

4.4 MEASURES TO MINIMIZE AND MITIGATE ADVERSE EFFECTS

Section 101(b) of the National Environmental Policy Act (NEPA) requires federal agencies incorporate into project planning all practicable measures to mitigate adverse environmental impacts resulting from the proposed action. This section summarizes concept-level impact mitigation commitments for the WIS 15 improvement project. Proposed mitigation measures reflect comments received from the public and agencies during the EIS preparation process. Agency coordination will continue through the construction phase of the project. During that time, concept-level commitments will be developed in detail. Final mitigation plans will be implemented by inclusion in the final engineering plans and specifications.

A. Transportation

A traffic management plan will be developed and implemented to allow reasonably convenient access to residences, businesses, farm parcels, community services, and local roads during construction. Work will be staged to minimize disruption during the construction period. To minimize delays to emergency vehicles, WisDOT will coordinate construction activities, staging, and traffic management plans with local fire, police, and emergency rescue districts and school districts. Traffic flow will be maintained during construction to the maximum extent possible. Lengthy detours will be minimized however, it is anticipated that, for various durations, side-road connections will be closed to accommodate construction activities.

B. Access Control

There will be full access control on the bypass **portions of the Preferred Alternative**. There will be no private or public access other than at the points where the bypass connects to the existing WIS 15 roadway. **Additionally, as part of the on-alignment portion of the Preferred Alternative, no new access will be permitted. For portions of the Preferred Alternative that follow the existing alignment, access will be frozen.** Existing access points will remain, but new access points or changes in access point usage will be restricted. Additionally the **Preferred Alternative incorporates a median, and median breaks will be installed sporadically. Many properties will have right-in/right-out access only. Left-turning vehicles will need to travel to a median break and make a U-turn. Locations of median breaks will be determined during the design phase.**

West of Hortonville and east of New London, **the Preferred Option (Option A)** follows the existing alignment. With this option, existing access points will remain, but new access points or changes in access point usage will be restricted.

C. Aesthetics

Measures to minimize adverse aesthetic impacts will include roadway design features to blend into the existing landscape and planting with natural vegetation where possible. Special consideration will be made to address aesthetics at cut and fill slopes. This may include planting wildflower species and/or native trees and shrubs. Vegetative screening will be considered where practicable to minimize the impacts to adjacent properties. WisDOT will preserve the existing vegetation beyond the slope intercepts in environmentally sensitive areas as much as possible.

D. Noise and Air Quality

To reduce the short-term impacts of construction noise, the special provisions for this project will require that motorized equipment be operated in compliance with all applicable local, state, and federal laws and regulations on noise levels permissible within and adjacent to the project construction site.

FHWA has established a set of policies and procedures related to traffic noise that are to be applied to federal aid projects. These are currently described in Federal Aid Policy Guide (FAPG) Part 772, titled Procedures for Abatement of Highway Traffic Noise and Construction Noise. The provisions of this FAPG apply to federal aid projects without regard to a jurisdictional system. They apply to highway construction or reconstruction projects, as well as to projects undertaken solely for noise abatement purposes along existing highways.

Noise mitigation may be achieved through a variety of measures that modify the noise source, noise path, or receiver characteristics. A noise barrier evaluation indicates that noise barriers **are not** economically practical. Consideration of noise barriers for residences adjacent to the new roadway alignment was in

accordance with Wisconsin Administrative Code Chapter TRANS 405, which states that noise barriers must reduce the noise levels by a minimum of 8 decibels and must be cost effective. Noise barriers are not practicable for isolated individual rural residences. To be effective, noise barriers must be continuous, without openings for driveways or access. Barriers cannot be used in instances where the relocation of streets and driveways is not reasonable.

Dust control will be accomplished in accordance with the WisDOT Standard Specifications, which require application of water or other approved dust control methods during grading operations on haul roads. The location and operation of asphaltic batch plants will follow the Standard Specifications and any special provisions developed during coordination with the WDNR regarding air quality standards and emissions. Any portable material plants would be operated in accordance with the WDNR air quality requirements and guidelines. Demolition and disposal of structures are regulated under the WDNR's asbestos renovation and demolition requirements (Wisconsin Administrative Code Chapter NR 447).

E. Property Acquisition

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended provides for payment of just compensation for property acquired for a federal aid project. In addition to acquisition price, costs for the replacement dwelling or business location, moving expenses, increased rental or mortgage payments, closing costs, and other valid relocation costs are covered. No person or business will be displaced unless a comparable replacement dwelling or business location, or other compensation where a suitable replacement business location is not practicable, is provided. The above compensation is available to all displaced persons without discrimination.

Before property acquisition activities begin, property owners will be contacted with an explanation of the details of the acquisition process and Wisconsin's Eminent Domain Law under Section 32.05, Wisconsin Statutes. One or more professional appraisers will inspect any property acquired. The property owner will be invited to accompany the appraiser during the property inspection. An independent property appraisal by the owner can also be provided. Based on the appraisal(s) made, the value of the property will be determined and an amount offered to the owner.

Property acquisition not involving residential, business, or other building relocations is also compensated in accordance with state and federal laws. In consultation with affected landowners, the value of the required right-of-way (R/W) or access rights will be appraised and the owner compensated at fair market value. The property owner may obtain an independent appraisal. If the fair market value cannot be reached, the property owner will be advised promptly of the procedure to follow in making an appeal.

Any septic tanks, drain fields, or wells on properties to be acquired will be abandoned by state regulations and local zoning standards.

F. Material Source/Disposal Sites

Selection of borrow material sites are the responsibility of the construction contractor subject to approval by WisDOT. It is anticipated that borrow will be obtained locally from existing sites that are properly zoned.

WisDOT makes the arrangements to have archival and literature searches conducted for off-site construction activity areas, such as borrow sites, batch plants, and waste sites to determine whether archaeological sites, burials, or mounds are present. The contractor is notified with the research results. When necessary, the contractor is responsible for coordination with the State Historical Society and for obtaining the services of an archaeologist.

The contractor in accordance with the *tandard pecifications or Road and ridge Construction* or project special provisions will dispose of unusable excavated material to ensure protection of wetlands and waterways. The contractor is responsible for identifying the appropriate disposal site and obtaining written permission from the property owner.

All waste and demolition material from project construction activities will be disposed of in approved upland areas or at licensed solid waste disposal sites under the Standard Specifications or project special provisions to ensure protection of wetlands and waterways.

Erosion Control and stormwater management will be followed at the borrow site or waste area as set forth in Wisconsin Administrative Code Trans 401 and the WISDOT/WDNR Cooperative Agreement. The contractor's Erosion Control Implementation Plan (ECIP) for borrow sites and waste areas will cover erosion control. The ECIP will establish the schedule of implementation for temporary and permanent erosion control devices on the highway project and at the project borrow or waste sites. The ECIP will become part of the contract and will be submitted to WisDOT for approval and to the WDNR for concurrence a minimum of 14 days prior to any preconstruction meeting.

Revegetation of the project site, including borrow pit sites and waste areas, will be incorporated as a component of the project's erosion control plan, ECIP, and construction contract. Revegetation and stabilization of cleared and graded areas shall be accomplished by using a combination of seed, mulch, erosion mat, or sod. Revegetation will occur as soon as practicable following the grading operations of the project.

G. Water Quality, Hydrology, and Hydraulics

WisDOT through Wisconsin Administrative Code Trans 401 and the WisDOT/WDNR Cooperative Agreement will comply with the substantive requirements of Chapter 147, Wisconsin Statutes, Wisconsin Pollutant Discharge Elimination System (WPDES). WisDOT, in accordance with the WisDOT/WDNR Cooperative Agreement, will contact the area WDNR liaison and coordinate with the WDNR prior to performing any construction activities that may adversely affect Waters of the State.

Creek, slough, and wetland involvement associated with the proposed project is subject to individual permits under Section 404 of the Clean Water Act (33 USC 1344). The permit program, administered by the USACE, covers the discharge of fill material into the waters of the United States, including wetlands. Issuance of Section 404 permits is contingent on receipt of water quality certification from the WDNR under Section 401 of the Clean Water Act and Wisconsin Administrative Code Chapter NR 299. Individual 404 permits will be required for this project. Coordination with the WDNR in this regard is accomplished under the Cooperative Agreement.

Precautions will be taken at the Black Otter Creek crossing and at the unnamed tributaries to the Wolf River and Rat River crossings for the **Preferred Alternative**. These precautions preclude erosion and stream siltation. All structure and crossing work will be coordinated with the WDNR so that fish habitat and water quality are protected. Impacts to water quality will be minimized through the implementation of erosion control measures according to the erosion control plan included in the construction contract, the Standard Specifications, and project special provisions. In-stream work will be restricted to those dates not detrimental to the warm water fishery within the creek and tributaries of this project. In addition, construction near surface waterways will be avoided during periods of high snowmelt or rains. Erosion control devices will be installed before erosion prone construction activities begin.

Temporary and permanent erosion control measures may include silt fence, retention basins, erosion mat, mulching, riprap, erosion bales, and seeding and sodding. Temporary measures will remain in place until new plantings are established.

Structure sizing will be performed in accordance with state and federal guidelines regarding floodplain encroachment and hydraulic capacity. All new structures over navigable waters will be consistent with the provisions of the Wisconsin Administrative Code Chapter NR 116 as administered under the Cooperative Agreement between WisDOT and the WDNR. WisDOT will mitigate any project impacts to waterways. This mitigation could be achieved through acquiring easements and/or working with the local agencies to change the applicable zoning ordinances.

Drainage systems, including ditches on private lands, will be maintained, restored, or reestablished in a manner that will not impound water. Permanent retention facilities will be considered in areas adjacent to streams and wetlands so roadway runoff will be intercepted before entering the waterway. The care and treatment of bridge runoff will be consistent with the latest federal and state laws and regulations. Selection of construction staging areas will be performed in accordance with the Standard Specifications or special provisions to ensure that the areas will not adversely affect wetlands, streams or drainageways.

During the preliminary design phase, soil borings will be taken to evaluate groundwater levels and the potential of the new highway construction impeding subsurface drainage to adjoining wetlands. If it is determined that groundwater flows will be adversely affected, special measures, such as the use of geotextile underdrains or the construction of collector ditches, would be incorporated into the design to

protect the natural integrity of wetland communities. Special design techniques, when required, are coordinated with the WDNR. As a minimum, equalizer culverts will be installed at frequent intervals along the roadway to maintain the natural flow of groundwater through the wetland. Placement of structures will similarly be evaluated so that surface water quality is not impaired by runoff.

Accidental spills have the potential to occur during refueling at construction sites or as the result of an accident involving petroleum or chemical haulers that use WIS 15. They will be handled by local government response procedures. First response is through local fire departments and emergency service personnel who maintain public safety and contain immediate threats to the environment. Depending on the nature of the spill or excavation revealing environmental contamination, the WDNR is notified to provide additional instructions regarding cleanup and restoration of the carrier involved in the accidental spill or larger site. WisDOT Standard Specifications state that the construction project contractor shall enforce public safety and environmental protection measures.

Communication with the WDNR will continue during the engineering design phase to obtain its input on erosion control, structure plans, HazMat issues, and construction sequencing to avoid critical fish spawning periods.

