

State Rail Plan

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EXECUTIVE SUMMARY

Overview of the Study

This document is the 2015 update to the Minnesota Comprehensive Statewide Freight and Passenger Rail Plan, first developed in 2010, referred to as the 2015 Minnesota State Rail Plan. Pursuant to Minn. Stat. Minnesota Session Law 2008, Section 174.03 subd. 1b, the purpose of the State Rail Plan is to guide the future of both freight and passenger (intercity) rail systems and rail services in the state. The development of the plan was jointly undertaken by the Minnesota Department of Transportation's Office of Freight and Commercial Vehicle Operations (OFCVO) and the Passenger Rail Office.

This executive summary provides an overview of the key components and recommendations of the 2015 Minnesota State Rail Plan, which follows the six-chapter structure required by the Federal Railroad Administration for state rail plans. The 2015 Minnesota State Rail Plan builds upon the technical analyses and findings of the 2010 State Rail Plan, incorporates information on changes between 2010 and 2015, and reflects the most current state of the system and stakeholder comments.

THE STATE'S ROLE IN RAIL TRANSPORTATION

The State of Minnesota has a significant role in interacting with the system of railroads that provide a necessary component in the state's transportation network. The Department of Transportation is the primary point of contact in coordinating public activities concerning rail transport. The Department was created 'In order to provide an integrated transportation system of aeronautics, highways, motor carriers, ports, public transit, railroads, and pipelines, and including facilities for walking and bicycling'. (Statute 174.01) Further, the goals of the Department include 'To provide multimodal and intermodal transportation facilities and services to increase access for all persons and businesses and to ensure economic well-being and quality of life without undue burden placed on any community;' (174.01, Subd. 2(2)), and 'To enhance economic development and provide for the economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway;' (174.01, Subd. 2(4)).

Unique among all the active modes of transportation, railroads involve private corporations operating for the most part on private infrastructure and regulated at the national level for the purpose of insuring unimpeded interstate commerce among the states, as reserved to the federal government in the Constitution. Despite the federal oversight, state and local governments are responsible for limited regulation as pertains to distinct local police powers, safety, and cooperative activities shared with federal agencies, including the State Partnership Program of the Federal Railroad Administration. The Commissioner of Transportation is specifically empowered to represent the state before the Surface Transportation Board involving issues of service, merger, construction,and abandonment. As changes in rail system safety and performance have manifested themselves in the last two years, documented in this Plan, MnDOT, the Governor, other state agencies, and numerous state and federal elected representatives have worked directly with and advocated for state industries and communities to ensure both public safety, and the continued delivery of effective transportation services by the railroads under their public responsibility as common carriers. This latter common carrier status of the railroads puts them on a par with public roads, waterways, and airports in providing the open and equitable transportation to all users that is an earmark of our economy and nation.

The public responsibility of the state toward its residents and businesses means that oversight and advocacy for responsive rail service, so important for access to national and international markets, is actively pursued. This function is necessarily being balanced with active provisions for community safety as well as support for local rail access, industrial development, travel options, and quality of life. Recent initiatives that ensure services for propane and agricultural rail shipments and expand preventative safety in crude-by-rail operations are just several examples of an active approach that can be beneficial to the state on an ongoing basis.

WHY FREIGHT RAIL?

Without rail, Minnesota businesses and consumers would not be able to access the products they need for everyday work and life. Located in the center of North America, Minnesota's freight rail system is critical in providing efficient connections to markets beyond state and country borders. Minnesota has a $289 billion economy, with 51 percent of businesses involved in producing, processing and handling commodities. These commodities—notably iron ore, farm products and food products—are moved by a multimodal freight network made up of highway, water, air and rail systems. In Minnesota, rail carries 25 percent of freight by weight. Freight on rail takes pressure off the state's constrained highway network and provides environmental benefits through fuel efficiency. Trains are four times more fuel efficient than trucks, and one ton of freight on rail can travel 473 miles on only one gallon of diesel fuel.

WHY PASSENGER RAIL?

Minnesota has a vision to develop a robust passenger rail system that results in improved travel options, costs and speeds for Minnesota and interstate travelers. Population and economic growth forecasts show a need for a statewide transportation network made up of multiple modes of travel. Expanding passenger rail options beyond the existing Amtrak Empire Builder service will offer Minnesotans a fuel-efficient, environmental and affordable travel option between Minnesota cities and to other states.

Context of the 2015 Rail Plan Update

Minnesota's 2013 population was approximately 5.4 million. Minnesota's population is projected to grow to 6 million by 2031 and 6.45 million by 2065, an annual growth rate of 0.5 percent.[1] Approximately 60 percent of Minnesota's population is centered in the Metro District in and around Minneapolis-St. Paul. Other highly populated areas are in St. Louis County (Duluth), Stearns County (St. Cloud), Olmsted County (Rochester) and along the corridors connecting these regions to the Twin Cities. Since the 1960s, population growth has shifted from the metropolitan core into the exurban regions of the Twin Cities. Although this trend has slowed in recent years, the collar counties are forecast to continue to see the highest rates of population growth between 2010 and 2040. Much of this projected growth will be within commuter rail or short intercity rail distance from the Twin Cities.

Minnesota's economy is diverse—"freight intensive" industries such as agriculture (led by corn-based products), mining (primarily taconite) and advanced manufacturing have long been a major driver of the state's growth and users of the freight transportation system, including freight rail. Many industries, including taconite and agricultural producers, rely on connections between rail and other modes to receive and ship a broad range of goods throughout North America and across the globe. Minnesota currently is developing a State Multimodal Freight Network. The MFN will include key multimodal hubs, including ports, rail yards and container facilities, and highway and rail infrastructure. The MFN will allow the state to better track freight activity, develop freight performance measures, and prioritize and incorporate projects into other planning and programming activities.

Recent industrial trends have changed the face of freight rail in the U.S. The broad adoption of advanced technologies including directional drilling and hydraulic fracturing (fracking) to extract oil and gas from shale oil formations in the Bakken Region of North Dakota, Montana, Saskatchewan, and Manitoba dramatically affects Minnesota's rail system. Unprecedented volumes of crude oil and liquefied natural gas are being shipped by rail, of it across Minnesota destined for refineries in the Midwest, and the East and Gulf Coasts. As of late 2014,

[1] Minnesota State Demographic Center Population Data, 2014.

approximately 50 oil trains per week transport Bakken crude oil across Minnesota. The drilling and fracking process also creates demand for substantial volumes of inbound material, including sand, which is mined in Southern Minnesota and Central Wisconsin

The increased crude traffic, in conjunction with a record grain harvest throughout the upper Midwest and a resurgence of coal use, drove up demand for rail service and led to significant railway congestion across the state's main rail corridors in 2013-2014, leading to fluctuations in rail service reliability over the past two years. Safety and security issues have also become of paramount concern, as a series of recent disasters involving unit trains of oil have occurred across North America. The Minnesota legislature responded to these trends by passing laws to increase the safety of rail movements in the state. In 2014, the legislature charged MnDOT to take action by conducting studies on highway grade crossing that have significant safety risks due to increased crude-by-rail activity, providing $2 million for improving rail grade crossings and hiring additional rail inspectors.

