



## Chapter 11: System-Plan Environmental Evaluation

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# Chapter 11: System-Plan Environmental Evaluation

## Introduction

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

## Chapter Structure

The following chapter highlights:

- Plan overview and the role of the Wisconsin Department of Transportation (WisDOT)
- Evaluation purpose and methodology
- Qualitative assessment, by key topic area

## Plan Overview and WisDOT’s role

*Wisconsin Rail Plan 2030* reviews the existing system, related needs and issues and outlines a series of recommendations for the next 20 years. The full scope of the *Wisconsin Rail Plan 2030* can be traced back to the state’s recently adopted multimodal long-range transportation plan, *Connections 2030* and previous efforts. The rail-specific policies defined as part of *Connections 2030* are adopted and further refined in this mode-specific plan.

In Wisconsin, private railroads own and operate the majority of the rail lines. Of the approximate 3,600 miles of state rail network, the Wisconsin Department of Transportation (WisDOT) owns about 530 miles. While the majority of rail-related decisions are made by private entities the department remains the steward of the entire system. In this capacity, WisDOT offers a leadership role in providing a system-level and regional view that considers each mode and its function as part of the overall system.

## Evaluation Purpose and Methodology

A SEE (System-plan Environmental Evaluation) must be prepared for any WisDOT state-level plan when the department determines that the plan contains “major and significant new proposals” likely to affect the quality of the human and natural environments. The SEE is a qualitative assessment of the plan’s recommended policies and potential effects on the environment. It is a conceptual and general document that analyzes potential environmental concerns. Because of the scale of analysis and conceptual focus, the analysis does not replace future project-level environmental reviews.

*Wisconsin Rail Plan 2030* analyzes a base case alternative and the plan alternative. Adopted in October 2009, *Connections 2030*, the state's multimodal 20 year plan, is the base case. The rail plan alternative is *Wisconsin Rail Plan 2030*. While the recommendations contained in the state rail plan generally represent those first introduced in *Connections 2030*, the department prepared this evaluation to:

- Inform the public of the system level plan's recommendations and possible negative and positive environmental impacts of implementation
- Continue its commitment to disclosing the potential environmental impacts of its activities
- Assess whether the plan's recommendations respond to potential negative impacts and, if so, offer related direction or guidance during implementation

Development of the *Wisconsin Rail Plan 2030* followed a comprehensive process that included consultation with environmental resource agencies (see *Wisconsin Rail Plan 2030* Environmental Consultation Summary) and Tribal Governments (see *Wisconsin Rail Plan 2030*, Tribal Consultation), as well as a public involvement component detailed in Chapter 2. The plan also incorporates the considerable feedback received during previous and current planning efforts, including: *Connections 2030* outreach, analysis conducted as part of the *Midwest Regional Rail Initiative* and development of Wisconsin's portion and early rail plan outreach conducted between 2001 and 2004.

## Qualitative Assessment by Key Topic Area

In response to the requirements defined under Trans 400, the SEE focuses on:

- Congestion
- Energy consumption
- Air quality
- Economic growth and development
- Communities and cultural resources
- Sensitive land and water resources
- Agriculture
- Indirect effects
- Cumulative effects

### ***Congestion***

Rail network congestion can occur when the capacity of the network is unable to accommodate a specific incident or need. For example, congestion may result when a train has to make an unexpected stop or slow down as a result of an event such as a blocked track, track sharing need, inclement weather, or a crash that prevents the train from moving as intended. It may also occur if the existing infrastructure (bridges, tunnels, track, rail station and rail yards) is insufficient to handle the volume or type of rail cars and/or commodities. Congestion can cause backups and delays.

In Wisconsin, there are no significant line capacity constraints that hinder the flow of rail traffic. However, there are a number of elements that, over time, may affect Wisconsin's rail network (additional capacity issues are identified in Chapter 5, Freight Rail.) These include:

- Projected growth in rail shipping and potential infrastructure upgrade needs
- Proximity to Chicago and the Twin Cities
- Panama Canal Expansion and Port of Prince Rupert, British Columbia
- Track sharing
- Rail line abandonments and possible restoration

#### **Projected growth in rail shipping and potential infrastructure upgrade needs**

Wisconsin's railroads move 33 percent of Wisconsin's total freight<sup>1</sup> by weight, about 180 million tons annually. In 2007, rail movements statewide were 46 percent overhead<sup>2</sup>, 42 percent terminating, 10 percent originating and two percent intrastate. Because of the state's key location between Minneapolis/St. Paul and Chicago, more freight passes through Wisconsin than originates or terminates in the state. Impacted by increases in economic activity, overhead freight is expected to grow through 2030, taking up valuable capacity on Wisconsin's transportation system. By 2030, the amount of freight shipped by rail in Wisconsin is expected to grow 16 percent. This projected growth will place increased demands on the state's rail network. The impact may mean an increase in the number of trains, carload weight, or changes to carload structure (longer or taller trains – double stack trains).

In addition to rail infrastructure needs, the connections between modal freight carriers such as rail to truck are also very important. Because a train's carrying capacity may allow it to be loaded with twice the weight currently carried, the projected increase in freight rail shipment does not necessarily imply more trains will be running on the system; it more likely means that the weight or length of the carloads will increase. Two single flat cars, for example, can carry equal the weight of one double-stack flat car. Accommodating increased carload weights or train lengths requires railroad upgrades. Private railroad operators address needs on their rail networks. The state works with operators on the publicly owned lines to address needs. WisDOT has assessed infrastructure on the publicly owned lines and the need for future upgrades. As a result, funding for the department's freight programs was increased during the 2009-2011 biennial budget process. This was done to address the needs and further support the department's role in rail service statewide.

Large railways typically favor dedicated movement of container traffic and seldom promote locations that are not capable of loading an entire train for movement to a single location. Several facilities of this scale are located in the Chicago region and two are located in the Twin Cities (operated by Burlington Northern Santa Fe and Canadian Pacific Railway). This means that Wisconsin shippers seeking access to long-haul intermodal service for import/export containers generally must move their commodities by truck across state lines to deliver boxes for delivery by freight rail to major U.S. port facilities.

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<sup>1</sup> Wisconsin's rail freight movement is characterized as the amount of freight that: originates or terminates within the state (with corresponding destinations or origins outside of the state); moves entirely within the state (intrastate); or passes through from an out-of-state origin to an out-of-state destination (overhead).

<sup>2</sup> Overhead freight includes freight shipments by truck, rail or intermodal that do not originate or terminate in Wisconsin.

Increased freight and passenger rail activity can result in increased congestion at at-grade crossings. As the number of trains or the length of trains increases, roadway congestion near crossings increases. In addition to affecting system capacity, this can negatively impact air quality and energy consumption.

Finally, Wisconsin faces challenges at the connections between the rail and truck networks, which typically occur at ports or intermodal facilities. These facilities are usually located away from highways and interstates, which are designed to handle the larger vehicles. This separation forces the local roadway system to function as the link between these facilities. Unlike highways, local streets typically have more congestion due to traffic signals, poor turning radii, inadequate overhead clearances and narrow bridges. These factors make access to terminals difficult. As congestion increases, the efficiency and quality of service provided by truck and rail carriers is reduced.

### **Proximity to Chicago and the Twin Cities**

Given the proximity of large rail terminals in Chicago and the Twin Cities, the majority of Wisconsin's import/export rail intermodal traffic will continue to move over the state's highway system before transferring to the rail mode in adjoining states. As mentioned previously, Wisconsin's overhead rail freight tonnage accounts for 46 percent of Wisconsin's freight shipments. This is due in large part to the preferences of large railways for dedicated movements of container traffic to a single port.

As the nation's busiest and most complex rail transportation hub and principal gateway for transcontinental traffic, Chicago continues to be a major regional rail bottleneck. Because none of the U.S.-based rail systems serve both the Pacific and Atlantic Coasts, all east-west traffic must interchange at one of the nation's rail "gateways." Chicago is the largest interchange point, moving over 35,000 freight rail shipments per day. Traffic moving east from Wisconsin must use the Chicago gateway. Congestion in the Chicago terminal area can back up rail operations and negatively impact service in southeastern Wisconsin.

The Chicago Region Environmental and Transportation Efficiency Program (CREATE), has been organized as a partnership between the U.S. DOT, the State of Illinois, the city of Chicago, Metra (Chicago's commuter rail operator), Amtrak and the nation's freight railroads to improve freight and passenger rail mobility, enhance safety and promote economic development. See Chapter 4, Freight Rail, for more information.

### **Panama Canal expansion and Port of Prince Rupert, British Columbia**

The expansion of the Panama Canal is expected to be completed in late 2014 or early 2015. The expansion will enable the canal to accommodate ships that are longer, wider and deeper than those currently passing through the facility. As a result, while the number of ships traveling through the canal will likely not increase, the doubling of permitted vessel size will improve the competitive position of the U.S. Gulf and East Coast ports in handling Asian trade. While the impacts to Wisconsin are not fully known, the expansion may result in slower growth or a decrease in intermodal rail traffic through Wisconsin.

In contrast, the Port of Prince Rupert, in British Columbia, Canada and the intermodal train service introduced there in 2007 by Canadian National (CN) may have a substantial impact on Wisconsin. First,

the location offers cargo ships an opportunity to unload two days earlier than the next closest coastal port, helping to speed vessel cycle times and productivity. Containers are then moved by expedited double stack trains to Harvey, Illinois (south of Chicago) and Memphis, Tennessee. This service may result in an increase in rail traffic through Wisconsin, with as many as 20 container trains per day traversing CN's main route through Wisconsin. This would represent an approximate doubling of rail traffic.