H. Fish, Wildlife, and Threatened and Endangered Species

The construction contractor's plan of operations will identify the location of all haul roads, material storage sites, and any other lands that may be disturbed outside the construction zone. WDNR and WisDOT will review the plan to assure the construction impacts to fish and wildlife habitat are minimized.

Mitigation measures proposed to protect water quality, wetlands, and upland vegetation will directly benefit fish and wildlife resources. These measures will help to maintain the quality of surface waters for use by aquatic flora and fauna. These measures will also minimize wetland loss and degradation and will help preserve the functional integrity of upland wildlife habitats.

Mitigation measures considered to reduce impacts to wildlife include scheduling construction during nonbreeding seasons and effective erosion control measures. Other mitigation measures include the development of native or other vegetative plantings of known value to wildlife. To date, various preliminary wetland mitigation sites have been screened by WisDOT/WDNR staff. The details of wetland mitigation and any other conceptual mitigative measures will be developed and coordinated with the WDNR, USFWS, USACE, and USEPA during design and closer to project construction.

WisDOT has conducted a habitat review for the arner blue butterfly as it relates to USFWS-noted habitat near WIS 15 and County JJ. No habitat was found for the arner blue butterfly.

WisDOT has conducted a review with the WDNR regarding reported Blanding's turtle sightings in the Wolf River area near Givens Road on the Preferred Alternative (Alternative 3). Coordination with the WDNR regarding the presence of Blanding's turtles indicated suitable habitat exists within the Preferred Alternative corridor. The following preventive measure should be included in the project:

- Turtle barrier from the railroad tracks east to County M. Permanent barrier could consist of:
 - Chain link fence entrenched 1 foot, with fine mesh such as chicken wire at the bottom 2 feet to prevent young turtles from getting through.
 - Wood boards that are entrenched 1 foot.
 - Poured concrete barrier
- Installation of temporary turtle barrier from the railroad tracks east to County M during construction. Temporary turtle barrier can consist of silt fence with modifications at the ends. The installation in wetlands should be coordinated with a herpetologist, unless it is installed early enough in the spring. An incidental take permit may be required depending on when the installation occurs.
- There is not enough suitable turtle nesting habitat north of the Preferred Alternative corridor. Therefore a turtle passage under the new highway should be installed to access known nesting areas. The design of turtle passage structures should be coordinated with WDNR.

- o Since the Preferred Alternative is a four-lane roadway with a median, the turtle passages should be daylighted in the median. The daylighting can consist of a steel grate and can incorporate drainage if necessary.
- o The turtle barrier should tie into the turtle passages in a way that directs the turtles to the crossing.

Because construction will not happen for 10 or more years, the list of state and federal threatened and endangered species will be revisited about 3 years prior to construction. A biological assessment will be prepared for the selected corridor if federally listed species are present in the project area. Areas of the project corridor that are environmentally sensitive areas as designated by the local planning agency or by reviewing agencies should similarly be reviewed for state-listed species.

The project was designed to minimize impacts to any threatened or endangered species. If threatened or endangered species become evident, the WDNR/WisDOT will coordinate an effort to reach a mitigation plan to address the issue.

Bridge and culvert construction will be scheduled to avoid migratory bird species nesting and brooding seasons. Work on existing structures will be restricted during May 15 to August 20, the bird nesting/brooding seasons, or netting can be used to minimize impacts.

To the maximum extent possible, the highway construction zone will be limited to minimize direct losses to wetland sites and other sensitive habitats.

Where appropriate, the revegetation program will utilize native seed mixtures that will enhance roadside wildlife habitat value. Seed selection will be the responsibility of WisDOT, with guidance as appropriate from the WDNR. The WDNR encourages the use of native species.

Construction site erosion and sediment control procedures will be followed as set forth in Wisconsin Administrative Code 401 and the WisDOT/WDNR Cooperative Agreement. During project design, an erosion control plan will be developed in consultation with the WDNR. Appropriate techniques and best management practices as described in WisDOT's Design Facilities Development Manual will be employed to prevent erosion and minimize siltation to any drainageways to be crossed by this project. These techniques may include the use of temporary and permanent sediment traps, turbidity barrier, silt fence, sodding, ditch checks, erosion mat, temporary and permanent seeding, and other means to prevent erosion and retard sediment transport. Revegetation will be incorporated as a component of the construction contract.

I. Wetlands

Executive Order 11990, Protection of Wetlands, requires federal agencies ...to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands wherever there is a practicable alternative... . The Order states further that where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands in accordance with state and federal agency policies and regulations for wetland preservation, including the Section 404 (b) (1) Guidelines for Specifications of Disposal Sites for Dredged or Fill Material (40 CFR, Part 230).

During construction, impacts to wetlands from erosion and sediment transport will be minimized or prevented by implementing erosion control BMPs as specified in the construction contract conform to the contract's special provisions and the WisDOT's *tandard pecifications for Road and ridge Construction*.

1. Avoidance

The alternatives under study in the FEIS have been located to avoid wetlands where practical. In some locations, however, avoidance is not possible. For the on-alignment alternatives (Preferred Option A and Alternative 1), some wetlands exist directly adjacent to the current roadway and expansion on-alignment would not be possible without impacting these adjacent wetland areas. Additionally, the Preferred Alternative (Alternative 3) is able to skirt the majority of the wetlands associated with the Lower Wolf River Bottomlands Natural Resource Area (LWRBNRA) but other alternatives investigated would not easily avoid wetlands because of alignment considerations on the northeast side of Hortonville. South of the current WIS 15 area is a large wetland area associated with Black Otter Lake and Creek. Because of the expanse of this wetland area, it was

difficult to avoid completely with Alternatives 1 and 4. Alternative 2 avoids the majority of the lake yet impacts extensive wetlands and floodplains to the south.

2. Minimize Wetland Impacts

WisDOT, in coordination with the WDNR, has identified wetland sites that may be affected by the proposed alternatives. Thorough detailed mapping of these wetlands was completed with GIS survey during the FEIS phase. WisDOT design will provide additional measures to minimize wetland impacts such as keeping roadway side slopes as steep as practicable, limiting fill beyond the roadway clear zones or slope intercepts, and reuse of excavated material on new roadway side slopes. These concepts will help minimize wetland losses and will protect the functional integrity of the wetland resources during and after construction.

3. Wetland Compensation

Compensation for unavoidable wetland loss will be carried out in accordance with the interagency *Wetland Mitigation and Technical Guideline* developed as part of the WisDOT/WDNR *Cooperating Agreement on Compensatory Wetland Mitigation*. Unavoidable wetland loss will be fully compensated at an appropriate replacement ratio that would be no less than 1:1 (one acre restored/created for each acre lost). The final ratio could vary depending on the criteria presently in place in the *Wetland Mitigation and Guidelines*. The replacement ratio can range from 1.5:1 to as high as 2:1 depending on the risk assessment.

As related to this project, WisDOT and WDNR staff have mutually identified potential wetland mitigation sites in the vicinity of the highway project as the corridor field reviews were being conducted. The final wetland mitigation plan will be developed during the engineering design phase. The development of the plan will be guided by WisDOT with assistance from the WDNR and will follow WisDOT procedures for compensating mitigation of unavoidable wetland losses resulting from highway construction. Review and regulatory agencies will be involved in the development or review of the plan.

Statement of Wetland Finding (FHWA)

Based on the information provided in this finding, WisDOT **has identified a Preferred Alternative**, out of four alternatives and two options, as being a practical alternative in terms of providing a balance among sound engineering design, environmental impacts, and addressing long-term project purpose and need objectives in the WIS 15 corridor. Further, it is anticipated there will be sufficient wetland restoration areas to fully compensate wetland loss for the alternatives either through creating/restoring replacement wetlands within an approximate 2.5-mile (4-km) distance of the **Preferred Alternative** corridor or in combination with using an established or future wetland bank site that would be available for debit at the time the WIS 15 project is constructed.

Based on the above considerations in accordance with Presidential Executive Order 11990, Protection of Wetlands, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

J. Uplands and Woodlands

Minimization of upland habitat disturbance includes restricting clearing to within 5 feet of slope intercepts (grading limits) and appropriate revegetation within the R/W according to the Wisconsin *Standard Specifications for Road and Bridge Construction*. During construction, cleared and graded areas will be seeded or sodded. The seeding and/or sodding will be staged to follow the grading operations to the maximum extent possible. Special care will be used to minimize exposure of upland and lowland forest to invasive species resulting from roadwork. Selective clearing beyond the toe of slope and dense and rapid restoration of groundcover will be used to minimize deleterious habitat impacts in environmentally sensitive areas. Tree and shrub plantings will also be considered in sensitive areas. These revegetation measures will minimize upland wildlife habitat loss. It is anticipated that the intended habitat will colonize the area after the construction is completed.

. Contaminated Sites

In the event petroleum sites are located prior to construction, WisDOT will work with all concerned to ensure the disposition of any petroleum contamination is resolved to the satisfaction of the WDNR, WisDOT Bureau of Environment, and FHWA before acquisition of any questionable site and before

advertising the project for letting. Nonpetroleum sites will be handled on a case-by-case basis with detailed documentation and coordination with FHWA as needed.

If any contaminated soils are identified during construction, they will be disposed of under applicable state and federal laws and guidelines.

With the Preferred Alternative, Option A and Alternative 3, there will be 28 sites that will need further investigation. A Phase 2 analysis will be completed before the final design.

One site requiring more investigation is a former landfill operated by the Village of Hortonville that was reportedly in operation from about 1963/1969 to 1987. It was licensed by the WDNR in 1969 and again in 1986. The Preferred Alternative travels through the south end of a former landfill. Depending on the limits of the landfill material, the alternative may affect this landfill. If alignment adjustments cannot avoid portions of the landfill, WisDOT will pursue one of the following options:

1. Construct the highway over the landfill.

This option will require a geotechnical investigation of the depth, extent, and nature of the waste at the landfill. This would be followed by appropriate fill placement and compaction to prevent differential settlement of the highway. This option would require more coordination with the WDNR and completion of an exemption application to construct the highway. The exemption would be for Development at a Historic Fill Site.

2. Disturb the landfill cap, remove some waste to an off-site landfill, and construct the highway.

This may minimize the volume of waste excavation and disposal. Under this scenario, the detailed geotechnical investigation and structural design requirements would remain. In addition, the disturbed landfill cap would be repaired. This option would also require the exemption to allow Development at a Historic Fill Site.

L. Historical/Archaeological Resources

WisDOT has made efforts throughout the project planning stages to identify and avoid direct impacts to archaeological sites and historical sites. Numerous historical and archaeological sites were located in the project area, and further investigation was necessary to determine their eligibility for inclusion in the National Register of Historic Places (NRHP). For the Preferred Alternative, there will be no archaeological resources impacted.

WisDOT consulted the State Historical Preservation Office (SHPO) to determine the project's effect upon historic sites that are potentially eligible for inclusion on the National Register of Historic Places. No eligible site will be affected by the Preferred Alternative (Option A and Alternative 3) except the modified access to the Hortonia Town Hall, which is eligible for NRHP. A determination of Conditional No Adverse Effect was obtained by SHPO; see Section 7.

