



Chapter 8: Livable and Sustainable Communities

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Chapter 8: Livable and Sustainable Communities

Introduction

Wisconsin's economy and overall quality of life largely depend on the ability to safely and efficiently move people and goods statewide. Specifically, Wisconsin residents, industries and businesses rely on a high quality transportation system that offers multiple transportation options. Rail is an important component of this transportation system and can enhance the overall livability and sustainability of Wisconsin communities.

A community's health, livability and sustainability is directly related to and impacted by transportation planning and design. The nation's dependence on automobiles in metropolitan areas has resulted in more sedentary lives. As a result, the U.S. Surgeon General reports that over 60 percent of American adults are overweight or obese.

U.S. Department of Transportation Secretary Ray LaHood defined a livable community as "a community where you can take kids to school, go to work, see a doctor, go to the grocery store, have dinner and a movie, and play with your kids in a park, all without having to get into a car." In general, livability is defined as a combination of attributes that define how attractive a given place is to live. These attributes typically include clean air and water, safe streets, positive race relations, affordable homes, quality public schools, greenery and open space, un-congested roads and low taxes.

In addition to livability, sustainability is defined as supporting growth in a way that does not negatively impact the natural or social environment. Sustainable development supports policies that integrate environmental, economic and social values in decision making.

The Wisconsin Department of Transportation's (WisDOT's) continued commitment to maintaining and enhancing community livability and sustainability is demonstrated in *Connections 2030*, the state's long-range multimodal transportation plan. *Connections 2030* defined the state's transportation vision as:

"...an integrated multimodal transportation system that maximizes the safe and efficient movement of people and products throughout the state, enhancing economic productivity and the quality of Wisconsin's communities while minimizing impacts to the natural environment."

While focused at the statewide level, *Connections 2030* includes several transportation policies that further define the department's commitment to the continued enhancement of the communities and the transportation system. These policies include:

- Ensuring system connectivity
- Planning and developing a multimodal system
- Continuing community sensitive solutions efforts to better integrate transportation projects into communities
- Balancing transportation needs with environmental considerations

Rail transportation offers a unique and complementary transportation option to help meet the state's multimodal transportation vision and policy goals. The department continues its emphasis on sustainability and livability with the development of *Wisconsin Rail Plan 2030*.

This chapter reviews the relationship rail transportation has with community livability and sustainability. Key components include:

- A review of specific transportation and land use regulations and policy initiatives at the federal, state, regional and local levels
- The role of rail relative to livability and sustainability
- A review of the issues or challenges facing government
- Specific rail plan recommendations

Livability and Sustainability Policy Framework

The following section summarizes some key regulatory and policy initiatives that influence the integration of livability and sustainability into transportation decision-making.

Federal

Federal legislation influences and directs transportation investment and policy by establishing federal funding levels for each state and defining how the funds may be spent. Historically, federal legislation has emphasized the planning and development of multimodal systems. With the passage of the Intermodal Surface Transportation Efficiency Act in 1991 and subsequent legislation, federal surface transportation policy shifted from an emphasis on system expansion to one of preservation and system efficiency.

Since 2008, federal legislation and funding have further shifted transportation investments to emphasize multimodal transportation that focuses on the enhancement and development of intercity passenger rail service and transit service. The next federal surface transportation legislation, the Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users, expired September 30, 2009. It was replaced by Moving Ahead for Progress in the 21st Century (MAP-21) on July 6, 2012. A number of other federal funding programs led to alternative investments in the country's passenger and freight rail system. Among these are the Passenger Rail Investment and Improvement Act (PRIIA), passed in 2008, and the American Recovery and Reinvestment Act (ARRA) which both include an emphasis on funding high-speed and intercity passenger rail. For more discussion of funding, see Chapter 10: Funding Wisconsin's Rail System Investments.

In addition to funding programs supporting passenger rail, the Federal Transit Administration's New Starts/Small Starts program funds transit fixed-guideway systems including heavy rail, light rail, commuter rail, bus rapid transit and ferries.

