater design. During the final design phase, MDOT will incorporate mitigation measures upstream to minimize backwater impacts resulting from future US-12 roadway improvements. Following the completion of the hydraulic analysis and throughout the design phase further coordination will occur with the Washtenaw County Drain Commission and the MDEQ to assure compliance with Washtenaw County's stormwater management program.

The US-12 Preferred Alternative and the resulting improvements to the Platt Road intersection will require that the Koch-Warner drain be enclosed along Platt Road from US-12 north to Textile Road. This enclosure will result in a majority of the Platt Road and Textile Road drainage being collected within a planned detention pond to be located in the northeast quadrant of the Platt Road/US-12 intersection as shown in Figure 2.6. This detention pond will have a controlled outfall into the Koch-Warner Drain just north of US-12. This detention pond has been preliminarily sized based upon existing and future flow data, and guidelines provided by the Washtenaw County Drain Commission, and the MDEQ. Additionally, the proposed culvert width size for the Koch-Warner Drain has been increased to twelve feet as shown in Table 3.2 to minimize future backwater impacts for the drain.

For the Koch-Warner Drain, a hydraulic analysis to determine the size of culvert and detention basins will be completed. If the hydraulic analysis determines that additional backwater storage is needed north of US-12 to accommodate increased stormwater runoff within the Koch-Warner Drain, the detention pond located within the northeast quadrant of the Platt Road/US-12 intersection will be increased in size and the stormwater discharge rate from this detention pond will also be reduced.

Groundwater Resources

Groundwater is subsurface water that has accumulated in the voids between soil particles and within porous bedrock. A large accumulation of groundwater is called an aquifer. The water within an aquifer can migrate horizontally, discharging to lakes and streams, or vertically, resulting in surface discharge or recharge of deeper aquifers. The three types of aquifers found within the study area are described below (SERGEM 1993).

Bedrock Aquifer

The bedrock aquifer is contained in thin layers of sandstone and shale formations ranging from approximately 140 feet to more than 300 feet below the ground surface. Few wells are completed in the bedrock; therefore, characterization of this aquifer is limited. The bedrock aquifer has not been a primary water supply. Water quality from the bedrock is comparatively poor due to elevated levels of hardness (salts) and dissolved minerals.

Drift Aquifer

The drift aquifer is more complex than the bedrock aquifer due to the uneven distribution of sediments. The thickness of drift materials below the study area increases from approximately 150 feet in the western portion to 300 feet in the eastern portion. The drift aquifer is typically found approximately 50 to 100 feet below the surface. However, the drift aquifer groundwater level in the study is less than 30 feet below the surface in many locations due to porous soils. Wells in this area are unusually shallow, indicating adequate long-term supplies that experience seasonally low levels.

Groundwater flow in the drift aquifer is generally to the southeast, nearly perpendicular to the orientation of US-12. Groundwater discharge in the study area is to the Saline River and Paint Creek basins. The groundwater divide follows the general pattern and location of the surface water divide.

Channel Aquifers

Channel aquifers are found in coarse sands and gravel and are often associated with existing stream channels or major depressions in the bedrock surface. In the study area, the Pittsfield-York Channel aquifer is a bedrock channel trending to the north and east. The Pittsfield-York Channel may be a prominent aquifer; however, study area wells are sparse and data is limited. The glacial till above the channel appears to contain a greater concentration of clay, which provides a measure of protection for the aquifer. This buffering potential in combination with depths of up to 300 feet provides natural protection of groundwater quality. Water quality is assumed to be suitable for domestic use.

Direct Impacts

Built systems such as water wells and septic and sewer systems provide a potential source of groundwater contamination. Where these utility systems are disrupted during roadway construction, inadvertent discharges to groundwater may occur. No impacts are anticipated for the No-Build Alternative. Construction of the Preferred Alternative will not have an adverse impact to groundwater resources, assuming appropriate methods for locating and securing these utility systems is implemented prior to construction activities. No wellhead protection areas are known to exist within the proposed construction area.

The study area has been evaluated to determine the relative degree of groundwater aquifer vulnerability to highway construction and operation activities (SERGEM, 1993). The drift aquifer is considered most vulnerable to contamination, since most of the water supply to private wells is produced in the upper 100 feet of the aquifer. In general, the area north of US-12 contains more moderate and moderately high-risk land, while the area south of the highway contains more moderately low and low risk land. The location of the Preferred Alternative along the existing highway is predominately in low-to moderate-vulnerability areas.

The evaluation also identified an unnamed tributary to Paint Creek located just east of the US-12 study area between Munger and Ellis Roads in the Chicken Creek subwatershed. Although outside of the study area, this small creek is vulnerable to water quality degradation from local groundwater contamination and temperature increases. Paint Creek is a designated coldwater trout stream with temperatures maintained to a large degree by the groundwater discharge from the Chicken Creek subwatershed. Given the sensitivity and uniqueness of the Paint Creek watershed, stormwater management that focuses on protecting the groundwater resources of this watershed will be important.

Mitigation Measures

Minimizing the potential exposure routes will reduce impacts to groundwater resources. Impacts to built systems such as water wells and sewer lines will be reduced by sealing water wells and sewer lines within the proposed right-of-way. Sealing will be performed according to MDOT specifications, as approved by the Washtenaw County Department of Environmental Health. If the water table intersects the roadway sub-base, underdrains will be installed to intercept horizontal drainage. Flow will be rerouted through vegetated swales and will discharge to storm water management areas.

3.2 ECOLOGICAL ENVIRONMENT

This section discusses the existing terrestrial, wetland, and aquatic resources within the project area. The status of resources relative to Wild and Scenic Rivers, Navigable Waterways, and Threatened and Endangered Species is also documented. Detailed information for the ecological surveys conducted during the US-12 Improvement Study are documented in the Natural Resources Technical Report.

Terrestrial Resources

Throughout a majority of the study area, natural communities have been altered by past human use associated with farming and residential, commercial, and industrial development. Field observations of terrestrial resources, including vegetation and wildlife, were conducted in late summer and fall 2001 and again in spring 2002. Results of those observations are summarized below and are included in detail in the Natural Resources Technical Report.

Vegetation

A botanical review of natural plant habitats within the study area was performed in September 2001 and May 2002. Much of the undeveloped land adjacent to US-12 is active, fallow, or abandoned farmland. Most of the remaining vegetated areas are either highly degraded or dominated by non-native plant species.

One exception to the degraded land adjacent to US-12 is a 49-acre woodlot located west of Platt Road between US-12 and Textile Road (see Figure 3.1). As part of the Pittsfield Preserve, Pittsfield Township owns 37 acres of this woodlot. Site inspections conducted on September 13, 2001 and May 6, 2002 provided a representative list of species from this site. The following three plant community types were identified within the woodlot:

- Cut-over dry mesic and mesic forest
- Hardwood swamp
- Mixed scrub-shrub and emergent wetland

A plant species list and floristic quality assessment was compiled for each community type according to the methodology presented in Herman et al. (1996). No species on federal or state threatened, endangered or special concern lists were observed during the field surveys. However, diverse and high quality floras characterized the cut-over dry mesic and mesic forest and hardwood swamp community types. One hundred and fifty-three species were observed in the cut-over dry mesic and mesic forest community types, and these plants yielded a floristic quality index of 43.25. The hardwood swamp community type was composed of 78 plant species, with a floristic quality index of 34.65. Areas with floristic quality indices higher than 35 are considered to be floristically important from a statewide perspective (Herman et al., 1996).

Wildlife

A total of 65 species of birds, 15 mammals, three reptiles, and six amphibians were identified during a survey of the study area completed on April 27 and 28, May 11 and 12, and June 21 and 22, 2002. A majority of the species observed are common species that are tolerant of fragmented plant communities and urbanized landscapes.

Tracts of natural habitat in the study area, although small and scattered, are valuable to wildlife. The following two areas represent the largest fragments of natural habitat in the study area.

- The wetland west of the Ann Arbor Railroad
- The woodlot west of Platt Road between US-12 and Textile Road

These areas contained over one half of the wildlife species recorded. No other areas contained as many species.

No species listed as threatened, endangered or special concern were recorded during the field surveys. The woodlot west of Textile Road was evaluated for its potential as habitat for the federally-listed endangered Indiana bat (*Myotis sodalis*) (see Threatened and Endangered Species section, page 3-18).

Direct Effects

Direct Impacts resulting from the No-Build Alternative are not expected. No acres of woodland or critical habitat for threatened and endangered species would be taken for roadway construction. Construction of the Preferred Alternative will result in the loss of 0.5 acres of woodland to accommodate grading activities associated with road construction. This impact will occur at the woodlot west of Platt Road between US-12 and Textile Road, where the existing road will be widened to the north. Of this total, 0.3 acres will occur in the hardwood swamp community and 0.2 acres will occur in the cut-over dry mesic and mesic forest community. Additional wetland impacts are described below. Because a majority of the study area has been altered by past human use, direct effects to terrestrial resources resulting from the Preferred Alternative will be minor.

Wetland Resources

The methodology used to identify wetlands within the study area was consistent with the approach outlined in the MDEQ *Wetland Identification Manual* (MDEQ 2001). This includes field verifying the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. To categorize plant species that are characteristic of wetland (hydrophytic vegetation), MDEQ conforms with the federal practice by using the *National List of Plant Species That Occur in Wetlands Region 3 – North Central* (<http://www.nwi.fws.gov/bha/>). Both MDEQ and the federal agencies use the wetland fidelity ratings presented in this publication to determine if the vegetation in an area is dominated by plant species characteristic of wetland areas.

Wetlands were classified according to the “Classification of Wetlands and Deepwater Habitats of the United States” (Cowardin 1979). Level 2 functional evaluations were performed using the Wetland Evaluation Technique (WET II) (Adamus 1987) developed by the U.S. Army Corp of Engineers (USACE) Engineer Waterways Experiment Station and the Federal Highway Administration. This analysis identifies the important ecological functions each wetland provides. Appendix A includes a table listing wetlands by number, amount of impact, predominant Cowardin classification, and high WET II values. Figure 3.1 indicates the location of wetlands identified during the field survey. Figure 2.6 in Appendix H also shows the wetlands in the study area along US-12.

Wetland Characterization

Two types of wetland ecological systems occur in the study area according to the Cowardin classification: riverine and palustrine. Riverine systems in Michigan include all wetlands and deepwater habitats contained within a channel, with the exception of wetlands dominated by trees, shrubs, persistent herbaceous vegetation, mosses, or lichens. Palustrine systems in Michigan include all wetlands dominated by trees, shrubs, persistent herbaceous vegetation, mosses, or lichens. Some areas lacking vegetation may also be included (Cowardin 1979).

In the study area, the riverine systems are narrow streams associated with the Hertler-Nissley Drain, the Pittsfield No. 5 Drain, and the Koch-Warner Drain. Vegetation within the streams is primarily algae. The remainder of study area wetlands are palustrine systems controlled by the presence of surface and subsurface water. These systems include three classes of wetlands: (1) emergent wetlands (marshes, wet meadows, stream banks, and shallow open water ponds); (2) scrub-shrub wetlands (willow and dogwood thickets); and (3) forested wetlands (hardwood swamps) and a combination of these wetland types.

Emergent wetlands in the study area are characterized by persistent low vegetation such as cat-tail (*Typha spp.*), common reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), and rushes (*Juncus spp.*). Scrub/shrub wetlands are characterized by willow (*Salix spp.*), dogwood (*Cornus spp.*), elderberry (*Sambucus canadensis*), and buttonbush (*Cephalanthus occidentalis*). American elm (*Ulmus americana*), silver maple (*Acer saccharinum*), red maple (*A. rubrum*), green ash (*Fraxinus pennsylvanica*), bur oak (*Quercus macrocarpa*), and swamp white oak (*Q. bicolor*) dominate forested wetlands.

Many of the wetlands within the study area are relatively small and isolated, although some are considered to be of particular value because of size and quality of habitat. These include:

- a predominantly emergent wetland associated with the Pittsfield No. 5 Drain north and south of US-12 (#23) which is one of the largest wetland complexes in the study area;
- the forested wetlands interspersed among the upland hardwoods west of Platt Road between US-12 and Textile Road (#15) that contains a diverse flora; and
- a shallow, ponded emergent wetland east of Carpenter Road (#4), which is unique in the corridor.

Direct Effects

The No-Build Alternative will have no or only minor direct effects on wetlands. Construction of the Preferred Alternative will require filling of 4.4 acres of wetland habitat to accommodate road widening and grading. This includes taking of some small wetlands in their entirety as well as placing fill along the edges of larger wetland complexes where the proposed roadway improvement unavoidably crosses these features. A summary of impacts by wetland type is shown in Table 3.3. These impacts are split between both the Saline River and Paint Creek watersheds. The main WET II values of the wetlands impacted include floodflow alteration, sediment/toxicant retention, sediment stabilization, and wildlife diversity/abundance. Groundwater recharge and uniqueness/heritage were identified as important functions of the bigger wetland systems (#12, 21/22/23). General mitigation for wetland impacts is addressed in Section 3.12.

Table 3.3
Summary of Wetland Impacts

Wetland Number	Wetland Impact by Type (acres)			Impact (acres)	Watershed
	Emergent	Scrub/Shrub	Forested		
2	0.3	0.2	---	0.5	Paint Creek
8	0.6	0.2	---	0.8	Paint Creek
9	0.2	---	0.1	0.3	Paint Creek
10	0.1	0.4	0.1	0.6	Paint Creek
11	---	0.1	---	0.1	Paint Creek
12	---	---	0.1	0.1	Paint Creek
15	0.2	0.1	0.3	0.6	Saline River
21	0.4	0.1	---	0.5	Saline River
22	0.5	0.2	---	0.7	Saline River
23	0.2	---	---	0.2	Saline River
Total Impact	2.5	1.3	0.6	4.4	
Mitigation Ratio	1.5:1	1.5:1	2:1		
Total Mitigation	3.8	2.0	1.2	6.9	

Mitigation Measures

Impacts to wetlands will require a permit including compensatory mitigation under the Natural Resource and Environmental Protection Act (P.A. 451 of 1994), Part 303 – Wetland Protection administered by the MDEQ. Wetland mitigation adjacent to the study area is preferred by regulatory agencies so that replacement will occur as close to the impact as possible. A review of the study area for potential wetland mitigation sites was completed as part of previous US-12 studies (MDOT 1994). Although one site was identified previously, it did not provide sufficient area to compensate for wetlands to be impacted. Consequently, an off-site wetland mitigation site selection study was initiated.

The off-site mitigation study included both the Saline River and Paint Creek watersheds within Washtenaw County. Both of these areas are in the same ecoregion, the Ann Arbor Moraines subsection of the Washtenaw Subsection, as established in Regional Landscape Ecosystems of Michigan (Albert et al., 1986). The study included analysis of topography, land cover, soils and natural features (wetlands and woodlands) to screen areas that would meet the minimum requirements necessary for successful wetland creation. There was a focus on agricultural lands classified as Prior Converted by the National Resources Conservation Service (NRCS). Prior Converted wetlands are areas that previously contained wetland that have been cleared or drained (hydrology altered for agricultural use). Such areas have a high success rate for wetland restoration.

This investigation yielded 20 sites totaling over 1,100 acres meeting the criteria for wetland creation. A field review of these sites revealed one property owner who expressed an interest in making land available for wetland creation. This 118-acre site is located approximately nine miles west of the study area in Section 23 of Bridgewater Township (see Figure 3.2). The Bridgewater No. 2 Drain flows east through the center of the site, joining the Saline River approximately 1.5 miles downstream. Several agricultural ditches have been excavated on the property. A majority of the site is farmed Adrian muck. Adrian muck is classified as a hydric soil in Washtenaw County. The site is effectively drained by underground tiles that discharge to the agricultural ditches. The NRCS has classified the entire parcel as Prior Converted wetland.

In fall 2002, a field review of the Bridgewater Township property was completed with a representative of the MDEQ, who concurred that this site would meet the mitigation needs of the study. MDEQ has agreed to accept mitigation in the same ecoregion, even though wetland impacts are located in two watersheds. The wetland mitigation site has also been field reviewed and cleared of any environmental issues (see Appendix A).

A detailed wetland creation plan will be designed by MDOT that will restore adequate hydrology to this site to re-establish wetland habitats. The primary emphasis will be through manipulation of existing drain tiles and water elevations in ditches. A mitigation and monitoring plan will be prepared to document the development of the created wetlands. The plan will include performance criteria, address the control of invasive species and specify the protection of the mitigation area in perpetuity through use of a conservation easement. MDOT will make this plan available for review and approval by the appropriate agencies.

Aquatic Resources

The study area contains three perennial streams, identified as county drains, and located within the sub-watershed boundaries of the Saline River. These have been classified as primarily second quality feeder streams, although each has been subject to maintenance activities such as dredging and straightening.