The Preferred Alternative has been refined to avoid and minimize adverse effects to 4(f) resources. For the two adjacent archaeological sites eligible for the NRHP, the following conditions will apply:

Creek View (47OU227)

The plan sheets and cross sections show the construction activities would come within 2 to 4 feet of the archaeological site boundary.

- a. No permanent or temporary limited easement will be acquired within the known site boundaries.
- b. Prior to construction, protective fencing will be placed along the north (existing slope intercept), east, and west boundaries of the archaeological site.
- c. Qualified archaeologist will monitor construction-related utility relocations within the archaeological site boundaries.
- d. No excavation, including topsoil removal, will be allowed along the existing ditch back slope along WIS 15 at the archaeological site.

- e. Archaeological site should not be used for borrow or waste disposal or for the staging of personnel, equipment and/or supplies.

Medium Pines (47OU216)

The aerial plan shows the roadway alignment shifting away from the archaeological site. The proposed slope intercept would be located along the existing southbound traffic lane.

- a. No permanent or temporary limited easement will be acquired within the known site boundaries.
- b. The archaeological site will not be used for borrow or waste disposal or for the staging of personnel, equipment and/or supplies.

Town of Hortonia Town Hall

For the Town of Hortonia Town Hall the following conditions shall apply:

- a. Prior to construction, temporary fencing shall be placed along the southern historic property boundary and the southernmost 20 feet of the eastern historic property boundary.
- b. Intense vibration-causing equipment for pavement obliteration such as concrete breakers will not be used for existing Givens Road and County T. Pavement will be removed with graders or similar heavy equipment.
- c. After removal the existing Givens Road and County T roadbeds abutting the historic property boundary, the exposed areas will be covered with topsoil and seeded with grasses, with little-to-no change to the elevation.

M. Public Use Lands

Alternatives 2 and 4 would both require crossing the Wiouwash State Trail. Both alternatives would involve a grade-separated crossing of the trail with adequate clearance to continue to provide access and use for walking, cycling, ATV/snowmobiling, and horseback riding. Additionally, sufficient clearance would be maintained to accommodate the possibility that the trail would be converted back to a rail line. All of the alternatives also have the potential to impact various 4(f) resources such as parks within the Village of Hortonville and historic resources. The Preferred Alternative (Option A and Alternative 3) will not affect public use lands.

N. Agricultural Land

During the final design, consideration will be given to minimizing impacts to agricultural fields and buildings. During construction, reasonable access will be provided to agricultural land. Existing drainage systems, ditches and tiles, will be kept operational at all times during construction. WisDOT will work with farm owners to minimize project impacts. Full consideration will be given to the recommendations of the Department of Agriculture, Trade, and Consumer Protection's Final Agricultural Impact Statement. This recommendation will be provided in the Agricultural Impact Statement.

O. Pollution Prevention

WisDOT plans carefully to avoid the creation of pollution and any subsequent environmental degradation. The project's design criteria, including geometric standards, construction standards and specifications, project sizing and the location of the facility, all attempt to prevent and minimize pollution. WisDOT regularly recycles demolition debris and incorporates the recycled products back into the project base course, new pavements, riprap for stream bank stabilization. Habitat is restored to maintain vegetation, fish, and wildlife diversity. WisDOT reviews roadway treatment to assess and devise methods to channel runoff away from water resources. In highway projects, pollution prevention has been required and fosters cost reduction efforts of WisDOT.

WisDOT utilizes coal incinerator ashes and foundry sand in various highway construction activities. Recycling of these ashes and foundry sand is considered by EPA to be a pollution prevention initiative beneficial reuse initiative. These waste products (fly ash and foundry sand) otherwise would be disposed of in a landfill. WisDOT has used coal ash for the following: fly ash (precipitant from the smoke stack) in place of Portland cement in concrete; bottom ash (boiler ash) as a roadway embankment fill, and when

mixed with asphalt, it has been used in place of chip sealing on town road maintenance projects. WisDOT has also used foundry sand as roadway embankment fill and a replacement to select borrow. Use of these and other recycled products will only be used in suitable areas where wetland or shallow water degradation would not occur.

This project has the potential for industrial by-product reuse. Further evaluation of the potential use, location(s), type, quantity, and supplier will follow in the design phase of the project.

All waste and demolition material that cannot be recycled through incorporation into the projects design and construction will be disposed of in accordance with WisDOT *tandard pecifications for Road and ridge Construction*. Disposal will be in compliance with all applicable federal and state regulations relating to solid waste.

4.5 ENVIRONMENTAL IMPACT SUMMARY

The No-Build Alternative involves irretrievable money, time, and personal hardship related to the high rate of personal injury and property damage accidents that are anticipated along the existing route. The cost, time, and frustration levels associated with decreasing levels of service stem from the inefficient facility and would continue under the No-Build Alternative. The impairment of recreational, service, emergency, and business travel within the project area also creates irretrievable commitments of resources

The Build Alternatives, including the Preferred Alternative, require irreversible commitments such as land acquisition of residential and commercial properties, wetland and farmland destruction, and access acquisition. Land converted from private use to public use decreases local tax revenues. Economic resources committed to the project include nonretrievable federal and state funding for construction and maintenance.

Irretrievable resources such as fuel, labor, and highway materials would be required to construct the build alternatives. Labor and materials are expected to remain in adequate supply. Construction energy expended to build the improved facility is considered irretrievable; however, the savings in operational energy requirements on the more efficient facility should more than compensate for the construction energy usage.

The commitment of these resources is based upon the concept that the traveling public and local residents will benefit from the improved quality of WIS 15. Benefits, which are anticipated to outweigh the commitments of resources, will include improved mobility and safety, greater facility capacity, and savings in travel time.

4.6 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Any build and no build actions involve short-term and long-term trade-offs. Short-term consequences include the more immediate impacts of the project. Long-term consequences relate to direct or secondary effects on future generations.

Short-term consequences include some increased localized noise, air, and water pollution and some traffic delays during construction. These impacts are important to those experiencing them; however, the impacts do not have a lasting effect on the quality of the environment. Other short-term consequences involve additional fuel use by motorists and construction equipment during construction. Public funds will also be committed to build the facility.

The proposed improvement project does not have a precedent-setting nature for future projects. The alternatives being studied offer common congestion relief and safety improvements that follow accepted standards.

The build alternatives **and Preferred Alternatives** will not foreclose future options. The proposed project is expected to provide acceptable capacity and safety for the foreseeable future. If additional capacity were required beyond what is provided by this project, other modal alternatives or additional highway alternatives could still be pursued.

Long-term environmental impacts because of the build alternatives and the Preferred Alternative include the creation of new environmental effects such as new structures, a wetland mitigation site, loss of uplands, and additional right-of-way, which increases the distances for wildlife crossings.

Long-term benefits realized from the build alternatives and the Preferred Alternative include improved convenience, safety, and energy use for those living in the project area and for those traveling through the area **and on the new multiuse trail.**

The No-Build Alternative avoids all the short-term and localized construction impacts. Safety and mobility would likely continue to deteriorate under the No-Build Alternative. As traffic volumes increase, the congestion and accident potential on the existing route will increase, thus reducing the long-term productivity of the area.

4.7 INDIRECT AND CUMULATIVE EFFECTS

The Council on Environmental Quality (CEQ) states that indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects or other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems, (CFR 1508.8). A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, CFR 1508.7)

A. Indirect Effects Analysis

1. Methodology

The study team utilized an Expert Panel to obtain local knowledge of the planning and development patterns that currently exist in the area and of how local experts expect development patterns to change under each alternative scenario including the no build and Preferred Alternatives.

The 13-member Expert Panel was asked to identify the potential indirect and cumulative effects of the preferred and other alternatives. The Panel was made up of local and regional government planners, elected officials, and economic and community development professionals. Many of the individuals selected to serve on the Expert Panel were also members of the Highway 15 Advisory Committee, and therefore, were already familiar with project details. Other Panelists were selected to serve based on recommendations of the Advisory Committee or because they possessed unique knowledge or perspective of the study area.

Project information was mailed to each Panel member, along with surveys to fill out for each of the seven alternatives. The information packets included all relevant and available data for the study area, including local land use plans, census data, and GIS data. Following is a general list of materials that were included in the packet:

- Project background, purpose and need, and description of alternatives
- Summary of adopted land use plans and regulations
- Housing data
- Population trends
- Commuting information
- Summary of previous public involvement
- Natural resource maps and information

Panel members worked individually to respond to the survey questions. However, it should be noted that because many of the Panelists already worked together on the Highway 15 Advisory Committee, the identity of all Panel members was open knowledge throughout the data collection process. Approximately one week after receiving the materials, each Panelist was contacted by phone and interviewed regarding their responses to the survey questions. Interviewers compiled all the data into a single spreadsheet.

Two weeks after the interviews were completed, an Expert Panel meeting was held to present and discuss the compiled results. Three of the thirteen Panelists were unable to attend this meeting. During the meeting, Panel members participated in a mapping exercise intended to further refine and more accurately depict the impacts addressed in the interviews.

The mapping exercise was followed by a facilitated discussion intended to identify the locations and nature of the impacts that could be agreed upon by everyone. Areas for which there was disagreement among the

Panelists were also discussed. In some cases, consensus was never reached for these areas, indicating that it may not be possible to predict certain impacts at this time.

Information gathered from both the project team analysis and the Expert Panel interviews and meetings as used to summarize the most probable indirect and cumulative effects of the WIS 15 expansion. Indirect effects are discussed and summarized in Subsection 4 and Table 4.7-2. Cumulative effects are summarized in Section 4.7 B.

In 2009, the project consultant team updated its review of local study area comprehensive plans and population projections to identify any significant changes that may impact the selection of the WIS 15 Preferred Alternative or be impacted by it. For communities that have not yet adopted comprehensive plans, the consultant contacted the Planning Department for Outagamie and Waupaca Counties. The consulting team also contacted the Village of Hortonville Administrator.

2. Project Study Area

The Indirect and Cumulative Effects (ICE) study area is depicted on Figure 4.7-1. The ICE study area includes the Towns of Maple Creek, Bovina, Liberty, Hortononia, Ellington, Dale, and Greenville in Outagamie County and the Towns of Lebanon, Mukwa, and Caledonia in Waupaca County. The study area was chosen so that it included the major commuting destinations of New London, Hortonville, and the western periphery of the Appleton Metropolitan Area as well as the surrounding rural areas that could experience indirect and cumulative effects. The majority of the analysis focused on the townships adjacent to the study corridor.