In addition to the federal regulation and funding, the 2009 initiative between the U.S. Department of Transportation, the U.S. Department of Housing and Urban Development, and the U.S. Environmental

Protection Agency to form the Partnership for Sustainable Communities further defines transportation policy and investment. Under this partnership, the agencies have pledged to ensure that housing and transportation goals are met while simultaneously protecting the environment, promoting equitable development and helping to address the challenges of climate change.

State

In response to federal direction as well as statewide initiatives, Wisconsin has also adopted regulations and policies that support multimodal transportation systems while enhancing community livability and sustainability.

WisDOT's policies and a majority of its investment decisions are guided by the statewide long-range multimodal transportation plan, *Connections 2030*, which was adopted in 2009. Developed as a policy plan, *Connections 2030* was structured to shift the department's focus from individual modes to consider transportation investment decisions within a comprehensive multimodal framework.

In addition to the 20 year multimodal plan, the state also adopted policy recommendations identified by the Governor's Task Force on Global Warming to reduce the state's greenhouse gas emissions. Another key initiative completed in the spring of 2008 by the Office of the Governor and the Office of Energy Independence was the publishing of *Clean Energy Wisconsin – A Plan for Energy Independence*. The plan's goals include generating 25 percent of the state's electricity and 25 percent of its transportation fuel from renewable fuels by 2025. The plan also sets a goal of capturing 10 percent of the market share for the production of renewable energy and bioproducts.

Regional

Wisconsin's urban and regional planning is conducted by:

- Metropolitan planning organizations
- Regional planning commissions

The state's 14 federally recognized metropolitan planning organizations conduct planning for urban areas with populations of 50,000 or more. Each metropolitan planning organization must develop a multimodal, long-range transportation plan which addresses the mobility needs of people and businesses throughout its metropolitan area. Working closely with WisDOT and local stakeholders, the metropolitan planning organizations are tasked with decision-making for regional transportation issues. This helps ensure that transportation planning is comprehensive and coordinated at each level.

In addition to the state's metropolitan planning organizations, Wisconsin has eight regional planning commissions. All but six of the state's 72 counties - Columbia, Dodge, Door, Jefferson, Rock, and Sauk -

are served by a regional planning commission¹. WisDOT works closely with the regional planning commissions to ensure a comprehensive, coordinated approach to local, regional and state issues affecting transportation planning.

Local

Over the years, Wisconsin's communities have developed local planning documents that define policies related to creating multimodal transportation systems and improving the overall livability of their communities.

Initially passed in 1999, the state's comprehensive planning law demonstrates the state's continued dedication to addressing community livability and sustainability. Wisconsin's Comprehensive Planning Law (also known as the smart growth law) requires that all actions and decisions made by a community that relate to land use be consistent with a locally adopted comprehensive plan. These comprehensive plans must have a minimum 20 year plan horizon and address nine elements including transportation.

WisDOT, along with the state's metropolitan planning organizations and regional planning commissions, act as partners in the development of the transportation element. Guidance issued by the department recommends that communities ensure their plans are multimodal, address the needs of all system users, and consider the transportation and land use impacts of development decisions.

With the expanded national and regional support for intercity passenger and commuter rail, many communities currently served by intercity rail or located adjacent to freight rail corridors outline policies and planning goals for the rail network within their communities.

Wisconsin's rail network includes:

Freight rail - transports goods and links shippers and businesses to markets.

Intercity passenger rail - connects cities typically 100 miles or more apart and offers an attractive transportation alternative for intercity travel.

Commuter rail - as transit service and part of the fixed-guideway transit category, generally provides local passenger train service that connects urban areas over short to moderate distances with average speeds between 18 and 55 miles per hour.

¹ Wisconsin's regional planning commissions are formed by executive order of the Governor and provide intergovernmental planning and coordination for the physical, social and economic development of a region. A board, typically appointed by county boards and the Governor, directs commission activities.

Issues and Plan Recommendations

Rail transportation plays a prominent role in the overall statewide multimodal network. By increasing its ability to safely and efficiently move people and goods within the state, rail transportation can help support local, state and federal initiatives aimed at creating more livable communities.