### **Track sharing**

The majority of Wisconsin's intercity passenger rail network operates on routes owned or operated by freight railroads. Proposed intercity passenger and commuter rail services would use some of the existing capacity of these lines. Unlike Amtrak, commuter rail operations do not have a legal right of access to the general railroad system. For commuter rail operators to gain access, they must reach a voluntary agreement with the freight railroad.

Shared use can sometimes lead to capacity issues that impact freight trains and passenger rail service if adequate infrastructure is not in place. On shared corridors, passenger rail service can experience congestion due to delays caused by problems with host-railroad train dispatching, speed restrictions, track maintenance, track sharing, insufficient track capacity, or problems with track and signals, delays, assisting passengers boarding or alighting, holding trains for connections, or equipment. Delays can increase operating costs of passenger rail and negatively impact revenues. Fortunately, Amtrak's Hiawatha Service has a very good on-time performance record due in large part to sound host railroad dispatching and maintenance practices.

Future freight and passenger rail service growth must be accommodated with minimal delays through appropriate track capacity improvements. Both state and freight railroad operators will work together to complete capacity analyses to ensure freight railroad service is not negatively impacted by the expansion of passenger rail service. Improvements necessary to accommodate passenger rail are expected to enhance freight service as well. The sponsoring agency, the state or another entity, will share in the cost of capacity improvements necessary to address increased passenger rail service.

Capacity improvements to accommodate these new services may include new passing sidings, improved coordination of signalization and scheduling, and track upgrades. WisDOT has completed a detailed operations simulation of the Chicago-Milwaukee-Madison intercity passenger rail corridor and determined that with appropriate infrastructure improvements new service can be implemented without harming current and future freight operations. See Chapter 4, Freight Rail, for more information.

To address capacity concerns, WisDOT continues to encourage coordination between different service providers; however, the department does not have a direct role. The impacts of congestion and corresponding air quality concerns are discussed later in the chapter.

### **Rail line abandonments and possible restoration**

Rail line abandonments may cumulatively influence rail line congestion levels. When lines are not used due to abandonment or other reasons, fewer active lines are available to handle rail-related activity. Passage of the Staggers Act in 1980 greatly changed the nature of freight rail movements in the country.

With modifications to rail industry regulatory requirements, carriers were able to focus on their most profitable commodities and routes. This had a substantial impact on Wisconsin. By 1986, over 2,000 miles of track had been abandoned in Wisconsin. In response, WisDOT has worked with its partners to preserve rail corridors – proposed for abandonment – for future use. If a corridor is being abandoned and the department and communities are not able to preserve the current use, efforts shift to a rail corridor preservation approach. This preserves rights-of-way for future transportation purposes. While preserved for future rail use, some of these corridors are used as recreation trails. Map 11-1 shows the locations of rails-to-trails<sup>3</sup> corridors and rail bank corridors as of 2009.

With the anticipated growth in freight rail shipping and expansion of intercity passenger rail service, some of these preserved corridors may be restored over the next 20 years. Restoration may be based on economic feasibility, creating system redundancy, or other factors. Other corridors may be converted for other transportation uses. This conversion will likely address capacity concerns, potentially enhance air quality issues by offering an expanded rail mode for transportation and further support economic development. However, it will likely affect surrounding communities that may have been using the corridor for other purposes such as recreation, or allowed development that is now incompatible with future rail service.

The base case and the state rail plan alternative both support the department's recommendations to: upgrade and rehabilitate Wisconsin's publicly owned rail lines and bridges to accommodate heavier railcars and projected increases in rail traffic. Both also support the department's focus on work with the state's private railroads to identify opportunities to address system needs, coordinate freight and passenger rail movements, and identify multimodal connections. In addition, both alternatives support and recognize WisDOT's role in preserving essential rail service and corridors for future use; ensure that appropriate service will be provided to all shippers through the increased investment in the network; and support efforts to address congestion in and around Chicago. Finally, both the base case and the state rail plan alternative recommend implementing Wisconsin's portion of the Midwest Regional Rail System

Beyond the base case alternative, the state rail plan recommends that Wisconsin, in cooperation with its partners, formalize its ability to assess the value of rail assets by working to implement an asset management system for state-owned rail lines. This approach would enable the department and its partners to identify needs and help ensure that the system performs to its desired level. In addition, the state rail plan recommends cooperation with others to monitor effectiveness of communication systems with regard to quick, clear and accurate dissemination of information to all involved parties during and after rail incidents. The plan also recommends support of research, development and demonstration of advances in signal communication and train control systems on existing rail lines. Finally, the state rail

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<sup>3</sup> Rails-to-Trails program

plan alternative supports Wisconsin & Southern Railroad's continued service to Chicago as a method of serving Wisconsin's carload rail traffic to and from eastern points.

Each of these recommendations will continue to support the state's rail system and has the potential to address capacity and congestion issues that may arise over the life of the plan.

### ***Energy Consumption***

In Wisconsin, all modern railroad engines use diesel as their main fuel source. In 2006, 25 percent of Wisconsin's total energy resources were consumed by transportation. Based on data from the American Association of State Highway and Transportation Officials (AASHTO), for each one percent of long-haul freight shifted from truck to rail, fuel savings could total approximately 111 million gallons per year and annual greenhouse gas reductions could total 1.2 million tons per year.

Compared to other modes of transportation, freight rail is second only to inland barges in fuel efficiency for transport. Trucking is less energy efficient than freight rail in ton-miles per gallon of fuel consumed. This is due in part to the low rolling resistance between the rail car's wheels and the track, even at high speeds. Passenger rail systems throughout the U.S. consume one-third less energy per passenger-mile than automobiles<sup>4</sup>. On a per passenger basis, Amtrak operations are 18 percent more energy efficient than airlines and 17 percent more energy efficient than automobiles. If traveling and shippers chose rail over other modes, this could result in fuel efficiency gains. Factors influencing rail-related energy consumption include U.S. rail passenger equipment, development patterns and train set technologies.

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<sup>4</sup> U.S. Department of Energy, *Transportation Energy Data Book*, 2007

Map 11-1: Wisconsin Rail Corridor Transportation Uses



### **Passenger rail equipment standards**

Current U.S. rail passenger equipment safety standards are designed to keep passengers and crew safe in an operating environment that includes conventional heavy freight equipment. The heavier equipment can result in increased fuel use, as well as reduce acceleration and deceleration speeds. Future rail systems may use lighter weight equipment to achieve performance efficiencies through reduced fuel use and faster train speeds. New equipment will help reduce maintenance costs through reliable and easier to maintain systems, reduced fuel consumption and better performance. WisDOT will monitor these issues and work with the federal government and other states, as well as freight and passenger rail operators to implement guidance or regulations and identify equipment needs.

### **Development patterns**

Mixed used development often results in higher densities that are more transit-, bicycle- and pedestrian-friendly. This development pattern, known as transit-oriented development or smart growth, facilitates travel patterns that can be more energy efficient than auto-oriented development, thus contributing to more livable, sustainable communities. The state rail plan continues WisDOT's emphasis on expanding rail transportation and linking rail routes with intercity and local bus service through multimodal transportation centers. The potential benefits derived from encouraging these connections include fostering less auto-dependent development, expanding options for transit-dependent persons in urban areas and improving transportation options in rural communities. In addition, rail has the benefit of reducing air emissions and energy consumption.

The base case and the rail plan alternative both support the department's efforts to increase transportation sustainability and monitor the implications of increased fuel costs to individuals, businesses, families and communities. The department will consider the recommendations of the Midwest Governors Greenhouse Gas Reduction Accord, the state Office of Energy Independence and the Governor's Task Force on Global Warming to reduce fuel dependency.

As part of the state rail plan alternative, WisDOT will share regulatory information that encourages operational efficiency improvements, including improving crossings, constructing grade-separated crossings where warranted and addressing safety needs.

### **Train set technologies**

Train set technologies can impact energy consumption. For example, on a given route, multiple trains timed with positive train control can be managed more efficiently than on routes without positive train control. Properly timed railroad crossings can increase rail-related energy efficiencies if automobile idling is kept to a minimum. In the future trains may become even more energy efficient as a result of more efficient diesel engines, better fuels types, training of engineers on practices to conserve fuel use for most efficient service, lower-resistance wheel bearings, and use of distributed power.

Other factors influencing rail energy consumption include transportation system characteristics (terrain, speed, congestion and service levels), federal fuel regulations (type and characteristics) and energy efficient buildings and amenities (e.g. lighting).

## ***Air Quality and Greenhouse Gas Emissions / Climate Change***

While emissions from the transportation sector are expected to continue to decrease with improvements in technology and regulatory measures, air quality remains a concern for Wisconsin. The state's air quality is affected by emissions generated internally, as well as those moving north along Lake Michigan from neighboring states. The highest levels of air pollution occur in Wisconsin's southeastern counties and in the counties along Lake Michigan.

The Clean Air Act (as amended in 1990) directed the U.S. EPA to establish allowable ambient concentrations for six criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide and lead. The standards for these six criteria pollutants are commonly referred to as the National Ambient Air Quality Standards (NAAQS).

