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SECTION 4

ENVIRONMENTAL CONSEQUENCES

This section describes the beneficial and adverse social, economic, and environmental consequences of the No Build and reasonable Build Alternatives that underwent detailed evaluation and comparison. Discussions are arranged by impact category, and applicable alternatives are addressed within each impact category. The alternatives are described in detail in EIS Section 2.

INTRODUCTION

The following brief synopsis regarding the scope of the proposed improvements to WIS 83 is provided to assist in reviewing the impact discussions throughout EIS Section 4.

The No Build Alternative would consist primarily of maintenance work or spot traffic operational improvements within the WIS 83 right-of-way. No capacity improvements would be made.

In general, the proposed Build Alternatives involve widening the existing highway to a multi-lane facility. One off alignment alternative (Alternative D in project section 2) is under consideration in Genesee Depot. WisDOT and SEWRPC traffic forecasts indicate the need for additional highway capacity in an approximate 20-year time frame in all segments (project sections 1, 3, 4, and 6) except County X to County DE/E and WIS 16 to Chapel Ridge Road. Alternatives in the County X to County DE/E segment (project section 2) include No Build, reconstructing the existing 2-lane highway, and a long-term 4-Lane Corridor Preservation Alternative. Various roadway cross sections were considered and refined throughout the corridor based on land use, community input, safety and transportation factors. No changes to the existing roadway cross section in the County DR/Golf Road to Meadow Lane segment (project section 5) are being proposed because the existing 4-lane roadway is considered sufficient to handle forecast traffic.

Key assumptions about the long-term and interim improvements relative to the impact discussion are as follows:

- The impact evaluations are based on the "best fit" alignment for the 4-lane alternatives. The "best-fit" alignment concept is defined in EIS Section 2, page 2-10.
- Impacts include additional right-of-way width for substantive cut and fill areas.
- The 2-lane improvements would be compatible with the 4-lane corridor preservation facility, and WisDOT could purchase land needed for the 4-lane facility at the time the 2-lane improvements are constructed. The impacts of the 2-lane improvements are shown independent of the 4-Lane Corridor Preservation Alternative. For some segments, the impacts of the 2-lane and 4-lane are the same and are noted as such. These segments in project section 2 are typically the sub segments from County X to Walnut Street and from County D to County DE/E. Homes or businesses that would be displaced to construct the 2-lane improvement would be relocated at the time of 2-lane construction. Those homes and businesses that would not need to be displaced for the 2-lane improvements, but are within the right-of-way for the 4-lane corridor preservation facility, could remain at their present location until/if the 4-lane highway would be constructed.

LAND USE PLANNING

WIS 83 has the potential to affect and to be affected by land uses. While WisDOT supports land use planning in the study area, the authority for such control rests with local units of government. WisDOT's authority is limited to that which occurs within the highway right-of-way. While a highway can influence land use, historically WisDOT has had no jurisdiction in controlling land use.

Planned land use along WIS 83, according to the 2020 Regional Land Use Plan, is illustrated in Exhibit 1-1 in Section 1, Purpose and Need. The land use plan was developed assuming WIS 83 would be expanded into a 4-lane facility in all segments except from WIS 59 to County DE/E. The proposed improvements would not cause substantial changes to existing and planned land use. See "Indirect Effects" discussion below for more details.

The recommended land use plan for Waukesha County as presented in the *Development Plan for Waukesha County* (SEWRPC Community Assistance Planning Report 209, August 1996) is shown in Exhibit 4-1. This plan is more detailed than the 2020 Regional Land Use Plan. The *Development Plan for Waukesha County* includes commercial development at/near the WIS 59 intersection, in Genesee Depot, near Main Street in Wales, at the US 18 intersection, adjacent to I-94, and at Cardinal Lane in Hartland. Industrial/commercial land use is noted in Hartland from near County KE to Capitol Drive. The main difference between the development plan and the regional land use plan is there is more residential development planned in the Wales and Hartland /City of Delafield areas versus agricultural. Existing land use along WIS 83 is generally consistent with the development plan. Additional land use planning data is found in EIS Section 3.

INDIRECT EFFECTS

Indirect effects or secondary impacts are those reasonably foreseeable effects that would be caused by the proposed highway improvement but at a later time than the direct effects, or farther in distance (beyond the footprint of the highway improvement itself). Indirect effects are generally related to factors such as induced growth, changes in land use patterns, and related effects on natural resources and ecosystems.

For purposes of the WIS 83 corridor study, potential indirect effects and tools to address such effects were identified in consultation with local officials who serve on the WIS 83 Project Advisory Committee and who have substantial knowledge about local land use planning as well as the WIS 83 study area. Input was obtained through a mail-back indirect effects worksheet.

The following assumptions were used to guide identification of potential indirect effects:

- The area of influence for considering indirect effects was assumed to be one mile (1.6 km) on each side of the WIS 83 corridor. This distance is sufficient to encompass land use changes that could reasonably be attributed to increased capacity on WIS 83 and to include existing or proposed sewer service areas for adjacent municipalities.
- The maximum future improvement scenario being considered under the Build Alternatives is widening WIS 83 to a multi-lane facility.

- Driveway and local road connections to WIS 83 would be maintained with some possible alteration or consolidation to improve safety. Property access in segments with a four-lane divided roadway would be limited to right-in and right-out turns except where median breaks would coincide with driveway locations. Access to opposite direction driving lanes would be from median breaks or local road intersections. Direct property access would be provided in segments with a four-lane undivided roadway that includes a center two-way left turn lane.

- Certain land use and development trends along the WIS 83 corridor with or without future improvements to WIS 83, are already proposed in regional and local land use plans. The objective in identifying indirect effects is to determine whether reconstructing WIS 83 to a multi-lane roadway in the future would likely influence/change what is already being planned.

- The time frame for a future multi-lane highway on WIS 83 depends on funding availability and emerging needs such as increased traffic, safety, and pavement condition. At this time, capacity expansion would likely occur in about 3 to 6 years in either the Meadow Lane to WIS 16 segment or County DE/E to Hillside Drive segment, and within 10 to 20 years in the County NN to County X segment. Traffic forecasts indicate capacity expansion would not likely be needed within a 20-year planning period in either the County X to County DE/E or WIS 16 to Chapel Ridge Road segments.

The results of the indirect effects survey are presented in Tables 4-1 and 4-2, and summarized below.

- In general, local governments indicated their land use planning is consistent with the recommendations in the 2020 Regional Land Use Plan and Waukesha County Development Plan. The Village of Wales indicated their development trends are less intensive than those envisioned in the regional plan. For all but two indirect effect issues, local governments indicated there would be no substantive change in land use, development, and related aspects with or without a future multi-lane WIS 83. The Village of Wales indicated there would be rezoning of residential use along WIS 83 to commercial use and that there would be a potential increase (low) in commercial development.

- All local governments indicated there is a potential for aesthetic impacts due to changes in the rural character of the WIS 83 corridor (particularly in the Genesee Depot area), loss of trees and other natural environmental resources, potential impacts on historic buildings, introduction of manmade features such as retaining walls and more pavement, and moving the highway closer to existing buildings. The Village of Wales indicated interest in aesthetic features of a wider bridge over the Glacial Drumlin State Trail.

- All local governments indicated there is a potential for creating non-conforming lot size or conflicts with local zoning regulations regarding lost size and setback requirements due to widening WIS 83.

- The Village of Hartland indicated that there could be an increase in vehicular traffic using West Capitol Drive depending on the extent to which widening WIS 83 would encourage development at or near the WIS 16 interchange.
- All local governments indicated they place a high priority on preserving wetlands, floodplains, environmental corridors, and known archaeological and historic resources by prohibiting development in such areas. They also indicated there would be no change in these priorities with or without a future multi-lane WIS 83.
- All local governments have land use plans in effect or are developing plans to guide where development will be allowed and where land should be preserved for agricultural, recreational, open space, or other uses.
- All but one local government indicated they follow regional and county farmland preservation recommendations and would support increased participation by area farmers in farmland preservation programs.
- Most local governments have in place or would support implementing intergovernmental boundary agreements to set parameters for annexation, extension of municipal services, and to guide orderly growth.
- All local governments have zoning regulations in effect to guide the type and location of buildings, lot sizes and setbacks, sign type, size, and location, and access to local roads connecting to WIS 83.
- All local governments have subdivision regulations in effect to guide new and expanded subdivisions through use of buffers, open space, stormwater facilities, internal circulation roads, and other amenities to make subdivisions more compatible with adjacent highways.
- Most local governments indicated they would participate in corridor preservation mapping to incorporate proposed highway right-of-way into their land use plans.

Based on information provided by local governments having the authority and responsibility for making land use decisions in the WIS 83 corridor, it is concluded that a future 4-lane highway will not substantially influence the type, intensity, or location of development over what is already planned for and expected to occur with or without future WIS 83 improvements. The local governments also indicated there are several tools in place today or that could be implemented in the future to further protect and preserve natural resources, historic sites, farmland, recreational land, and other open space such that indirect effects on these resources are minimized to the extent practicable.

TABLE 4-1
Potential Indirect Effects

Indirect Effect Issues	Comments
Regional and Local Land Use Planning Future land use in the WIS 83 corridor as presented in the *2020 Regional Land Use Plan for Southeastern Wisconsin* is based on an intermediate growth scenario with urban development generally occurring within and along the periphery of existing urban centers. The majority of the WIS 83 corridor is envisioned as having a mix of low to medium density suburban residential development as well as substantial open space such as primary environmental corridors, farmland, and rural density residential development. The *Development Plan for Waukesha County* indicates similar land use trends for the WIS 83 corridor, but is based on a "build-out" scenario that would occur gradually over time and would be reached sometime after year 2020. In addition to the regional plans, local municipalities along the WIS 83 corridor either have or are developing land use plans and related guidance/regulations. A future multi-lane WIS 83 highway could influence local land use decisions, practices, and policies. The issues listed below are designed to cover both regional and local planning interests.	
Characterization of ongoing and future development trends	Town of Genesee—generally in accordance with regional plans Village of Wales—less intensive than regional plans Town of Delafield—generally in accordance with regional plans Village of Hartland—generally in accordance with regional plans Waukesha County—generally in accordance with regional plans
Effect of multi-lane WIS 83 on future development trends	Town of Genesee—no substantive change Village of Wales—rezoning of residential use along WIS 83 to commercial use Town of Delafield—no substantive change Village of Hartland—no substantive change Waukesha County—no substantive change
Effect of No Build Alternative on future development trends	Town of Genesee—no substantive change Village of Wales—no substantive change Town of Delafield—no substantive change Village of Hartland—no substantive change Waukesha County—no substantive change
Potential for increase in residential development beyond that envisioned in regional/local plans	Town of Genesee—none Village of Wales—none Town of Delafield—none Village of Hartland—none Waukesha County—none
Potential for increase in commercial/industrial development beyond that envisioned in regional/local plans	Town of Genesee—none Village of Wales—there would be an increase in commercial development (low) Town of Delafield—none Village of Hartland—none Waukesha County—none
Potential for increase in urban services to new development beyond that envisioned in regional/local plans	Town of Genesee—none Village of Wales—none Town of Delafield—none Village of Hartland—none Waukesha County—none
Potential for increase in development along local roads that connect to WIS beyond that envisioned in regional/local plans	Town of Genesee—none Village of Wales—none Town of Delafield—none Village of Hartland—none Waukesha County—none
Potential for increase in amount of agricultural land converted to other uses beyond that envisioned in regional/local plans	Town of Genesee—none Village of Wales—none Town of Delafield—none Village of Hartland—none Waukesha County—none
Potential for effect on aesthetics due to advertising signs/other visual changes along the WIS 83 corridor	Town of Genesee—loss of rural ambiance due to destruction of natural environment, old growth trees and historic buildings Village of Wales—a multi-lane highway would further divide the village and would result in a loss of trees and shrubs; suggested mitigation would include green medians and landscape screening along the roadway Town of Delafield—loss of rural character due to loss of trees and natural areas and introduction of manmade elements such as retaining walls Village of Hartland—wider highway will affect aesthetics due to more development, more

TABLE 4-1
Potential Indirect Effects

Indirect Effect Issues	Comments
	pavement, tree removal, and highway being closer to existing buildings Waukesha County—older character of Genesee Depot area will be affected
Potential for non-conforming lot size or conflict with local zoning regulations regarding lot size/setback requirements	Town of Genesee—could occur in older sections of town where originally platted lots are small Village of Wales—non-conforming or undesirable setback situations are likely for some residential properties Town of Delafield—possible effects to 10-14 lots in Twin Oaks and Meadows subdivisions where some lots are already below minimum size due to change in code Village of Hartland—none Waukesha County—numerous locations could be affected in Genesee Depot area
Potential effect of No Build Alternative on land use and development trends from what is presently envisioned in regional/local plans	Town of Genesee—none Village of Wales—none Town of Delafield—none Village of Hartland—none Waukesha County—none
Environmental Resources Although many environmental resources are protected under state and federal laws and are recommended for preservation in SEWRPC's *Regional Natural Areas and Critical Species Habitat Protection and Management Plan*, a multi-lane WIS 83 highway could influence the extent to which local governments view such resources as expendable for increased development. The issues listed below are designed to indicate how future improvements to WIS 83 could influence priority placed on protecting environmental resources.	
Priority placed on protecting and preserving wetlands, floodplains, and environmental corridors by prohibiting development in such areas	Town of Genesee—high priority Village of Wales—high priority Town of Delafield—high priority Village of Hartland—high priority Waukesha County—high priority
Extent to which a future multi-lane WIS 83 would change priority	Town of Genesee—no change Village of Wales—no change Town of Delafield—no change Village of Hartland—no change Waukesha County—no change
Priority placed on protecting and preserving parkland, natural areas, and recreational trails in making development and zoning decisions	Town of Genesee—high priority Village of Wales—high priority Town of Delafield—high priority Village of Hartland—high priority Waukesha County—high priority
Extent to which a future multi-lane WIS 83 would change priority	Town of Genesee—no change Village of Wales—no change Town of Delafield—no change Village of Hartland—no change Waukesha County—no change
Priority placed on protecting and preserving known historic structures and archaeological sites in making development and zoning decisions	Town of Genesee—high priority Village of Wales—high priority Town of Delafield—medium priority Village of Hartland—medium priority Waukesha County—high priority
Extent to which a future multi-lane WIS 83 would change priority	Town of Genesee—no change Village of Wales—no change Town of Delafield—no change Village of Hartland—no change Waukesha County—no change
Other	Village of Wales—interested in aesthetic features of wider bridge over Glacial Drumlin State Trail. Village of Hartland—to the extent that widening WIS 83 would encourage development at or near the WIS 16 interchange, there could be an increase in vehicular traffic using West Capitol Drive.

TABLE 4-2
Tools to Address Indirect Effects

Potential Tools	Comments
Land Use Plans—Local governments can develop land use plans to guide where development will be allowed and where land should be preserved for agricultural, recreational, open space, or other uses.	Town of Genesee—land use plan in progress, anticipated completion in 2003 Village of Wales—land use plan in progress Town of Delafield—adopted land use plan Village of Hartland—adopted land use plan, currently being updated Waukesha County—adopted land use plan
Farmland Preservation Plans—Regional plans identify areas where agricultural land should be preserved or transition to other uses over time. In the WIS 83 corridor these areas are primarily from County NN to WIS 59 and from County KE to WIS 16 (west side).	Town of Genesee—no response Village of Wales—not applicable Town of Delafield—in general does not follow regional farmland preservation plans in making development decisions, will preserve farmland in the future if possible Village of Hartland—not applicable Waukesha County—generally follows regional farmland preservation plans in making development decisions, will continue to preserve farmland in the future
Participation in Farmland Preservation Programs—Local governments can encourage area farmers to participate in farmland preservation programs such as the USDA Conservation Reserve program.	Town of Genesee—low participation today in farmland preservation programs by area farmers Town of Delafield—low participation today in farmland preservation programs by area farmers, would encourage more participation in the future Village of Hartland—not applicable Waukesha County—low participation today in farmland preservation programs by area farmers, would encourage more participation in the future
Municipal Boundary Agreements—Local governments can enter into growth boundary and similar agreements to set parameters regarding annexation, extension of sewer, water, and other public services, and to provide an opportunity for orderly growth in areas adjacent to cities and villages.	Town of Genesee—boundary agreements in effect with two adjacent municipalities Village of Wales—boundary agreement in effect with towns of Genesee and Delafield Town of Delafield—boundary and development agreement in effect between town of Delafield, city of Delafield and village of Hartland Village of Hartland—boundary and development agreement in effect between village of Hartland, town of Delafield and city of Delafield Waukesha County—not applicable
Corridor Preservation Mapping—Local governments and WisDOT can work together to officially map the land needed for future highway improvements (Section 84.295, Wis. Stats), or local governments can place proposed highway improvements on their adopted land use maps. Such mapping would be used to inform the public and potential developers about land that has been preserved for future highway improvements and to help prevent costly development from taking place in or too close to future highway right-of-way.	Town of Genesee—unlikely that official mapping would be effective due to extent of existing development Village of Wales—would consider future corridor preservation mapping Town of Delafield—would consider future corridor preservation mapping Village of Hartland—would consider future corridor preservation mapping, notes village already uses a mapping process for future local street development Waukesha County—would consider future corridor preservation mapping
Zoning—Local governments can implement new zoning regulations/ordinances or expand existing regulations to guide type and location of buildings, lot sizes and setbacks; sign type, size, and location; and access to local roads (driveway number, types, and locations).	Town of Genesee—follows Waukesha County zoning code and has a subdivision control ordinance that is somewhat more restrictive Village of Wales—existing zoning in effect to some degree; will be updated for consistency with long-range plan Town of Delafield—several zoning regulations/ordinances in effect including a zoning code that sets forth various requirements for all zoning districts Village of Hartland—zoning regulations covering all listed issues Waukesha County—county zoning code, shoreland and flood land protection ordinances
Subdivision Regulation—Local governments can set development specifications for new and expanded existing subdivisions. For example, developers can be required to provide buffers, noise berms, open space, storm water facilities, internal circulation roads, and other amenities to make subdivisions more compatible with adjacent highways.	Town of Genesee—ordinances in effect covering all listed issues Village of Wales—regulations in effect to some degree; will be updated for consistency with long-range plan Town of Delafield—planned unit development code regulates stormwater management and open space, town does not allow noise barriers, traffic circulation is enhanced by restricting driveway access Village of Hartland—regulations cover open space, stormwater facilities, roads, sewer and water, landscaping, street trees, and buffer strips along major roads are being implemented Waukesha County—county shoreland and flood land subdivision control, also has street and highway width ordinances

CUMULATIVE IMPACTS

Cumulative impacts are those incremental impacts to the environmental resource base that result from the proposed action (WIS 83 improvements) when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative actions can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative impact analysis for the WIS 83 corridor study focuses on resource categories that are important in the highway corridor and the broader geographic area, and that are key factors in regional and local land use plans.