Passenger rail service, whether intercity service or commuter rail service, can create a sustainable transportation option for Wisconsin's residents, encourage compact, smart growth development, and help reduce the dependence on the automobile and reduce vehicle miles traveled.

Freight rail also plays a prominent role in the livability and sustainability of a community. The ability to efficiently transport goods to economic centers or markets is crucial to the overall success of a region's economy. Time wasted due to transportation inefficiency and congestion negatively impacts profitability and the ability to attract new business to the region.

The following chapters also discuss each rail mode and connectivity:

- Chapter 5, Freight Rail
- Chapter 6, Intercity Passenger Rail
- Chapter 7, Commuter Rail

This section provides an overview of the following rail related issues:

- Strengthening intermodal/multimodal connectivity
- Improving/sustaining mobility
- Addressing network sustainability and resilience
- Encouraging smart growth/land use planning
- Enhancing environmental benefits
- Encouraging economic development

For each of these issues, a series of plan recommendations is identified.

Strengthening intermodal/multimodal connectivity

The development of a multimodal or intermodal transportation network is fundamental to the growth of a sustainable and resilient economy. Current projections indicate that demands will exceed the available system capacity (see Chapter 2: Development Process and Outreach). As a result, solutions that provide a safe, efficient and connected system must include other modes of transportation.

Redevelopment of the Milwaukee Intermodal Station was completed under a partnership between the department, city and private entity aimed at supporting the city and state's economic growth initiatives while providing key connections to intercity passenger bus, local transit, intercity passenger rail, taxi, bikes and pedestrians. As part of the Marquette Interchange reconstruction project, WisDOT funded improvements to local streets located under the interchange that not only mitigated the construction impacts, but also improved the connectivity and aesthetic qualities of the pedestrian walkways between the station and the downtown.

Intermodal and multimodal connectivity can facilitate livable communities by adding new mobility options, more opportunities for inter-community exchanges and development opportunities. They also provide a mechanism to achieve community planning goals. Enhancements to the rail system can play a critical role in strengthening multimodal connectivity. A planning process for rail enhancements must

include close coordination with communities and other agencies, transit authorities, and businesses responsible for the other modes to ensure they are seamless in nature. Wisconsin's rail system should include as many direct connections to other modes as feasible to increase its availability and attractiveness.

WisDOT recognizes that multimodal planning and integration of passenger rail service with freight rail, highways, transit, and airports are essential to the success of Wisconsin's rail service. Each mode requires specific accommodations when interconnecting with rail. These accommodations often relate to storage needs (parking), access (roadway improvements), scheduling (coordination with local transit agencies) and wayfinding.

In response, WisDOT will:

Partnering to improve community livability:
WisDOT's partnership with the city of Milwaukee and neighborhood redevelopment interests focused on the Menomonee River Valley. Efforts were focused on the design and construction of three bicycle/pedestrian bridges, establishing a major segment of the Hank Aaron State Trail, river restoration and earthwork, and the West Extension of Canal Street. Within the team charter, the goal of the partnership and project was to create "a model for integrating sustainability and economic development; for green technologies, alternative transportation; for effective partnership and teamwork; for nurturing the long-term health and well-being of the community."

- Coordinate with local governments in local comprehensive planning efforts
- Work with local communities to identify opportunities to link other modes with rail
- Align agency staff to fully leverage new federal partnerships and funding opportunities structured around multimodal principles
- Support the expansion of Wisconsin's short line carrier franchises, including possible partnerships that would position these railways to serve a broader role in the movement of intermodal and shorter-haul rail traffic
- Continue to work with freight railroads to ensure that appropriate rail service is provided to shippers
- Support increased investment in rail infrastructure in response to shipper needs and market demands
- Continue to implement marketing campaigns aimed at providing potential users with information on available rail services
- Encourage transit agencies to accommodate connections with new rail service
- Work with local governments to identify station area and access amenities, such as park and ride facilities, bike lanes, or pedestrian crossings
- Work with communities to encourage the use of wayfinding information and distinct branding to make stations and service easier to use and locate
- Create guidance regarding rail station development to aid communities when locating and building facilities so that consideration is given to the range of elements including Americans with Disabilities Act (ADA) compliance, providing adequate lighting and visibility, emergency response needs, and the location of other services and activities within or adjacent to stations, such as vendors and stores, government and commercial offices and police stations