The potential air quality impacts discussed here focus on:

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

### **Ground-level ozone**

Ground-level ozone is a pollutant of primary concern in Wisconsin. Ozone is formed when volatile organic compounds and nitrogen oxides combine in the presence of heat and sunlight. Motor vehicle exhaust and gasoline vapors, as well as industrial emissions and chemical solvents, are some of the major sources of volatile organic compounds and nitrogen oxides. While a threshold for human health exposure to ozone has not been established, exposure to ozone has been linked to both acute and chronic adverse health effects, including heart and lung disease. When inhaled into the lungs, ozone can aggravate existing lung diseases, exacerbate asthma attacks and bronchitis and may shorten life span. In 2010, seven Wisconsin counties were designated non-attainment for the eight hour ozone standard: Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha. In 2013, these areas are portions of Kenosha County and Sheboygan County.

### **Particulate matter**

Particulate matter is another pollutant of concern to Wisconsin. Particulate matter is a complex mixture of extremely small particles and liquid droplets. It is made up of a number of components such as nitrates and sulfates, organic chemicals, metals and soil or dust particles. Like ozone, when inhaled into the lungs, fine particles can aggravate existing heart and lung diseases and cause cardiovascular symptoms, arrhythmias, heart attacks, chronic obstructive pulmonary disease, asthma attacks and bronchitis. The U.S. EPA has designated Milwaukee, Racine and Waukesha counties as nonattainment for the particulate matter 2.5 standard.

### **Greenhouse gas emissions**

The burning of fossil fuels results in greenhouse gas (carbon dioxide, methane and nitrous oxide) emissions, which trap heat in the earth's atmosphere. Fossil fuels are the largest contributors to the climate crisis, and transportation sources remain a large contributor. Impacts resulting from continued increases in greenhouse gas emissions include more extreme weather events, changing landscapes,

weather related illnesses, disease and economic losses. In Wisconsin, the transportation sector contributes about 24 percent of greenhouse gas emissions.<sup>5</sup>

In general, reductions in vehicle miles traveled resulting from increased availability of modal choices, such as intercity passenger rail and commuter rail, may reduce overall carbon dioxide emissions from the transportation sector and help reduce future

Effects on air quality can change based on changing land use patterns, transportation mode shifts, source locations and forecasted congestion increases and reductions.

greenhouse gas emission targets. Intercity passenger rail travel emits an estimated 40 percent fewer kilograms of CO<sub>2</sub> emissions per passenger mile than auto travel and less than half that of air travel.<sup>6</sup> Communities next to intercity passenger and commuter rail stations and rail yards, including areas where trains idle for long periods of time will potentially have more concentrated exposure to engine emissions. However, the diversion of people traveling by rail instead of automobile is likely to offset some of the potential negative air quality impacts. In response to concerns about train idling and emissions, communities may be able to influence the amount of landscaping around rail corridors and stations. In addition, changes in locomotive technologies may help to address emissions concerns.

In 2007, nine Midwest states, including Wisconsin, signed a climate change accord to target greenhouse gas emission levels. In 2008, the Governor's Task Force on Global Warming presented recommendations to reduce Wisconsin's contribution to the global climate crisis.

The base case and the state rail plan alternative support the department's commitments related to air quality improvement. WisDOT will monitor ways to reduce transportation-related emissions in the state. Both the base case and state rail plan alternative emphasize the importance of expanded rail service and continue WisDOT's focus on improving the transportation system and providing modal alternatives to help improve air quality.

The rail transportation mode offers a viable option to help reduce emissions. The U.S. Environmental Protection Agency (EPA) estimates that for every ton-mile, a typical truck emits three times more nitrogen oxides and particulates than a train. Related studies suggest that trucks emit six to 12 times more pollutants per ton-mile than railroads, depending on the pollutant measured. The American Society of Mechanical Engineers found that 2.5 million fewer tons of carbon dioxide would be emitted into the air annually if 10 percent of intercity freight now moving by highway were shifted to rail.

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<sup>5</sup> World Resources Institute, Wisconsin Greenhouse Gas Emissions Inventory and Projections, 25 June 2007.

<sup>6</sup> www.amtrak.com. Energy Efficiency and Environmental Benefits. Critical Link. 2007. Emissions factors based on calculations from the World Resources Institute (WRI) and Carbonfund.org. Calculations assume single-occupant car and the added impact of high-altitude emissions for air.

Factors affecting air quality related to rail transportation include:

- Congestion
- Federal regulatory changes
- Train set technologies
- Expanded mobility options

### **Congestion**

Rail network congestion can impact air quality, particularly at railroad-highway crossing locations where automobile engine idling occurs. With anticipated increases in freight shipment movements on Wisconsin's rail network, emissions may increase at roadway-rail crossings. In addition, because a large percentage of freight shipments neither originates nor terminates in the state, a portion of Wisconsin's freight shippers must move goods over the highway system to access large railroad intermodal facilities in Chicago. West bound intermodal freight traffic from Minnesota and the Dakotas often travels east by truck on I-94 and I-90 through Wisconsin before it is transferred in Chicago to west-bound trains. Truck volume on these interstate routes is large – around 10,000 vehicles per day – and is expected to grow faster than passenger vehicle traffic over the next 20 years.

The base case (*Connections 2030*) supports several policies that will address highway system preservation and transportation system efficiencies. As part of the state rail plan, WisDOT supports service and infrastructure improvements to reduce automobile congestion and congestion-related impacts at crossing locations.

### **Federal regulatory changes**

In March 2008, the EPA finalized new rules and clean diesel requirements that when fully implemented will cut allowable particulate matter emissions from railroad locomotive engines by as much as 90 percent and NOX emissions by as much as 80 percent. The EPA expects air quality to continue to improve based on increased regulations, examples of which include the *Locomotive Engines and Marine Compression-Ignition Engines Rule* and the *Clean Air Non-Road Diesel Rule*.<sup>7</sup>

### **Train set technologies**

Engines produce exhaust. As train speeds increase, levels of particulate matter and other toxins increase. Heavier freight cars (due in some part to the urea that is added to fuel to reduce particulate matter and nitrous oxides) take more fuel to move, which can result in negative impacts to the environment. However, when older model rail engines are replaced with newer models in combination with clean diesel requirements, locomotives produce fewer emissions.

### **Expanded mobility options**

The state rail plan alternative emphasizes expanding rail transportation and linking rail routes with intercity and local bus service through multimodal transportation centers. The potential benefits derived from encouraging these connections include fostering development that is less auto-dependent,

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<sup>7</sup> United States Environmental Protection Agency, "Our Nation's Air: Status and Trends through 2008," (EPA-454/R-09-002, February 2010), pg 2.

expanding options for transit-dependent people in urban areas and improving transportation options in rural communities. With a shift to other transportation modes, the potential for reduced emissions increases.

Both the base case and state rail plan continue the department's emphasis on air quality improvement. WisDOT will continue to comply with federal and state policies and regulations, encourage development and expansion of the state's multimodal system, identify opportunities to support the rail network and preserve essential rail service where appropriate. Further, the department will support the efforts of CREATE, improve communication and encourage operators to meet regulatory agency goals as soon as possible.

Other entities, including private railroads and local governments, can help to address air quality concerns. For example, Amtrak plans to minimize its carbon footprint by reducing diesel fuel use per single engine, over time.<sup>8</sup> Another example is the increased intermodal movement (highway to rail freight) of goods by private entities to address greenhouse gas emissions, improve energy efficiency and encourage the sustainable transport of goods. Wisconsin-based Schneider National is one of the nation's largest users of rail intermodal services.

Wisconsin's railroad industry results in over \$1 billion (2008) invested in the state through infrastructure investments, wages and indirect expenditures like purchases and housing.

The 2006 Midwest Regional Rail Initiative economic analysis estimates that Wisconsin communities would see \$704 million in increased joint development potential and \$173 million in extra household income with full build-out of the Wisconsin portion of the proposed Midwest Intercity Passenger Rail System. The analysis also found that Wisconsin will receive \$1.80 in benefits for every \$1 invested in the system.

See Chapter 4: Economic Development.

### ***Economic Growth and Development***

Wisconsin benefits from a transportation system that safely and reliably moves people and goods to their destinations. Rail improvements can encourage economic development in various ways. Wisconsin's businesses directly benefit from enhanced freight mobility and connectivity to economic centers located in and out of state. Investments in passenger and freight rail transportation also produce economic returns achieved through additional connectivity and reductions in congestion. The benefits of passenger and freight rail investments can enhance the competitiveness of the state and the region by retaining existing work forces and businesses, as well as attracting new ones and further bolstering statewide economic development.

Intercity rail and commuter rail provide environmentally friendly alternatives that connects the state's major economic centers. More and faster passenger trains can increase mobility options for intercity travelers, commuters and people who are transit dependent. An expanded and improved passenger rail network improves access to jobs, goods and services, and expands the labor pool and market areas for business.

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<sup>8</sup> Amtrak, "Amtrak ink, A Monthly Publication for and by Amtrak Employees," (Volume 14, Issue 4, April 2009), pg 4.

With respect to increased passenger rail services and smart growth, various economic benefits can be anticipated. Foremost is the shifting of personal trips from motor vehicles to trains, with resulting fuel savings. Second, with intercity and commuter trains stopping in urban centers, opportunities exist to promote transit-oriented mixed used developments. Transit-oriented development can be a catalyst for new economic activity that results in more jobs and higher property values. Commuter rail can increase economic activity around commuter rail stations within a corridor.

Rail enhancement will also help create a more sustainable freight network. Currently, rail shipments account for one-third of the state's total freight movement by tonnage and 15 percent by total value, second only to truck shipments. Shifting this freight from truck to rail would not only help reduce roadway congestion, but would also result in less pollutants and a lower cost due to better efficiencies in fuel per ton-mile.