While trends leading to industrial growth and the need for freight rail investments are expected to continue, much of the future job growth in Minnesota will be focused on service, professional and management occupations, leading to continued growth in the demand for commuting and business travel. This trend supports the importance of connecting Minnesota—in particular the Twin Cities metropolitan economy—with Chicago and other regional business centers by a strong and robust transportation system that includes passenger rail service. It also suggests the potential to advance economic growth across the state by linking smaller communities with the Twin Cities by passenger rail.

The Vision for Minnesota's Multimodal Transportation System

In late 2011, MnDOT adopted the Minnesota GO Vision. The Vision aligns the transportation system with what Minnesotans expect for their quality of life, economy and natural environment. It provides the desired outcomes for the Statewide Multimodal Transportation Plan over the next 20 years, for MnDOT's complete Family of Plans and for all individual modes and key transportation partners. It includes a set of principles that are intended to guide future policy and investment decisions for all forms of transportation.

Minnesota's railroads form a critical part of the state's multimodal transportation system. For Minnesota, a strong rail system supports economic development, enhances environmental sustainability, helps to preserve the publicly-owned roadway infrastructure and increases the business marketability of the state. Future challenges for Minnesota will include increasing regional and international economic competition, constrained highway capacity, environmental protection and uncertain energy costs. The state is committed to developing a freight rail system that can support expanded traffic volumes and a changing customer base; and a passenger rail system to support the travel needs of citizens, businesses and visitors.

A successful, viable rail industry that meets the future needs of Minnesota's economy requires continued investment and improvement to its infrastructure. Made up of private firms, the freight railroad industry is unique in that it has largely borne the cost of maintaining its own infrastructure. This is expected to continue, but further improvements to the infrastructure will be necessary, not all of which may be fully self-funded. In recent experience, rail shippers and public entities have partnered in both mainline improvements and secondary lines and shipping facilities.

- Continue to make improvements to the condition and capacity of Minnesota's primary railroad assets
- Address critical rail network bottlenecks
- Upgrade main line track (all Class I to III railroads) to 25 mph minimum speed, as warranted
- Implement state-of-the-art traffic control and safety systems
- Improve the network (all Class I to III railroads) to support the use of 286,000 pound railcars throughout
- Expand intermodal service access options throughout the state
- Continue to develop programs promoting safety of freight rail and hazardous material transportation

PASSENGER RAIL GOALS

Minnesota should act in the following ways to meet the Minnesota GO Vision and develop a robust intrastate and interstate intercity passenger rail system that results in improved travel options, lower costs and higher speeds for Minnesotans and interstate travelers.

- Continue to participate in the Midwest Regional Rail Initiative and support the development of minimum 110 mph service for connections from the Twin Cities to Wisconsin and the Chicago Hub Network
- Develop an intrastate intercity passenger rail network connecting the Twin Cities with viable service to major outlying regional centers
- Develop all services with the ultimate goal to connect to both the Target Field Station and St. Paul Union Depot
- Advance corridors incrementally
- Prioritize project qualified corridors based on state of readiness
- Establish rail connections to intercity and commuter rail markets in Wisconsin and Minnesota, to the I-35 Corridor, the Red River Valley, the eastern plains and Canada, as demand warrants
- Promote energy-efficient technology and efficient transportation through expanded use of rail and intermodal shipping

PLANNING AND POLICY DEVELOPMENT GOALS

- Maintain and ensure broad access to competitive freight rail services for shippers throughout the state
- Better integrate rail into the public planning process
- Actively pursue public-private partnerships, partnerships with other agencies and private financing or operations in support of freight and passenger rail corridor development
- Build state assistance for freight rail projects upon the existing Minnesota Rail Service Improvement program
- Expand the Rail/Highway Grade Crossing program
- Actively manage and evaluate preserved rail corridors held in the State Rail Bank for possible future transportation uses

Minnesota's Existing and Future Rail System

The institutional structure of the rail industry in North America is different from the other transportation modes (highways, air, water, etc.). While the other modes are generally owned and maintained at public expense and accessible to any licensed operator, rail carriers not only provide the service, but also maintain and control the tracks and other facilities required to provide service. Physical conditions, service and institutional structure are closely related.

MINNESOTA'S FREIGHT RAILROAD INDUSTRY

America's railroad industry is commonly classified by size, with the seven largest carriers – BNSF,, Canadian National, Canadian Pacific, CSX, Kansas City Southern, Norfolk Southern, and Union Pacific - referred to as Class I railroads. Minnesota is served by four of these major carriers— BNSF, CN, CP, and UP. The state is also served by 18 smaller railroads. These include one Class II or regional railroad, the recently formed Rapid City Pierre and Eastern, and 14 small or Class III railroads.. Among the Class III railroads are three switching railroads and 11 small line-haul or "short line" carriers.

While the economic health of the large Class I railroads has improved in recent years, they still face intense capital needs. Of Minnesota's four Class I railroads, BNSF dominates many markets in the state including bulk freight, crude oil, agricultural products and intermodal traffic. UP primarily transports agricultural products, ethanol and coal. CN transports most of the taconite produced in Minnesota, along with a mix bulk and intermodal goods on its transcontinental through route. CP's primary commodities include grain, coal, crude oil and intermodal freight.