Improved/sustained mobility

Individual mobility is very important to an individual's quality of life, providing affordable access to jobs, health care, financial and social services, schools and leisure activities. Individual mobility can be defined as the ability to safely and effectively get from an origin to a destination. While mobility is an issue for everyone, it can represent a significant challenge to certain groups such as:

- Those with limited access to an automobile
- Lower income individuals
- Teenagers
- Those who cannot or choose not to drive

Mobility may also be a challenge for young people seeking driver licenses. In recent years, the percentage of public

schools offering driver education programs has steadily declined across the state. The only option for some students is driving courses offered by private agencies, which are typically more expensive. If young people ages 16 and 17 cannot receive driver's education due to its lack of availability in public schools and the cost of commercial driver training schools, they will not be able to obtain a driver license until they are 18. These unlicensed young people may choose to drive unsafely without a license and insurance. Lack of a driver license may also limit their mobility to those transportation modes that are available to them such as public transit, bicycling and walking.

WisDOT recognizes the importance of individual mobility and has worked with the Center for Driver's License Recovery and Employability in Milwaukee to help increase the number of licensed low-income drivers in Milwaukee County. The Center is part of Wisconsin Community Services, which advocates for justice and community safety, providing innovative opportunities for individuals to overcome adversity. In addition to serving over 3,000 persons per year, the program works to improve public policy at the local and state levels, restore driver's education for low-income teens and increase awareness about the negative effects of high license withdrawal rates among the poor.

All of these groups benefit from expanded transportation choices and a more walkable urban environment. Expanding rail transportation and linking rail routes with intercity and local bus service through multimodal transportation centers is a key goal for Wisconsin. The potential benefits derived from encouraging these connections include fostering less auto-dependent development, expanding options for the transit-dependent in urban areas and improving transportation options in rural communities.

In response to these issues, WisDOT will:

- Implement the Wisconsin component of the Midwest Regional Rail System (subject to legislative direction and funding)
- Coordinate with local governments in local comprehensive planning efforts

According to the 2000 U.S. Census:

- Eight percent of Wisconsin's households did not own an automobile.
- Three percent of households were age 65 and older. This demographic group may have issues driving especially long-distances and is expected to grow by 90 percent by 2030.

- Work with local communities to identify opportunities to link other modes with rail
- Implement marketing campaigns to provide potential users with information on available services
- Coordinate with transit agencies to integrate new rail service
- Coordinate with government agencies to identify station areas and access amenities, such as park-and-ride facilities, bike lanes, or pedestrian crossings
- Work with communities to encourage the use of wayfinding information and distinct branding to make stations and service easier to use and locate
- Create guidance regarding rail station development to aid communities when locating and building facilities so that consideration is given to the range of elements including ADA compliance, providing adequate lighting and visibility, emergency response needs, and the location of other services and activities within or adjacent to stations, such as vendors and stores, government and commercial offices and police stations

Network sustainability and resilience

The U.S. Environmental Protection Agency defines a sustainable transportation system as “one in which fuel consumption, vehicle emissions, safety, congestion, and social and economic access are at such levels that they can be sustained into the indefinite future without causing great or irreparable harm to future generations of people throughout the world.”

Resilience is defined as the ability of the complete network to accommodate variable and unexpected conditions without failure. Factors affecting network resilience can include safety, availability of alternatives, independence from finite resources, or ability to meet economic, social, or environmental goals under a range of unpredictable future scenarios.