Wetlands

In 1990, wetlands in Waukesha County totaled approximately 52,000 acres (21,000 ha), roughly 14 percent of the county's total area. According to the *Waukesha County Land and Water Resource Management Plan 1999 – 2002*, Waukesha County lost about 600 acres (243 ha) of wetland between 1963 and 1990 (a decline of about 1 percent). The plan also notes that wetland loss trends will continue as the county continues to urbanize with an estimated 40 percent increase in urban land use in 2010. Historically, wetland loss has been primarily due to draining, filling, and ditching to provide more tillable farmland, stream channelization, destruction of vegetated shorelines, and floodplain development.

The effects of wetland loss and fragmentation include habitat loss, diminished flood control capacity, and diminished nutrient retention capacity. Habitat loss would cause a decline in the number and diversity of wetland plant and animal species and adverse water quality impacts.

Highway construction also contributes to direct and indirect loss of wetlands. Although not quantifiable, implementing recommended transportation improvements in Waukesha County as called for in the regional transportation system has the potential for additional wetland loss over time. The proposed WIS 83 improvements could result in loss of approximately 9 acres (4 ha) of wetland.

Local and regional land use plans and state and federal regulations will help limit wetland loss overall, but will not eliminate the loss. Agricultural reserve programs, and the requirement to mitigate unavoidable wetland impacts for WisDOT transportation projects such that there will be no net loss of wetland, will also limit future wetland loss.

Surface Water

Waukesha County has 268 miles (431 km) of perennial streams totaling just over 14,000 acres (5,670 ha). Streams in the WIS 83 corridor are within the Fox River and Rock River watersheds and include the following:

- Fox River tributary north of County NN—warm water community
- Spring Brook north of County X—cold water community
- Genesee Creek branch west of Genesee Depot—cold water community
- Genesee Creek branch north of Genesee Depot—cold water community
- Scuppernong Creek between US 18 and I-94—cold water community
- Bark River between County KE and WIS 16—warm water sport fish community

According to the *Regional Water Quality Management Plan for Southeastern Wisconsin: An Update and Status Report* (SEWRPC Memorandum Report No. 99, March, 1995) water quality in the Fox River and Rock River watersheds has been affected historically by nonpoint source pollution such as runoff from farmland, residential and commercial development, and pollution from point sources such as sewage treatment plants and industries.

Based on their classification as cold water or warm water sport fish communities, water quality in the streams along the WIS 83 corridor streams is considered good. The primary sources of potential pollution include farmland and other nonpoint source runoff. In general, given the land use planning scenario for the WIS 83 corridor that includes large tracts of open space, protection of wetlands and environmental corridors, no substantial changes in water quality would be expected to occur.

Highway construction has a potential for affecting water quality due to erosion, sedimentation, and storm water runoff. Although not quantifiable, implementing recommended transportation improvements in Waukesha County as called for in the regional transportation system has the potential for water quality impacts over time. Widening WIS 83 would involve replacing or extending existing structures over the streams noted above. Strict erosion control measures, erosion control implementation plans, and storm water management measures would minimize water quality impacts. In addition, DNR's watershed management plans for the Fox River and Rock River watersheds will continue to improve water quality over time.

Upland Habitat

Upland habitat generally includes a combination of woodlands and other "unused" land that has a potential for supporting wildlife and providing other ecological values. Based on this assumption, the Waukesha County Development Plan indicates upland habitat has remained relatively stable between 1970 and 1990. Woodland comprised about 30,800 acres (1,538 ha) in 1970 and 29,580 acres (11,976 ha) in 1990. The amount of unused land increased from about 16,700 acres (6,760 ha) in 1970 to 24,250 acres (9,818 ha) in 1990. Historically, loss of upland habitat has occurred primarily due to agricultural practices and urban expansion.

Although not quantifiable, transportation improvements and future development called for in the regional land use and transportation system plans will continue to affect upland habitat. Proposed improvements to WIS 83 could potentially affect approximately 51 acres (21 ha) of upland habitat through strip takings adjacent to the existing highway.

Farmland

Information from the Wisconsin Agricultural Statistics Service administered by the U.S. Department of Agriculture indicates Waukesha County had 105,600 acres (42,753 ha) of farmland in 1997, a decrease of 8 percent since 1992. Farmland loss is primarily due to planned residential and commercial development. Although the *Waukesha County Farmland Preservation Plan* recommends maintaining prime agricultural land in agricultural zoning districts and preserving the most productive agricultural soils, there is expected to be a loss of up to 30,080 acres (12,173 ha) of prime farmland by year 2010, a decrease of approximately 28 percent since 1997 (*Waukesha County Land and Water Resource Management Plan 1999-2002*).

Although not quantifiable, transportation improvements and future development called for in the regional land use and transportation system plans will continue to affect farmland. The

proposed WIS 83 improvements have the potential for impacting approximately 53 acres (21 ha) of farmland, primarily as strip takings along the existing highway.

In summary, proposed improvements to WIS 83 would increase the incremental or cumulative loss of wetland, upland habitat, and farmland resources in Waukesha County. The proposed WIS improvements also have the potential for additional adverse effects on water quality. However, unavoidable wetland impacts would be mitigated and strict erosion control measures, stormwater management, and other measures should eliminate or greatly reduce the potential for adverse water quality impacts.

TRANSPORTATION IMPACTS

Traffic and Operational Characteristics

The entire WIS 83 corridor is expected to experience about a 53 to 64 percent increase in traffic by 2026 based on projected growth trends. Traffic in the 2-lane rural/suburban segments in the northern half of the corridor (County DE/E to WIS 16) already exceed the 13,800 AADT threshold volume that can be safely handled at an acceptable service level (LOS D) on a 2-lane rural/suburban highway. In 2026 all but two segments (County X to County DE/E and WIS 16 to Chapel Ridge Road) are projected to operate below LOS D. The 4-lane urban segment from Hillside Drive to County DR/Golf Road presently carries about 23,200 AADT and is approaching the 28,000 AADT threshold volume that can be safely handled at an acceptable service level (LOS D) on an urban 4-lane highway. Traffic in this segment is expected to operate below LOS D by 2026. Traffic in the County DR/Golf Road to Meadow Lane section is forecast to reach 26,300 AADT in Design Year 2026 and the existing 4-lane suburban roadway with shoulders is considered sufficient to handle the forecast traffic. See EIS Section 1 for more details.

Truck traffic ranges from 420 to 1,400 per day and is expected to reach 700 to 2,200 per day in 2026. The highway operates at a lower level of service during morning and evening peaks, however the WIS 83 segment in the commercial area near I-94 peaks at mid-day on weekends. Traffic operations on WIS 83 are substantially affected by more than 318 access points (local roads, driveways, and field entrances) between County NN and WIS 16.

No Build Alternative

The No Build Alternative would fail to address roadway segments that operate below LOS D for existing and 2026 conditions. Further, it would preclude WisDOT from preserving land needed for future transportation improvements where segments may not operate below LOS D until after 2026. This alternative would not be consistent with the regional transportation system plan that shows the need for capacity expansion as part of the recommended system wide transportation improvements. However it would be applicable as an interim improvement in the County X to County DE/E and WIS 16 to Chapel Ridge Road sections.

The No Build Alternative would not address the effects of trucks on traffic operations and congestion. As traffic increases and no improvements are made, the level of service (LOS) would continue to deteriorate. Table 4-3 provides a comparison between the existing and future LOS under the No Build and Build Alternatives.

TABLE 4-3
Roadway Mainline Level of Service (LOS)

Roadway Segment	Existing (2000) LOS	2026 LOS No Build Alternative	2026 LOS Build Alternative
County NN to County X	D	E	A
County X to County DE/E	C	D[1]	A[2]
County DE/E to Hillside Drive	E	F	B/C
Hillside Drive to County DR/Golf Road	D	E	D
County DR/Golf Road to Meadow Lane	B	C	N/A[3]
Meadow Lane to WIS 16	E	F	B
WIS 16 to Chapel Ridge Road	D	D	N/A[3]

Notes:
1. Also applicable for the 2-Lane Reconstruction Alternative.
2. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.
3. Existing cross section sufficient.

Under the No Build Alternative, traffic operations would continue to deteriorate due to higher traffic volumes combined with cross traffic turning to and from local roads and driveways, speed changes, and lack of auxiliary lanes to get around turning vehicles.

Build Alternatives

There are three Build Alternatives in the County X to County DE/E segment, a 2-Lane Reconstruction Alternative, a 4-Lane Corridor Preservation Alternative, and a combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative. The combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative would essentially be a No Build in Genesee Depot from the beginning of the off-alignment to Depot Road. About 80 percent of the WIS 83 traffic is projected to split along Off-Alignment Alternative D. The remaining roadway in Genesee Depot would likely be jurisdictionally transferred to the Town of Genesee and traffic volumes and congestion would be substantially reduced.

Providing additional capacity on WIS 83 would address traffic demand where the roadway operates below LOS D for existing and 2026 conditions. Further, the 4-lane corridor preservation Build Alternative provides an opportunity for preserving the land needed for future transportation improvements where segments may not operate below LOS D until after 2026. The Build Alternative that includes the 2-lane reconstruction in the County X to County DE/E and WIS 16 to Chapel Ridge Road segments would be consistent with the regional transportation system plan that documents the need for capacity expansion for the majority of the corridor as part of the recommended system wide transportation improvements.

The 4-lane Build Alternatives would address the effects of trucks on traffic operations and congestion by providing an additional roadway lane in each direction for trucks and other vehicles to maneuver around slow and/or turning traffic, and by providing additional turning capacity at intersections. The 2-Lane Reconstruction Alternative in the County X to County

DE/E segment would provide minor benefits to truck operations with wider shoulders and improved intersections with turn lanes. The addition of a median for the majority of the Build Alternatives would improve traffic operations (Table 4-3), by reducing conflicts with turning traffic from numerous access points. Turn lanes at intersections also would enhance traffic operations throughout the corridor. Reducing the number of access points in the Hillside Drive to County DR/Golf Road segment would improve operations and safety.

Safety

A total of 579 crashes occurred along the WIS 83 corridor during the 4-year period from 1997 through 2000. Crashes involving property damage accounted for 52 percent of the total (301) and crashes resulting in personal injury accounted for 48 percent (276). All but three segments along WIS 83 had average crash rates higher than statewide average rates. Crash rates in the County DE/E to US 18 and Hillside Drive to County DR/Golf Road segments were substantially higher. Six of the 27 intersections along WIS 83 had crash rates worse than the national average during 1997 through 2000 (County I, WIS 59, Depot Road, Heritage Drive, I-94 eastbound ramp terminals, and I-94 westbound ramp terminals).

No Build Alternative

As traffic increases on WIS 83, safety problems will grow if no improvements are made. Congestion, combined with a mix of through and turning traffic, will increase the potential for roadway mainline and intersection crashes. Left and right turns from and to WIS 83 at side roads and private driveways would be more difficult without improvements. For vehicles entering WIS 83, the increased traffic volumes will cause fewer gaps and longer queuing times at driveways and side roads. Drivers will be more likely to make unsafe maneuvers when entering the traffic stream on WIS 83, thus increasing the likelihood of angle and rear end crashes. Without improvements, the increased traffic volumes would also increase the potential for conflict between through traffic and unprotected left turning traffic. The crash history on WIS 83 underscores the safety problems that would worsen with the No Build Alternative. Between 1997 and 2000, the two most common types of crashes involved rear end collisions and angle crashes. In addition, the No Build Alternative would fail to address geometric deficiencies such as poor sight distance at intersections and hills.

Build Alternatives

Adding turning lanes and improving geometric deficiencies, and adding driving lanes and a median in most segments will reduce the potential for crashes on the highway mainline and at intersections. Additional capacity will reduce congestion and provide smoother traffic flow. A divided highway for the majority of the corridor will separate counter-directional traffic, and intersection turn lanes along with a median will provide vehicle storage and minimize conflicts with turning traffic. Reconstructing the highway to modern design standards will address sight distance problems. Safety will be improved in the commercial area in Genesee Depot with the combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative including the Depot Road intersection.

Access to Facilities and Services

Under the No Build Alternative, there would be no changes in access to facilities and services except at spot locations where future safety concerns may indicate the need to modify a driveway or local road connection.

In general, local road and driveway connections to WIS 83 would be retained with the Build Alternatives and recommended alternative. More detailed design in a future engineering phase could identify locations where driveways and field entrances can be consolidated or relocated to improve safety. Existing median openings could be modified or closed to improve safety.

A divided highway would restrict turns from most driveways to right-in /right-out only. The nearest median opening would need to be used to make left-hand turns into or out of these driveways. Although this would cause some out-of-distance travel and U-turns, safety would be improved by providing median storage where vehicles would wait to make left-hand turns.

Emergency service and school bus service would be enhanced through reduced congestion, auxiliary turning lanes at intersections, additional room to maneuver around slow or stopped traffic, and a median in most segments that would provide a protected turn lane.

UTILITY IMPACTS

Under the No Build Alternative, utility impacts would be those associated with normal facility maintenance and service extensions to new development or redevelopment areas.

The recommended alternative requires relocation or replacement of overhead or buried utilities (electric lines and cables, fiber optic cables, telephone lines and cables, gas, water, and sewer lines) that would be in conflict with roadway widening. The extent of utility relocations would be determined based on more detailed design during a future engineering phase. Two substantial utility locations have been identified based on preliminary engineering evaluation for purposes of the WIS 83 corridor study. WE Energies – Gas Operations has 20-inch and 16-inch high-pressure gas mains buried on the west side of WIS 83 between Sugden Road and Road X. Relocation of this utility may be necessary due to roadway construction activities. American Transmission Company has two overhead high voltage transmission lines located north of County DR/Golf Road and south of the Canadian Pacific Railroad crossing. No impact to these lines is anticipated due to their existing height above the roadway.

VISUAL CHARACTER / AESTHETICS

The visual character and aesthetic quality of the existing WIS 83 corridor is discussed in EIS Section 3. Highways are a landscape feature that can affect the visual quality of the natural and built environment in which they are located. The type of highway and its relationship to the natural and built environment can also affect the visual experience for those who use the highway.

The ultimate long-term Build Alternatives for WIS 83 involve widening the majority of existing 2-lane segments to a multi-lane facility. This would increase the visual mass and scale of the highway for adjacent viewer groups that include scattered rural residences, subdivisions, commercial development, institutions such as churches, and other development with a view of the highway. From Mukwonago to Genesee Depot, the number of viewers of the existing highway is considered relatively low based on existing development density. In the remainder of the WIS 83 corridor, there is a moderate number of existing highway viewers where there is more residential and commercial development adjacent to the existing highway.

In general a divided 4-lane roadway cross section (with a median) would essentially double the highway's visual scale. Undivided roadway cross sections (without a median) would have the

appearance of a suburban or urban type highway rather than a rural facility. Although there wouldn't be substantial changes to the horizontal alignment for alternatives that would widen the existing highway, moving the northbound or southbound driving lanes closer to adjacent viewers would further increase the highway's visual mass and scale.

The off alignment alternative at Genesee Depot (Alternative D) would introduce an adverse visual element into an area that is presently undisturbed and that contains several high quality visual features including a pond, stream, wetlands, and woodland.

The visual character and aesthetic quality of the viewing experience for highway users are affected by a number of factors including viewer groups (trip purpose), traffic volumes and level of congestion and travel speed.

Viewer groups using WIS 83 include a mix of local, commuter, and tourist traffic. Local users tend to favor and appreciate the natural and cultural features along the corridor. Commuters tend to focus on safe, clearly marked and rapid routes to their destinations. Tourists want to experience the unique aspects of a particular highway corridor including the different communities through which the highway passes. Where traffic volumes are high and congestion is a factor, highway users are more likely to pay attention to the highway and not the surrounding landscape. This is also true where travel speeds are higher. Conversely, on lower volume highways with less congestion and slower travel speeds, highway users are more likely to enjoy the scenery.

The existing WIS 83 corridor has a mix of these conditions and to some extent, a future multi-lane facility without increased speed limits, would be more conducive to allowing travelers to drive safely and at the same time enjoy the visual character of the corridor. Making roadway cuts and fills to improve the vertical profile would detract somewhat from the present visual experience provided by the rolling terrain.

SOCIOECONOMIC IMPACTS

Neighborhoods and Community Cohesion

The impacts of highway expansion on neighborhoods and community cohesion relate to changes in the physical, social, and community services setting and other factors that promote a sense of community among residents along WIS 83. Neighborhoods along the corridor are associated with residential subdivisions or groups of houses not part of a subdivision. Community cohesion encompasses facilities that provide services and recreational opportunities such as churches, commercial development, municipal buildings, golf courses, and schools.

In discussing potential impacts to community cohesion, it is important to examine the manner in which people interact and the role of the highway in those interactions. Although WIS 83 extends through development in the Village of Wales, City of Delafield, and Village of Hartland, the village centers are not located along the project corridor. However WIS 83 does extend through the Genesee Depot village center where there is a mix of residential, commercial, and public uses that tend to be focal points for community interaction. In project-area towns, community interaction tends to be more dispersed because of the lack of an established center. With the distances between subdivisions, commercial areas, and public facilities along the highway and the lack of pedestrian and bicycle connections between such

areas, community interaction is highly dependant on vehicles transporting people to other subdivisions and community facilities. The reliance on vehicles to "bring people together" does not mean there is not a sense of community in the study corridor. Rather, it indicates that study area residents use WIS 83 and other roads to drive to locations to interact—to develop and maintain the sense of community cohesion. In general, WIS 83 is not a barrier to community cohesion, but rather an important part of the local road network people use to access neighborhoods and other gathering places.

Given the assumption that community interaction/cohesion in the project corridor is highly dependent on vehicles, the question is whether the existing pattern would change under the No Build or Build Alternatives. Would study area residents be less inclined to travel along or across WIS 83 than they are today, thereby affecting community cohesion? Given the pattern of development occurring in the project area (low density, lack of connecting streets among subdivisions, etc.) which will continue to occur, future travel in the corridor will continue to be dominated by vehicles almost regardless of the trip type for shopping, work, school, and recreation. Non-vehicle trips in the corridor with either the No Build or Build Alternatives will be a small fraction of the total future trips. The width of WIS 83 under the No Build or Build Alternatives has little to no role in the highway acting as a barrier. Community cohesion does not and will not rely on non-vehicle trips along or across the corridor. Study area residents will be equally inclined to drive to community gathering places under both alternatives because driving is and will continue to be the preferred mode of travel in the corridor.

Conceptual Stage Relocation Discussion

General Relocation Considerations

The No Build Alternative would not require residential or business displacements.

The residential and business displacement evaluation for the Build Alternatives includes the number and types of residential units and businesses displaced, availability of replacement dwellings and business sites, and relocation cost estimates.