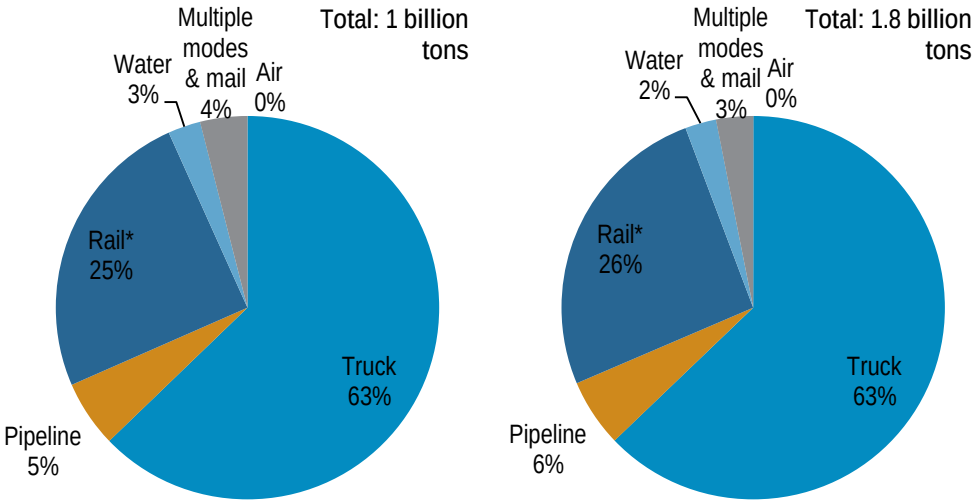
The short line industry consists of a mix of profitable and marginal companies. High-volume markets and lines have done relatively well and low-volume markets and lines have struggled. The national trend toward consolidation of short line ownership and some consolidation of low-density lines and collector/distributor functions has improved the business outlook for some short lines. This trend has emerged to a lesser degree in Minnesota, which can be attributed to the minimal presence of short line holding company ownership in the state. It is apparent that some short lines operating in Minnesota and elsewhere are not meeting critical volume thresholds, and services and investment in track and equipment are declining. Concurrently, short line railroads are facing pressure for investment to remain competitive with the Class I railroads as well as other modes of freight transportation.This includes being able to accommodate heavier weight railcars and providing competitive pricing and service offerings in conjunction with their Class I connections. At times, contractual arrangements and other institutional constraints curtail the ability of short lines to compete successfully.

Freight Demand

The future needs of Minnesota's rail system are driven by trends in freight demand in relation to Minnesota's economy and more broadly that of the United States and global economies. Consistent with federal and MnDOT planning horizons, existing and projected demand for the plan year 2040 was examined using the USDOT's FAF3.5 forecast. In all likelihood, actual freight volumes and the mix of traffic will not match projections, but certain fundamental trends such as population growth, income and economic activity are strong predictors of freight activity. Unanticipated changes in the economy, freight logistics, technology, public policy and other factors will influence the general demand for goods movement and that of the individual modes such as rail.

Minnesota's rail system has some of the highest volumes in the nation. In 2012, with 1 billion tons of freight using the state's transportation system, rail carried 253 million tons—25 percent of the total freight tonnage (Figure E.1). Trucks held the largest share at 63 percent of this tonnage, and the remaining 12 percent was moved by multiple modes, air, pipeline and water. By 2040, volumes are projected to total 1.8 billion tons, an increase of 44 percent. By value, $912 billion in freight moved over Minnesota's transportation system in 2012.That number is projected to grow to $2.3 trillion by 2040 (Figure E.2). Measured in units, in 2012 more than 3.9 million railcars moved on the state's rail system, a volume that is expected to increase by 108 percent and by 8 million railcars by 2040. Of the total rail volume, 93 percent of tonnage (234 million tons) is carried in railcars and 7 percent (19 million tons) in intermodal equipment (containers and trailers).

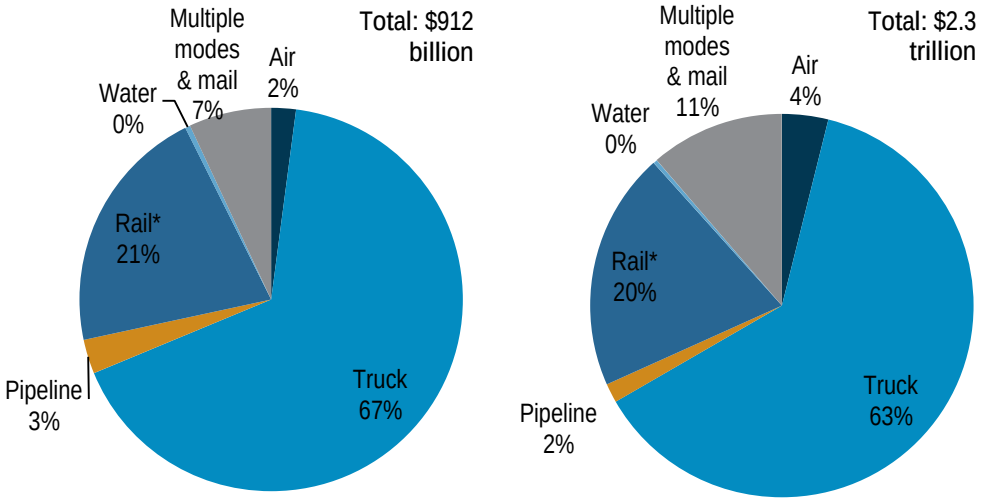
Figure E.1 Mode Share by Weight
2012 (left) and 2040 (right)



Source: FHWA FAF3 2015 Provisional estimates and 2040 Forecast, and through truck traffic estimated by routing these data; and, STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics.

Note: *Rail intermodal was excluded from Multiple Modes and Mail and included in Rail.

Figure E.2 Mode Share by Value
2012 (left) and 2040 (right)



Source: FHWA FAF3 2015 Provisional estimates and 2040 Forecast, and through truck traffic estimated by routing these data; and, STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics.

Note: *Rail intermodal was excluded from Multiple Modes and Mail and included in Rail.

The top commodities moved across the state are coal, farm products, chemicals and allied products, freight-all-kinds (i.e., miscellaneous mixed shipments moving in intermodal containers or trailers), hazardous materials (e.g., chemicals, petroleum and coal products, and crude petroleum, natural gas and gasoline), metallic ores and agricultural products The future is likely to see an increase in intermodal and petroleum shipments and a decline in coal due to the rise of new sources of electricity production and increasingly stringent environmental regulation of

coal burning power plants. Minnesota's top "trading partners" are Illinois, Wisconsin, Wyoming, Washington, Canada, Texas and North Dakota.

Issues Affecting Current and Future Freight System Performance

To meet current and future demand, improvements are needed in the freight rail network. Additional intermodal service is needed in terms of terminals and access to additional in-state and out-of-state markets. There are several major rail bottlenecks in the state. The Hoffman Junction east of the Union Depot in St. Paul is used by BNSF, CP, and UP, and carries 120 trains per day. Bottlenecks at the Minneapolis Junction and corridors to the north have caused delays to freight service as well as Northstar Commuter Rail and Amtrak's Empire Builder. The East Metro Rail Capacity Study, funded jointly by the three Class I railroads and Ramsey County Regional Railroad Authority, identified specific Hoffman Junction-area capacity improvements that are being systematically pursued. Other bottlenecks near La Crescent and Moorhead have worsened statewide system performance. Constructing additional double track, adding/increasing siding length, improving signal systems, and rehabilitating outdated structures will alleviate these problems as freight shipments and passenger rail demand grow. For short lines, the primary focus will continue to be on infrastructure that can efficiently accommodate the needs of existing and new shippers. This includes universally accommodating 286,000 pound railcars and achieving a state of good repair with track and bridges.