Taken together, sustainability and resilience offer a framework within which future transportation investments may be made. As part of *Connections 2030*, three related themes were identified:

- Preserve and maintain Wisconsin’s transportation system
- Promote transportation efficiencies
- Preserve Wisconsin’s quality of life

Each theme defined a set of policies aimed at managing and enhancing the state’s transportation system so that it is both sustainable and resilient. In addition, *Connections 2030* defined the policy “Partner with consumers and businesses to increase transportation sustainability.” With over 83 percent of all petroleum used in Wisconsin being consumed by the transportation sector, this policy further addressed the anticipated implications of increasing fuel costs and their impacts to individuals, businesses, families and communities.

Issues related to transportation and sustainability are often grouped in terms of economic, social or environmental impacts. Table 8-1 shows the potential transportation network impacts by category. See

Chapter 11: System-plan Environmental Evaluation and Chapter 12: Environmental Justice Analysis, for a discussion of actions identified to address and mitigate these potential impacts.

Table 8-1: Transportation Impacts on Sustainability

| Economic | Social | Environmental |
|--------------------------------------|------------------------|----------------------|
| Traffic congestion | Inequity of impacts | Air pollution |
| Mobility barriers | Mobility disadvantaged | Climate change |
| Crash damages | Human health impacts | Habitat loss |
| Transportation facility costs | Community cohesion | Water pollution |
| Consumer transportation costs | Community livability | Hydrologic impacts |
| Depletion of non-renewable resources | Aesthetics | Noise pollution |

Source: Victoria Transport Policy Institute

In terms of transportation options, rail is generally accepted as one of the most sustainable modes because of its ability to reduce potential negative impacts related to safety, air quality, climate change and cost. Enhancements to the rail network will make it more attractive and competitive with other travel options (including the truck or automobile) and will contribute toward the development of a more sustainable statewide transportation system.

In response to these issues, WisDOT will:

- Continue to implement community sensitive solutions to encourage transportation projects that minimize negative impacts while preserving local character
- Work with local governments and ports to identify solutions to address roadway issues for port areas
- Continue to upgrade and rehabilitate Wisconsin’s publicly-owned rail lines and bridges
- Continue to preserve rail corridors for future transportation use
- Prioritize and preserve corridors for use by future rail service
- Support improvements in rail systems that lead to a more efficient and safe transportation system
- Support more direct connections between freight rail and ports to reduce the amount of truck travel required

Encouraging smart growth/land use planning

Transportation and land use are linked. Land use patterns can support and encourage the use of one type of mode; while transportation systems can support and encourage the development of certain types of land use. Enhancements to the rail network can encourage land use decisions that support the availability of the rail mode 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 development pattern, known as transit-oriented development or smart growth, facilitates

travel patterns that can be more energy efficient than auto-oriented development and contribute to a more livable, sustainable community.

There are a number of factors that must be considered relative to rail transportation and smart growth/land use planning. These include:

- Incompatible land uses
- Traffic
- Safety
- Community impacts

Incompatible land uses

Since transportation and land use are closely linked, good planning and education can minimize the negative impact of incompatible land uses and promote both natural and built environmental benefits. However, many communities must address how to handle land uses that may have changed over the years as rail use declined. These changing land uses may not be compatible with increased rail activity. For example, the conversion of abandoned rail lines to trails likely resulted in economic development 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. Conversion of trails back to rail usage needs to address the negative impacts that may occur.

Likewise, previous freight rail or passenger rail activity may have been minimal. Train speeds may have been slow. As a result, even older residential neighborhoods may have been built near active rail lines, but the impacts were minimal. Increasing the frequency, length or speeds of these trains can negatively impact these neighborhoods.

As the state's rail network continues to grow and expand with increased frequencies of rail service and potentially more lines being brought into service, land use planning and analysis activities should support improved coordination between neighboring land uses, and be integrated into any relevant comprehensive or region-wide transportation strategy. The goals of such planning and analysis may include:

- Consideration of noise and other environmental impacts
- Evaluation for compatibility with freight facility operations, including any storage or intermodal yards
- Analyses of economic and employment impacts of freight facility operations on adjacent communities

Traffic

While increased freight rail activity can help replace some existing truck travel, the connection between the rail and truck networks typically occurs at ports or intermodal facilities. These facilities are usually located away from highways and interstates, which are designed to appropriately handle 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.

