

11 – Chapter 11: System-Plan Environmental Evaluation

11.1 Introduction

This chapter discusses the System-Plan Environmental Evaluation (SEE) developed in conjunction with the Wisconsin State Freight Plan. This evaluation provides a qualitative review of potential environmental impacts resulting from the strategies presented in Chapters 8, *Freight Policies and Strategies*, and 9, *Investment and Implementation*, of the plan. The evaluation discussed in this chapter is in accordance with Wisconsin Administration Code, Trans 400 *Wisconsin Environmental Policy Act Procedures for Department Actions*.

This chapter highlights:

- The definition and function of a SEE
- Freight Plan development process
- Description and comparison of Base Case and State Freight Plan
- Assessment of potential impacts
- Impact avoidance, minimization, or mitigation strategies

SEE Definition, Function and Regulatory Requirements

Trans 400 defines the process to review the potential environmental impacts of a system plan in accordance with the Wisconsin Environmental Policy Act. This review is referred to as a System-plan Environmental Evaluation (SEE), which is required when a long-range plan includes recommendations that are deemed to have potentially major and significant impacts to the natural environment. The freight plan proposes the continuation of many existing policies and programs, but it also includes the development of new freight strategies, requiring the development of a SEE. The inclusion of this evaluation contributes to WisDOT's policy of meeting transportation needs while also minimizing environmental impacts. The SEE further supports WisDOT's mission of providing leadership in the development and operation of a safe and efficient transportation system.

Trans 400 Definitions

- **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.
- **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.
- **Base Case** – a future condition which assumes no major shift in policies or resources away from WisDOT's current direction. The Base Case is the continuation of existing and present day policy action items.
- **State Freight Plan** – an alternative future condition, in contrast to the Base Case, which includes policies, investment, and implementation strategies developed following analysis of projected freight volumes and movement.

The completion of a SEE analysis reviews potential environmental impacts as a result of the State Freight Plan, compared to the Base Case plan, which is the continuation of existing and present day WisDOT policy action items. The content of the evaluation is conceptual and qualitative, and is not meant to replace project-level environmental reviews. Additional review of environmental impacts resulting from specific projects is required during project development. The qualitative review of impacts at the system plan level provides many benefits, including a streamlined environmental review process¹, interagency coordination, and regional/local consistency for the analysis of potential impacts.

Plan Development Process

Early Outreach

Early stakeholder involvement is a key component of the long-range planning process, as it helps to understand the base condition upon which the plan is built. Stakeholder engagement also helps to define specific strengths and weaknesses of the existing system that can be addressed in the project development and implementation strategies. Chapter 3, *Public Involvement*, provides an overview of the early outreach efforts with Wisconsin's MPOs and RPCs, local and county officials, Tribal organizations, and other local, state and federal organizations. Consultation efforts with environmental resource agencies, such as the United States Environmental Protection Agency, Wisconsin's Department of Natural Resources, and the National Park Service, predominantly informed the SEE.

All freight modes were discussed during the early outreach process, and the following themes emerged:

- Movement of hazardous materials
- Transload facility needs
- Funding for first and last mile connections
- Funding for key freight infrastructure through the FAST Act
- Link between intermodal connection and economic development
- Data sharing between entities
- Streamlining of regulatory process

Freight stakeholders groups were also engaged during the early outreach efforts. Key topics and issues identified at these meetings included:

- Alternative fuels - Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG)
- First- and last-mile connections
- Rail service and accessibility
- Intermodal connections
- Implements of husbandry state law implementation
- Performance measures
- Prioritization of funding
- Port accessibility and corridor preservation

¹ On January 13, 2013, the U.S. DOT published the final rule on "Environmental Impact and Related Procedures." The rulemaking established requirements to streamline the environmental review process and was required as part of Moving Ahead for Progress in the 21st Century (MAP-21), the two-year transportation authorization bill signed by President Obama in July 2012.

Plan Development

WisDOT's long-range plan development process includes the following elements: a review of existing documents/policies, system inventory, forecast of future demands, analysis of trends and issues, and plan development. Beyond the critical input received from the early outreach process, WisDOT used various data resources to understand the existing state of the freight system and developed analytical tools to identify needs and assess effects.

Multiple tools and methodologies were developed by WisDOT to analyze the system with the goal of identifying and prioritizing freight transportation investments. Integral in the development of overall plan strategies was the utilization of criteria to define a weighted "freight factor" score. This tool helped to prioritize the strategies and assist in the development of multimodal freight investments through public funding sources. The freight factor score is weighted by how important a particular segment is to freight movement in Wisconsin, which is based on tonnage, value, and economic importance. The resulting freight factor score for each mode helped to shape the forecasts and policy recommendations outlined within the plan. Chapter 5, *Wisconsin's Transportation System Assets*, provides additional details regarding tools and methodologies used to analyze the system.

Relationship to Environmental Justice Analysis

Chapter 10, *Environmental Justice Analysis*, includes an analysis of potential impacts on low income, minority, youth, elderly, disabled, and zero vehicle household populations resulting from plan implementation of the freight plan's recommendations. Environmental justice analysis is completed by WisDOT in conjunction with the Department's mission to serve as responsible stewards of transportation investments, from project development through to implementation. Impact analysis of the identified populations informs project level development and ensures potential impacts upon these populations are considered more equitably throughout project implementation.

Additionally, the Environmental Justice (EJ) analysis satisfies Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."² The purpose of Executive Order 12898 is to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations. Executive Order 12898 requires that the proposed actions be reviewed to determine if there are "disproportionately" high or adverse impacts on these populations. "Disproportionate" is defined in two ways: the impact is "predominantly borne" by the minority or low-income population group, or the impact is "more severe" than that experienced by non-majority or non-low-income populations.

Potential impacts resulting from the recommended actions are analyzed at the system or statewide level to determine what actions, if any, may disproportionality affect low-income and minority populations. Similar to the analysis included in this chapter, a detailed EJ analysis is required as part of a project-level review since this analysis is required by federal law. The results of the EJ analysis play an important role in the overall impact of the freight plan.

In addition to low income and minority populations, the EJ analysis evaluated impacts to youth, senior, disabled, and zero-vehicle household populations. While not required for analysis under Executive Order 12898, these populations may be susceptible to impacts created by freight movement and are included as part of the analysis.

² Executive Office of the President, "Executive Order 12898." (February 11, 1994)

The SEE and EJ analyses include the review of similar categories that work together to provide the holistic review of the freight plan. Air quality, economic development, and community impacts are analyzed and discussed in both chapters, each using a different context. The SEE considers the potential impacts to multiple environmental categories³ at a statewide level; while the EJ analysis focuses on minority, low-income, youth, senior, disabled, and zero-vehicle populations at a statewide level. Refer to Chapter 10, *Environmental Justice Analysis*, for complete definitions of these population categories.

Relationship to Quality of Life

The SEE provides an analysis of potential environmental impacts resulting from the freight plan policy recommendations. While a statewide plan, these policies and their potential impacts may affect individuals at the local level. Local-level environmental review is conducted as part of WisDOT projects and includes several strategies which aim to avoid, minimize, or mitigate environmental impacts. Together, the SEE and EJ Chapters help to inform project level environmental analysis.

Impact avoidance, minimization, and mitigation strategies discussed later in this chapter, demonstrate the efforts WisDOT employs to protect the natural environment and enhance quality of life throughout the state. These efforts are defined as policies, procedural requirements, and strategies at the state and project level.

SEE Outreach

Consultation with environmental agencies is a critical step in the planning process, but also a state and federal requirement in the development of long-range plans. In addition to Trans 400 requirements, the FAST Act and 23 CFR 450 – Statewide and Nonmetropolitan Transportation Planning Rule, requires the state to develop long-range statewide transportation plans, in consultation with state, Tribal, and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.

In order to obtain a comprehensive understanding of the current state of environmental policy and changing or emerging trends, consultation was held with various local, state, and federal agencies, including those mentioned in this chapter's Plan Development Process section as well as others such as the Pipeline and Hazardous Materials Safety Administration and Wisconsin's Department of Agriculture, Trade and Consumer Protection, during the development of the SEE. Initial outreach was held early to develop an understanding of current issues, trends, and policies. Refer to Chapter 3, *Public Involvement*, for more information on the early public involvement efforts held for the State Freight Plan.

Early Environmental Resource Agency Outreach

Early consultation with local, state, and federal environmental resource agencies was an important step in the development of the SEE. Discussion among stakeholders focused on existing concerns, programs, and policies related to multiple environmental categories. Major themes resulting from the conversation included (see Appendix 11-1 for additional information):

- Existing state and federal programs and policies related to wetland, air, noise, and other environmental impacts should be considered during the analysis

³ Wisconsin Administration Code, Trans 400 Wisconsin Environmental Policy Act Procedures for Department Actions, requires that the SEE examine the range of potential system impacts in the following environmental categories, including: sensitive land resources, sensitive water resources, air quality, energy consumption, traffic congestion, economic development, and communities.

- Secondary impacts resulting from the development of large distribution centers should be considered as part of the initial development
- Concerns of congestion and delays at loading facilities and distribution centers
- The provision of adequate off-site facilities (i.e. rest areas, overnight parking, etc.) are a concern with the development of new facilities

11.2 Modal Comparison of Base Case and State Freight Plan

The Base Case describes a future condition which assumes no major shift in policies or resources away from WisDOT's current direction. The Base Case is the continuation of existing and present day policy actions. A Base Case, or existing system, provides a comparison for the potential impacts resulting from the State Freight Plan alternative. The Base Case considers the continued practice of the existing programs, policies, and requirements of WisDOT on the five freight modes into 2040. No major shifts in policies or resources were assumed for the Base Case. This should not be considered a no-build alternative, as WisDOT will continue to proceed with planned infrastructure development into 2040.

Multiple existing long-range system plans and reports contribute to the Base Case condition, including *Connections 2030*, *Wisconsin Rail Plan 2030*, *2030 Wisconsin State Airport System Plan*, and *Keep Wisconsin Moving*. These plans outline policies and procedures that are currently employed by WisDOT and expected to continue through 2030, defining the Base Case for the State Freight Plan SEE analysis.

Many existing department policies and programs focus on strategies for specific modes. However, there are a few that are multimodal and focus on freight movement:

- Establish a freight focus within WisDOT to better understand freight needs across the state and to integrate freight transportation policies into department planning and investment decision-making processes
- Seek innovative ways to maintain an all-mode freight network to improve efficiencies among the modes and facilitate movement of goods
- Assume the role of facilitator and advocate for freight between public and private interests
- Collect and analyze data to support freight planning
- Partner with stakeholders to ensure that freight movements are safe, reliable, and provide positive environmental and community impacts
- Improve emergency response to improve transportation system resiliency
- Support individuals and businesses related to transportation by providing loan assistance to Wisconsin businesses and communities
- Partner with consumers and businesses to increase transportation sustainability

Discussion of Base Case by Mode

Highways

Freight movement by truck throughout Wisconsin is dependent on the state trunk highway system, including Interstates, US highways and state highways. Nearly 12,000 miles of highway provides a network for the movement of goods, commodities, raw materials, and hazardous materials via truck to destinations within the

state and other parts of the United States.⁴ Of the five modes of freight movement, WisDOT has responsibility over freight movement by highway, with a primary responsibility of maintaining and preserving the state trunk highway system for the safe and efficient operation of the transportation system.

Table 11-1: Highways Freight Tonnage

	Originating	Terminating
2013 Tonnage	210,154,768	193,536,142
2040 Tonnage (projected)	390,234,435	332,965,120

Source: 2013 IHS Transearch Database

Many of WisDOT's current policies and programs are focused on the preservation of the trunk highway system, influencing the movement of freight. The Six Year Highway Improvement Program lists scheduled highway projects within the state and cost estimate information. The projects listed reflect the department's intent to improve the state highway system based on assumptions about available revenue, inflation, and legislative decisions. As these assumptions change, so does the program.

Policies range from broad measures benefiting multiple forms of movement on the highway system to specific freight-related actions. Current policies, investment strategies, and programs include:

- Preserve Wisconsin's state trunk highway system infrastructure
- Develop, implement, and expand technology for monitoring highway operations to manage state trunk highway traffic
- Monitor state trunk highway system conditions, and address operation and maintenance needs
- Identify methods to improve traffic movements
- Improve the reliability and efficiency of state trunk highway operations
- Actively manage the daily operation of the state trunk highway network via the State Traffic Operations Center and other technology systems
- Plan and prepare for WisDOT's prompt and consistent response to incidents
- Provide permits to freight trucks moving through the state
- Optimize traffic movement on the state trunk highway system by utilizing tools to improve existing capacity and, where necessary, adding capacity
- Explore emerging technologies related to the movement of goods, including real-time tracking of hazardous materials, radio frequency identification to track shipments, and use of Global Positioning System (GPS) to notify commercial drivers of real-time conditions.
- Preserve the local road and bridge system
- Assess impacts of freight on highway maintenance costs

Local Roads

Wisconsin's local roads serve as a critical link in the movement of freight traffic throughout the state – particularly connecting the state trunk highway system with intermodal freight facilities. This first/last mile linkage is an important part of the overall freight system and efficient flow of commodities throughout the state.

⁴ Wisconsin Department of Transportation, Bureau of State Highway Programs.