Several other issues emerged during the development of the 2015 Minnesota State Rail Plan that will influence the Minnesota freight rail networks and services. Many of these issues could require substantial investments in the rail system in coming years, including:.

- Infrastructure Constraints. Planned or needed improvements and conceptual cost estimates were identified for select lines, as well as more general conditions that impede system performance such as substandard track conditions and weight limits that impede efficient operations and ability to offer a competitive service. The substandard track and weight limits are primarily an issue with some of the state's short lines, while the formersystem improvements including bottlenecks and mainline capacity typically affects Minnesota's principal main lines. Several of the corridors went through advanced levels of engineering assessment and have more detailed cost estimates. While these projects are on the freight system today, many of these upgrades only become critical if passenger service is introduced on the line. These projects are described in detail in Chapter 4; a summary cost estimate is show in the Program Implementation and Funding section.

- Rail Facility and Line Relocation. Freight rail tracks and associated infrastructure represent significant capital investments at fixed locations. Under certain circumstances, however, the relocation of freight rail lines may be warranted to ease rail bottlenecks, reduce vehicle traffic delays at grade crossings, improve safety, and spur economic development opportunities. Substantial freight rail relocation or expansion projects, such as a rail bypass, a new line or yard or significant increases in train volumes, require the review and approval of the federal Surface Transportation Board (STB). Relocation projects underwent detailed study in Rochester and are under consideration in Shakopee and Hennepin County.

- Intermodal Services. The Twin Cities are the only location where rail intermodal (the haulage of containers and trailers) service is available in Minnesota, and Chicago and the Pacific Northwest/Western Canada are the only directly served markets. Although efforts to provide service in other parts of the state have not been successful, stakeholder conversations revealed a strong desire for intermodal service in Duluth and the western and southern parts of the state, as well as additional terminal capacity and services in the Twin Cities. Intermodal service is density driven, and given that a broadly used competitive service must typically operate on a daily basis, the volume requirements are substantial. Particular interest has developed around the need for service

from this market to the Pacific Northwest gateways. For a terminal served by a Class I railroad, the minimum volume threshold is around 50,000 units, while for a short line it may be less.

- Positive Train Control. The purpose of PTC is to prevent most train-to-train collisions, overspeed derailments and casualties or injuries to roadway workers. The technology combines precise locating of all trains and other track vehicles; lineside infrastructure such as switches, crossings and junctions; automated cataloging of speed restrictions and traffic conditions; and real-time wireless communications with locomotives and other operating equipment The U.S. Rail Safety Improvement Act of 2008 mandated the widespread installation of PTC systems by December 2015 on most lines handling passenger trains or hazardous materials,a network totaling 80,000 miles.[2] The Class I railroads are implementing PTC largely at their own expense, and installation is well underway in Minnesota and elsewhere. However, PTC poses costly challenges to some short lines that are handling hazardous materials, or more commonly must operate over PTC-equipped Class I main lines. The $100,000 plus cost of retrofitting older locomotives that are typical of short line fleets is beyond the financial ability of many carriers.

- Hazardous Material Transport. For many years, the railroad and chemical industries and USDOT were actively engaged in improving the safe transport of hazardous materials by rail. Substantial progress was made in the design of and materials used in tank cars, reporting, custody, education, communications and safe handling. The FRA and the Pipeline and Hazardous Materials Safety Administration are currently updating safety regulations related to transporting flammable liquids by rail. Specifically, these regulations relate to DOT 111 tank cars and their operations. Recommendations currently under review include enhanced tank head and shell puncture resistance systems and enhanced top fittings protection. Minnesota is actively pursuing preventative and emergency response measures to improve the safety of crude oil and hazardous materials shipments, especially track and hazmat inspection and grade crossing improvements.

PASSENGER RAIL

Minnesota has one active intercity passenger rail service, Amtrak's Empire Builder. The Empire Builder operates one train per day between Chicago and Seattle/Portland. Stops in Minnesota include Winona, Red Wing, St. Paul, St. Cloud, Staples, Detroit Lakes and Fargo/Moorhead. In recent years, the Empire Builder had the highest ridership of any single train on the Amtrak system; in FY 2014, it slipped to second place due to increased delays caused by congestion along its route. In the Twin Cities metro area, there are two major rail stations: Target Field Station in Minneapolis and the Union Depot in St. Paul. Target Field Station is currently the terminal for the Northstar Commuter Rail, while the Union Depot is a station for the Empire Builder.

Passenger Demand

As a part of the 2010 Statewide Freight and Passenger Rail Plan, a needs analysis was conducted for all potential passenger rail corridors in Minnesota. A process was developed so that a clear understanding of needs on the rail system for passenger operations—today and in the future (2040)—could be derived. Key to this process was the understanding of the cumulative effect projects have on each other and how critical the underlying freight infrastructure is to the eventual development of a robust passenger rail network in the state. In the 2015 Minnesota

[2] Federal Railroad Administration, www.fra.dot.gov.

State Rail Plan, which builds upon the needs analysis conducted in 2010, rail corridors were divided into three categories: Phase I Projects in Advanced Planning, Phase I and Phase II. Having had substantive planning work, four projects were designated as being in Advanced Planning. Three are High Speed Rail services (at least 110 mph), and consist of Twin Cities to Milwaukee as part of an overall Chicago hub regional service, Duluth (Northern Lights Express or NLX) and Rochester (Zip Rail). The fourth advanced planning effort entails a second Empire Builder between the Twin Cities and Chicago that would complement the existing daily train. Robust analyses are being performed on passenger ridership for these rail corridors under active development. Passenger demand estimates from these corridors will be included in updates to this document as they become available.