US-12
IMPROVEMENT STUDY

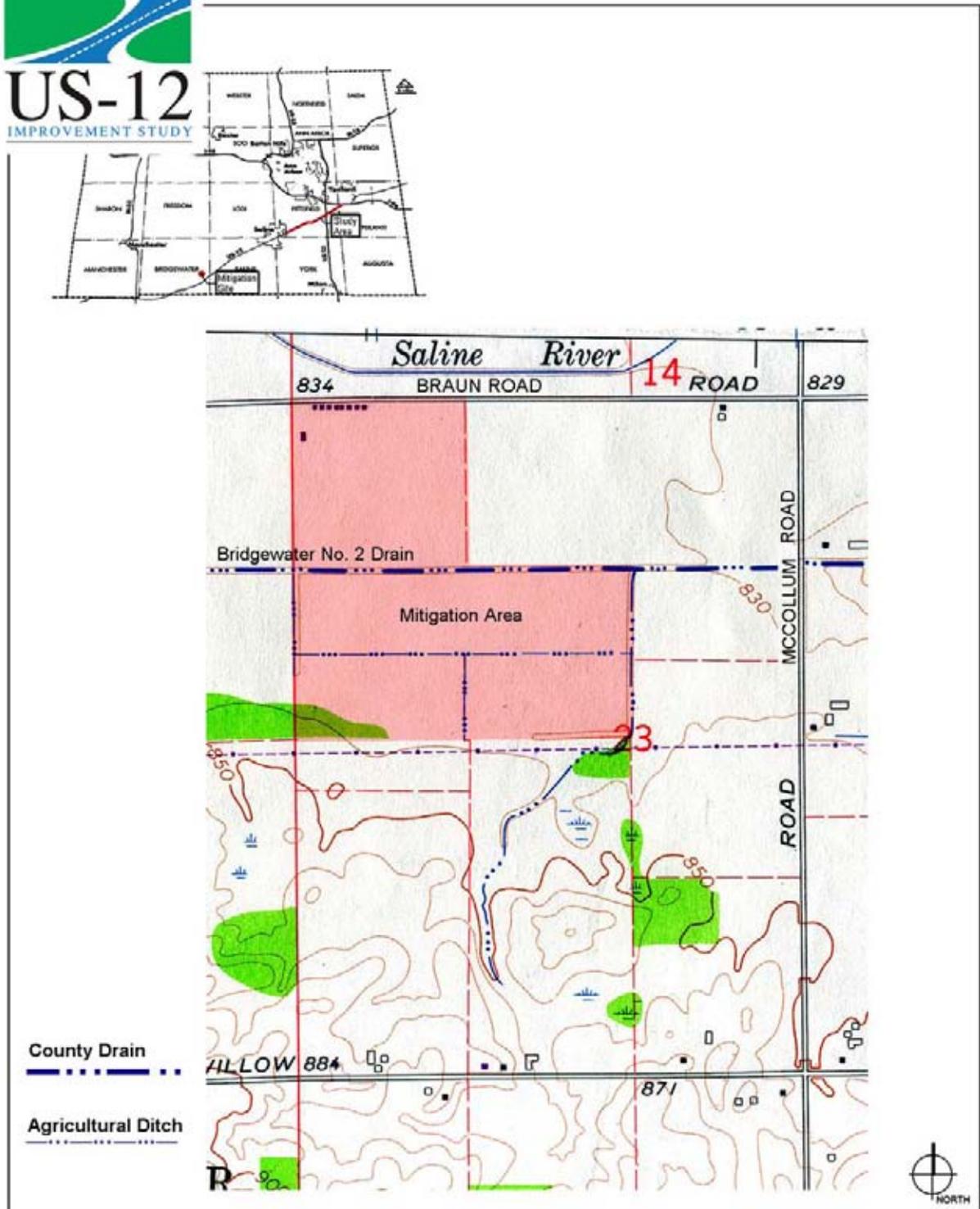


FIGURE 3.2
PROPOSED WETLAND MITIGATION SITE

Assessments of aquatic macroinvertebrates, fish, water quality, and aquatic habitat were conducted in the spring of 2002. MDEQ approved Great Lakes Environmental Assessment Section (GLEAS) Procedure #51 methodologies were utilized to rate the stream sites. Three sites were selected to allow assessments of significant aquatic resources. One site was located on the Koch-Warner Drain south of US-12 and immediately west of Platt Road (Site A). Two other sites were located on the Pittsfield No. 5 Drain: one just north of US-12 (Site B) and another downstream where Fosdick Road crosses the drain (Site C). These sites were selected because they are representative of conditions within each of the surveyed streams. The Hertler-Nissley Drain was not assessed due to the recent construction activities that have opened a formerly enclosed section of the drain. Subsequent evaluation of the recently opened section would not be meaningful, as it does not exhibit any signs of aquatic life or viable habitat.

Aquatic Macroinvertebrates

A total of 574 macroinvertebrates representing 24 families of aquatic macroinvertebrates was collected. Midge larvae (*Chironomidae*) were the dominant taxa recorded, comprising approximately 38 percent of the individuals collected. Net-spinning caddisflies (*Hydropsychidae*) were also abundant. Study area streams lacked sensitive families, such as stoneflies (Plecoptera) and certain species of mayflies (Ephemeroptera). This observation, coupled with the overwhelming dominance of one taxon, is indicative of nutrient enrichment and increased eutrophication. All sites received a rating of acceptable with a tendency toward poor, indicating that aquatic communities have suffered or continue to suffer from some form of degradation.

Fish

A total of 196 individuals representing 17 species were collected, of which blacknose dace (*Rhinichthys atratulus*) and creek chub (*Semotilus atromaculatus*) were the most abundant species collected. The streams exhibited low densities of individuals and a predominance of fish species that survive surface water quality and habitat impairment, and are considered tolerant of impaired environmental conditions. The fish community at Site A was not rated due to the low population of fish residing in the stream. Site B was rated acceptable tending towards poor, and Site C was rated poor. Overall, the fish communities in the streams within the project area appear to be impacted by dredging and variable stream flow and do not constitute a recreational fishery resource.

According to the MDNR Fisheries Division (MDNR 1996), streams in the study area fall within the green sunfish or creek chub association, which includes small warm-water streams with minimal groundwater contribution. Other fish species expected to occur in these streams include the Johnny darter (*Etheostoma nigrum*) and the stoneroller minnow (*Campostoma anomalum*); however these species were not found during the surveys. Lack of these species indicates that the streams are either in the process of being degraded or are recovering from habitat alteration.

Aquatic Habitat

Field assessment data and GLEAS rating of aquatic habitat are shown in Table 3.4. A score greater than or equal to 107 represents an excellent rating, a score ranging from 71 to 106 represents a good rating, and a score ranging from 35 to 70 represents a fair rating. Scores less than 35 are considered poor. Aquatic habitat of streams in the study area was rated from poor to good. This indicates that at survey locations, streams provide a wide range of habitats needed to support a moderately diverse ecosystem of aquatic organisms. Lack of riparian vegetation, new growth on dredge spoils alongside the stream, and stream straightening are evidence that aquatic habitat is in the early stages of recovery from past dredging activities. Site A was rated poor due to the amount of habitat alteration caused by dredging and straightening, and Sites B and C were rated good.

Table 3.4
Qualitative Aquatic Habitat Survey Results

Habitat Feature	Aquatic Habitat Survey Locations		
	A	B	C
Bottom Substrate: Available Cover	1	13	8
Embeddedness	1	13	7
Velocity: Depth	1	18	9
Flow Stability	3	13	9
Bottom Deposition/Sedimentation	3	9	5
Pools-Riffles-Runs-Bends	3	10	10
Bank Stability	7	9	9
Bank Vegetative Stability	9	10	10
Streamside Cover	3	9	9
Total Score	31	104	76
Aquatic Habitat Rating	Poor	Good	Good

Direct Effects

No direct effects are expected with the No-Build Alternative. Direct effects associated with construction of the Preferred Alternative will be limited to extensions of existing culverts. The lengths of these extensions are identified in Table 3.2. These effects will result in loss and displacement of aquatic resources, primarily warm water-tolerant macroinvertebrates and fish. Short-term effects include increased turbidity and sedimentation from construction activities. Long-term effects are associated with discharges of oils and grease from

accidental spills along the right-of-way and discharges of storm-water runoff containing highway contaminants. The Preferred Alternative is expected to have minor adverse effect on aquatic resources in the study area.

Mitigation Measures

Additional stream enclosure or work below the ordinary high water mark of any lake or stream requires a permit under the Natural Resources and Environmental Protection Act, Part 301 – Inland Lakes and Streams. It is anticipated that mitigation for all stream impacts will be required regardless of size or quality. This shall be achieved primarily through use of open-bottom box culverts where possible. Buried-bottom box culverts allow for the re-establishment of aquatic resources in the stream channel. Because the culvert extensions are relatively minor, no other mitigation is proposed.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System (PL90-542, 1968) was established to designate and preserve rivers with outstanding natural, cultural, or recreational features. No federally or state-designated Wild or Scenic Rivers are located within the study area; therefore, no impacts are expected for the No-Build and Preferred Alternatives.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) and the Michigan Department of Natural Resources (MDNR) Wildlife Division reviewed the records of occurrence in the study area of any federal or state-listed threatened or endangered plant or animal species, or species of special concern, and their associated habitat. According to the USFWS, the following species may occur in the study area:

<u>Common name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Indiana bat	<i>Myotis sodalis</i>	endangered
Massasauga rattlesnake	<i>Sistrurus catenatus catenatus</i>	candidate

According to MDNR, the Preferred Alternative is not expected to impact rare or unique natural features. In Michigan, the Indiana bat is also listed as endangered and the Massasauga rattlesnake is considered a species of special concern.

To investigate the possible occurrence of the Indiana bat in the study area, a habitat survey was completed in October 2001 (Kurta 2001). The survey ranked a mature 49-acre woodlot west of Platt Road between US-12 and Textile Road (see Figure 3.1) as highly suitable for Indiana bats. In particular, areas in the north-central and northeastern part of this woodlot showed evidence of storm damage that had killed and/or broken many trees, creating suitable foraging space and resulting in an abundance of potential roost trees. This area is located approximately 500 feet north of existing US-12.

A field survey of this woodlot was completed in June 2002 (Kurta 2002) following protocol recommended by the Indiana Bat Recovery Team (USFWS 1999). The survey yielded big brown bat (*Eptesicus fuscus*), red bat (*Lasiurus borealis*), and northern bat (*Myotis septentrionalis*). No Indiana bats were captured. A field review of this area was completed with representatives of the USFWS who confirmed that this woodlot contains suitable habitat for Indiana bat (see USFWS correspondence in Appendix A).

As part of the Pittsfield Preserve, Pittsfield Township owns 37 acres of this woodlot, including the areas identified in the north-central and northeastern part of this site. With the exception of this woodlot, no suitable threatened or endangered species habitat was identified in the study area.

Direct Effects

No direct effects are expected for the No-Build Alternative. Construction of the Preferred Alternative will require clearing of 0.5 acres of the woodlot identified above to accommodate road construction. This clearing will occur immediately north of and adjacent to existing US-12. The proposed road will be widened approximately 30 to 40 feet north of the existing edge of pavement. It will not directly affect the area identified as highly suitable Indiana bat habitat, which is located further north and east of the existing road. The primary effect of proposed activities will be a loss of some buffer area surrounding identified Indiana bat habitat.

Mitigation Measures

Regarding the woodlot to be impacted by the Preferred Alternative which contains Indiana bat habitat, mitigation will include restrictions on tree cutting to a period between November 1 and April 30. Tree clearing will be limited to clear zone areas within the proposed right-of-way.

Navigable Waterways

Section 10 of the Rivers and Harbors Act requires a permit from USACE for any obstruction to the navigable capacity of any water of the United States. No navigable waterways are located within the study area; therefore, no impacts are expected with the No-Build and Preferred Alternatives.

3.3 SOCIAL AND ECONOMIC ENVIRONMENT

This section provides an overview of social and economic characteristics of the study area. For the purposes of this section, the term study area refers to the area bounded by the municipal limits of the City of Saline and Pittsfield Township. Various social and economic considerations are discussed herein, including demographics, housing, economic setting, and community livability and cohesion. The Social, Economic, and Land use Technical Report contains more detailed information.

Population Levels and Trends

An examination of historic and forecast population levels and trends for the study area, as given in Table 3.5, shows that Pittsfield Township grew approximately 2.5 times as much as Washtenaw County from 1990 to July 2002, and Pittsfield Township is forecast to grow nearly three times as much as Washtenaw County between 2002 and 2030.

Table 3.5
Historic and Forecast Population Trends

	1990	2002	2030	Percent Change (1990 to 2002)	Percent Change (2002 to 2030)
Study Area					
Pittsfield Township	17,668	31,610	58,348	78.91%	84.59%
City of Saline	6,660	8,455	9,717	26.95%	14.93%
Total	24,328	40,065	68,065	64.69%	70.00%
Washtenaw County	282,937	331,529	433,205	17.17%	30.67%

Source: SEMCOG Population Estimates July 2002 and SEMCOG 2030 Regional Development Forecast for Southeast Michigan

Direct Effects

There are unlikely to be direct effects to population levels and trends from either the No Build or the Preferred Alternative.

Population Characteristics

Between 1990 and 2000, the population in the study area aged slightly and it is forecast to continue aging between 2000 and 2030. In Pittsfield Township, the percentage of the population in both the 35 to 64-year-old age group and the 65 + age group increased. Also, it is forecast that the proportion of population in Pittsfield Township 65 years and older will continue to increase between 2000 and 2030.

The population in the City of Saline did not age overall from 1990 to 2000. However, the population in the 5-to-17 and 35-to-64 year old age groups did increase slightly. Population in the 65 years and older age group is forecast to increase slightly from 2000 to 2030.

The aging population in the study area is likely to be accompanied by a rising demand for higher density residential development, such as condominiums and elderly apartment homes. This increase in higher density development could lead to increasing traffic levels on US-12.

Between 1990 and 2000, the percentage of population in the White and Black racial groups in Pittsfield Township decreased, while the percentage of population in the Asian, American Indian, and Other race categories increased. In 2000, 71 percent of the population in the Township was White compared to 78 percent in 1990, and 15 percent of the population was Black, compared to 17 percent in 1990.

The White percentage of population in Saline decreased very slightly from 1990 to 2000. At the same time, all other racial categories gained population. This racial shift in the study area is also occurring in the larger region and the rest of the U.S.

Direct Effects

There are unlikely to be direct effects to the age and population characteristics of the study area from either the No-Build or the Preferred Alternative.

Housing

From 1990 to 2000, there was a relatively large increase in the percentage of one-family detached houses in Pittsfield Township; a moderate increase in the percentage of one-family attached houses, and a dramatic decrease in the percentage of multi-unit apartments. All other categories remained stable. The Social and Economic technical report shows housing units by structure type in the study area.

The City of Saline experienced a relatively large increase in one-family detached houses from 1990 to 2000, while all other categories remained stable.

Direct Effects

There are unlikely to be direct effects to housing due to the No-Build Alternative.

There are going to be nine residential displacements due to a wider right-of-way with the Preferred Alternative.

Economic setting

Median Household Income

From 1990 to 2000, median household income increased for study area communities and Washtenaw County. Pittsfield Township experienced a higher increase in median household income (32 percent), than either Saline or Washtenaw County.

Jobs

In 2000 there were 18,327 jobs in Pittsfield Township and 7,461 jobs in Saline, for a total of 25,788 jobs in the study area (see Table 3.6). From 2000 to 2030, SEMCOG (2002) estimates that there will be a 59 percent increase in the number of jobs in Pittsfield and a 19 percent increase in the number of jobs in Saline. This represents a 51 percent increase in the number of jobs in the study area. This large increase in jobs and the forecast for an 85 percent increase in Pittsfield's population from 2000 to 2030 will greatly increase traffic on area roads, especially major thoroughfares such as US-12 (see Table 3.6).

Table 3.6
Historic and Forecast Job Growth, 1990 to 2030

	1990	2000	2010	2020	2030
Pittsfield Township	11,963	18,327	18,560	20,052	29,040
City of Saline	6,596	8,034	8,859	8,884	8,891
Total Study Area	18,559	26,361	27,419	28,936	37,931

Source: U.S. Census and SEMCOG, 2002

In Pittsfield Township, the three industrial-class employment categories forecast to gain the most jobs between 2000 and 2020 services, fire services and telecommunications. In Saline, the three industrial classes that will gain the most jobs between 2000 and 2020 are agricultural and natural resources, public administration, and services

In the study area overall, these individual community increases combine to result in the following top three industrial class employment gain categories forecast from 1990 to 2020: 145 percent in the services category; 119 percent increase in the telecommunications category; and 81 percent in the public administration industrial class.