To address local road challenges, Chapter 8, *Freight Policies and Strategies*, identifies policies and strategies that support Wisconsin's local roads and bridges. These policies include:

- Assist in providing asset management strategies and tools for local governments to ensure that selected system preservation improvements provide cost-effective service life extension
- Work with local entities to identify and address key safety issues on the local system
- Partner with local governments to manage and invest in the local road and bridge network

While the state's overall freight system is dependent upon local roads, WisDOT does not have a direct role in the planning, construction, maintenance, or operation of local road systems. These responsibilities are typically held by the operating local jurisdiction. In an effort to provide assistance for local governments and ensure infrastructure investments align with state transportation goals, WisDOT provides local project funding through various programs.

Transportation funding programs specific to freight flows, which assist local governments with needed improvements, include:

- General Transportation Aids (GTA): The second largest program in WisDOT's budget, GTA returns to local governments roughly 21.8 percent of all state-collected transportation revenues (fuel taxes and vehicle registration fees) - helping offset the cost of county and municipal road construction, maintenance, traffic, and other transportation-related costs.⁵
- Connecting Highway Aids: Assists municipalities with costs associated with increased traffic and maintenance on roads that connect segments of the State Trunk Highway System.
- Local Bridge Improvement Assistance: Allocates federal and state funds to help local governments rehabilitate and replace the most seriously deficient existing federal-aid-eligible local structures on Wisconsin's local highway systems.
- Local Roads Improvement Program (LRIP): Assists local governments in improving seriously deteriorating county highways, town roads, and city and village streets.
- Airport Improvement Program: Combines federal and state financial resources to help fund improvements to public-use airports throughout the state.
- Freight Railroad Infrastructure Improvement Program (FRIIP): Provides loans that assist with improvements to rail infrastructure, highway/grade crossings, and the construction of new rail-served facilities in an effort to boost economic activity. Eligible applicants include private industries, railroads, and local governments.
- Freight Railroad Preservation Program (FRPP): Provides grants to local governments and public entities that cover up to 80 percent of the costs of rail projects designed to preserve rail service or rehabilitate fixed-facilities on publicly-owned rail lines. Projects can include the purchase of rail lines in an effort to preserve freight rail service.
- Harbor Assistance Program (HAP): Assists Wisconsin harbor communities along the Great Lakes and Mississippi River with projects that maintain and improve waterborne commerce. Eligible applicants include municipal and Tribal governments.
- Transportation Facilities Economic Assistance and Development Program (TEA): Provides 50 percent matching grants of up to \$1 million that help local municipalities complete road, rail, harbor, or airport improvements that create or retain jobs.

⁵ Wisconsin Department of Transportation, Bureau of Transit, Local Roads, Railroads and Harbors.

Railroads

WisDOT works with the Rail Transit Commissions and the Office of the Commissioner of Railroads to maintain, improve, and increase freight rail service on a regular basis. WisDOT owns 617 miles of railroad and coordinates planning and investment issues with Class I and Class II railroads.⁶ The Surface Transportation Board categorizes railroads as Class I or Class II based on annual carrier operating revenues thresholds. Class I railroads are defined as a carrier generating annual revenues exceeding \$447.6 million (as of 2017) and Class II railroads are defined as a carrier having revenues between \$35.8 million and \$447.6 million (as of 2017).⁷

Table 11-2: Railroad Freight Tonnage

	Originating	Terminating
2013 Tonnage	28,119,363	61,319,227
2040 Tonnage (projected)	51,340,697	72,743,885

Source: 2013 IHS Transearch Database

WisDOT currently has a variety of policies specific to the railroad system and the movement of goods via rail. Investment strategies, planning efforts, and service improvements are defined as WisDOT railroad policies and programs. Current policies, programs, and strategies include:

- Continue state assistance programs for rail improvements
- Continue to fund track and bridge upgrades for publicly-owned rail corridors
- Fund track upgrades for publicly-owned rail lines to preserve the existing system and, where appropriate, meet changing industry standards
- Monitor the CREATE Program's progress and partner with Illinois to support additional federal funding to move the improvements forward. The CREATE Program is a partnership between the United States DOT, the State of Illinois, City of Chicago, Metra, Amtrak, and the nation's freight railroads that was established to invest in critical capital improvements to increase efficiency of the region's rail infrastructure
- Investigate new policies and new financing strategies for projects that improve freight service
- Provide loan assistance to Wisconsin businesses and communities
- Support increased investment in rail infrastructure in response to shipper needs and market demands
- Work with railroads to ensure that appropriate rail service will be provided to all shippers statewide
- Explore opportunities to increase freight rail penetration of Chicago-directed traffic flows through intermodal offerings and expanded direct carload service to Chicago interchanges by Wisconsin's short-line partners
- Continue to support freight rail shippers and short-line carriers in preserving service to light-density rail lines
- Support freight shipper investments that permit new or continued local service in high-traffic areas; in some cases relocation support for a rail shipper to move to a branch line or short-line served point may prove to be a more cost-effective option for continue rail service
- Continue to maintain the availability of essential railroad service to maintain and expand economic development opportunities, including efforts to acquire abandoned rail lines, or preserving corridors for future transportation use through trails, rail banking, or land banking, where appropriate
- Facilitate relationships to reduce the number of abandonments and strengthen the market for rail
- Conduct detailed studies of publicly-owned rail line infrastructure needs

⁶ Wisconsin Department of Transportation, Bureau of Transit, Local Roads, Railroads and Harbors.

⁷ Surface Transportation Board, "FAQs."

- Continue to offer planning support to metropolitan planning organizations and regional planning commissions throughout the state in considering transportation needs that support developing rail-friendly industrial development sites
- Develop outreach to, and foster relationships with, all Wisconsin railroad operators to keep abreast of market demands and railroad interests
- Monitor railroad activity and create partnerships among businesses and railroads to increase the use of rail
- Continue to monitor changes in international trade flows and work with communities that are impacted by dramatic changes in train frequencies
- Encourage dialogue with major rail carriers and Wisconsin business interests to leverage container backhaul capacity for improved Wisconsin export access to foreign markets
- Include external stakeholders, as appropriate, during policy-setting activities

Waterways and Ports

Wisconsin's geographic position between three water bodies that serve as major freight corridors, the Mississippi River, Lake Superior and Lake Michigan, enhances the importance of the movement of freight by water nationally and internationally. Twenty-nine ports and harbors dispersed along the northern, eastern, and western borders of the state provide a connection for the movement of goods to and from Wisconsin.⁸ WisDOT provides funding and support for improvements to harbors and ports, which include dredging and channel maintenance activities. Coordination between WisDOT, the Wisconsin Commercial Ports Association, and port owners and operators helps to address port and waterway issues.

Table 11-3: Waterways and Ports Freight Tonnage

	Originating	Terminating
2013 Tonnage	19,030,673	9,303,554
2040 Tonnage (projected)	23,897,937	10,379,989

Source: 2013 IHS Transearch Database

The Base Case focuses on the enhancements to and future planning for existing harbors, ports, and waterfronts throughout the state. These strategies include:

- 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 harbor improvements
- Encourage comprehensive harbor and waterfront land use planning
- Examine and address roadway issues at ports

⁸ Wisconsin Department of Transportation, Bureau of Transit, Local Roads, Railroads and Harbors.

Aeronautics

Air cargo continues to be an important method for the movement of freight, especially for expensive or time bound shipments. Of the 98 airports statewide, twelve airports account for approximately 105,000 tons of air cargo shipped annually.⁹ WisDOT provides planning and funding assistance to maintain and improve infrastructure and air service at all of Wisconsin's airports.

Table 11-4: Aeronautics Freight Tonnage

	Originating	Terminating
2013 Tonnage	57,965	56,009
2040 Tonnage (projected)	275,003	114,377

Source: 2013 IHS Transearch Database

Current policies related to the movement of cargo by air focus on improvements and updates to existing infrastructure throughout the state. Many policies are closely tied to the airport system as a whole, including the movement of freight and passenger flights, including:

- Address airport system needs through the Airport Improvement Program, coordination with owners and operators and *State Airport System Plan* update efforts
- Provide airport infrastructure to attract business-supporting economic growth
- Provide a system of airports that meets existing and future needs

Pipelines

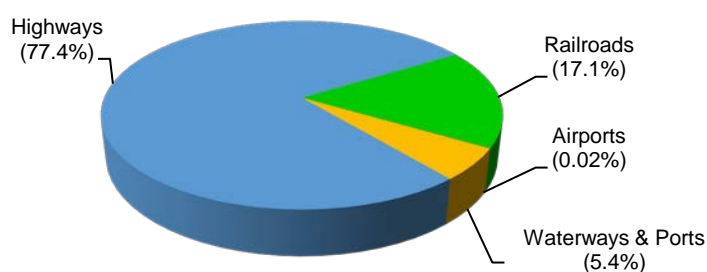
The movement of freight via pipeline occurs entirely within privately-owned infrastructure. WisDOT has a limited role with pipeline planning and development, which is limited to the construction of facilities within state highway right-of-way; however, as a mode of multimodal freight movement, pipelines have been included as a part of the statewide multimodal freight plan. Although WisDOT does not retain any oversight of pipeline infrastructure, coordination between private sector and other federal agencies is necessary in response to disruptions in service. Currently, there are no specific policies or requirements within the Base Case to use for comparison.

⁹ 2013 IHS Transearch Database.

Discussion of State Freight Plan Alternative

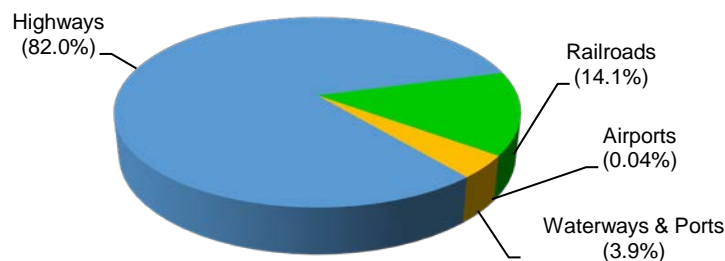
The Wisconsin State Freight Plan analyzes the existing condition and future of the multimodal transportation system throughout the state. Forecasts were projected for the future volumes of freight movement into 2040, as shown in Figure 11-1 and Figure 11-2. These forecasts did not include scenarios set forth by the recommendations in the freight plan. In 2013, a total of nearly 522 million tons of freight originated or terminated in the State of Wisconsin via highways, railroads, waterways and ports, and airports. Highways were the primary mode of freight movement, moving over 75 percent of the tonnage in 2013. The State Freight Plan forecasts that by the year 2040, over 880 million tons of freight will be moved through Wisconsin, representing an increase of nearly 70 percent. Freight tonnage for each mode is expected to increase throughout the state; however, highway and airport freight movement is anticipated to contribute a larger percentage in the state by 2040.

Figure 11-1: Total Freight by Mode (522 million tons in 2013)



Source: 2013 IHS Transearch Database

Figure 11-2: Total Freight by Mode (882 million tons in 2040)



Source: 2013 IHS Transearch Database

The Wisconsin State Freight Plan is a policy-focused plan, which incorporates a needs-based approach that outlines WisDOT's vision for project direction and implementation for the movement of freight throughout the state. The SEE analysis utilizes policies which outline improvements to highways, railroads, waterways

and ports, aeronautics, and pipelines aimed to address the plan's overall goals. Under the State Freight Plan, WisDOT identifies policies for improving freight operations, facilities, planning and overall system functionality. These recommendations build upon the existing policies of *Connections 2030* and other long-standing freight policies and practices used to develop the Base Case. The State Freight Plan alternative discussed includes new and revised policies for implementation of the plan. The policies outlined in Chapter 8, *Freight Policies and Strategies*, apply to the system as a whole or are specific to an individual mode, and are grouped in the following categories:

- Highway Policies, Strategies, and Data Analysis
- Local Roads Policies, Strategies, and Data Analysis (included within the discussion of highways for this chapter)
- Railroad Policies, Strategies, and Data Analysis
- Ports and Waterways Policies, Strategies, and Data Analysis
- Aeronautic Policies, Strategies, and Data Analysis
- Pipeline Policies and Strategies

Wisconsin State Freight Plan Goals
<ul style="list-style-type: none"> • Enhancing safety, security, and resiliency • Ensuring system preservation and enhancement • Enhancing system mobility, operations, reliability, efficiency, and connectivity

In addition to freight policies and strategies in Chapter 8, *Freight Policies and Strategies*, Chapter 9, *Investment and Implementation*, fulfills FAST Act requirements by outlining investment and implementation strategies at the project level. Federal formula dollars may be spent only on the projects found on the National Highway Freight Network (NHFN), which is a highway-only network. These freight-specific funds are used to improve the movement of freight on the NHFN. Up to ten percent of state federal formula dollar apportionments can also be used for freight rail and intermodal freight projects. Projects identified in Appendix 9-1 and 9-2 in Chapter 9, *Investment and Implementation*, are programmed through various federal, state and local funding sources.

As a system-level evaluation, the analysis in the SEE does not attempt to evaluate environmental impacts of the construction projects programmed in Appendix 9-2. This level of analysis is needed for construction projects and conducted on a project by project basis in accordance with NEPA and/or WEPA requirements. Rather, the SEE focuses on broader, system-wide impacts of the policies defined in Chapter 9 and the potential environmental impacts they may have throughout the state. For more information regarding specific freight projects and funding, please refer to Chapter 9, *Investment and Implementation*.