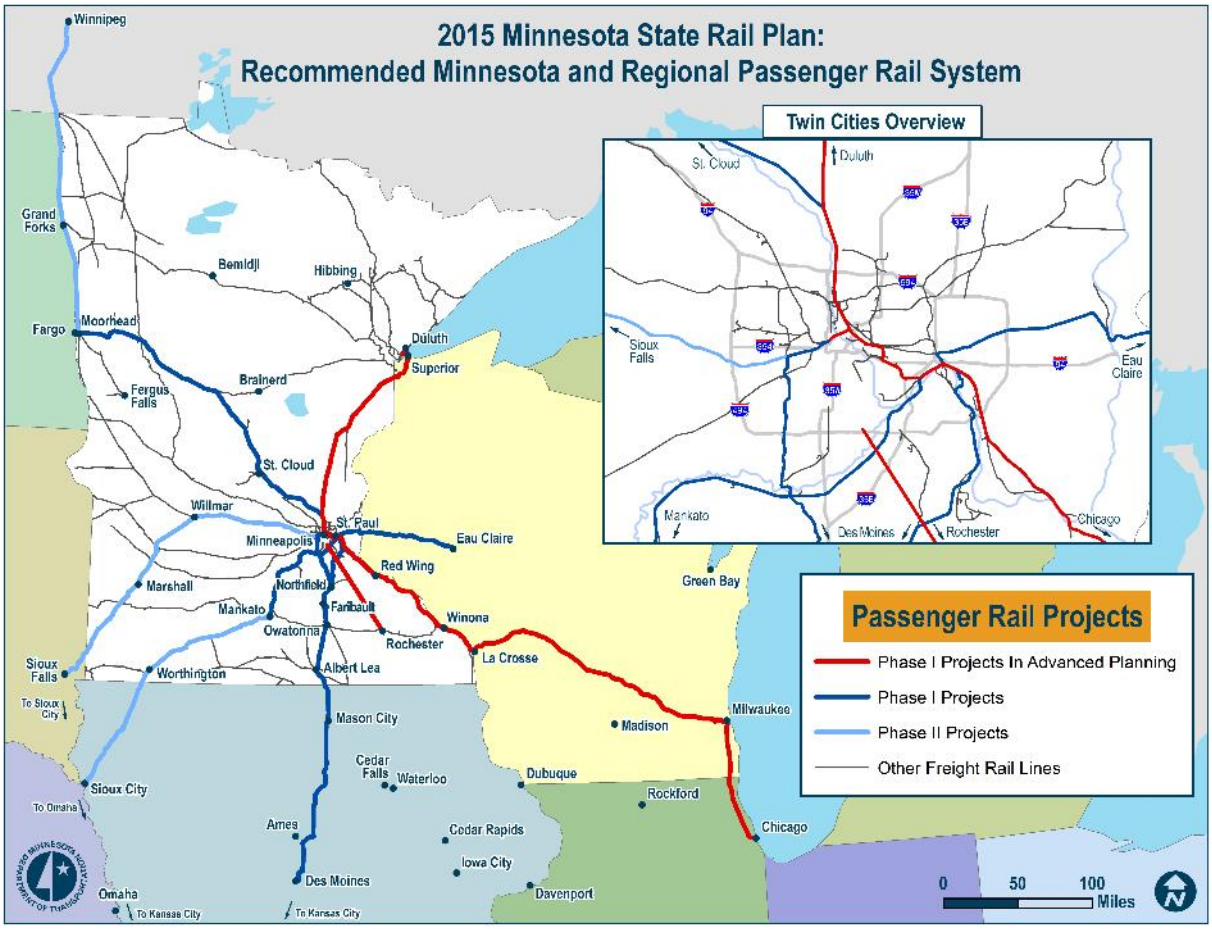
The next two levels apply to projects that have not yet entered advanced corridor-level planning. These corridors are assigned a Phase I or Phase II priority as follows:

- Phase I: Projects that are within a 0- to 20-year implementation horizon and would connect the Twin Cities with the following cities—St. Cloud and on to Fargo, Northfield and on to Albert Lea and Des Moines, Mankato and Eau Claire.
- Phase II: Projects that have a 20+ year implementation horizon, such as extensions of the Mankato service to Sioux City, Iowa; the Fargo service to Winnipeg and service from the Twin Cities to Willmar and on to Sioux Falls, South Dakota.

For these Phase I and II corridors, the rail passenger travel demand was re-estimated using the methodology developed in the 2010 State Rail Plan, but updated to reflect more recent demographic data. The highest total travel demand to/from the Twin Cities along these corridors is with St. Cloud, with more than 1 million forecast rail trips annually and a rail market share of about 8 percent. This city pair is followed by a second cluster of city pairs with more than 100,000 annual trips or between 4 and 5.5 percent of the total travel market, including Eau Claire, Mankato and Northfield.

All of the corridors are shown in Figure E.3.

Figure E.3: Passenger Rail Corridors



Issues Affecting Current and Future Passenger Rail

Issues affecting current and future passenger rail include:

- Safety. There is a continuing need for improved safety at highway-rail grade crossing concern due to a history of collisions with crossing vehicles, bicyclists and pedestrians. While significant improvements were made in recent years, many of the currently installed warning devices will need replacement by 2030 due to age and functional obsolescence. Improvements beyond active warning devices also will be necessary in some locations. The recent rapid increase in the transport of shale oil and other hazardous materials across Minnesota poses new challenges to ensuring safety.
- Prioritization and Coordination of Passenger Rail Projects. Advancing passenger rail projects is complex and competition for funding is intense. Great attention is necessary for selecting the best projects,such as having detailed supporting analyses including rigorous cost benefit analysis, and focusing on moving projects through the planning process. Passenger rail systems sharing infrastructure with Minnesota's freight network will require coordination between operations. Passenger terminal design and capacity must continue to be developed to allow for advanced multimodal connections and support, including the destinations of St. Paul and Minneapolis.

- Need for Increased Passenger Service Reliability. Amtrak's Empire Builder currently provides the only passenger rail service in Minnesota. An increase in the number of delays primarily due to increased freight rail volume resulted in a drop in on-time performance, from 78 percent in 2010 to 27 percent in 2014. There is a strong near-term interest in increasing the frequency and reducing service delays on the Empire Builder. In the short-term, double tracking segments along the route, proactive scheduling and continued investments from the host railroads are expected to alleviate Amtrak delays.

Stakeholder and Public Involvement

Throughout the 2015 Minnesota State Rail Plan development process, various strategies were used to engage the public, stakeholders and other agencies. These strategies were outlined at the beginning of the project in a Public Involvement Plan. The goals and objectives of the engagement process were to create opportunities for involvement, provide opportunities for education and information about the state's rail system, use the input to identify opportunities to guide MnDOT's vision for rail, and integrate and coordinate stakeholder and public involvement with technical tasks.

Comments were solicited through two rounds of public open house meetings across the state, passenger Rail Forum meetings, the Minnesota Statewide Freight Summit, individual stakeholder meetings, a MetroQuest online survey, website and online engagement, and letters and resolutions.

Program Summary and Action Plan

To achieve the vision laid out by Minnesota GO and the goals outlined in this document, a set of short- and long-term actions were developed and are summarized below.

4-YEAR ACTION PLAN

During the next 4 years, the following actions are necessary to implement the vision for rail.