Direct Effects

It is unlikely that the No-Build Alternative will have direct effects on the study area economy.

The Preferred Alternative would displace two businesses in the US-12 corridor. There may be a loss of some jobs and businesses due to these displacements for the proposed roadway improvements. These businesses and jobs may relocate within Pittsfield Township. There is also a potential loss of revenue to the Township resulting from the loss of jobs – the affected employees may no longer spend a portion of their earnings in Saline or surrounding communities. This loss, however, is likely to be minimal in relation to the high job increase forecast by SEMCOG for the study area.

Community Livability and Cohesion

The communities of Pittsfield Township and the City of Saline embody many of the characteristics used by FHWA to describe a “livable community,” and, with US-12 serving as a primary connecting roadway, travel between communities in the township is relatively convenient. However, the US-12 roadway also becomes a barrier to cross-traffic when traffic loads are particularly heavy.

Direct Effects

It is likely that increases in traffic congestion and further access limitations associated with the No Build Alternative for US-12 will undermine the accessibility and cohesiveness that currently help foster a sense of community within the US-12 study area.

Constructing the Preferred Alternative will directly affect the sense of community and cohesion in the study area, particularly for those communities in close proximity to US-12. In the short term, common travel routes will be redirected to accommodate construction activities. In the long term, the Preferred Alternative will ease vehicular congestion in the study area. Should the township choose to implement them, sidewalks and associated pedestrian crossings at the State Road, Industrial Boulevard and Platt Road intersections with US-12 will improve north-south pedestrian access across US-12.

Mitigation Measures

The following tools are suggested to mitigate effects of the Preferred Alternative on the social and economic environment:

- The City of Saline and Pittsfield Township should coordinate closely with MDOT in their efforts to design a roadway that provides good north-south and east-west connections for vehicles and non-motorized transportation modes to enhance community livability and cohesion.
- The City of Saline is working in cooperation with the Washtenaw Development Council, the Saline Area Chamber of Commerce and the Southern Regional Center of Washtenaw Community College to recruit and provide assistance to businesses, which will complement the Saline community. These efforts should be coordinated with transportation planning efforts along US-12 to maximize access, visibility and the efficiency of transporting goods and services for Saline area businesses.

3.4 LAND USE

This section provides an overview of existing land use and related characteristics in the study area. Subsections address a summary of land use planning and zoning; land use acreages; and, an overview of each land use classification including: agricultural, residential, commercial/industrial, institutional/municipal, public parks and recreational areas, and utilities. Following the description of land uses, direct, indirect and cumulative effects to land use and mitigation measures are discussed.

Land Use, Planning, and Zoning

Planning and zoning documents adopted for use in the study area include:

- *City of Saline Master Plan (1992)*
- *City of Saline Zoning Code (1993)*
- *Pittsfield Township Zoning Ordinance (2001)*
- *Pittsfield Township Comprehensive Plan (2002)*

The *Pittsfield Township Comprehensive Plan* provides detailed recommendations for US-12 improvements including an Access Management Amendment for US-12, which was adopted in December 2002. The land use portions of the City of Saline and The Pittsfield Township plans do not include land use acreages, therefore land use acreage data incorporated into this section is from the *Washtenaw County Comprehensive Plan (1998)*.

The City of Saline and Pittsfield Township share similar land use planning approaches. Both communities use capacity of existing infrastructure and compatibility between land uses to determine future land use patterns. They also promote diversity of housing options and commercial areas that will serve community residents.

Existing Land Use

Ford Motor Company's Visteon manufacturing facility is at the western study limit. Between the Visteon facility and Platt Road, the major land uses in the study area are agricultural, residential and commercial. From Platt Road to the eastern study area limits, land uses are primarily residential and commercial. The area surrounding the US-23 interchange and the Carpenter Road intersection is entirely commercial. In addition to single-family home developments, multifamily residential developments are also located in the eastern portion of the study area. Figure 3.3 shows the existing land use in Pittsfield Township and Figure 3.4 shows existing land use in the City of Saline. Table 3.7 shows land use acreage per land use type.

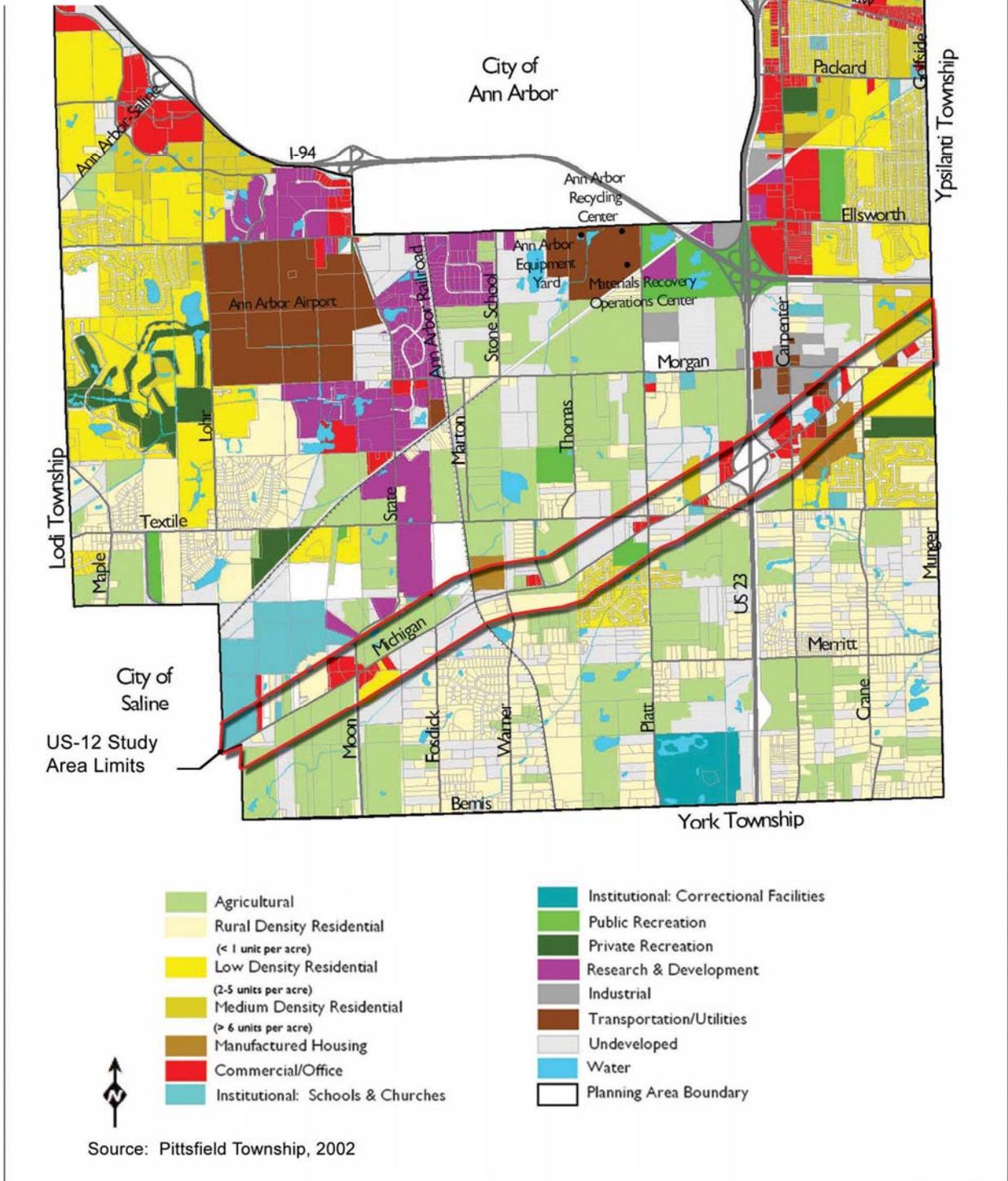


FIGURE 3.3
PITTSFIELD TOWNSHIP EXISTING LAND USE



US-12
IMPROVEMENT STUDY

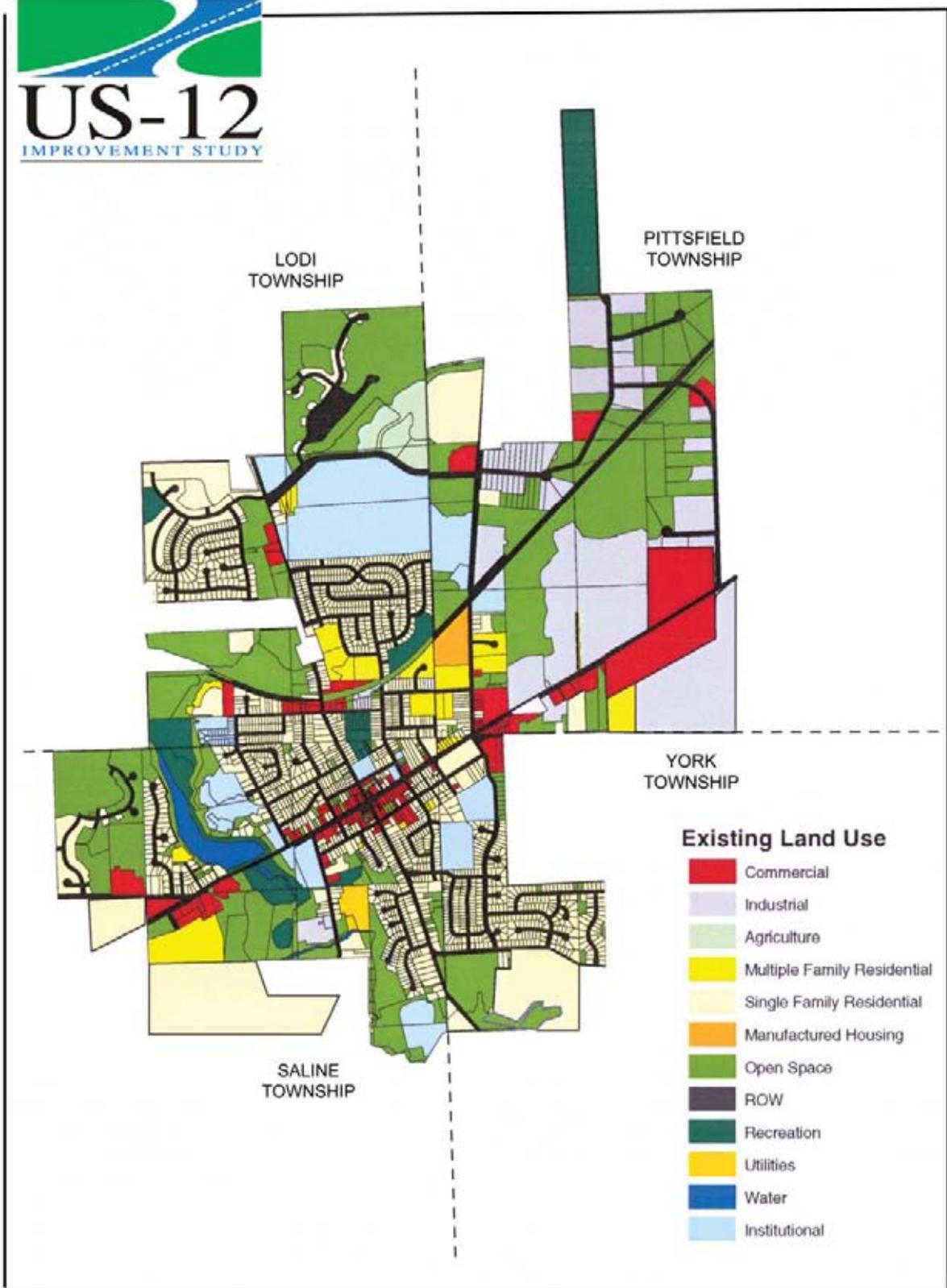


FIGURE 3.4
CITY OF SALINE EXISTING LAND USE

Table 3.7
Study Area Land Use Acreage and Percentage, 2001

Land use type	Pittsfield Township Land Use Acreage and Percentage of Total	City of Saline Land Use Acreage and Percentage of Total	Total Study Area Land Use Acreage and Percentage of Total
Agricultural	4,025 (24%)	N/A	4,025 (21%)
Single-family residential	3,486 (21%)	562 (24%)	4,048 (21%)
Multifamily residential	527 (3%)	77 (3%)	604 (3%)
Undeveloped Lands (Open, Recreation, Water and Right-of-Way)	7,636 (45%)	1,350 (58%)	8,986 (47%)
Commercial and office lands	678 (4%)	96 (4%)	774 (4%)
Industrial lands	482 (3%)	236 (10%)	718 (4%)
Total	16,834	2,321	19,155

Source: Washtenaw County Comprehensive Plan, 2001 (base data includes digital ortho-photos taken in April 1998 and current parcel data)

Non-Motorized Transportation Modes

With the exception of a short sidewalk section at Gateway Center at the west end of the study area, there is no accommodation for non-motorized transportation, i.e., designated bike lanes or sidewalks, in the study area. The current *City of Saline Master Plan* includes a system of safety path routes and scenic corridors in its Pathway Plan. The safety path routes, which accommodate both pedestrians and bicyclists are completely separate from the street system.

The need for pedestrian and bicycle facilities in the Township is also recognized in the 2002 *Pittsfield Charter Township Comprehensive Plan* which discusses the creation of “walkable”, or non-motorized, connections between residential areas and small local commercial nodes. For example, policy statements support “...an integrated motorized and non-motorized transportation system...” and recommend creating development areas that include “...non-motorized and motorized transportation systems linking key destination areas...” (*Pittsfield Charter Township Comprehensive Plan, 2002*).

In response to the Plan’s emphasis on encouraging development of a non-motorized transportation system, Pittsfield Township’s Citizen’s Greenways Committee has developed recommendations for non-motorized connections in the township. However, on-road bike lanes, particularly on US-12, are not a township goal. The Citizen’s Greenways Committee, charged with developing a conceptual greenways plan for the township, wishes to avoid the high traffic and conflicting vehicle uses on US-12.

The proposed Greenways Plan (not yet formally adopted) emphasizes off-road combined sidewalk/bike lanes to provide safer travel for children and families. Routes have been identified to provide non-motorized access to key destination centers within the township including township and county parks, commercial centers such as Sam's Club, business and office centers such as found in the State Road corridor north of US-12, and the new Saline Public School campus. Concern has been raised as to the problems of providing a safe crossing of US-12 for pedestrians and bikes as facilities and community services are developed within the Pittsfield Preserve.

In contrast to the recommendations of the Township, WATS believes US-12 to be an important non-motorized transportation route, as transit service will eventually be available, making transit/bike connections important. Possible links include Saline and Ypsilanti, with a potential commuter rail stop at Ypsilanti's Depot Town. Recreational weekend biking to rural destinations using US-12 are also considered potentially important links that will support local economies (Blackmore, 2002).

Direct Effects

The No-Build Alternative does not propose any non-motorized improvements along US-12.

Because there are no sidewalks (except for new or proposed development) or no bike lanes along US-12 in the study area and no current non-motorized use in the corridor, no direct effects are expected to occur to existing non-motorized transportation activities for the Preferred Alternative. However, appropriate placement of sidewalks and pedestrian crossing by the Township in areas of high future pedestrian activity, such as the US-12/State Road and US-12/Platt Road intersections, would facilitate improved non-motorized access north and south of US-12 in Pittsfield Township. In support of this, the right-of-way planned for the Preferred Alternative will accommodate a 10 foot-wide area beyond the curb for a future sidewalk/non-motorized network along the US-12 corridor.

Mitigation Measures

US-12 is recognized as a major road corridor whose aesthetic appearance represents Pittsfield Township's character to the traveling public, according to the Township's Comprehensive Plan. In recognition of this, 10-foot wide pathways are recommended in developed areas to promote connections within the Township. The addition of walkways and associated landscaping by the township would support local non-motorized transportation goals. Through this project, MDOT will provide right-of-way for sidewalks along US-12. Township implementation of this enhancement would support their interest in promoting non-motorized connections. This is particularly important in addressing the crossing of US-23 and supporting connection to Ypsilanti and other points east.

Residential Land Use

Approximately 21 percent (4,048 acres) of the study area is in single-family residential land use, and 3 percent (604 acres) is in multi-family residential land use. Within Pittsfield Township, there are currently eleven subdivisions and apartment complexes that connect to

the corridor. These represent 4,953 single-family residences, 543 multifamily housing structures and 701 manufactured housing units. In addition, five new residential or multifamily condominium developments that will add 698 single family units and 418 multifamily units are either approved or currently under review. These are in addition to scattered single-family residences along the entire US-12 study corridor and 577 manufactured housing sites in the study area. In Saline, there are 1,307 single-family residences, 112 multifamily housing structures and 77 manufactured housing units.

