

CHAPTER 14: System-Plan Environmental Evaluation

This chapter presents the System-plan Environmental Evaluation developed in conjunction with *Connections 2030*. The evaluation meets the requirements of WisDOT’s administrative code, Trans 400, *Wisconsin Environmental Policy Act Procedures for Department Actions*.

Structure of chapter

This chapter highlights:

- » Evaluation purpose and methodology
- » Plan development process
- » Modal comparison of the base case and draft plan
- » Qualitative assessment of the potential impacts of the base case and draft plan on congestion, energy, air quality, climate change, agriculture, economic growth, community, sensitive land and water resources, and the indirect effects and cumulative effects on these and on land use.

System-plan environmental evaluation purpose and methodology

Trans 400 establishes rules for analyzing the environmental effects of transportation plans under the Wisconsin Environmental Policy Act. Statutorily defined as the conceptual environmental evaluation, a system-plan environmental evaluation analysis is required during the preparation of statewide, system-level transportation plans when initial WisDOT analyses determine that the plan contains “major and significant new proposals” likely to affect the quality of the human and natural environment. WisDOT determined that although several components of the draft plan were continuations of current policy and procedure, Wisconsin’s long-range transportation plan, *Connections 2030*, includes major and significant new proposals. In addition, WisDOT prepared the evaluation because:

Trans 400 definitions

- › “Major and significant new proposal” – a new proposal developed by WisDOT which, if legislatively authorized and funded, may significantly affect the quality of the human environment, and represents a significant departure from, or expansion of, the department’s existing responsibilities by substantially expanding or substantially reducing total resources allocated to any existing programs
- › “Significant effects” – considerable and important impacts of department actions on the quality of the human environment
- › “System plan” – a plan that identifies transportation facility or service needs for a statewide system. The needs are identified conceptually without addressing specific design and location details

- » Even though the plan presents policies for non-highway modes, the department anticipates single occupant vehicle travel will continue to be the predominant mode of choice for travelers.
- » WisDOT remains committed to disclosing and discussing the impacts of its activities as they affect the environment, the economy, communities, and opportunities for businesses and residents.
- » While analyzing the potential impacts of implementing a long-range, system-level plan remain challenging and difficult to predict, the department will continue to perform as comprehensive an analysis as possible to not only meet the statutory requirements but also inform the public.

The system-plan environmental evaluation does not provide the kind of quantitative detail found in project-level environmental reports (e.g., environmental



assessments, environmental impact statements), nor does it replace those reviews. Project-level impacts depend on location and design decisions that were not known during the preparation of *Connections 2030* and the system-plan environmental evaluation analysis. Given these limitations, the system-plan environmental evaluation looks at the policies and recommended actions identified in *Connections 2030* and discusses the potential environmental impacts of implementing these policies and actions in qualitative and comparative terms. In summary, project-level environmental reports focus on specific individual project details while the level of analysis in the long-range plan system-plan environmental evaluation is at a broad policy-level covering conceptual ideas about the future of transportation in Wisconsin.

Trans 400 recommends that the system-plan environmental evaluation consider the range of potential environmental impacts relating to traffic congestion, energy consumption, air quality, land use, agriculture, communities, economic growth, and sensitive land and water resources. Cumulative effects of these policies and actions are considered to the extent they can be recognized during the system-level planning process.

While *Connections 2030* is a multimodal plan, with policies and recommended implementation strategies presented in a comprehensive approach to further encourage multimodal transportation investments, the potential environmental impacts resulting from plan implementation are presented by mode. There are several reasons for this. First, because the policies and theme chapters overlap and interrelate, analysis by policy would result in significant repetition. Analysis by mode minimizes this. Second, some policies that appear to address only a single mode may actually impact other modes. For example, the policy, “Ensure that freight rail remains a viable transportation mode for Wisconsin shippers,” may result in improved freight rail service. Because of this, more freight may be shipped by rail than by truck. Decreased truck traffic could positively impact communities by causing less noise pollution and improving safety. However, increased freight rail traffic may increase noise pollution. The freight example also points to the reality that many different players

manage transportation policy, thereby influencing environmental impacts. Through the system-plan environmental evaluation, WisDOT strives to outline the broad concepts impacting the environment that not only emanate from state policy but also pertain to all transportation providers throughout the state.

Plan development process

Early public outreach

Early public outreach included stakeholder meetings, interviews and focus groups, as well as a statewide telephone survey. (For information related to the early public outreach activities, refer to Chapter 4, *Public Involvement*). These outreach activities identified several areas of concern, including:

- » Wisconsin’s deteriorating transportation infrastructure
- » Availability of funding
- » Availability of transportation choice (e.g., public transit, intercity bus)

Apart from shaping the plan’s policies and related action steps, these areas of concern helped shape the development of the plan’s vision: “An integrated multimodal transportation system that maximizes the safe and efficient movement of people and products throughout the state, enhancing economic productivity and the quality of Wisconsin’s communities while minimizing the impacts to the natural environment.”

Early plan scoping and the planning process

Traditionally, WisDOT has used a needs-based process to develop long-range system plans. Under a needs-based plan development process, WisDOT has used models and traffic forecasts to identify recommended transportation system improvements and estimate related costs resulting in a discussion of specific funding needs. A needs-based plan limits flexibility, and tends to focus the reader on estimates of funding needs and dollars beyond the first two years which tend to be less

certain. The first two years of funding estimates are generally known since they represent the most recent budget approved by the state legislature and governor. Beyond the first two years, the funding estimates are broad and uncertain due to changing funding levels and potential shifts in system infrastructure priorities.

Early plan scoping¹ assumptions for *Connections 2030* included developing a needs-based plan around transportation modes. However, as the planning process continued, the plan shifted to a policy-based plan organized around seven transportation themes not modes. So while models and traffic forecasts were still used to identify recommended needs, the policy-based plan approach includes broad goal statements and strategies establishing the general direction of the agency over the course of the planning period. Implementation is dependant on the actual timing of projects and available resources. The themes not only follow the planning factors identified under the Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU), but they also reflect the key issues and concerns raised during early plan outreach efforts. The themes are: preservation, safety, economic growth, mobility and choice, efficiency, quality of life, and security.

A policy-based plan provides the framework upon which priorities are defined and investments are made. *Connections 2030* is written to be flexible and responsive to shifting priorities and funding availability, and to changing project-level decisions. This framework more accurately represents WisDOT's response to transportation needs and offers a tangible plan in which priorities may be addressed through 2030.

As discussed in Chapter 12, *Funding Wisconsin's Transportation System*, transportation funding continues to be a challenge and faces two key challenges in the next 20 years: increasing costs and an eroding revenue base. *Connections 2030* identifies strategies to address these challenges and continue to fund Wisconsin's transportation system needs. These strategies are based on

¹ Plan scoping means defining the overall direction and content of the proposed plan.

Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users

The legislation authorizes federal surface transportation programs for highways, highway safety, and transit for the five-year period 2005-2009. It addresses many of today's transportation challenges and provides policy direction on how to address these challenges.

Policy-based plans

- > Describe overarching strategies to accomplish future results
- > Include official policies for solving problems, typically based on legislation and implemented through programs
- > Identify means to accomplish these policies through investments, strategies or programs

the recommendations of the National Surface Transportation Policy and Revenue Study Commission. (See Chapter 12, *Funding Wisconsin's Transportation System* for more information).

Consultation process

In addition to the Trans 400 requirements, SAFETEA-LU requires WisDOT to develop the draft plan in consultation with state, tribal and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation. The consultation process requires a comparison of the draft plan to available state and tribal conservation plans or maps, as well as inventories of natural and historic resources. SAFETEA-LU also requires WisDOT to include in the



Environmental mitigation activities

As defined in 23 CFR 450.104, environmental mitigation activities are policies or actions that “serve to avoid, minimize, or compensate for (by replacing or providing substitute resources) the impacts to or disruption of elements of the human and natural environment associated with the implementation of a long-range statewide transportation plan.”

draft plan a discussion of potential environmental mitigation activities and potential areas to carry out these activities. The discussion must be developed in consultation with federal, state and tribal land management, wildlife and regulatory agencies, and may focus on policies, programs or strategies, rather than specific projects. (Appendix B documents the consultation process.) The feedback received during this process helped to further shape and refine the content and focus of the long-range plan.

Modal comparison of the base case and draft plan

The system elements of *Connections 2030* are focused predominantly on:

- » State trunk highway system
- » Intercity passenger rail
- » Intercity bus
- » Airports
- » Public, specialized and human services transit and fixed-guideway transit
- » Bike and pedestrian facilities
- » Freight

Of these elements, WisDOT has primary responsibility for maintaining and preserving the state trunk highway system. For the rest of the transportation system, WisDOT manages available federal and state funding, and provides technical assistance and appropriate data resources. However, the infrastructure and facilities belong either to private entities or local governments. In general, WisDOT is responsible for evaluating potential environmental impacts, as well as avoiding, minimizing or mitigating those impacts for any projects related to the state trunk highway system. For the remaining elements, WisDOT, a local government, or private entity is responsible for evaluating potential impacts, depending on the project sponsor.

To better understand the potential impacts of implementing *Connections 2030*, WisDOT prepared a “base case” scenario. The base case is a vision of the future that does not include any major shift in policies or resources away from the department’s current direction. Stated simply, the base case is a continuation of existing department policies. Under the base case, the department remains focused on the state trunk highway system and is reactive in addressing the needs of non-highway modes.