Discussion of State Freight Plan Modal Comparison

The Wisconsin State Freight Plan continues or updates the current policies implemented by WisDOT for the preservation or enhancement of the freight system. These current policies were used to develop the Base Case alternative described within this chapter. Tables 11-5 through Table 11-9 outline the policies and strategies of the Base Case and State Freight Plan alternatives, highlighting a comparison between the two. Nine additional policies were developed as a result of the public input meetings, described in Chapter 3. These nine policies are identified in the following tables with an asterisk. The new policies support the vision and direction of the originally defined policies; therefore, the qualitative assessment, described in section 11.3 remains unchanged.

As discussed previously, WisDOT plays a primary or supporting role for the implementation or management of funding programs and policies regarding freight movement via highways, railroads, waterways and ports, and aeronautics. WisDOT maintains a limited role with pipelines, working with other agencies to support the

movement of freight via pipeline throughout the state. Due to WisDOT's limited role, pipelines have been excluded from the modal comparison and the environmental evaluation. WisDOT will continue to work with external partners regarding pipeline development and will support their existing policies and procedures for addressing environmental impacts.

Table 11-5: All Modes Comparison of Base Case and State Freight Plan

Base Case	State Freight Plan	Comparison
Improve standards for infrastructure	Improve standards for infrastructure	Improve standards for infrastructure
Enhance security of the transportation system by reducing vulnerability	Enhance security of the transportation system by reducing vulnerability	Enhance security of the transportation system by reducing vulnerability
Improve emergency response to make the transportation system more resilient	Improve emergency response to make the transportation system more resilient	Improve emergency response to make the transportation system more resilient
Partner with stakeholders to ensure that freight movements are safe, reliable, and provide positive environmental and community impacts	Partner with stakeholders to ensure that freight movements are safe, reliable, and provide positive environmental and community impacts	Partner with stakeholders to ensure that freight movements are safe, reliable, and provide positive environmental and community impacts
Partner with consumers and businesses to increase transportation sustainability	Partner with consumers and businesses to increase transportation sustainability	Partner with consumers and businesses to increase transportation sustainability
Support individuals and businesses related to transportation by providing loan assistance to Wisconsin businesses and communities	Support individuals and businesses related to transportation by providing loan assistance to Wisconsin businesses and communities	
<p>Continue to support Metropolitan Planning Organizations, Regional Planning Commissions, and local partners in the implementation and execution of their freight policy, including the following themes:</p> <ul style="list-style-type: none"> - Local connectivity - Safety and Security - Modal Improvements - System Operations and Management - Economic Development - Partnerships and Performance Measures 	<p>Continue to support Metropolitan Planning Organizations, Regional Planning Commissions, and local partners in the implementation and execution of their freight policy, including the following themes:</p> <ul style="list-style-type: none"> - Local connectivity - Safety and Security - Modal Improvements - System Operations and Management - Economic Development - Partnerships and Performance Measures <p>Work with stakeholders to facilitate a discussion to develop an intermodal strategy for Wisconsin*</p> <p>Review the department's project development process and design standards to incorporate the needs of freight system users*</p> <p>Provide information to communicate and educate industry and the general public on pertinent freight topics and issues*</p> <p>Leverage the data, tools, and methods developed through the freight plan to inform project prioritization and investment decisions, as well as provide them for DOT partners*</p> <p>Continue to work with other states to identify harmonization opportunities*</p> <p>Investigate ways to simplify, streamline, and provide more permitting options*</p> <p>Monitor national best practices and other initiatives related to reducing freight's impact on the environment*</p>	

Table 11-6: Highway & Local Road Comparison of Base Case and State Freight Plan

Base Case	State Freight Plan	Comparison
Implement cost-effective maintenance activities on Wisconsin's state trunk highway infrastructure	Implement cost-effective maintenance activities on Wisconsin's state trunk highway infrastructure	Both alternatives continue to preserve existing highway infrastructure
Preserve Wisconsin's state trunk highway system infrastructure	Preserve Wisconsin's state trunk highway system infrastructure	Both alternatives support maintenance activities and the preservation of the highway and local road systems. The State Freight Plan identifies the need to improve upon these current practices
Preserve the local road and bridge system	Preserve the local road and bridge system	Both alternatives identify the need to continue to improve the reliability and efficiency of the system
Continue and improve the performance of the Major Highway Development Program	Continue and improve the performance of the Major Highway Development Program	
Improve the reliability and efficiency of state trunk highway operations	Improve the reliability and efficiency of state trunk highway operations	
<p>Actively manage the daily operations of the state trunk highway network via the State Traffic Operations Center and other technology systems</p> <p>Optimize traffic movement on the state trunk highway system by utilizing tools to improve existing capacity and, where necessary, adding capacity</p> <p>Manage access on Wisconsin's state trunk highway system</p> <p>Plan and prepare for WisDOT's prompt and consistent response to incidents</p> <p>Continue to use the Department's MAPSS System to measure performance</p>	<p>Actively manage the daily operations of the state trunk highway network via the State Traffic Operations Center and other technology systems</p> <p>Optimize traffic movement on the state trunk highway system by utilizing tools to improve existing capacity and, where necessary, adding capacity</p> <p>Manage access on Wisconsin's state trunk highway system</p> <p>Plan and prepare for WisDOT's prompt and consistent response to incidents</p> <p>Continue using a performance-based approach to identify state trunk highway system preservation needs, including development of a bridge asset management system</p> <p>Refine and expand a state-of-the-art process for prioritizing needs and identifying cost-effective state trunk highway system preservation needs</p> <p>Revise the Facilities Development Manual (FDM) to more clearly include freight considerations in its project development guidance</p> <p>Identify and preserve a sub-system of Wisconsin's State Highways that accommodate over-height loads (up to 20 feet), over-weight and over-size loads</p> <p>Maintain a formal, ongoing preventive maintenance process</p> <p>Implement proven maintenance management practices</p> <p>Monitoring existing state trunk highway conditions, identifying deficiencies and setting priorities</p> <p>Improve the department's existing maintenance management tools</p>	<p>Both alternatives encourage the optimization of traffic movements via the State Traffic Operations Center and other technology systems.</p> <p>Both alternatives identify the need to plan and prepare for emergency response along the highway system</p> <p>The State Freight Plan identifies a performance-based approach to monitor system performance and identify future transportation projects based on comprehensive data analysis</p> <p>The State Freight Plan encourages the development of improved freight standards to ensure project designs minimize barriers</p> <p>The State Freight Plan promotes designations to the over-weight/over-height network and permitting system</p> <p>The State Freight Plan identifies the need to improve communication with truck freight drivers on the road via enhanced cellular coverage</p> <p>The State Freight Plan encourages increased use of technology in multiple aspects of the freight system</p> <p>The State Freight Plan identifies the need to complete projects on the highway system</p> <p>The State Freight Plan promotes improvements to the freight system to address safety concerns</p> <p>The State Freight Plan identifies the need to improve the local roadway and bridge network to support freight movement</p>

	<p>Implement work zone and lane-closure management strategies and tools to maintain safety and minimize impacts on travelers</p> <p>Continually monitor the state trunk highway network and respond to operational needs</p> <p>Improve motor carrier efficiency and enforcement</p> <p>Support communications along state highway corridors of freight significance to ensure drivers can remain informed of changing conditions</p> <p>Support greater use of technologies to improve the safety and efficiency of operations along corridors with high freight movement frequencies</p> <p>Support an increase in the availability of truck parking at state-owned facilities and raise the awareness of its availability</p> <p>Complete the currently enumerated Major Highway Development projects</p> <p>Improve standards for infrastructure</p> <p>Improve emergency response</p> <p>Identify freight-specific safety concerns and development strategies for solutions</p> <p>Assist in providing asset management strategies and tools for local governments to ensure that selected system preservation improvements provide cost-effective service life extension</p> <p>Work with local entities to identify and address key safety issues on the local system</p> <p>Partner with local governments to manage and invest in the local road and bridge network</p> <p>Continue to support WISLR as a data and pavement asset management tool</p> <p>Work with local entities to enhance their ability to quantify local road infrastructure needs</p> <p>Continue to coordinate with locals to manage available safety funding and to program safety improvements</p>	<p>The State Freight Plan promotes local agency coordination to assist in the implementation of plan goals</p> <p>Assist in providing asset management strategies and tools for local governments to ensure that selected system preservation improvements provide cost-effective service life extension</p> <p>Work with local entities to identify and address key safety issues on the local system</p> <p>Partner with local governments to manage and invest in the local road and bridge network</p>
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Table 11-7: Railroad Comparison of Base Case and State Freight Plan

Base Case	State Freight Plan	Comparison
<p>Ensure that freight rail remains a viable transportation mode for Wisconsin shippers</p> <p>Preserve rail corridors, including rights-of-way, for freight service</p> <p>Continue to support the existence of locally-organized, locally-staffed Rail Transit Commissions</p> <p>Continue state assistance programs for rail improvements</p> <p>Continue to fund track and bridge upgrades for publicly-owned rail corridors</p> <p>Investigate new policies and new financing strategies for projects that improve freight service</p> <p>Support increase investment in rail infrastructure in response to shipper and market demands</p> <p>Continue to support freight rail shippers and short-line carriers in preserving service to light-density rail lines</p> <p>Support freight shipper investments that permit new or continued local service in high-traffic areas</p>	<p>Ensure that freight rail remains a viable transportation mode for Wisconsin shippers</p> <p>Preserve rail corridors, including rights-of-way, for freight service</p> <p>Continue to support the existence of locally-organized, locally-staffed Rail Transit Commissions</p> <p>Continue state assistance programs for rail improvements.</p> <p>Continue to fund track and bridge upgrades for publicly-owned rail corridors</p> <p>Investigate new policies and new financing strategies for projects that improve freight service</p> <p>Support increase investment in rail infrastructure in response to shipper and market demands</p> <p>Continue to support freight rail shippers and short-line carriers in preserving service to light-density rail lines</p> <p>Support freight shipper investments that permit new or continued local service in high-traffic areas</p> <p>Maintain state-owned rail lines to allow service levels to continue uninterrupted, and without additional restrictions</p> <p>Acquire rail lines into public ownership, when appropriate, to preserve essential railroad service</p> <p>Fund track upgrades for publicly-supported rail lines to meet changing industry standards</p> <p>Continue efforts to promote safe rail crossings throughout the state*</p>	<p>Both alternatives continue to promote freight rail for Wisconsin shippers</p> <p>Both alternatives promote the preservation of rail corridors for future services</p> <p>Both alternatives continue to support the partnership and work of the state's RTCs and their planning efforts</p> <p>Both alternatives recommend the continued funding of the state's existing railroad assistance programs</p> <p>Both alternatives support increased investment in rail infrastructure throughout the state</p> <p>The State Freight Plan promotes private freight shipper investments for improvements to high-traffic areas</p> <p>The State Freight Plan encourages uninterrupted freight rail travel along public rail lines</p> <p>The State Freight Plan encourages the acquisition of additional rail lines into public ownership. In the cases where those corridors are listed for abandonment or other disposition, WisDOT policy will be to acquire corridors, when supported by local partners, even if service cannot be preserved in the short-term</p> <p>The State Freight Plan supports upgrades to existing rail lines when publicly-supported</p>

Table 11-8: Waterway and Ports Comparison of Base Case and State Freight Plan

Base Case	State Freight Plan	Comparison
<p>Maintain and improve waterways critical to Wisconsin's transportation system</p> <p>Continue state assistance for harbor improvements</p> <p>Advocate for federal funding and environmental improvements for the Upper Mississippi River-Illinois River Water Way Systems and for the construction of a new lock in Sault Ste. Marie</p> <p>Encourage comprehensive harbor and waterfront land use planning</p> <p>Examine and address roadway issues at ports</p>	<p>Maintain and improve waterways critical to Wisconsin's transportation system</p> <p>Continue state assistance programs for harbor improvements</p> <p>Advocate for federal funding for navigation and environmental improvements for the Upper Mississippi River-Illinois River Waterway and improvements to the Soo Lock System</p> <p>Encourage comprehensive harbor and waterfront land use planning</p> <p>Examine and address roadway issues at ports</p> <p>Continue to coordinate with state, regional and international partners, as well as explore the development of a maritime strategy for Wisconsin, to support maritime transportation as part of a safe, efficient and seamless freight transportation system*</p>	<p>Both alternatives continue to monitor waterways and identify improvements</p> <p>Both alternatives continue to support assistance programs</p> <p>Both alternatives advocate for federal funding for navigation and environmental improvements for the Upper Mississippi River-Illinois River Waterway</p> <p>Both alternatives support land use planning and identification of roadway issues near existing ports</p> <p>Both alternatives examine and address roadway issues at ports</p> <p>The State Freight Plan supports improvements for existing waterway and port projects</p>

Table 11-9: Airport Comparison of Base Case and State Freight Plan

Base Case	State Freight Plan	Comparison
<p>Preserve Wisconsin's airport system infrastructure</p> <p>Address airport system needs through the Airport Improvement Program, coordination with owners and operators and State Airport System Plan update efforts</p> <p>Provide airport infrastructure to attract business-supporting economic growth</p> <p>Provide a system of airports that meets existing and future needs</p>	<p>Preserve Wisconsin's airport system infrastructure.</p> <p>Address airport system needs through the Airport Improvement Program, coordination with owners and operators and State Airport System Plan update efforts</p> <p>Provide airport infrastructure to attract business-supporting economic growth</p> <p>Provide a system of airports that meets existing and future needs</p> <p>Use the Airport Improvement Program to help Wisconsin airports accommodate business planes</p> <p>Support the needed airport system infrastructure, including inclement weather capability, to enable and sustain jet aircraft and related activity</p>	<p>Both alternatives continue to preserve airport infrastructure, including inclement weather capability, to enable and sustain jet aircraft and related activity</p> <p>Both alternatives continue to encourage infrastructure improvements support for growth and future needs</p> <p>The State Freight Plan encourages infrastructure investments to expand business plane availability</p>

11.3 Qualitative Assessment

WisDOT is committed to protecting the natural environment throughout project development and implementation, and regularly employs mitigation strategies to minimize environmental impacts. Strategies defined within the Wisconsin State Freight Plan may result in environmental effects, especially

when built improvements to corridors or services are identified or strategized. The revision to existing or the addition of new multimodal freight policies and investment strategies may also result in effects. The Base Case and State Freight Plan alternatives both have the potential to result in direct and indirect environmental effects. Both adverse and beneficial impacts will be considered as a result of the Base Case and State Freight Plan.