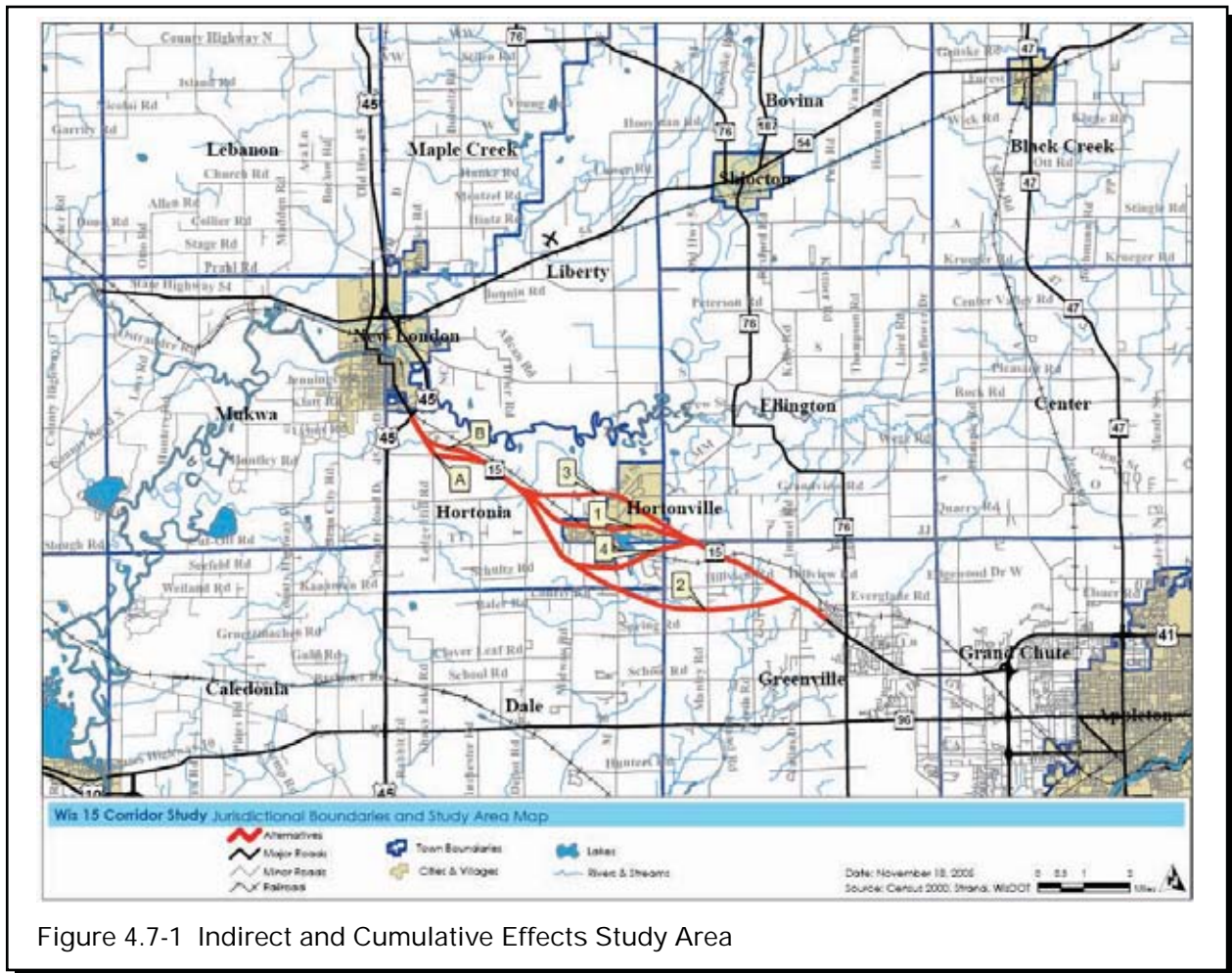


Figure 4.7-1 Indirect and Cumulative Effects Study Area

3. Existing Conditions and Development Trends

Table 4.7-1 shows the official Wisconsin Department of Administration's 2030 population projections for each of the municipalities included in this study area. The expected population growth rate for the study area communities between 2010 and 2030 (without highway expansion) is generally higher than the projected statewide growth of 12.4 percent. It is also higher than growth in Waupaca County (5.3 percent) and is comparable to or higher than in Outagamie County (19.6 percent). Among the study area communities, unincorporated towns along the existing arterial highway (which accesses the larger US 41/45 corridor metropolitan areas east of the study area) have experienced the highest rates of growth. Growth in communities along existing arterial routes (US 45, WIS 15, WIS 76, WIS 10) also appears to be positively correlated with population regardless of distance from the eastern metro areas.

Table 4.7-1 Population Projections for the Indirect and Cumulative Effects Study Area, 2005-2030

Municipality	Census 2000	2005 Estimate	2010 Projection	2030 Projection	Population Change 2000-2010		Population Change 2010-2030	
					Numeric Change	Percent Change	Numeric Change	Percent Change
<i>Outagamie County</i>								
Town of Bovina	1,130	1,223	1,308	1,668	178	13.6	360	27.5
Town of Dale	2,288	2,542	2,765	3,696	477	17.3	931	33.7
Town of Ellington	2,535	2,757	2,960	3,812	425	14.4	852	28.8
Town of Greenville	6,844	8,284	9,580	14,915	2,736	28.6	5,335	55.7
Town of Hortonia	1,063	1,071	1,103	1,224	40	3.6	121	11.0
Town Liberty	834	888	942	1,171	108	11.5	229	24.3
Town of Maple Creek	687	683	687	690	0	0.0	3	0.4
Village of Hortonville	2,357	2,613	2,796	3,582	439	15.7	786	28.1
Village of Shiocton	954	960	977	1,054	23	2.4	77	7.9
<i>Waupaca County</i>								
Town of Caledonia	1,466	1,539	1,613	1,882	147	9.1	269	16.7
Town of Lebanon	1,648	1,743	1,836	2,175	188	10.2	339	18.5
Town of Mukwa	2,773	2,959	3,122	3,692	349	11.2	570	18.3
City of New London	7,085	7,205	7,280	7,634	195	2.7	354	4.9
<i>Source Wisconsin Department of Administration</i>								

The study team gathered data on existing characteristics and current trends in the study area. A series of charts and tables were compiled to show detailed information on population trends, age, race, household characteristics, poverty, place of work and travel time, employment and economic activity, and existing land use. This information is included in Appendix C and focuses on the townships directly adjacent to the study corridor. Additional demographic data was collected on all of the townships in the study area. Several maps were compiled to identify existing land use on a regional scale, natural areas, and prime agricultural soils. Information on existing patterns and trends for land use and development is also included in Section 3.4, Land Use and Related Characteristics.

The study team also researched the state of land use planning and regulation in the municipalities within the study area. The study team interviewed local experts and gathered planned land use maps to understand the extent of land use planning for each village, city, and township. This information is included in Section 3.4, Land Use and Related Characteristics. Additional discussion is included in sections G and H later in the document.

As of 2009, a number of communities in the study area have completed or updated comprehensive land use plans. The following is a summary of comprehensive plans or the status of comprehensive plan development as of August 2009. For communities that have no plans or are updating plans, the project team spoke with appropriate county or local officials.

Outagamie County Comprehensive Plan (County Staff, 2008)

The Outagamie County Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The County's adopted comprehensive plan generally incorporates recommendations from each of the Outagamie County town (but not village or city) comprehensive plans, although in some cases, the County plan recommends significantly greater protection of agricultural and open space land uses and tighter controls on residential and nonresidential development than the local plans. The plan's land use element recommends preservation of agricultural land, natural resource area, and open space uses as the predominant land uses in the WIS 15 ICE study area. Specific policies stated in the plan would allow some low density residential development in the towns as well as scattered commercial, agricultural support, and rural industrial uses.

The plan's transportation element recommends working with WisDOT, local communities, and other agencies on finalizing plans to determine the best location for the WIS 15 project, but it does not include specific recommendations with regard to the County's preferred location and design of the WIS 15 bypass alternative. Review of County comments indicates the Preferred Alternative would have fewer wetland, habitat, existing development, and local transportation impacts than the other study alternatives.

The plan's transportation element also recommends extension of the network of bicycle/pedestrian/recreation facilities to be considered during all phases of highway projects. More specifically, the plan references extending the existing Wiouwash State Trail that currently runs from Oshkosh to the Village of Hortonville to other regional trails and destinations to the north and west. In order to accomplish these bicycle/pedestrian facility and recreation trail goals, the final design for the preferred WIS 15 would need to provide safe and convenient trail crossings of WIS 15 and/or a separate path paralleling WIS 15 at appropriate locations. The WIS 15/County M or County MM interchange (or intersection) is one potential location that would be compatible with trail plans regulated thus far.

Because Outagamie County exercises subdivision control over all ICE study area towns and exercises zoning authority in all the ICE study towns except Greenville and Hortonville, the Outagamie Comprehensive Plan is likely to be a better predictor of land use outcomes than most of the town plans described below.

Village of Hortonville Comprehensive Plan (Ruekert/Mielke, 2003)

The Village of Hortonville Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The plan's land use element shows primarily low and medium density residential development on sanitary sewer for the undeveloped areas immediately adjacent to the Preferred Alternative. New industrial areas are shown primarily to the southwest of the existing Village in the established industrial park. New commercial areas are shown at various points along existing arterial and major collectors. The plan recommends preservation of sensitive environmental areas north and south of the Village.

The current plan's transportation element addresses the purpose, need, and Preferred Alternatives as developed during the Wisconsin Department of Transportation study of the WIS 15 alternatives. At the time of plan adoption, the Village expressed a preference for a southern bypass (described as Alternative 2 in the DEIS) and mapped preferred future residential, commercial, and industrial land uses accordingly. However, the plan also acknowledged the WisDOT Preferred Alternative as a potentially viable option.

As of July 2008, the Village was considering amending its comprehensive plan to acknowledge the Preferred Alternative for WIS 15. Implementation of the Preferred Alternative would likely increase commercial development in the vicinity of the new WIS 15 alignment at the expense of some potential residential development currently recommended for this area and possible adverse effects on existing downtown businesses. Existing and planned industrial development would likely be unaffected and the Preferred Alternative may increase interest in industrial development north of the Village.

The Village has expressed the following concerns with and modifications to the Preferred Alternative:

- The Village is concerned that any bypass alternative may reduce visibility and incidental traffic through the downtown and thus adversely affects businesses and economic development. The Village recommends strongly that one full interchange be included at County MM (the Village's preferred location) or some other location adjacent to the Village. The Village has expressed the opinion that a full interchange would provide a more convenient and identifiable community gateway.
- If a full interchange is not possible, the Village would at minimum want underpasses or overpasses at County MM and Nash Street, and extension of buried utilities under the WIS 15 alignment. New frontage or other connecting streets should also be provided to compensate for any disruption caused by the Preferred Alternative.
- The final WIS 15 design should include provisions for adequate signage to Village businesses and at the proposed interchanges or intersections that serve as gateways into the community.
- The final Preferred Alternative should include design details that will facilitate pedestrian, bicycle, and recreation trails across and along WIS 15. Regional trail plans include extension of the Wiouwash Trail from the current terminus in the Village northward along County M or County MM and/or a path parallel to WIS 15 between the Village and the City of New Freedom.

Town of Bovina (Outagamie County, 2004)

The Town of Bovina Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The Town of Bovina is northeast of the WIS 15 study area. The Village of Shiocton is located at the center of the Town, and WIS 187 and WIS 76 connect the Town and Village to WIS 15 farther to the south. The Town's plan allows low density residential development to occur in residential areas.

Town of Dale (Outagamie County, 2004)

The Town of Dale Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The largely rural and undeveloped Town south of the Village of Hortonville recommends allowing additional low density rural residential development on private well and septic systems through 2030. WIS 15 does not and would not pass through any part of the Town. State Highway 96 is the most important east-west arterial, providing direct access to the City of Appleton to the east. In addition, Outagamie County exercises both zoning and subdivision control over the Town in accordance with the County's adopted plan (see above), which places greater emphasis on agricultural and open space preservation.