As a policy-focused “draft plan,” *Connections 2030* presents a shift in the department’s development of the state’s long-range transportation plan and discussion of proposed actions. Under the draft plan, WisDOT identifies ways to meet the needs of non-highway modes (for example, public transit, intercity passenger rail, bicycles), while balancing highway needs. The draft plan also proposes several new

Base case assumptions

- > Current WisDOT policies, programs and projects will continue through 2030.
- > It is not a no-build alternative.

policies that promote a multimodal transportation system, such as new strategies related to transit, intercity bus, transportation demand management, and intermodal connectivity. It also recommends establishing a freight focus within the department to better understand freight-related issues and position the department to respond to the range of needs at all levels. The draft plan does not ignore the state trunk highway system, but continues existing highway policies and identifies enhanced policy direction that will improve the efficiency, safety and reliability of the state trunk highway system.

State trunk highway system

While *Connections 2030* addresses highway system policies in primarily Chapter 5, *Preserve and Maintain Wisconsin's Transportation System* and in Chapter 9, *Promote Transportation Efficiencies*, other theme chapter policies impact highway decisions and investment priorities.

Connections 2030 continues the policies and strategies currently implemented by WisDOT to preserve and maintain previous investments in the state trunk highway system, help maximize infrastructure longevity and optimize its efficiency through maintenance, preservation and operations policies. Specifically, WisDOT continues to:

- » Monitor state trunk highway system conditions and address operation and maintenance needs
- » Use proven maintenance strategies and techniques
- » Identify methods to improve traffic movements
- » Plan and prepare for WisDOT's prompt and consistent response to incidents
- » Use a performance-based approach to identify preservation needs on the state trunk highway system
- » Develop, implement and expand technology for monitoring highway operations to manage state trunk highway traffic

To optimize the system's efficiency, *Connections 2030* continues WisDOT's policy of enhancing roadway capacity² within the confines of WisDOT rights of way. It does this by continuing to evaluate traffic management options using a variety of tools and strategies. These include transportation demand management, improved incident response, work zone management, Intelligent Transportation System strategies, lower cost infrastructure investments, constructing passing lanes, and developing a statewide congestion management plan and program.

Because these policies reflect a continuation of current activities, implementing these maintenance, preservation and operations strategies and actions are the same for both the base case and draft plan. In general, these activities have minimal potential environmental impacts since activities occur within the existing highway right of way.

WisDOT actions that occur outside of WisDOT rights of way that optimize state trunk highway efficiency by enhancing roadway capacity tend to impact the environment more than those that remain with WisDOT right of way. These actions occur only after careful consideration of the purpose of and need for each proposed highway project. Related investment decisions and draft plan policy recommendations include:

- » Major Highway Development Program
- » Adding lanes
- » Passing lanes
- » Interchanges
- » Bridges
- » Expressway upgrades/freeway conversion
- » Operations tools
- » *State Access Management Plan*

²Roadway capacity is defined as the number of vehicles a roadway can carry. Capacity is determined by several factors, such as the number of lanes, width of lanes and shoulders, traffic signal timing, intersection controls, number and type of access points (e.g., interchanges, driveways, intersections), speed and alignment (e.g., grades and curves). Enhanced roadway capacity should improve mobility, traffic flow and safety.



From the perspective of plan implementation, Table 14-1 documents impacts that may remain within or may go beyond existing WisDOT right of way. The miles shown in Table 14-1 will likely change as project-level decisions are made to respond to the needs and priorities identified at the corridor level. Table 14-2 compares the base case and draft plan.

The results show that there is not a significant change in policy in many of the draft plan’s proposed actions where the potential to impact highway rights of way is great. Most of the policies and actions are the same for both the base case and draft plan. In many cases, the draft plan refines many of WisDOT’s processes and actions. With the exception of the candidate expressway upgrades/freeway conversion actions and the *State Access Management Plan*, the remaining highway policies, and actions related to enhancing capacity and impacting the environment, are the same for the base case and draft plan.

Candidate expressway upgrades and expressway-to-freeway conversions

The base case and draft plan both recommend continued construction of expressway upgrades and expressway-to-freeway conversions where warranted and feasible. Expressways are multi-lane highways with at-grade intersections and some interchanges. Freeways are multi-lane highways with access only at interchanges. Often, candidate upgrades and conversions are addressed at specific locations as projects are scheduled and design requirements are met. For example, an at-grade intersection may be removed or replaced by an interchange; or a field entrance or driveway may be closed. Expressway upgrades and expressway-to-freeway conversions can impact the surrounding environment by constructing additional travel lanes, frontage roads or interchanges and closing existing access points. Project locations and design elements are determined during the project planning phase; exact analysis of potential impacts is limited at the system-level plan. For the purpose of the system-plan environmental evaluation, the entire corridor length is calculated to arrive at an estimated number of miles identified for candidate expressway upgrades/freeway conversions to ensure that all potential

Table 14-1: Approximate number of highway centerline¹ mile changes

Policy/action	Centerline miles/number ²
Major Highway Development Program (under authorization of the Transportation Projects Commission ³)	400
Adding lanes ⁴	800
Interchanges ⁵	200 locations
Bridges	700 locations
Expressway upgrades/freeway conversion	Table 14-2
Passing lanes	2,000
Operations tools	Table 14-2
State Access Management Plan	Table 14-2

¹ Centerline miles count the total length of a roadway without taking into account the number of lanes. Lane miles count the length of a roadway by lane. For example, a 1-mile stretch of a 2-lane roadway has 1 centerline mile but 2 lane miles.

² Roadway miles and numbers of interchanges and bridges are approximate. Roadway mile estimates are conservative. For example, WisDOT has identified 2,000 miles of state trunk highway on which passing lanes may improve traffic movement and safety. Passing lanes will not be constructed along all 2,000 miles. Instead, passing lanes will be constructed in spot locations. These locations will be determined during the project planning phase. For system-level planning, the entire corridor was identified to ensure full disclosure of potential impacts related to plan implementation. Additional environmental review will occur at the project level. This will determine the project scope and include a detailed environmental review process.

³ Includes 27 enumerated projects, which account for 300 miles; and 8 studies, which account for 100 miles.

⁴ Includes Major Highway Development Program projects and candidate expressway upgrades and expressway-to-freeway conversions.

⁵ Includes 50 study or right of way preservation projects; 100 existing interchange reconstructions and 50 new interchange constructions.

impacts are considered. As a result, the number of miles identified for candidate expressway upgrades and candidate expressway-to-freeway conversions is higher than the actual miles on which projects will occur since the actual project impacts will occur only at site-specific locations along the corridor.

Under the base case, candidate expressway upgrades and candidate freeway conversions are limited to the *Corridors 2020* Backbone routes since the recommended update to *Corridors 2030* discussed in the draft plan would not be implemented. *Corridors 2030* is part of the draft plan and would not be implemented under the base case. Under *Corridors*

2020, 1,400 miles of upgrades/conversions have been completed, and 40 miles remain to be completed. The draft plan expands the candidate expressway upgrades and candidate freeway conversions to include some of the *Corridors 2030* routes, the *State Access Management Plan* and the Major Highway Development Program projects. The draft plan identifies the possible conversion of approximately 610 miles of state highways to expressways or freeways (the majority of these conversions will include ‘spot’ improvements to bring the roadway up to standard, meaning that the calculated 610 miles is likely an over-estimation). Some of these miles are also included under the “Adding lanes” category in Table 14-1.

The impacts of implementing candidate expressway upgrades and/or expressway-to-freeway conversions are discussed under each emphasis area in the Qualitative Impacts section of this chapter.

State Access Management Plan

The draft *State Access Management Plan* recommends implementation of access management³ on the entire state trunk highway system. The draft plan provides a vision for the safety and capacity preservation benefits of access management on all 11,800 miles of the state trunk highway system. Priorities are focused on highways that require greater mobility over access (Tier 1, 2A or 2B), with particular attention to routes that currently have no access controls. As a result, the draft plan focuses access management on 5,100 miles or 42 percent of the state trunk highway system.

³ Access management is the process of planning and maintaining appropriate access spacing, design, and the total number of access points (driveways) to the state trunk highway system, to safely maintain the highway’s traffic carrying capacity. For more information, refer to the “Manage access on Wisconsin’s state trunk highway system” policy in Chapter 9, *Promote Transportation Efficiencies*.