Direct Effects

Mobility and access to residential land uses along US-12 will continue to be impeded as traffic volumes increase on US-12. These effects will have the greatest impact on larger residential developments that generate a high trip volume on US-12. For the No-Build Alternative, access to these residential developments will become increasingly difficult as traffic continues to increase along US-12. While constructing the Preferred Alternative will displace ten residential units, it is likely to generally improve mobility and access to residential developments as a result of the expected increased capacity, and turning lane and intersection improvements.

Relocation assistance and services will be provided by the acquiring agency in accordance and compliance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) as amended, and Act 87, Michigan P.A. 1980 as amended. For more details, see Appendix B, *US-12 Conceptual Stage Relocation Plan*.

Commercial/Industrial Land Use

Commercial/industrial land use accounts for approximately 8 percent (1,492 acres) of the study area. Commercial land use is primarily concentrated around the intersections of US-12 and State/Moon Road, US-12 and Platt Road; and US-23 and Carpenter Road. Industrial complexes near the corridor that generate US-12 traffic include several complexes in the study area such as the Visteon Plant. Like residential land use, a number of new commercial/industrial developments are proposed or under construction in the study area, which are likely to significantly increase traffic on US-12. Together, they account for more than 430,000 square feet of new commercial/industrial space.

Direct Effects

For the No-Build Alternative, as traffic volumes continue to increase on US-12, mobility and access to commercial and industrial land uses in close proximity to the corridor will be impeded. This will negatively impact existing business activity and decrease the desirability of the area as a potential business location.

Construction of the Preferred Alternative will displace two existing commercial structures. In addition, there will be some loss of land for business expansion to ROW acquisition, however traffic access and mobility will improve supporting commercial and industrial expansion near the corridor.

Mitigation Measures

Displaced businesses will receive the same relocation assistance as provided for residential displacements (see Appendix B).

Institutional/Municipal Land Use

The *Washtenaw County Land Use Plan* does not currently have an institutional land use category; therefore land use acreage is not available for this land use. Other data from field surveys and interviews indicates that the study area includes a minimal amount of institutional land use.

Police and Fire Protection

The headquarters for the Pittsfield Fire Department and Police Station are located at 6227 W. Michigan Avenue (US-12), just west of the intersection of US-12 and Platt Road. A second Pittsfield fire station is located at the corner of Ellsworth Road and State Road, adjacent to the Ann Arbor Municipal Airport.

The City of Saline Fire Department is located at 205 E. Michigan Avenue east of Ann-Arbor-Saline Road. The Saline Police Department is located at 7605 N. Maple Road.

Government Offices

Pittsfield Township government offices are located at 6201 Michigan Avenue (US-12), near the intersection of US-12 and Platt Road. The Clerk's Office, and Planning and Zoning Department are both at this location.

The City of Saline government offices are located in the recently completed Saline Municipal Building at 100 N. Harris Street. This building houses the City Hall and new police station.

Schools

Pittsfield Township is served by the Saline, Milan and Ann Arbor school systems. The Ann Arbor and Saline school districts provide 10 schools within approximately 3 miles of US-12.

A new Saline Area elementary school and a new Saline High School are under construction on a 260-acre site east of the corner of State Road and Michigan Avenue. Together they are expected to generate approximately 4,100 trips per day within confined periods of time. Together with the new Washtenaw Christian Academy under construction at the southwest corner of US-12 and Moon Road, these new institutions are expected to have a noticeable impact on the traffic load on US-12.

Direct Effects

Without added capacity to address increasing traffic congestion, the No Build Alternative may increase response times for police and fire departments. In addition, concentrated congestion generated by school traffic between State and Moon roads at peak travel times may negatively impact the capacity for safe travel in this section of the corridor.

The Preferred Alternative will better facilitate critical response times for fire and police , and will more safely serve the increased traffic generated by the new Saline Area School campus and the Washtenaw Christian Academy by providing for smoother and more efficient traffic flow between these institutions and US-12.

Farmland

Prime farmlands are identified by the U.S. Department of Agriculture Natural Resource Conservation Service (USDA NRCS) as having the best combination of physical and chemical characteristics for the production of food, feed, forage, fiber and oilseed crops under average farming method conditions. Four prime farmland soil types occur within the study area: Blount loam, Morley loam, Napanee silty clay loam and St. Clair clay loam. The prime farmland soils found in association with land zoned as Agricultural District within the study area are found on both sides of US-12 between Platt Road and Industrial Park Drive. Exceptions to the agricultural zoning in this area include: (1) commercial and office developments at the US-12 intersections with Platt Road, Old State Road and State Road/Moon Road, (2) large residential subdivisions like Warner Creek west of Platt Road and Rolling Hills west of State Road, and (3) the Pittsfield Township office also located west of Platt Road.

Approximately 21 percent (4,025 acres) of the study area is in agricultural land use. No farmland along the US-12 corridor is enrolled in either the State Purchase of Development Rights (PDR) program or Part 361 (formerly known as PA 116) of PA 451, of 1994 as amended.

Direct Effects

The No-Build Alternative is not likely to have any direct effects on agricultural land along the US-12 corridor, and much of the agricultural land along US-12 in the Township is planned for conversion to other uses. As required by the Federal Farmland Protection Policy Act an A.D. 1006 form was prepared and submitted to the U.S. Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS).The overall farmland conversion score prepared for the Preferred Alternative and submitted to the NRCS as part of the project review is 118.3 (Site A) out of a possible 260 points (see Appendix C). Site A is the Preferred Alternative and Site B is Alternative 1-N. This low score results from the proximity of agricultural land to urban areas, a lack of on-farm investments in this area and the limited effect of the project on conversion of existing farm support services. Direct effects of the Preferred Alternative on agricultural land are expected to be minor and limited to additional right-of-way acquisition along the existing roadway.

Open Space, Public Parks and Recreational Areas

Approximately 46.9 percent of the study area is classified as undeveloped land. This classification includes open space, recreation, water and right-of-way (classification from *Washtenaw County Comprehensive Plan*). The open space land contains either woodlands and wetlands or it applies to prairies and open fields. Many of these areas are wildlife habitat and they add to the rural character of the study area.

Pittsfield Preserve. In April 2002, Pittsfield Township purchased approximately 540 acres of undeveloped land north of US-12 to create the Pittsfield Preserve. The Pittsfield Preserve was added to the Pittsfield Township park system in an amendment to the parks Master Plan on December 17, 2002. The park boundary touches US-12 in two locations, the largest of which lies between Campbell and Platt Roads across from and immediately west of the entrance to the Warner Creek subdivision. The Township is currently programming a variety of passive and non-passive recreational uses for this new community park. The Preserve may also serve as the future location for a new community center and Department of Public Safety building for the Township.

Direct Effects

There are unlikely to be any direct effects to public parks and recreational areas with the No-Build Alternative.

The Preserve is located on US-12, immediately west of Platt Road. Construction of the Preferred Alternative will require acquisition of a limited amount of right-of-way (1.4 acres) along approximately 1,100 feet where this park abuts the existing roadway. The Township's 2002 Comprehensive Plan supports preserving right-of-way for upgrading Michigan Avenue (US-12) as part of its transportation policy.

Mitigation Measures

Pedestrian access to this recreational area will be improved with the Preferred Alternative through installation of a cross-walk at Platt Road. Other mitigation measures are discussed in Section 4.6 (Section 4(f) Evaluation) of this EA.

Utilities

The US-12 corridor is not only used by vehicular traffic, but also serves as a utility corridor. Contained within and running adjacent to the US-12 right-of-way are utility easements for private utilities such as Ameritech (phone), Comcast (cable), Detroit Edison (electric), Verizon (phone and fiber optic), and Michigan Consolidated Gas (natural gas). Also, the Washtenaw County Drain Commission is responsible for the three county drain crossings within the area.

In addition, municipal sanitary sewer and water lines along US-12 are owned and operated by the City of Saline, Pittsfield Township, and Washtenaw County. Sanitary sewer and water service extends from the intersection of Moon Road and US-12 to the eastern study limits. The sewer continues beyond the study limits to the Ypsilanti Community Utility Authority's (YCUA) Golfside Interceptor and wastewater treatment plant. YCUA also provides the Township with treated water.

Direct Effects

Minor direct effects are expected by the No-Build Alternative. Some utility relocations may be required as a result of minor planned intersection or roadway improvements.

The Preferred Alternative will affect utilities within the proposed four-lane boulevard section of US-12 as well as the intersections of US-12 with Moon/State Roads, Platt Road, and Carpenter Road. Significant utility relocation will be necessary in these locations due to the widening and intersection improvements. The natural gas and fiber optic lines that run the length of the US-12 corridor will require relocation at multiple locations due to the various crossings along the route.

Mitigation Measures

Prior to construction, all potential utility conflicts will be determined and possible solutions will be brought forward for discussion.

3.5 ENVIRONMENTAL JUSTICE

The purpose of Executive Order 12898 on Federal Actions to address Environmental Justice in Minority and Low-income Populations is to identify, address, and avoid disproportionately high and adverse human or environmental effects on minority and low-income populations. Disproportionately high and adverse human health or environmental effects on minority and low-income populations are not anticipated as a result of this project.

The occurrence of minority or low-income populations was determined by an evaluation of U.S. Census data, Michigan State Housing Development Authority (MSHDA) data, interviews with local Housing Commissions, and public involvement activities.

A detailed analysis of the U.S. Census data indicates that minority populations are present at the block level; however, there are none greater than the percent minority for the State of Michigan and Washtenaw County, 19.6 percent and 21 percent respectively (see Figure 3.5). Economic data from the 2000 census was used to determine the presence of low-income populations. According to the 2000 economic data, there is a percentage of the population below the poverty level within the study area. However, this percentage is equal to or below the average for the State of Michigan and Washtenaw County, 10.5 percent and 11 percent respectively. (see Figure 3.6).

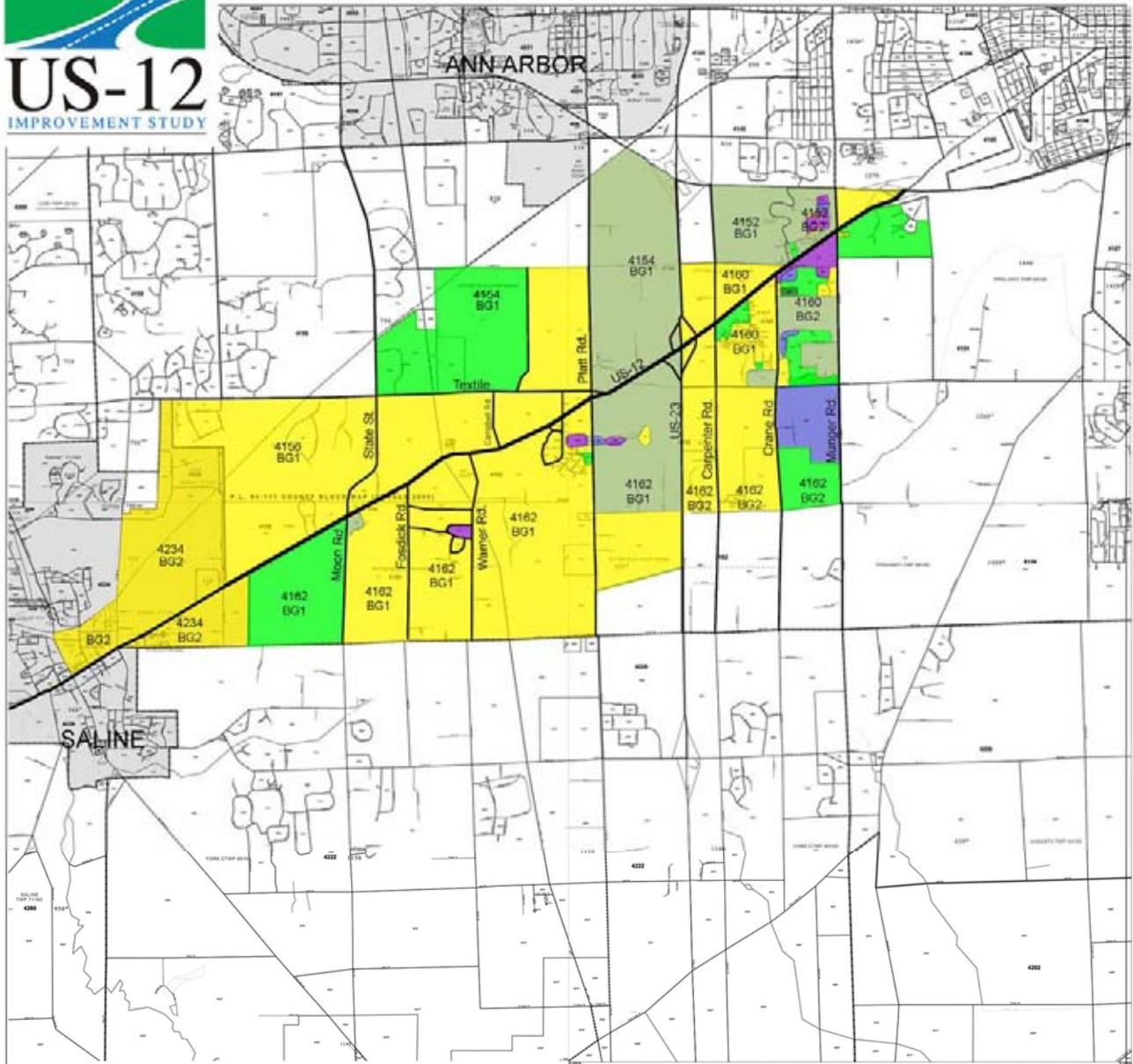
A review of the Michigan State Housing Development Authority subsidized housing directory for Washtenaw County indicates that there is no subsidized housing, which includes Section 8, public housing and Section 236, in the study area.

Local housing commissions for Pittsfield Township, Ann Arbor, Ypsilanti, and Plymouth were contacted to collect information on the presence of Section 8 or public housing in the study area. Each commission indicated there is not a concentration of people receiving public assistance. Every effort will be made to involve impacted groups in the project development process and to avoid or mitigate these impacts.

The Preferred Alternative may benefit all Pittsfield Township residents by reducing traffic congestion on US-12. However, temporary short-term impacts may occur during roadway construction such as increased construction noise, increased traffic volumes on adjacent local roads, and travel delays during the widening of US-12.



US-12
IMPROVEMENT STUDY



Percent Minority along US-12 Corridor

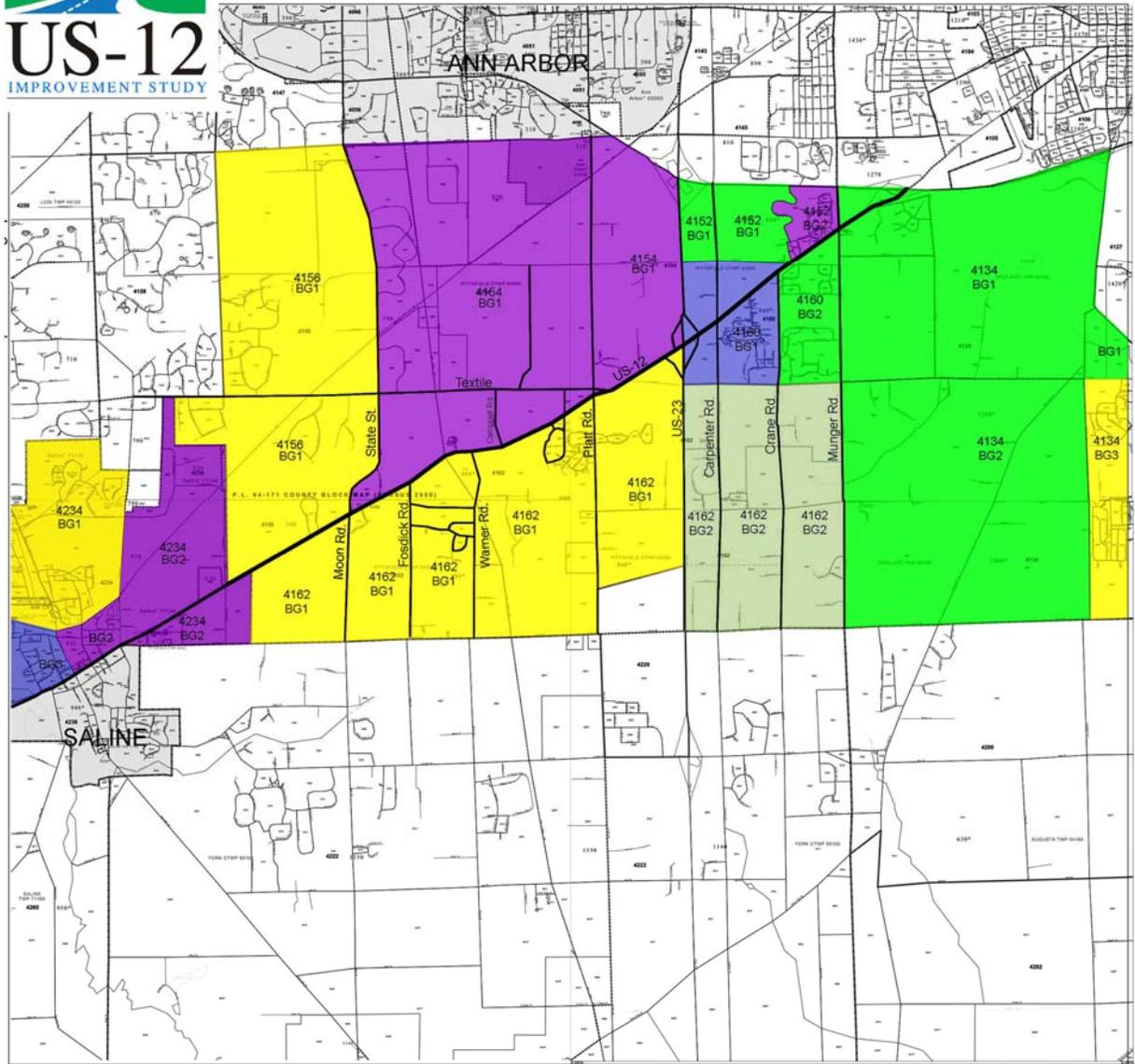


LEGEND

4156 Census Tract Number
BG1 Block Group Number



FIGURE 3.5
MINORITY REPRESENTATION IN THE STUDY AREA



Percent Poverty along US-12 Corridor



LEGEND

4156 Census Tract Number
BG1 Block Group Number



FIGURE 3.6
HOUSEHOLDS AT POVERTY LEVEL IN THE STUDY AREA

Direct Effects

The Preferred Alternative will not have a disproportionately high and adverse effects on minority or low-income populations within the study area. Although there are no environmental justice issues associated with the proposed improvements at this time, a continuing effort will be made to identify disproportionately high and adverse impacts to minority and low-income populations during subsequent phases of this project.