Town of Ellington (Outagamie County, 2004)

The Town of Ellington Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The plan calls for preservation of sensitive environmental resources and protection of the most valuable agricultural soils, but it would allow significant amounts of low density residential on private sewer. Low intensity commercial development would be allowed at existing hamlets and some major roads.

The transportation chapter of the plan acknowledges the WIS 15 project but provides no recommendations about Preferred Alternatives. The transportation chapter of the plan also recommends retention of a snowmobile trail and a new recreation trail that cross US 45/WIS 15 in the vicinity of Hortonville.

Town of Greenville (East Central Wisconsin Regional Planning Commission, 2009)

The Town of Greenville Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. Most Town land is undeveloped farm or woodlands, but extensive low density residential development and several large rural residential subdivisions exist. More intensive development has occurred at the eastern end of the Town and WIS 15 ICE study area, and the Outagamie County Airport is located in the Town's southeastern quadrant. The Town has experienced relatively rapid growth in population over the last decade owing in part to ready access to US 41/US 45 corridor located approximately 1 mile to the east. The City of Appleton is less than 2 miles from the terminal end of the study area. WIS 15/US 45, US 10 and STH 76 are major arterial routes within the Town. The plan indicates allowance for continued significant low density residential development to continue through 2035 in addition to some commercial industrial development at locations where more robust transportation and water quality infrastructure exists.

Because of the Town's established arterial road network and its geographic location and because the preferred WIS 15 alternative would involve mostly widening along existing alignment, the plan specifically notes the Preferred Alternative north of the Village of Hortonville would have little impact on existing land uses and future development trends in the Town of Greenville.

Town of Hortonville (Outagamie County, 2009)

The Town of Hortonville's adopted comprehensive plan favors the Preferred Alternative, noting that it would have the least impact on farmland, wetland, and other areas south of the Village of Hortonville. The Town's adopted plan emphasized agricultural preservation in areas south of the Village of Hortonville but allows for some additional residential and commercial development. For areas north of the Village of Hortonville, the Town's plan acknowledges that medium density residential and commercial development is likely to occur along the new WIS 15 alignment associated with the Preferred Alternative and that some increased commercial development associated with the growth of the Village of Hortonville is likely to occur in any event.

Town of Liberty (Omni, 2004)

The Town of Liberty Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The Town of Liberty is north of the existing WIS 15. The Preferred Alternative alignment and the plan make no specific recommendation regarding WIS 15. The dominant land uses in the Town are woodlands and environmental corridors associated with the Wolf River and Embarrass Rivers and other streams. The dominant form of development is low density residential uses and the Town's plan would allow for additional development of this type. The Town's future land use plans would allow for some additional low density single family residential development in areas with suitable soils. The small portion of Liberty located south of the Wolf River and nearest to WIS 15 would be the most likely to experience discernable indirect effects of WIS 15 project owing to realignment of the WIS 15 corridor closer to the Town. However, development restrictions associated with the Wolf River environmental corridor, local land use regulations, and the established transportation and settlement patterns noted in the plan will mean that any effects on resources and development attributable to the Preferred Alternative will likely be very minor and localized.

Town of Maple Creek (Pending as of July 2009)

The Town of Maple Creek had not yet adopted a comprehensive plan in compliance with Wisconsin statutes as of August 2009. The Town of Maple Creek is north of the WIS 15 study area. The Town's major arterials include WIS 54 in the south and WIS 76 in the north. The most significant urban area in the immediate commutershed is the City of New London which is located to the southwest. Most of the Town is agricultural and woodland land uses (much of it in regulated or owned environmental corridors) with sparse, low density residences being the dominant development type.

Waupaca County Year 2030 Comprehensive Plan (Foth, 2007)

The Waupaca County Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The County's adopted comprehensive plan includes specific land use recommendations from each of the Waupaca County Towns in the WIS 15 ICE

study area (Caledonia, Lebanon, and Mukwa). The County is not adjacent to WIS 15 and makes no specific recommendations concerning this arterial roadway. The plan's transportation element recommends making use of existing arterial roads such as US 45.

Town of Caledonia Year 2030 Comprehensive Plan (Foth, 2007)

The Town's comprehensive plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The majority of the Town is currently in agricultural, woodlot, and other open land uses, with some clusters of rural residential subdivisions and scattered commercial uses. The Town's adopted comprehensive plan would allow significant levels of low density residential development to occur throughout much of the Town and could accommodate more population growth than is projected through 2030. Only limited commercial, institutional, and industrial development is anticipated, with limestone quarries being the most extensive example of the latter. The Town is not adjacent to WIS 15. The plan's transportation element recommends making use of existing arterial roads such as US 45.

Town of Lebanon Year 2030 Comprehensive Plan (Foth, 2007)

The Town's comprehensive plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The majority (approximately 90 percent) of the Town is currently evenly split between agricultural and woodlot land uses, with some clusters of rural residential subdivisions and scattered commercial uses. The Town's adopted comprehensive plan would allow significant levels of rural residential subdivisions to occur at the east end of the Town adjacent to US 45 and low density residential development at the west end of the Town, with some areas in the north and central part preserved for agricultural use. The mapped land uses could accommodate more population growth than is projected through 2030. Only limited new commercial, institutional, and industrial development is anticipated at scattered locations throughout the Town. Lebanon is not adjacent to WIS 15 and makes no specific recommendations concerning this arterial roadway. The plan's transportation element recommends making use of existing arterial roads such as US 45.

Town of Mukwa Comprehensive Plan (Town of Mukwa, 2007)

The Town of Mukwa developed its own comprehensive plan to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. Much of the currently undeveloped Town would be allowed to develop in low density residential uses and mapped development potential is in excess to accommodate projected population growth through 2030. Residential subdivisions on private well and private septic systems would be allowed at the periphery of the City of New London. Commercial, institutional, and industrial development would be limited to a few scattered locations and is not expected to be significant. The Town is not adjacent to WIS 15 and makes no specific recommendations regarding this arterial road.

City of New London Year 2030 Comprehensive Plan (Foth, 2007)

The City of New London Year 2030 Comprehensive Plan was adopted to comply with the requirements of the State of Wisconsin Smart Growth comprehensive planning statutes. The adopted comprehensive plan would allow additional commercial and industrial development to occur, primarily in areas adjacent to US 45 (WIS 15) at the north and southeast end of the City at the junction of US 45 and WIS 15. In addition, significant new residential development would be allowed in several areas of the City, including a large area located east of the City between WIS 54 and WIS 15. Small scale institutional development would also be allowed in these expansion areas. The adopted plan makes no specific recommendations concerning WIS 15 but identifies this highway as a key component of the City's future growth and development.

4. Indirect Effects Analysis

The Preferred Alternative for the WIS 15 project would reduce travel time, increase safety, and improve convenience and accessibility between most destinations in and around the WIS 15 corridor. The traffic efficiencies resulting from the Preferred Alternative may effectively expand the range in which commuters and businesses are willing to travel, possibly widening the range of locations for desirable for residential, commercial, and industrial development. Therefore, the Preferred Alternative has the potential to accelerate

the rate of development within the commutershed area. The Preferred Alternative would also result in changes in local access to - and visibility from - WIS 15, particularly in areas adjacent to the new alignment in the Town of Hortonville and Village of Hortonville. In addition to direct project impacts that include relocation of some businesses, homes, and farms as well as the division of some farm fields; the closure of some access points and diversions to traffic patterns may create somewhat longer or shorter commutes for remaining residences and businesses near these alterations. In addition, because the Preferred Alternative includes a new WIS 15 alignment north of the Village of Hortonville, it has the potential to somewhat alter the character and type of development nearby (within 0.5 to 1.0 mile) of both the existing and proposed WIS 15 alignments between Givens Road west of Hortonville and Manley Road east of Hortonville, including the Village of Hortonville downtown.

Figure 4.7-1 depicts the Indirect and Cumulative Effects Expert Panel's estimates for changes in the location and type of development likely to occur under the Preferred Alternative. The figure is a composite of the Expert Panel analysis of two components assessed as separate alternatives (Option A and Alternative 3) in the preliminary ICE assessment. For purposes of comparison, Figure 4.7-1 depicts the ICE Expert Panel's predictions for development patterns under the current conditions or No Build alternative.

Compared to the projected development trends as depicted in No Build alternative, the Preferred Alternative would most likely increase the rate and possibly the amount of residential development at the periphery of the City of New London and the unincorporated area south of WIS 15/US 45 in the vicinity of the Cross Road intersection. The Preferred Alternative would alter the pattern of residential development in the vicinity of the Village of Hortonville by reducing the desirability of locales near the new WIS 15 alignment at the north end of the Village near the new improvements, but it creates more desirable locations for residential development along the old WIS 15 alignment nearer the Village core and farther north of the Village. New access improvements near Hill View Road may also lead to additional low density development.

Some additional commercial development may occur along US 45 and the US 45/ WIS 15 intersection near the City of New London. Near the Village of Hortonville, new commercial and possibly industrial development may occur near the WIS 15 alignment. The impact on commercial development along the current WIS 15 alignment through the existing downtown is likely to be mixed. By providing improved highway access and possibly visibility north of the Village, existing downtown businesses may become less viable, possibly inducing some to relocate nearer the new alignment. Another possible outcome is to facilitate retention and redevelopment of the downtown to include businesses and institutional uses that serve more local needs and may benefit from reduced congestion on the current WIS 15 alignment, and possible infill opportunities created by departing or closing businesses. Farther from the incorporated municipalities, commercial development may occur at WIS 15 intersections with major access improvements. However, in addition to adding roundabouts along the corridor, other existing access points will be closed or restricted, possibly leading to decreases in development around areas that currently have direct access to WIS 15.

In terms of industrial development, some thought that the Preferred Alternative would accelerate industrial development in the existing industrial parks in the Village of Hortonville and City of New London while others thought that the new WIS 15 alignment may reduce visibility and access to the Village of Hortonville business park at the southwest corner of the Village. It should be noted that truck access between WIS 15 and the latter area would be retained.

The Preferred Alternative would have minimal indirect impact on institutional development. Most Expert Panelists noted improved access for emergency services. Some school and parkland would be in proximity to the new alignment but adverse impacts would likely be negligible. The final design of the WIS 15 alternative will determine whether the project will positively or negatively impact existing and planned recreation trails and trail crossings. The Preferred Alternative is compatible with local and regional trail and bicycle facility plans provided adequate crossings and lanes/parallel paths along WIS 15 are provided.

In terms of the greater ICE study area, although the Preferred Alternative may slightly increase the pace of development, and localized changes in the mix of land uses are likely, it is anticipated the Preferred Alternative will have a relatively minor impact on the overall pattern and rate of development in the ICE study area communities. Most intensive commercial and industrial development is still likely to occur in the territories in and around New London, Hortonville, and the urbanizing areas of the Town of Grand Chute. New commercial and industrial development outside of these areas will continue to be limited by the availability of other necessary infrastructure and local policies. Medium and high density residential development will also occur mainly in the urban service areas. The impact of the Preferred Alternative on

potential new low density residential development would exist owing to an increased potential commuter shed, but the project effects would likely be minor in relationship to other existing conditions (rapid urban growth to the east, existing state and federal arterial routes, local plans, land use regulations) and trends (desire for affordable housing, rural locations, non farm income from property.)