“Significant Effect”

Considerable and important impacts of department actions on the quality of the human environment.

-Trans 400 (WEPA)

Analysis Process

Trans 400 provides the guidance for the development of a SEE as part of a system plan that includes significant proposals. Trans 400.10 outlines the categories of which environmental impacts should be analyzed to meet the requirements of the Wisconsin Environmental Policy Act (WEPA):

- Traffic congestion
- Energy consumption
- Air quality
- Agriculture
- Economic development
- Communities
- Sensitive land resources
- Sensitive water resources

This SEE conceptually analyzes the potential environmental effects of the proposed actions of the State Freight Plan in comparison to the existing condition. The modal comparison of the Base Case and State Freight Plan provided differences/similarities in policy recommendations that can be analyzed for their environmental impact. While the State Freight Plan includes the continuation of many existing policies and programs, a SEE is necessary to evaluate potential environmental impacts. These proposals include:

- Complete the currently enumerated Major Highway Development projects and study approved corridors
- Identify freight-specific safety concerns and develop strategies for solutions
- Partner with local governments to manage and invest in the local road and bridge network
- Fund track upgrades for publicly-supported rail lines to meet changing industry standards
- Support the needed airport system infrastructure, including inclement weather capability, to enable and sustain jet aircraft and related activity

Traffic Congestion

Traffic congestion can be experienced by all modes of freight movement, which includes highways, railroads, waterways and ports, and aeronautics. Congestion for some modes can be catalyzed by other modes of freight or by non-freight movements. Traffic congestion may result in the potential for environmental impacts to two main areas, air pollution and quality of life. There are two general areas where congestion can occur within the freight system – along the transportation corridor (while the freight is being transported) and at the onset or terminus of freight system (loading and unloading facilities).

The safety of the general public is an important consideration when discussing freight movement by any mode. These considerations should include the safety of operators and employees, but also the safety of those traveling by other modes that may have conflicts with the freight system.

The plan forecasts an increase in originating/terminating tonnage for all modes by 2040 (79.1 percent for highways, 38.7 percent for railroads, 241.6 percent for aeronautics, and 21.0 percent for waterways and ports). The forecasted increase equates to an overall increase of nearly 70 percent for the tonnage of freight transported to and from Wisconsin during this time. The plan forecasts also indicate a shift in the freight moved by specific modes throughout the state. Freight movement via highway is expected to remain the dominant mode (accounting for 82.0 percent of originating and terminating statewide freight tonnage), while railroad will account for roughly 14 percent and waterways roughly 4 percent. Additionally, the use of pipelines for the movement of freight at a shorter distance may also result from increased trucking costs or the proximity of the origin and destination.

Congestion along the primary freight corridors is mostly experienced by truck traffic and rail traffic in some instances; however, all modes can be affected by first/last mile and loading congestion. First/last mile connections describe the short movement between the origin/destination and the primary movement of freight commodities from one mode to another. For example, a distribution center moving goods via air may depend on a truck for the first mile connection to the airport. Congestion experienced during the first/last mile connections or at unloading/loading facilities can result in delays and increased prices.

Traffic Congestion Comparison

The Base Case and State Freight Plan alternatives include proposed policies for all modes that may impact the environment and affect congestion. However, the forecasted growth of the State Freight Plan for freight movement imported to and exported from Wisconsin may result in a greater impact from all modes. The plan includes policies for the optimization of operations throughout the system, creating an opportunity to respond to congestion concerns. Additionally, policies geared at permitting and communication improvements will also benefit freight movement, allowing for the informed movement of goods.

The State Freight Plan provides additional strategies for the management of congestion and efficient freight movement. Considerations should be made for congestion issues along the freight corridors, as well as first/last mile impacts. Particular attention should be given to intermodal and transload facilities throughout the state along with local road and bridge weight restrictions. These potential barriers in freight connections can create challenges for the efficient flow of goods throughout the state and increase congestion. Continued review of freight impacts on congestion should be included with larger-scale congestion improvements for freight and all modes of transportation.

Energy Consumption

The movement of freight is an energy intensive activity. Primarily, mobile freight modes require the consumption of fuel to move vehicles; however, energy consumption can occur during times of vehicular idling. Freight modal choice is driven primarily by the present price of fuel and existing infrastructure. The price of fuel continues to be highly volatile. WisDOT can encourage modal choices by means of alternative fuel promotion and fuel reduction strategies. Additionally, investment in freight infrastructure, which supports the safe and efficient movement of goods, encourages use and the free flow of commodities. For example, investment in CNG fueling stations throughout the state supports the ability of truck freight drivers to easily travel throughout the state while utilizing alternative means of fuel.

Energy use and consumption vary by freight mode. The length of trip, fuel efficiency, and weight of the load can impact the fuel efficiency of vehicular freight modes. Advancements in technology, such as idling reduction systems, are improving energy efficiency for certain modes.

Bulk freight movement is generally more energy efficient when moved by railroads or waterways and ports. The Base Case and State Freight Plan alternatives both support the continued support of rail and harbor assistance programs, including the continued support of rail preservation and maintenance.

The State Freight Plan supports the efficient movement of freight via all modes. Improvements that increase efficiencies will benefit energy consumption by reducing idling and congestion. Improved modal choice resulting from the State Freight Plan will benefit energy consumption, as modes with lower energy use become more attractive and competitive in the State of Wisconsin. Additionally, continued improvements to fuel technologies for all modes of freight movement will benefit energy consumption.

Energy Consumption Comparison

The State Freight Plan supports improved modal choice for cargo movement throughout the state, which may result in reduced energy use as all modes become more competitive. Additionally, improvements to address traffic congestion also benefit energy consumption, as the need for idling and inefficient movement is reduced.

Air Quality

Mobile sources, such as transportation, continue to contribute to air pollution on a national scale. In 2015, transportation sources contributed over 50 percent of carbon monoxide (CO) and nitrogen oxide (NO_x) emissions throughout the United States.¹⁰ Freight movement contributes to these emissions with diesel fuel being the primary fuel source for many freight modes. According to the Wisconsin Department of Natural Resources (DNR), more than 40 percent of man-made volatile organic compounds (VOC) and over 60 percent of man-made NO_x emissions are attributed to transportation sources in Wisconsin.¹¹ Improved technologies continue to reduce emissions contributed by transportation sources (i.e. new fuels, modified engine systems, and modal shifts); however transportation sources continue to be a large contributor to the emissions of the following primary air pollutants:

- Ozone
- Particulate Matter
- Greenhouse Gas Emissions

The Clean Air Act requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants that are considered harmful to public health and the environment. These pollutants include carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Areas of the country where levels of these pollutants persistently exceed the NAAQS may be designated as “nonattainment areas.”

Ozone

Ground level ozone continues to be a regional concern for Wisconsin. Historically, counties in eastern Wisconsin have been designated by the EPA as nonattainment areas based on NAAQS for ozone. Currently, two areas of the

¹⁰ U.S. Environmental Protection Agency, “Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2015.”

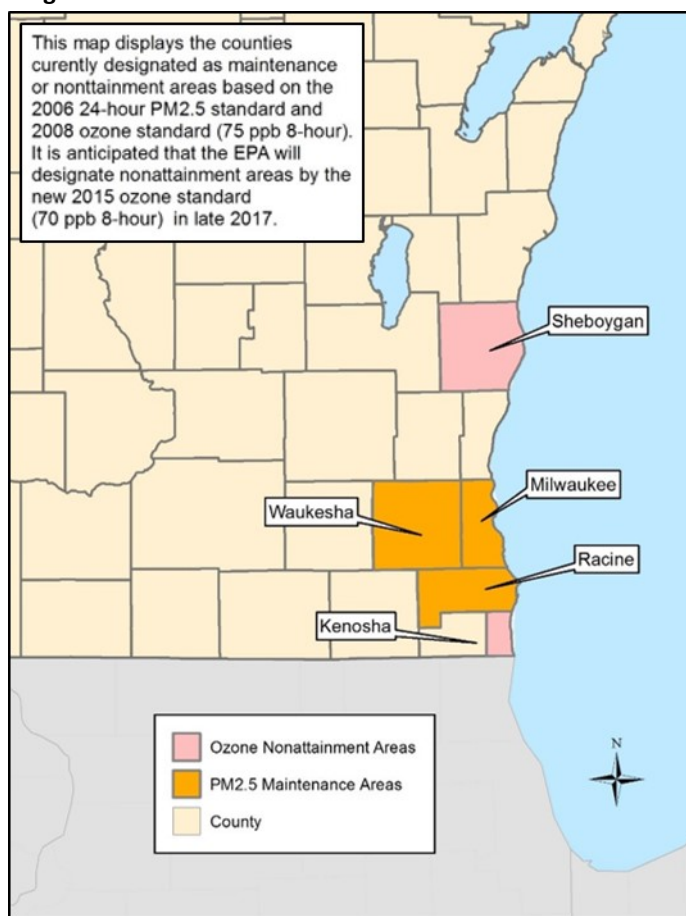
¹¹ Wisconsin Department of Natural Resources, “Vehicles - Mobile sources.”

state, Sheboygan County and a portion of Kenosha County, are considered nonattainment areas for the 2008 eight-hour ozone standard. Both areas were designated in July of 2012, as shown in Figure 11-3.¹²

On November 24, 2014, the EPA announced proposed changes to the NAAQS for ozone. The proposal sought to strengthen the ozone standard by lowering the standard from 75 parts per billion (ppb) to a value between 65 ppb and 70 ppb. Parts per billion measures the volume of the specified pollutant on a per unit basis. The proposal was based on scientific evidence that indicates ozone impacts human health at levels below the existing standard of 75 ppb.¹³ On October 1, 2015, the EPA set the ozone standard at 70 ppb.¹⁴ The EPA's decision to lower the ozone standard may result in additional counties being designated as non-attainment.

Ground level ozone is created by a chemical reaction between volatile organic compounds (VOC) and nitrogen oxides (NOx), pollutants released from automobiles, diesel trucks, industrial facilities, and other sources. Concentrations of ground level ozone can increase during times of high temperatures. Temperature increases throughout the state have the potential result of increased concentrations of ground level ozone, resulting in greater impacts to areas that commonly experience pollution.

Figure 11-3: EPA: Non-Attainment and Maintenance Areas



Source: U.S. Environmental Protection Agency

Particulate Matter

All counties in Wisconsin are in attainment with particulate matter standards as established by the United States EPA and NAAQS. Particulate matter is a mixture of liquid droplets and solid material of visible or microscopic size. Particulate matter is grouped into two primary categories: PM₁₀ (inhalable coarse particles of up to 10 micrometers in size) and PM_{2.5} (fine particles of up to 2.5 micrometers in size). Three counties (Milwaukee, Racine, and Waukesha Counties) in southeastern Wisconsin were previously listed as nonattainment areas for

¹² Wisconsin Department of Natural Resources, "Wisconsin Air Quality Trends." (April 2015).

¹³ Congressional Research Service, "EPA's 2015 Ozone Air Quality Standards." (August 15, 2017).

¹⁴ Ibid.

PM2.5, but were re-designated to attainment in April 2014 as a result of efforts to reduce particle pollution levels.¹⁵ These three counties continue to be considered a particulate matter maintenance area¹⁶.

Transportation sources emit a relatively small proportion of all particle pollution sources. PM10 particles can be emitted from the dust from paved and gravel roads, material handling during construction or loading of freight, and crushing and grinding operations. Fuel combustion, power generation, and industrial operations are direct contributors to PM2.5 emissions that can be emitted directly into the atmosphere.

Interest in fine particulate matter emissions and related health effects has increased in recent years, and additional research has focused on various PM emission sources, including diesel engines with a majority of emissions ranging around the nanometer size. The EPA continues to monitor and study PM2.5 and PM10 emissions, with special attention on diesel emissions, as diesel vehicles produce higher emissions of particulate matter compared to vehicles that utilize gasoline. Recent updates to the current 2012 PM2.5 standard include updated monitoring requirements. For example, heavily traveled roadways in large urban areas will be monitored as particle pollution is increased in these areas from cars and heavy duty diesel trucks. Near-roadway monitoring is currently required for larger urban core-based statistical areas and will be required for all urban areas with a population over 1 million (i.e. Milwaukee-Waukesha-West Allis Metropolitan Statistical Area) by January 1, 2017.¹⁷

Freight emissions may drop due to increased availability and competitiveness of modal choices between freight shippers. For example, improvements to the rail network that improve connections, efficiency, and load capacity may make rail transport more viable than truck transport for some situations. For cases where modal choices are not available, the delineated policies will result in strategies that improve the efficiency of all modes. The policies outlined in the State Freight Plan include more specificity, and therefore it will result in greater improvements to efficiency and modal choices. While increased modal choice and improved efficiencies will reduce emissions, the reduction for either draft alternative is minimal.