If such impacts are identified, every effort will be made to involve the impacted groups in the project development process, and to avoid or mitigate any potential impacts that may result from the proposed project.

3.6 CULTURAL RESOURCES

Historical Resources

For the purposes of the US-12 Improvement Study, the Area of Potential Effect (APE) consisted of all properties within approximately 0.25 miles of the following portions of the study area, including:

- those locations where a 4-Lane Urban Boulevard design might be employed, or that section of the 1-N Alternative located off the existing US-12 alignment

For the area beginning just east of Platt Road, where the only proposed alternative was the five-Lane Urban Arterial, the APE was reduced to those structures adjacent to the roadway.

Evaluations of historical resources in the study area were performed according to MDOT guidelines for historical property investigations. These evaluations included conducting research at local and other libraries, conducting personal interviews with key people knowledgeable about the properties, and taking photographs of all nine properties to depict their characteristics and their relationship to US-12. Results of the evaluations are discussed in *Evaluation of Above-Ground Cultural Resources, Reconstruction of US-12* (CCRG, 2002).

During the study each property was assessed according to standards established for listing on the NRHP. Except under exceptional instances, these standards require a property to be at least 50 years old and exhibit integrity of location, design, setting, materials, workmanship, feeling, or association. The standards also require the property to meet one or more of the following four National Register Criteria for Evaluation:

- A Association with events that have made a significant contribution to the broad patterns of history
- B Association with the lives of persons significant in the past
- C Embodiment of distinctive characteristics of the type, period, or method of construction; representative of the work of a master; possession of high artistic

value; or representation of a significant distinguishable entity whose components may lack individual distinction

D Ability to yield information important in prehistory or history

During the early 1990s, MDOT initiated consultation with the Michigan State Historic Preservation Office (SHPO) to identify architectural resources in the study area. Preliminary surveys identified 32 pre-World War II sites along the US-12 study area, six of which were determined to be eligible for inclusion on the National Register of Historic Places (NRHP). The six properties included the following: 7640, 7500, 7443, 7125, 5896, and 5138 Michigan Avenue.

During the course of the US-12 Improvement Study, MDOT requested the re-evaluation of the properties previously surveyed and found to be significant, and evaluation of any other properties in the APE not previously documented. A field review confirmed that all above-ground resources at least 50 years of age in the APE had been previously surveyed.

The study included field investigations undertaken in May and July 2002. In total, 10 properties were evaluated for possible eligibility for inclusion on the NRHP during the current study. Six of the properties were determined to be eligible for inclusion on the NRHP during the previous study. MDOT requested that a seventh property, the Harwood house, might be considered culturally significant because of its association with persons or events significant in local history. Two additional properties, the Valentine School and the Asher Aray house, were subsequently added to the investigation at the request of the Saline Area Historical Society and the Washtenaw County Historic District Commission.

During this re-evaluation, five of the 10 properties were determined to be eligible for inclusion on the NRHP, because they contain at least one structure which meets one or more National Register Criteria for Evaluation. Also, the Valentine School was added to the NRHP eligibility list after the SHPO asked that further research be conducted to determine its historical significance, based on a request from representatives of the Saline Area Historical Society (SAHS) and the Pittsfield Township Historical Commission (PTHC). The additional research was conducted by SAHS and PTHC and submitted to the SHPO. Therefore, a total of six properties in the study area are considered NRHP – eligible. These six properties are shown in Figure 2.6 and described in Table 3.8.

The other four properties evaluated during the current study were determined to be not eligible for inclusion on the NRHP, due to their lack of integrity and undistinguished character. These properties include:

- 5896 Michigan Avenue (Hoy/Roberts Farmstead). (Note: This building is no longer standing).
- 7125 Michigan Avenue (Hertler House)
- 5843 Michigan Avenue (Asher Aray House)
- The Chicago Road (US-12 itself, i.e., Michigan Avenue) in the study area

Table 3.8
Historic Properties in the Study Area

Property	National Register Criteria	Description	Impacts of the Preferred Alternative
Rentschler Farmstead 7640 Michigan Avenue	A C	Highly intact farmstead complex, associated with events relating to southeast Michigan's agricultural history. Currently owned by the City of Saline and managed since 1999 as a farm museum/working farm. Mid 1850s-era farmhouse is excellent example of Queen Anne style Gabled Ell form.	No property acquisition required. The new road will not be closer to the farmstead buildings than the present road. Yard vegetation and existing driveway (i.e., current property access) to be maintained.
Morton-Hertler House 7500 Michigan Avenue	C	1840s-era farmhouse and associated outbuildings. Considered an incomplete representation of an early farm. Farmhouse has unique combination of Greek Revival and Italianate elements. House currently used as a construction office for the planned Saline Area School complex.	Potential relocation or demolition of house. This resource had been scheduled for demolition by the Saline Area Schools, the property owner. Local stakeholders would like to provide a suitable place for relocation.
Brown-McCoy House 7443 Michigan Avenue	C	1850s-era farmhouse and associated outbuildings currently obscured from roadway by mature vegetation. Although there have been some alterations to the building, the farmhouse is considered an excellent example of the Italianate style.	No property acquisition required, and new roadway will remain approximately the same distance from the house and farmstead as the existing roadway. Yard vegetation that is not within the proposed right-of-way, and the existing driveway (i.e., current property access) will be maintained.
Valentine School 7172 Michigan Avenue	C	1860s-era former one-room schoolhouse, currently vacant, but previously used as a rental residential property, resulting in alterations to the original exterior. One of 2 extant one-room schoolhouses located in the Township.	Potential relocation or demolition of building.

Property	National Register Criteria	Description	Impacts of the Preferred Alternative
Harwood House 6356 Michigan Ave.	A and B	1840s-era home of early historical period in the settlement of Washtenaw County, William W. Harwood. Harwood was associated with the first grist mill in the County, assisted in the platting of Ypsilanti and served as a conductor for the Underground Railroad. Portion of Farmstead that is eligible includes farmhouse and associated grounds around house.	Potential relocation or demolition of buildings.
Boss-Schmidt House 5138 Michigan Avenue	C	1870s-era farmhouse and associated outbuildings, one of which is currently used for the main showroom of Schmidt's Antiques. Farmhouse has the distinctive characteristics of a Gabled Ell house with Italianate features.	Roadway to pass within approximately 40 feet of the house. Acquisition required of a narrow, 10-foot-wide portion of land in front of the house. Existing driveway (i.e., current property access) and yard vegetation and landscaping to be maintained, but vegetation on opposite (south) side of road to be removed.

Source: *Evaluation of Above-Ground Cultural Resources, Reconstruction of US-12, August 2002.*

Direct Effects

No direct effects are anticipated with the No-Build Alternative. Table 3.8 describes the direct impacts that would result from implementation of the Preferred Alternative. Three historic properties would be potentially relocated or demolished and one property requires property acquisition. The SHPO has issued a Determination of Effects letter for the historic resources in the US-12 study area (see Appendix D).

Mitigation Measures

Mitigation measures covering NRHP-eligible properties affected by the Preferred Alternative are outlined in the Section 106 Consultation Memorandum of Agreement (MOA) (see Appendix D).

Archaeological Resources

No archaeological studies were performed in the study area during the US-12 Improvement Study. However, information from prior field investigations was reevaluated and determined

to be valid. In 1992, a Phase I archaeological site location survey was conducted for the study area. This survey located 19 archaeological sites, including 16 prehistoric sites, two multi-component (prehistoric and historic) sites, and one historic site. The State Archaeologist's office required that four of the prehistoric sites be subjected to Phase II archaeological testing in order to determine their eligibility for listing on the NRHP as significant resources likely to yield information important in prehistory. Phase II testing indicated that none of the four prehistoric sites met the requirements for listing on the NRHP.

The SHPO determined that US-12 improvements would not affect archaeological resources included on or eligible for inclusion on the NRHP. (see November 1, 1993 SHPO letter in Appendix D.)

3.7 VISUAL RESOURCES

Regional Landscape Character

The study area landscape adjacent to the US-12 corridor is one typical of outlying suburban areas across the country where development is interspersed with active or fallow farm fields, wetland complexes and scattered woodlots. There is generally no integration between the architectural features of each development or between a given development and its surrounding landscape, and while the township has taken active steps to acquire land to preserve open space, most of the views along the US-12 study area are of residential or commercial development.

Direct Effects

No direct effects to visual resources are expected as a result of the No-Build Alternative. For the Preferred Alternative, the boulevard section east of the Brown-McCoy Farmstead to west of the Ann Arbor Railroad will help maintain an open visual character in this rapidly developing section of the study area. In addition, using curb and gutter throughout the corridor will improve the appearance of the road by introducing a finished pavement edge and eliminating sections of deteriorating gravel shoulder and mismatched driveway connections that contribute to negative visual impressions.

Mitigation Measures

Implementing the Preferred Alternative could provide an opportunity to improve the existing visual landscape of US-12 using a variety of enhancements such as:

- Screening negative views;
- Emphasizing a "Main Street" character;
- Landscaping key gateway areas and road edges;
- Preserving remaining areas of scenic value;
- Preserving historic features;

- Promoting pedestrian connections; and
- Building visual coherence and integrity by incorporating common visual elements the length of the study area.

Often this aesthetic integration is achieved through shared colors and styles applied to common elements within foreground views. A landscape treatment of the boulevard and roadside edge will also offer seasonal color and textural change. Because of the speed of travel, traffic loads, and level of commercial development, treatment strategies that improve foreground views will have the greatest beneficial impact on visual resources.

Further development or re-development along US-12 should occur in ways that support integration. Aesthetic elements that may be introduced include sidewalks, pedestrian-scale street lighting of a consistent architectural style, and landscape improvements such as street trees, landscaped planting beds and lawn areas. The more this type of landscape treatment can be consistent and integrated throughout the study area, the stronger its impact at creating a unique identity that is visually pleasing.

Support for these types of aesthetic treatments is beyond the level of MDOT responsibility and must be initiated by Pittsfield Township. However, funding is available to support these efforts through a variety of grant programs such as the state/federally funded Transportation Enhancement (TE) program. MDOT is willing to support the Township should they choose to apply for TE funding to implement these types of enhancement strategies.

3.8 AIR QUALITY

This section summarizes existing air quality conditions, as well as Year 2010 (first year of operation) and 2025 (design year) carbon monoxide concentrations for the Preferred Alternative. Details of the air quality analysis for the US-12 Improvement Study are outlined in the October 2003 *Air Quality Analysis Technical Report*.

Regulatory Setting

Under the authority of the Clean Air Act and the 1990 Clean Air Act Amendments (CAAA) [42 U.S. Code (USC) 7401 *et seq.*], EPA established a set of primary and secondary Ambient Air Quality standards for six criteria pollutants was established. The primary standards are intended to protect the public health. Secondary standards are intended to protect public welfare and are based on a pollutant's effect on vegetation and other materials. The primary standards for each of the six pollutants is shown in Table 3.9 Except for sulfur dioxide and carbon monoxide, the secondary standards are the same as the primary standards for all pollutants. Michigan's Ambient Air Quality Standards are identical to the Federal standards shown in Table 3.9.

Table 3.9**Summary of Federal and State Primary Ambient Air Quality Standards**

Pollutant	Averaging Time	Primary Standard
Particulate Matter, 10 micrometers (PM ₁₀)	Annual Arithmetic Mean	50 ug/m ³
	24-hour	150 ug/m ³
Particulate Matter, (PM _{2.5})	Annual Arithmetic Mean	15 ug/m ³
	24-hour	65 ug/m ³
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	0.03 ppm (80 ug/m ³)
	24-hour	0.14 ppm (365 ug/m ³)
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m ³)
	1-hour	35.0 ppm (40 mg/m ³)
Ozone (O ₃)	1-hour/day	0.12 ppm (235 ug/m ³)
	8-hour/day	0.08 ppm (157 ug/m ³)
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.053 ppm (100 ug/m ³)
Lead (Pb)	Maximum Quarterly Average	1.5 ug/m ³

Source: EPA/MDEQ

ppm parts per million

ug/m³ micrograms per cubic meter of air

Generally, when levels of pollutants do not exceed the annual average standards and do not exceed the short-term (1-, 8-, and 24-hour) standards more than once per year, an area is considered in attainment of the National Ambient Air Quality Standards (NAAQS). According to the 2000 Air Quality Report, which is published by the MDEQ Air Quality Division, the study area is in attainment for all six of the pollutants covered by the NAAQS.

Historic and Current Ambient Air Quality

The Michigan Air Sampling Network includes two monitoring stations in Washtenaw County, one in Ann Arbor and one in Ypsilanti. The Ann Arbor site measures particulate matter (PM_{2.5}). Since air monitoring began in 1999, there have been no violations for a 24-hour average or an annual. The Ypsilanti site measures air toxics, ozone, and PM_{2.5}. In the past five years, there were no violations of the one-hour ozone standard at this site, although there was a violation of the eight-hour ozone standard at this site, according to 1999-2001

monitoring data. (In determining violations for both one-hour and eight-hour ozone standards, a three-year average is used.) In Michigan, monitoring for fine particulate matter (PM_{2.5}) began in mid-1999. The fine PM standard has two forms, one based on a 24-hour average and the other is based on an annual average. Because full three years of data is needed to determine violations of the annual PM_{2.5} standard, data is not yet available. However, there have been no violations of the 24-hour PM_{2.5} standard since 1999.

Conformity

The study area is located within a designated maintenance area under the one-hour ozone air quality standard. Accordingly, a conformity determination is required under 40 CFR Part 93 (“Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act”). The US-12 improvement project is part of the SEMCOG *2025 Regional Transportation Plan*; therefore, it is included in SEMCOG's conformity analysis. The Michigan state 2003-2005 Transportation Improvement Plan (*TIP*) is currently being updated. The study area is in attainment for all other air pollutants.

Carbon Monoxide Microscale Analysis

Since carbon monoxide (CO) is a site-specific pollutant whose major concentrations are generally found immediately adjacent to roadways, it is usually of concern on a local, or microscale, basis. Therefore, a CO microscale air quality analysis was performed. This analysis evaluated local CO levels at receptor sites located near major intersections.

Since data on street-level CO concentrations was not available, microscale CO levels for the study area were estimated through the use of computerized mathematical models. The most recent mobile source emissions factors issued by EPA, known as MOBILE5B, were used, following Conformity Regulations dated November 11, 1993 (40 CFR Part 93). The CAL3QHC model, Version 2.0 (EPA, 1992), was the intersection model used for this analysis.

For this project, edge of right-of-way receptors were identified at the US-12 intersections of Carpenter Road, Platt Road, and State Road/Moon Road.