Farmland

Local government protection of farmland varies throughout the ICE study area. Outagamie County has an adopted farmland preservation plan in which participating towns zone agricultural land to limit residential development to one home per 35 acres in exchange for tax incentives to farmers. Furthermore, the county exercises zoning control in all ICE study area towns except Greenville and Hortonville. However, not all the Outagamie County towns in the ICE study area participate in the farmland preservation program and most allow rural residential development to occur in agricultural areas at a density higher than one home per 35 acres. Local tolerance for rural residential development has been a contributing factor in the recent rate of population growth and conversion of farmland, and only the Towns of Hortonville and Maple Creek have zoning restrictive enough to meet the farmland preservation plan requirements. The Waupaca County towns in the ICE study area also would allow significant rural residential development in farm areas. Besides the land directly needed for the WIS 15 widening, new alignment, and other improvements, the Town of Hortonville and Village of Hortonville anticipate accelerated conversion of farmland near WIS 15 and at improved access points. Elsewhere, the rate at which farmland is converted to nonagricultural land uses will depend more on a number of factors beyond the control of the WIS 15 improvement project, including local approaches to the preservation of farming and farmland.

Woodlands

Only a few areas of woodlands would be directly affected by the project, and most are isolated by agricultural uses and/or development. The Preferred Alternative would result in the loss of some wooded areas, including a small encroachment on woodlands associated with the Wolf River area and a new right-of-way through the Black Otter Creek environmental corridor. However, the Preferred Alternative would not cause any other major new severing or division of substantial woodland. Other potential indirect effects include any woodlands lost to development induced by the project and possible disruption of wildlife corridors and habitat. As with farmland, local policies allow for conversion of some isolated and upland woodlands to low density development. However, larger woodlands associated with environmental corridors as identified in local plans (generally those associated with sensitive water features) are afforded more protection through state and local restrictions on development in wetlands, shorelands, and soils unsuitable for septic systems.

Wetlands and Water Quality

In addition to direct impacts caused by crossing or conversion of wetland areas associated with the Preferred Alternative, there is some concern about indirect effects of the new alignment north of the Village of Hortonville on the wetland complex associated with the Wolf River farther to the north and some other more isolated wetlands. Negative impacts could arise from road runoff and nonpoint pollution from traffic that may accumulate in surrounding wetlands. Another concern is that some new development induced by the project may locate near sensitive wetlands and generate similar impacts. However, the reduction of access points along WIS 15 could actually prevent some development that would otherwise occur in these areas, and local governments can take measures to prevent these actions.

Threatened Species

The widening of WIS 15 may aggravate existing barriers between wildlife habitats and create a new one along the new WIS 15 alignment north of Hortonville. Potential indirect effects on aquatic habitats may be caused by disturbances to wetlands and the Wolf River tributaries affected by the project. The eastern blue butterfly, which depends on a specific species of wild plant and is most threatened by habitat fragmentation and loss, was identified as a threatened terrestrial species early in the study with habitat near County JJ, but corridor alignment changes and the potential for additional habitat disturbance in this area would be limited. Also, there is habitat suitable for the state threatened Blandings turtle. Measures to minimize harm incorporated to the Preferred Alternative include turtle barriers and turtle passes that travel underneath the highway.

Historic Sites

The most significant direct impact associated with the Preferred Alternative is the change in access to the Town of Hortonia Town Hall. No other historically significant resources were noted by the Expert Panel.

Community Character

Most Expert Panel members believed the impact on community character would be negligible or very local (within viewing or hearing range of the widened roadway) except for the Village of Hortonville and the area north of the Village in the Town of Hortonia in which the new alignment would occur. Some noted that the new WIS 15 roadway alignment to the north, and thus the bypassing of the downtown, would preserve and even restore the small community character of the downtown. However, the indirect effects of the new alignment would have medium to large impacts on the existing and future character of the community for a number of reasons. First, the new alignment would reduce visibility and awareness of the community and its businesses by diverting traffic around the existing downtown. Second, without at least one full interchange or intersection north of the City, the new WIS 15 alignment would create both a psychological and to some extent physical barrier between older parts of the Village and new development to the north (in spite of the planned underpasses). Local opinion strongly favored at least one full interchange at County M or MM and one or more safe pedestrian/bicycle/recreation trail crossings in an under- or overpass. In addition to these improvements, the Village recognized other means of local mitigation of adverse effects on aesthetics and character through design of development in and outside of the project area right-of-way and a system of wayfinding signage.

Table 4.7-2 summarizes some of the indirect effects discussed above and illustrated in Figures 4.7-2 and 4.7-3.

Table 4.7-2 Summary of Indirect Effects

Location and Potential Impact-Causing Activity	Possible Indirect Effect	Influencing Factors		Effect of No Action
		Supports Change	Discourages Change	
Four-Lane Expansion on Existing Alignment Greenville to Hortonville	<p>1. Reduced travel times will expand potential commuting range for employees, customers, and businesses possibly accelerating rate of low density rural development in towns and higher density residential, commercial, and industrial development in and around cities and villages.</p> <p>2. Potential accelerated conversion and fragmentation of farmlands and natural resource areas.</p>	<p>1. WIS 15 communities close to growing metro areas to the east and upgraded network of major arterials (US 41, US 45, and US 10)</p> <p>2. Local plans and regulations allow low density single-family residential growth in rural areas and residential and nonresidential growth in and around cities and towns.</p>	<p>1. Local plans and regulations place some limitations on location, intensity, and type of growth, with generally lower allowable densities in most of WIS 15 communities.</p> <p>2. Presence of environmental corridors associated with Wolf River and similar features which are protected by federal, state, and local development regulations.</p>	<p>1. Existing arterial road improvements, proximity to larger and growing metro areas to the east, and local land use regulations that permit significant future development indicate that WIS 15 communities are likely to grow in substantially the same manner though possibly at a somewhat slower rate.</p>
East Bypass Roundabout Section	<p>1. Potential increases in the pace and amount of commercial and residential development near the roundabout.</p> <p>2. Roundabout may divert through-traffic away from Hortonville Downtown.</p>	<p>1. Area immediately surrounding roundabout has been planned for commercial and residential growth within Village of Hortonville.</p> <p>2. Close to Appleton and other metro areas to east.</p>	<p>1. Village of Hortonville plans to emphasize growth at other locations at Village periphery.</p>	<p>1. Village development in this area is still likely to occur over time.</p> <p>2. Developed Village properties abutting WIS 15 may be more likely to remain or redevelop in commercial uses.</p>

Location and Potential Impact-Causing Activity	Possible Indirect Effect	Influencing Factors		Effect of No Action
		Supports Change	Discourages Change	
<p>WIS 15 Bypass on new alignment north of the Village of Hortonville Downtown</p>	<ol style="list-style-type: none"> 1. Potential additional loss of farmland in this area. 2. Potential additional disruptions of wetlands and tributary streams associated with the Wolf River. 3. May induce more commercial and possibly industrial development north of the Village rather than previously emphasized residential uses. 4. May cause decrease in Hortonville Downtown businesses and induce some of them to move closer to WIS 15 or out of community. 5. May create opportunities for Hortonville Downtown to retain existing and attract new businesses and institutional uses more compatible with traditional downtown and local needs. 	<ol style="list-style-type: none"> 1. Local plans would allow additional Village development in area on sewer and water, though previous Village plans emphasized residential rather than commercial uses. 	<ol style="list-style-type: none"> 1. Local plans and zoning need to be updated to allow commercial rather than residential land uses in areas north of Hortonville. 2. Current Town of Hortonville polices favor agricultural and natural resource protection in these areas. 3. Village can control higher density growth through extension of sewer and water and use of annexation and zoning authority. 4. Lack of direct access to WIS 15 bypass north of Hortonville may discourage growth. 5. Local plans and regulations call for prevention of development in environmentally sensitive wetlands, woodlands, and waterways associated with Wolf River. 	<ol style="list-style-type: none"> 1. Local Village plans would allow for future development in and around Village including the proposed bypass locations, though type and location of development would likely be somewhat different and pace of development would potentially be slower.

Location and Potential Impact-Causing Activity	Possible Indirect Effect	Influencing Factors		Effect of No Action
		Supports Change	Discourages Change	
Access Restrictions on new WIS 15 Bypass north of the Village of Hortonville	<p>1. Physical and psychological separation of existing Village to the south and future Village growth to the north.</p> <p>2. Lack of direct access to WIS 15 may decrease incentives for commercial development in areas adjacent to bypass.</p> <p>3. Lack of access to WIS 15 may reduce awareness of existing Hortonville downtown and businesses.</p> <p>4. May restrict development and potential development impacts near Wolf River.</p>	None	<p>1. Planned underpass will retain physical and possibly psychological connectivity between both sides of WIS 15 bypass.</p> <p>2. Proposed community gateway and business signage at east and west roundabouts will retain awareness and access to existing industrial, downtown, and other areas.</p>	1. Commercial, industrial and residential development would continue in accordance with local plans and regulations.
West Bypass Roundabout Section	<p>1. Potential increases in the pace and amount of commercial and residential development near roundabout.</p> <p>2. Roundabout may divert through-traffic away from Hortonville Downtown.</p>	1. Area immediately surrounding roundabout has been planned for commercial and industrial development within Village of Hortonville.	1. Town of Hortonville Plan recommends limited growth until annexed by Village.	1. Continued development of Hortonville business park at southeast end of Village, and commercial and residential development elsewhere in accordance with local plans and regulations.