Acquisitions and relocations are done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Besides providing for payment of fair market value for acquired property, other benefits are available to eligible displaced persons required to relocate from their residence, business, or farm. Benefits include relocation advisory services, reimbursement of moving expenses, replacement housing and business payments, down payment and rental assistance for tenants, and business reestablishment expenses. Under state law, no person or business may be displaced unless a comparable replacement dwelling or business location is provided.

Real estate acquisition would be handled by WisDOT. Prior to appraisals and property acquisition, an authorized relocation agent interviews each owner and renter to be relocated to determine their needs, desires, and unique situations associated with relocating. The agent explains the relocation benefits and services each owner may be eligible to receive. Compensation is available without discrimination to all displaced persons. Before initiation of property acquisition, WisDOT provides information explaining the acquisition process and the state's Eminent Domain Law under Section 32.05, *Wisconsin Statutes.* A professional appraiser inspects the property to be acquired. Property owners are invited to accompany the appraiser to ensure that full information about the property is taken into consideration. Property owners may also obtain an independent appraisal. Based on the appraisal, the value of the property is determined and that amount offered to the owner.

Information for the following relocation discussion items was obtained from local municipality tax assessment rolls for 2002.

Residential Displacements

The estimated residential displacements for the reasonable Build Alternatives considered in the EIS are summarized in Table 4-4. The estimated displacements were based on preliminary information regarding roadway width and location relative to abutting residential properties. Based on more detailed geometric and profile data developed during a future engineering phase, the actual number of residential displacements could change.

Demographic data for the municipalities in which the residential displacements would occur is provided in EIS Section 3. There is no indication that minority status, age, or income level characteristics would require special relocation consideration or services. If unusual circumstances were to arise during real estate activities, WisDOT real estate personnel would be available to provide the appropriate relocation services.

TABLE 4-4
Residential Displacements

Project Section	Number and Type of Displacement[1]
1. County NN to County X	2 Single-family units 1 Rental unit
2. County X to County DE/E	4 Single-family units[2]
	8 Single-family units[3] 2 Multi-family units[3] 2 Rental units[3]
	7 Single-family units[4] 2 Multi-family units[4]
3. County DE/E to Hillside Drive	1 Single-family unit
4. Hillside Drive to County DR/Golf Road	No displacements
5. County DR/Golf Road to Meadow Lane	No displacements
6. Meadow Lane to WIS 16	4 Single-family units

Notes:
1. Residential displacements are calculated based on the number of individual living units. A unit equals 1 displacement.
2. 2-Lane Reconstruction Alternative.
3. 4-Lane Corridor Preservation Alternative.
4. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Residential displacements for the various Build Alternatives are provided in Exhibit S-B in the Summary Section.

Table 4-5 summarizes the residential displacement characteristics and replacement dwelling needs based on the worst-case Build Alternatives scenario (those with maximum residential displacements). The prices for owner-occupied dwelling units are based on the equalized

assessed value provided by applicable municipalities. The cost for purchasing the units in the future would be based on the fair market value at the time of acquisition.

TABLE 4-5
Residential Displacement Characteristics[1]

Project Section	Type[2] / Number of Bedrooms	Owner Occupied		Tenant Occupied	
		Price[3], $	Units Needed	Rent, $	Units Needed
1. County NN to County X	SF / 3 bed	148,000 152,000	2		
	SF / 4 bed			800	1
2. County X to County DE/E	SF / 2 bed	103,000 125,000	2	900	1
	SF / 3 bed	41,000 58,000 100,000 111,000 115,000 122,000	6		
	SF / 4 bed			700	1
	MF / 2 bed	105,000	2	800	1
3. County DE/E to Hillside Drive	SF / 2 bed	157,000	1		
4. Hillside Drive to County DR/Golf Road	No residential displacements				
5. County DR/Golf Road to Meadow Lane	No residential displacements				
6. Meadow Lane to WIS 16	SF / 2 bed	108,000	1		
	SF / 3 bed	125,000 146,000 209,000	3		

Notes:
1. 4-Lane Corridor Preservation Alternative.
2. SF = Single-family, MF = Multi-family
3. The price is based on 2002 assessed value information obtained from local municipalities. The acquisition price would be based on current market value and other factors at the time the residences would be purchased.

Table 4-6 summarizes available purchase and rental housing in the study area. This information was based on Multiple Listing Service (MLS) information during February 2003. Housing availability would be reassessed during future engineering and real estate project phases that would include a detailed Acquisition Stage Relocation Plan. Preliminary investigations for purposes of the WIS 83 corridor study indicate there will likely be an

adequate supply of comparable replacement dwellings. Homes that are part of farming operations could be re-established on the farmstead. Because of the long-term construction schedule for the portions of the WIS 83 corridor, WisDOT would respond to requests for early acquisition.

TABLE 4-6

Availability of Replacement Housing

Price Range, $	Available Housing - Purchase		
	2 Bedroom	3 Bedroom	4 Bedroom
35,000-65,000			
65,000-95,000	2	2	2
95,000-125,000	8	7	1
125,000-155,000	8	39	8
155,000-185,000	3	41	8
185,000-215,000	1	48	19
215,000-245,000		36	11
Rental Range, $	**Available Housing – Rental Units**		
	1 Bedroom	**2 Bedroom**	**3 Bedroom**
450-550	11	1	
550-650	7	14	
650-750	2	5	4
750+	2	5	4

Business Displacements

Table 4-7 summarizes business displacements based on the worst-case Build Alternatives scenario (those with maximum business displacements). The prices for businesses are based on the equalized assessed value provided by applicable municipalities. The cost for purchasing the businesses in the future would be based on the fair market value at the time of acquisition. Based on more detailed geometric and profile data during a future engineering phase, and new development that occurs, the actual number of business displacements could change. There are no known age, ethnic, handicapped, or minority characteristics that would require special relocation consideration for any business displacement.

Due to the nature of the business displacements, no unusual requirements are anticipated that would preclude successful relocation. If unusual problems were to arise, WisDOT real estate personnel would be available to provide the appropriate relocation services. Based on MLS

listings for March and June 2003, there were approximately 12 commercial buildings/properties for sale in or near the study area in addition to available commercial space in business parks and commercial centers. Commercial buildings included 4 that would be suitable for use as a restaurant, tavern, or deli. Several others would be suitable for small businesses such as the antique store and for office space. Given the long-term construction time frame for any improvements in the County X to County DE/E segment that has the majority of business displacements, it is not feasible to predict the number of similar buildings would be available at a later time. However, based on the preliminary sampling for purposes of the EIS, it appears likely that sufficient replacement business structures/building sites would be available in the future.

TABLE 4-7
Business Displacement Characteristics

Project Section	Business Type	Estimated Number of Employees	Price[1], $
1. County NN to County X	No business displacements		
2. County X to County DE/E	Restaurant[2,3]	4 Full-time 6 Part-time	234,000
	Antique Store[2]	1 Full-time	118,000
	Tavern[2]	6 Full-time 15 Part-time	103,000
	Deli[2]	4 Full-time 5 Part-time	47,000
3. County DE/E to Hillside Drive	No business displacements		
4. Hillside Drive to County DR/Golf Road	No business displacements		
5. County DR/Golf Road to Meadow Lane	No business displacements		
6. Meadow Lane to WIS 16	Development Office	5 Full-time 2 Part-time	184,000

Notes:
1. The price is based on 2002 assessed value information obtained from local municipalities. The acquisition price would be based on current market value and other factors at the time the business would be purchased.
2. 4-Lane Corridor Preservation Alternative.
3. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Displacement Cost Estimates

Table 4-8 summarizes the range of residential and business acquisition/relocation cost estimates for the Build Alternatives. The cost estimates include real estate purchase and maximum relocation costs (relocation payments and benefits) for properties involving relocations. The costs are based on equalized assessment values for 2002. The cost to purchase properties in the future would be based on the fair market value at the time of purchase. There are additional costs for purchasing real estate that does not involve residential or business displacements such as strip right-of-way acquisition. These costs are reflected in the total

project cost estimates provided under "Economic Impacts." The Conceptual Stage Relocation Discussion section was reviewed by a WisDOT Real Estate representative.

TABLE 4-8
Residential / Business Displacement Cost Estimates (2002 Dollars)

Project Section	Residential	Business	Total
Real Estate Costs[1]			
1. County NN to County X	$482,000	0	$482,000
2. County X to County DE/E	$449,000[3]	0[3]	$449,000[3]
	$954,000[4]	$1,005,000[4]	$1,959,000[4]
	$818,000[5]	$633,000[5]	$1,451,000[5]
3. County DE/E to Hillside Drive	$157,000	0	$157,000
4. Hillside Drive to County DR/Golf Road	0	0	0
5. County DR/Golf Road to Meadow Lane	0	0	0
6. Meadow Lane to WIS 16	$588,000	$368,000	$956,000
Relocation Costs[2]			
1. County NN to County X	$64,000	0	$64,000
2. County X to County DE/E	$108,000[3]	0[3]	$108,000[3]
	$263,000[4]	$280,000[4]	$543,000[4]
	$216,000[5]	$140,000[5]	$356,000[5]
3. County DE/E to Hillside Drive	$27,000	0	$27,000
4. Hillside Drive to County DR/Golf Road	0	0	0
5. County DR/Golf Road to Meadow Lane	0	0	0
6. Meadow Lane to WIS 16	$108,000	$70,000	$178,000
Total Costs			
1. County NN to County X	$546,000	0	$546,000
2. County X to County DE/E	$557,000[3]	0[3]	$557,000[3]
	$1,217,000[4]	$1,285,000[4]	$2,502,000[4]
	$1,034,000[5]	$773,000[5]	$1,807,000[5]
3. County DE/E to Hillside Drive	$184,000	0	$184,000
4. Hillside Drive to County DR/Golf Road	0	0	0
5. County DR/Golf Road to Meadow Lane	0	0	0
6. Meadow Lane to WIS 16	$696,000	$438,000	$1,134,000

Notes:
1. Real estate costs include the 2002 assessed value for residences and twice the assessed value for businesses.
2. Relocation costs include: $27,000 for each single-family residence; $50,000 relocation benefit plus $20,000 moving expenses for each business; $10,000 for each rental residence.
3. 2-Lane Reconstruction Alternative.
4. 4-Lane Corridor Preservation Alternative.
5. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Environmental Justice

Presidential Executive Order on Environmental Justice 12898 requires all federal agencies to address the impacts of their programs with respect to environmental justice. The Executive Order states

that, to the extent practical and permitted by law, neither minority nor low-income populations may receive disproportionately high or adverse impacts as a result of a proposed project. It also requires representatives of any low-income or minority population that could be affected by the project in the community be given the opportunity to be included in the impact assessment and public involvement process.

Demographic information relative to minorities and income levels in the area of potential effect for the Build Alternatives is provided in EIS Section 3, Affected Environment. Based on the demographic information and contacts with potentially affected property owners through the project's public information meetings and other meetings as discussed in Section 6, Comments and Coordination, the study team has concluded that no alternatives would have a disproportionate effect on minority or low income populations.

Economic Impacts

The economic impacts of the No Build Alternative would primarily be the long-term cost of maintaining the existing highway including pavement resurfacing or replacement. Increased traffic, particularly heavy trucks, would contribute to the frequency of required pavement maintenance. There would also be costs to the public and individuals associated with crashes.

The immediate economic impact of the Build Alternatives would be expenditure of public funds to construct the highway improvements. The total project cost estimates for the reasonable Build Alternatives considered in the EIS are summarized in Table 4-9. These costs include construction of roadway improvements, strip right-of-way acquisition, and those costs associated with residential and business relocation costs and benefits. Costs do not include utility relocations, administrative/engineering contingency costs, wetland or other mitigation costs.

Additional economic impacts are associated with the loss of property tax base used to finance local government services. All Build Alternatives would remove residential, commercial, and agricultural land from the local government tax rolls, causing a loss of property tax revenues.

In the short term there would be an economic impact due to tax base loss. In the long term, it is expected that the economic impacts of tax base loss would be offset by continued planned development and increased land value in the study area.

The adverse economic effect of removing farmland from production would not be entirely offset. Loss of productive, income-producing cropland could result in a potentially lower gross income for farmers. Compensation would consist of paying fair market value for farmland required for the proposed highway improvements. WisDOT would also consider purchasing uneconomic remnants, with possible resale to adjacent farming operations.

Long-term positive economic impacts may include travel time cost savings for highway users (including local residents and businesses) and a reduction in costs associated with crashes.

TABLE 4-9
Total Project Cost Estimates (2002 Dollars)

Project Section	Cost (millions)[1, 2]
1. County NN to County X	16.3
2. County X to County DE/E	12.1[3]
	18.6[4]
	21.6[5]
3. County DE/E to Hillside Drive	14.7
4. Hillside Drive to County DR/Golf Road	1.6
5. County DR/Golf Road to Meadow Lane	0.4[6]
6. Meadow Lane to WIS 16	13.5
7. WIS 16 to Chapel Ridge Road	0.7

Notes:
1. Preliminary cost estimates (2002 dollars) include construction of roadway improvements and residential and business relocation costs and benefits. Costs do not include utility relocations, administrative/engineering contingency costs, wetland or other mitigation costs.
2. Based on a best-fit alignment developed for each project section. See "Alternatives Retained for Detailed Study" in EIS Section 2 for a description of each best-fit alignment.
3. 2-Lane Reconstruction Alternative.
4. 4-Lane Corridor Preservation Alternative.
5. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.
6. Existing cross section sufficient; cost estimate for trail grade separation structure

ENVIRONMENTAL AND RELATED RESOURCE IMPACTS

Water Quality and Fishery Resources

The No Build Alternative could result in minor water quality impacts due to erosion and sedimentation during pavement and structure maintenance activities over and near waterways. There would also be impacts associated with highway runoff and de-icing. All Build Alternatives would involve replacing or extending structures over several streams crossed by WIS 83. Stream crossings and probable replacement structure types are summarized in Table 4-10. Stream crossing locations are shown on the Aerial Photo Exhibit inside the back cover.

TABLE 4-10
Stream Crossing Summary

Name	General Location	Proposed Structure Type
Tributary to Fox River	South of Saxony Court	culvert pipes or box culvert
Spring Brook	South of Holiday Road	box culvert
Genesee Creek (west branch)	South of Genesee Depot	box culvert
Genesee Creek (west and north branches)	WIS 59, east of WIS 83	widen existing bridge
Scuppernong Creek	Adjacent to Mary Court	culvert pipes or box culvert
Bark River	Midway between Cardinal Lane and Walnut Ridge Drive	widen existing bridge

Erosion and sedimentation, storm water management, pollutant concentrations in highway runoff, and highway deicing also have the potential for affecting water quality and other resources. These issues are discussed as follows.

Erosion and Sedimentation

Exposed soils during and after highway construction has the potential for erosion and sedimentation into environmentally sensitive areas such as streams, wetlands, threatened or endangered species habitat, open space areas, as well as adjacent farmland, residential, and commercial properties. Soil types, existing drainage patterns, terrain, and the extent and duration of highway construction influence the degree to which erosion and sedimentation could occur at a particular location.

According to the Waukesha County Agricultural Soil Erosion Control Plan, Community Assistance Planning Report No. 159, SEWRPC, June 1988, soil erosion potential along the WIS 83 corridor in Waukesha County is generally classified as follows:

- Moderate to severe erosion potential – majority of corridor
- Slight erosion potential – flat areas near wetlands and stream crossings (Fox River tributary, Spring Brook, Genesee Creek, Scuppernong Creek, Naga-Waukee Park, Bark River)

The potential for erosion and sedimentation under the No Build Alternative would be minimal, and would be associated with future maintenance activities or spot traffic operational improvements within existing highway right-of-way.

Construction activities for the Build Alternatives would include substantial clearing and grading, cutting hills where sight distance is a problem, placing fill in low areas, building new structures over streams, and other activities that have the potential for causing erosion and sedimentation.

Guidelines and regulations for minimizing the potential for erosion and sedimentation for highway construction projects include the WisDOT Facilities Development Manual, Chapter 10—Erosion Control and Storm Water Quality, Wisconsin Administrative Code Chapter TRANS 401—*Construction Site Erosion Control and Storm Water Management Procedures for*

Department Actions, and the WisDOT/DNR Cooperative Agreement Amendment—*Memorandum of Understanding on Erosion Control and Storm Water Management*. The key principles and standards are summarized as follows.

Basic Principles and Best Management Practices

- Plan the highway project to fit the particular topography, soils, drainage patterns, and natural vegetation to the extent practicable.
- Minimize the size of disturbed area exposed at any one time and the duration of exposure. Construction contracts could include limits on the amount of soil that can be exposed at any one time, measures to prevent erosion during spring thaw if construction is not completed before winter, and specifications to complete grading as soon as possible and re-vegetate with temporary and permanent cover.
- Use control methods to prevent erosion and sedimentation in sensitive areas. Such methods include proper design of drainage channels with respect to width, depth, gradient, side slopes, and energy dissipation; protective ground cover including vegetation, mulch, erosion mat or riprap; diversion dikes and intercepting embankments to divert sheet flow away from disturbed areas; and sediment control devices such as retention/detention basins, ditch checks, erosion bales and silt fence to help filter out the sediment.
- Apply perimeter control practices to protect the disturbed area from off-site runoff and prevent sediment from leaving the construction site.
- Keep runoff velocities low by maintaining short slope lengths, low gradients, and vegetative cover.
- Stabilize disturbed areas as soon as practicable through use of temporary vegetation, mulch, stabilizing emulsions, or a combination of these measures immediately after rough grading is completed.
- Establish and implement a maintenance program that includes periodic checks of the erosion and sediment control devices and practices.

Geometric Design Features/Erosion Control Facilities

- Use a smooth grade line with gradual changes.
- Preserve natural and existing drainage patterns to the extent possible.
- Leave stabilized steep slopes, soil, and stream banks undisturbed where possible.
- Set construction limits that preserve trees and shrubs and prevent over-clearing.
- Avoid irregular ditch profiles and steep ditch gradients.
- Provide vegetated ditches and drainage channels with wide rounded cross sections.
- Locate and align culverts to avoid erosion at the outlet and inlet.
- Leave an undisturbed buffer strip between disturbed soil and sensitive areas when possible.
- Obtain adequate right-of-way or temporary easements to avoid steep unstable slopes and to provide for detention ponds or other sediment trapping devices.

- Provide direct protection to the soil surface by using vegetation (permanent and temporary seeding and sodding), mulch, erosion mat, and riprap.
- Remove sediment and filter or slow down the velocity of sediment-laden water by using erosion bales, silt fence, stone or rock ditch checks, sediment traps and basins.
- Prevent off-site runoff from entering the construction area or redirect on-site runoff to an acceptable area by using diversion channels and ditches, diversion dikes and intercepting embankments, slope drains, and flumes.

Erosion Control Implementation Plan

The construction contractor is required to prepare an Erosion Control Implementation Plan that includes all erosion control commitments made during the planning, location, and project development phases. The construction plans and contract special provisions must include the specific erosion control measures agreed on by WisDOT in consultation with DNR who reviews the Erosion Control Implementation Plan.