Freight	Passenger
• Develop and implement a comprehensive plan that addresses key safety vulnerabilities across Minnesota's rail network • Continue development and investment in reducing rail/highway conflicts, including upgrading rail/highway grade crossings, grade separations, and crossing closures • Complete initial deployment of state-of-the-art traffic control and safety systems on Minnesota's high-density main lines • Better integrate rail into the public planning process • Build upon the existing Minnesota Rail Service Improvement Program, including raising the maximum	• Implement a second frequency along the Empire Builder route between Chicago and the Twin Cities and reduce service delays • Continue development of the High Speed Rail services listed as Phase I in Advanced Planning through environmental and permitting processes including the Twin Cities to Milwaukee segment of Chicago HSR; Zip Rail between the Twin Cities and Rochester; and NLX between the Twin Cities and Dululth

During the next 4 years, the following actions are necessary to implement the vision for rail.	
Freight	Passenger
loan amount beyond the current $200,000 ceiling • Initiate advanced planning and construction of solutions to the state's most critical network bottlenecks	

20-YEAR ACTION PLAN

During the next 20 years, the following actions are necessary to implement the vision for rail.	
Freight	Passenger
• Improve the safety of the freight rail system in all aspects, and ensure the ability of the rail infrastructure to safely support growing traffic volumes • Make improvements to the condition and capacity of Minnesota's primary railroad arterials to accommodate existing and future demand • Address all critical network bottlenecks • Upgrade main line track (all Class I to III railroads) to 25 mph minimum speed, as warranted. • Improve the network (all Class I to III railroads) to support the use of 286,000 pound railcars throughout • Implement state-of-the-art traffic control and safety systems • Expand intermodal service access options throughout the state • Maintain and ensure broad access to competitive freight rail services for shippers throughout the state, and leverage the state's rail network for desirable economic development • Actively manage preserved rail corridors held in the State Rail Bank and evaluate for possible future transportation uses • Support the implementation of Positive Train Control on	• All projects currently not in Advanced Planning will fall into Phase I (implementation within 20 years), or Phase II (implementation beyond 20 years). Further study is required to fully determine into which phase projects are placed. Currently, public support appears to be greatest for service to Northfield, continuing on eventually to Des Moines and Kansas City. Also, service to St. Cloud reflects a combination of intercity service and an extension of the existing Northstar Commuter Rail service, and as such has strong performance. Enhanced service to Fargo is included in the improvements to the Empire Builder. Other potential Phase I markets include Mankato, Willmar and Eau Claire, Wisc. • Advance corridors incrementally depending on analysis results, financing, right of way acquisition, and agreements with freight railroads • Connect all services (including the Advanced Planning projects) to both Target Field Station and St. Paul Union Depot

During the next 20 years, the following actions are necessary to implement the vision for rail.	
Freight	Passenger
short line corridors where conditions warrant, such as the handling of certain categories of hazardous materials[3]	

COSTS

The capital cost of the fully implemented program would be approximately $6.6 billion and includes both private and public investment. This amount consists of $3.5 billion for freight-only improvements and $3.1 billion for passenger improvements for Phase I projects, but does not include costs for the Phase I projects in Advanced Planning. More detailed engineering cost estimates will be produced for these projects as studies are completed. Consideration should be given to building these projects as a system rather than a series of individual, unrelated projects.

Program Implementation and Funding

FUNDING AND INVESTMENT OPPORTUNITIES

The approach to financing the 2015 Minnesota State Rail Plan presumes the need for multiple actors, methodologies and years. This is a 20-year program—the full program costs should be viewed as a long-term goal which can be achieved incrementally over the life of the program. A range of financing tools is needed among the public sector stakeholders—federal, state and regional/local—and the private sector including railroads and investor/developers

State and local funding commitment to planning, capital investment, and operations has already been demonstrated in Minnesota. State general fund and bond proceeds are dedicated to the existing freight and safety programs (including MRSI), MnDOT's Passenger Rail Office, Zip Rail, NLX, service to Milwaukee/Chicago, and station facilities at Target Field Station and St. Paul Union Depot. Minnesota counties and their Regional Railroad Authorities committed significant local funding from both general funds and special purpose tax levies to advance these projects and support ongoing rail operations.

On the federal side, the funding picture has changed considerably since 2010. The Moving Ahead for Progress in the 21st Century (MAP-21) authorization was enacted in 2012. While it did not include any substantive changes to potential funding sources for intercity passenger rail service, appropriation levels dropped substantially. MAP-21 was extended through May 2015 under a continuing resolution.

At the time of the development of the 2010 State Rail Plan, the federal government had authorized substantial funding for the Passenger Rail Investment and Improvement Act. Since 2010, Congress has not appropriated any further funding under the PRIIA programs, and PRIIA's authorization expired at the end of FY 2013. Current draft

[3] It is assumed that the Class I railroads will implement PTC at their own cost as federally mandated.

legislation does not include substantive direct funding for passenger rail program development outside of the Northeast Corridor.

Since 2010, the MnDOT OFCVO and Office of Passenger Rail have pursued a variety of strategies for moving individual projects forward, such as:

- Including projects in the state's long-range transportation plans, after which environmental analyses can begin. Service-level environmental assessments and alternatives analyses should be prepared for all identified components of the passenger rail system.
- Pursuing funding through combinations of federal grants, state and local appropriations and bonding authority, and private investment.
- Reaching formal agreements with the freight railroads to move projects forward.
- Continuing to authorize and empower corridor-level special purpose authorities or joint powers authorities, much like the Northstar Commuter Rail system was originally planned by MnDOT, delivered by the Northstar Commuter Rail Development Authority and operated by Metro Transit.
- Prioritizing projects, both freight and passenger, based on:
    - Cost-benefit analyses
    - Mutual benefits to freight and passenger services;
    - The potential for funding partnerships among multiple public and private entities
    - Deliverability as a project reaches final federal approval stages.

Exploration of new funding opportunities are necessary to move rail development forward. In addition to strategies mentioned above, some options for MnDOT to pursue in the future include:

- Pursuing funding through federal grant programs. The USDOT's TIGER discretionary grant program has provided funding for freight and passenger rail projects; however, the program is highly competitive for a relatively small pot of money. The 2014 program received 1,400 applications totaling $57 billion in project costs—for only $1.5 billion in available grants.
- Rail eligible corridor investments. Some states have identified major intercity corridors that enable economic activity, and are focusing their infrastructure investments in these corridors. These programs facilitate capacity expansion and congestion relief in road and rail facilities. In 2000, MnDOT designated a primary set of highways for moving goods and people between regional trade centers in Minnesota called the Interregional Corridor System. These corridors could serve as a primary focus for investment in rail projects as well as highway, and are consistent with many of the major freight rail, and potential passenger rail corridors.
- Freight rail improvements. Many states have programs that offer financial assistance to freight railroad operations. Some of these programs are focused on short line or regional railroads and can involve public ownership of rail lines with private operators. Other programs offer tax incentives for expansion of facilities, spurs or lines for new or expanded business development. Some states offer assistance through revolving loan

programs, while others make direct grants. Examples include programs in Wisconsin, Pennsylvania, Florida, Ohio and Nebraska.