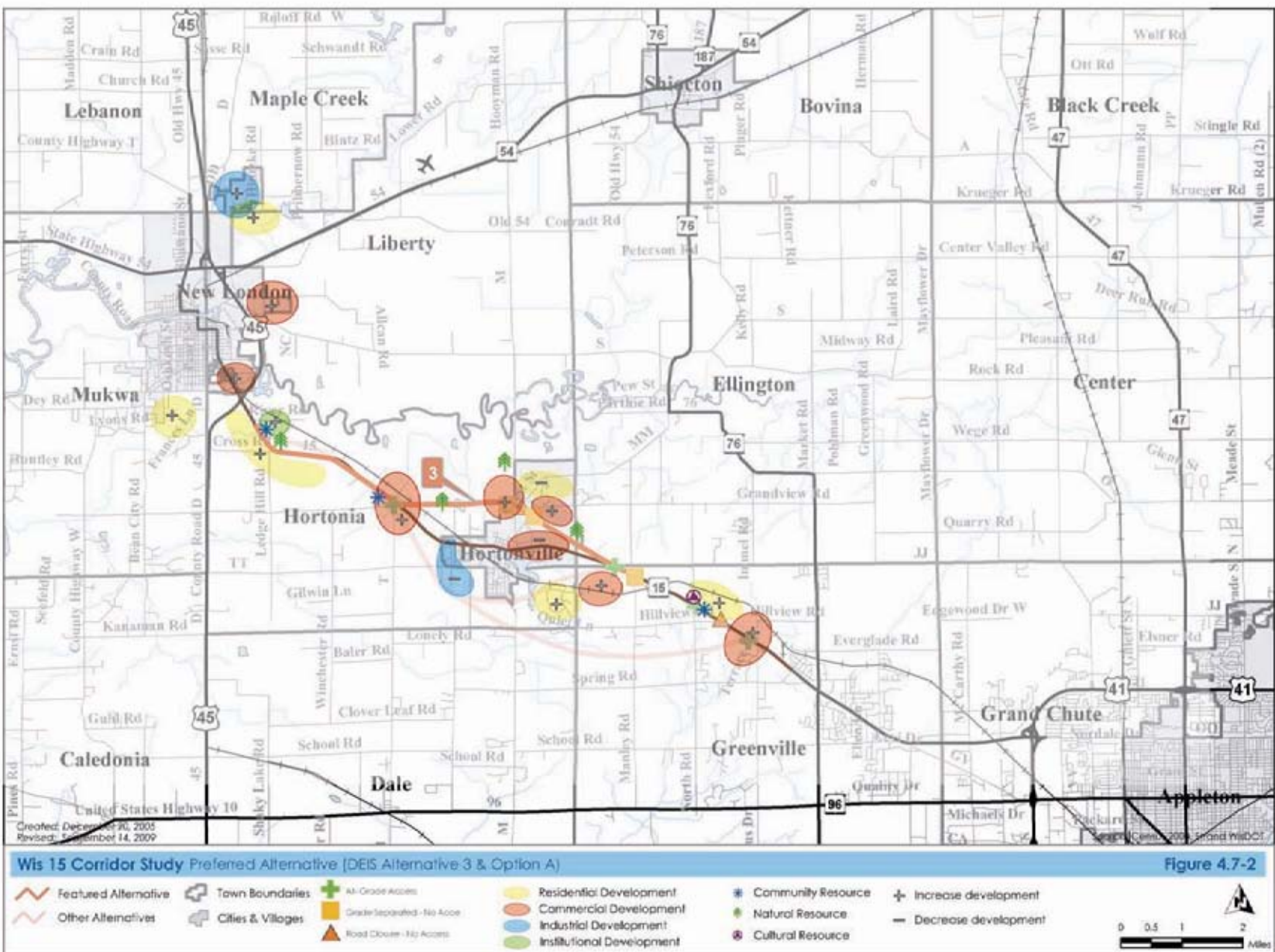


Figure 4.7-2 Preferred Alternative Development Impacts

4.8 CUMULATIVE EFFECTS ANALYSIS

Cumulative effects are defined as impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Following is a qualitative assessment of the potential cumulative effects of the Preferred Alternative (Option A and Alternative 3) when combined with activities that have occurred in the study area in the past and those that may be reasonably foreseen in the future.

1. Significant Cumulative Effects Associated with the Proposed Action

This analysis will address the following resources, which have been identified as being directly and/or indirectly impacted as a result of the Preferred Alternative.

- Agricultural Land
- Wetlands and Water Quality
- Upland Habitat
- Threatened species

2. Geographic Scope

The study area for this cumulative effects analysis encompasses the same area used for the Indirect Effects Analysis (Figure 4.7-1). The study area includes the Towns of Maple Creek, Bovina, Liberty, Hortonia, Ellington, Dale, and Greenville in Outagamie County and the Towns of Lebanon, Mukwa, and Caledonia in Waupaca County. The potential cumulative project effects on water quality were also evaluated in the context of the watersheds that encompass both the WIS 15 project area and ICE study area. (Figure 4.8-1).

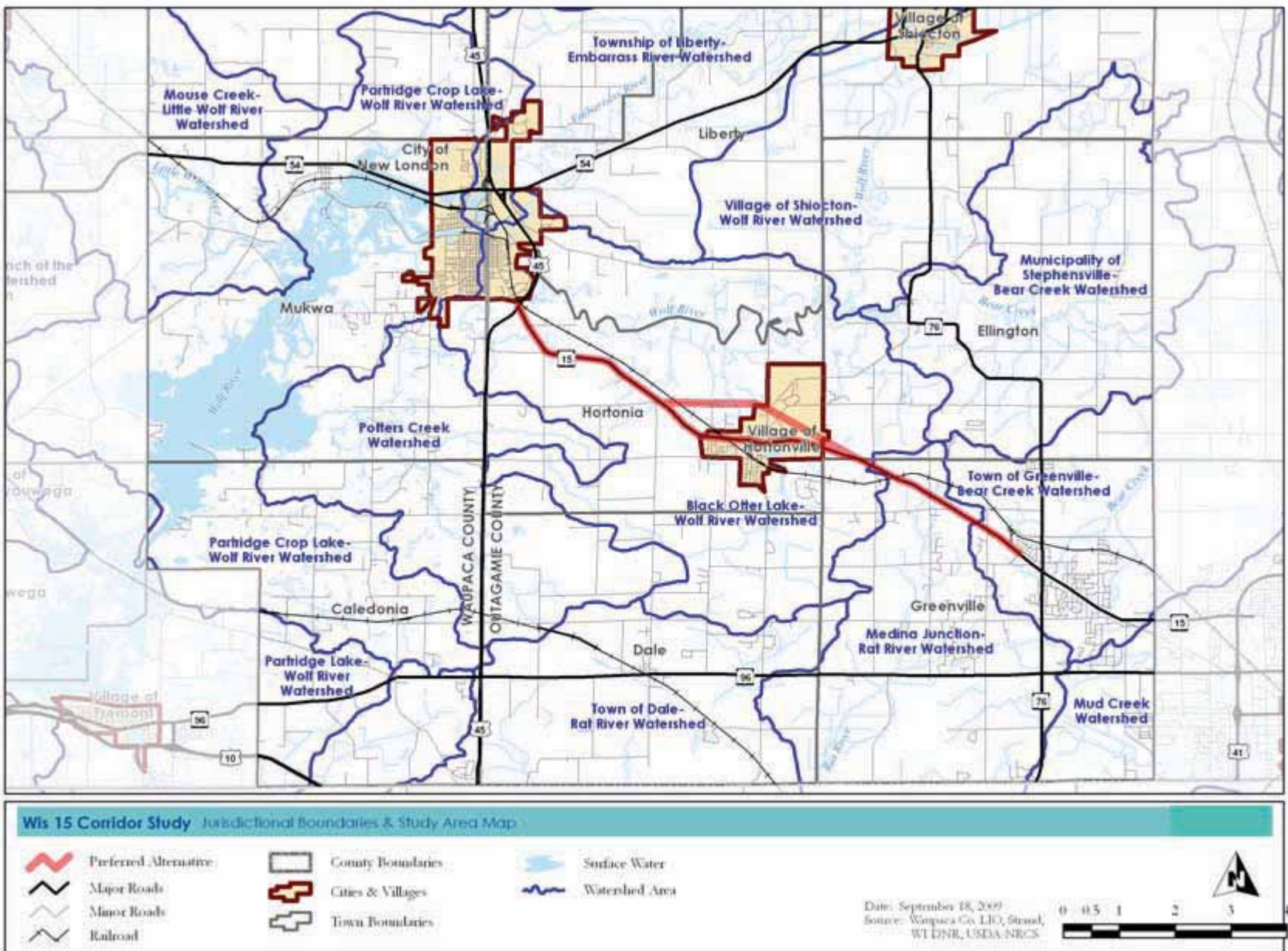


Figure 4.8-1 Watershed Map

3. Time Frame for Analysis

The time frame for this cumulative effects analysis was 20 years, which corresponds with many of the local community plans used to help identify reasonably foreseeable actions in the study area.

4. Other Actions Affecting the Resources, Ecosystems, and Human Communities of Concern

Past Actions

The WIS 15 corridor has experienced little change in land use patterns in the past two decades. The majority of the study area remains in agricultural use. Over the years, some unsewered residential development has occurred in the towns, both near WIS 15 and elsewhere in the ICE study area. Most intensive development has occurred within and around cities and villages located in the study area, including the City of New London and Village of Hortonville. Farther east, the City of Appleton and other metropolitan areas along the US 45 and US 41 arterial corridors have experienced significant growth over the last ten years.

Over the years, incremental development in the study area has occurred in farmland and some natural resource areas, affecting the resources in these areas.

Within the past ten years, several major upgrades to existing highways have occurred within and near the WIS 15 study area, including capacity and access improvements to US 45 west of WIS 15 and capacity and access improvements to US 10 and WIS 110 from Oshkosh to US 51. These projects have improved regional traffic efficiency and attracted development to major access points and communities adjacent to them.

Present and Future Actions

Future actions include activities that are reasonably foreseeable and that, when combined with the WIS 15 expansion and alignment changes, might present cumulative effects on the resources identified previously.

At the time of this writing, a plan to designate US 41 east of WIS 15 as an Interstate Highway sometime within the next 10 to 20 years was being considered. Combined with past and ongoing projects to bring US 41 up to interstate highway design standards, this project may stimulate additional development in the already urbanized areas of the US 41/US 45 corridor. As these areas are developed, locales near connecting routes such as WIS 15 may experience additional interest in commercial and industrial development.

Based on an analysis of local future land use plans and discussions with local officials (see Indirect Effects methodology section), communities within the study area have planned for additional long-term residential and nonresidential development. Development is planned to occur in the locations described under Existing Conditions and Development Trends in the Indirect Effects Analysis.

Based on the results of the Indirect Effects Analysis, it is anticipated the pace of residential and commercial development within the study area may increase modestly as a result of highway expansion. The most probable locations for future development related to highway expansion are depicted on Figure 4.7-2 and described in further detail in the Indirect Effects section.

5. Characterization of the Resources, Ecosystems, and Human Communities Identified During Scoping in Terms of Their Response to Change and Capacity to Withstand Stress

Agricultural Land: Over time, population growth and development has and will continue to lead to the incremental loss of farmland in the study area. Based on local land use plans, this trend is likely to continue. Population growth in the study area has historically been modest in terms of numbers, but recent trends indicate the area is likely to continue to experience above average rates of growth when compared to other areas of the state. Local land use plans indicate varying degrees of support for preservation of farmland by the communities in the study area. Most express this support through policies and regulations limiting residential densities in agricultural areas and by directing most development to areas adjacent to existing cities and villages where it can be served by sewer and water and generally developed at greater densities. Nevertheless, the degree of restrictions varies and most local communities in the ICE study area would allow significant additional conversion of agricultural lands.

Wetlands: Wetlands are scattered throughout the study area, with large concentrations located primarily near river and stream corridors, most notably the Wolf River environmental corridor. The incremental filling of wetlands has occurred over time as a result of development and the conversion of land to agricultural uses. Several areas of significant remaining wetlands in the study area are on state-managed lands. Others are protected to some extent by federal, state and/or county regulations concerning building in floodplains and shoreland-wetland areas. Local plans generally support limiting new development in the most sensitive wetland and river basin areas.

Water Quality: The WIS 15 project area is located within the Wolf River drainage basin, primarily within the Black Otter Lake/Wolf River Watershed. Small portions of the project area east of the Village of Hortonville are located within the Greenville/Bear Creek Watershed and the Medina Junction/Rat River Watershed.