Strategies that improve available technologies, communication, and other resources also contribute to improved air quality by reducing trip lengths and idling. For example, the construction of strategically placed public truck parking areas improve the availability of the resource and allows for innovative idling reduction technologies to be implemented as necessary. Improved communication between WisDOT, its agency partners, and the driving public will help to disseminate information that may provide alternatives to keep traffic moving during incidents or construction situations. State Freight Plan policies also address efficiencies at connection points between modes. This includes improvements to the local road system at ports, resulting in a reduction of truck idling while accessing ports.

Greenhouse Gas Emissions

According to the United States Environmental Protection Agency (EPA), greenhouse gases trap heat in the atmosphere.¹⁸ Carbon dioxide, methane, nitrous oxide and fluorinated gases are the primary greenhouse gases.

The emission of greenhouse gases into the atmosphere continues to be debated nationally and internationally. Transportation, deforestation, and manufacturing are considered contributors in the release of greenhouse gases.

¹⁵ Wisconsin Department of Natural Resources, "Wisconsin Air Quality Trends." (April 2015).

¹⁶ Maintenance area is any geographic region of the United States previously designated nonattainment pursuant to the Clean Air Act (CAA) Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

¹⁷ 40 CFR Part 58

¹⁸ U.S. Environmental Protection Agency, "Greenhouse Gas Emissions > Overview of Greenhouse Gases."

Based on current research, transportation sources are the second largest contributor to greenhouse gas emissions, contributing 27 percent of the total United States emissions. Electricity production is considered the largest source, contributing 29 percent of all emissions.¹⁹

The federal government has monitored emission trends for all transportation modes since 1990. Nationally, the emissions for on-road vehicles have grown 23 percent since 1990, according to the EPA.²⁰ Medium- and heavy-duty truck emissions have a major role in this increase, with an increase of 79 percent in the same timeframe.²¹ The increase is likely a result of an increased number of trucks, especially considering that vehicle and fuel standards continue to improve. Emissions as a result of rail transportation have also increased since 1990, with an increase of 20 percent.²² This increase in emissions from rail transportation is likely due to an increase in freight transported via rail. Aircrafts and ships/boats have decreased emissions by 15 and 26 percent, respectively, since 1990.²³

The introduction of federal policies and increased emissions standards are aimed at reducing emissions and developing solutions to meet enhanced air quality standards, with mobile source emission standards providing one of the leading sources of overall emission reduction (i.e., EPA Phase 2 Greenhouse Gas Standards). Emission standards continue to be refined for all modes of freight. The Wisconsin DNR and other state agencies continue to work closely with the EPA on emission standards and reduction programs. Emission reduction goals have been established with the EPA for Wisconsin with a primary focus on coal and natural gas-fired power plants.

Fuel improvements are thought to play a primary role in the reduction of greenhouse gas emissions from the transportation sectors beyond the emissions standards for each mode. New ultra-low sulfur fuels and engines are available for multiple modes, which reduce emissions compared to standards fuels and engines. Programs like the National Clean Diesel Campaign and SmartWay offer funding and assistance programs aimed at a reduction in emissions.

WisDOT manages infrastructure investments to minimize impacts from the environment. Due to an increased investment in modal choices for freight movement, the State Freight Plan provides opportunities to reduce transportation-related greenhouse gas emissions compared to the Base Case. Recommendations related to the development of tools and coordination with stakeholders and governmental entities are also likely to help reduce congestion and provide opportunities to address changes in air quality.

¹⁹ U.S. Environmental Protection Agency, “Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2015.”

²⁰ U.S. Environmental Protection Agency, “Fast Facts: U.S. Transportation Sector Greenhouse Gas Emissions 1990-2015.” (July 2017).

²¹ Ibid.

²² Ibid.

²³ Ibid.

Air Quality Comparison

The Base Case and State Freight Plan alternatives both include policies that may result in reduced emissions and improved air quality. Projected freight cargo increases identified for 2040 will result in the expansions of fleets, frequency of trips, or increase in loads to accommodate this increase. Policies to improve efficiencies and modal choices will help to combat the additional trips and resulting emissions.

Modal choices and improved freight movement efficiencies will improve air quality and may reduce overall carbon emissions from the freight transportation sector. The increase in available modes for the shipment of freight cargo may increase the use of modes with lower carbon emissions (i.e., waterways and pipelines). The continued development of new fuel technologies for multiple freight modes will also contribute to a reduction in carbon emissions.

Federal, state, and local agencies continue to develop efforts and strategies for the reduction of carbon emissions from the transportation sector. A recent example is the medium- and heavy-truck emissions standards released by the EPA and USDOT in 2016. The policies outlined in the State Freight Plan alternative allow WisDOT to stay apprised of and respond to changing policies and initiatives as needed.

Agriculture

In 2015, over 41 percent (or 14.4 million acres) of the land in Wisconsin was identified as farmland (see Figure 11-4).²⁴ Approximately 200,000 acres of farmland were converted to other purposes between 2011 and 2015.²⁵ The conversion of working farmlands to non-agricultural development is a contributor to this loss in farmland. Converted farmland is comprised of residential, commercial and industrial development, undeveloped land, and supporting facilities (i.e. transportation facilities).

Agriculture lands and practices can potentially be impacted by the movement of freight in three primary ways: 1) the ability to efficiently move agricultural goods and products, 2) the impacts resulting from new or expanding transportation projects, and 3) impacts resulting from the movement of freight along existing corridors. The policies of the Base Case and State Freight Plan alternatives have the potential to impact agricultural land statewide. Generally these policies include freight corridor expansion or construction, corridor maintenance, and access management.

Farmland Preservation/Prime and Unique Farmlands

Wisconsin continues its history of dairy, agriculture, and manufacturing, representing the number one state in the production of cheese, cranberries, ginseng, snap beans, and carrots in 2015.^{26,27} The agriculture industry had an economic impact on the state of over 88 billion dollars in 2012, employing 154,000 people on farms and 260,000 people in food processing.²⁸ The continued preservation of farmland is key to the success of the agricultural industry in Wisconsin, particularly preservation of prime farmland.

Prime farmland is defined as land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The soil quality, growing season, and moisture supply make the land

²⁴ U.S. Department of Agriculture, "2015 State Agriculture Overview: Wisconsin."

²⁵ U.S. Department of Agriculture, National Agricultural Statistics Service, "2016 Wisconsin Agricultural Statistics."

²⁶ U.S. Department of Agriculture, National Agricultural Statistics Service, "2015 Wisconsin Agricultural Statistics."

²⁷ Wisconsin Economic Development Corporation, "Feeding the World With Food and Beverage Production and Research in Wisconsin." (May 10, 2016).

²⁸ Ibid.

ideal for producing economically sustained high yields of crops. The preservation of this land is important to the sustainability of the agriculture industry. Many other industries can be relocated to a new location or building with little impact to their operations. However, agricultural production areas cannot be relocated in the same manner due to varying soil characteristics, growing seasons, and moisture supply. Because of its importance to farming, priority is made to protect prime farmland from potential conversion to non-agricultural uses including transportation. Conversions are reviewed through the USDA Farmland Conversion Impact Rating. Exclusive agriculture zoning is used throughout the state as another mechanism for farmland preservation. The use of this zoning district identifies key farmland areas with local support for preservation. These areas are reviewed at the project level to identify strategies to reduce impacts from the expansion or construction of transportation corridors.

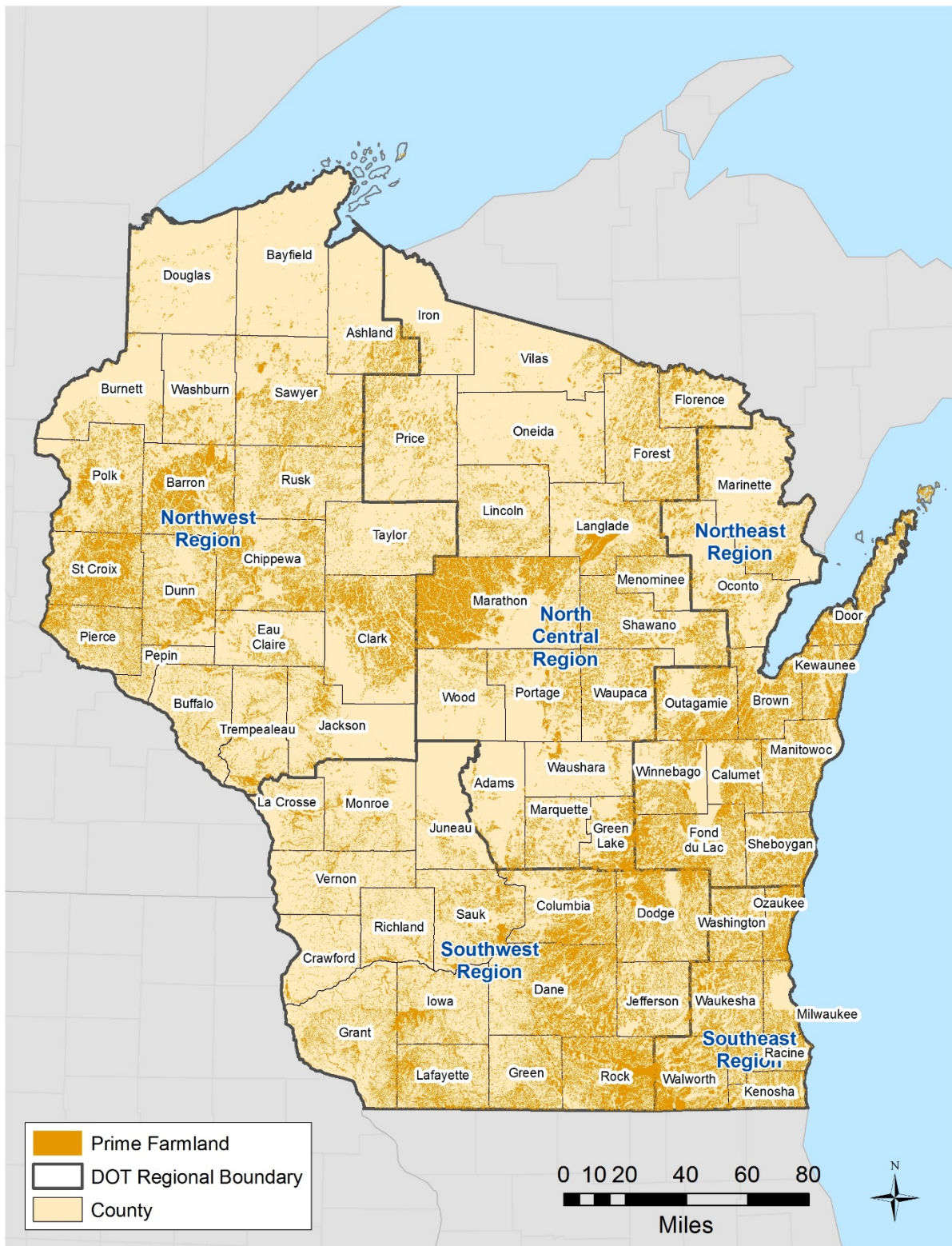
The Base Case and State Freight Plan do not identify specific construction projects for any of the modes. With preservation of the existing system as a top priority, it is likely that corridor expansions or new construction will be studied carefully. However, it may be determined that corridor expansion or new construction is required to accommodate the forecasted freight volumes in the state. At the system-wide level, these impacts are difficult to estimate should expansion or new construction be pursued. Project-level analysis and decisions regarding the extent of impacts to agricultural lands will occur as projects are determined, as well as the determination of potential mitigation strategies.

Four modes of freight movement, including highways/local roads, railroads, waterways/ports, and aeronautics, have the potential to impact agricultural lands at different levels. One of the largest concerns is the conversion of farmland to another use, directly or indirectly. For example, conversion of farmland may occur as a direct result of highway expansion. Most commonly direct conversion occurs as a result of purchasing real estate adjacent to existing highways to accommodate transportation project needs. Indirect conversion may include land development adjacent to a highway expansion. These acquisitions can occur at a range of levels from the construction of a corridor to minor intersection improvements.

WisDOT transportation projects consider and analyze the impacts to resources and infrastructure that support agricultural production in addition to the conversion of farmland area. For example, 31 counties throughout the state contain one or more drainage districts to manage agricultural lands.²⁹ The district provides a system of ditches that can be used by landowners for the drainage for cropland. Impacts to districts and ditches are minimized and avoided as a result of transportation-related projects. The Base Case and State Freight Plan alternatives promote the preservation of existing corridors for future or expanded rail use. These policies will help to reduce the severity and magnitude of conversions as the corridors are currently in place. The expansion or construction of facilities also has the potential to segment properties, creating a barrier that must be crossed to provide field access. However, increased capacity via other freight modes (air, water, and pipeline) has the potential to minimize expansion of existing highway and rail corridors, allowing for decreased agricultural fragmentation. In addition, intelligent transportation systems (ITS), along with enhanced passing lanes on highways, may potentially create more efficient transport systems, reduce congestion, and decrease the need for corridor expansion and construction.