Table 14-2: Comparison of state trunk highway actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Continue to use tools and strategies to measure performance of existing system • Prioritize needs • Pursue sufficient funding to address state highway system preservations needs • Continue to use ITS technology tools to monitor and manage traffic flows daily • Reduce congestion through: <ul style="list-style-type: none"> › Access management; approximately 5,300 miles of high priority › Operations tools; entire state highway system › Passing lanes; approximately 2,000 miles › Expressway upgrades/freeway conversions; approximately 40 miles remain to be completed (included in the “adding lanes” category) for a total of 1,440 miles › Bridges; approximately 700 › Interchanges; approximately 200 (50 new) › Adding lanes; approximately 800 miles › Major Highway Development Program; approximately 400 miles (included in the adding lanes category) 	<ul style="list-style-type: none"> • Continue to use tools and strategies to measure performance of existing system • Use and refine a state-of-the-art process for prioritizing needs • Pursue sufficient funding to address state highway system preservations needs • Continue to use ITS technology tools to monitor and manage traffic flows daily • Develop plans and programs that use different and new design and operations improvements to reduce congestion through: <ul style="list-style-type: none"> › Access management approximately 5,100 miles of high priority. Follow <i>State Access Management Plan</i> to manage access on state highways and collaborate with others to develop access management plans to preserve state highways and meet local needs › Operations tools; entire state highway system › Passing lanes; approximately 2,000 miles › Expressway upgrades/freeway conversions; approximately 610 miles to be completed (some included in the adding lanes category) for a total of 2,010 miles › Bridges; approximately 700 › Interchanges; approximately 200 (50 new) › Adding lanes; approximately 800 miles › Major Highway Development Program; approximately 400 miles (included in the adding lanes category) 	<ul style="list-style-type: none"> • Both alternatives monitor state trunk highway system conditions and address operation and maintenance needs • Both alternatives use proven maintenance strategies and techniques • Both alternatives identify appropriate methods to improve traffic movements • Both alternatives use a performance-based approach to identify preservation needs • Both alternatives allow WisDOT to plan and prepare for prompt and consistent response to incidents • Both alternatives develop, implement and expand technology for monitoring highway operations to manage state trunk highway traffic • Both alternatives enhance roadway capacity by continuing to evaluate a range of traffic movement options • The draft plan has a more refined approach to access management policy and recommends 5,100 miles of high priority access management versus the base case recommendations of 5,300 miles • The draft plan outlines 610 miles of expressway upgrades/freeway conversion, while the base case outlines 40 miles • Both alternatives are similar in all other impacts of implementing policies that have the potential to go beyond WisDOT rights of way



While the base case also focuses on access management for the entire state trunk highway system, it places a higher priority on limiting access on *Corridors 2020* routes and various “supplemental highways” (approximately 5,300 miles or 45 percent of the state trunk highway system). The impacts of implementing the *State Access Management Plan* are discussed by emphasis area, in the Qualitative Impacts section of this chapter.

Intercity passenger rail

The base case and the draft plan both implement the Midwest Regional Rail System⁴, and support existing Amtrak *Hiawatha Service* between Chicago and Milwaukee. However, the draft plan builds on the base case vision for intercity passenger rail by recommending evaluating possible extension of intercity passenger rail service to other regions of Wisconsin. Table 14-3 depicts the approximate number of miles of intercity passenger rail lines likely to be impacted by intercity passenger rail service. Table 14-4 summarizes the similarities and differences between the base case and the draft plan relative to intercity passenger rail. The impacts of implementing intercity passenger rail policies will be discussed, by emphasis area in the Qualitative Impacts section of this chapter.

⁴The Midwest Regional Rail System is a 3,000-mile regional high-speed passenger rail system proposed by Wisconsin and eight other Midwest states. For more information, refer to the “Increase intercity travel options by improving intercity passenger rail service” policy in Chapter 8, *Provide Mobility and Transportation Choice*.

Table 14-3: Approximate intercity passenger rail mileage changes (in one direction)

Policy phase	Miles
Milwaukee to Madison	80
Illinois-Wisconsin state line to Milwaukee	40
Madison to La Crosse	140
Milwaukee to Green Bay	130
Tomah to Eau Claire	100
Total	490

Intercity bus

The base case and draft plan support intercity bus service and create intermodal connections where possible. However, the draft plan recommends financing and supporting implementation and restoration of bus service and connections across modes by establishing a state intercity bus program, while the base case continues to rely on existing federal programs to provide funding for intercity bus service. The draft plan also proposes approximately 60 intercity bus locations across the state, 10 of which would be Midwest Regional Rail System intercity passenger rail stations. Table 14-5 shows the similarities and differences between the base case and draft plan as related to intercity bus service. The impacts of implementing the intercity bus policies will be discussed, by emphasis area in the Qualitative Impacts section of this chapter.

Table 14-4: Comparison of intercity passenger rail actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Implement Midwest Regional Rail System phases 1-3; approximately 390 miles • Continue to support and enhance existing passenger rail service 	<ul style="list-style-type: none"> • Implement Midwest Regional Rail System phases 1-3; approximately 390 miles • Establish a state rail capital assistance program • Study extending service to regions of Wisconsin not originally included in the Midwest Regional Rail System; approximately 100 additional miles • Continue to support and enhance existing passenger rail service 	<ul style="list-style-type: none"> • Both alternatives implement Midwest Regional Rail System phases 1-3 • Both alternatives continue to support and enhance existing passenger rail service • The draft plan outlines the establishment of a state rail capital assistance program, where the base case does not propose one • The draft plan outlines the study of extending service to other regions of the state, totaling an approximately 100 additional miles in service versus the base case, which does not propose the study of additional extended service.

Table 14-5: Comparison of intercity bus actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Continue to support current carriers through existing federal programs • Work with local communities to identify opportunities for intermodal facilities • Continue to improve coordination between transportation modes 	<ul style="list-style-type: none"> • Support the development of a state intercity bus funding assistance pilot program (Phase 1) • Implement an expanded state intercity bus funding assistance program that supports connections between metropolitan areas and feeder service to Midwest Regional Rail System rail stations (Phase 2) • Expand state intercity bus funding assistance program to include connections with key non-metropolitan destinations (Phase 3) • Provide funding assistance for intermodal facilities • Continue to improve coordination between transportation modes • Increase the availability of alternative modes in both urban and rural areas 	<ul style="list-style-type: none"> • Both alternatives continue to improve coordination between transportation modes • The draft plan supports the development and future expansion of a state intercity bus funding assistance pilot program, while the base case continues supporting current carriers through existing federal programs • The draft plan provides funding assistance for intermodal facilities, while the base case outlines working with local communities to identify opportunities for intermodal facilities • The draft plan increases the availability of alternative modes in both urban and rural areas, while the base case is less proactive in encouraging the availability of alternative modes

Table 14-6: Comparison of airport actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Continue to use the Airport Improvement Program to assist with infrastructure improvements 	<ul style="list-style-type: none"> • Continue to use the Airport Improvement Program to assist with infrastructure improvements • Advocate for improved air service at airports • Analyze potential for increased use of very light jets 	<ul style="list-style-type: none"> • Both alternatives continue to use the Airport Improvement Program • The draft plan advocates for improved service at airports, while the base case does not advocate for improved service • The draft plan analyzes potential for increased use of very light jets, while the base case does not analyze the potential

Airports

The base case and draft plan both support the construction of runway extensions at 14 airports around the state. Any additional airport system infrastructure projects will be identified in WisDOT’s pending update to the *State Airport System Plan 2020*. In addition to the airport infrastructure projects, the draft plan also notes WisDOT’s role as an advocate for improved direct air service, and for analyzing possible improvements to Wisconsin’s airport system to accommodate potential increased use of very light jets.⁵

⁵Very light jets are also called light jets, microjets or mini-jets. They are single-pilot jets that weigh 10,000 pounds or less and have two engines, five to six passenger seats and automated cockpits. Very light jets may cost only half as much as today’s least expensive business jets; they also cost less to operate. Very light jets are able to land on runways as short as 3,000 feet.

Table 14-6 compares the similarities and differences between the base case and draft plan relative to airport needs and future direction.

The impacts of implementing the airport policies are discussed, by emphasis area, in the Qualitative Impacts section of this chapter.

Public, specialized and human services transit and fixed-guideway transit

Under both the base case and draft plan, WisDOT continues to support public, specialized, human services and fixed-guideway transit in local communities. The draft plan supports the creation of regional governing bodies with revenue raising authority, such as regional transit authorities, to



Table 14-7: Comparison of public, specialized and human services transit and fixed-guide transit actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Continue WisDOT’s role as a funding partner for Milwaukee and Madison • Continue to support legislative changes to allow local governments to have transit funding options, other than property taxes • Continue state funding assistance for fixed-guideway transit studies • Continue to participate in studies of potential fixed-guideway transit service 	<ul style="list-style-type: none"> • Work to ensure the availability of adequate funding for existing transit systems • Continue WisDOT’s role as a funding partner for Milwaukee and Madison • Work with partners to improve transit service coordination, eliminate inefficiencies and improve transit planning • Support urban and regional transit systems with new regional governance and funding structures • Continue state funding assistance for fixed-guideway transit studies • Develop a capital and operating assistance program to implement fixed-guideway transit in major metropolitan areas • Continue to participate in studies of potential fixed-guideway transit service • Continue to promote coordination between modes 	<ul style="list-style-type: none"> • Both alternatives continue WisDOT’s role as a funding partner for Milwaukee and Madison • Both alternatives continue participation in studies of potential fixed-guideway transit service • Both alternatives propose continuing state funding assistance for fixed-guideway transit studies. The draft plan also supports urban and regional transit systems with new governance and funding structures, and the development of a capital and operating assistance program to implement fixed-guideway transit in major metropolitan areas • The draft plan proposes working to ensure the availability of adequate funding for existing transit systems, while the base case continues to support legislative changes to allow local governments to have transit funding options other than property taxes • The draft plan proposes working with partners to improve transit service coordination, eliminate inefficiencies and improve transit planning, while the base case does not

Table 14-8: Comparison of bicycle and pedestrian actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Continue to implement bicycle and pedestrian plan goals and objectives 	<ul style="list-style-type: none"> • Continue to implement bicycle and pedestrian plan goals and objectives • Evaluate opportunities to increase the inclusion of bicycle and pedestrian accommodations on urban state highway projects 	<ul style="list-style-type: none"> • Both alternatives continue to implement plan goals and objectives • The draft plan evaluates opportunities to increase the inclusion of accommodations on urban state highway projects

independently fund and administer local transit systems. The draft plan also supports enhanced coordination and transit system planning to identify and eliminate inefficiencies in existing programs for transit operators and providers. It also recommends new state funding for fixed-guideway transit, as well as for rural and regional transit systems capital and operational needs. Table 14-7 summarizes the key similarities and differences between the base case and draft plan regarding transit.