If efforts are made to develop Wisconsin intermodal load centers, such as inland ports, where intermodal containers might be gathered into blocks and hauled to either Minneapolis or Chicago rail centers, the number of trucks on the state's highways could be reduced. Potential benefits of this diversion would include fuel cost and highway maintenance savings, as well as the minimization of highway accidents and their related costs.

Abandonments and rail lines converted from rails-to-trails or from trails-to-rails can affect economic growth and development as well. WisDOT has worked with its partners to preserve, for future use, rail corridors proposed for abandonment. Wisconsin has preserved about 330 miles of track statewide. With the anticipated growth in freight rail shipping and expansion of intercity passenger rail service, some of these preserved corridors may be restored over the next 20 years.

Both the base case and state rail plan alternative support the department's emphasis on connectivity between modes, freight rail mobility and ensuring that rail remains a viable mode for the state. Both alternatives continue the department's emphasis on preserving rail service, addressing network needs to maintain and improve the state's economic competitiveness (which may include improvements to accommodate heavier car loads and faster trains) and continue support for the department's grant and loan assistance program aimed at promoting rail freight and economic development.

As part of the rail plan alternative, WisDOT will continue economic analysis on transportation projects.

### ***Communities and Cultural Resources***

The character of communities and neighborhoods is impacted by rail activities. The following discussion focuses on:

- Land use
- Community barriers
- Connectivity and economic development
- Service needs/governance structures
- Noise and vibration

- Project-level and site impacts
- Safety

Map 11-2 depicts active rail lines statewide in 2009. Tribes, counties, county seats and cities with populations over 5,000 alongside existing rail lines are noted. Eight Wisconsin counties and one-third of the county seats do not have rail service. These are predominately located in northern and southwestern Wisconsin. In general, tribal lands have few connections to rail services.

**Map 11-2: Active Rail Lines Statewide in 2009**



**Land use**

Enhancements to the rail network can encourage land use decisions that support the availability of rail and encourage appropriate development around station locations. This is often mixed-use development, which combines residential, commercial and retail uses into a small area. Mixed-used development often results in higher densities that are more transit-, bicycle- and pedestrian-friendly. This type of development pattern, facilitates travel patterns that can be more energy efficient than auto-oriented development and contribute to a more livable, sustainable community.

As part of the development of the state rail plan, WisDOT conducted an inventory of rail stations statewide. The station inventory highlights needs and challenges at current passenger rail stations and will help guide station improvements and investment in the future. See Appendix 6-D, Wisconsin Intercity Passenger Rail Station Inventory, for more information. In addition, WisDOT will work with communities to facilitate connections and coordination between modes. This includes designing and locating stations to accommodate transit and intercity buses, facilitation of interlining agreements between rail operator and intercity bus operators, coordinating with communities and transit agencies to increase service to stations, providing adequate bike facilities at all stations and providing bike accommodations on trains.

In some parts of the state, restoring service on preserved rail corridors may present challenges for adjacent or nearby communities. Transportation corridors are some of the most valuable assets in the state. Several hundred miles of rail lines or rail rights-of-way at risk for abandonment may have been preserved so that future rail transportation options could be maintained. These corridors may be used by adjacent communities or other entities as recreational trails. Growth and development may have occurred around them, which may be incompatible with future rail service. Conversion back to rail service will impact many communities that must address how to handle land uses that may have changed over the years as rail use declined. For example, the conversion of abandoned rail lines to trails likely resulted in economic and residential development near trails. Some communities have redeveloped their downtowns to highlight the trails. In other areas, residential communities have been built adjacent to these former rail lines. Previous freight rail or passenger rail activity may have been minimal and train speeds may have been slow. As a result, even older residential neighborhoods may have been built near active rail lines with minimal impacts. Increasing the frequency, length or speed of these trains could negatively impact these neighborhoods.

**Community barriers**

Rail facilities that run through a developed area can, in many cases, act as a barrier to communities. This impact can occur if tracks are cannot be easily crossed because of safety concerns. Long, slow-moving freight trains split communities for periods of time, triggering delays in motor vehicle traffic and potentially impacting emergency services. In addition to freight train impacts, intercity passenger rail with speeds of up to 110 mph will require additional crossing safety treatments, such as median barriers or quad gates, to minimize the possibility of motorists driving around gates. While the addition of gates or other safety devices may create a barrier, the expected 17 percent increase in freight rail traffic and an increase in passenger rail activity is a safety concern that must be addressed. Improving the rail line to accommodate increased rail traffic will encourage planning activities that may include addressing

community concerns, offsetting grade crossing closures, installing fencing and other safety improvements and implementing quiet zones that can help link the community together. To assist with assessing impacts and considering mitigation opportunities, WisDOT will participate in local comprehensive planning efforts when requested and offer technical expertise and guidance where appropriate. If the project is a state led, the department will coordinate with the surrounding communities as appropriate.

Consideration of freight rail facilities is also important. This may include determining the frequency of trains entering an area, assessing potential train schedule impacts on vehicle traffic, siting rail yards and terminals to maximize surrounding uses while minimizing potential impacts to community residents, and identifying potential connections between shippers and area businesses with railroad facilities.

### **Connectivity and economic development**

Positive effects of increased passenger and commuter rail services include creation of new economic development opportunities, enhanced service and increased mobility. Upgraded freight rail lines may positively impact freight shipments and create other economic opportunities as well.

Rail systems can foster focused growth around activity centers like rail stations, compared to current auto/truck centric greenfield locations. This pedestrian-friendly development pattern reduces fuel use, air pollution and greenhouse gas emissions. It also reduces urban sprawl by satisfying housing and business needs in a more efficient manner. Reducing urban sprawl will reduce the pressure to develop farms and forest lands. Also, compared to adding highway lanes, expanding rail lines in rural areas will require little, if any, additional land. The department's Rail Station Capital Assistance Program may be used to upgrade existing stations and build new ones.

### **Service needs/governance structures**

Political boundaries can present obstacles to providing transit services such as commuter rail. In some areas insufficient coordination among transit services that cross county or municipal borders raises challenges. Local governments will need to cooperate to successfully implement commuter rail. Special purpose governments, such as regional transit authorities (RTAs) that can administer and fund transit systems on a region-wide basis, offer a possible governance structure. RTAs are special purpose units of government that can administer and fund transit systems and manage regional transit systems that would serve a greater portion of the traveling public.

### **Noise and vibration**

Engines, locomotive mounted horns, ventilation systems, train cars, construction activities, track maintenance and rail yard activities all cause noise. Typically, sound levels caused by trains are measured relative to the existing ambient sound without a train present. When a train is present, significant sound impacts may be heard as far out as 600 feet from the centerline of the rail line. With greater train frequencies and speeds, train noise increases. Dominant noises during intercity passenger rail speeds of 0 to 80 miles per hour include propulsion noise of motors and cooling fans. When speeds increase to 125 miles per hour, noise predominately radiates from the wheels and rails. The effects of

noise on humans may include general disturbance and other secondary economic impacts. Train noise may also deter wildlife and impact habitat.

Design decisions influencing noise levels include whether the rail line is grade-separated from other infrastructure (including roadways), the number of railroad crossings, surface choice for track and locations of sound barriers. Sound barriers that utilize surrounding land masses absorb sound; these include ditches, embankments and trenches. Walls act as independent structures and reflect more sound. While a barrier can mitigate noise for humans, the same barrier may cause habitat fragmentation for plants and wildlife.

Train engineers are required by the Federal Railroad Administration to sound the locomotive horn as a warning at public roadway-railway crossings. However, the FRA also provides an opportunity for communities to mitigate the effects of train horn noise by establishing quiet zones. Wisconsin's local governments have exercised their authority to create quiet zones within their jurisdictions to improve their community's quality of life. Trains running during the day have less perceived noise than trains running at night. Similarly, train maintenance activities occurring during the day, surrounded by other ambient noise, are less "noisy" than those that occur at night. Slower trains cause less friction on the rails, resulting in decreased decibel level.

Before intercity passenger rail is implemented, project level studies will be conducted on proposed sound levels prior to infrastructure improvements. Measures for future noise level reduction will be considered as appropriate. On portions of routes that are envisioned for intercity passenger rail service with higher speeds, noise levels may cross decibel-level thresholds that would require mitigation. These concerns will be addressed during project-level environmental analyses.

Train vibration is caused by rough track and wheel touch points, high engine throttle settings and topography. Unfortunately, vibration may cause impacts to the environment, especially on properties near tracks or rail yards. Vibration can affect a greater number of people in suburban and urban areas, where populations are dense. Corridors with more trains and higher speed trains may have more frequent episodes of earth vibration. In some areas, building damage could occur, if proper measures are not incorporated in project design.

The state rail plan does not specifically address vibration. However, increased efforts to repair wheel flats on freight cars, newer equipment and reconstructed track and roadbed could mitigate vibration impacts. Component development (using new technologies and materials) could also help reduce earth vibration from trains. Project-related reviews for vibration thresholds will occur as rail projects continue.

#### **Project level impacts and site impacts**

Railroad crossings, contaminated properties and transport of hazardous materials pose safety risks to communities and may also have business or economic impacts. During construction of new or expanded rail yards, replacement of historic bridges and railroad abandonments, archeological site impacts are identified with surveys that rediscover surviving remnants, habitat or archeological items. WisDOT recognizes the importance of archeological sites and historic properties. WisDOT will continue to comply with State Statute 44.40 and Section 106 of the National Historic Preservation Act of 1966.