²⁹ Department of Agriculture, Trade and Consumer Protection, Drainage District Program, "Agricultural Drainage in Wisconsin."

Figure 11-4: Wisconsin's Prime Farmland



Source: Wisconsin Department of Agriculture, Trade and Consumer Protection

Corridor Maintenance

Once a corridor is established, various maintenance activities are required to maintain the corridor for efficient transportation use. Primarily these activities include projects to maintain load restrictions, improve ride quality, and address safety concerns (i.e. the maintenance of vegetation along a rail corridor). The State Freight Plan alternative proposes policies aimed at improving maintenance strategies for many modes. Therefore, the State Freight Plan alternative is anticipated to provide a benefit to agricultural lands regarding impacts from maintenance activities.

Access Management

Freight transportation improvements have the potential to affect access to agricultural lands. Specifically, access management for highways and limited crossing locations along rail corridors could impact agricultural practices and production. The Base Case and State Freight Plan alternatives do not differ on policies for access management. Special attention should be given at the project level to minimize agricultural access impacts. Access management policies and farmland preservation strategies are further discussed in WisDOT's Facilities Development Manual (FDM) for project-level guidance.

Agriculture Comparison

The Base Case and State Freight Plan will result in similar impacts to the state's agriculture, with agricultural conversions and access management providing the greatest potential for impact for both roads and railroads. Under the State Freight Plan, highway improvements targeting system preservation can ensure the system safely and efficiently addresses local needs with potentially minimal impacts to surrounding communities while also serving the larger statewide need to facilitate the movement of freight and the traveling public. Neither port nor airport improvements will have a significant impact on agricultural resources for either case.

Economic Development

Wisconsin's transportation system is critical to the economic vitality of the state, as raw materials and manufactured goods are moved within and outside of Wisconsin's borders. Existing manufacturers, distributors, and retail businesses rely heavily on the transportation system's ability to efficiently move goods. Additionally, the health of the network plays an important role in the attraction of new industries to Wisconsin.

Freight transportation investments can serve as catalysts for additional private investments. For example, the development of well-served distribution or intermodal facilities have spurred the development of similar or complementary investments in the surrounding area.

The Base Case and State Freight Plan alternatives include policies that support economic growth. This includes the continuation of funding programs that result in freight improvements and business opportunity growth and development. These policies continue to improve the efficient movement of freight for all modes, allowing for efficient movement for Wisconsin's businesses.

Further economic growth is supported with the policies and strategies of the State Freight Plan alternative. These include track improvements to meet industry standards, airport investments to accommodate business planes, waterfront land use planning, and technology and communication improvements along the highway system. For example, the use of the Airport Improvement Program to help Wisconsin airports accommodate business planes will help to improve the efficiency of freight movement by air. Similar policies aimed at improving the efficiencies for freight movement are recommended for highways, railroads, and waterways and ports. These improvements will diversify modal choice for current business owners, by making freight movement by each mode more cost-

effective and efficient. These benefits can be experienced by existing business owners, but can also result in the attraction of new jobs and businesses to the State of Wisconsin.

Economic Development Comparison

The Base Case and State Freight Plan alternatives both support economic development throughout the state. The State Freight Plan highlights specific activities that diversify modal choice and improve options for doing business within the state. These improvements will increase the efficiency of the transportation system, and may also spur economic development at the local level as improvements occur. For example, the re-establishment of a railroad through a community may stimulate future private investments with improved access to rail transportation. The improvement projects generating positive impacts to economic development may also result in environmental impacts.

Communities and Cultural Resources

Each of Wisconsin's 190 cities, 1,260 towns, 407 villages, and eleven Tribes are comprised of diverse characteristics, making each one unique. These characteristics can be dependent on an area's history, population demographics, social resources, and the natural and built environments. The history of a community plays an important role in understanding its goals for the present and the future. Freight transportation impacts can be both potentially positive and negative. They may include changes to access and mobility, quality of life, safety, employment, noise, relocation, and character.

Wisconsin's Tribes

Wisconsin is home to eleven Tribal nations, each representing individual history, demographics, environments and resources. Approximately 1,025 square miles of the state represent the Tribal lands of the eleven reservations. The Tribes are located throughout the State of Wisconsin, as shown in Figure 11-5. Each Tribe represents individual social and natural resources important to their identity. Impacts to these communities should consider the unique relationships to the natural environment, along with the potential for social impacts.

Historic Places

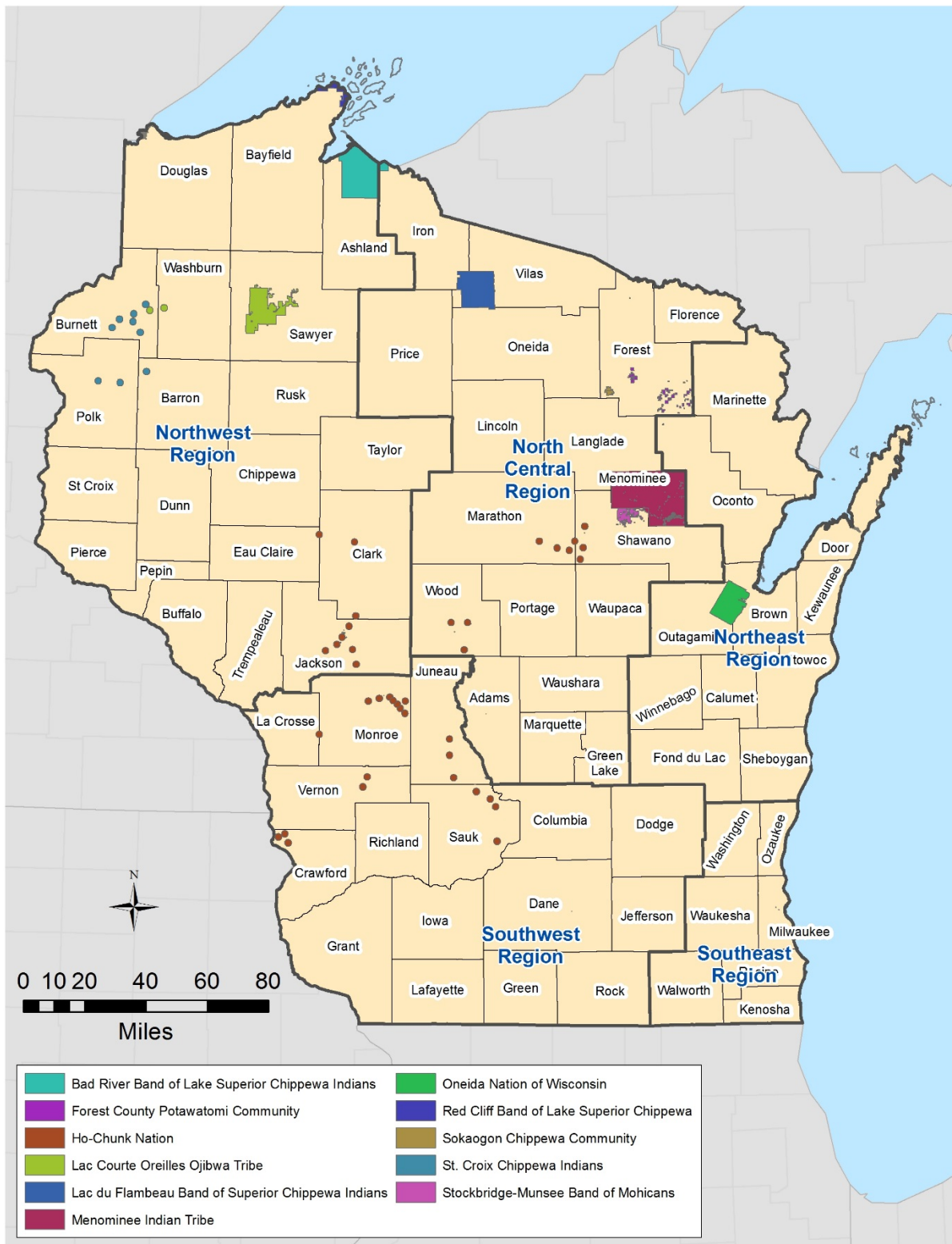
The National Register of Historic Places and the Wisconsin Historical Society list historically significant places throughout the State of Wisconsin. This list includes buildings, sites, structures, and other elements that are significant to national, state, or local history. Additionally, the Wisconsin Historical Society maintains a database of recorded archaeological sites. Additional historic properties and archaeological sites exist but are not documented by the National Register of Historic Places and Wisconsin Historical Society. Typically, impacts and minimization efforts to communities and cultural resources are defined at the project level.

Community Safety

The personal safety of Wisconsin residents is an important consideration for all communities. In 2014, a total of 7,358 large truck crashes and 39 train crashes were recorded in Wisconsin, with 30 and 46 percent of the accidents resulting in injuries, respectively.³⁰ The State Freight Plan includes multiple strategies for improvements to the safety of the freight system. Identification of freight-specific safety concerns and strategies to address these concerns are included. These policies will assist in the maintenance of a resilient freight transportation system. Projects have been deployed throughout the state to improve safety and reduce crossing conflicts, such as quiet zones and Operation LifeSaver initiatives.

³⁰ Wisconsin Department of Transportation, "Final year-end Crash Statistics."

Figure 11-5: Wisconsin Tribal Lands



Source: Wisconsin Department of Natural Resources

Hazardous materials transported via the freight system in Wisconsin include explosives, various types of compressed gases, solids, flammable and combustible liquid, select agents and toxins, and other materials. The movement of these materials are heavily regulated due to the risks of handling. First responder teams are trained to respond to hazardous material spills and events resulting from an incident of any type of freight movement. Continued training and coordination with partner agencies should continue as part of the State Freight Plan.

Communities and Cultural Resources Comparison

Both alternatives include strategies that could impact communities. For example, the re-establishment of an abandoned railroad corridor within a community could result in the potential for adverse noise, vibration, and congestion impacts, but could also result in beneficial economic development impacts within the community. Construction projects tend to result in temporary impacts to mobility, access, or quality of life during construction; however, the resulting impact is generally beneficial as improved transportation facilities are available. Specifically, freight transportation improvements help to support economic development for businesses within a community, or aid in the attraction of new businesses.

Construction projects can result in negative impacts that extend beyond the temporary construction timeline as well. These impacts can include increased noise levels, relocation of businesses or residences, or the segmentation of a community. For example, the re-establishment of a rail line to support high volume rail movement through a community could create a barrier for pedestrian and vehicular movement and emergency responders to pass from one side of the community to the other.

The State Freight Plan alternative includes many policies aimed at the identification of and improvements to safety along freight corridors. These improvements will provide a direct benefit to the safety of communities and the traveling public as projects are implemented. The State Freight Plan alternative provides greater benefit to local safety compared to the Base Case. A variety of strategies for safety improvements are aimed at the improved safety for shippers, the traveling public, and adjacent users.

Sensitive Land Resources

The Wisconsin Department of Natural Resources (DNR) divides the state into sixteen unique ecological landscapes³¹, ranging from the Superior Coastal Plain to the Southwest Savanna. Each ecological landscape includes unique characteristics defining different areas around the state and providing habitats for various animal and plant communities. The Base Case and State Freight Plan alternative have the potential to impact habitat and public lands throughout the state. Sensitive land resources, including habitats and public lands were analyzed.

Habitat

Wisconsin is home to over 300 rare plant species and over 100 endangered and threatened species, along with the hundreds of other plant and animal species in the state.^{32,33} Generally, impacts to habitats can include the destruction or degradation of known habitat areas. Additional impacts may include the construction of facilities that provide a barrier for the movement of species from one habitat to another (i.e. highway construction segmenting a habitat area and the construction of bridges or culverts to create transportation crossings). In addition to upland habitat areas, considerations for aquatic habitat may be considered as potential impacts are

³¹ Wisconsin Department of Natural Resources, "Ecological Landscapes of Wisconsin, Chapter 3: Comparison of Ecological Landscapes."

³² Wisconsin Department of Natural Resources, "Wisconsin's rare plants."

³³ Wisconsin Department of Natural Resources, "Wisconsin's endangered and threatened species list."

evaluated. These habitat areas may include impacts to all waterbodies providing the overall health of aquatic plants and animals. The introduction of invasive species traveling along these waterways also has the potential to impact habitat areas and various species. For example, growth of common reed (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*) into stormwater drainage facilities requires maintenance and removal to prevent these invasive populations from disrupting the proper function of drainage facilities which could potentially lead to flooding.

Wisconsin state law prohibits the taking, transportation, possession or exportation of endangered or threatened species as established per Wisconsin State Statute 29.604 and administrative Rule Chapter NR 27. The DNR may allow an incidental take of endangered or threatened species under certain circumstances through an Incidental Take Permit/Authorization (ITP/A). An ITP/A may only be issued if the action minimizes and mitigates for impacts to the species and does not threaten the survival of the species. Examples of mitigation measures include restricting the timing of disruptive activities during a nesting period, utilizing biodegradable erosion control materials, installing exclusion fencing, and restoring or enhancing habitat.