CO was selected as the air pollution indicator to be evaluated for this project because automobiles and trucks are major sources of CO emissions. Using the models, CO levels were calculated for the peak one-hour and eight-hour time periods, corresponding to the averaging periods of ambient CO standards. Default background CO concentrations of 3.0 and 1.5 ppm were used for the one-hour and eight-hour analyses, respectively. For future year analyses, no rollback was used to adjust the background concentrations. CO concentrations were calculated for “worst case” receptors for the years 2001 (existing), 2010 (first year of operation), and 2025 (design year). A “worst case” receptor is typically defined as a location nearest the roadway segment with the highest traffic volumes and lowest average speeds on the project route and nearest to a high volume crossroad where an individual is likely to be found for the time extent in the NAAQS.

As shown in Table 3.10, maximum existing one-hour average CO concentrations were estimated to range from 5.5 to 7.8 ppm for the receptors analyzed. The estimated eight-hour average concentrations range from 3.3 to 4.9 ppm. These estimated concentrations are below the NAAQS one-hour and eight-hour standards of 35.0 and 9.0 ppm, respectively. The highest existing CO concentrations is estimated at the intersection of Carpenter Road and US-12. CO concentrations were modeled at Platt Road to address Pittsfield Township's and residents' concerns expressed at a January 2003 Stakeholder Meeting.

Table 3.10
Predicted Carbon Monoxide Concentrations (in parts per million)

US-12 Intersection	2001 Existing		2025 No Build		2010 Build (Preferred Alternative)		2025 Build (Preferred Alternative)	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
Carpenter	7.8	4.9	7.0	4.3	7.4	4.6	7.8	4.9
Platt	6.6	4.0	5.8	3.5	6.0	3.6	6.2	3.7
State/Moon	5.5	3.3	5.2	3.0	5.4	3.2	5.6	3.3

*Note: 1-hour background = 3 ppm
8-hour background = 1.5 ppm*

Direct Effects

The results of the microscale CO analysis indicate that the No-Build Alternative and Build Alternative will not result in violations of either the one-hour (35.0 ppm) or eight-hour (9.0 ppm) NAAQS for CO. All of the predicted 1-hour CO concentrations are well below the NAAQS of 35.0 ppm. The highest predicted 8-hour concentration, 4.9 ppm at the Carpenter Road intersection, is below the NAAQS of 9.0 ppm (see Table 3.10). It is unlikely that this level would actually be experienced because conservative assumptions were built into the CO analysis, including the location of receptors along the edge of the right-of-way, which means a person would have to be located on the right-of-way for 8 hours consecutively to experience the calculated maximum CO concentration.

Mitigation Measures

No violations of the NAAQS are anticipated after implementation of the Preferred Alternative. Therefore, no air quality mitigation measures are required for the roadway improvements.

3.9 NOISE

This section summarizes the noise analyses performed for existing (2001) and future (2025) conditions in the study area.

Regulations

Noise impacts for this project were evaluated in accordance with Federal Highway Administration (FHWA) noise assessment guidelines. The Federal Aid Highway Act of 1970 established the requirement that noise control be a part of the planning and design of all federally-aided roadways. FHWA guidelines for conducting noise studies, set forth in 23 CFR 772, outline noise abatement criteria for different land use activity categories.

Noise Assessment Guidelines

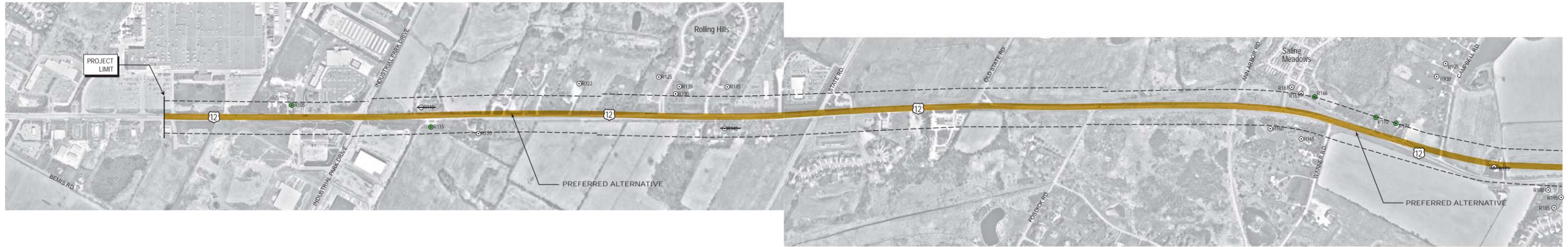
Traffic noise levels in these analyses were estimated for existing and future conditions using the computer simulation model STAMINA 2.0, which is based on the FHWA Highway Traffic Noise Prediction Model. All noise levels discussed are for the peak traffic hour.

Traffic noise levels are expressed in terms of the hourly, A-weighted equivalent sound level in decibels (dBA). The A-weighted sound level is a single number measure of the sound intensity with weighted frequency characteristics that correspond to a human's response to noise. However, because most environmental noise fluctuates from moment to moment, it is common practice to condense information into a single number called the equivalent sound level (L_{eq}). The L_{eq} is the value of a steady sound level that represents the same sound energy as the actual time-varying sound evaluated over the same time period. For traffic noise assessment, L_{eq} is typically evaluated over a one-hour period and is denoted as $L_{eq}(h)$.

In the study area, 126 noise receptor sites were identified using aerial photographs. Structures that would be displaced by the Preferred Alternative were not assessed for potential noise impacts. All of the noise prediction sites fall under FHWA activity Category B land use, whose noise abatement criterion is 67 dBA. Category B land uses include residences, churches, schools, recreation areas, and similar uses. However, a noise level is considered an impact when the noise level is within one dBA of the criterion, so impacts would occur when the noise level is 66 dBA or greater. Since there is no FHWA noise criterion for undeveloped lands, such sites were not analyzed. A substantial increase is considered to be an increase of 10 dBA or greater. A noise impact is a noise level that exceeds any of these criteria.

Estimated Existing Noise Levels

Noise levels were calculated at the 126 sensitive receptor sites in the study area under existing conditions (2001). The current estimated noise levels range from 55 to 70 dBA during the peak traffic hour. The 67 dBA noise criterion was approached or exceeded at 20 receptor sites under existing conditions (2001). Figure 3.7 shows the receptor locations and the 66dBA contour lines along the US-12 roadway for the Preferred Alternative in the year 2025. The October 2003 *Noise Analysis Technical Report* also provides receptor locations and results of the noise analysis for the US-12 Improvement Study.



LEGEND

- R000 Receiver for Noise Model
- 66 dBA Noise Contour Line
- R000 Receiver Approaching or Exceeding FHWA Noise Impact Criteria
- ⊕ R000 Receiver Acquired Under Preferred Alternative

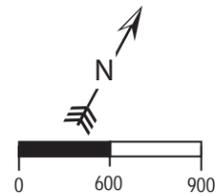


FIGURE 3-7
(Sheet 1 of 2)

NOISE ANALYSIS
PREFERRED ALTERNATIVE



LEGEND

- R000 Receiver for Noise Model
- 66 dBA Noise Contour Line
- R000 Receiver Approaching or Exceeding FHWA Noise Impact Criteria
- ⊙ R000 Receiver Acquired Under Preferred Alternative

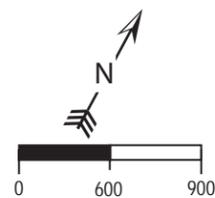


FIGURE 3-7
(Sheet 2 of 2)

NOISE ANALYSIS
PREFERRED ALTERNATIVE

Direct Effects

Future noise levels were estimated for the No-Build Alternative and the Preferred Alternative.

No-Build Alternative. Compared to existing conditions, projected noise levels will approach or exceed the noise abatement criteria at 2 additional Category B receptors under the No-Build Alternative. Projected noise levels at the receptors analyzed range from 55 dBA to 70 dBA. No receptors are projected to experience a noise increase of greater than 1 dBA.

Preferred Alternative. Of the 126 receptors analyzed for the No-Build alternative, six receptors would be acquired under this alternative. Compared to existing conditions, projected noise levels associated with US-12 improvements will approach or exceed the noise abatement criteria at 25 Category B receptors under this alternative. Projected noise levels at the receptors analyzed range from 54 dBA to 70 dBA. All noise level increases are projected to be below 10 dBA (compared to existing levels) for all receptors analyzed for the Preferred Alternative.

Mitigation Measures

Noise abatement for projects on new alignment or where additional lanes are added to an existing facility could be provided for sensitive receptors projected to experience noise levels equal to or greater than 66 dBA or projected to experience a 10 dBA increase from existing noise levels. Appendix E includes the MDOT policy regarding noise abatement.

A common method of mitigating traffic noise impacts for a residential unit is to construct a noise barrier in the form of an earth berm, vertical wall, or combination berm/vertical wall. For MDOT to provide noise abatement measures, the following criteria must be met:

- Noise abatement is considered feasible if noise levels can be reduced by 5 dBA or more.
- A noise mitigation project will be considered reasonable if the comparative construction cost will be \$34,200 or less (in 2003 dollars) per benefiting dwelling unit. Additionally, the local jurisdiction(s) must have entered into the required agreements with MDOT regarding maintenance, land use policy, and funding participation. A majority of the affected residents must be in favor of abatement.
- If during final design, the project cost becomes not reasonable (construction costs exceed the total benefited amount of \$34,200 per unit), the local jurisdiction(s) will be asked if they wish to increase their financial participation in the noise abatement project to cover the excess cost per dwelling unit (the amount over \$34,200 per unit), or have noise abatement dropped from further consideration.

- All noise abatement will follow MDOT design standards. Noise abatement will be provided along the shoulder only where a roadside barrier would otherwise be present.

Using the MDOT criteria as a guide, potential noise barriers were analyzed to determine if they were both reasonable and feasible to construct. MDOT requires that a minimum number of benefiting receivers be achieved before a noise barrier is considered cost effective. According to MDOT's guidelines the minimum length of a noise barrier is 600 feet. A 12-foot high wall of this length would require six benefiting residences to be considered cost effective.

Several locations where noise impacts are predicted consist of isolated or scattered residences. Noise abatement would not be cost effective and was not considered further in these areas. However, at other locations where impacts are predicted there is a more concentrated or cluster of residences. At these locations, noise abatement was considered further. These locations are listed below:

- Saline Meadows
- Arbor Glen
- Arbor Ridge
- Warner Creek
- Hickory Pointe

To provide significant noise reduction, a barrier's length is normally eight times the distance from the barrier to the residence. For example, a residence located 50 feet from the barrier would require a barrier 400 feet long. An access opening of 40 feet or 10 percent of the area would limit its noise reduction by approximately 4 dBA. Therefore, barriers have a lack of effectiveness in reducing noise when access openings must be provided.

Each site listed above was analyzed to determine the barrier length required to provide adequate abatement. At four of the five locations in the study area, a noise barrier could not be provided at a cost of less than \$34,200 per benefiting receiver as shown in Table 3.11. Therefore, it was determined that barriers would not be effective and are not recommended for these areas. For Hickory Pointe, a noise barrier could be provided for a cost less than \$34,200 if the wall height was either 16 or 20 feet high (see Table 3.11). If the Preferred Alternative becomes the Recommended Alternative, MDOT will conduct additional barrier analysis and coordinate with local jurisdictions regarding the feasibility of noise barrier construction.

**Table 3.11
Barrier Cost Per Benefiting Receiver for the Preferred Alternative**

Barrier Location	Roadway Cross Section	Barrier Length	Barrier Height	Total Cost	Number of Benefiting Receivers	Cost per Benefiting Receiver	Reasonable to Build?
Saline Meadows	5-Lane Arterial	650'	12'	\$ 195,000	4	\$48,750	NO
			16'	\$260,000	5	\$52,000	NO
			20'	\$325,000	7	\$46,400	NO
Warner Creek	5-Lane Arterial	2400'	12'	\$ 720,000	12	\$60,000	NO
			16'	\$960,000	17	\$56,500	NO
			20'	\$1,200,000	20	\$60,000	NO
Arbor Glen	5-Lane Arterial	1200'	12'	\$ 360,000	4	\$90,000	NO
			16'	\$480,000	7	\$68,600	NO
			20'	\$600,000	9	\$66,700	NO
Hickory Pointe	5-Lane Arterial	1425'	12'	\$ 427,500	11	\$38,900	NO
			16'	\$570,000	25	\$22,800	YES
			20'	\$712,500	30	\$23,800	YES
Arbor Ridge	5-Lane Arterial	700'	12'	\$ 210,000	4	\$52,500	NO
			16'	\$280,000	6	\$46,700	NO
			20'	\$350,000	7	\$50,000	NO

Notes: Assumed cost of barrier = \$25 per square foot

Other abatement measures, such as reducing the speed limit, quieter pavement types, planting vegetation, creating buffer zones, or providing air conditioning and insulation, were evaluated and are still being considered for this project.

3.10 POTENTIALLY CONTAMINATED SITES

A Project Contamination Survey (PCS) of the study area was conducted in accordance with ASTM E 1527-00 and MDOT guidelines. The purpose of the PCS was to identify Recognized Environmental Conditions (RECS) in the study area. The PCS included the following elements: site records review, site reconnaissance, interviews, review of available government research, and review of historical aerial photographs and U.S. Geological Survey (USGS) topographic maps. For the records review, the standard ASTM search distances were modified and limited to 0.5 miles on either side of US-12 for all regulatory databases. The PCS findings are discussed in the July 2003 *US-12 Project Contamination Survey*.

A reconnaissance of the study area occurred in April and May 2002. During this time, field personnel made observations of the environmental status of properties along both sides of US-12, focusing on intersections and existing structures. Each property or portion of a property observed was assigned a stop number, beginning with Stop Number 1 at US-12's intersection with Maple Road, and ending with Stop Number 52, west of the single-family residence at 4779 Michigan Avenue. Thus, environmental conditions at a total of 52 stops were recorded.

The PCS did not identify any specific RECs. However, at 16 stops, potential environmental concerns were identified. In general, the locations of concern, either consisted of areas where past or current operations may be associated with a release of hazardous substances, or areas where contamination is highly probable, and where further investigation is necessary to confirm or deny the existence of that contamination. Appendix F contains a summary of recognized environmental concerns. Specifically, these areas included:

- Areas where uncontrolled dumping or landfilling had apparently taken place.
- Areas whose current or past use could be associated with potential contamination, including gas stations, a farm machinery storage area, an electrical substation, and a used car lot.
- Areas containing foundations of buildings whose past use is unknown.

Direct Effects

No concerns would be anticipated with the No-Build Alternative. The Preferred Alternative may require right-of-way on 11 of the 16 areas of concern identified. Most areas are located near the proposed improvements to the US-12/US-23 interchange.

Mitigation Measures

If, after selection of the Recommended Alternative, right-of-way is required at any of these 11 properties, a Phase II environmental site assessment (ESA), which would include collection of subsurface samples and other further site, investigation may be recommended.

In addition, given the age of some of the buildings along US-12, the potential exists that buildings in the study area may contain asbestos and/or lead-containing materials. Prior to implementation of the Preferred Alternative, contractors will be required to identify potential lead and asbestos-containing materials in affected buildings, and to provide lead and asbestos abatement specifications prior to building demolition.

3.11 INDIRECT AND CUMULATIVE EFFECTS

Physical Environment

Indirect Effects. Development pressure in Pittsfield Township is strong. Township planners are currently reviewing several residential and commercial site plans for undeveloped parcels in the study area. Although construction of the Preferred Alternative will ease traffic congestion and facilitate access, indirect effects to physical features resulting from construction of the Preferred Alternative are expected to be minor. Residential and business construction in this area is primarily due to strong market demand rather than a result of proposed road improvements.

Cumulative Effects. There is potential for construction of the Preferred Alternative to attract new development to study area and surrounding region. Cumulative effects may be realized in surface water quality with an increase in impervious surface and to groundwater resources if vulnerable aquifer recharge areas are developed. Washtenaw County requires implementation of a soil erosion and sedimentation control plan as well as on-site storm water detention as part of all new developments. One goal of these requirements is to minimize the impact on surface water bodies. The County has also recognized sensitive groundwater recharge areas however neither they nor Pittsfield Township control development in these areas.

Ecological Environment

Indirect Effects. A majority of the study area has already been altered by past human use. As a result, there is very little important terrestrial habitat remaining. Pittsfield Township purchased approximately 540 acres of land now designated as the Pittsfield Preserve, which includes 37 acres of the high quality woodlot located west of Platt Road between US-12 and Textile Road. This woodlot also contains suitable habitat for the Indiana bat. Wetland resources in the study area are primarily found in large units under EPA jurisdiction under Section 404 of the Clean Water Act, and the MDEQ under the Natural Resource and Environmental Protection Act (P.A. 451 of 1994), Part 303 – Wetland Protection. In addition, a Wetland Protection Ordinance was proposed for Pittsfield Township in January 2003.