Likewise, 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. This can negatively impact air quality and energy consumption.

Safety

Each year more than 30,000 deaths and two million injuries from highway collisions are reported by the National Highway Traffic Safety Administration. In addition to the overwhelming tragedy caused by death, there is also a cost associated with these losses. The cost of these collisions to the national economy is more than \$200 billion – representing more than two percent of the U.S. gross domestic product. Much of this cost is borne by the public at large either through public expenditures (law enforcement, medical, disability payments, etc.) or insurance premiums.

Per passenger-mile traveled, rail transportation is safer than automobiles. As reported by the National Safety Council in 2000, the fatality rate for travel by automobile was 0.80 deaths per 100 million passenger miles compared to 0.03 for passenger rail. 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 high volumes of traffic, including not only auto traffic but also bike and pedestrian traffic moving near the rail facility and increasing the potential for collisions.

Freight rail transportation is also safe. As reported by the Federal Railroad Administration, the multi-year trend is positive with all reportable incidents (derailments, fatalities, injuries, etc., on the national rail system) declining by almost 25 percent between 2006 and 2009.

Increased freight and passenger rail activity can increase congestion at at-grade crossings. This represents several safety concerns. As wait time increases, 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 side.

Finally, safety is a factor as it relates to shared use corridors between 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 adequate safety devices are in place to reduce the risk of accidents.

Community impacts

Rail systems can foster focused growth around activity centers like rail stations, compared to the 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. Improved rail service can also be a catalyst for the revitalization of older neighborhoods and housing stock. This revitalization can improve the quality of life by bringing not only improved transportation service but new retail and service providers to the

neighborhood. Reducing urban sprawl will reduce the pressure to develop farms and forest lands. Also, compared to adding additional highway lanes, expanding rail lines in rural areas will require little, if any, additional land.

While they may act as a catalyst for economic development, rail facilities that run through a developed area can in many cases act as a barrier. This impact can occur when tracks are not easily crossed from one side to the other because of safety concerns. Long, slow moving freight trains can split communities for excessive amounts of time, triggering long delays to motor vehicle traffic, including emergency services needing to cross the tracks.

Rail line improvements for intercity passenger service with attendant grade crossing closures and additional fencing will create barriers through neighborhoods compared to the existing rail lines with many crossings and little fencing. However, with the predicted 17 percent increase in freight rail traffic forecasted in the plan, these rail lines, if left unimproved, could become a safety concern. Improving the rail line for intercity or commuter rail can bring planning and improvement resources to address community concerns, offset the grade crossing closures, install fencing and other safety improvements, and implement quiet zones that can help link the community together.

In addition to considering passenger rail needs, 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 negative impacts to community residents, and identifying potential connections between shippers and area businesses with railroad facilities.

In response to these issues, WisDOT will:

- Continue efforts to implement community sensitive solutions to encourage transportation projects that minimize negative impacts while preserving local character
- Continue to work with the Office of the Commissioner of Railroads (OCR) and private railroad companies to identify potential rail crossing safety improvements such as signals, gates, grade separations or closing crossings and discourage trespassing by installing fencing
- Work with the OCR to preserve intercity passenger rail corridors by discouraging new at-grade crossings of the corridor
- Work with local governments and ports to identify solutions to address roadway issues for port areas
- Assist local governments, as requested, in local comprehensive planning efforts
- Work with local communities to identify opportunities to link other modes with rail
- Create guidance regarding rail station development to aid communities when locating and building facilities so that consideration is given to the range of elements including ADA compliance, providing adequate lighting and visibility, emergency response needs, and the location of other services and activities within or adjacent to stations, such as vendors and stores, government and commercial offices and police stations

Environmental benefits

An enhanced rail network, followed by a reduction in auto, truck, and air travel, can result in numerous environmental benefits. The direct reductions in total vehicle miles traveled that result from a shift to more fuel efficient rail can translate into less energy consumption, fewer greenhouse gas emissions and improved air quality. Shifting traffic to rail can also help relieve congestion and lower emissions that result from additional fuel use due to traffic congestion. Amtrak onboard surveys indicate that the majority of rail passengers are traveling alone. This is because rail passenger service tends to be more economically attractive for the solo traveler than the automobile. As a key priority, focusing on shifting solo travelers from the auto to rail yields the greatest energy and greenhouse gas savings.