Inspections

The construction project engineer is responsible for ensuring that erosion control measures are implemented and maintained. Inspections are required at least weekly, and within 24 hours after every precipitation event that produces 0.5 inches (13 mm) or more of rain during a 24-hour period.

Storm Water Management

The change from partially developed rural, suburban, and urban land use that is occurring along the WIS 83 corridor will increase storm water runoff by reducing the amount of infiltration area available to absorb and dissipate rainfall. Expanding the amount of impervious highway surface with the WIS 83 Build Alternatives will also increase storm water runoff. The combination of additional suburban/urban runoff and highway runoff indicates the need for a future storm water management plan that jointly addresses these issues.

The majority of existing WIS 83 is a suburban/rural facility with gravel shoulders, vegetated backslopes and sideslopes, and grass-lined ditches that convey storm water to the lowest points along the corridor (streams and wetlands). According to the USEPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, January 1993, highways with these features provide maximum buffering for storm water runoff. For urban/suburban highways with curb and gutter, as proposed from the middle of the corridor near Walnut Street to US 18 in Wales and from Hillside Drive to County DR/Golf Road, storm water treatment measures will need to be implemented.

Storm water management plans are intended to reduce nonpoint source pollution from urban runoff and to provide guidelines and best management practices for future development. In general, storm water management plans consists of detention/retention ponds in subdivisions and business parks, open space areas that absorb and dissipate overland flow, diversion of overland flow to adjacent wetlands, and intercepting runoff via existing roadway drainage ditches. The potential for flooding and drainage problems at the low spots on WIS 83 could increase over time as runoff increases.

Although a detailed storm water management plan for the urban/suburban portion of WIS 83 would need to be designed in a future engineering phase when more information is available regarding roadway dimensions, elevation, runoff volumes and velocity, the following

conceptual storm water management plan has been developed for purposes of the EIS. The conceptual plan is based on the guidelines and regulations cited earlier in the Erosion and Sedimentation discussion.

Basic Principles and Best Management Practices

- Limit disturbance of natural drainage features and vegetation.
- Develop a highway storm water management plan for the highway project that is compatible with local storm water plans. This would include an inventory of existing storm water conveyance and storage systems, re-establishing any storm water devices/ponds on private property that are affected by highway construction (like the detention pond near Crossgate Drive) and/or designing the highway drainage system to provide a similar function, and reviewing site plans for any proposed development adjacent to WIS 83 to ensure compatibility with the highway drainage system.
- Prior to land disturbance, prepare and implement an approved erosion and sediment control plan (see discussion under Erosion and Sedimentation).
- Protect areas that provide important water quality benefits and/or that are susceptible to erosion and sediment loss.
- Reduce direct discharge of highway runoff into streams and wetlands by having it flow through a filter strip, vegetated swale, or detention/retention facility.
- Reduce runoff velocities by running storm water in shallow depth, flat-bottomed vegetated swales or by using weirs or other barriers to dissipate high velocities.

Geometric Design Features/Storm Water Facilities

Development of a storm water management plan for WIS 83 will depend on several factors and constraints including available highway right-of-way, extent and proximity of development adjacent to the right-of-way, and location/type of existing storm water facilities on private land abutting the highway. Following is a summary of the storm water facilities that could be considered in the urban/suburban segment of the WIS 83 corridor.

- Vegetated strips or grass swales adjacent to the highway curb could remove about 65 percent of suspended sediments, and would not require additional right-of-way to construct.
- Infiltration basins to impound urban runoff until it gradually infiltrates into the surrounding soil could remove about 75 percent of suspended sediments, but would likely require additional right-of-way to construct.
- Infiltration trenches that consist of shallow excavated ditches backfilled with stone could remove about 75 percent of suspended sediments and would not require additional right-of-way to construct.
- Water quality inlets that consist of underground catch basins to collect runoff and sediment could remove about 35 percent of suspended sediments and would not require additional right-of-way to construct.
- Wet detention ponds that temporarily store runoff and release it at a controlled rate could remove about 60 percent of suspended sediments but would require substantial additional right-of-way to construct.

- Filtration basins and sand filters that are lined with filter media such as sand or gravel could remove about 80 percent of suspended sediments, but would require additional right-of-way to construct.

Preliminary investigations indicate that storm water facilities would likely be required at the several low spots along the WIS 83 urban/suburban segments and also in rural areas where streams cross the roadway: at the Fox River tributary, Crossgate Drive, Spring Brook, near WIS 59, west branch of Genesee Creek, just north of County D, London Drive, Brandybrook Road, existing ponds and wetlands at Main Street, US 18, Scuppernong Creek, existing ponds at I-94, County KE, and increasing the Bark River pond size. The proposed facilities are generally ponds and infiltration basins and are noted on the Aerial Photo Exhibit inside the back cover. These facilities would require additional right-of-way which has been included in the impact calculations.

Maintenance

- Re-establish vegetation on eroded areas.
- Mow grass filter strips and swales to prevent woody growth and promote dense vegetation.
- Remove debris from detention/retention ponds, storm sewer and culvert inlets, catch basins, and other collection-type devices.

Highway Runoff

Water quality impacts can occur due to highway runoff during the operational life of the Build Alternatives. The primary highway runoff components include suspended sediments (pavement wear and dirt), lead (gasoline, tire filler), zinc (tire filler, motor oil stabilizers), copper (metal platings, brake linings), and petroleum (gasoline, antifreeze, hydraulic fluids).

Throughout the mid-1980s, the Federal Highway Administration (FHWA) conducted nationwide studies to determine highway runoff constituents, amounts relative to roadway types and traffic conditions, and the potential impacts to surface water resources (Pollutant Loadings and Impacts from Highway Storm water Runoff, Volume I, FHWA, April 1990). FHWA's research concluded that pollutants in highway runoff are not present in amounts sufficient to threaten surface or groundwater where traffic volumes are below 30,000 ADT. WIS 83 traffic volumes are forecast below 30,000 ADT for all but a short segment near I-94. These findings are also cited in the U.S. Environmental Protection Agency's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. Storm water quality measures in the short segment near I-94 include two existing ponds, and the City of Delafield is planning for a regional storm water pond just to the northwest of the segment.

Table 4-11 lists the pollutant concentrations in highway runoff for highways with traffic volumes less than 30,000 ADT. To assist in understanding the pollutant concentrations in Table 4-11, the USEPA Acute Toxicity levels for human health are 0.477 mg/L for lead, 0.800 mg/L for zinc, and 0.065 mg/L for

TABLE 4-11
Pollutant Concentrations in Highway Runoff

Pollutant	Event Mean Concentration* (mg/L) for Highways with less than 30,000 ADT
Suspended Solids	41
Lead	0.080
Zinc	0.080
Copper	0.022

*Derived by averaging concentrations from several storm events.

copper. The values in Table 4-11 are well below human health levels. Regarding impacts to aquatic life, FHWA research indicates pollutants in runoff for highways with less than 30,000 ADT, and *without* runoff abatement, will not cause adverse effects to such resources.

Highway Deicing

Potential water quality impacts can occur due to application of de-icing chemicals (calcium and sodium chlorides). Potential impacts include accumulation of chlorides in surface water, groundwater, and soils adjacent to the highway. WisDOT has an ongoing monitoring program that was started in 1970. Data from streams, groundwater wells, and soil has been collected and analyzed from several sites throughout the State representing various climatic conditions, soil types, and vegetation cover types.

The latest progress report *Investigation of Road Salt Content of Soil, Water, and Vegetation Adjacent to Highways in Wisconsin* (1996) indicates there has been no substantial accumulation of chlorides. In permanent-flow streams, chloride values have generally differed by less than 10 parts per million (ppm) for upstream and downstream values. Although some intermittent or low-flow streams showed occasional high chloride levels during rapid snowmelt conditions, long-term accumulation has not occurred. This is presumably due to natural flushing and dilution during spring thaw. Data from shallow groundwater wells located in permeable soil types indicates the highest chloride accumulation with some sites having over 100 ppm chloride accumulation.

Environmental Corridors and Natural Areas

Environmental Corridors

The Build Alternatives would require a strip taking from the four primary environmental corridors shown on Exhibits 2-4, 2-5, and 2-6. The environmental corridors include a mix of floodplain, upland, and wetland. Impacts to these specific resources are discussed later in EIS Section 4. Environmental corridor impacts are listed below.

- Spring Brook (project section 2): 0.6 acre (0.2 ha)
- Genesee Creek (project section 2): 0.6 acre (0.2 ha) for 4-lane and 2-lane reconstruction
- Scuppernong Creek (project section 3): 3.6 acres (1.5 ha)
- Bark River (project section 6): 3.1 acres (1.3 ha)

The No Build Alternative would not affect primary environmental corridors.

Natural Areas

The Build Alternatives would require strip right-of-way from the Carroll College Conservancy natural area, which is located just north of WIS 59. The 2-Lane Reconstruction Alternative, which includes upgrading the WIS 59 intersection, would require 0.02 acres (0.01 ha) of right-of-way from the natural area. The 4-Lane Corridor Preservation Alternative would require 0.1 acres (0.04 ha) of right-of-way from the natural area. The No Build Alternative would not affect natural areas.

Floodplain and Hydraulics

Executive Order 11988, *Floodplain Management,* requires that federal agencies, in carrying out their proposed projects, take action to reduce the risk of flood loss; minimize the impacts of

floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains.

As discussed in EIS Section 3, Affected Environment, the following streams along WIS 83 have mapped floodplains: Spring Brook, Genesee Creek, Scuppernong Creek, and the Bark River.

Structure replacements or extensions at these locations would involve crossings of the 100-year floodplains. All structures would be sized to handle the 100-year flood without interruption to public transportation due to flood damage to the roadway or structures. None of the floodplain crossings would cause interruption or termination of a transportation route needed for emergency vehicles or that serve as the area's only evacuation route. Crossings would be consistent with local floodplain management goals and objectives. Structure sizing would be evaluated using HEC-2 or WSPRO computer analysis programs to ensure that backwater increases will be less than 0.01 foot (3 mm). All floodplain crossings would be constructed in accordance with the requirements of Wisconsin Administrative Code Chapter NR 116—*Wisconsin's Floodplain Management Program* and Chapter NR 320—*Bridges in or over Navigable Waterways.*

Impacts to natural and beneficial floodplain values such as wetlands would be minimized to the extent practicable. See EIS Section 6 for additional information.

Inquiries made to Waukesha County indicate there are no designated local drainage districts along the WIS 83 corridor.

Groundwater and Water Supply

There would be no effects on groundwater or drinking water supply under the No Build Alternative. None of the Build Alternatives are expected to adversely affect drinking water supply or localized groundwater at or near the land surface. There are no sole source aquifers in the project area as stipulated in Section 142(e) of the Safe Drinking Water Act.

Public water supply facilities along the WIS 83 corridor include those in the Village of Mukwonago, City of Delafield, and Village of Hartland. There are also private high capacity wells serving the Ethan Allen School in Wales and the Magee Elementary School in Genesee Depot. All of these facilities are deep-aquifer wells and are located outside the area of potential effect for the proposed WIS 83 improvements.

Water supply along the majority of the WIS 83 corridor is provided by private wells. Representative well depth information adjacent to WIS 83 is summarized in EIS Section 3, Table 3-11. Based on the representative data, the depth to potable water along the WIS 83 corridor is such that this resource would not be affected by any hill cuts that would be required on WIS 83 or adjacent side roads.

Localized groundwater is at or near the land surface in wetlands along the WIS 83 corridor. Because wetlands occur in flat or low areas, highway cuts would not be required at these locations. Existing groundwater levels would be maintained using replacement structures and equalizer pipes sized and designed such that hydrologic and hydraulic characteristics would not be altered.

Wetlands

Wetlands in the study area are described in detail in EIS Section 3 and shown on the Aerial Photo Exhibit inside the back cover.

The No Build Alternative has the potential for minor wetland impacts due to erosion and sedimentation during pavement and structure maintenance activities. Wetland impacts for the Build Alternatives considered in the EIS (including impacts to ADID wetlands) are summarized in Table 4-12. Wetland impacts will occur due to widening the existing highway through wetlands already bisected by, or that lie adjacent to the existing highway.

In addition to loss of wetland area, wetland functions and values would be affected. Filling wetlands affects wildlife that depend on wetland vegetation and permanent or temporary standing water for food, cover, and nesting; cause a change in ecosystem biodiversity and reduction in floral diversity by filling wetland edges; reduces sediment trapping/nutrient retention; and reduces flood storage for wetlands adjacent to streams and drainageways. Information on Executive Order 11990, *Protection of Wetlands*, and wetland mitigation is provided in EIS Section 6.

TABLE 4-12
Wetland Impact Summary

Project Section and Alternatives	Affected Wetlands	Impact[1]
1. County NN to County X	**W-1:** fresh meadow, second growth, wet lowland hardwoods, sedge meadow; 1.3 acres (0.5 ha); tributary to the Vernon Marsh (Fox River)	0.2 acres (0.1 ha)
	W-2 (ADID wetland): fresh meadow, shallow marsh, shrub-carr; 10.3 acres (4.2 ha)	1.2 acres (0.5 ha)
	W-3: fresh meadow, shallow marsh; 3 acres (1.2 ha)	0.2 acres (0.1 ha)
2. County X to County DE/E	**W-4** (ADID wetland): shallow marsh, sedge meadow; 2.5 acres (1 ha); primary environmental corridor; Spring Brook floodplain	1.0 acres (0.4 ha)[2,3,4]
	W-5 (ADID wetland): second growth, wet to wet-mesic lowland hardwoods, fresh meadow, shallow marsh, shrub-carr; 1.4 acres (0.6 ha); primary environmental corridor; Genesee Creek floodplain	No wetland impacts
	W-6 (ADID wetland): second growth, wooded swamp; 3 acres (1.2 ha); primary environmental corridor; Genesee Creek floodplain	0.01 acres (0.01 ha)[2,3,4]
	W-7: (ADID) wetland: open water, shallow marsh, shrub-carr, sedge meadow; 1 acre (0.4 ha); primary environmental corridor; Genesee Creek floodplain	0.4 acres (0.2 ha)[4]
	W-8 (ADID wetland): shallow marsh, wet meadow, shrub-scrub; 4.1 acres (1.7 ha); primary environmental corridor; Genesee Creek floodplain	0.1 acres (0.04 ha)[2,3]
3. County DE/E to Hillside Drive	**W-9:** pond, second growth, wooded swamp; 1.7 acre (0.7 ha)	0.3 acres (0.1 ha)
	W-10 (ADID wetland): fresh meadow, shallow marsh, sedge meadow, shrub-scrub; 20 acres (8.1 ha); primary environmental corridor; Scuppernong Creek floodplain	2.6 acres (1.1 ha)
4. Hillside Drive to County DR/Golf Road	No area wetlands	No wetland impacts
5. County DR/Golf Road to Meadow Lane	**W-11:** shallow marsh; 0.2 acres (0.1 ha)	No wetland impacts
	W-12: open water, shallow marsh; 1.3 acres (0.5 ha)	No wetland impacts
6. Meadow Lane to WIS 16	**W-13** (ADID wetland): fresh meadow, shrub-carr, sedge meadow; 2.5 acre (1 ha); primary environmental corridor; Bark River floodplain	0.4 acres (0.2 ha)
	W-14 (ADID wetland): shallow marsh, shrub-carr, sedge meadow; 10.5 acres (4.2 ha); primary environmental corridor; Bark River floodplain	2.5 acres (1.0 ha)
	W-15 (ADID wetland): shallow marsh, shrub-carr; 5 acres (2 ha); primary environmental corridor; Bark River floodplain	0.6 acres (0.02 ha)

Notes:
1. Impacts are based on the best-fit alignment developed for each project section. See "Alternatives Retained for Detailed Study" in EIS Section 2 for a description of each best-fit alignment.
2. Also applicable for the 2-Lane Reconstruction Alternative.
3. 4-Lane Corridor Preservation Alternative.
4. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Upland Habitat / Wildlife

Upland habitat occurs in environmental corridors, isolated natural areas, and other tracts of land that have forested or grassland cover. Wooded areas are scattered throughout the project area. Wooded/upland areas adjacent to WIS 83 include the Vernon Marsh Wildlife Area, the Carroll College Conservancy, Genesee Woods, Lapham Peak State Park, and Naga-Waukee County Park. Land in agricultural use that includes forested edges, open fields, and fencerows also provides important wildlife habitat.

The primary impact associated with the loss of upland plant communities is loss of wildlife habitat that serves movement corridors and provides cover for breeding, foraging, and nesting. Other wildlife impacts caused by removing vegetation include interrupting the natural succession to mature, climax communities; increasing the potential for soil erosion; and reducing aesthetic values.

Upland habitat impacts for the reasonable Build Alternatives considered in the EIS are summarized in Table 4-13. Most build alternative improvements would occur adjacent to the highway and upland impacts would be strip or "edge takings." New woodland edges created by highway right-of-way may experience tree loss from the drying effects of wind, sun, and exposure to road runoff. Overall, upland habitat impacts would be relatively minor. The No Build Alternative would not affect upland habitat. Construction of Off-Alignment Alternative D would increase upland impacts, due to tree loss and land disturbance for construction of the new roadway.

TABLE 4-13
Upland Habitat Impact Summary

Project Section	Upland Habitat Impacts[1]
1. County NN to County X	15.2 acres (6.2 ha)
2. County X to County DE/E	12.5 acres (5.1 ha)[2]
	15.6 acres (6.3 ha)[3]
	21.1 acres (8.5 ha)[4]
3. County DE/E to Hillside Drive	12.8 acres (5.2 ha)
4. Hillside Drive to County DR/Golf Road	No upland impacts
5. County DR/Golf Road to Meadow Lane	No upland impacts
6. Meadow Lane to WIS 16	13.0 acres (5.3 ha)
7. WIS 16 to Chapel Ridge Road	0.9 acres (0.4 ha)

Notes:
1. Impacts are based on the best-fit alignment developed for each project section. See "Alternatives Retained for Detailed Study" in EIS Section 2 for a description of each best-fit alignment.
2. 2-Lane Reconstruction Alternative.
3. 4-Lane Corridor Preservation Alternative.
4. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) indicated that one federally-listed threatened species, the Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) occurs in wet grassland areas in Waukesha County. However, USFWS stated in their December 3, 2001 letter that this species would not be affected by the proposed project (see Appendix C, page C-13).