Some degradation of aquatic resources may result from increased development and the consequent increase in impervious surface. However, the storm water management requirements of the Pittsfield Township, Washtenaw County and the Washtenaw County Drain Commissioner's office will serve to minimize these impacts. Although land use in the study area is developing rapidly, indirect effects resulting from construction of the Preferred Alternative are considered to be minor.

Cumulative Effects. There is potential for construction of the Preferred Alternative to attract new development to the study area and surrounding region. Cumulative effects to terrestrial resources and wetlands will be minor. A majority (75 percent) of the high quality woodland habitat found in the study area is under the ownership of Pittsfield Township as part of the Pittsfield Preserve which is also the location of habitat identified as suitable for the Indiana bat, a federally endangered species. Ownership by the Township and designation as a recreation area will afford protection from future development. Although formal programming for these lands has not been completed, conversations with Township officials indicate that the woodland area would be maintained for passive recreation and nature interpretation (Lirones 2003).

Many of the remaining wetlands are part of large complexes under the protection of state and federal legislation. In addition, the Township is expected to have a local wetland ordinance in effect in 2003. Cumulative effects may be realized on aquatic resources with an increase in impervious surface and storm water runoff. Storm water management of existing and future development is essential to limit further degradation.

Social, and Economic Environment

The following represents a summary of an evaluation of the indirect and cumulative affects of the alternatives on social and economic affects within the study area.

Population, Age, and Population Characteristics. Forecasted population growth is not projected to be dependent on US-12 improvements.

Expected demographic shifts are not likely to be indirectly affected by either the No-Build or the Preferred Alternative.

Housing. Housing trends in the study area are likely to continue regardless of which alternative is chosen.

Economic Setting. The forecasted trend is expected to continue independent of US-12 improvements.

The No-Build Alternative, with added congestion and access limitations, may impede the efficiency of transporting goods and services and reduce worker productivity and create higher commuting-related stress. The Preferred Alternative may provide incentive to locate in the study area. Transportation improvements that are well coordinated with potential development areas will provide more efficient movement of goods, services, and people.

Land Use

It is unlikely that there will be significant indirect and cumulative effects to land use in the study area resulting from construction of the Preferred Alternative. Developers with current proposals in the study area have not expressed that their developments will be threatened or that they are dependent on US-12 improvements (Spencer 2000). The general belief is that forecast levels of growth (SEMCOG 2002) are going to occur with or without construction of US-12 improvements.

Indirect and cumulative effects to land use were assessed using the existing and future land use maps and goals and recommendations of the *City of Saline Master Plan* (City of Saline 1992) and the *Pittsfield Township Comprehensive Plan* (Pittsfield Township 2002), along with proposed new developments as discussed above in the Affected Environment section. Figure 3.8 shows the future land use of Pittsfield Township, and Figure 3.9 shows the future land use of the City of Saline.

Undeveloped and Agricultural Land. It is unlikely that there will be indirect and cumulative effects to undeveloped and agricultural land with the No-Build Alternative.

Parks and recreational lands such as the Pittsfield Preserve are protected from development. For this reason, there is unlikely to be future development pressure on these areas and little indirect and cumulative effect associated with the Preferred Alternative. However, there may be increased visitation of the area parks from improved access associated with the Preferred Alternative.

Commercial/Industrial Land Use. The development of land is unlikely to be dramatically different with either Alternative. However, the No Build Alternative could have the indirect effect of slowing down the pace of future development of commercial and industrial areas due to increasing congestion and access problems.

A possible cumulative effect of the Preferred Alternative is the acceleration of pending commercial/industrial projects and planned commercial/industrial areas through a combination of US-12 improvements, other area roadway improvements, and the Township's future land use plan. Pending commercial/industrial projects are noted in section 4.4. Planned commercial/industrial areas include the Saline Industrial Parks. As of October 2002, there were approximately 53 acres of industrial land available for development in the Saline Industrial Parks. The sewage, water, electric and gas line infrastructure is available and ready for immediate use. The sanitary sewer and water lines are of sufficient size to accommodate virtually every fire, safety, and industrial need at full build-out of the Saline Industrial Parks.

There may also be accelerated development in the area north of US-12 along State Road and surrounding the I-94/US-23 interchange area, where existing agricultural and undeveloped land is proposed for research and development and light industrial development in the Township's *Comprehensive Plan*. There is also a proposed Planned Development Area at the US-12/US23 interchange where development may become more feasible due to the Preferred Alternative.

US-12
IMPROVEMENT STUDY

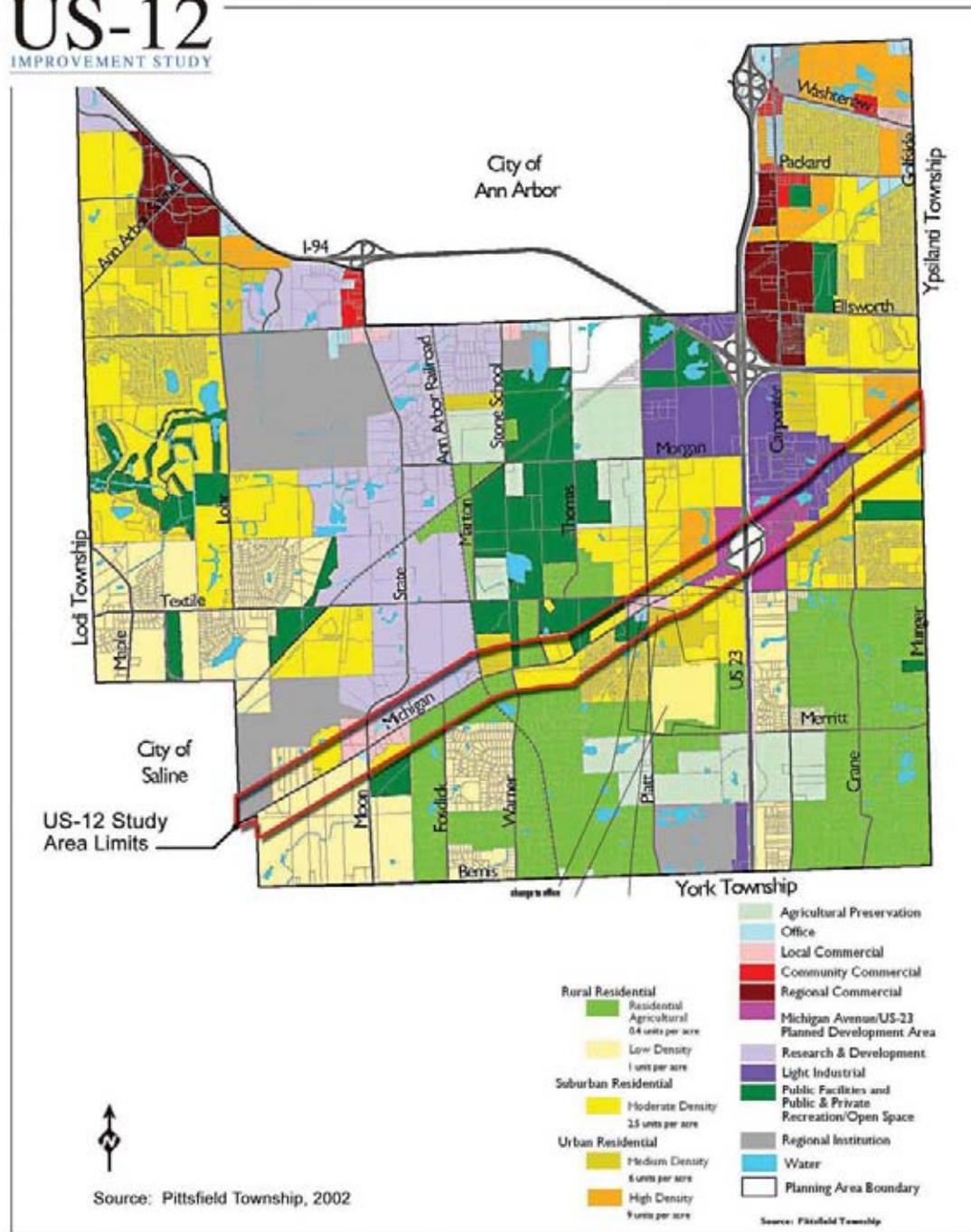


FIGURE 3.8
PITTSFIELD TOWNSHIP FUTURE LAND USE





US-12 IMPROVEMENT STUDY

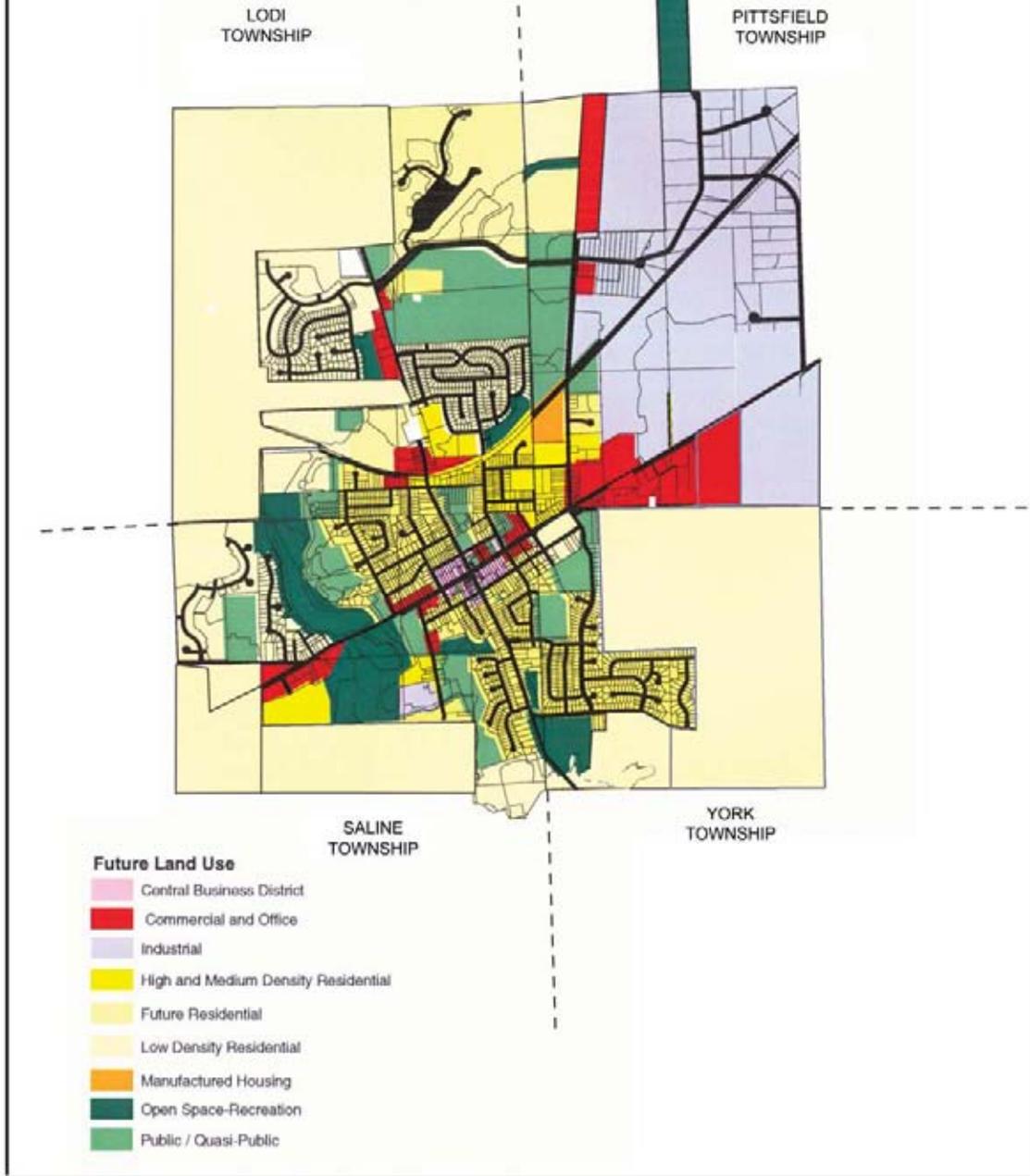


FIGURE 3.9
CITY OF SALINE FUTURE LAND USE

Increasing the pace of developing commercial/industrial land could result in the cumulative effects of gradual increases in property values and tax base, and increased service costs for utilities, sewer and water, schools, police and fire protection.

Residential Land Use. The No-Build Alternative is unlikely to have indirect and cumulative effects on residential land.

The Township's comprehensive plan proposes converting agricultural land to rural residential land use south of US-12 along Moon Road and between Moon Road and Munger Road; agricultural to moderate density residential land use south of Textile Road between the Ann Arbor Railroad, State Road and US-12; and, agricultural to moderate density residential land use north of US-12 along Platt Road, and between US-23 and Munger Road. These plans, in combination with pending residential development projects and the Preferred Alternative, could result in the cumulative effects of increased property values and tax base, and increased service costs for utilities, sewer and water, schools, police and fire protection.

Non-Motorized Transportation. With the No-Build Alternative, continuing development along the US-12 study area will increase traffic loads and further decrease the usability of the roadway for non-motorized use although speeds are likely to slow with increased traffic. Safety concerns will be exacerbated by more cars and trucks generated by the higher population densities. These effects are likely to decrease the feasibility in the future of pedestrian scale improvements.

The Preferred Alternative will be constructed with wider shoulders that can support future use as a bike lane. However, the increased traffic load and continued higher speeds supported by the new cross section are likely to continue to minimize the attractiveness of using the US-12 study area for non-motorized transportation. Boulevard areas of the Preferred Alternative are more likely to provide the opportunity for pedestrian scale development given that the boulevard would provide a refuge for pedestrians and bicyclists crossing US-12.

Visual Resources

Because the study area is developing rapidly, future visual/aesthetic impacts that will occur will be most strongly influenced by the type and quality of development that continues within the study area viewshed. Both indirect and cumulative effects associated with the Preferred Alternative, such as an access management plan and implementation of aesthetic treatments along the proposed roadway, can function to visually unify the area and generally improve visual resources.

3.12 GENERAL MEASURES TO MITIGATE IMPACTS

The goal of mitigative measures for the US-12 Improvement Study is to preserve, to the greatest extent possible, existing neighborhoods, land use, and resources, while improving transportation. Although some adverse impacts are unavoidable, the Michigan Department of Transportation (MDOT), through the route location, design, environmental, and construction processes, takes precautions to protect as many social and environmental

systems as possible. Construction activities which include the mitigation measures included below are those contained in the current Michigan Standard Specifications for Construction.

The following paragraphs discuss the mitigation concepts that are being considered for the US-12 Improvement Study. Without the benefit of detailed design plans and data, tentative mitigation ideas are proposed as a means to avoid or reduce adverse impacts on identified resources. Further agency coordination will continue through the design stage. Design plans will be reviewed by MDOT personnel prior to contract letting in order to incorporate any additional social, economic, or environmental protection items. Construction sites will be reviewed to ensure that the mitigation measures proposed are carried out, and to determine if additional protection is required.

More mitigation measures may be developed if additional impacts are identified. Specific mitigation measures for the US-12 Improvement Study are shown on the Green Sheet: Mitigation Summary, which follows this section. These mitigation measures will be included on the design plans and permit applications.

Measures To Mitigate Right-Of-Way Acquisition and Relocation Impacts

Compliance with State and Federal laws - Acquisition and relocation assistance and advisory services will be provided by the Michigan Department of Transportation (MDOT) in accordance and compliance with Act 31, Michigan P.A.1970; Act 227, Michigan P.A. 1972; the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended; and Act 87, Michigan P.A. 1980, as amended. The MDOT will inform individuals, businesses and non-profit organizations adjacent to the US-12 roadway of the impact, if any, of the project on their property. Every effort will be made through relocation assistance to lessen the impact when it occurs.

Residential – The MDOT is required by statute to determine the availability of comparable, decent, safe and sanitary housing for eligible displaced individuals. The MDOT has specific programs to implement the statutory and constitutional requirements of property acquisition and relocation of eligible displacees. Appropriate measures will be taken to ensure that all eligible displaced individuals are advised of the rights, benefits, and courses of action available to them.

Business, Farms or Non Profit Organizations - The MDOT is required by statute to offer relocation assistance to displaced businesses, farms and non profit organizations. The MDOT has specific programs that will implement the statutory and constitutional requirements of property acquisition and relocation of eligible displacees. Appropriate measures will be taken to ensure that all eligible displaced businesses, farms or non profit organizations are advised of the rights, benefits, and courses of action available to them. Displaced businesses and organizations will be encouraged to relocate within the same community.