The Base Case and State Freight Plan alternatives support future construction projects ranging from minor safety projects to the construction of new corridors. Potential effects to habitats are typically delineated at the project level; however, there are considerations that should be accounted for when planning such projects. The first is habitat destruction and fragmentation. Intersection improvements, for example, may result in direct destruction impacts to an existing habitat within close proximity to the project area. Fragmentation can occur whether habitats are located within or outside of the project area. For example, an expansion project may increase the crossing distance for a species between its two habitat areas, increasing the potential for conflict. Opportunities to reduce or eliminate habitat destruction and fragmentation should be considered.

Invasive species have the potential to impact important habitat areas through Wisconsin (land and water). Freight transportation includes the movement of goods and vehicles through Wisconsin from other parts of the nation. These movements create a mechanism for invasive species to be transported into a new area. Additionally, the vegetated areas buffering freight corridors are generally intended to require lower maintenance. These lower maintenance approaches have the potential to harbor and spread invasive species. Spraying and other maintenance activities occur to reduce this risk. The State Freight Plan alternative includes multiple maintenance activities that will assist in the reduction of impacts from invasive species.

In addition to habitat destruction or fragmentation, wildlife collisions should also be considered. In 2014, approximately 15 percent of all reported vehicular crashes involved deer in Wisconsin.³⁴ Wildlife crossing hazards are of primary concern for highway, railroad, and aeronautics. Expansion or new construction projects from these modes are supported in the Base Case and State Freight Plan alternatives, resulting in similar impacts.

Public Lands

Wisconsin's natural resource areas are a key element of Wisconsin's identity. The variety of recreational activities throughout the year attract visitors and residents to various locations across the state. Wisconsin includes a variety of public lands, including national and state parks and trails; state wildlife and fishery areas; state natural areas; and state and county forests (see Figure 11-6). Twenty-nine county forests provide 2.4 million acres of public recreation areas in the state alone.³⁵

³⁴ Wisconsin Department of Transportation, "Final year-end Crash Statistics."

³⁵ Wisconsin County Forests Association, "Homepage."

WisDOT Native Plant and Prairie Program

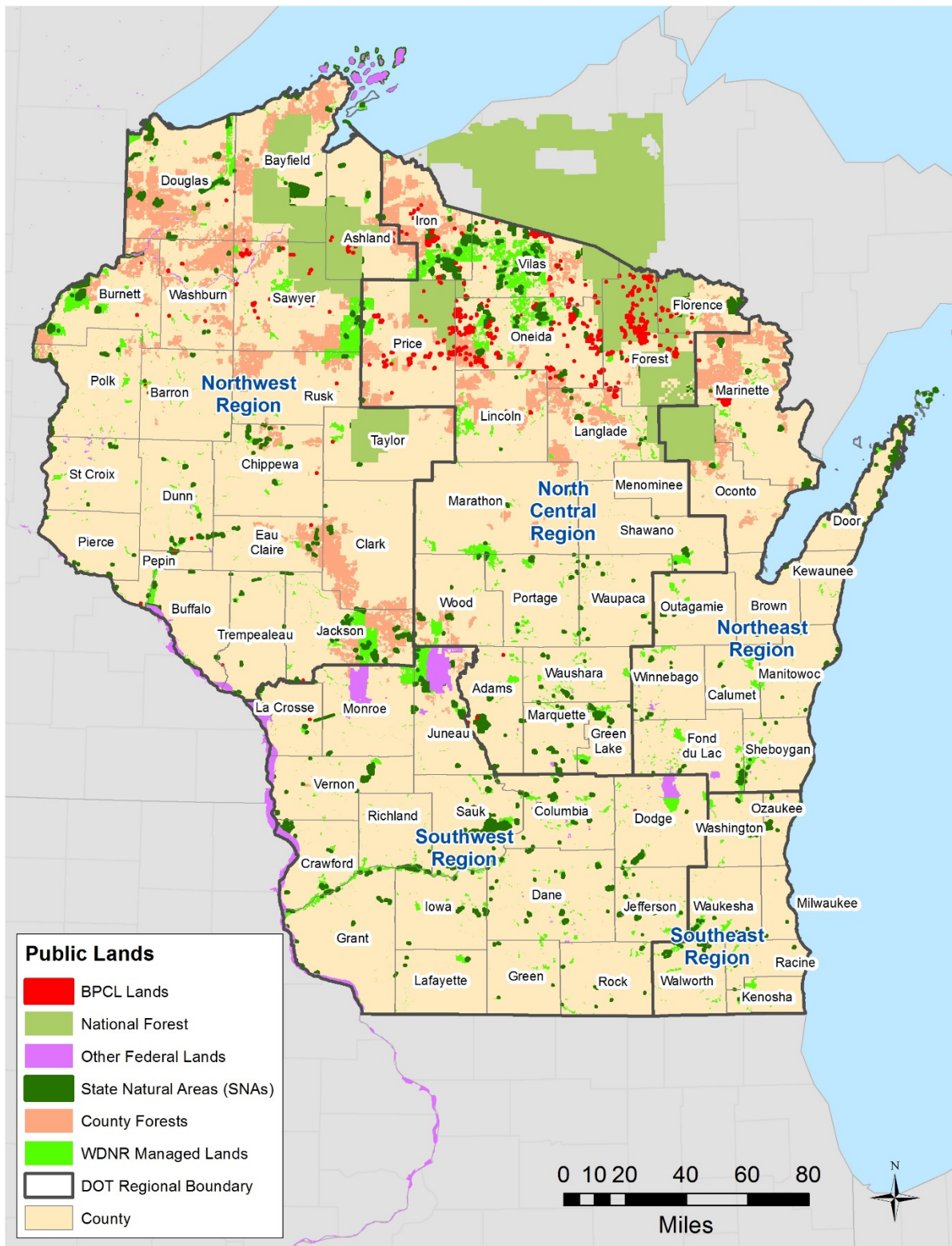
Many prairie remnants exist on Wisconsin Department of Transportation's rights of way. In these situations, the plant communities are often relatively intact, undisturbed by agricultural and construction activities.

In the early 1990's, the department began an inventory of roadside vegetation. Before funding ceased, the completed inventories were evaluated to determine if there are quality remnants of native prairies remaining on state highway rights of way. During this process, over 20 high quality sites were identified. The department continues to maintain these prairie remnants as well as actively trying to re-establish native plants along roadsides by using special native seed mixes. Maintenance policy also allows much of native vegetation that exists along the roadside to be preserved.

This began in the mid 1970's when the department began planting native grasses and forbs on roadsides and roadside sites such as safety rest areas and waysides. Initial efforts began as part of the federal Operation Wildflower program in cooperation with local garden clubs. This evolved into special seeding items in highway construction project special provisions, and finally to several standard native seed mixes in Standard Specification Section 630 for Highway and Structure Construction.

Facilities development manual 27-25-5 describes steps to be taken to preserve and protect native plants. It also describes the process of establishing native seeding as well as long-term management needs.

Figure 11-6: Public Lands in the State of Wisconsin



Source: Wisconsin Department of Natural Resources

Freight transportation projects have the potential to affect public land resources. Generally, impacts may result from the permanent or temporary acquisition of land. However, these effects are managed and mitigated at the project level in accordance with federal and state regulations (i.e., Section 4(f), Section 6(f), etc.). The Base Case and State Freight Plan alternatives both include policies supporting capacity and other improvements to freight corridors, having a similar potential to affect public lands. However, the State Freight Plan alternative places special focus on preventative and maintenance activities, potentially reducing the magnitude of effects to public lands.

Sensitive Land Resources Comparison

The Base Case and State Freight Plan alternatives both have the potential to impact public lands as a result of construction projects. These impacts are identified, minimized and mitigated at the project level. The State Freight Plan may result in greater impacts as a result of specific improvement strategies. However, improved preventative maintenance approaches may reduce the overall magnitude of impacts overall. Specific maintenance guidelines are discussed in more detail later in this chapter and in WisDOT's FDM.

Sensitive Water Resources

Wisconsin's aquatic ecosystems include sensitive water resources composed of the state's 15,000 lakes and 12,600 rivers, streams, and wetlands (see Figure 11-7).³⁶ The protection of sensitive water resources is an important element in Wisconsin's identity given the significance of the state's water-dependent recreation and tourism industry and unique abundance of water resources. Of the five freight modes, movement of goods by waterways and ports have the greatest potential to result in impacts to water resources. Highway, railroads, airports, and pipelines could also result in impacts.

Potential impacts to sensitive water resources include impacts to water quality, the introduction of aquatic invasive species, wetlands, aquatic habitat, and the maintenance of aquatic connectivity. Every waterbody has some form of critical habitat that contributes to the overall health of plants and animals. A large percentage of aquatic species are found in the shallow margins and shores of Wisconsin's wetlands. The maintenance of aquatic connectivity is important to aquatic species and navigation and transportation infrastructure. Attention may, for example, be placed on the maintenance of connectivity through adequate stream crossings, navigability for barge traffic and impacts of weather events.

Water Quality

Approximately 84,000 miles of rivers and streams flow across the Wisconsin landscape. Nearly 32,000 miles of streams and rivers continuously flow throughout the year, with the remaining flowing during spring and times of high water.³⁷ These rivers are of high recreation value for Wisconsin, providing fishing and active recreation opportunities.

In 2016 the DNR proposed the addition of 225 waterbody segments to the existing list of over 600 impaired waterbodies in the state.³⁸ Impaired waters do not meet the water quality standards established by the DNR or the EPA. Concentrations of various pollutants (i.e. sediment, phosphorus, ammonia, nitrate, and chloride) contribute to a watershed's determination as impaired.

³⁶ Wisconsin Academy of Sciences, Arts and Letters, "Waters of Wisconsin: The Future of Our Aquatic Ecosystems and Resources." (2003).

³⁷ Wisconsin Department of Natural Resources, "River facts."

³⁸ Wisconsin Department of Natural Resources, "Wisconsin Water Quality Report to Congress 2016."

Many factors of the freight transportation system have the potential to affect water quality. Changes in erosion and run-off characteristics resulting from the construction of new or modifications to existing corridors can directly affect water quality. Furthermore, the development of supporting freight services, such as publically-owned truck parking can impact on-site water quality. The transport of hazardous or toxic materials via highway, rail, and waterway, in addition to road salt and other de-icers on runways and highways, use of sealants for asphalt repairs, and flooding of transportation systems that flush pollutants into waterways, also have the potential to affect water quality as a result of maintenance issues or spills/incidents.

The policies and strategies of the Base Case and State Freight Plan alternatives have the potential to impact water quality. Both alternatives support construction projects of varying scales. WisDOT currently maintains policies and relationships with regulatory agencies regarding water quality impacts during and following construction. The State Freight Plan alternative may have a slightly larger potential to result in water quality impacts with the delineation of more project improvements. Water quality impacts resulting from port and waterway improvements should also be considered. Impacts and mitigation measures are defined in cooperation with partner agencies, and will be followed with any actions from the Base Case or State Freight Plan alternatives.

Aquatic Invasive Species

Aquatic invasive species (AIS) can be introduced to the Great Lakes through shipping vessels or barges. Pathways for transport of new aquatic invasive species (AIS) into the Great Lakes include the discharge of ballast water from ships and from AIS attaching themselves to hulls, anchors and other exterior surfaces of shipping vessels or barges.

AIS can result in significant ecosystem and economic impacts. Ecosystem impacts include loss of food resources and habitat due to increased competition from invasive species, physically and/or chemically modified aquatic habitats, and decreased biodiversity. For example, the introduction of the sea lamprey, a parasitic fish, contributed to the collapse of lake trout populations in Lake Superior in the mid-twentieth century. Economic impacts include loss of recreational and commercial fishing opportunities, damage to infrastructure, and damage to boats and equipment.

The Base Case and State Freight Plan alternatives have the potential to affect the movement of AIS in the same way. A 21 percent increase in cargo transported by waterway is expected by 2040, resulting in the potential for increased ship movement into Wisconsin's waterbodies.³⁹ However, many programs are in place to minimize the spread of AIS into the Great Lakes and connected waterbodies.

³⁹ 2013 IHS Transearch Database.

Figure 11-7: Wisconsin's Open Water



Source: Wisconsin Department of Natural Resources

Wetlands

Wisconsin contains millions of acres of wetlands, of varying size and typology. The DNR estimates that since the 1800's, nearly half of the state's wetlands have been destroyed.⁴⁰ The elimination of wetlands contributes to increases in flooding, water quality issues, and reduction in bird, mammal, fish, amphibian, and reptile habitat.

Unavoidable impacts to wetlands as a result of WisDOT actions are mitigated according to the *Wetland Mitigation Banking Technical Guideline*. These guidelines were developed and implemented with the collaboration of various state and federal agencies. The overall goal of these guidelines is to minimize harm and mitigate impacts to wetlands as a result of transportation projects. Measures to avoid and minimize wetland impacts include reducing the corridor footprint, modifying the alignment, or selecting an alternative route. Compensation through mitigation banking is required for all unavoidable wetland losses. Restoration of a former wetland is the preferred method; however, compensation may also include wetland creation, enhancement, preservation, and restoration/preservation of vegetative buffers. A combination of mitigation measures is typically proposed.

The Base Case and State Freight Plan alternatives both support various improvements to the freight system. These improvements range from small-scale safety improvements to large-scale capacity improvements (i.e. expansions or new corridors). The potential for wetland impacts occurs at all scales as a result of filling or dredging of wetlands. The determination of actual impacts and mitigation strategies will occur at the project level as specific projects are defined.