- Passenger rail investments. Most investments in passenger rail capacity by states involve expanding the facilities of freight railroads over which the passenger services will operate. These passenger rail investment programs provide operating benefits for the freight railroads and can be characterized as investments in shared corridors. Examples include programs in North Carolina and Virginia.
- Rail safety programs. Thirty states cooperate in enforcing federal rail safety regulations and in supporting federally certified rail safety inspectors. These programs, funded solely with state resources, leverage the efforts of the FRA, and are coordinated through the FRA's eight regional safety offices. The Federal Surface Transportation Program dedicates $220 million to funding improvements in highway-rail grade crossing protection. Several states augment this federal funding with state resources, aimed at allocating resources on a safety risk-based process.
- Public Private Partnerships. MnDOT has limited legal authority to implement some forms of PPPs, but the state of the practice has changed significantly since MnDOT's PPP authorization legislation was enacted.[4] MnDOT's programs could be greatly expanded to support the development of passenger rail projects. Tools for leveraging private sector investment include:
  - Expanding the Minnesota Rail Service Improvement Program (MRSI) from a revolving loan program to a combination of loan and grant programs as done in some other states such as Iowa, Wisconsin and Virginia, and increasing the loan ceiling from the current $200,000
  - Offering financial assistance for Railroad Rehabilitation and Improvement Financing applicants. Oregon has such a program
  - Providing state maintenance and investment tax credits for rail improvements;
  - Broadening access to the Minnesota Revolving Loan Fund for projects beyond grade crossing improvements;
  - Amending the constitutional limit of $200 million in debt to support rail projects
  - Creating a dedicated funding source for multimodal investments not subject to annual appropriations

Conclusions

WE HEARD FROM OUR STAKEHOLDERS

A robust rail network is vital to Minnesota's economy, environment and quality of life. We heard this unifying statement from diverse stakeholders over and over when writing this plan. Stakeholderssaid it in different ways.

[4] http://www.fhwa.dot.gov/ipd/p3/state_legislation/state_legislation_key_elements.aspx

Minnesota needs a rail system that is safe, one that works well and carries both people and freight. It is important to our economy, our environment and our quality of life.

WHAT'S NEXT?

The need for a robust rail network is great, and the success of Minnesota's rail system depends on the coordinated efforts of many public and private stakeholders. Although passenger and freight interests are sometimes seen as at odds with one another, this plan sets forth unifying strategies for meeting the needs of both. Rail improvements to safety, capacity and system efficiency benefit both freight and passenger rail systems. MnDOT will fulfill a dual role of developing new economically-beneficial rail systems in the state and promoting and enforcing transportation safety and commodity delivery equity within the state. With public and private interests working together, our state's freight and passenger rail system will grow investments in Minnesota's economy, help the environment and improve overall quality of life.

1.0 THE ROLE OF RAIL IN STATEWIDE TRANSPORTATION

Background and Purpose of Study

This document is the 2015 update to the Minnesota Comprehensive Statewide Freight and Passenger Rail Plan, first developed in 2010, referred to as the 2015 Minnesota State Rail Plan. According to Minn. Stat. Minnesota Session Law 2008, Section 174.03 subd. 1b, the purpose of the State Rail Plan is to guide the future of the rail system and rail services in the state. The development of the plan was jointly undertaken by the Minnesota Department of Transportation's Office of Freight and Commercial Vehicle Operations and the Passenger Rail Office.

The 2015 Minnesota State Rail Plan follows the six-chapter structure required by the Federal Railroad Administration for state rail plans:

- Chapter 1 provides an overview of the role of rail in the state's multimodal transportation system, and the state organization to support rail development.
- Chapter 2 describes the state's existing rail system, including future trends, forecasts, needs, and opportunities.
- Chapters 3 and 4 outline proposed passenger and freight rail improvements and investments, by corridor.
- Chapter 5 describes the state's rail service and investment program.
- Chapter 6 documents the coordination with other plans and stakeholder outreach conducted as a part of this effort.

The 2015 Minnesota State Rail Plan builds upon the technical analyses and findings of the 2010 State Rail Plan, incorporates information on changes and happenings between 2010 and 2015, and reflects the most current state of the system and stakeholder comments.

Rail has long played a significant role in the movement of freight in Minnesota, much more than in many comparable states and regions. Minnesota has the eighth highest number of rail miles of all states in the nation. Rail accounts for 25 percent of freight tonnage moving in the state and is especially important in moving bulk commodities such as the minerals and agricultural products that drive Minnesota's economy. The state is first in the nation in the volume of originating and terminating metallic ores (e.g., iron ore from the Mesabi Range) moving by rail, is second for originated farm products, and is third for originated food products.[5]

Recently, the focus of Minnesota's freight rail system planning has shifted due to factors such as record grain harvests and the development of the Bakken Shale Oil fields of western North Dakota. New commodities, such as frac sand, move by rail from Wisconsin and other states through Minnesota to support the shale oil production process, and extracted crude oil is shipped back through Minnesota to refineries in the eastern United States. It is estimated that trains with 100 or more tank cars filled with Bakken crude oil cross Minnesota at a rate of 37 to 52 trains per week on BNSF and nine per week on Canadian Pacific lines.[6] Because of the volatility of the Bakken crude, rail safety is a top priority in Minnesota; the 2014 legislature has passed several bills aimed at understanding

[5] AAR State Rankings. www.aar.org/data-center/railroads-states#state/MN

[6] Minnesota officials: Cost is $280M to upgrade oil train routes. *Duluth News Tribune*, January 4, 2015.

and ensuring the safety of crude-by-rail movements. These laws require MnDOT to conduct studies on highway grade crossings that have significant safety risks due to increased crude-by-rail activity, provide $2 million for improving rail grade crossings identified in the study and resulted in the hiring of two additional rail inspectors. MnDOT also has recommended other actions, and the FRA continues to advocate for positive train control implementation by December 2015 to enhance the safety of rail operations nationwide..