The impacts of implementing the public, specialized and human services transit and fixed-guideway transit policies are discussed, by emphasis area, in the Qualitative Impacts section of this chapter.

Bicycle and pedestrian facilities

The base case and draft plan both promote bicycle and pedestrian travel by implementing the goals and objectives outlined in the 1998 *Wisconsin Bicycle Transportation Study 2020* and the 2002 *Wisconsin Pedestrian Policy Plan 2020*. In addition, the draft plan notes that WisDOT will evaluate opportunities to expand the inclusion of bicycle and pedestrian accommodations on urban state trunk highway projects. Table 14-8 shows the similarities and differences between the base case and draft plan related to bicycle and pedestrian facilities. The impacts of implementing the bicycle and pedestrian facilities policies are discussed, by emphasis area, in the Qualitative Impacts section of this chapter.

Table 14-9: Comparison of freight-related actions

Base case	Draft plan	Differences/similarities
<ul style="list-style-type: none"> • Continue state assistance programs for rail and harbor improvements • Continue to acquire rail lines into public ownership, when appropriate, to preserve essential freight railroad service • Continue to fund track and bridge upgrades for publicly owned rail corridors • Support increased investment in rail infrastructure in response to shipper needs and market demands • Continue to preserve corridors for future transportation use using Rails-to-Trails, rail banking or land banking • Address airport system needs through the Airport Improvement Program, coordination with owners and operators and <i>State Airport System Plan</i> update efforts 	<ul style="list-style-type: none"> • Establish a freight focus within WisDOT • Advocate for federal funding and environmental improvements for the Upper Mississippi River-Illinois River Waterway System and for the construction of a new lock in Sault Ste. Marie • Continue state assistance programs for rail and harbor improvements • Encourage comprehensive harbor and waterfront land use planning • Examine and address roadway issues at ports • Work with railroads to ensure that appropriate rail service will be provided to all shippers statewide • Continue to acquire rail lines into public ownership, when appropriate, to preserve essential freight railroad service • Continue to fund track and bridge upgrades for publicly owned rail corridors • Support increased investment in rail infrastructure in response to shipper needs and market demands • Continue to preserve corridors for future transportation use using Rails-to-Trails, rail banking or land banking • Address airport system needs through the Airport Improvement Program, coordination with owners and operators and <i>State Airport System Plan</i> update efforts 	<ul style="list-style-type: none"> • Both alternatives continue state assistance programs for rail and harbor improvements • Both alternatives continue to acquire rail lines into public ownership, when appropriate, to preserve essential freight railroad service • Both alternatives continue to fund track and bridge upgrades for publicly owned rail corridors • Both alternatives continue to preserve corridors for future transportation use • Both address needs through existing programs, coordination and long-range plan updates • Both continue working with railroads to ensure that appropriate rail service will be provided to all shippers statewide • Both alternatives support increased investment in rail infrastructure in response to shipper needs and market demands • The draft plan establishes a freight focus within WisDOT, while the base case does not • The draft plan advocates for federal funding and environmental improvements, while the base case does not • The draft plan encourages comprehensive harbor and waterfront land use planning, while the base case does not • The draft plan promotes examination and action to address roadway issues at ports, while the base case does not

Freight (rail, truck, water, air)

The base case and draft plan continue upgrading and rehabilitating Wisconsin’s publicly owned rail lines and bridges to accommodate heavier railcars and increasing volumes of traffic. The draft plan also establishes a freight focus and continued funding and technical assistance for Wisconsin’s freight rail and commercial harbor systems.

Table 14-9 notes the key similarities and differences between the base case and draft plan as related to freight.

The impacts of implementing the freight policies are discussed, by emphasis area, in the Qualitative Impacts section of this chapter.

Qualitative assessment

Plan elements likely to have significant environmental effects often involve new or substantially expanded mode-specific facilities and services. They can also include significant multimodal policies or programs. The base case and draft plan each have the potential for causing direct and indirect effects. The impact of these effects will vary depending on the type of action or facility proposed, the scale or intensity of that action, its location or context, and its duration. Impacts can be either adverse or beneficial, and can occur over the short-term, long-term or throughout the planning period. The system-plan environmental evaluation addresses the impacts of the base case and draft plan for the following broad areas:



- » Congestion
- » Energy
- » Air quality
- » Climate change
- » Agriculture
- » Economic growth
- » Community and cultural resources
- » Sensitive land and water resources
- » Indirect and cumulative effects

Congestion

Traffic congestion occurs whenever a driver’s ability to enter and exit a roadway, change lanes, pass a slow-moving vehicle or simply drive forward is reduced. There are two types of traffic congestion, recurring and non-recurring. Recurring congestion, accounting for nearly 40 percent of all delays, is caused by insufficient capacity on roadway systems and is a function of the increases in both passenger vehicles and freight transportation. Non-recurring congestion, accounting for about 60 percent of delays, can be caused by special events, weather, and traffic incidents. Addressing congestion can reduce energy consumption and improve air quality. The state’s total vehicle miles traveled, while experiencing a slight decrease in 2005 and 2006, has continued to increase. The decreases can be attributed at least in part to high fuel prices. However, many factors influence travel behavior. More data is needed before a determination can be made as to whether the recent decreases constitute a long-term trend. Like the oil shortages in the 1970s, there are many unknown factors:

- » Will fuel prices remain high?
- » Will drivers permanently adjust their driving habits and drive less or are the changes temporary?

- » How will increased fuel efficiency or new fuel alternatives influence driving habits?

WisDOT forecasts vehicle miles traveled to grow at 1.33 percent per year from 2005 to 2030. Of this total, passenger vehicle miles traveled are forecast to grow 1.16 percent per year while commercial vehicle miles traveled are forecast to increase 2.89 percent per year.

This forecast is a best-fit trend line or average for all years in the forecast. Actual year-by-year numbers are expected to show passenger vehicle miles traveled increasing at a decreasing rate (tapering growth) over time. Fuel prices may have an impact on vehicle miles traveled increases over time. While current conditions cannot be considered a trend, WisDOT will continue to monitor changes in vehicle miles traveled and adjust its forecasts as appropriate.

Regardless of whether vehicle miles traveled increase or decrease, the state’s transportation system will continue to have extensive needs due to infrastructure age and usage. Even if vehicle miles traveled were to decrease, projections indicate that freight truck traffic will increase significantly through 2030. This increase alone will contribute significantly to infrastructure deterioration and capacity considerations. In addition, addressing system safety needs will remain a top department priority. As a result, responses to safety needs will persist regardless of reductions vehicle miles traveled. The amount of freight moving through Wisconsin is expected to grow throughout the planning period. Even though the total amount of freight shipped is expected to increase across all modes (air, rail, water and trucking), trucking is expected to remain the dominant mode of freight transportation for Wisconsin. However, if fuel costs continue to rise, Wisconsin’s freight rail system may become more competitive with trucking for shorter haul distances. By 2030, freight rail traffic is expected to increase 60 percent over current levels.

The draft plan policies that may impact the environment and affect congestion are not limited to highway related projects. Highway-related projects are not the only types of disruptions or

activities that may affect congestion. Vehicle crashes or decisions altering the number and distance of access points can affect congestion levels. Natural disasters and special events may also affect congestion. Many plan policies seek to address the congestion challenges created by these disruptions or activities.

As noted under the state trunk highway section of the modal comparison discussion and Table 14-2, the base case and draft plan identify approximately 2,000 centerline miles of potential passing lane improvements and 800 centerline miles of potential additional lanes. Other policies identified in the draft plan have the potential to add to the system's traffic carrying capacity as well as reduce and manage congestion. These include:

- » Developing a statewide congestion management plan and program
- » Working with transportation management areas to develop congestion management processes
- » Coordinating with local governments and developers to manage the state trunk highway system more effectively and identify critical links and access points with the local system
- » Continuing to plan and prepare for WisDOT's prompt and consistent response to incidents

Increased modal choices can also reduce traffic congestion. Under the draft plan, WisDOT will:

- » Implement intercity passenger rail service and improved intercity bus service
- » Support public, specialized and human services transit
- » Support airport projects and advocate for direct air service
- » Support bicycle and pedestrian accommodations

The draft plan also addresses the expected increases in freight movement. Under the draft plan, WisDOT will:

- » Establish a freight focus within WisDOT to develop a better understanding of freight-related issues
- » Continue support of rail and harbor assistance programs

Congestion summary

The draft plan provides more and enhanced tools and options than the base case alternative for WisDOT to improve its efforts to address traffic congestion. For example, the draft plan calls for enhanced coordination with the state's largest metropolitan planning organizations, identifying and addressing bottlenecks statewide, coordinating a state level congestion management plan and improving operational efficiencies for the state trunk highway system and other modes as appropriate.

Energy

Energy is required to operate all transportation modes. In 2006, 25 percent of Wisconsin's total energy resources were consumed by transportation. While many factors influencing transportation energy consumption are beyond WisDOT's control (e.g., world oil prices, vehicle fuel efficiency), WisDOT policies can influence transportation choices.

Energy use and consumption depend on transportation mode. Bicyclists and pedestrians are the most energy efficient in terms of the mechanics of energy transfer. For other transportation modes, energy efficiency is affected by several factors including fuel efficiency, number of passengers carried and length of trip. Advancements in technology, such as hybrid vehicles, are improving the energy efficiency of personal automobiles and public transit.