The DNR has identified several plants, fish, and other threatened, endangered or special concern species that could potentially be present in the WIS 83 study area (see Appendix C, page C-4). Additional coordination has been initiated with the DNR Bureau of Endangered Resources to obtain more specific information on these resources relative to the area of potential effect for the reasonable build alternatives. Updated information will be provided in the Final EIS. Threatened and endangered species likely to be present in the area of potential effect for the reasonable build alternatives are listed below:

Genesee Creek
Longear Sunfish – threatened fish

Off-Alignment Alternative D (Genesee Depot)
Blanding's Turtle – threatened turtle
Butler's Garter Snake – threatened snake
Silphium Borer Moth – endangered moth

Scuppernong Creek
Ozark Minnow – threatened fish

Bark River
Slender Madtom – endangered fish
Pugnose Shiner – threatened fish

A Herptile Assessment was conducted by Gary Casper, Casper Consulting, Milwaukee. The purpose of the report was to assess potential impacts to threatened and endangered amphibian and reptile species along the project corridor. A copy of Mr. Casper's report *Highway 83 Herptile Assessment: Final Report* (March 2003) is on file at the WisDOT Waukesha District Office. Table 4-14 summarizes the results of the survey.

The No Build Alternative could have impacts to the Blanding's Turtle population with increased WIS 83 traffic due to road mortality and further habitat loss due to land development in the corridor. The Build Alternatives could further impact the Blanding's Turtle population due to habitat fragmentation, loss of movement corridors, and habitat degradation. Blanding's Turtle habitat would be substantially impacted along Off-Alignment Alternative in Genesee Depot. There is no evidence of the Butler's Garter Snake in the corridor but there is potential habitat along Off-Alignment Alternative D.

The State Endangered Species Law (Section 29.604, *Wisconsin Statutes*) allows the DNR at its discretion to authorize taking individuals of listed species (through an Incidental Take Permit) that otherwise is prohibited, if the following conditions apply:

- The benefit to public health, safety, or welfare justifies the activity.
- The taking will not be the purpose of, but will be only incidental to the carrying out of a lawful activity
- The party requesting taking authorization will, to the maximum extent practicable, minimize and mitigate the impact caused by the taking
- The taking will not appreciably reduce the likelihood of the survival or recovery of the endangered or threatened species within the state, the whole plant-animal community of which it is a part, or the habitat that is critical to its existence.

To comply with these requirements, Casper Consulting and WisDOT have developed a Conservation Plan for the WIS 83 project. Additional information is provided in EIS Section 6. As noted in EIS Section 3, barn swallow nests were found under the WIS 59 and Bark River bridges along the WIS 83 corridor in the spring of 2003. Barn swallows and their nests are protected under the Migratory Bird Treaty Act. Replacement or extension of any structure would need to be done in a manner that would not jeopardize this species. Additional information is provided in EIS Section 6.

TABLE 4-14
Results of Herptile Assessment

Project Section	General Survey Areas for Herptile Habitat	Comments
1. County NN to County X	Tributary to Fox River crossing of WIS 83 south of Saxony Court	Stream crosses through pasture and fields west of WIS 83, flows into Vernon Marsh east of WIS 83. Blanding's Turtle (Threatened Species) identified in area.
	Wetlands west of WIS 83, west of Vernon Marsh	Open field and open wetland habitat.
	Wetland west of WIS 83, south of County I	Open marsh and shrub wetland in an agricultural area. Blanding's Turtle (Threatened Species) identified in area.
2. County X to County DE/E	Spring Brook crossing	Stream crossing south of Genesee Depot. Blanding's Turtle (Threatened Species) habitat.
	Circle S Ranch, west of Off-Alignment Alternative D	Complex mix of woodlands, streams, springs, ponds, and wetlands. Blanding's Turtle (Threatened Species) identified in area. Potential Butler's Garter snake habitat.
	Southeast of WIS 83/WIS 59 intersection	Section of Genesee Creek corridor that includes woodlands, streams, ponds, wetlands, and an impoundment. Pickerel Frog (Special Concern Species) identified in area. Also barn swallow nests beneath the WIS 59 bridge crossing North Branch of Genesee Creek.
	Carroll College South Property, east of WIS 83	Includes Genesee Creek, woodlands, glacial moraines, an old field, agricultural lands, springs, and an impoundment. Blanding's Turtle (Threatened Species) identified in area.
	Carroll College Field Station, east of WIS 83	Includes stream, pond, wetland, and woodland habitat. Blanding's Turtle (Threatened Species), Butler's Garter snake (Threatened Species), and American Bullfrog (Special Concern Species) identified in area.
	East and West of WIS 83, County D to County DE/E	Includes wetland and stream complexes on both sides of the existing highway. Butler's Garter snake (Threatened Species) and Pickerel Frog (Special Concern Species) identified in area.
3. County DE/E to Hillside Drive	Scuppernong Creek Crossing	Area where project corridor parallels the creek for approximately one mile.
4. Hillside Drive to County DR/Golf Road	No survey areas in this section	Not applicable
5. County DR/Golf Road to Meadow Lane	No survey areas in this section	Not applicable
6. Meadow Lane to WIS 16	Bark River Crossing	Project crosses the river and borders and associated floodplain marsh. Barn swallow nests beneath the STH 83 bridge crossing over the Bark River.

Agricultural Impacts

The No Build Alternative could have minor agricultural impacts immediately adjacent to the existing highway due to pavement, shoulder, and structure maintenance, and spot safety improvements.

The Build Alternatives generally are oriented to the existing highway and the majority would involve adding a median and two (2) driving lanes either east or west of the existing roadway, or widening down the middle. One off alignment alternative is being considered in the Genesee Depot area. Although strip farmland acquisition would be required for most of the alternatives, initial impact calculations indicate there would not be more than five (5) acres from a single farming operation. The impacts involve strip acquisitions, and there would be no parcel severances other than one for Off-Alignment Alternative D. Agricultural impacts for the Build Alternatives considered in the EIS are shown in Table 4-15 and also summarized in Exhibit S-B in the Summary Section.

In general, existing field access would be maintained. Possible modifications to field entrance locations to improve safety could be made during a future engineering design phase. Median openings would be provided at all local road intersections. Special farm crossings would be considered at other locations to allow farm machinery to cross the reconstructed highway. A Farmland Impact Rating Form (see Exhibit 4-2) was completed for the Build Alternative in accordance with the Farmland Protection Policy Act. The impact rating indicates the Build Alternatives will not cause substantial impacts to farmland. The Department of Agriculture, Trade and Consumer Protection will evaluate the project's agricultural impacts during a future engineering phase to determine whether an Agricultural Impact Statement is needed for the recommended alternative.

If a build alternative is selected, those farm operations with building displacements would be evaluated further in a future engineering design phase to determine the status of the farm operation and to consult with the owners regarding their plans. Compensation for impacted farm operations would be done in accordance with state relocation regulations for business, farm, and nonprofit organizations in Sections 32.185-32.27, Wisconsin Statutes. Options would be evaluated in consultation with farm owners and could include replacing buildings/structures on the existing farm or locating a replacement farmstead with similar characteristics and in reasonable proximity to the impacted farm.

TABLE 4-15
Agricultural Impact Summary

Project Section	Farmland Impacts[1]
1. County NN to County X	33.8 acres (13.7 ha) from 18 farm operations buildings displaced on 3 farms: • barn & silo • house, machine shed, & outbuilding • house, storage shed, garage, & outbuilding
2. County X to County DE/E	11.5 acres (4.7 ha) from 7 farm operations buildings displaced on 3 farms[2]: • house & storage building • house, barn, & shed • abandoned stand-alone barn (poor condition)
	11.9 acres (4.8 ha) from 8 farm operations buildings displaced on 3 farms[3]: same as above
	12.9 acres (5.2 ha) from 8 farm operations buildings displaced on 3 farms[4]: same as above
3. County DE/E to Hillside Drive	6.1 acres (2.5 ha) from 7 farm operations no buildings displaced
4. Hillside Drive to County DR/Golf Road	No farmland impacts
5. County DR/Golf Road to Meadow Lane	No farmland impacts
6. Meadow Lane to WIS 16	6.6 acres (2.7 ha) from 6 farm operations buildings displaced on 1 farm: • stand-alone barn

Notes:
1. Impacts are based on the best-fit alignment developed for each project section. See "Alternatives Retained for Detailed Study" in EIS Section 2 for a description of each best-fit alignment.
2. 2-Lane Reconstruction Alternative.
3. 4-Lane Corridor Preservation Alternative.
4. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Cemeteries

The No Build Alternative would not affect any known cemeteries or burial sites. Cemeteries and possible prehistoric Native American burial sites and their relationship to the Build Alternatives are summarized as follows.

Jerusalem Cemetery located adjacent to the east side of WIS 83 just north of County G. Documentation and investigations for the cemetery indicates that no burials are within the Build Alternative limits. The Build Alternative improvements at the Jerusalem Cemetery

include replacing the existing roadway curb along the cemetery with the road widening on the west, therefore there will be no encroachment on the cemetery property. There is an existing guardrail behind the curb and this is planned for replacement with some type of guard rail or concrete barrier to protect the cemetery and prevent vehicles from colliding with stone monuments.

Salem Cemetery located adjacent to the west side of WIS 83 south of Welsh Road. Documentation and investigations for the cemetery indicates that no burials are within the Build Alternative limits. The best fit alignment Build Alternative improvements at the Salem Cemetery include constructing a multi-use path and new roadway curb just inside the existing curb line near Welsh Road where the majority of existing graves are located. Construction on this north end will occur within existing and previously disturbed WIS 83 right-of-way. Although the roadway alignment has been shifted east to the extent possible and a minimal 4-lane cross section is being proposed, there will be encroachment and strip right-of-way acquisition along the south portion of the cemetery where there are a few existing graves. A triangular right-of-way strip would be required totaling about 0.2 acres (0.1 ha). There is no evidence that there are existing graves within the area of disturbance.

Hazardous Materials

Potentially contaminated soil and contaminated localized groundwater adjacent to WIS 83 is an important environmental factor in the alternatives screening process. It is WisDOT's policy to avoid acquiring potentially contaminated properties to the extent practical. Where such properties cannot be avoided for the selected improvement alternative, public and private funds are required for additional investigations and if needed, remediation.

Due to the long-term construction schedule for the majority of the WIS 83 corridor, a preliminary Phase 1 screening assessment was conducted to identify sites that could warrant further investigation during a future engineering phase. The screening assessment consisted of a records search, windshield survey of residential properties, and site visits/owner interviews for commercial properties. The records review includes the DNR Leaking Underground Storage Tank (LUST) lists, Wisconsin Department of Commerce Underground Storage Tank (UST) lists, and DNR Spill lists, as well as other sources such as topographic, soil, and plat maps together with regional geologic and hydrogeologic data. Other federal and state regulatory databases were also searched.

Hazardous materials investigations in a future engineering phase could consist of the following:

- Phase 2 investigation—involves taking samples of soil and water to confirm or dismiss the possibility of contamination. This is done by drilling holes in the proposed right-of-way and having the soil and water analyzed for various contaminants. If the soil or groundwater is contaminated, DNR is notified, and potential responsible parties are identified and notified of remediation responsibilities. Facility audits and detailed file reviews and interviews may be completed to limit the extent of drilling required.
- Phase 2.5 Remediation Planning Necessary for Construction of a Highway Project—involves planning prior to construction for potential handling and disposal of any contaminated materials.
- Phase 3 investigation—involves determining the extent of contamination and developing the remediation plan.

- Phase 4 investigation—involves carrying out the remediation, and any associated long-term monitoring.

The No Build Alternative would not likely affect any potential contamination sites. Table 4-16 summarizes potential contamination sites in each project section that are within the area of potential effect of the Build Alternatives.

If further investigation is deemed necessary during a subsequent engineering phase, the DNR and other affected parties would be notified of the results. WisDOT would work with concerned parties to ensure disposition of any petroleum contamination to the satisfaction of the DNR, the WisDOT Bureau of Environment, and the Federal Highway Administration before acquisition of any questionable site, and before advertising the project for construction.

TABLE 4-16

Hazardous Materials Phase I Screening Summary

Project Section	Potential Sources of Environmental Contamination
1. County NN to County X	Gasoline station (active gas station with USTs) approximately 150 feet (46 meters) south of project limit.
2. County X to County DE/E	Operating UST and AST adjacent to existing WIS 83 Closed LUST case; operating gasoline station/USTs approximately 100 feet (30 meters) west of existing WIS 83 Former UST site adjacent to existing WIS 83 Abandoned Landfill approximately 750 to 1000 feet (229 to 305 meters) east of WIS 83
3. County DE/E to Hillside Drive	Operating gasoline station/USTs approximately 100 feet (30 meters) west of existing WIS 83 LUST case closed in 2001; waste oil AST and UST in use approximately 400 feet (122 meters) east of existing WIS 83 Ongoing LUST case where free product and groundwater contamination has been detected adjacent to existing WIS 83 Abandoned Landfill approximately 500 feet (152 meters) east of WIS 83
4. Hillside Drive to County DR/Golf Road	Closed LUST case; operating gasoline station/USTs approximately 200 feet (61 meters) west of existing WIS 83 Closed LUST case; operating gasoline station/USTs approximately 200 feet (61 meters) west of existing WIS 83 Soil and groundwater impacts attributed to an off-site source approximately 600 feet (183 meters) east of existing WIS 83
5. County DR/Golf Road to Meadow Lane	No parcels identified for further hazardous materials investigation.
6. Meadow Lane to WIS 16	Operating gasoline station/USTs approximately 200 feet (61 meters) east of existing WIS 83

Air Quality

Regional Level

At the regional (mesoscale) level, the motor vehicle pollutants of concern with respect to air quality are oxides of nitrogen (NO_x) and volatile organic compounds (VOC), which can react chemically in the presence of sunlight to produce ozone. Depending on concentration levels, length of exposure and physical tolerances of people exposed, ground level ozone may cause

headaches, dizziness and difficulty breathing. In some parts of the State, ozone concentrations exceed federal standards. As a result, the USEPA has designated 11 counties in Wisconsin as ozone nonattainment areas.

According to the 1998 *Transportation Equity Act for the 21st Century (TEA 21)*, federal agencies cannot approve or fund transportation projects that are not in conformance with the applicable State Implementation Plan (SIP) for air quality. The 1990 Clean Air Act Amendments (CAAA) provide a general definition of SIP conformity applicable to all transportation plans, programs, and projects funded under Title 23 U.S.C. or the Federal Transit Act. The conformity definition states that such activities will not (1) Cause or contribute to any new violation of any National Ambient Air Quality Standard (NAAQS) in any area; (2) Increase the frequency or severity for any existing violation of any NAAQS in any area; or (3) Delay timely attainment of any NAAQS or any required interim emissions reductions or other milestones in any area.

SEWRPC is the designated federal Metropolitan Planning Organization for ensuring air quality conformity for transportation improvement programs in southeastern Wisconsin that includes six severe non-attainment counties for ozone standards (Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha counties).

Waukesha County is within the Southeastern Wisconsin Intrastate Air Quality Control Region as designated under Wisconsin Administrative Code Chapter NR 404.03. According to the USEPA, Waukesha County is presently classified as severe non-attainment for ozone in accordance with the categories of non-attainment specified in the 1990 CAAA. The WIS 83 improvement project is an integral component of the 2020 Regional Transportation System Plan, and is included in the 2002-2004 TIP endorsed by SEWRPC. The TIP was found to conform to the SIP by the Federal Highway Administration on December 10, 1997 and by the Federal Transit Administration on January 4, 1998.

To provide flexibility in the range of alternatives being considered in the WIS 83 Corridor Study, the 2002-2004 TIP was amended on March 28, 2003 to include the corridor study from the Village of Mukwonago to STH 16 (TIP Project #856). The FHWA and Federal Transit Authority (FTA) jointly determine conformity on an annual basis and whenever projects of regional significance are added to the TIP. The alternatives evaluated in the EIS are all consistent with the *2020 Regional Transportation System Plan for Southeastern Wisconsin*. It should be noted that the plan recommends two traffic lanes between WIS 59 and County DE/E. The 4-Lane Corridor Preservation Alternative for this roadway section, if and when ultimately implemented, would require amendment of the regional transportation system plan and a TIP amendment. The intent of such a conformity finding is to ensure that the estimated motor vehicle emissions resulting from TIP implementation are consistent with the projected emissions and required reductions contained in the SIP. A project level emissions analysis is not required for this project since such an evaluation would duplicate the findings of the TIP regional conformity analysis.

Since the Build Alternative (excluding the gap segment from County X to County DE/E) is a component of a conforming regional transportation plan and TIP, and has been shown to be in accordance with the conformity criteria described previously, the project is in conformity with the current SIP under the provisions of the 1990 CAAA.

The No Build Alternative, which is not in conformance with the 2020 Regional Transportation System Plan, would require a new emissions analysis to determine whether there would be any violation of the NAAQS.

Project Level

Carbon monoxide (CO) is the only motor vehicle pollutant that is presently analyzed at the project level. An adverse air quality impact occurs if the CO concentrations exceed 75 percent of the 1-hour National Ambient Air Quality Standard, or 75 percent of the standard for an average 8-hour period. Project level CO emissions are determined through air quality dispersion modeling *unless* exemption criteria are met under Wisconsin Administrative Code Chapter NR 411—*Construction and Operation Permits for Indirect Sources*. The exemption criteria for metropolitan counties (including Waukesha County) are summarized as follows:

Highway Mainline

Any modified road or highway segment located in a metropolitan county where the increase in the peak hour volume will be less than 1,200 under anticipated traffic volumes that will occur 10 years after construction.

Any new road or highway segment located in a metropolitan county where the peak hour volume will be less than 1,200 under anticipated traffic volumes that will occur 10 years after construction.

Intersections

There will be a shift of more than 12 feet (3.6 m) in the nearest roadway edge (within the intersection) toward any potential receptor, and

- The highway segment has no more than two approach lanes (excluding exclusive turn lanes), and
- Any potential receptor is located more than 25 feet (8 m) from the nearest proposed roadway edge, and
- The peak hour traffic volume on each intersection approach leg is less than 1,800 vehicles per hour under anticipated traffic volumes that will occur 10 years after construction.

Comparisons to NR 411 screening criteria are summarized as follows:

Highway Mainline

The entire corridor length was studied to determine a representative worst-case scenario for comparison to NR 411 screening criteria. The segment between County DE/E and Hillside Drive was selected. This is because construction in this segment could occur within a reasonably foreseeable time frame (2007-2009), and because the roadway mainline and intersection traffic volumes would be among the highest in the corridor.

The increase in the peak hour volume will be less than 1,200 in the time frame 10 years after construction (2016):

- County DE/E to Hillside Drive —The construction year (2006) peak hour volume would be approximately 2,148; the peak hour volume 10 years after construction (2016) would be approximately 2,556, an increase of 408. The worst case is actually the Hillside Drive to Golf Road segment, however construction would likely be beyond 10 years and the resultant peak hour volume increase would still be less than 1,200.

The peak hour volume will be less than 1,200 in the time frame 10 years after construction (2016) for a new segment:

- Off-Alignment Alternative (Alternative D) —The peak hour volume 10 years after construction (2016) would be approximately 893.