## Safety

The expansion of rail service can provide a safer travel option. However, consideration must be given to safety around rail stations. Concentrated development can result in increased potential for collisions as a result of high auto, bike and pedestrian traffic volumes near rail facilities.

Increased freight and passenger rail activity can increase congestion at at-grade crossings and result in several safety concerns. As wait time increase, the likelihood of drivers, pedestrians or bicyclists attempting to “beat the train” increases. Likewise, emergency response services can also be negatively impacted, particularly if services are located on one side of the track and an incident occurs on the other. *Wisconsin Rail Plan 2030* states that WisDOT will continue to work with the Office of Commissioner of Railroads to ensure proper safety upgrades at rail crossings of roadways. WisDOT will improve crossings, and through intercity passenger rail projects, accelerate a program to upgrade intercity passenger rail corridor crossings.

Finally, safety is a factor as it relates to corridors shared by rail and non-motorized modes such as bikes and pedestrians. While the use of the actual rail corridor by a non-rail mode is considered trespassing, the potential conflict between these modes must be addressed during the design phases to ensure that adequate safety devices are in place to reduce the risk of accidents.

The base case and state rail plan alternative continue to emphasize policies related to community impacts. These include continuing integrated approaches to transportation and environmental issues, preserving and enhancing positive land use and transportation relationships, and incorporating environmental justice in all transportation decisions. Furthermore, both alternatives continue recommendations to avoid and minimize impacts to sensitive natural areas and historical and archeological sites; and to mitigate unavoidable impacts and work with key partners to address safety concerns. The base case and state rail plan alternatives also continue the department’s emphasis on improving connectivity, encouraging access to intercity passenger rail by expanding implementation of new and improved intercity bus service and routes that connect to rail stations.

The rail plan alternative recommends that WisDOT increase public awareness of the benefits of intercity passenger rail service, including opportunities to connect to rail service using intercity bus service.

The Wisconsin Department of Natural Resources’ *Wisconsin Land Legacy Report: An Inventory of Places to meet Wisconsin’s Future Conservation and Recreation Needs* describes 229 named legacy/state places. The report outlines a vision for land and environmental resource goals.

## ***Sensitive Land and Water Resources***

Wisconsin has 16 distinct ecological landscapes defined by the state’s climate, soils, vegetation, topography and aquatic features. Wisconsin’s public lands include local parklands, county and state forests, national wildlife refuges and national forests. Wisconsin’s natural resources are some of the state’s most valuable assets. These range from critical species habitat, undeveloped woodlands and pastures, to wetlands, park lands and the surrounding Great Lakes.

Rail-related projects can impact these resources.

This discussion focuses on:

- Habitat
- Water quality
- Wetlands
- Public lands

WisDOT emphasizes the preservation of protected resources and continues its comprehensive approach to integrating transportation and environmental issues. With that in mind, WisDOT considers the range of potential environmental impacts and identifies feasible, cost-effective solutions that avoid, minimize or mitigate impacts.

### **Habitat**

Habitat is defined as the area where plants and animals are located. Transportation projects can impact natural habitats by fragmenting an area and introducing invasive species. As a result, species of plants and animals can be negatively impacted. Conversely, projects can positively impact natural habitats through mitigation activities that might modify facility design to accommodate migratory movements (e.g. underpasses), natural plantings along rights of way and addressing the spread of invasive species through modified mowing schedules and washing of equipment prior to moving to a new location.

Rail rights-of-way provide potentially rich natural habitats for both plant and animal species. As corridors dedicated to a single mode of transportation, with little other activity, rail lines can provide a habitat of nesting and feeding areas for many types of wildlife and birds, as well as possibilities for habitat continuity along the corridor. Similar to highways, the movements of the trains do, however, raise environmental concerns, including impacts resulting from invasive species, wildlife collisions and habitat fragmentation.

Invasive species are plants or animals not native to an environment; they have the potential to cause severe environmental devastation by overwhelming native species. Invasive species can also diminish the economy by affecting recreational opportunities and public health, as well as incurring mitigation costs. Controlling invasive species is often difficult as they are easily spread by human activities such as transportation maintenance, operation and construction activities. WisDOT continues to work with the Wisconsin DNR to address concerns regarding invasive species.

*The Finding of No Significant Impact (2004) for the Milwaukee to Madison intercity passenger rail corridor called for fences to protect the secure transport of hazardous material cars and for human safety in urban areas. Fences can fragment prairies and habitat and threaten the viability of species.*

The movement of trains can contribute to the spread of invasive plants and seeds. Right-of-way owners strive to keep

Endangered or threatened species located near transportation infrastructure, such as railroads, can be impacted by the construction, operation and maintenance of the facility.

areas around rail infrastructure free of all vegetation to provide surface drainage, accommodate utilities, prevent erosion, reduce the risk of fires, control weeds, provide visibility and prevent buildup of windblown debris and snow. While clearing the invasive plant life around and along the rights-of-way offers benefits, the potential remains for plant life to transfer from moving trains to other parts of the corridor.

Some of the negative impacts associated with invasive species are addressed in the *Invasive Species Best Management Practices for Transportation and Utility Rights-of-Way*.<sup>9</sup> The activities apply to utility and transportation corridor construction as well as maintenance activities. The report includes best management practices for soil disturbance, vegetation management and inspection/monitoring transport of materials, re-vegetation and landscaping. Best management practice examples include scouting for, locating and documenting invasive species infestations prior to implementing activities, and selecting noninvasive or native species for re-vegetation and landscaping activities. Limited construction in native prairies can also mitigate negative impacts to prairies. Further, rail line abandonments can help mitigate habitat losses because these lands often remain without active management, in long-term rest.

The base case and the state rail plan alternative continue WisDOT's commitment to addressing invasive species along transportation corridors.

Changes to rail corridors can fragment critical habitats or result in habitat loss. If new habitat is created during construction, each new piece of habitat (fragmented from a larger whole) may not be capable of supporting the same wildlife or plant species as an older, undisturbed piece. Smaller, fragmented habitats are less likely to be as sustainable as a larger regional habitat. Given that the majority of the corridors considered as part of the rail plan are existing facilities, concerns regarding habitat fragmentation are minimal.

The Wisconsin Department of Natural Resources *Wild Life Action Plan* defines the state's focus on native wildlife species most at risk of becoming endangered or threatened or already listed by either the state or federal government. Currently, over 230 species in Wisconsin are listed as threatened or endangered. The state's strategy emphasizes the importance of protecting habitats as a means of protecting a whole suite of species rather than focusing on conservation efforts targeting individual species.

While neither the base case nor the state rail plan alternative specifically identifies new rail line construction, new intercity passenger or freight service may occur along rail lines preserved for future use. Because the natural environment may have reclaimed an abandoned rail line, new construction or resuming rail activity along these corridors may result in some negative impacts.

A wildlife collision with all types of transportation modes is a risk. Overall, wildlife hazards associated with the base case and state rail plan alternative are essentially the same. As train frequencies increase, the potential for collisions will also likely increase. However, rail passenger corridors may include fencing

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<sup>9</sup> Wisconsin Council on Forestry, *Invasive Species Best Management Practices for Transportation and Utility Rights-of-Way*, (Version: January 6, 2010), pg 4.

and other structures to minimize trespassing concerns. This may help to minimize the number of collisions along certain sections.

Both the base case and the rail plan alternative continue the department's efforts to collaborate with the DNR to educate others on environmental issues. The department will continue to emphasize safeguarding protected resources by identifying sensitive resources early in the planning process and avoiding or minimizing impacts. Both the base case and the state rail plan alternative emphasize that WisDOT should develop guidance and procedures to discourage transportation development activities from intensifying the spread of invasive plants. On state-owned lines, when projects occur, WisDOT will improve crossings over waterways to address any previous natural resource impacts.

### **Water quality**

Wisconsin has more than 12,600 rivers and streams and over 15,000 lakes, most of which are located in the northern half of the state. Wisconsin's highest quality waters, or outstanding resource waters, consist of about 200 streams and 100 lakes. There are about 1,500 streams classified as exceptional resource waters in Wisconsin.<sup>10</sup> Surface waters provide recreational opportunities, support fisheries and have unique physical features and environmental settings. Communities use water resources for drinking, irrigation, recreation and industrial processes.

Rail facility construction may affect water resources by filling or diverting ponds or wetlands (changing drainage patterns), reducing groundwater absorption through compression of surface soils, affecting the navigability of waterways and affecting access to recreational resources. Track construction activities can impact multiple acres of wetlands for each one mile of track construction. During construction, storm water runoff must be carefully managed. Additionally, development patterns accompanying transportation system changes may result in indirect impacts to water supplies or the demand for water. State Statute 88.87(2) (a) requires the department to ensure that when building and maintaining any railroad grade in or across a waterway (which may range from marshes, to drainage courses), it shall not impede the general flow of the surface water or stream. In addition, WisDOT will continue to encourage and use wetland bank sites to help mitigate the unavoidable loss of wetlands with efforts focused on on-site mitigation and wetland banking during projects. WisDOT's continued adherence to 'no net loss' wetland strategies supports the policies of the United States Army Corps of Engineers and the Wisconsin Department of Natural Resources.