Congestion also impacts energy use and consumption. For example, the Texas Transportation Institute estimates that highway congestion in the Milwaukee urban area results in 10.8 million extra gallons of fuel consumed per year as compared to the fuel needed to travel during free-flow conditions.⁶ In addition to energy consumption impacts resulting from congestion, increases in speeds over 60 miles per hour can



also impact energy use.⁷ Cars and trucks typically achieve better fuel economy at lower speeds.

While the base case and draft plan both support new and improved intercity passenger rail service, the draft plan offers additional opportunities to increase energy efficiency and conservation through actions that support new and improved intercity bus service and public, specialized and human services transit. The draft plan also seeks to manage congestion through congestion management planning and coordination, and optimizing the system’s efficiencies by using a range of tools such as technological strategies like ramp metering and signal timing, as well as improved design elements.

When moved by rail or water, freight transportation, particularly bulk freight, is more energy efficient. Both the base case and draft plan continue rail and harbor assistance programs. However, the draft plan provides additional opportunities to reduce energy use by establishing a freight focus within WisDOT and working with Class I and other railroads to ensure local rail service is maintained, improved and increased.

For additional information on how the base case and draft plan potentially impact congestion, refer to the Congestion section of this chapter.

Energy summary

The draft plan has more transportation choices for both freight and passenger travel than the base case; this may result in reduced energy use. For example, the draft plan proposes to implement the intercity passenger rail recommendations outlined in the Midwest Regional Rail System for initial phases, and evaluate expansion of the intercity network to other areas of the state.

Air quality

Transportation contributes to increased air pollution and poor air quality. The potential air quality impacts discussed here focuses on:

- » Ground-level ozone
- » Particulate matter
- » Greenhouse gas emissions

Ground-level ozone is the primary pollutant of concern in Wisconsin. Ozone is formed when volatile organic compounds and nitrogen oxides combine in the presence of heat and sunlight. Motor vehicle exhaust and gasoline vapors, as well as industrial emissions and chemical solvents, are some of the major sources of volatile organic compounds and nitrogen oxides. While a threshold for human health exposure to ozone has not been established, exposure to ozone has been linked to both acute and chronic adverse health effects, including heart and lung disease. When inhaled into the lungs, ozone can aggravate existing lung diseases, exacerbate asthma attacks and bronchitis, and may shorten life span. Currently, nine Wisconsin counties are designated non-attainment for the 8-hour ozone standard: Door, Kenosha, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha. Particulate matter emissions also affect air quality. Particulate matter is a mixture of solid particles or liquid droplets in the air. Motor vehicle exhaust emits fine particulate matter.⁸ Although a threshold for human health exposure to fine particles has not been established, both acute and chronic exposures to fine particles have been linked to heart and lung disease. Like ozone, when inhaled into the lungs, fine particles can aggravate existing heart and lung diseases and cause cardiovascular symptoms, arrhythmias, heart attacks, chronic obstructive pulmonary disease, asthma attacks, and bronchitis. The U.S. EPA has designated three Wisconsin counties as non-attainment for the particulate matter 2.5 standard.

Greenhouse gas emissions, which include gases such as carbon dioxide, methane, and nitrous oxide, trap heat in the earth’s atmosphere. The burning of fossil fuels and the resulting greenhouse gas emissions, particularly carbon dioxide, are the largest

⁶ Texas Transportation Institute, *The 2007 Urban Mobility Report*, September 2007.

⁷ Each 5 miles per hour drive over 60 miles per hour is like paying an extra \$0.20 per gallon for gas. Source: U.S. Environmental Protection Agency. <http://www.fueleconomy.gov>.

⁸ Fine particles are 2.5 micrometers in diameter and smaller. They are also referred to as PM2.5.

contributors to the human causes of climate change. Carbon dioxide emissions from transportation sources account for one-third of all carbon dioxide emissions. In total, the transportation sector emits approximately 25 percent of all U.S. greenhouse gas emissions.⁹ As a result of reducing congestion and improving state trunk highway efficiency, the base case and draft plan may improve air quality. Free-flow traffic conditions result in fewer emissions than stop-and-go traffic. For more information, refer to the Congestion section of this chapter.

Increased availability of modal choices, such as intercity passenger rail, intercity bus, transit, and bicycle and pedestrian accommodations, may also improve air quality by reducing the number of single occupant vehicles. In addition, the department is evaluating opportunities to integrate on-site electrification for the *Hiawatha Service* at the Milwaukee Intermodal Station. This will help reduce emissions due to rail car idling. The department will also consider integrating this technology into the Midwest Regional Rail System station in Madison. While the base case continues support for intercity passenger rail and pedestrian and bicycle accommodations, the draft plan may result in greater air quality benefits due to the actions supporting improved intercity bus and public, specialized and human services transit service. In addition, the draft plan promotes transportation demand management strategies to improve the efficiency of the transportation network, particularly in metropolitan areas. While increased modal options and transportation demand management strategies will improve air quality, the improvement will be minimal.

In addition to transportation demand management and multimodal policies, the draft plan also outlines strategies and actions aimed at improving incident response times. This not only minimizes secondary crashes, but also can limit the amount of time cars are left idling in traffic. Applying intelligent transportation system strategies are also proposed to address traffic flow considerations and alert drivers to upcoming

incidents. Finally, infrastructure design element updates, such as roundabouts, improved ramp designs and improved signal timing, are recommended not only to address safety concerns, but also to minimize congestion and help keep traffic moving. Freight transportation efficiencies may also improve under the draft plan's freight-related policies. This may result in some industries switching from less efficient freight transportation modes, such as air and truck, to more energy efficient modes such as rail and water. In addition, efforts to add traffic carrying capacity to the system through operational and engineering strategies will help maintain and improve system reliability and help minimize vehicle and truck idling on the highway system. Air quality may improve as a result.

Air quality summary

The draft plan provides more opportunities to improve air quality than the base case due to more and enhanced tools and strategies to reduce congestion, and more travel options to improve energy efficiency and provide alternatives to single occupant vehicles. WisDOT will follow U.S. EPA regulations and address air toxics in environmental documents in accordance with FHWA guidelines. Mobile Source Air Toxics standards will likely become a more important issue in the environmental review process.

Climate change

Assessing the effects of, and possible solutions to, climate change is gaining priority. Nationally, the United States Congress is addressing climate change through several proposed bills. In addition, Wisconsin has begun discussions to evaluate implementing carbon emission caps and trade programs. In 2007, nine Midwest states, including Wisconsin, signed a climate change accord to combat global warming by targeting greenhouse gas emissions with carbon trading programs and other initiatives to meet emission targets. Twelve Midwest states also signed an agreement aimed at reducing dependence on petroleum-based energy sources, particularly foreign oil.

In addition, in 2007 the governor established the Governor's Task Force on Global Warming to look

⁹ U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006*, EPA 430-R-08-005, April 2008.



at actions to curb greenhouse gas emissions. In July 2008, the task force presented its findings and recommendations for a state plan to reduce Wisconsin's contribution to global warming. As of 2007, 720 cities across the United States, including 16 communities in Wisconsin, have signed on to meet the Kyoto protocol's greenhouse gas emission reduction targets (United States Conference of Mayors Climate Protections Agreement).

The burning of fossil fuels and the resulting greenhouse gas emissions - particularly carbon dioxide, but also methane and nitrous oxide - trap heat in the earth's atmosphere and are the largest contributors to climate change. Carbon dioxide emissions resulting from transportation sources account for one-third of all carbon dioxide emissions. In Wisconsin, the transportation sector contributes about 24 percent of greenhouse gas emissions.¹⁰ In general, alternative modes of transportation such as rail, intercity bus, transit, and biking and walking are more fuel-efficient and typically emit fewer carbon emissions per passenger mile than single-occupancy private automobiles, trucks and airplanes. See Tables 14-10 and 14-11 for more information.

Improved vehicle fuel efficiency and emissions, congestion mitigation, and reductions in vehicle miles traveled resulting from increased availability of modal choices, such as intercity passenger rail, intercity bus, transit, and bicycle and pedestrian accommodations, may reduce overall carbon dioxide emissions from the transportation sector and help achieve future greenhouse gas emission reduction targets. The increase in alternative mode choices may reduce the number of single occupant vehicles. In addition, all of the alternative modes mentioned are more energy efficient and emit significantly fewer carbon dioxide emissions per passenger mile than the auto and air modes.

Many national, state and local agencies and stakeholder groups will be involved in managing

efforts to address climate change. As a policy-based plan, *Connections 2030* positions WisDOT to respond to, track and adapt to new climate change initiatives as they are introduced. In addition, the draft plan addresses climate change and energy independence by recommending increases in the state's investment in alternative modes of transportation beyond the base case, as detailed in Chapter 8, *Provide Mobility and Transportation Choice*. These policies are consistent with some of the recommendations of the Governor's Task Force on Global Warming. In both the base case and the draft plan, WisDOT will provide assistance to and follow the governor's policies on climate change and other state and national initiatives, as appropriate, and will continue to track ways to reduce transportation related carbon emissions in the state.

While the base case continues support for intercity passenger rail and pedestrian and bicycle accommodations, the draft plan may result in greater reductions in carbon dioxide emissions from transportation due to the actions supporting improved intercity bus and public, specialized and human services transit services. In addition, the draft plan promotes transportation demand management strategies to reduce vehicle miles traveled, particularly in metropolitan areas.

Climate change summary

Overall, WisDOT recognizes the importance of climate change, and the many different and often conflicting perspectives on energy use, gas prices and impacts to vehicle miles traveled. The draft plan provides more opportunities to reduce transportation related greenhouse gas emissions than the base case because it increases investments in more travel options to improve energy efficiency and provide alternatives to single occupant vehicles. The recommendations related to development of tools and coordination with stakeholders and government entities are also likely to help reduce congestion and provide opportunities to address climate change.