The following discussion evaluates the issues and recommendations relative to:

- Energy
- Air quality
- Natural environment

Current passenger rail systems throughout the U.S. consume one-third less energy per passenger-mile than automobiles.

U.S. Department of Energy,
Transportation Energy Data Book,
2007.

Energy

Wisconsin's transportation system depends on petroleum and related products. Petroleum-based fuels account for about 97 percent of the energy used by automobiles, trucks, airplanes, trains and ships. According to the U.S. Environmental Protection Agency (EPA), transportation accounts for 25 percent of Wisconsin's total energy resources. Nationally, transportation accounts for 25 percent of all U.S. greenhouse gas emissions. Adding to this demand, future growth patterns also suggest a needed expansion of alternative fuel efficient transportation options.

Fuel prices have driven some changes in the transportation sector. Rising fuel costs encourage consumers and businesses to use fuel more efficiently by either driving less, slower or switching to a more fuel efficient mode of transportation.

The reductions in fossil fuel usage and greenhouse gas emissions that result from a shift to the rail mode is supported by the U.S. Department of Energy's 2008 Transportation Energy Data Book. The data showed that Amtrak is 18 percent more energy efficient than air and 24 percent more efficient than the auto. The same is true for freight traffic. In 2008, one gallon of diesel fuel moved a ton of freight by rail 457 miles – four times the efficiency of trucks.

Air quality

While the 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. Pollutants of greatest concern include ozone² and particulate matter.

Seven Wisconsin counties – Milwaukee, Kenosha, Racine, Ozaukee, Waukesha, Sheboygan and Washington - are designated as non-attainment³ for the current ozone standard.

In addition to ozone, particulate matter is a concern for Wisconsin. Particulate matter is a complex mixture of extremely small particles and water droplets. It is made up of a number of components such as nitrates and sulphates, organic chemicals, metals and soil or dust particles. The EPA has designated three counties as nonattainment for the particulate matter 2.5 standard: Milwaukee, Racine and Waukesha.

The rail transportation mode offers a viable option to help reduce emissions. The 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.

Also impacting congestion and greenhouse gas emissions is the transport of “overhead freight” through Wisconsin. Overhead freight includes freight shipments by truck, rail or intermodal that do not originate or terminate in Wisconsin. 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. See Chapter 4: Economic Development, for more information. Based on data from the American Association of State Highway and Transportation Officials, ton-miles for truck movements of more than 500 miles are projected to increase from 1.40 trillion in 2000 to 2.13 trillion in 2020. Finally, adding to highway congestion and greenhouse gas emissions, many rail/truck intermodal containers originating in Wisconsin are trucked to Chicago to be placed on trains.

In response to air quality concerns, Wisconsin has several targeted initiatives underway to reduce fossil fuel usage and greenhouse gas emissions. These initiatives are:

- A commitment through the Midwest Greenhouse Gas Reduction Accord to establish greenhouse gas reduction targets and to develop a market based cap-and-trade mechanism to achieve those targets

² Ground level ozone is formed from NOx and VOCs reacting to sunlight. These pollutants come from motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents, as well as natural sources. Ground level ozone is the primary constituent of smog. Sunlight and hot weather cause ground level ozone to form in harmful concentrations in the air.

³ The EPA established allowable ambient concentrations for six criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. Areas that exceed or violate these standards are considered to be in nonattainment.