During railroad operations, hazardous materials from small leaks in switching yards or large spills during a derailment can harm water resources. The transport of hazardous materials by rail is considered much safer than by truck. According to the Association of American Railroads, the risk of an accidental hazardous waste material release is 16 times greater for hazardous material shipped over roadways compared to those shipped by rail.<sup>11</sup>

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<sup>10</sup> Wisconsin Department of Natural Resources, *Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need*, [http://dnr.wi.gov/org/land/er/wwap/plan/pdfs/02\\_4\\_0\\_Vert\\_Habitat.pdf](http://dnr.wi.gov/org/land/er/wwap/plan/pdfs/02_4_0_Vert_Habitat.pdf), accessed April 2008.

<sup>11</sup> Association of American Railroads, HAZMAT FAQ, <http://www.aar.org>.

Much of the state's rail network is comprised of wooden railroad ties. Creosote is applied to the wooden ties in a pressurized chamber that allows the creosote to penetrate into the wood fiber. As a result, there is very little creosote migration from a treated tie into the ground except perhaps at the treating facility. Generally speaking, concrete ties are used on lines that carry heavier loads or have severe curves. The advantages of using reinforced concrete over wood include longer service life, greater strength (thus requiring fewer ties per mile of track) and lower maintenance costs. Concrete ties also form a more stable track bed that results in a smoother ride. This leads to longer track and equipment life, lower fuel consumption and lower maintenance costs for both locomotives and rolling stock. Early analysis suggests that the longer life and corresponding benefits of the concrete ties will help reduce greenhouse gas emissions.

In response to waterway impacts, specific regulations have been created to address and mitigate water resource impacts at the project level, through an environmental analysis or an environmental impact statement. To prevent contamination in state waters, Amtrak is improving wastewater treatment.<sup>12</sup>

Both the base case and state rail plan alternative continue the department's efforts to identify sensitive resources early in the planning process. The goal of these efforts is to continue to minimize impacts to sensitive resources, identify costs, and identify effective and feasible solutions that will avoid, minimize and mitigate potential negative impacts resulting from transportation decisions.

Under the base case and state rail plan alternative, proposed expansion of intercity passenger rail service may result in upgraded or new track construction. Expansion of intercity passenger rail service to other areas of Wisconsin may result in upgraded or new track construction. Working with Class I railroads to maintain, improve and increase freight rail service may also result in the need to upgrade and construct additional track. Each of these activities could impact water quality through an increased amount of impervious surface and increased density of harmful chemicals in runoff.

The state rail plan alternative will encourage the use of best practices to control invasive species by implementing department policies, as well as using the guidance in *Invasive Species Best Management Practices for Transportation and Utility Rights-of-Way*. WisDOT will encourage and use wetland bank sites to help mitigate the loss of wetlands. On-site mitigation efforts will continue during projects. WisDOT will continue to collaborate with the DNR to educate others about environmental issues.

### **Wetlands**

Wetlands are ecological systems that are typically partially or completely covered by water for part of the year. They are among the most productive natural ecosystems in the world. Wetlands support aquatic plants and provide habitat for more species of plants and animals than any other type of landscape in Wisconsin. Additionally, wetlands improve water quality, decrease flooding and protect shorelines. Wisconsin has 5.3 million acres of wetlands, most of which are located in the northern portion of the state. The DNR estimates that Wisconsin has lost about half of the estimated 10 million acres of wetlands that were present in the 1800s.

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<sup>12</sup> Amtrak, "Amtrak ink, A Monthly Publication for and by Amtrak Employees," (Volume 14, Issue 4, April 2009), pg 4.

WisDOT mitigates unavoidable wetland losses using the Wetland Mitigation Banking Technical Guideline established and implemented in cooperation with state and federal agencies. Through 2030, WisDOT will continue its commitment to protect and preserve wetlands. However, efforts to locate and fund future wetland bank sites will likely experience greater challenges due to higher real estate costs.

Potential wetland impacts related to intercity passenger rail service, commuter and freight rail might occur. Both the base case and the rail plan alternative recommend expansion of intercity passenger rail service to other areas of the state. This may result in new track construction or upgrading of existing track. Additional Class I rail infrastructure may need to be constructed to maintain, improve and increase existing freight service.

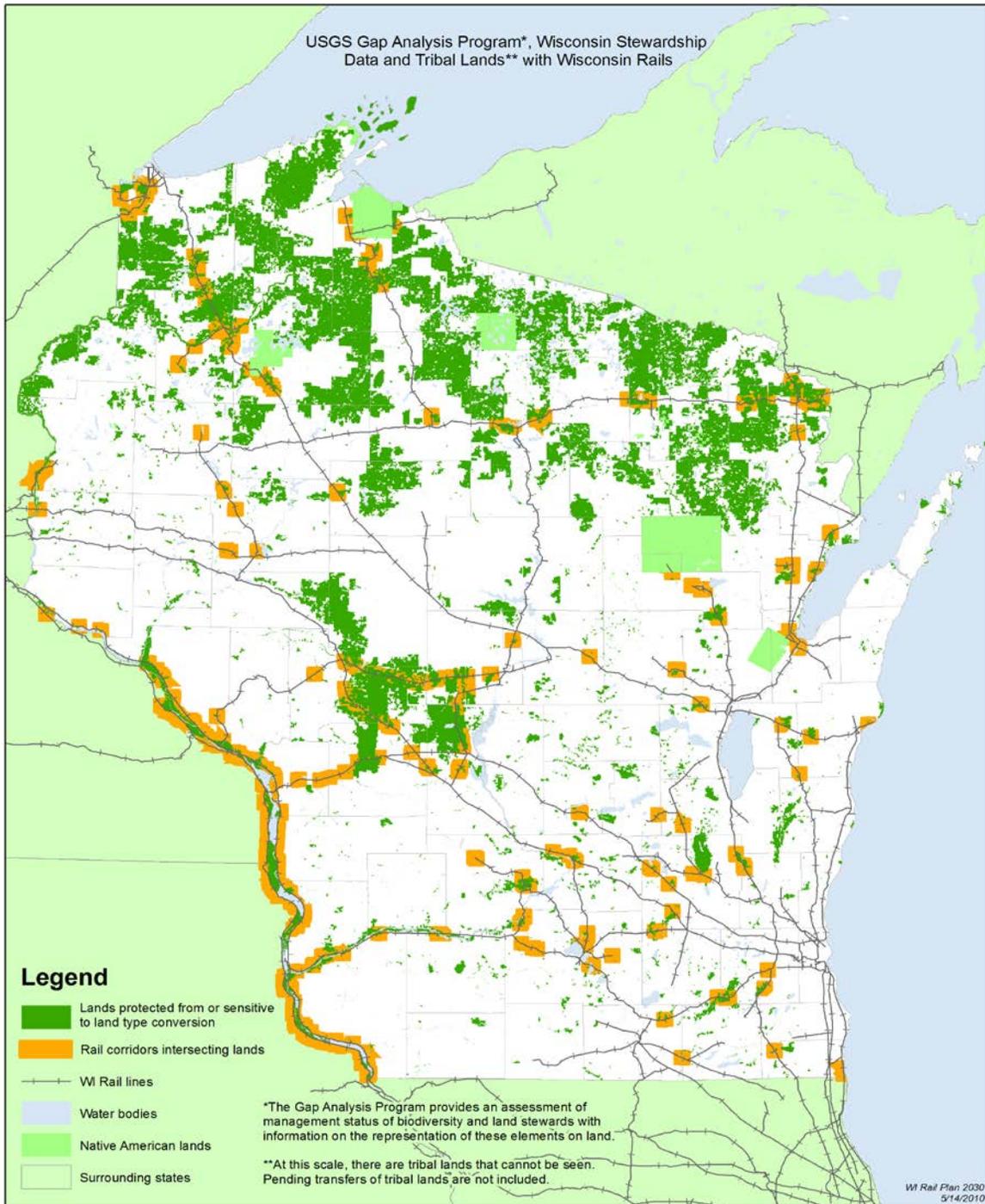
### **Public lands**

Wisconsin has about 2.5 million acres of county forest, two million acres of national forest and 0.5 million acres of United States Fish and Wildlife lands. The DNR manages 1.5 million acres of land across the state, including state forests, state parks, wildlife areas, trails, natural areas and forest nursery facilities. Map 11-3, Wisconsin Rail with Stewardship Data, shows where rail lines intersect lands protected from or sensitive to land conversion (one type of analysis to show how rails and lands intersect on a larger scale). Specifically, it shows that the Mississippi River corridor has more DNR program lands near rail corridors and that sensitive lands are prominent in Douglas, Washburn, Sawyer, Jackson, Wood, Juneau, Monroe and Marinette counties.

Changes to rail right-of-way and increasing the capacity of track can impact surrounding lands and related uses. Potential changes to lands occur when constructing infrastructure such as additional track, sidings, rail yards, stations, fences, bridges (including land bridges over wetlands), pedestrian crossings and other facilities. Possible impacts would likely be mitigated during the project level design activity. Impacts to public lands are the same for the base case and the state rail plan alternative.

As noted in Map 11-1, Wisconsin Rail Corridor Transportation Uses, rails-to-trails corridors can be converted from recreational trails back to rail uses in the future. If this were to occur, WisDOT would follow all applicable laws and environmental processes for conversion. For example, the Hank Aaron Trail has been identified in the Southeast Wisconsin Regional Plan Commission's long-range transportation plan as a potential future commuter rail corridor.

**Map 11-3: Wisconsin Rail with Stewardship Data**



Because commuter rail is a local initiative, WisDOT would participate if requested. WisDOT will also examine whether shared uses are appropriate.