Agriculture

In 2005, Wisconsin's working lands covered 21.4 million acres (or 61 percent) of the state's total

¹⁰ World Resources Institute, *Wisconsin Greenhouse Gas Emissions Inventory and Projections*, 25 June 2007.

34.8 million acres. Of these working lands, 12.1 million acres were agricultural land and 9.3 million acres were forest. From 2000-2005, the state lost 600,000 acres of working lands to non-agricultural development and the growth of undeveloped land. Non-agricultural development lands, commonly known as “development,” occur when agricultural lands are converted to residential, commercial, manufacturing, or other uses. Of these 600,000 acres, 255,000 acres were developed. Undeveloped lands are lands that were previously productive, but are now unfarmed or left fallow. Of the 600,000 acres of agricultural lands lost between 2000 and 2005, 345,000 acres were allowed to go fallow.¹¹

The policies in both the base case and the draft plan that have the potential to impact statewide agricultural land use include:

- » Adding lanes
- » Constructing new interchanges
- » Implementing access management
- » Intercity passenger rail
- » Local roads

Adding lanes and new interchanges

On average, WisDOT impacts approximately 2,000 acres of agricultural land per year statewide, or less than 0.02 percent of the state’s total agricultural land. From 1993-2007, the number of lane miles added per year ranged from 40 to 150 lane miles, with an average of approximately 80 lane miles per year. Using these numbers, and assuming that past trends are a reasonable assumption of future actions, each additional lane mile potentially impacts approximately 25 acres of agricultural land. Note that these impacts are a rudimentary system-wide estimate. Project level decisions regarding whether surrounding land is needed

determines the extent of the actual impact, as well as the potential mitigation strategies.

The base case and draft plan identify about 800 added centerline miles, which includes approximately 400 centerline miles of Major Highway Development program projects. To calculate lane miles, it was assumed that two lanes would be added, for a total of 1,600 lane miles. Adding lanes may potentially impact 40,000 acres of agricultural land, or about 0.3 percent of the state’s total agricultural land. Note that these impacts are a rudimentary system-wide estimate. Project level decisions regarding whether surrounding land is needed determines the extent of the actual impact, as well as the potential mitigation strategies. Passing lanes were not included, as these projects are typically constructed within the existing right of way and do not add capacity.

New interchange construction may also impact agricultural lands. The base case and draft plan identify 50 potential new interchanges. Typical interchanges require 50 to 100 acres of land, depending on the design and function. Using these numbers, 2,500 to 5,000 acres of agricultural land, or 0.04 percent of the state’s total agricultural land, may be impacted by new interchange construction statewide. Note that these impacts are a rudimentary system-wide estimate. Project level decisions regarding whether surrounding land is needed determines the extent of the actual impact, as well as the potential mitigation strategies.

Upgrading highways to expressways may also impact agricultural lands. Expressways are multi-lane highways with at-grade intersections and some interchanges. Alternatively, converting expressways to freeways should have minimal impacts, as freeways are multi-lane highways with access only at interchanges. Since expressways are already multi-lane highways, upgrading the expressway to a freeway would require closing at-grade intersections and constructing interchanges. Many of the upgrades and conversions are included with scheduled capacity and interchange projects to minimize project impacts and maximize the available funds. The base case identifies 40 centerline miles of upgrades and conversions to be

¹¹ University of Wisconsin-Madison, *The Status of Working Lands in Wisconsin: Current Trends and Future Policies*, October 2006.



completed. To calculate lane miles, it was assumed that two lanes would be added, for a total of 80 lane miles. The base case upgrades and conversions may impact 2,000 acres of agricultural land. The draft plan identifies an additional 610 miles of upgrades and conversions. To calculate lane miles, it was assumed that two lanes would be added, for a total of 1,220 lane miles. The draft plan upgrades and conversions could impact 24,000 acres of agricultural land. In both instances, the actual impact to agriculture would be minimal since most of the impacts are already included in the additional lane and interchange impacts discussed previously. Note that these impacts are a rudimentary system-wide estimate. Project level decisions regarding whether surrounding land is needed determines the extent of the actual impact, as well as the potential mitigation strategies.

Access management

Transportation projects that address access onto or off of a state trunk highway may also impact agriculture. Implementation of the *State Access Management Plan* under both the base case and the draft plan will have the greatest potential impact along Tier 1 and Tier 2A routes that maximize interstate and interregional traffic movement and limit access points to the highway. For both of these tiers, field entrances would be allowed on an interim basis, but would be closed if opportunities arose to close driveways during the planning horizon. New driveways would be prohibited. As a result, affected adjacent farmers and other landowners may need to travel farther and spend additional time and resources to continue farming parcels with altered access points. However, impacts to adjacent landowners are carefully considered during any project and efforts to mitigate potential losses are evaluated and implemented where possible.

Intercity passenger rail

Implementation of intercity passenger rail may also impact agricultural land. Under both the base case and draft plan, improvements will be made at roadway-railway crossings, which may close crossings. As a result, farm operations may become less efficient since the movement of farm equipment between fields may require alternative routes and more travel time. The draft plan may have a slightly greater impact on agriculture than the base case because it extends

intercity passenger rail service to regions of Wisconsin not included in the Midwest Regional Rail System.

Local road network

The local road network is a critical component to the overall function of the state's transportation system. Even though WisDOT does not have a direct role in planning, constructing, maintaining or operating the local road system, the department manages and distributes state and federal funding for local road projects. While the base case continues these funding programs, the draft plan emphasizes enhanced coordination between WisDOT and local entities to define a network vision, identify needs, address key safety issues, and encourage sound investment decisions. A safe, efficient and well-maintained local road network supports Wisconsin's agricultural economy and potentially reduces the costs of farming by providing reliable and safe connections.

Agriculture summary

Both the base case and draft plan may potentially impact agricultural lands.

- » Construction of additional highway lanes and interchanges may result in the loss of some agricultural land for transportation purposes. These highway-related impacts may be slightly higher under the draft plan due to the proposed expressway/freeway conversions. As noted, the majority of the expressway/freeway conversions efforts undertaken by the department will include spot improvements and not entire roadway segments.
- » Implementation of the *State Access Management Plan* may impact farm access. These impacts would be very similar for the base case and draft plan.
- » Field access may also be impacted due to implementation of intercity passenger rail. These impacts would be slightly greater under the draft plan.
- » Identifying a vision for local roads and addressing key safety issues may positively impact agriculture. These positive impacts would be greater under the draft plan.

Economic growth

Wisconsin's economic growth relies heavily on the ability of the transportation system to safely transport people, goods, services and information reliably and efficiently throughout the state and beyond Wisconsin's borders. Wisconsin's businesses directly benefit from enhanced freight mobility and connectivity to economic centers both in and out of state. For example, WisDOT's Freight Rail Infrastructure Improvement Program provides funding assistance for improving rail infrastructure used by ethanol plants in Wisconsin.

The base case and draft plan recommend continuing existing programs and policies that support economic growth. These include the Major Highway Development Program, harbor and rail assistance programs, and transportation sector individual and business opportunity growth and development, and policies that support and maintain a reliable and efficient state trunk highway system. These programs and policies can help reduce transportation costs and provide opportunities for Wisconsin businesses, enabling them to be more competitive and better connected to regional, national and international markets.

The draft plan also includes new actions that further support economic growth. These include advocating for improved air service; supporting improved public, specialized and human services transit service; increasing intercity passenger rail service; and improving intercity bus service. For example, improved transit service could expand links to employment opportunities for individuals, particularly those who are transit-dependent. Similarly, improved intercity travel options can increase tourism to areas with new or improved intercity travel service. Under both the base case and draft plan, safety remains a priority for WisDOT. Improved transportation safety not only protects those traveling on the transportation system, but also supports economic growth by reducing the costs related to a range of considerations from property damage and loss of productivity to increased insurance costs. The base case and draft plan policies may also

stimulate job creation through the construction, operation and maintenance of new transportation infrastructure, as well as the continued support of disadvantaged business enterprise opportunities, training opportunities through business and labor capacity building efforts, and continued youth outreach and training programs supported by the department. The draft plan policies may result in improved and expanded economic growth and greater access to job opportunities by implementing improved intercity bus service and improved transit service. Job creation benefits communities as employees spend money on local goods and services.

Economic growth summary

Both the base case and the draft plan support the state's economic growth initiatives. The draft plan provides more opportunities to support economic growth than the base case by:

- » Implementing new actions to further support economic growth, such as advocating for improved air service and supporting improved public transit service.
- » Creating economic opportunities by implementing intercity passenger rail service and supporting improved intercity bus service.
- » Continued investment in the enhancement of the state's highest quality intercity highway network (*Corridors 2030*).

While the draft plan's enhanced economic growth policies will make the state highway system more efficient, they have the potential to negatively affect the environment. For example, policies that enhance roadway capacity during special events may enhance economic growth opportunities but may negatively affect the environment by allowing the number of vehicles to increase on a segment of roadway. The increased number of vehicles may result in more vehicle emissions than would otherwise be emitted.

Community

Every community in Wisconsin has a unique set of values and interests. A community's character



is often closely linked to its history. Community comprehensive plans reflect these cultural resources as natural linkages between the past and present. Transportation investments can have both positive and negative impacts on a community’s social and cultural environment. These impacts can include changes to mobility, accessibility, safety, employment, noise, relocation, isolation, and identity. The type of impact will vary by project and community. Identifying and addressing these impacts appropriately occurs at the project planning and design phase. However, some qualitative assumptions about the potential impacts of the draft plan can be made.