The Wisconsin Department of Natural Resource classification system places the Black Otter Lake/ Wolf River Watershed and Stephenville/Bear Creek Watershed within the larger Wolf River/New London and Bear Creek Watershed (WR 12). This watershed is located in west central Outagamie County and covers an area of 145 square miles. This watershed includes approximately 25 miles of the main stem of the Wolf River from the confluence with the Shioc River to the city of New London. Black Otter Creek is a tributary of the Wolf River within the watershed and flows northward through the Village of Hortonville, where it is dammed to form Black Otter Lake. There are seven point source dischargers in the watershed: Village of Hortonville, City of New London, Village of Shiocton, Stephenville Sanitary District No. 1, Borden Inc - Consumer Products Division, Carl H. Peters Poultry Dressing, and the Larsen Company. It is unknown whether the cooling wastewater discharge is impacting the Wolf River. Level ditches in an area known as Hortonville Flats restrict water flow and prevent walleye spawning.

The Winnebago Comprehensive Management Plan ranked the Wolf River/New London and Bear Creek Watershed Medium for streams and Low for groundwater under the NPS priority watershed selection process. The data search for the Wolf River Basin plan indicates both streams have high priority problems, but insufficient information was available for the Wolf River segment and two other streams to elevate the entire watershed to a High ranking. The Plan ranked the Black Otter Creek Watershed as a Medium priority because of nutrient and sediment runoff from croplands and a few high priority barnyard/feedlot operations causing accelerated eutrophication of Black Otter Lake. Biotic ratings show water quality ranging from fair to very poor. The WDNR recommends rating the Wolf River/New London and Bear Creek Watershed a Medium priority for streams, a Medium priority for lakes, and a Low priority for groundwater for potential selection for the Wisconsin Nonpoint Source Water Pollution Abatement Program.

The Medina Junction/Rat River Watershed is located within the larger Arrowhead River and Daggets Creek Watershed (WR 01) as defined by the WDNR. It drains a portion of the WIS 15 project area east of the Village of Hortonville. The Arrow River and Daggets Creek Watershed ranked High priority for streams and Low for groundwater under the Wisconsin Nonpoint Source Water Pollution Abatement Program priority watershed selection process. There are four point source discharges in the watershed. Available data for the Wolf River Basin indicated that major problems are widespread within this watershed and include excessive vegetation, dissolved oxygen standard violations, and critical levels of soil loss.

The Rat River is located within the watershed and is a tributary of the main stem of the Wolf River. Its marshy shoreline has areas of purple loosestrife and beaver dam problems. Of eleven barnyard/feedlot operations rated for their NPS pollution hazard, five are ranked Critical, two are High priority, and four are Medium priority. Data indicates dissolved oxygen violations on this stream. Ratings of biotic levels range from good-fair to poor-very poor. (SOURCE: www.dnr.state.wi.us/org/gmu/wolf/basinreport.htm)

Upland and Lowland Habitats: Undeveloped lands in the study area are predominantly in agricultural use, and the majority of remaining upland habitats exist as isolated woodlands or prairie/savannahs. The Wolf River, its immediate environs, and tributary streams form a relatively extensive, environmental corridor made up primarily of wooded lowlands. The segment of WIS 15 requiring a new alignment north of the existing alignment and the Village of Hortonville would require two small peripheral encroachments of lowland/wetland that is part of the larger Wolf River wetland complex/environmental corridor.

Threatened and Endangered Species: According to WDNR surveys, various (mostly aquatic but some terrestrial) threatened or endangered species have been identified in survey sections within the ICE study area, including survey sections in which the proposed new WIS 15 alignment would be constructed. Most are associated with the Wolf River and the surrounding lowland/riparian habitat. The proposed WIS 15 alternative would be constructed mostly south of - but in close proximity to - the areas deemed most vital to the Wolf River and its adjacent lowland habitat, and the segment of WIS 15 on the new alignment may create additional habitat disruptions between Black Otter Lake and the Wolf River that are currently connected. In addition, one terrestrial species, the arner blue butterfly, is associated with upland savannah habitats and has been identified in the vicinity of County JJ and WIS 15. There is also habitat suitable for the state threatened Blandings turtle along the alignment of the Preferred Alternative. (Source: WDNR Bureau of Endangered Resources Map of Outagamie County Aquatic and Terrestrial Rare Species and Natural Community Occurrences updated 04/08/2009).

6. Stresses Affecting these Resources, Ecosystems, and Human Communities and their Relation to Regulatory Thresholds

Human population growth, future development, sewer service extensions, transportation, other infrastructure improvements, agricultural practices, and other nonpoint sources of pollution could continue to negatively impact wetlands, water quality, upland habitats, and wildlife in the study area. Agricultural land may also continue to be lost because of increasing urbanization in the study area.

7. Baseline Condition for the Resources, Ecosystems, and Human Communities

The baseline conditions for the purposes of this cumulative effects analysis are based on information provided by local land use plans, County plans, and WDNR plans and reports and are generally described in this cumulative effects analysis.

8. Important Cause and Effect Relationships Between Human Activities and Resource, Ecosystems, and Human Communities

The WIS 15 expansion and realignment project promotes more efficient and safe travel between the Appleton metropolitan area and other Fox River Valley communities and areas in central and north central parts of the state. As described in the Indirect Effect analysis, this project has the potential to accelerate future development in the study area. Where access has been restricted and focused by the construction of new intersections (roundabouts), the project will also likely focus the location of development. Additional development in the study area will lead to a loss in agricultural land and will further encroach on and fragment natural habitats such as wetlands and woodlands. Habitat loss may also threaten sensitive species such as those identified above as State Threatened Species. Development will also generate additional stormwater runoff, which will impact water quality in the region and any species sensitive to resulting changes in water quality.

Local governments do, however, have the ability to mitigate these impacts through the administration of land use controls that determine where development occurs, what types of development occur, and the density to which the development occurs.

9. Estimated Magnitude and Significance of Cumulative Effects

This project, when considered within the context of other past and reasonably foreseeable actions, is likely to contribute to population growth and development in the study area. Taken together, the cumulative effect of the WIS 15 project and other actions analyzed above will be the incremental loss of agricultural land and other natural areas in the study area, particularly in the vicinity of the Village of Hortonville, City of New London, and nearby towns.

Although it is anticipated the WIS 15 project may focus development at access points and frontage areas adjacent to WIS 15, future growth and development have been planned for by local communities largely outside of the context of the WIS 15 project, suggesting that the WIS 15 expansion is likely to have a relatively minor impact on the overall future development within the ICE study area. Since the Preferred Alternative includes an off-alignment expansion, loss of agricultural land and some natural features as well as disturbance of upland and lowland habitats and some local alterations in anticipated development patterns are likely to occur. Nevertheless, much of the project is an on-alignment expansion and the

portion that involves a new alignment is within one-half mile of the existing alignment and bypasses the growing Village of Hortonville. As a result, the location of future development will generally be at the same location as it would be if the WIS 15 expansion did not occur, with the exception of areas where interchanges may be constructed in the future. In more rural areas where access will be restricted, the potential for development is likely to decrease.

The WIS 15 project would require the crossing and filling of wetlands. WisDOT intends to mitigate these impacts in compliance with federal and state requirements.

The WIS 15 project is expected to contribute to increases in stormwater runoff both directly and indirectly (i.e., runoff coming off of the expanded highway, and runoff associated with development). However, the on-alignment expansions minimize both wetland loss and regional increases in impervious surface. For both the on-alignment expansion and the segment of the Preferred Alternative that requires a new alignment north of the Village of Hortonville, the future highway design will also incorporate best management practices for managing runoff both during and after highway construction.

The Preferred Alternative would create a new alignment in proximity to (but outside of) the area near the Wolf River deemed in local plans to be vital to the preservation of the Wolf River. This area provides habitat for many species including some classified as endangered or threatened. Because the Preferred Alternative would lie outside of this area, the primary concern with the project impacts relates to disruption of upland habitat caused by the new alignment, new crossings of the Black Otter Creek and other Wolf River tributary streams, and nonpoint pollutant runoff from WIS 15 traffic. Design of the WIS 15 improvements to mitigate wetland impacts, stormwater runoff, and impacts on streams will be required to minimize impacts on habitats and species. Use of bridging techniques that allow safe transit of both aquatic and terrestrial species would be useful in maintaining habitats along Black Otter Creek.

Ultimately, local governments are in a position to regulate land development and to minimize impacts on agricultural land and natural resources. Some of the tools that can be used to regulate development are listed in Section 10.

10. Alternatives to Avoid, Minimize, or Mitigate Significant Cumulative Effects

Existing and future land use regulations will play a significant role in helping to avoid, minimize, or mitigate the cumulative effects of the WIS 15 project. Commonly used land use planning tools include the following:

- **Comprehensive Planning:** Wisconsin law requires that by 2010 all communities that wish to regulate land use must have an adopted comprehensive plan to guide land use decisions. A Comprehensive Plan will help a community define the types of land uses it would like to see in the future and identify appropriate locations for development and preservation. At the time of this writing only the Town of Maple Creek has yet to adopt a comprehensive plan meeting the state requirements, and the Town was in the process of developing one.
- **Zoning Ordinance:** A zoning ordinance and map should be consistent with the community's future land use map and can dictate what land uses can be developed where and at what densities that development can occur. For example, zoning land for agricultural use can help ensure that it will not be developed for residential or commercial use, unless zoning policies or designations change. All local units of government in the ICE study area either exercise zoning authority or are subject to the zoning of an overlapping jurisdiction.
- **Subdivision/Land Division Ordinance:** Subdivision ordinances should also be consistent with a community's future land use map. These ordinances determine design standards, the way land can be divided, the types of public improvements needed to serve development, and in conjunction with the zoning ordinance, the development density. All local units of government in the ICE study area either exercise land division authority or are subject to the zoning of an overlapping jurisdiction.
- **Extraterritorial Jurisdiction:** Wisconsin Statutes specifically allow villages and cities to prepare plans for, and to unilaterally regulate land divisions within, their extraterritorial jurisdictions (1.5 miles outside municipal boundaries for villages and class IV cities; 3 miles for class I, II, and

Ill cities). Such extraterritorial powers can help keep development out of agricultural areas and can help ensure that when development does occur, it can be developed compactly and can be served by municipal sewer and water.

- **Official Mapping:** Official mapping is one of the most cost-effective planning tools available to communities. An Official Map is a plan implementation tool authorized under Wisconsin Statutes Section 62.23(7) for adoption as an ordinance by cities, villages, and towns. These maps may be used to show alignments of future roads, expanded rights-of-way for existing roads, and other planned public facilities like trails and parks. When land development is proposed in an area within which a public facility is shown on the Official Map, the municipality may obtain or reserve land for that future facility through public dedication, public purchase, or reservation for future purchase.

In addition, WisDOT will take measures to ensure that direct and indirect effects to natural resources will be minimized and mitigated to the extent practicable through the highway design and construction process.

11. Monitoring and Evaluation of the Cumulative Effects of the Selected Alternative and Adoption of Management

WisDOT will design the Preferred Alternative in such a way as to minimize indirect effects by limiting access points and making sound decisions with respect to interchange and highway design. When designing the improvements, WisDOT will consider the potential indirect and cumulative impacts identified earlier in this document. WisDOT regional staff are also available to work with communities to provide important transportation data and project information and to provide technical assistance with local comprehensive plans and transportation plans.

WisDOT could also work with towns and counties to maintain agricultural planning and zoning on the remnants of parcels partially used for expanded right-of-way and interchange areas, rather than requiring a zoning district that is more permissive of development simply because of minimum parcel size requirements.

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