Intersections

The entire corridor length was studied to determine a representative worst-case scenario for comparison to NR 411 screening criteria. The segment from Hillside Drive to County DR/Golf Road was evaluated, and the build alternative nearest roadway edge shift is less than 12 feet (3.6 m) and therefore exempt. The segment from County DR/Golf Road to Meadow Lane is not recommended for roadway improvements.

None of the intersections will have more than two approach lanes (excluding exclusive turn lanes). Existing or future receptors are located more than 25 feet (8 m) from the nearest roadway edge. For the majority of the corridor length, the safety clear zone width plus additional distance to the highway right-of-way line precludes potential receptors within 25 feet (8 m) of the nearest roadway edge. In addition, local zoning setbacks for commercial and residential development provide an additional buffer for future development that may occur adjacent to the intersection.

Peak hour traffic volumes on the approach legs at the highest volume intersection will be less than 1,800 vehicles per hour under anticipated traffic volumes that will occur 10 years after construction (2016):

- US 18 intersection (highest volume)—The highest construction year peak hour volume on any leg approaching this intersection would be approximately 1,289; the highest peak hour volume on any approach leg in 2016 would be approximately 1,534.

The Build Alternatives meet all NR 411 exemption criteria and WisDOT is therefore exempt from obtaining a Construction Permit prior to project implementation if a Build Alternative is selected.

Noise

Traffic Noise Impacts

Traffic noise impacts occur when the predicted sound levels approach or exceed Noise Abatement Criteria (NAC) established for a particular land use, or when the predicted sound levels substantially exceed the existing levels. WisDOT defines "approach" as 1 decibel (dBA) less than the NAC, and defines "substantially exceed" as 15 or more dBA greater than existing levels. These criteria defining traffic noise impacts are found in Wisconsin Administrative Code, Chapter TRANS 405, *Siting of Noise Barriers*. WisDOT's noise policies under TRANS 405 were approved by the Federal Highway Administration on February 29, 1996. The NAC as established in TRANS 405 are summarized in Table 4-17.

TABLE 4-17
Noise Abatement Criteria

Activity Category	NAC (dBA L_{eq})	Description of Activity Category
A	57 (Exterior)	Land serving an important public need on which serenity and quiet are of extraordinary significance and on which preserving those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, and parks not included in Category A; residences, motels, hotels, public meeting rooms, schools, churches, libraries and hospitals.
C	72 (Exterior)	Developed lands, properties or activities not included in Categories A or B.
D	—	Undeveloped lands.
E	52 (Interior)	Residences, motels, public meeting rooms, churches, libraries, hospitals and auditoriums.

Note:
The noise level descriptor (L_{eq}) is the equivalent sound level defined as the steady state sound level which in a stated time period (usually 1 hour) contains the same sound energy as the actual time varying sound.

Source: Wisconsin Administrative Code, Chapter TRANS 405

Noise impact comparisons are based on the number of noise receptors that approach or exceed the NAC for particular activity categories and/or that experience a substantial noise increase. Noise receptors are defined as lower level units that front on the highway and are thus subject to traffic noise. Existing and future noise levels are predicted through a computer noise model that takes into account design hour traffic volumes, speed, traffic mix (autos, medium and heavy trucks), highway geometry, distance between the highway and adjacent receptors, differences in elevation between the highway and receptors, and type of intervening terrain. The noise analysis for the WIS 83 corridor study was completed using FHWA's STAMINA 2.0/OPTIMA noise prediction computer program.

Traffic noise associated with the No Build Alternative would increase due to an increase in traffic volumes on the 2-lane highway. There would be no change in the distance between the nearest highway edge and adjacent receptors. Noise impacts for the Build Alternatives occur due to an increase in traffic volumes as well as changes in the distance between the nearest highway edge and adjacent receptors, and traffic dispersion over 2 sets of driving lanes separated by a median.

Existing and future (2026) noise levels for representative receptors along WIS 83 under the Build Alternatives are shown in Table 4-18. The listed Build Alternatives are the best-fit alignment developed for each project section. See "Alternatives Retained for Detailed Study" in EIS Section 2 for a description of each best-fit alignment. The representative noise receptors are shown on the Aerial Photo Exhibit inside the back cover.

TABLE 4-18
Noise Impact Summary

Receptor Number	Number of Units Typical of Site	NAC, dBA	Existing Noise Level, dBA	Build Alternative Future Noise, dBA (2026)	Difference Between the NAC and Future Build, dBA	Difference Between Existing and Future Build, dBA	Impact (approach or exceed NAC)
County NN to County X							
R-1	4 Units	67	68	71	+4	+3	Impact
R-2	11 Units	67	70	71	+4	+1	Impact
R-3	5 Units, Briarfield Manor	67	64	67	0	+3	Impact
R-4	4 Units	67	66	67	0	+1	Impact
R-5	7 Units	67	71	71	+4	0	Impact
County X to County DE/E							
R-6	10 Units, McFarlane Manor	67	64	66[1,2,3]	-1[1,2,3]	+2[1,2,3]	Impact[1,2,3]
R-7	4 Units	67	65	67[1,2,3]	0[1,2,3]	+2[1,2,3]	Impact[1,2,3]
R-8	12 Units	67	66	68[1,2,3]	+1[1,2,3]	+2[1,2,3]	Impact[1,2,3]
R-9	4 Units	67	64	66[1,2,3]	-1[1,2,3]	+2[1,2,3]	Impact[1,2,3]
R-10	1 Unit	67	59	61[1,2]	-6[1,2]	+2[1,2]	No Impact[1,2]
				59[3]	-8[3]	0[3]	No Impact[3]
R-11	37 Units	67	65	67[1,2]	0[1,2]	+2[1,2]	Impact[1,2]
				61[3]	-6[3]	-4[3]	No Impact[3]
R-12	11 Units	67	66	68[1,2,3]	+1[1,2,3]	+2[1,2,3]	Impact[1,2,3]
R-13	12 Units	67	62	64[1,2,3]	-3[1,2,3]	+2[1,2,3]	No Impact[1,2,3]
R-14	3 Units	67	61	63[1,2, 3]	-4[1,2,3]	+2[1,2,3]	No Impact[1,2,3]
R-15	20 Units	67	65	68[1,2,3]	+1[1,2,3]	+3[1,2,3]	Impact[1,2,3]
R-16	7 Units, Esser Point	67	62	65[1,2,3]	-2[1,2,3]	+3[1,2,3]	No Impact[1,2,3]
R-17	1 Unit	67	52	54[1,2]	-13[1,2]	+2[1,2]	No Impact[1,2]
				64[3]	-3[3]	+12[3]	No Impact[3]
County DE/E to Hillside Drive							
R-18	8 Units, Esser Point	67	65	67	0	+2	Impact
R-19	31 Units, Cambrian	67	67	69	+2	+2	Impact
R-20	19 Units	67	68	71	+4	+3	Impact
R-21	11 Units, Hills of Delafield	67	68	70	+3	+2	Impact
R-22	6 Units, Hidden Hills Estates	67	65	67	0	+2	Impact
R-23	27 Units, The Meadows of Delafield	67	67	70	+3	+3	Impact
Hillside Drive to County DR/Golf Road							
R-24	11 Commercial Units	72	69	71	-1	+2	Impact
County DR/Golf Road to Meadow Lane							
R-25	4 Units, Nagawaukee Heights	67	68	70	+3	+2	Impact

TABLE 4-18
Noise Impact Summary

Receptor Number	Number of Units Typical of Site	NAC, dBA	Existing Noise Level, dBA	Build Alternative Future Noise, dBA (2026)	Difference Between the NAC and Future Build, dBA	Difference Between Existing and Future Build, dBA	Impact (approach or exceed NAC)
Meadow Lane to WIS 16							
R-26	5 Units, Lakewood Estates	67	67	68	+1	+1	Impact
R-27	1 Unit	67	71	76	+9	+5	Impact
R-28	3 Units, Timber Oak	67	66	68	+1	+2	Impact
R-29	3 Units	67	69	71	+4	+2	Impact
R-30	8 Commercial Units	72	68	70	-2	+2	No Impact
R-31	5 Units	67	68	70	+3	+2	Impact
R-32	9 Units	67	65	68	+1	+3	Impact
R-33	7 Commercial Units	72	68	69	-3	+1	No Impact
R-34	2 Multi-family Units Country Aire Apts.	67	70	71	+4	+1	Impact

Notes:
1. 2-Lane Reconstruction Alternative.
2. 4-Lane Corridor Preservation Alternative.
3. Combination Off-Alignment Alternative D / 4-Lane Corridor Preservation Alternative.

Traffic Noise Abatement Measures

Various traffic noise abatement measures summarized below were reviewed to mitigate the noise impacts of the Build Alternatives.

Traffic Control Measures

Prohibiting certain types of vehicles such as medium and heavy trucks from using WIS 83 could reduce traffic noise. However, since the entire highway is designated as a State Trunk Highway, trucks cannot be prohibited.

Lowering the Highway

Although depressing the roadway below the natural grade could provide some noise abatement, this would not be practical at the various noise receptor locations due to drainage considerations, the need to maintain safe driveway and local road grade lines, and driver and pedestrian safety/visibility concerns.

Building Modifications

Retrofitting existing buildings with sound dampening insulation and non-opening windows was also considered, but ruled out as a feasible option because it would not address outdoor noise levels at the receptor locations. Outdoor noise levels are used to assess noise impacts for highway projects. Soundproofing is usually considered effective only for public buildings with little or no outside use.

Buffer Strips

Buffer strips between the highway right-of-way and adjacent noise receptors would provide additional land for construction of noise walls, berms, or plantings. However, since buffer

strips require substantial additional right-of-way for effective noise abatement, this would result in extensive impacts to residential properties that are already close to the highway.

Noise Barriers

This abatement technique would involve constructing noise walls (various materials) or earth berms to reduce the transmission of traffic noise from the highway to an adjacent receptor. Wisconsin Administrative Code Chapter TRANS 405, *Siting Noise Barriers*, specifies several criteria for determining whether noise barriers are practical or feasible:

- Noise barriers protecting a receptor shall reduce noise levels by a minimum of 8 dBA.
- Noise barriers shall be designed to provide protection only to the ground floor of abutting buildings and not other parts of the buildings.
- The total cost of a noise barrier may not exceed $30,000 (1988 dollars) per abutting residence. WisDOT may annually adjust this maximum amount based on changes in the construction price index after 1988.

Construction of noise barriers was considered at each of the locations where receptors exceeded the NAC. TRANS 405 defines feasibility for a noise barrier as the ability to achieve an 8-dBA reduction in the peak hour L_{eq} noise level. Reasonableness is defined primarily through economic considerations with the cost per benefited receptor not to exceed $30,000. In urban areas along the WIS 83 corridor, such as the area in Genesee Depot and other communities, noise barriers could only be constructed in very short segments due to the frequent driveways and cross streets intersecting the roadway, rendering a low noise abatement effectiveness, and therefore not a feasible alternative according to TRANS 405.

Residential properties at the following locations were initially considered to be feasible and potentially reasonable impacted receptors that could benefit from a noise barrier. The estimated cost per abutting residence for each area is also listed.

- Residences between Frog Alley Road and Crossgate Drive, east of WIS 83
  $67,000 per benefited receptor
- Residences immediately north and south of McFarlane Road, east of WIS 83
  $53,000 per benefited receptor
- Residences south of Old Village Road, east and west of WIS 83
  $45,000 per benefited receptor
- Residences southwest and northeast of the WIS 83 and County DE/E intersection
  $40,000 per benefited receptor
- Residences immediately north and south of Meadows Boulevard, west of WIS 83
  $35,000 per benefited receptor

The estimated cost per benefited receptor in each area exceeds $30,000, which exceeds the TRANS 405 reasonableness criteria; therefore, the construction of noise barriers is not considered feasible.

Following the selection of a preferred alternative, local units of government will receive a letter regarding sound levels on currently undeveloped lands. This letter will encourage good land use planning to insure future development is not impacted by roadway sound.

Construction Noise Impacts

Typical construction equipment and noise generated by such equipment is shown in Exhibit 4-3. Construction equipment noise varies greatly depending on equipment type, model, make, duration of operation, and specific type of work being performed at any one time. Typical noise levels may occur in the 67 dBA to 107 dBA range at a distance of 50 feet (15 m) from the noise source. Adverse impacts related to construction noise would be localized and temporary. See Section 6 for additional information.

Energy

Energy consumption related to highway projects involves construction and operational energy. Construction energy is that required in raw materials and equipment to build or maintain the highway. Operational energy is the direct consumption of fuel by vehicles using the roadway. Fuel usage is affected by vehicle type, highway grades and other geometric characteristics, speed, congestion, and queuing caused by high traffic volumes and intersection stop conditions.

Energy consumption for the No Build Alternative would be associated with long-term fuel usage and effects due to increased congestion on the existing highway. The Build Alternatives all involve reconstruction of the existing highway. This would require construction energy for excavating, filling, hauling, pavement construction, and material manufacturing required to construct the new roadway and appurtenances. Operational energy under the Build Alternatives would be less than under the No Build Alternative because of more efficient traffic operations and fewer delays.

The overall energy consumption for the Build Alternatives would likely be offset by the operational energy saved through reduced stops and starts at intersections, and reduced delay. The energy saved because of the new pavement, uniform travel speed, and decrease in the number of crashes would also help offset the energy consumption required for construction.

CULTURAL RESOURCES IMPACTS

The WIS 83 corridor's area of potential effect for cultural resources was established with input from engineering, environmental, and cultural resource team members. It is based on consideration of changes that would occur to the existing roadway cross section and in view of whether the proposed Build Alternatives would likely be found to diminish the integrity of the location, design, setting, materials, workmanship, feeling, or association for adjacent cultural resources during assessment of effects under Section 106 of the National Historic Preservation Act.

- The area of potential effect for historic structures includes all structures immediately adjacent to and fronting on existing WIS 83 and its sideroads, and those additional structures located within a distance of approximately 300 feet (91 m) on each side of the existing highway in open rural areas. Due to the rolling terrain, the area of potential effect also includes structures within a reasonable distance that overlook WIS 83 from a nearby hill.

- The area of potential effect for archaeological resources encompasses the existing and proposed highway right-of-way within which construction activities have the potential for disturbing ground that has not been previously disturbed beyond normal agricultural practices. The archaeological survey covered a sufficient width on each side of the existing WIS 83 to account for all possible disturbance associated with widening/reconstructing the existing highway and the off alignment alternative at Genesee Depot.

Cultural resources were evaluated for eligibility to the National Register of Historic Places under the following criteria specified in Section 106 of the National Historic Preservation Act:

- Criterion A—Structures associated with events that have made a significant contribution to broad patterns of our history
- Criterion B—Structures associated with the lives of persons significant in our past
- Criterion C—Structures that embody the distinctive characteristics of a type, period, or method of construction, that represent the work of a master, that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
- Criterion D—Sites that have yielded or may be likely to yield information important in prehistory or history

Following is a summary of the cultural resources in the WIS 83 area of potential effect that have been found eligible to the National Register of Historic Places or for which additional investigation is warranted. The relationship between these resources and proposed WIS 83 Build Alternatives is also discussed. The No Build Alternative would have no effect on the resources.

Archaeological Sites

Six previously recorded prehistoric sites were identified during the project's phase 1 archaeological investigation. None of these sites yielded material that would indicate the need for further evaluation or testing.

One new prehistoric site was discovered near the project's south terminus. The approximate 4-acre (1.6 ha) site is located on both sides of existing WIS 83. The site has a relatively high density of lithic artifacts and could possibly contain undisturbed archaeological deposits below the plow zone. Therefore, a phase 2 investigation was recommended. The phase 2 investigation was conducted in summer 2003, and no additional materials were found that would indicate site significance or eligibility to the National Register. State Historical Society review of the archaeological investigation report is pending and will be included in the Final EIS.

Historic Sites

Two historic sites are already listed on the National Register of Historic Places, the old Genesee Town Hall (Lion's Club) in Genesee Depot listed in June 1981, and the Ten Chimneys complex listed in February 1998. Ten Chimneys has also been nominated as a National Historic Landmark (status pending). The general location of these sites is shown on Exhibit 4-4 and further information is provided as follows.

Genesee Woolen Mill Historic District— The main portion of the Genesee Woolen Mill site is located about 500 feet (152 m) east of existing WIS 83. The old millrace stream passes under existing WIS 83 through a modern concrete box culvert and extends to a dam west of WIS 83. The woolen mill complex is eligible to the National Register under Criterion D as an industrial archaeological resource and under Criterion A for the information it may yield in regard to the history of woolen mills in Wisconsin and Waukesha County in particular. The portion of the mill complex east of WIS 83 includes both visible and subsurface mill foundation remains/depressions, a residence and barn, the old "picker house", and a small log building that was built with reclaimed logs from another location. All features except the log building are considered to be contributing elements, including the millrace crossed by WIS 83.

The 2-Lane Reconstruction Alternative would not involve any roadway widening at this location. The 4-Lane Corridor Preservation Alternative on existing alignment would consist of widening the existing 36-foot (11-meter) wide suburban roadway to a 52-foot (16-meter) wide urban roadway with curb and gutter. Widening would occur only on the west side, away from the main portion of the mill complex, and would require an approximate 10-foot (3-meter) wide strip of additional right-of-way and extension of the millrace box culvert. The Woolen Mill Historic District is outside the area of effect for the Off-Alignment 4-Lane Corridor Preservation Alternative (Alternative D).

Archaeological investigations in the area west of WIS 83 that would be potentially affected by any future highway construction yielded no evidence of any materials associated with the old mill complex or evidence of prehistoric sites. Further, much of the land within the existing highway right-of-way at the millrace crossing has been previously disturbed due to a 1989 reconstruction project that included extending the existing box culvert and associated excavation and backfill.

Based on the scope of the proposed WIS 83 improvements in the vicinity of the woolen mill complex, the results of archaeological investigation, and previous disturbance at the millrace crossing, it is recommended that no further investigation is required at this site. State Historical Society concurrence in this recommendation is pending and final resolution will be reported in the Final EIS.

Union House—This structure is located on the north side of WIS 83 just west of the Wisconsin Southern Railroad in Genesee Depot. The structure is a former hotel and tavern built in 1861. It has been found eligible to the National Register under Criterion A because it is one of the oldest buildings in Genesee Depot and was a primary center for social activity. It is also considered eligible under Criterion B because the original owner/proprietor played an important role in the overall development of Genesee Depot.

The 2-Lane Reconstruction Alternative would not involve any roadway widening at this location. The 4-Lane Corridor Preservation Alternative on existing alignment would widen existing WIS 83 to a 4-lane undivided cross section. Widening would occur on the south side of existing WIS 83, away from the Union House, and no new right-of-way would be required from this property. This property is outside the area of effect for the Off-Alignment 4-Lane Corridor Preservation Alternative (Alternative D).