Wisconsin has approximately 6,000 formally recorded intact archaeological sites throughout the state. In addition, the National Register of Historic Places and the Wisconsin Historical Society each list about 1,750 properties as historically significant.

The base case and draft plan both include actions that impact communities. For example, accommodating bicycle and pedestrian travel through the construction of over and underpasses, sidewalks, trails, etc., increases opportunities. In addition, increased support for improved public transit and intercity bus service may encourage individuals to use the bus system rather than single occupant vehicles. The base case and draft plan both continue community sensitive solutions efforts that help ensure that projects are designed to fit the natural, social, environmental and cultural environment. The draft plan also promotes implementation of transportation demand management strategies and enhancing the availability of other modes such as fixed-guideway transit, public transit, and intercity passenger rail to encourage travelers to shift from single occupant vehicles and ridesharing, or look at other travel options.

In addition, the draft plan introduces the department’s use of corridor management as not only a plan implementation tool, but also a method to prioritize dollars and to focus resources to corridor level activities and needs. WisDOT’s corridor management approach will enhance communities’ abilities to:

- » Improve community safety

- » Support future land use plans that seek more compact development
- » Improve accessibility for transit, bicycle and pedestrian modes
- » Incorporate local plans into WisDOT activities

The base case and draft plan also include recommendations to add system capacity, which may impact communities. While the specific activities may impact the environment, these actions may also improve safety, access to services, economic opportunities and transportation choices. The actions with the greatest potential to impact communities include:

- » Additional lanes
- » Increased intercity passenger rail service
- » Support for increased freight rail service
- » Support for fixed-guideway transit
- » Support for airport runway extensions and increased direct air service

Potential negative impacts will vary by project and location. For example, potential impacts resulting from additional highway capacity in urban areas may include:

- » Relocating or displacing businesses and residences
- » Dividing a city or neighborhood with multi-lane, high volume roads
- » Increased noise levels during construction

For example, implementing intercity passenger rail service or increased freight rail service may result in heightened noise levels. Improving rail safety may result in the installation of fencing along rail lines and the closure of existing rail crossings. While these actions address safety issues, they may also limit motor vehicle, bicycle and pedestrian mobility across the rail lines. Increased

rail activity may also impact emergency response times if emergency responders are unable to cross a rail line to reach an incident when a train is passing. Airport activities may have the greatest potential to increase noise levels. Airport runway extensions and increased direct air service may increase noise levels as larger airplanes use the airport and the number of flights increases. However, as technology advancements are adopted in the aviation sector, larger airplanes will become quieter.

Impacts associated with transportation projects are identified at the project level. Efforts are undertaken to avoid these impacts, whenever feasible. When impacts cannot be avoided, efforts are undertaken to avoid and minimize them.

Community summary

The base case and draft plan include actions that may impact communities. The draft plan has a greater opportunity to positively impact communities through the corridor management approach. The draft plan also has a slightly greater opportunity to impact communities due to support for increased freight rail service and direct air service, as well as support for fixed-guideway transit and extending intercity passenger rail service beyond the Midwest Regional Rail System.

Sensitive land and water resources

The diversity of Wisconsin's landscape is a function of a number of factors including climate, soils, existing and historic vegetation, topography, and types of aquatic features. Wisconsin has 16 distinct ecological landscapes, ranging from the Northwest Sands to the Central Sand Hills to a Southern Coastal ecological landscape.¹²

Sensitive land and water resources are some of the most important and valued elements of Wisconsin's natural landscape. These resources include undeveloped woodlands and pastures, critical species habitat, wetlands, park lands, and lakes Michigan and Superior.

All transportation modes have the potential to impact sensitive land and water resources; however, airport,

rail and highway projects (including bridge and other infrastructure) could result in the greatest impacts. The potential impacts are discussed for these areas:

- » Water quality
- » Wetlands
- » Habitat
- » Public lands

Water quality

Wisconsin has more than 12,600 rivers and streams. Of the 44,000 miles of rivers and streams in Wisconsin, about 32,000 miles of these water resources flow throughout the year. In addition, Wisconsin has over 15,000 lakes, most of which are located in the northern half of the state.

The Wisconsin Department Natural Resources (DNR) classifies the state's highest quality waters as "Outstanding Resource Waters" and "Exceptional Resource Waters." These surface waters provide outstanding recreational opportunities, support valuable fisheries, have unique physical features and environmental settings, and are not significantly impacted by human activities. The Wisconsin Department Natural Resources classifies over 200 streams and about 100 lakes and flowages as "Outstanding Resource Waters," and over 3,600 miles, or about 1,500 streams, as "Exceptional Resource Waters."¹³

Wisconsin also has over 600 impaired waters. These waters do not meet state water quality standards. For impaired waters, the Wisconsin Department Natural Resources establishes total daily maximum loads, which identify the amount a pollutant must be reduced to achieve the required water quality standard and meet the designated use of the water body (e.g., fish and wildlife habitat, drinking water supply, fish consumption).

¹² Wisconsin Department of Natural Resources, Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need, http://dnr.wi.gov/org/land/er/wwap/plan/pdfs/02_4_0_Vert_Habitat.pdf, accessed April 2008.



Poor water quality could be caused by many things, such as chemicals in oil, grease or antifreeze. The operation, maintenance and preservation of the state's transportation infrastructure may impact water resources due to storm water runoff. For example, winter operations activities, including the salting and deicing roadways and airport runways, may impact the surrounding environment.

Similarly, construction activities may also impact water resources due to construction-related erosion and runoff. Storm water best management practices, such as silt fences and storm water detention ponds can reduce the potential impacts of construction-related runoff. Apart from increasing sediment levels in a water body, storm water runoff can carry toxic compounds such as oil and fertilizer. Under both the base case and draft plan, WisDOT will continue to use tools and techniques for effective erosion control, water quality management and drainage as related to highway maintenance activities. WisDOT will also continue to follow published storm water and erosion control rules for construction activities.

Potential water quality impacts related to the state trunk highway system are slightly greater under the draft plan due to additional expressway upgrades and expressway-to-freeway conversions. In addition, potential impacts related to intercity passenger rail service, freight rail and airports might be slightly greater under the draft plan.

Under the draft plan, expansion of intercity passenger rail service to other areas of Wisconsin may result in upgraded or new track construction. For freight rail, working with Class I railroads to maintain, improve and increase service may also result in the need to upgrade and construct additional track. Likewise, supporting increased direct air service may result in airports constructing new runways or runway extensions. Each of these activities could potentially impact water quality through an increased amount of impervious surface and increased density of harmful chemicals in runoff.

¹³ Wisconsin Department of Natural Resources, Revisions to Chapter NR 102, Wisconsin Administration Code, January 2006, <http://www.dnr.state.wi.us/org/water/wm/wqs/orwerw/OERW%20Communication%20Outreach%20NON-BOOKLET.pdf>, accessed April 2008.

Wetlands

Wetlands are ecological systems that are typically partially or completely covered by water for part of the year. They are among the most productive natural ecosystems in the world. Wetlands support aquatic plants and provide habitat for more species of plants and animals than any other type of landscape in Wisconsin. Additionally, wetlands improve water quality, decrease flooding and protect shorelines.

Wisconsin has 5.3 million acres of wetlands, most of which are located in the northern portion of the state. The Wisconsin DNR estimates that Wisconsin has lost about half of the estimated 10 million acres of wetlands that were present in the 1800s. On average, WisDOT impacts 120 to 200 acres of wetlands per year, or less than 0.01 percent of the total wetlands in the state. From 1993 to 2006, the total number of lane miles increased by an average of 80 miles per year in Wisconsin. Using these numbers, each additional lane mile, on average, can impact between 1.5 and 2.5 wetland acres.

WisDOT mitigates unavoidable wetland losses using the Wetland Mitigation Banking Technical Guideline established and implemented in cooperation with state and federal agencies. For example, from 1990 to 1997, over 500 WisDOT projects resulted in wetland losses of 1,300 acres. WisDOT compensated for these losses by developing 1,900 acres of wetlands. (For additional information on WisDOT's wetland banking system, refer to the "Emphasize the preservation of protected resources" policy in Chapter 10, *Preserve Wisconsin's Quality of Life*.) Through 2030, WisDOT will continue its commitment to protect and preserve wetlands. However, efforts to locate and fund future wetland bank sites will likely experience greater challenges due to higher real estate costs.

The base case and draft plan identify 800 centerline miles of potential additional lanes, which includes 400 centerline miles of Major Highway Development Program projects. To calculate lane miles, it was assumed that two new lanes would be constructed, resulting in 1,600 lane miles. Using these numbers, 2,400 to 4,000 acres of wetlands could be impacted by adding highway lanes over

the planning period. This represents 0.05 percent to 0.08 percent of the state's total wetlands. Note that these are system-wide estimates. Actual loss and mitigation decisions occur at the project level.

New interchange construction may also impact wetlands. The base case and draft plan identify 50 potential new interchanges. As previously noted, new interchanges require 50 to 100 acres of land, depending on the design and function of the interchange. While some wetland impacts may result from interchange construction, these would only include small parcels of the interchange area. Note that these are system-wide estimates. Actual loss and mitigation decisions occur at the project level.