- The State Office of Energy Independence focus on increasing the use of renewable fuels and alternative energy sources
- The Governor’s Task Force on Global Warming efforts to stabilize and reduce greenhouse gas emissions⁴

In addition, WisDOT will emphasize air quality improvement by:

- Complying with existing policies and regulations aimed at maintaining and improving air quality
- Supporting and participating in air quality improvement programs and activities
- Monitoring emerging air quality issues

Connections 2030 documented several key policy recommendations that have direct bearing on the natural environment surrounding rail corridors. Given that these corridors are in large part privately owned, the department’s role is one of facilitator and technical expert to aid railroad operators in understanding state and federal requirements.

Natural environment

Whether active or inactive, rail corridors can act to preserve remnants of prairie and other habitats. Due to their linear nature, rail corridors can also provide a continuity of habitat along the corridor. Finally, the corridors can provide nesting and feeding areas for many types of wildlife and birds.

However, rail corridors can also negatively impact the natural environment. Examples of these impacts may include:

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

For more information on the impacts rail may have to the natural environment, see Chapter 11: System-plan Environmental Evaluation.

In response to these issues, WisDOT will:

- Work with stakeholders to identify sensitive habitats or resources early in the planning process and avoid or minimize impacts
- Monitor state and national efforts and be prepared to address potential future greenhouse gas regulations, pursuant to changes in regulation

⁴ The final report of the Governor’s Task Force on Global Warming was submitted in 2008. The Task Force is no longer active.

- Develop guidance and procedures to discourage transportation development activities from intensifying the spread of invasive plants
- Identify feasible, cost-effective solutions that avoid, minimize or mitigate impacts
- Track changes and analyze responses to transportation energy and costs

Encouraging economic development

Rail improvements can encourage economic development in various ways. More and faster passenger trains can increase mobility options for intercity travelers, commuters and the transit dependent. More efficient access to the freight rail system, such as new intermodal facilities and continuing state support of short lines, can lower transportation costs for shippers. As a result, benefits resulting from passenger and freight rail investments can enhance the competitiveness of the state and the region. These benefits help retain existing work forces and business, and attract new ones, bolstering economic development. See Chapter 4: Economic Development, for more information.

Investments in passenger and freight rail transportation can produce economic returns achieved through additional connectivity and reductions in congestion. Intercity rail and commuter rail provide an environmentally friendly alternative and an opportunity to connect the state's major economic centers. An expanded and improved passenger rail network improves access to jobs, goods and services and expands the labor pool and market areas for business.

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 the resulting benefit in fuel savings. Second, with intercity and potentially 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, potentially resulting in more jobs and higher property values.

Rail enhancement would 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 also result in less pollutants and a lower cost due to better efficiencies in fuel per ton-mile.

Improved access to the national rail system, whether through short lines or new intermodal centers, will generate economic advantages to shippers and to the state as a whole. The cost of rail transportation per ton-mile is less than the typical alternative, which is truck. Transportation cost savings can be spent on more manufacturing, which can increase payrolls. Growth in payrolls would translate into more revenue for Wisconsin's service industries. The traditional economic theory of a multiplication of benefits resulting from an investment clearly applies here.

Should efforts be 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. The potential benefits of this

diversion would include fuel cost and highway maintenance savings, as well as the minimization of highway crashes and their related costs. Development of intermodal load centers must be done in coordination with freight railroads which would serve the facilities.

For more information regarding intercity passenger rail, see chapter 6. For more information regarding freight rail, see chapter 5. For more information regarding commuter rail, see chapter 7.

In response to these issues, WisDOT will:

- Encourage transit-oriented development at intercity and commuter rail stations, to serve as catalysts for revitalization of urban centers and new economic activity
- Continue to work with Wisconsin's metropolitan planning organizations and regional planning commissions, to coordinate rail planning and investment decisions
- Continue to upgrade and rehabilitate Wisconsin's publicly owned rail lines and bridges
- Continue to preserve rail corridors for future transportation use
- Support improvements in rail systems that lead to a more efficient and safe transportation system
- Create guidance regarding rail station development to aid communities when locating and building facilities so that consideration is given to the range of elements including ADA compliance, adequate lighting and visibility, emergency response needs, and the location of other services and activities within or adjacent to stations, such as vendors and stores, government and commercial offices and police stations.