A. Purchasing Property –

The MDOT will pay just compensation for fee purchase or easement use of property required for transportation purposes. “Just compensation” as defined by the courts is the payment of “fair market value” for the property rights acquired plus allowable damages to any remaining property. “Fair market value” is defined as the highest price estimated, in terms of money, the property would bring if offered for sale on the open market by a willing seller, with a reasonable time allowed to find a purchaser, buying with the knowledge of all the uses to which it is adapted and for which it is capable of being used.

Relocation Information - A booklet entitled “Your Rights and Benefits” detailing the relocation assistance program can be obtained from the Michigan Department of Transportation, Real Estate Support Area, P.O. Box 30050, Lansing, Michigan, 48909 or phone (517) 373-2200.

Property Acquisition Information - A booklet entitled “Public Roads & Private Property” detailing the purchase of private property can be obtained from the Michigan Department of Transportation, Real Estate Support Area, P.O. Box 30050, Lansing, Michigan, 48909 or phone (517) 373-2200.

Conceptual Stage Relocation Plan - The conceptual stage relocation plan for this project is attached in Appendix B.

B. Environmental Permits

A wetland permit from the Michigan Department of Environmental Quality (MDEQ) is required under the Natural Resources and Environmental Protection Act, PA 451 of 1994, Part 303 - Wetland Protection, to place fill material into a wetland, dredge, remove, or permit removal of soils from a wetland, or to drain surface water from a wetland.

A permit from the MDEQ will be required to "work below the ordinary high water mark of any lake or stream " under the Natural Resources and Environmental Protection Act, PA 451 of 1994, Part 301 - Inland Lakes and Streams.

The MDEQ monitors the MDOT to ensure compliance with the Natural Resources and Environmental Protection Act, Part 91- Soil Erosion and Sedimentation Control, and National Pollution Discharge Elimination System (NPDES) as found in Part 31 of the same act. The MDOT has been designated an “Authorized Public Agency (APA) by the MDEQ. The MDOT is not required to obtain individual soil erosion and sedimentation control permits for this project. The approved Soil Erosion Control Program and Standard Plan on file with the MDEQ will be followed.

A permit from the Washtenaw County Drain Commissioner's office will be required for any work in county drains in accordance with the Michigan Drain Code, PA 40 of 1956.

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

C. Water Quality

Adequate soil erosion and sedimentation control measures based on MDOT's approved soil erosion program will be implemented for the US-12 roadway improvements. Vegetation buffer strips approximately 10 feet in width will be left in place along both sides of all stream crossings on new alignment, if possible. Highway runoff will be diverted through vegetative controls (grassed waterways) into containment areas prior to outletting into the streams, wherever possible. This will promote infiltration, thereby reducing the potential impact on the streams from added runoff and associated pollutants, including deicing salts, heavy metals, and pesticides.

D. Soil Erosion and Sedimentation Control

Accelerated sedimentation caused by US-12 highway construction will be controlled before it enters a water body or leaves the highway right-of-way by the placement of temporary or permanent erosion and sedimentation control measures. MDOT has developed a series of standard erosion control items to be included on design plans to prevent erosion and sedimentation. The design plans will describe the erosion controls and their locations. Payment is made to the contractor for construction and maintenance of items used from this list or items specifically developed for US-12.

The MDOT has on file with MDEQ an approved operating erosion and sedimentation control program which ensures compliance with Part 91, Soil Erosion and Sedimentation Control of Act 451, as amended. The MDOT has been designated an "Authorized Public Agency" by the MDEQ and is self-regulated in its efforts to comply with Part 91. However, the MDEQ may inspect and enforce soil erosion and sedimentation control practices during construction to ensure that the MDOT and the contractor are in compliance with Part 91 and the acceptable erosion and sedimentation control program.

The following is a partial listing of general soil erosion and sedimentation control measures to be carried out in accordance with permit requirements.

1. No work will be done in the three drain channels during periods of seasonally-high water, except as necessary to prevent erosion.
2. All road and bridge construction operations will be confined to the existing or proposed right-of-way limits or acquired easements.
3. Road fill side slopes, ditches, and other raw areas draining directly into the three drains will be protected with riprap (up to three feet above the ordinary high water mark), sod, seed and mulch, or other measures, as necessary to prevent erosion.
4. The surface area of erodible earth material exposed at any one time will be limited to 5000 feet of dual roadway or 10000 feet of single roadway. Once the contractor has final graded and stabilized a section of roadway, additional clearing and grading will be allowed.

5. Areas disturbed by construction activities will be stabilized and vegetated within 5 days after final grading has been completed. Where it is not possible to permanently stabilize a disturbed area, appropriate temporary erosion and sedimentation controls will be implemented. All temporary controls will be maintained until permanent soil erosion and sedimentation controls are in place and functional.
6. The contractor shall have the capability of performing seeding and mulching at locations within 500 feet of any wetlands, lakes, streams, and drains within 24 hours of being directed to perform such work by the project engineer.
7. Special attention will be given for the US-12 roadway improvements to protecting the natural vegetative growth outside the project's slope stake line from removal or siltation. Natural vegetation, in conjunction with other sedimentation controls, provides filtration of runoff not carried in established ditches.
8. The integrity of any agricultural drainage or field tile system encountered will be maintained.
9. The contractor is responsible for preventing the tracking of material onto local roads and streets. If material is tracked onto roads or streets, it shall be removed.

E. River, Stream, and Drain Crossings

Bridge and culvert work at US-12 stream and drain locations will require construction staging and additional protection items to minimize impacts on the watercourse. The following items are general mitigation items designed to reduce impacts at water crossings. The design plans will show all specific controls for each watercourse.

All work below the ordinary high water mark of any stream or drain will require permits from the Michigan Department of Environmental Quality, and/or the U. S. Army Corps of Engineers, and/or the U. S. Coast Guard. All permit conditions will be adhered to during construction. Permit conditions may include fish spawning protection dates where no work can occur in the water unless it is isolated behind a cofferdam installed prior to the start of the protection date.

All construction operations adjacent to watercourses will include appropriate soil erosion and sedimentation controls (See Section D above).

The contractor may be required to maintain a navigable channel during all phases of the project. During part-width construction operations, the contractor will place signs both upstream and downstream of the construction area that clearly indicates the location of the navigable channel. Navigation access on smaller streams may also be required to accommodate small boat and/or canoe usage. The contractor may be required to provide lighting of barges or other navigation obstructions at night.

All construction activities will be isolated from the flowing watercourse where possible. A method to do this would be to construct a temporary channel to relocate the existing watercourse while construction takes place at the existing watercourse location. The

temporary channel and proposed new channel shall be stabilized prior to water flow being released.

Any channel excavation or riprap placement will be done using part-width construction methods. Work will be done on part of the channel while the water flow is temporary diverted away from the work area. MDOT has a standard detail showing the temporary water flow diversion that will be included on the design plans for all projects that require in-stream work.

F. Existing Vegetation

Although some tree removal will be necessary for the US-12 roadway improvements, the existing natural and ornamental vegetative cover will be retained wherever possible within the right-of-way. Where the existing groundcover must be removed, replacement vegetation will be established in a timely manner using seed and mulch, or sod.

Roadside trees adjacent to residences will be saved wherever possible. Where trees are to be removed from in front of residences, property owners will be given appropriate notice, and will be offered replacement trees to help offset the functional or aesthetic loss of the trees.

Replacement tree species, size, and numbers will be determined by the MDOT's Region Resource Specialist or the Roadside Development Section following coordination with adjacent property owners. For those owners who request replacement trees, the trees will be placed (with the property owner's approval) on adjacent private property as close to the right-of-way line as possible. Property owners would then assume the responsibility for maintaining these trees.

G. Hazardous/Contaminated Material

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

H. Groundwater Quality

Sealing water wells and sewer lines for the protection of groundwater quality is ensured by MDOT specifications imposed on the contractor. For houses or other structures in urban situations which are relocated or must be razed, sewer lines must be filled with concrete grout at the basement level, and water must be turned off at the street. In rural areas, the sewer line to the septic tank must be filled at the basement level. Abandoned water wells must be filled with cement grout applied from the bottom upwards through a conduit extended to the bottom of the well (in one continuous operation) until the well is filled. The

contractor must also meet all local Washtenaw County Department of Environmental Health and Michigan Department of Community Health (MDCH) requirements.

Contractors are generally allowed 60 to 90 days following issuance of the demolition contract for the site to be completely cleared. However, only 48 hours is permitted following removal of any structure to fill the foundation to ground level. If the foundation is not filled within this time, MDOT may take independent action to fill the foundation, charging the costs incurred to the contractor. The MDEQ notification procedures for demolitions will be followed.

The above specifications have been approved by the MDCH. The contractor is also referred to the local health department for assistance when special conditions such as flowing wells or wells with a high artesian head are encountered. If high water tables are encountered in cut sections, special methods will be used to reduce any negative effects on the area groundwater. One such method is to raise the road grade.

Drains will be built as necessary along the pavement to drain the roadway subbase. Edge drains are used to intercept horizontal seepage. Stone baskets are used to maintain and reroute the flow of springs when found below the roadway. Intercepted water will be discharged into an available roadside ditch or watercourse. Siltation of such watercourses from this intercepted water is rare.

I. Disposal of Surplus or Unsuitable Material

Surplus or unsuitable material generated by removal of structures, trees, peat, etc., must be disposed of in accordance with the following provisions designed to control the possible detrimental impacts of such actions.

1. When surplus or unsuitable material is to be disposed of outside the right-of-way, the contractor shall obtain and file with MDOT written permission from the owner of the property on which the material is to be placed. In addition, no surplus or unsuitable material is to be disposed of in any public or private wetland area, watercourse, or floodplain without prior approval (and permit) by the appropriate resource agencies and the Federal Highway Administration.
2. Inert debris may be used as a basement fill to a depth not less than two feet below the ground level if the basement is not within the roadway cross section. Debris used as fill must be covered with at least two feet of clean soil to fill voids. Basement walls are to be removed to ground level.
3. All regulations of the MDEQ governing disposal of solid wastes must be complied with.

J. Maintaining Traffic During Construction

Disruption of traffic in the US-12 construction area will be minimized to the extent possible. Although control of all construction-related inconveniences is not possible, motorist and pedestrian safety will be ensured by signing all construction areas. Access will be

maintained to properties adjacent to US-12 to the extent possible. Traffic will be maintained using part-width construction techniques. This involves maintaining traffic on one half of the roadway while the other half is being reconstructed.

K. Continuance of Public Utility Service

Water, sanitary sewer, gas, telephone, and electrical transmission lines adjacent to or crossed by the project may require relocation or adjustment. If this should be the case, coordination between the MDOT and the affected utility company will take place during design, and relocation will take place prior to construction of the road if possible. The contractor will coordinate his construction activities with the affected utility company.

Service to the project area may be temporarily interrupted during the adjustment period. For the most part, the effects of this work will go unnoticed.

L. Construction Noise Levels and Vibration Impacts

Construction noise will be minimized by measures such as requiring that construction equipment have mufflers, that portable compressors meet federal noise-level standards for that equipment, and that all portable equipment be placed away from or shielded from sensitive noise receptors if at all possible. All local noise ordinances will be adhered to.

Where pavement must be fractured or structures must be removed, care will be taken to prevent vibration damage to adjacent structures. In areas where construction-related vibration is anticipated, basement surveys should be conducted before construction begins to document any damage caused by highway construction.

M. Control of Air Pollution During Construction

The contractor must comply with all federal, state, and local laws and regulations governing the control of air pollution.

Dust Control: During the construction of any project, the contractor will be responsible for adequate dust-control measures so as not to cause detriment to the safety, health, welfare, or comfort of any person, or cause damage to any property, residence, or business.

Bituminous and Concrete Plants: All bituminous and portland cement concrete proportioning plants and crushers must meet the requirements of the rules of Part 55 of Act 451, Natural Resource and Environmental Protection. For any portable bituminous or concrete plant or crusher, the contractor must apply for a permit-to-install or a general permit from the Permit Section, Air Quality Division, of the MDEQ.

This permit-to-install should be applied for a minimum of 30 calendar days for plants with an active MDEQ permit (or 60 calendar days for plants not previously permitted in Michigan) prior to the plant being installed.

Dust collectors will be provided on all bituminous and concrete proportioning plants. Dry, fine aggregate material removed from the dryer exhaust by the dust collector will be returned to the dryer discharge unless otherwise directed by the project engineer.

N. Additional Mitigation or Modifications

The final mitigation package for the US-12 roadway improvements will be reviewed by division representatives on the MDOT project study team, in cooperation with concerned state, federal, and local agencies.

Some changes in the early mitigation concepts discussed in this document may be required when design begins or when in-depth soil borings are taken and analyzed. These mitigation concepts will be implemented to the extent possible. Where changes are necessary, they will be designed and field reviewed before permits are applied for and construction begins. Changes may also be necessary during the construction phase, but they will reflect the early mitigation intent. These preceding mitigation concepts are based on the best information available through June 2003.

**US-12 Improvement Study
City of Saline to Munger Road
Washtenaw County, Michigan
Environmental Assessment/Section 4(f) Evaluation**

Green Sheet: Mitigation Summary

<i>Impact Category</i>	<i>Mitigation Measures</i>
I. Social and Economic Environment	
a. Access to Residential and Commercial	Roadway right-of-way can accommodate future sidewalks and pedestrian/bicycle crossings at intersections to facilitate north-south pedestrian access across US-12. Pittsfield Township would be responsible for the design and construction of sidewalks and bicycle paths. MDOT will replace any existing sidewalks that need to be relocated as a result of construction.
b. Aesthetics /Visual	The boulevard section of the Preferred Alternative with the use of an open grass ditch and no curb and gutter in the median will improve roadway aesthetics. Landscaping will be integrated into the roadway design as appropriate to replace affected vegetation.
II. Natural Environment	
a. Wetlands	Impacted wetlands will be replaced by restoring wetlands at an inland site southwest of the study area. A permit will be obtained from Michigan Department of Environmental Quality for compensatory wetland mitigation, and a wetland restoration plan will be prepared. The mitigation site will be in the same ecoregion as the affected wetlands. The 4.4 acres of wetland impact will be mitigated by the restoration of 6.9 acres of wetland, replaced in kind.
b. Tree Removal/ Clearing/ Landscaping	<p>Tree cutting in the woodlot west of Platt Road will be limited to the period between November 1 and April 30. Tree clearing will be in clear zone areas only within the US-12 right-of-way. Roadside trees adjacent to residences will be saved wherever possible and where removed, replacement trees will be offered. Replacement tree species and locations will be determined by MDOT following coordination with property owners.</p> <p>Appropriate planting of trees, shrubs and landscaping will be done along the MDOT right-of-way adjacent to the Pittsfield Reserve, an important Section 4(f) resource, to minimize visual impacts and replace vegetation removed during construction. The contractor shall not park any vehicles or store any materials on public recreation property. Access will be maintained through the public recreation property during construction.</p>

<i>Impact Category</i>	<i>Mitigation Measures</i>
<p>c. Water Quality</p>	<p>During construction, Best Management Practices will be implemented according to MDOT and MDEQ standards. A participation agreement will be obtained from the Washtenaw County Drain Commissioner for the Hertler-Nissley, Pittsfield No. 5, and Koch-Warner drains.</p> <p>For highway runoff, stormwater management facilities will include detention basins and grassed channels or swales to reduce the concentrations of road contaminants. Ditch check dams will be installed to control runoff volocities. Stormwater management will be incorporated into final roadway design. All proposed culvertrs and detention basins will be sized to enusre that no backwater impacts will occur for the Hertler-Nissley, Pittsfield No. 5, and Koch-Warner drains.</p>
<p>III. Cultural Environment (Memorandum of Agreement Mitigation)</p>	
<p>a. Historic Buildings</p>	<p>Consultation with interested parties and The State Historic Preservation Officer (SHPO) has resulted in a draft Memorandum of Agreement (MOA) to mitigate any adverse impacts to historic properties. See stipulations of MOA in Appendix D.</p>
<p>b. Archaeological - Historic</p>	<p>Prior to the relocation of the Harwood House, a Phase I archaeological survey of the property will be conducted. Phase II and Phase III archaeological surveys will be performed as necessary and in consultation with the SHPO and the Office of the State Archaeologist.</p>
<p>IV. Hazardous/Contaminated Materials</p>	
<p>a. Contaminated Materials</p>	<p>A Project Area Contamination Survey (PACS) has been completed. During the design phase, further investigation of affected sites may be warranted. Results of these investigations may lead to remediation measures at some sites near the US-12/US-23 Interchange.</p>
<p>V. Construction</p>	
<p>a. Air Quality</p>	<p>Dust control during construction will be monitored to avoid affecting adjacent land uses. The contractor will be responsible for adequate dust-control measures.</p>