Upgrading a highway to an expressway may also impact wetlands. Freeway conversions, however, should have minimal impacts since the highways are already multilane roadways and activities would focus on restricting access to interchanges only. The base case identifies 40 miles of upgrades and conversions to be completed. This could impact 100 to 200 acres of wetlands statewide. The draft plan identifies an additional 610 miles of upgrades and conversions that could impact 1,800 acres to 3,100 acres of wetlands. Note that these are system-wide estimates. Actual loss and mitigation decisions occur at the project level. In both instances, the actual impact to wetlands would be less than estimated at the system-level. The actual project-level impacts will be site-specific and most of these potential impacts are already included in the additional lane and interchange impacts discussed in the previous paragraphs.

Potential wetland impacts related to intercity passenger rail service, freight rail and airports might also be slightly greater under the draft plan. Under the draft plan, expansion of intercity passenger rail service to other areas of the state may result in new track construction or upgrading of existing track. Additional Class I rail infrastructure may need to be constructed to maintain, improve and increase existing freight service. Similarly, supporting increased direct air service may result in airports building new runways or runway extensions that could negatively affect wetlands.

Habitat

Transportation projects may impact the environment in which a plant or animal lives, otherwise known as an organism's habitat. Impacts of transportation projects on habitat include fragmentation, introduction of invasive species and negative interactions with endangered or threatened resources.

Transportation investments, such as highways, rail and airports have the potential to fragment habitat. Highway construction along new alignments (such as bypasses), or new rail line construction along new alignments, has a greater potential to fragment habitat than highway or rail investments that occur within the original corridor. New highway alignment will occur under the base case and draft plan as related to the Major Highway Development Program. However, not all Major Highway Development Program projects result in new roadway alignment. In addition, development that may occur near a new interchange, bypass or corridor (indirect effect) may also result in habitat destruction or fragmentation.

While neither the base case nor the draft plan specifically identifies new rail line construction, new intercity passenger or freight service may occur along rail lines that are not currently being used. Because the natural environment may have reclaimed an abandoned rail line, new construction or resuming rail activity along these lines may result in some negative impacts. Some types of airport improvements may also result in habitat fragmentation. Runway or taxiway extensions require additional land that may limit wildlife movement. However, since these projects are limited in scope – generally less than 1,000 feet – the potential for habitat isolation is minimal. Similarly, projects to improve airport approach capabilities may result in habitat changes due to tree clearing or tree topping. The potential for habitat fragmentation related to airport projects are slightly greater under the draft plan than under the base case due to actions supporting improved air service.

Invasive species are plants or animals that are not native to an environment and have the potential to cause severe environmental devastation by



overwhelming native species. Invasive species can also affect the economy by affecting recreational opportunities and public health, as well as incurring mitigation costs. Controlling invasive species is often difficult as they are easily spread by human activities such as transportation maintenance, operation and construction activities. To mitigate this, WisDOT implemented a mowing policy in 2007, which requires mowing equipment to be washed prior to moving to a new site. The draft plan also includes seeking funding to implement an “early detection, rapid response” program to address invasive species in partnership with the Wisconsin DNR. Consequently, the draft plan offers greater opportunities to identify and control invasive species than the base case.

Habitat fragmentation and invasive species may impact endangered and threatened resources. Wisconsin supports a wide range of natural habitats for hundreds of species of birds, fish and mammals. Some of these species are common, but others, such as the Osprey, Butler’s Gartersnake and Ornate Box Turtle, are considered threatened or endangered. Currently over 230 species in Wisconsin are listed as threatened or endangered.

Endangered or threatened species located near transportation infrastructure can be impacted by the construction, operation and maintenance of infrastructure. The greatest potential impacts are associated with highway, rail or airport projects (especially those that involve expansions or runway extensions). Potential impacts to endangered and threatened species as related to the state trunk highway system may be slightly greater under the draft plan due to the greater number of expressway upgrades and expressway-to-freeway conversions over the base case alternative. Potential impacts related to intercity passenger rail service, freight rail and airports might be slightly higher under the draft plan due to the actions discussed under the water quality section in this chapter.

Wildlife collisions are a threat for all transportation modes. Overall, the wildlife hazards associated with the base case and draft plan are similar. However, the

draft plan supports increased direct air service that may result in airport runway additions or expansions. These activities may increase the threat of wildlife strikes, particularly between birds and airplanes. The Federal Aviation Administration has identified numerous land use practices and natural features for airport owners and operators to try to avoid, eliminate or mitigate the likelihood of airplanes striking wildlife.

Public lands

Transportation projects may affect public lands. Wisconsin’s public lands include local parklands, county and state forests, and national wildlife refuges and forests. Wisconsin has about 2.5 million acres of county forest, 2 million acres of national forest, and 0.5 million acres of U.S. Fish and Wildlife lands.

The Wisconsin DNR manages 1.5 million acres of land across the state, including state forests, state parks, wildlife areas, trails, natural areas and forest nursery facilities. Federal regulations protect public lands and require transportation projects to minimize and mitigate any unavoidable impacts. The potential impacts to public lands would be the same for the base case and draft plan.

Sensitive land and water resources summary

Both the base case and draft plan impact sensitive land and water resources. Impacts to public lands would be the same under the base case and draft plan. The draft plan may result in slightly greater impacts to water quality, wetlands, and endangered and threatened species due to:

- » A greater number of expressway upgrades and expressway-to-freeway conversions
- » Upgraded or additional track for freight rail service
- » Expanded intercity passenger rail beyond Midwest Regional Rail System
- » Airport projects to accommodate increased air service

The draft plan offers greater opportunities to identify and control invasive species than the base case.

Indirect effects

Transportation projects can have a wide range of direct and indirect effects on the environment. Direct effects result from a specific project. For example, a project might convert two acres of agricultural land for highway use. Indirect effects associated with transportation projects may be caused by the decisions of others, such as local governments or developers. These effects may:

- » Be viewed as either positive or negative or both, depending on the specific effect
- » Occur later in time, or beyond the project right of way, but can be reasonably foreseeable
- » Include changes in land use, population density, growth rate, economic development, and the rate of development

Factors such as improved access, improved travel time, and change in property values influence the growth and development of communities. Improved access to the transportation system has the potential to induce development and additional travel; however, improved access by itself is not likely to spur development. Instead, other factors need to be present, such as the availability of sewer and water services, market demand and supporting local land use decisions.

Under the base case, the actions with the greatest potential for indirect effects include:

- » New interchanges
- » Access management
- » Intercity passenger rail service

The draft plan identifies additional actions that may have indirect effects. These actions include:

- » Developing a capital and operating assistance program to implement fixed-guideway transit in major metropolitan areas

- » Improving intercity bus service and connections
- » Funding intermodal facilities
- » Funding track and bridge upgrades on publicly owned rail corridors
- » Working with Class I and other railroads to ensure local service is maintained, improved and increased

These actions may result in induced or diverted travel. Induced travel is any increase in daily travel that occurs due to a change in transportation service (e.g., improved transit service) and refers to trips that were not taken before the change. Diverted travel is when existing users move from one service to another service after a change. For example, intercity passenger rail service may divert trips taken on the highway or intercity bus. The amount of induced or diverted travel is location-specific and depends on numerous factors including cost, travel time and ease of use. Depending on perspective, induced or diverted travel can be a positive or negative indirect effect.

A potential positive indirect effect of the base case and draft plan actions may be community or neighborhood redevelopment or infill development – promoted under the state’s comprehensive planning law. For example, the resumption of intercity passenger rail service may result in redevelopment activities near rail stations. Also, WisDOT’s Corridor Management Program and the corridor management approach will be used to help coordinate land use decisions along corridors by establishing a common vision for those corridors. By looking beyond the traditional highway right of way, the corridor management approach considers adjacent land uses, development pressure, and multimodal system needs to prioritize planning studies. These planning studies often include coordination with local governments and public involvement opportunities.

The indirect effects associated with implementing the base case or draft plan are often beyond WisDOT’s control. While WisDOT will work with local governments and private entities to assess potential impacts on the transportation system, the local government or private entity makes the final decision.



Indirect effects summary

The draft plan may result in more indirect effects than the base case due to additional actions implemented under the draft plan such as funding intermodal activities and improving intercity bus service and connections.

Cumulative effects

Cumulative effects are the total effect of past, present and future activities or actions on an environmental resource. Transportation project impacts are just one of many categories of impacts. Other factors include additional transportation and infrastructure developments, as well as all public and private development projects. For this reason, cumulative impacts differ based on individual communities and environmental resources. Cumulative effects are the result of the combined actions of various agencies and private entities. WisDOT is responsible for mitigating effects of WisDOT projects. The department is not responsible for, nor required to mitigate, the impacts caused by non-WisDOT actions. However, WisDOT will provide information on potential cumulative effects and will work with local governments and other interested stakeholders to suggest potential mitigation strategies for those effects.

Based on the potential direct and indirect effects described previously, the following resources have the greatest potential for negative cumulative impacts:

- » Water quality
- » Wetlands
- » Endangered and threatened species
- » Agriculture
- » Water quality
- » Air quality

Mitigation

As noted in the previous sections, implementing the actions in both the base case and draft plan may impact

the environment. In some instances, there will be unavoidable impacts. However, in all cases, WisDOT will work to avoid, minimize and mitigate impacts. *Connections 2030* identifies numerous policies and actions to mitigate these potential impacts. For example, the draft plan identifies department policies and specific implementation strategies to address air quality, protection of sensitive resources, wetland banking, congestion management, coordination, data sharing to improve communication and analyses, and actions related to the effects of transportation decisions on surrounding land uses. Most of these are discussed in Chapter 10, *Preserve Wisconsin's Quality of Life*; however, other actions are mentioned throughout the plan. The environmental resource agency and tribal consultation processes identified additional mitigation strategies to minimize the potential impacts of implementing *Connections 2030* (Appendix B).