Old Genesee Town Hall—This structure is located on the north side of WIS 83, west of the Wisconsin Southern Railroad in Genesee Depot. The old town hall has been placed on the National Register based on Criterion A because it served the social, cultural, and political needs of Genesee Depot for nearly 70 years.

The 2-Lane Reconstruction Alternative would not involve any roadway widening at this location. The 4-Lane Corridor Preservation Alternative on existing alignment would involve widening existing WIS 83 to a 4-lane undivided cross section. Widening would occur on the south side of WIS 83 away from the Old Genesee Town Hall, and no new right-of-way would be required from this property. This property is outside the area of effect for the Off-Alignment 4-Lane Corridor Preservation Alternative (Alternative D).

Ten Chimneys Complex—The main Ten Chimneys complex is located off Depot Road, west of WIS 83 and Genesee Depot. A small parcel that is part of the designated National Historic Landmark boundary abuts the WIS 83 west right-of-way line for a distance of approximately 300 feet (91 m). The Ten Chimneys complex has been placed on the National Register under Criteria B and C. Under Criterion B, Ten Chimneys is nationally significant in the area of performing arts for its association with Alfred Lunt and Lynn Fontanne who exerted a profound influence on twentieth century American theater and who are considered to be America's most famous theatrical couple. Lunt and Fontanne lived at Ten Chimneys from 1915 to 1983, during which time the complex was a social and cultural center of the American theater. It is eligible under Criterion C as an assemblage of Period Revival historic buildings.

The main house is situated in a ravine with hills rising to the sides and rear. A cottage sits at the crest of the ravine behind the main house. The secondary structures are all located over the top of the ravine and are not visible from the main house and its immediate grounds. None of the main complex buildings are visible from WIS 83. The National Historic Landmark boundary for the complex also includes the Noll parcel just north of the present day Ten Chimneys complex. The residence on the Noll parcel was the former caretaker house and is a contributing element in the National Historic Landmark boundary. The house is located approximately 80 feet (24 meters) west of existing WIS 83.

The 2-Lane Reconstruction Alternative would not involve any roadway widening at this location. The 4-Lane Corridor Preservation Alternative on existing alignment and the combination Off-Alignment Alternative D/4-Lane Corridor Preservation Alternative would

widen existing WIS 83 to a 4-lane undivided cross section. Widening would occur slightly east (away from Ten Chimneys) to balance residential, school, and church proximity impacts in this WIS 83 segment. No new right-of-way would be required from Ten Chimneys. However, based on initial design concepts, a temporary grading easement could be required to match the roadway slope into the adjacent land. The grading easement would encompass an approximate 15-foot (5-meter) wide strip and some trees would be removed.

Based on determinations of eligibility for 9 other historic sites along the WIS 83 corridor, 4 were recommended eligible to the National Register. The State Historical Society of Wisconsin has concurred that all 4 sites are eligible (see Appendix C, page C-7). Following is a brief description of the sites and their relationship to proposed WIS 83 improvements. The general site locations are shown on Exhibit 4-4.

Magee-Oliver Farmstead—This site is located east of WIS 83 and north of John's Way in Genesee Depot. The residence on this farmstead has been found eligible to the National Register under Criterion C as a fine example of Italianate style architecture.

The 2-Lane Reconstruction Alternative would not involve any roadway widening at this location, but would include placement of curb and gutter along the east side of WIS 83 within the existing right-of-way. The 4-Lane Corridor Preservation Alternative on existing alignment and the combination Off-Alignment Alternative D/4-Lane Corridor Preservation Alternative would widen existing WIS 83 to a 4-lane undivided cross section. Widening would occur on the west side of WIS 83, away from the Magee-Oliver Farmstead and there would be no right-of-way acquisition from this property.

Albert Campbell Residence—This structure is located west of WIS 83 and north of Walnut Ridge Drive (north). This structure exhibits a Greek Revival architectural style that has been substantially altered. However, it has been found eligible to the National Register under Criterion B because Albert Campbell was a prominent township resident, farmer, and one of the first school commissioners.

Proposed improvements at this location would widen existing WIS 83 to a 4-lane hybrid urban/rural roadway and would include a multi-use path along the east side between County KE and Cardinal Lane. The best-fit alignment would widen east to avoid the Albert Campbell Residence and no new right-of-way would be required from this property.

Conclusions

Additional activities are required to complete the Section 106 process. These include State Historical Society review of the archaeological investigation report, assessment of effects for the historic sites on or eligible to the National Register, and further consultation with the State Historical Society. All remaining Section 106 requirements will be completed prior to approval and distribution of the Final EIS.

RECREATIONAL RESOURCES / PUBLIC USE LAND

Publicly Owned Land

Publicly owned land and recreational resources in the area of potential effect along the WIS 83 corridor are described below along with their relationship to proposed WIS 83 improvements under the Build Alternatives. The No Build Alternative would have no effect on these resources. The resource locations are shown on Exhibit 3-3 in EIS Section 3 and the Aerial Photo Exhibit inside the back cover. Additional information including proposed mitigation/compensation for unavoidable impacts is provided in EIS Section 5.

Vernon Marsh Wildlife Area

This resource is located on the east side of WIS 83 between County NN and County I. The wildlife area is approximately 4,596 acres (1,861 ha) in size based on a combination of owned and leased parcels. The primary designated use is wildlife habitat management. Passive recreational uses include hiking, bird watching, cross-country skiing, canoeing and fishing.

The land is owned/leased and administered by DNR. According to DNR (see letter in Appendix C, page C-21) funding for purchase and development of the Vernon Marsh wildlife area was obtained from the Land and Water Conservation Fund Act (L&WCF), Wisconsin's Outdoor Recreation Acquisition Program (ORAP), the Federal Aid in Wildlife Restoration Act commonly known as the Pittman-Robertson (PR) Act, and state Stewardship funds.

L&WCF funds are provided to DNR through the National Park Service. ORAP funds were provided through a 10-year, $50 million program initiated in 1961 to purchase privately owned parcels and preserve them for wildlife habitat and other uses. Pittman-Robertson funds are used primarily for purchasing, restoring, and improving wildlife habitat and for wildlife management research, and state Stewardship funds are used primarily for habitat restoration and preservation of natural ecosystems.

The only portion of the wildlife area that abuts existing WIS 83 right-of-way is an undeveloped finger of land providing access from WIS 83. The access is gated and locked, signed for non-motorized vehicles/hunting/hiking, and parking is available for about 1-2 vehicles. Additional access is available off Frog Alley Road where there is a parking area and boat launch, County I, and County NN.

Proposed WIS 83 improvements at this location would widen the existing highway to a 4-lane suburban roadway. The best-fit alignment would widen down the middle to balance residential proximity impacts. The existing access point to the wildlife area would be maintained and improved. Approximately 0.1 acre (.04 hectare) of new right-of-way would be required.

Spring Creek Parkway Easement

This resource is located on the west side of WIS 83 adjacent to Spring Brook. The undeveloped parkway easement is approximately 22 acres (9 ha) in size and the boundaries follow the 100-year floodplain. Its primary use is to protect water quality, provide for pedestrian access and preserve the natural resource features including floodplain, wetlands, and wildlife habitat. Passive recreational uses may include hiking and bird watching. The land, zoned conservancy, is privately owned and the easement is administered by Waukesha County.

Traffic in this WIS 83 segment is not expected to reach the threshold volume that can be safely handled at an acceptable service level on the existing 2-lane highway by Design Year 2026. Therefore the No Build Alternative, 2-Lane Reconstruction Alternative, and a 4-Lane Corridor Preservation Alternative are being considered.

The No Build Alternative would have no effect on the Spring Creek Parkway. The 2-Lane Reconstruction Alternative would generally be centered on the existing highway and would require an approximate 90-foot (27-meter) strip from the parkway totaling about 0.5 acres (0.2 ha). This strip taking would be needed for reconstructing the 2-lane roadway slopes and could also be used with a future 4-lane highway.

The 4-Lane Corridor Preservation Alternative would widen the existing highway to a 4-lane hybrid urban/rural roadway. The best-fit alignment would widen west to minimize residential proximity impacts on the east side. It is also proposed to use steep roadway slopes and beam guard at the Spring Brook crossing to minimize resource impacts. The 4-Lane Corridor Preservation Alternative would require the same strip of right-of-way as the 2-Lane Reconstruction Alternative.

Wales Community Park

This resource is located on the east side of WIS 83, south of County G. The 80-acre (32-ha) parcel was purchased and partially developed with state Stewardship funds administered by DNR. The existing park boundary and a proposed park boundary revision are illustrated on the Aerial Photo Exhibit inside the back cover (page 4 of 9). Land within the existing and proposed park boundary adjacent to WIS 83 is presently undeveloped. The boundary revision is being proposed because the Village of Wales has tentative plans for building a new fire station facility in the portion of the existing park that abuts WIS 83. Due to Stewardship funding aspects, the village is working with DNR on a land transfer that would swap the future fire station parcel with a similar sized parcel to the south. The revised park boundary would also be adjacent to WIS 83. The primary use of the new parcel would be for open space, passive recreation, and hiking.

Proposed WIS 83 improvements at this location would widen the existing highway to a 4-lane divided urban roadway. If the existing park boundary remains, the WIS 83 alignment would be shifted west to avoid the park with resultant residential proximity impacts on the west. If the land transfer occurs, the WIS 83 alignment would be centered on the existing alignment to balance the impacts. No new right-of-way would be required from either the existing or revised Wales Community Park boundary.

Glacial Drumlin State Trail

Located south of US 18, the Glacial Drumlin Trail passes beneath WIS 83 on an abandoned railroad corridor. It is a 47-mile (75-km) paved multi-use recreational trail owned and administered by DNR. Funding for purchase and development of the trail was obtained from L&WCF.

The present vertical clearance between the trail and the WIS 83 overhead structure is approximately 23 feet (7 m). Proposed WIS 83 improvements in the vicinity of the trail would widen the existing 2-lane highway to a 4-lane divided urban roadway with a multi-use path on the west side. The existing WIS 83 overhead structure is in poor condition and would be replaced. In addition, the hill at this location would be cut by approximately 3 feet (1 meter) to improve sight distance on WIS 83. Trail use would be enhanced by making a connection to the Glacial Drumlin State Trail from the proposed multi-use path along the west side of WIS 83.

The connection would be provided near Pick-n-Save in the northwest corner of the WIS 83 trail crossing.

Scuppernong Creek Parkway

This resource is a linear strip of land along Scuppernong Creek on the west side of WIS 83, north of US 18. It consists of three separate parcels and the total size is 44 acres (18 ha). The primary use is a greenway area to protect water quality and provide a continuous corridor for plant and animal habitat. Waukesha County's future plans include constructing a paved recreational trail in the parkway.

The larger triangular shaped parcel comprises approximately 30 acres (12 ha) and is owned, funded and administered by Waukesha County. The land has a combination of zoning depending on the distance from Scuppernong Creek (rural residential, conservancy, and wetland/floodplain). Proposed WIS 83 improvements at this location would widen the existing highway to a 4-lane hybrid urban/rural roadway. A multi-use path at the toe of the road embankment on the west side of WIS 83 is also proposed. The best-fit alignment would widen slightly west to balance impacts due to cutting into the hill on the east side (residential development on the hill), wetland impacts, and parkway impacts. The proposed improvements would require an approximate 80-foot (24-meter) strip of right-of-way acquisition from this parcel for a total of approximately 4.6 acres (1.9 ha).

The second parcel, approximately 9 acres (4 ha) in size, is an easement from the Hickory Hills subdivision. This undeveloped parcel is privately owned, zoned conservancy, and the easement is administered by Waukesha County. Proposed WIS 83 improvements at this location would widen the existing highway to a 4-lane hybrid urban/rural roadway. A multi-use path at the toe of the road embankment on the west side of WIS 83 is also proposed and would be located at the top of the embankment from Mary Court to Scuppernong Valley Court to minimize wetland and stream impacts. The best-fit alignment would widen east to minimize wetland impacts and avoid impacts to Scuppernong Creek west of WIS 83. The proposed improvements would not require any right-of-way acquisition from this parcel.

The third parcel, approximately 5 acres (2 ha) in size, is adjacent to Scuppernong Valley Court. The land is owned, funded and administered by Waukesha County and has a combination of zoning depending on the distance from Scuppernong Creek (rural residential, conservancy, and wetland/floodplain). Proposed WIS 83 improvements at this location would widen the existing highway to a 4-lane hybrid urban/rural roadway. A multi-use path on the west side of WIS 83 is also proposed and would be located at the top of the embankment from Mary Court to Scuppernong Valley Court to minimize wetland and stream impacts. The best-fit alignment would widen east to minimize wetland impacts and avoid impacts to Scuppernong Creek west of WIS 83. A retaining wall on the east side of WIS 83 north of Mary Court would minimize slope grading and woodland impacts to the Hidden Hills Estates subdivision east of WIS 83. Other techniques to minimize impacts include guardrail, concrete barrier wall, and steeper side slopes. The proposed improvements would require a triangle of right-of-way acquisition from this parcel at Scuppernong Valley Court for a total of approximately 0.1 acres (0.04 ha).

Naga-Waukee County Park and Golf Course

This resource consists of a developed community park west of WIS 83 and an 18-hole public golf course east of WIS 83. The entire complex is approximately 416 acres (168 ha) in size and is owned, funded and administered by Waukesha County. DNR funds were used for

constructing boat launches and any funding restrictions apply only to those facilities. Park features include swimming, camping, picnic areas, playfields, trails, and boat launches. The entire complex is officially designated and zoned as county parkland.

Because the existing 4-lane divided highway in the County DR/Golf Road to Meadow Lane WIS 83 segment is sufficient to handle forecast traffic, no further roadway improvements are being proposed and there would be no new right-of-way acquisition from the Naga-Waukee County Park and Golf Course.

Lake Country Trail

The 9-mile (14-km) unpaved multi-use Lake Country Trail crosses existing WIS 83 just north of County DR/Golf Road and runs through the south portion of the Naga-Waukee Park and Golf Course discussed above. The trail is owned and administered by Waukesha County. According to DNR (see letter in Appendix C, page C-21), state Stewardship funds have been used for acquisition and development of various segments of the trail. In addition, DNR has provided L&WCF funds and state Stewardship funds to the City of Delafield for two park development projects that "currently provide support facilities" for the Lake Country Trail. The present trail crossing is at-grade and unsignalized. As noted under the Naga-Waukee County Park discussion, no WIS 83 improvements are being proposed in this project segment and there would be no right-of-way acquisition from the Lake Country Trail.

Based on input from Waukesha County, DNR, National Park Service, and Ice Age Trail Foundation representatives at an inter-agency meeting held on March 27, 2003, there is strong interest in improving the Lake Country Trail crossing as part of the WIS 83 corridor study. Although specific trail use data is not available, agencies believe trail use is hampered today by the fact that it is unpaved, has an at-grade crossing, and because of high traffic volumes on WIS 83. There is strong concern that trail safety will deteriorate as traffic volumes continue to increase over time. Agencies also stated their opinion that trail use will increase in the future if the trail is paved and if a connection or concurrent routing is made with the Ice Age Trail. Agency preference is for a combined grade-separated trail crossing that would serve the Lake Country Trail and the Ice Age Trail.

Ice Age Trail

The Ice Age Trail is a designated National Scenic Trail and is Wisconsin's only State Scenic Trail. The trail is owned and administered by the Ice Age Park and Trail Foundation in cooperation with the National Park Service and DNR. Funding for the trail was provided through the Ice Age Park and Trail Foundation. The existing Ice Age Trail crosses WIS 83 at Mariner Drive. On the west side of WIS 83 it runs along the north edge of the Naga-Waukee Park property. On the east side of WIS 83 the trail is described as occupying WIS 83 right-of-way to County KE although there has been no trail construction in the highway right-of-way. The unofficial trail used by hikers and others follows subdivision roads east of WIS 83 and crosses County KE about ¼ mile (0.4 km) east of WIS 83. Trail development within existing WIS 83 right-of-way has not occurred because the long range plan is to have the official Ice Age Trail cross WIS 83 concurrently with the Lake Country Trail. The Ice Age Trail would then run about ¼ mile (0.4 km) east of WIS 83 along the Naga-Waukee Park and Golf Course and then be on easement to County KE.

No improvements to the existing 4-lane roadway are proposed in the County DR/Golf Road to Meadow Lane WIS 83 segment that includes the existing Lake Country Trail and Ice Age Trail

crossings. Proposed WIS 83 improvements in the Meadow Lane to County KE segment would widen the existing 2-lane highway to a 4-lane hybrid urban/rural roadway. Therefore, the unimproved Ice Age Trail route that occupies existing WIS 83 right-of-way between Meadow Lane and County KE would be shifted to the new highway right-of-way.

Based on input from Waukesha County, DNR, National Park Service, and Ice Age Park and Trail Foundation representatives at the March 27, 2003 interagency meeting, there is strong interest in improving the Ice Age Trail crossing as part of the WIS 83 corridor study. Agency preference is for a combined grade-separated crossing that would serve the Ice Age Trail and the Lake Country Trail.

Ice Age Park and Trail Foundation Parcel

This approximate 80-acre (32-ha) parcel is located on the east side of WIS 83 between County KE and Cardinal Lane. It is owned and administered by the Ice Age Park and Trail Foundation in cooperation with the National Park Service and DNR. State Stewardship funds were used to purchase this parcel. The primary use is for open space, wetland preservation and management, educational use, pedestrian use and enjoyment, and to protect the Bark River. The parcel also contains a hiking trail. The Ice Age Trail is just to the east of the parcel along Cottonwood Avenue.

Proposed WIS 83 improvements at this location would widen the existing highway to a 4-lane hybrid urban/rural facility and would include a multi-use path along the east side between County KE and Cardinal Lane where the Ice Age Park and Trail Foundation parcel is located. A loop connection could be constructed to link with a future path under the Bark River bridge. The best-fit alignment would widen east to avoid impacts to a historic property west of WIS 83 near the Bark River. The proposed improvements would require an approximate 60-foot (18-meter) strip of new right-of-way from the Ice Age Trail parcel. Total right-of-way acquisition would be approximately 2.3 acres (1 ha).

RELATIONSHIP OF LOCAL SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Highway construction projects require the investment or commitment of resources in the project area. Short-term uses refer to the immediate consequences of the project while long-term productivity relates to its direct and secondary effects on future generations.

The No Build Alternative would involve minimal short-term and localized construction impacts associated with maintenance of pavement and structures and spot safety improvements. However, projected traffic growth in the study area would further reduce the operational efficiency of the existing highway, resulting in reduced safety and mobility, and the possible loss of economic growth opportunities.

Short-term consequences of the Build Alternatives include:

- Removing private property from local government tax rolls, thereby temporarily reducing the local tax base.
- Committing public funds to construct the highway improvements. Because highway funding is derived from vehicle user fees and motor fuel taxes, those using the highway ultimately pay for the improvements.