Sensitive Water Resources Comparison

Both the Base Case and State Freight Plan alternatives impact sensitive water resources. These impacts are assumed as a result of potential construction projects for all modes. These impacts are anticipated to vary in size from small intersection improvements to large harbor construction. Specific impacts to water resources are determined at the project level. Coordination with agency partners is an important element of alternative analysis to ensure that all regulations are addressed.

Indirect Effects

The impacts resulting from freight projects can have a variety of results, including direct and indirect effects. The direct impacts to the environment tend to be those resulting directly from the project and at the project site. Indirect effects may be the result of decisions made in response to the direct impact. For example, private investments made in the area surrounding a new transload facility would be considered an indirect impact of the development of the transload facility. These effects may:

- Be viewed as either positive or negative or both, depending on the specific event
- 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

Elements of the Base Case and State Freight Plan alternatives can result in indirect effects as a result of implementation. For example, freight corridor improvements in a certain area may serve as a catalyst for development; however, the extent and magnitude is difficult to project. Though specifics may be unknown, other factors such as land use planning, local roadway planning, and market demand should be present.

⁴⁰ Wisconsin Department of Natural Resources, "Reversing the Loss: A Strategy to Protect, Restore and Explore Wisconsin Wetlands." (June 2008).

Polices of the Base Case that have the greatest potential to include indirect effects include:

- Funding assistance for local agencies and businesses for freight projects
- Increased investment strategies for rail transportation
- Local road and bridge improvements

Additional polices with the potential of indirect effects are present in the State Freight Plan alternative, including:

- Identification of an over-size, over-weight, and over-height highway sub-system
- Increased availability of state-owned truck parking facilities
- Local freight system improvements
- Funding strategies for railroad, waterway and ports, and airport improvements to accommodate freight travel

Indirect Effects Summary

Indirect effects from the Base Case and State Freight Plan alternatives have the potential to range from increased trips on an improved corridor to local land use decisions. WisDOT generally has little control over indirect effects resulting from long-range planning actions. However, WisDOT is committed to mitigating the impacts of negative indirect effects and will work with regional and local level stakeholders to ensure possible negative indirect effects are identified and avoided. Continued coordination and partnerships with local governments and private entities regarding these effects will help with the assessment of impacts to the transportation system. Furthermore, efforts to increase planning and environmental linkages (PEL) will support collaborative and integrated approaches in planning level analysis and project level implementation.

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
- Habitats
- Air quality
- Agriculture

Comparison of Environmental Impacts and Benefits

The previous sections provide an overview of the actions of the Base Case and State Freight Plan that may impact the environment. These impacts can include benefits to the environmental category as a result of the action. Table

11-10 includes a comparison of the impacts and benefits to each environmental category as a result of the Base Case and State Freight Plan alternatives.

Table 11-10: Comparison of Environmental Impacts and Benefits

Impact Category	Mode	Base Case	State Freight Plan
Traffic Congestion	Highways/Local Roads	Congestion levels under the Base Case have the potential to be greater, as projects addressing communication, technologies, and congestion mitigation are not identified.	Congestion under the State Freight Plan may be lower than the Base Case, due to improvements to communication and optimization of the highway and local road systems.
	Railroads	Congestion levels under the Base Case have the potential to be greater than the State Freight Plan as the emphasis on expansion and acquisition is less.	Congestion under the State Freight Plan may be lower than the Base Case as a result of continued improvements and expansion to rail lines.
	Waterways and Ports	Congestion levels at ports and airports may be slightly greater as a result of the Base Case.	Congestion is likely to be reduced at ports and airports as a result of the State Freight Plan with planning and project improvements to access and services.
	Aeronautics		
Energy Consumption	Highways/Local Roads	Energy consumption will be similar under both alternatives, with improvements to modal choice and efficiencies.	Energy consumption will be similar under both alternatives as a result of improvements to modal choice and efficiencies. Additional strategies of the State Freight Plan may result in greater reduction.
	Railroads	Energy consumption will be similar under both alternatives. Improvements to railroads, waterways and ports, and airports will improve attractiveness of these reduced energy consuming modes.	Energy consumption will be similar under both alternatives. Improvements to railroads, waterways and ports, and airports will improve attractiveness of these reduced energy consuming modes.
	Waterways and Ports		
	Aeronautics		
Air Quality	Highways/Local Roads	The Base Case will result in a reduced benefit to air quality, as an increase in freight movement will occur, with condensed strategies for improvements.	The State Freight Plan will experience a greater reduction in emissions compared to the Base Case, resulting from projects that improve efficiency of the roadway system.
	Railroads	The Base Case will result in similar improvements to emissions from rail, waterway and ports, and air freight movement. Increased modal choice and improved first/last mile connections will make these modes more competitive.	The State Freight Plan will result in similar improvements to emissions from rail, waterway and ports, and air freight movement. Increased modal choice and improved first/last mile connections will make these modes more competitive.
	Waterways and Ports		
	Aeronautics		

Table 11-10: Comparison of Environmental Impacts and Benefits (continued)

Impact Category	Mode	Base Case	State Freight Plan
Agriculture	Highways/Local Roads	The Base Case will result in similar impacts to the State Freight Plan. Agricultural conversions and access management provide the greatest potential for impact.	The State Freight Plan will result in similar impacts to the Base Case. Agricultural conversions and access management provide the greatest potential for impact. The State Freight Plan will provide greater benefits as the efficient movement of agricultural products will increase. Highway improvements targeting system preservation can ensure the system safely and efficiently addresses local needs with potentially minimal impacts to surrounding communities while also serving the larger statewide need to facilitate the movement of freight and the traveling public.
	Railroads	The Base Case will result in similar impacts to the State Freight Plan. Agricultural conversions and access management provide the greatest potential for impact.	The State Freight Plan will result in similar impacts to the Base Case. Agricultural conversions and access management provide the greatest potential for impact. The State Freight Plan will provide greater benefits as the efficient movement of agricultural products will increase.
	Waterways and Ports	Port and airport improvements of both alternatives will have limited effects to agricultural resources.	Port and airport improvements of both alternatives will have limited effects to agricultural resources.
	Aeronautics		
Economic Development	Highways/Local Roads	The Base Case will result in similar benefits to the State Freight Plan, to a lesser extent. Improvements to freight corridors will improve freight movement throughout the state; however, additional investment programs are not considered.	The State Freight Plan will provide greater benefit to economic development as the movement of freight through the state will be more efficient and modal choices will be increased. Policies support funding assistance for local government and private investments.
	Railroads		
	Waterways and Ports		
	Aeronautics		
Community and Cultural Resources	Highways/Local Roads	The Base Case will result in fewer negative community impacts resulting from construction than the State Freight Plan. However it will also result in fewer positive impacts from mobility and safety improvements.	The State Freight Plan will likely result in greater negative community impacts, but will also result in greater benefits to communities. Projects to address safety and mobility concerns on the local network will provide benefits to the community, but may result in relocation, access management, and temporary impacts.
	Railroads		
	Waterways and Ports		
	Aeronautics		
Sensitive Land and Water Resources	Highways/Local Roads	Under the Base Case, policies have the potential to impact sensitive land and water resources as a result of future construction projects.	The State Freight Plan policies have the potential to result in greater impacts to sensitive land and water resources due to additional improvement strategies.
	Railroads		
	Waterways and Ports	The Base Case has the potential to impact sensitive water resources as a result of port improvements and increased freight movement.	The State Freight Plan policies have the potential to result in greater impacts to sensitive water resources as specific port improvement projects are defined.
	Aeronautics	Under the Base Case, policies have the potential to impact sensitive land and water resources as a result of future construction projects.	The State Freight Plan policies have the potential to result in greater impacts to sensitive land and water resources due to additional improvement strategies.

11.4 Impact Avoidance, Minimization, and Mitigation Strategies

The SEE provides a qualitative analysis of potential impacts to the environment as a result of the actions of the Base Case and State Freight Plan. In many instances, impacts will occur during the implementation of policies and strategies, with the impacts quantified at the project level. WisDOT will work to avoid, minimize and mitigate impacts as a result of Wisconsin State Freight Plan activities. Additionally, the implementation strategy defined in Chapter 9, *Investment and Implementation*, of the plan helps to provide a framework for putting the plan into action where avoidance and minimization efforts will be taken into consideration.

WisDOT will continue to work with partnering agencies to reduce impacts and mitigate unavoidable impacts as policies of the plan are implemented. Continuation of existing policies and regulations defined in previous planning efforts include:

Connections 2030

WisDOT's long-range multi-modal plan, *Connections 2030*, established a vision of 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 impacts to the natural environment.⁴¹ *Connections 2030's* Chapter 10: Preserve Wisconsin's Quality of Life, discussed environmental transportation elements specifically, defining short term (2008 – 2013) and long term (2008 – 2030) environmental policy action items. Key environmental policy action items defined in Chapter 10 of *Connections 2030* include:

- Continue a comprehensive approach to integration of transportation and environmental issues
- Emphasize air quality improvement
- Emphasize the preservation of protected resources
- Incorporate environmental justice in all planning, programming, and project decisions
- Comply with federal and state environmental laws, regulations and executive orders relevant to transportation and support future standards and programs
- Support and fulfill the WisDOT – Wisconsin Department of Natural Resources (DNR) cooperative agreement, and other current and future interagency agreements
- Meet recognized standards, practices, and guidelines for assessing and mitigating direct, indirect, and cumulative environmental impacts
- Seek balanced solutions when potential conflicts arise on projects or initiatives

Connections 2030 established environmental justice as an integral element of the transportation planning process. While federally mandated by law, *Connections 2030* reinforced WisDOT's policy to incorporate environmental justice in all planning, programming, and project decisions. This policy action item established WisDOT's continued commitment to integrating environmental justice in transportation planning.

Wisconsin State Rail Plan

The *Wisconsin Rail Plan 2030* examined sustainability and livability in relation to rail transportation. The plan reviewed the relationship rail transportation has with community sustainability and livability by examining economic, social, and environmental elements as integrated system elements. Mechanisms which aimed to

⁴¹ Wisconsin Department of Transportation, "Connections 2030: Wisconsin's long-range transportation plan."

enhance environmental benefits were examined in depth, with an emphasis on air quality policies and regulations. In addition, the *Wisconsin Rail Plan 2030* identified the following challenge areas:

- Invasive Species – train movement, as well as track maintenance and construction, may contribute to the spread of invasive species
- Habitat Fragmentation – changes to rail corridors may fragment habitats or result in a loss of habitat
- Water Resources – rail construction activities may change drainage patterns or impact waterway navigability
- Wetlands – rail construction activities may result in the loss of wetlands

In response to these challenges, the state *Rail Plan* established the following policy action items:

- Work with stakeholders to identify sensitive habitats or resources early in the planning process and avoid or minimize impacts
- Monitor state and national efforts and be prepared to address potential future greenhouse gas regulations, pursuant to changes in regulation
- Develop guidance and procedures to discourage transportation development activities from intensifying the spread of invasive species
- Identify feasible, cost-effective solutions that avoid, minimize, or mitigate impacts
- Track changes and analyze responses to transportation energy and costs

WisDOT Environmental References and Resources

In addition to environmental policies outlined in previous long-range plans, WisDOT avoids or minimizes the impacts of transportation projects to the natural and human environment through specific programs managed at the state and project scale. These include:

- Agriculture
- Air
- Community and residential
- Cultural resources (archeology, history and tribes)
- Endangered species
- Environmental justice
- Erosion control and drainage
- Habitat evaluation
- Hazardous materials (asbestos, bioremediation, and hazardous substances)
- Indirect and cumulative impacts
- Public involvement
- Sections 4(f) and 6(f), unique areas
- Sound quality
- Stormwater management
- Wetlands and waters
- Visual impacts

Furthermore, the WisDOT Facilities Development Manual (FDM) includes several chapters which discuss environmental transportation topics at the local level. This manual provides policy, procedural requirements, and guidance encompassing the facilities development process within the Wisconsin Department of Transportation.

Chapters relevant to transportation and the environment include:

- Chapter 5: Agency Coordination
- Chapter 6: Public Involvement
- Chapter 10: Erosion Control and Storm Water Quality
- Chapter 20: Federal and State Environmental Laws, Policies, Regulations and Agreements
- Chapter 21: Environmental Documents, Reports and Permits
- Chapter 22: Air Quality
- Chapter 23: Noise
- Chapter 24: Land and Water Resources Impacts
- Chapter 25: Socio-Economic Factors
- Chapter 26: Cultural Resource Preservation
- Chapter 27: Planting and Aesthetic Design

Impact Avoidance, Mitigation and Minimization Summary

WisDOT is committed to protecting the natural environment while enhancing the quality of life for all Wisconsin residents. The policies, strategies and procedural requirements discussed above demonstrates WisDOT's motivation to avoid, mitigate, and minimize environmental impacts resulting from freight plan policy recommendations.

Chapter 11, Appendix 11-1 – Environmental Resource Agency Input

1. ERA Consultation #1 Agenda
2. ERA Consultation #1 Summary List
3. ERA Consultation #1 Meeting Summary
4. ERA Consultation #2 Agenda
5. ERA Consultation #2 Summary List
6. ERA Consultation #2 Meeting Summary

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