## ***Agriculture***

In 2005, Wisconsin's working lands covered 21.4 million acres (or 61 percent) of the state's total 34.8 million acres. Of these working lands, 12.1 million acres were agricultural land and 9.3 million acres were forest. From 2000 to 2005, the state lost 600,000 acres of working lands to non-agricultural development and the growth of undeveloped land. Non-agricultural development lands, commonly known as "development," occur when agricultural lands are converted to residential, commercial, manufacturing, or other uses. Of these 600,000 acres, 255,000 acres were developed. Undeveloped lands are lands that were previously productive, but are now unfarmed or left fallow. Of the 600,000 acres of agricultural lands lost between 2000 and 2005, 345,000 acres were allowed to go fallow. Rail projects may affect individual farms and the resources of farmland area.

Implementation of intercity passenger rail may impact agricultural land. Both the base case and state rail plan alternative recommend implementation of the Wisconsin component of the Midwest Regional Rail System. Once this system is complete, the state will consider expansion to other parts of the state if appropriate (see Chapter 6, Intercity Passenger Rail, for more information). The service will result in increases in the number of trains passing through the state and will likely impact agricultural operations. Under both the base case and state rail plan alternative, improvements are recommended at roadway-railway crossings to address passenger rail service and other safety concerns. Improvements may include changing the physical structure of the crossing, adding gates or signals, improving the track or closing crossings. As a result, farm operations may become less efficient since the movement of farm equipment between fields may require alternative routes and that require more travel time.

Passenger rail service offers several benefits as well. Rail systems can foster more focused growth around activity centers like rail stations as compared to auto/truck centric greenfield locations. This pedestrian-friendly development pattern reduces fuel use, air pollution and greenhouse gas emissions. It also reduces urban sprawl by satisfying housing and business needs in a more efficient manner.

In terms of agriculture, the opportunity to promote development around urban centers and potentially attract residents to adjacent areas may reduce urban sprawl. This could subsequently reduce the pressure to develop farms and forest lands. Also, compared to adding highway lanes, expanding rail lines in rural areas will require little, if any, additional land.

Under the base case and the state rail plan alternative, WisDOT will continue to consider the importance of agriculture lands when making project level decisions and will continue to focus efforts on minimizing, to the extent possible, the negative impacts on agriculture. WisDOT will continue to work with the Wisconsin Department of Agriculture, Trade and Consumer Protection to assess impacts of rail projects on agricultural lands. WisDOT will also coordinate with the Natural Resource Conservation Service. In addition, WisDOT will continue to preserve and enhance a positive land use and transportation relationship and address the direct land use effects of transportation.

Through *Wisconsin Rail Plan 2030*, WisDOT will develop passenger rail corridors within the existing right-of-way, where feasible, to minimize the impacts to the surrounding landscape. WisDOT will continue to work with others to identify feasible, cost-effective solutions that avoid, minimize or mitigate impacts.

## ***Indirect Effects***

Transportation projects can have a wide range of direct and indirect effects on the environment. Direct effects result from a specific project. For example, increased speeds for passenger rail may require the closing of railroad crossings in response to train frequency changes and corresponding safety concerns. Indirect effects associated with transportation projects may be caused by the decisions of others, such as local governments or developers. These effects may:

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

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

Under the base case and state rail plan alternatives, the actions with the greatest potential for indirect effects include intercity passenger rail and commuter rail service.

Both include additional actions that may have indirect effects. These actions include:

- Seeking on-going funding for the capital and operating assistance program to implement fixed-guideway transit in major metropolitan areas
- Improving intercity bus service and connections
- Funding track and bridge upgrades on publicly owned rail corridors
- Working with Class I and other railroads to ensure that local service is maintained, improved and increased

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

Community or neighborhood redevelopment and in-fill development, both promoted under the state's comprehensive planning law, are potential positive indirect effects of the base case and state rail plan alternative. For example, the resumption of intercity passenger rail service may result in redevelopment activities near rail stations. Similarly, development may increase or occur around a new rail spur or rail yard as area shippers and businesses seek efficient access to freight rail operations.

The indirect effects associated with implementing the base case or rail plan alternative are often beyond WisDOT's control. While WisDOT will work with local governments and private entities to assess potential impacts on the transportation system, the local government or private entity makes the final decision regarding the amount and type of development that occurs within their municipal boundaries.

### ***Cumulative Effects***

Cumulative effects are the total effects 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 the effects of WisDOT projects. It is not responsible for, nor required to mitigate, the impacts of non-WisDOT actions. However, WisDOT will provide information on potential cumulative effects and will work with local governments and other interested stakeholders to suggest potential mitigation strategies for those effects.

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

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

Table 11-1 shows some of the possible direct, indirect and cumulative impacts related to land use changes that may result from implementation of *Wisconsin Rail Plan 2030*.

**Table 11-1: Potential rail-related land use impacts**

	<b>Urban Areas</b>	<b>Suburban Areas</b>	<b>Rural Areas</b>
<b>Passenger Service Increase (increased service on current routes)</b>	<ul style="list-style-type: none"> <li>Increased travel-oriented service businesses</li> <li>Redevelopment of under-utilized sites including brownfield sites</li> <li>Increased business attraction</li> <li>Increased intermodal/mass transit facilities at station sites</li> <li>Potential for reduced home values at locations near tracks, especially if whistle bans are not permitted</li> <li>Increased noise and vibration</li> <li>Traffic congestion at rail crossings and signals</li> </ul>	<ul style="list-style-type: none"> <li>Increased business attraction as in urban areas</li> <li>Redevelopment</li> <li>Increased apartments/housing near station locations</li> <li>Demand for additional parking spaces in immediate station area</li> <li>Increased noise and vibration</li> </ul>	<ul style="list-style-type: none"> <li>Increased environmental sensitivity, especially at locations of major bridge and roadbed reconstruction</li> <li>Reduced access between farm fields separated by rail right-of-way</li> <li>Increased noise and vibration</li> </ul>
<b>Passenger Service Addition (Service to new destinations)</b>	<ul style="list-style-type: none"> <li>Increased business attraction, as in urban areas</li> <li>Redevelopment</li> <li>Increased intermodal/mass transit facilities at station sites</li> <li>Potential for greater degree of impacts than at locations currently with passenger service</li> <li>Increased noise and vibration</li> </ul>	<ul style="list-style-type: none"> <li>Increased business attraction as in urban areas</li> <li>Increased apartments/housing near station locations</li> <li>Demand for additional parking spaces in immediate station area</li> <li>Increased noise and vibration</li> </ul>	<ul style="list-style-type: none"> <li>Increased noise and vibration</li> </ul>
<b>Freight Service Increase</b>	<ul style="list-style-type: none"> <li>Increased noise and vibration</li> <li>Expanded, new rail yards, intermodal facilities and trackside warehousing</li> <li>Displaced businesses or residents</li> <li>Increased truck traffic at intermodal facilities, affecting air quality</li> <li>Increased attraction of "heavy industry," where permitted by local zoning, affecting air quality</li> <li>Redevelopment</li> <li>Reduced home values at locations near tracks, especially if whistle bans are not permitted</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts as in urban areas</li> <li>Increased noise and vibration</li> </ul>	<ul style="list-style-type: none"> <li>Increased business and expansion of business</li> <li>Increased noise and vibration</li> </ul>
<b>Freight Service Reduction/ Elimination</b>	<ul style="list-style-type: none"> <li>Closed, relocated businesses</li> <li>Abandonment</li> <li>Redevelopment</li> <li>Increased chance of mode shifts to truck</li> <li>Air quality improvement</li> <li>Less noise and vibration impacts</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts as in urban areas</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts as in urban areas</li> </ul>
<b>Roadway-Railway Crossing Improvements</b>	<ul style="list-style-type: none"> <li>Increased quiet zones</li> <li>Safer crossings</li> <li>Enhanced value of adjacent commercial or industrial properties if traffic flows are improved</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts as in urban areas</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced value of adjacent land if traffic flows and safety are improved</li> </ul>
<b>New Grade Separated Crossings</b>	<ul style="list-style-type: none"> <li>Displaced adjacent houses or businesses</li> <li>Separated communities</li> <li>For rail-over-road crossings, would create "walls" of earth, eliminating views to other side of tracks</li> <li>Altered hydrology in area</li> </ul>	<ul style="list-style-type: none"> <li>Displaced adjacent houses or businesses</li> <li>Altered hydrology in area</li> </ul>	<ul style="list-style-type: none"> <li>Altered hydrology in area</li> </ul>
<b>Roadway-Railway Crossing Maintenance</b>	<ul style="list-style-type: none"> <li>Decreased degree of quiet</li> <li>Reduced housing values for properties in close proximity to crossings</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts to urban areas</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts to urban areas</li> </ul>
<b>Roadway-Railway Crossing Closings</b>	<ul style="list-style-type: none"> <li>Isolated neighborhoods or businesses</li> <li>Diverted traffic to remaining crossings, potentially contributing to congestion and air quality</li> <li>Reduced access would reduce value of most commercial/industrial property while lack of signal noise may enhance residential property value</li> </ul>	<ul style="list-style-type: none"> <li>Similar impacts to urban areas</li> </ul>	<ul style="list-style-type: none"> <li>Reduced access to bisected farm fields</li> <li>Reduced farm property value</li> <li>Increased emergency response times to properties</li> </ul>

## Summary of Consultation Efforts and Plan Comparison

### *Legislative Requirements*

In the absence of state rail plan development guidelines from the Federal Railroad Administration, WisDOT followed public participation requirements identified in the Passenger Rail Investment and Improvement Act of 2008 and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

SAFETEA-LU requires that states develop their long-range statewide transportation plans in consultation with state, tribal and local agencies that are responsible for land use management, natural resources, environmental protection, conservation and historic preservation. The consultation process includes a comparison of the state rail plan alternative to any available state and tribal conservation plans or maps and to inventories of natural and historic resources.