- Converting residential and commercial land, wetland, agricultural land, and other resources to transportation use.
- Displacing residences and businesses. Although displacement costs would be reimbursed through state and federal relocation assistance programs, displaced residents and businesses may relocate outside the project area, thus reducing the local tax base.
- Right-of-way acquisition from some residential properties may result in nonconforming lot sizes.
- Inconvenience and added travel time during the construction period for through and local traffic, area residents and businesses.
- Generating construction noise and dust that may affect residences and businesses near the construction areas.

Some long-term benefits of the Build Alternatives include:

- Reduced congestion and increased safety.
- Improved emergency vehicle service.
- Increased operational energy efficiency.
- Additional roadway capacity to address future traffic demand.

The local, short-term impacts and use of resources by the Build Alternatives are consistent with the maintenance and enhancement of long-term productivity.

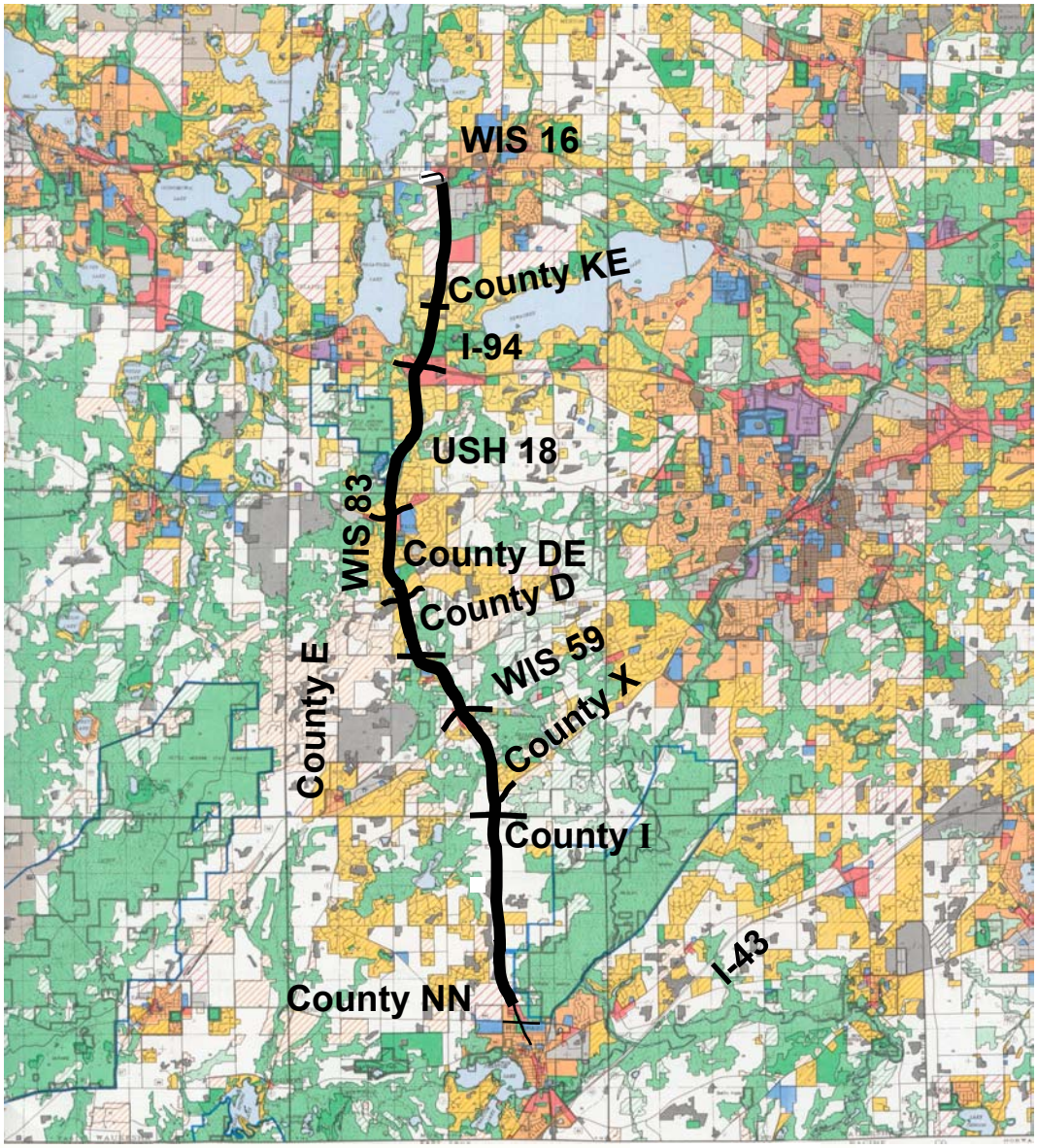
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The No Build Alternative would involve minimal commitments of resources to maintain the pavement and structures and to make spot safety improvements. Under the Build Alternatives, land acquired for road construction is considered an irreversible commitment during the period such land is used for highway purposes. Large amounts of fossil fuel, labor, and highway construction materials such as cement, aggregate, and asphaltic material would be required. Labor and natural resources would be used in the fabrication and preparation of construction materials. These resources generally are not retrievable. However, they are expected to remain in adequate supply.

Expenditure of public funds for construction of the Build Alternatives is considered an irretrievable commitment. In addition, land converted from private to public use would reduce local tax revenues.

As an alternative to total use of new resources, full consideration will be given to using clean construction demolition materials and recycled cement or asphaltic materials. Depending on current technology at the time the project would be constructed, alternative types and sources of materials may be available.

The proposed commitment of resources is based on the concept that residents in the study area, region, and state would benefit by the improved quality of the highway. Benefits, which are expected to outweigh the commitment of resources, will include improved safety and travel time savings.



LEGEND

GENERALIZED PLANNED LAND USE CATEGORY

- HIGH DENSITY RESIDENTIAL (LESS THAN 6,000 SQUARE FEET OF LOT AREA PER DWELLING UNIT)
- MEDIUM DENSITY RESIDENTIAL (6,000-19,999 SQUARE FEET OF LOT AREA PER DWELLING UNIT)
- LOW DENSITY RESIDENTIAL (20,000 SQUARE FEET TO 1.4 ACRES OF LOT AREA PER DWELLING UNIT)
- SUBURBAN I DENSITY RESIDENTIAL (1.5 TO 2.9 ACRES OF LOT AREA PER DWELLING UNIT)
- SUBURBAN II DENSITY RESIDENTIAL (3.0 TO 4.9 ACRES OF LOT AREA PER DWELLING UNIT)
- RURAL DENSITY RESIDENTIAL AND OTHER AGRICULTURAL LANDS
- COMMERCIAL
- INDUSTRIAL
- GOVERNMENTAL AND INSTITUTIONAL
- RECREATIONAL
- TRANSPORTATION, COMMUNICATION, AND UTILITIES
- EXTRACTIVE
- LANDFILL
- PRIMARY ENVIRONMENTAL CORRIDOR
- SECONDARY ENVIRONMENTAL CORRIDOR
- ISOLATED NATURAL RESOURCE AREA
- OTHER OPEN LANDS TO BE PRESERVED
- PRIME AGRICULTURAL
- SURFACE WATER
- ADOPTED WISCONSIN DEPARTMENT OF NATURAL RESOURCES PROJECT BOUNDARY

N

Source: SEWRPC
Development Plan for Waukesha County
Community Assistance Planning Report 209
August, 1996

Exhibit 4-1
Recommended Land Use Plan
For Waukesha County

U.S. DEPARTMENT OF AGRICULTURE **Form AD-1006**

FARMLAND CONVERSION IMPACT RATING

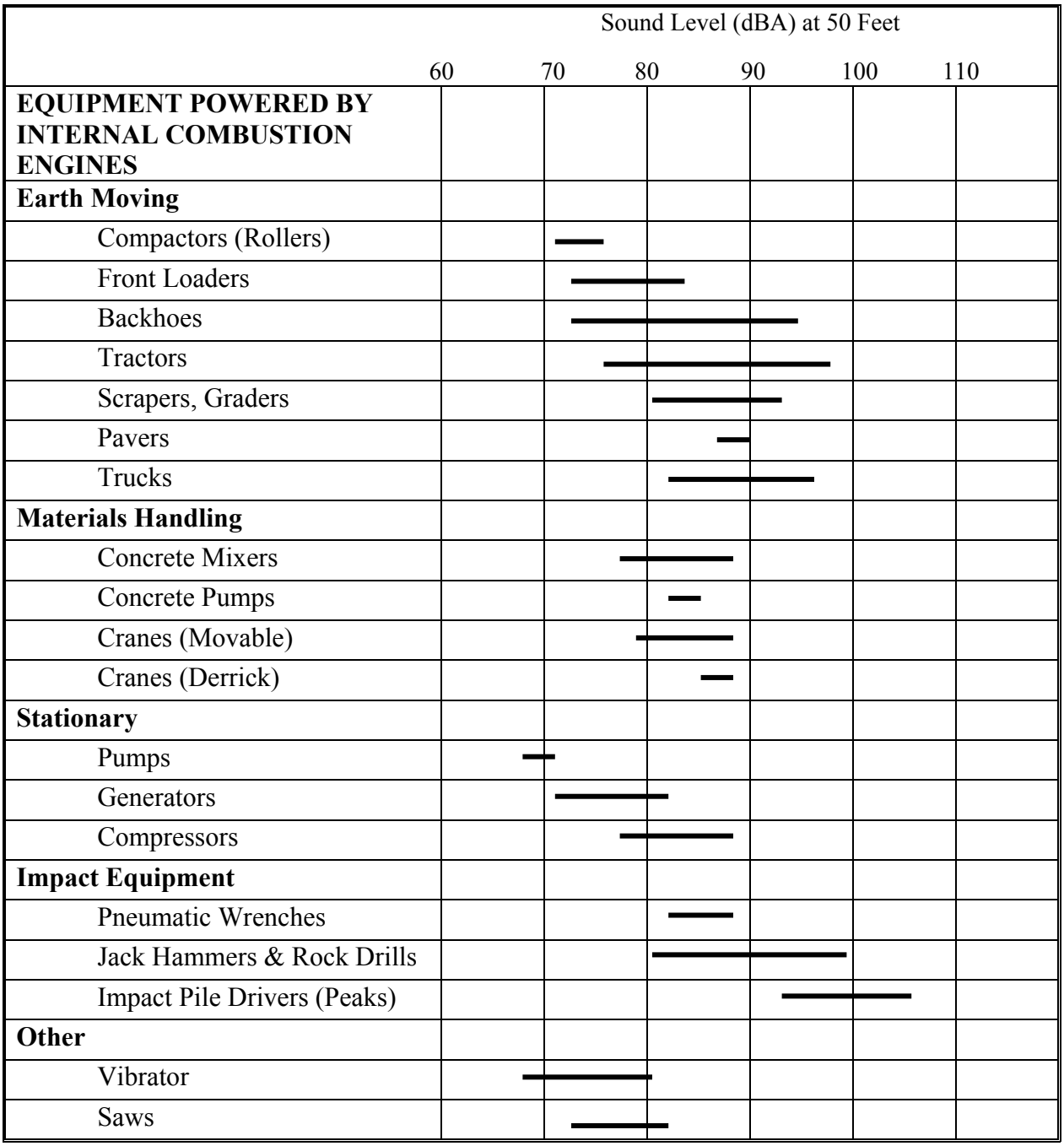
PART 1 ***(To be completed by Federal Agency)***	1. Date of Land Evaluation Request	2. Sheet 1 of 1
3. Name of Project STH **83 Corridor Study (CTH NN to STH 16), Waukesha County, I.D. 1330-15-00**	4. Federal Agency Involved **Federal Highway Administration**	
5. Proposed Land Use **STH 83 highway improvements**	6. County and State **Waukesha County, WI**	7. Type of Project: Corridor X Other ☐
PART II ***(To be completed by NRCS)***	1. Date Request Received by NRCS	2. Person Completing the NRCS parts of this form
3. Does the site or corridor contain prime, unique ,statewide or local important farmland? Yes ☐ No ☐ (If no, the FPPA does not apply - Do not complete additional parts of this form)		4. Acres Irrigated / 5. Average Farm Size
6. Major Crop(s)	7. Farmable Land in Government Jurisdiction Acres: %	8. Amount of Farmland As Defined in FPPA Acres: %
9. Name of Land Evaluation System Used	10. Name of Local Site Assessment System	11. Date Land Evaluation Returned by NRCS

PART III ***(To be completed by Federal Agency)***		**Alternative Site Rating *** * Alternative site A = ultimate multi-lane facility oriented to existing STH 83 centerline			
		Site A	**Site B**	**Site C**	**Site D**
A. Total Acres To Be Converted Directly		**54**			
B. Total Acres To Be Converted Indirectly, Or To Receive Services		**0**			
C. Total Acres in Site		**54**			
PART IV ***(To be completed by NRCS) Land Evaluation Information***					
A. Total Acres Prime and Unique Farmland					
B. Total Acres Statewide and Local Important Farmland					
C. Percentage of Farmland in County or Local Govt. Unit to be Converted					
D. Percentage of Farmland in Govt. Jurisdiction with Same or Higher Relative Value					
PART V ***(To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland to be Serviced or Converted (Scale of 0 - 100 Points)***					
PART VI ***(To be completed by Federal Agency) Corridor or Site Assessment Criteria (These criteria are explained in*** **7 CFR 658.5(b & c))**	**Max. Points Corridor**				
1. Area in Nonurban Use	15 15	**15**			
2. Perimeter in Nonurban Use	10 10	**10**			
3. Percent of Site Being Farmed	20 20	**20**			
4. Protection Provided by State and Local Government	20 20	**20**			
5. Distance from Urban Built-up area	0 15	**15**			
6. Distance to Urban Support Services	0 15	**15**			
7. Size of Present Farm Unit Compared to Average	10 10	**10**			
8. Creation of Non-Farmable Farmland	25 10	**25**			
9. Availability of Farm Support Services	5 5	**5**			
10. On-Farm Investments	20 20	**20**			
11. Effects of Conversion on Farm Support Services	25 10	**25**			
12. Compatibility with Existing Agricultural Use	10 10	**10**			
TOTAL CORRIDOR OR SITE ASSESSMENT POINTS	160	**55**			
PART VII ***(To be completed by Federal Agency)***					
Relative Value of Farmland (from Part V above)	100				
Total Corridor or Site Assessment (From Part VI above or a local site assessment)	160				
TOTAL POINTS ***(Total of above 2 lines)***	260				

PART VIII ***(To be completed by Federal Agency after final alternative is chosen)***		
1. Corridor or Site Selected: **Site will be selected at the conclusion of the NEPA process (Final EIS and Record of Decision)**	2. Date of Selection:	3. Was A Local Site Assessment Used? Yes ☐ No X
4. Reason For Selection:		
Signature of person completing the Federal Agency parts of this form:		DATE

Wisconsin substitute form AD-1006 6-9-97 Completion instructions: http://www.wi.nrcs.usda.gov/soil/prime/prinotes.html

Exhibit 4-2



SOURCE: Figure 2-36, Report to the President and Congress on Noise, Prepared by the U.S. EPA, February 1972

Exhibit 4-3
Construction Equipment Sound Levels

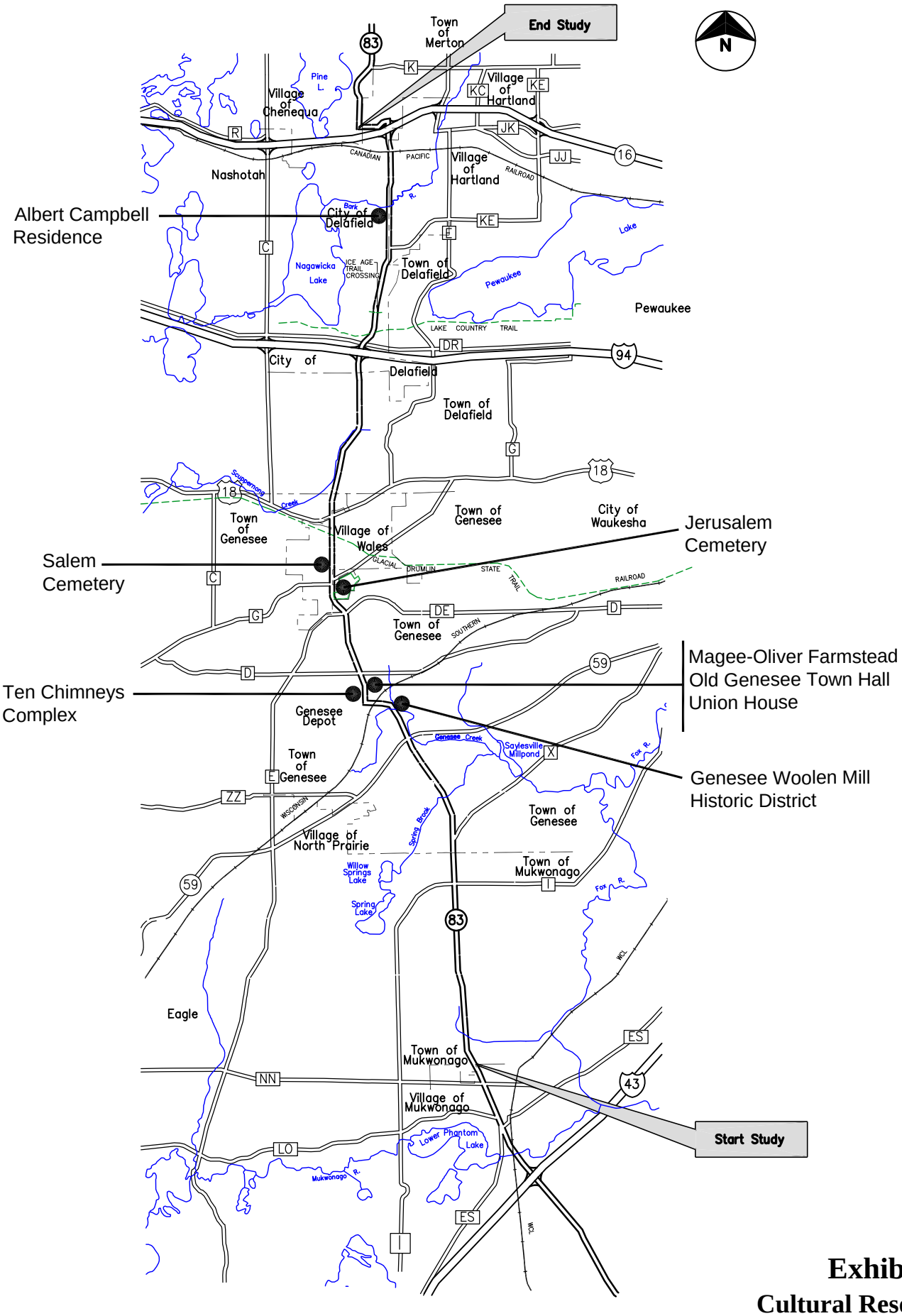


Exhibit 4-4
Cultural Resources
General Location Map