### *Process*

WisDOT conducted environmental consultation activities with state, tribal and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation, voluntarily following SAFETEA-LU for rail planning activities.

Two environmental consultation meetings were held. The Wisconsin Department of Transportation (WisDOT) and the Wisconsin Department of Natural Resources (WisDNR) met on March 1, 2010. The second and primary all-agency meeting with state and federal environmental agencies and tribes was held on June 3, 2010. Those invited to participate are shown below; those followed by an asterisk participated in the meetings.

- *Federal Emergency Management Agency*
- *Federal Railroad Administration*
- *Federal Highway Administration*
- *Federal Transit Administration*
- *National Park Service*
- *Public Service Commission of Wisconsin\**
- *US Army Corps of Engineers\**
- *US Coast Guard-Eighth Coast Guard District*
- *US Dept. of Agriculture*
- *US Environmental Protection Agency\**
- *US Fish and Wildlife Service*
- *USDA Forest Service*
- *WI Dept. of Administration*
- *WI Dept. of Agriculture, Trade and Consumer Protection\**
- *WI Dept. of Health Services\**
- *WI Dept. of Natural Resources\**
- *WI State Historical Society*

The feedback received will further shape and refine the content and focus of the long-range plan.

## ***Plan Comparison***

The following are lists of key environmental agencies' plans and policies that relate to the state rail plan:

### **Wisconsin Dept. of Natural Resources (WisDNR)**

Sets emission levels for engine pollutants; regulates and enforces rules and permits; educates, researches, conducts environmental analysis; sets policy; has a role in NEPA/WEPA; has a cooperative agreement with WisDOT; has trails group; has shared HAZMAT (Title 3 – spills) role with Wisconsin Emergency Management; and sets policy on brownfield redevelopment.

- *Land Legacy Report*
- *Wisconsin Wildlife Action Plan*
- *Fish, Wildlife and Habitat Management Plan*
- *State Comprehensive Outdoor Recreation Plan*
- *Wisconsin State Trails Strategic Plan*
- *Statewide Forestry Plan*
- *State Facility Master Plans*
- *Endangered Resource Management Plan*
- *Outstanding and Exceptional Water Resources*
- *Wisconsin State Implementation Plan*
- *Contaminated Lands Environmental Action Network (CLEAN)*
- *Solid and Hazardous Waste Information Management System (SHWIMS)*
- *Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need (WisDNR)*
- *Wisconsin's Biodiversity as a Management Issue (WisDNR)*
  - Air quality
  - Economic growth and development
  - Communities
  - Environmental effects
  - Land use

### **U.S. Environmental Protection Agency (EPA)**

Develops emission and air quality standards; enforces and regulates air quality and idling rules; develops "clean" switcher locomotive standards, sets policy for engine and fuel 'controls', hazardous waste and materials (spill response techniques); and researches noise, environmental justice and speed break issues.

- *2006-2011 Strategic Plan*
- *American Clean Energy Act*
  - Air quality (including particulate matter)
  - Energy
  - Environmental effects (including wetlands and waters)
  - Land use

### **Natural Resources Conservation Service (NRCS)**

Educates; oversees land use policies and programs; helps develop engineering standards relating to lands and waters; engages in farmland preservation strategies; and works with railroads when ownership changes impact programs.

- *Productive Lands, Healthy Environment, Strategic Plan 2005-2010*
- *Wetland Reserve Program, Farm and Ranchland Protection Program - Maps*
- *Prime and Unique Farmland Soils - Maps*
  - Air quality
  - Economic growth and development
  - Environmental effects
  - Land use

### **U.S. Fish and Wildlife Service (USFWS)**

- *National Wildlife Refuges*
- *Wetland Management Districts*
- *Fish and Wildlife Service Properties – Maps*
  - Air quality
  - Economic growth and development
  - Environmental effects

### **National Park Service/National Register of Historic Places**

Guides processes, funds renovations and ensures program consistency.

- *The Future of America's National Parks*
- *National Register of Historic Places*
  - Economic growth and development
  - Communities
  - Environmental effects

### **Wisconsin Historical Society**

Maintains, educates and develops policy on significant places (including State Historical Society sites).

- *Wisconsin Historic Preservation Plan, 2006-2015*
- *National Register of Historic Places*
  - Communities
  - Environmental effects
  - Land Use

### **U.S. Army Corp of Engineers**

Oversees regulatory programs including Section 10 of the Rails and Harbors Act; oversees waterway concerns (including the discharge of fill into U.S. waters), maintains "404" permits; clarifies mitigation watershed approach; and cooperates and partners on project-level NEPA phases.

- Communities
- Environmental effects (including aquatic resources)

**Wisconsin Dept. of Administration (WisDOA)**

Authorizes municipal boundaries; oversees comprehensive plans; implements coastal management policies; clarifies laws concerning planning-related issues; interacts with the WisDNR and Army Corps of Engineers on permits; and oversees rails-to-trails and abandonment issues.

- *Wisconsin Community Comprehensive Plans*
- *Wisconsin Coastal Management Program: A Strategic Vision for the Great Lakes*
  - Communities
  - Land use
  - Environmental effects (coastal management and great lakes)

**Wisconsin Council on Forestry (in partnership with Wisconsin's environmental agencies)**

- *Invasive Species Best Management Practices for Transportation and Utility Rights-of-Way*
  - Environmental effects

**U.S. Forest Service**

Enforces laws and policies and regulates national forest land use within national forest lands.

- *USDA Forest Service Strategic Plan FY 2007-2012*
- *Forest Service Lands - Maps*
  - Land use
  - Environmental effects

**Wisconsin Department of Agriculture, Trade and Consumer Protection (WisDATCP)**

Sets farmland rules and pesticide policies (including licensing pesticide applicators and enforcing pesticide safety training for railroad employees) and works with county drainage boards overseeing wet soils and flooding.

- *Working Lands Initiative*
- *Drainage District Program*
- *Agriculture Chemical Clean-Up Program (Act 286 – Pesticide Use by Railroads)*
  - Land use
  - Environmental effects (including water runoff from farm fields and drainage in railroad right of way)

**Office of Commissioner of Railroads (OCR)**

Sets policies and laws on safety and adequacy of warning devices at crossings.

- Communities
- Land use

### **Federal Emergency Management Agency (FEMA) [and Wisconsin Emergency Management]**

Organizes approach to HAZMAT, spills.

- Communities

### **U.S. Department of Transportation (U.S. DOT)**

Federal Railroad Administration provides funding, technical assistance and regulations; oversees and enforces railroad safety and operations programs; and establishes train set vehicle codes. Within U.S. DOT, Federal Highway Administration provides funding, regulation of highway safety and operations programs, technical assistance and oversight. Also within U.S. DOT, Federal Transit Administration coordinates with transit issues, funding.

- *Department of Transportation Strategic Plan: New Ideas for a Nation on the Move, Fiscal Years 2006-2011*
- *Preliminary National Rail Plan*
  - Communities
  - Land use
  - Environmental effects
  - Energy
  - Air quality

### **U.S. Department of Homeland Security/U.S. Coast Guard (8th and 9th Coast Guard Districts)**

This agency oversees the application of federal bridge statutes and regulations through permit requirements or drawbridge operations, clarifying jurisdictional issues with railroads.

- *Bridges that Cross Navigable Waters*
  - Land use
  - Environmental effects

### **Metropolitan Planning Organizations (MPOs)**

MPOs create and implement plans, develop policies, determine transportation impacts and priorities, and review federal, state and local plans that have the potential to impact regional transportation.

### **Native American Tribes**

Native American Tribes create and implement plans, develops policies, determines transportation impacts and priorities and review federal, state and local plans that have the potential to impact tribal interests.

### **Public Service Commission of Wisconsin (PSC)**

Regulates the transport of coal; co-locates transmission lines including interacting with railroads (rails-to-trails); and reviews construction plans.

- *Strategic Energy Assessment: Energy 2014, Ensuring the Availability, Reliability and Sustainability of Wisconsin's Electric Energy Supply, Final Report*
  - Energy
  - Land use (including utility and transmission line location)

**Wisconsin Department of Commerce**

- Communities (through their major economic centers)
- Land use (through discussions of economic sustainability)

**Wisconsin Department of Revenue (WisDOR)**

Regulatory, collects taxes from railroads.

**U.S. Department of Housing and Urban Development (HUD)**

HUD's Office of Sustainable Housing and Communities helps to create strong, sustainable communities by connecting housing to jobs, fostering local innovation and helping to build a clean energy economy.

- Communities
- Land use

**Wisconsin Department of Health Services (WisDHS)**

WisDHS sets state health policies, focuses on health impacts, works with local health departments to ensure that whistle bans may be placed, and works on all-hazards mitigation plans with communities, Wisconsin Emergency Management and the Department of Military Affairs.

- *2010 Plan*
  - Communities (including environmental justice issues)
  - Land use (including brownfield revitalization and rails-to-trails)
  - Air quality

**Department of Military Affairs**

Creates and implements hazard mitigation plans (including 100-year flood planning) with communities and Department of Health Services.