Increased traffic on Minnesota's rail system is also a result of record grain harvests, a resurgence in coal traffic, and increasing iron ore and LPG shipments, all occurring during late 2013 and early 2014. Combined with the "crude boom," this activity has resulted in unintended consequences for several of Minnesota's key industries. Rail system congestion has been noted as a reason for the idling of coal-fired power units in the state due to the inability to obtain coal shipments.[7] While the Class I railroads have embarked on historic capital improvement plans to improve service and increase system capacity, farmers continue to face challenges in getting their product to export ports in the Pacific Northwest. Due to slower travel times and longer cycle times, there was a shortage of rail cars available for grain shipment and other bulk commodities moving via unit trains, including iron ore and coal. Increased capacity and resulting increases in system velocity are the only true long term solution to these service issues. A recent study by the University of Minnesota's Center for Farm Financial Management estimates delays in railroad shipping cost Minnesota corn, soybean and wheat farmers nearly $100 million due to poor deliverability, loss of market responsiveness, lower prices and higher costs. The report also estimates that, as of June 1, 2014, 330 million bushels of corn remaining in on-farm storage bins across Minnesota due to rail bottlenecks were worth $122 million less.[8]

These freight rail system statistics are significant on their own; however, they also need to be weighed with respect to passenger rail service and the state's goal to increase service. The 2010 Minnesota Statewide Freight and Passenger Rail Plan laid out a comprehensive plan for priority passenger rail corridors that overlaps with, and would in part share, key freight rail trackage in the state. Funding for rail is changing, and the primary federal intercity passenger rail programs in place during development of the 2010 State Rail Plan were phased out. The advent and continuation of the TIGER grant program continues to provide funds for construction and some planning, but Minnesota's rail and multimodal projects compete with each other, and the program places Minnesota in stiff competition with other states. In 2014, TIGER's sixth year, USDOT received 797 eligible applications valued at $9 billion for $600 million in available funding.

The 2015 Minnesota State Rail Plan addresses both freight and passenger rail systems in Minnesota, and ensures that opportunities identified within the plan and as part of other state rail projects strive for balance among economic opportunity, personal mobility, public-private partnerships and investment benefits and costs.

The Vision for Minnesota's Multimodal Transportation System

In early 2011, MnDOT launched the Minnesota GO visioning process. Teaming with the University of Minnesota and the Citizens League, MnDOT asked Minnesotans to help shape a Vision that answers the question, "What are we trying to achieve for transportation over the next 50 years?" The visioning effort intended to collectively define a desired destination toward which state, regional and local transportation planning could navigate. The end result was a shared Vision that aligns the transportation system with what Minnesotans expect for their quality of life, economy and natural environment. This is the first long-range transportation vision adopted for Minnesota. It provides the

[7] Power plants worry about winter coal supplies. *Star Tribune*, November 15, 2014.

[8] Rail shipping delays cost Minnesota corn, soybean, wheat farmers nearly $100 million. *Star Tribune,* July 10, 2014.

desired outcomes for the Statewide Multimodal Transportation Plan during the next 20 years, for MnDOT's Family of Plans, and for all modes and transportation partners.

Thousands of Minnesotans played a role in helping craft the Minnesota GO Vision for transportation for future generations. This vision also includes a set of guiding principles that are intended to be used collectively to help guide future policy and investment decisions for all forms of transportation. The Minnesota GO Vision was adopted in November 2011. The Minnesota GO Vision serves as an overarching set of principles guiding the development of freight and passenger rail service, along with other modes of transportation, within the state.

MINNESOTA GO VISION FOR TRANSPORTATION

Minnesota's multimodal transportation system maximizes the health of people, the environment and our economy.

The system:

- Connects Minnesota's primary assets—the people, natural resources and businesses within the state—to each other and to markets and resources outside the state and country
- Provides safe, convenient, efficient and effective movement of people and goods
- Is flexible and nimble enough to adapt to changes in society, technology, the environment and the economy

QUALITY OF LIFE

The system:

- Recognizes and respects the importance, significance and context of place—not just as destinations, but also where people live, work, learn, play and access services
- Is accessible regardless of socioeconomic status or individual ability

ENVIRONMENTAL HEALTH

The system:

- Is designed in such a way that it enhances the community around it and is compatible with natural systems
- Minimizes resource use and pollution

ECONOMIC COMPETITIVENESS

The system:

- Enhances and supports Minnesota's role in a globally competitive economy as well as the international significance and connections of Minnesota's trade centers
- Attracts human and financial capital to the state

Minnesota's Rail System Goals

Minnesota's railroads form a critical part of the state's multimodal transportation system. Many of the state's major industries rely on the rail system as a cost competitive way to deliver goods. The rail system is critical in providing efficient connections to markets beyond the state's borders, throughout North America, and to the world via the deep-water ports on the Pacific and Atlantic coasts and the Great Lakes. Rail provides energy efficient transportation options to shippers in terms of market access, modal economics and service.

For Minnesota, a strong rail system supports economic development, enhances environmental sustainability, helps to preserve the publicly owned roadway infrastructure, and increases the business marketability of the state. Future challenges for Minnesota will include increasing regional and international economic competition, constrained highway capacity, environmental challenges and rising energy costs. Additionally, the state must respond to calls for effectively developing and utilizing a freight rail system to support expanded traffic volumes and a more diverse customer base. The private ownership of Minnesota's rail system presents unique challenges and opportunities for public sector planning.

The rail industry in Minnesota is a vital and vibrant transportation sector, ranging from four large Class I railroads to 17 smaller regional and local carriers. In recent years, growth in traffic hauled by Minnesota's short line railroads outpaced the industry as a whole, and showed success in locations where prior efforts failed. Maintaining and expanding this vitality should be central to the state's involvement with the rail industry.

Minnesota's intercity passenger rail service provides connections to its eastern and western neighbors, and commuter and light rail provide service within the state. Minnesota currently has one active intercity passenger rail service—Amtrak's Empire Builder—which provides service between Chicago and points west, one active commuter rail service—Northstar—which provides service between Big Lake and the Twin Cities, and two light rail lines—the METRO Blue Line (Hiawatha), which operates between the Mall of America and downtown Minneapolis, and the METRO Green Line (Central), which began service between downtown Minneapolis and downtown St. Paul in 2014.

Several existing conditions make it desirable for Minnesota to develop an intrastate and interstate intercity rail system:

1) Expected continued population and economic growth place additional demands on the state's capacity-constrained highway system

2) Macroeconomic and global environmental and energy trends and policies which are likely to significantly increase long-term fuel prices and require significant controls on greenhouse gas emissions

3) Changing travel patterns—lower car-ownership rates and an increase in older and younger populations that seek alternatives to car transportation

FREIGHT RAIL GOALS

A successful, viable rail industry that meets the future needs of Minnesota's economy requires continued investment and improvement to its infrastructure. Owned by private firms, the freight railroad industry is unique in that it has largely borne the cost of maintaining its own infrastructure. This is expected to continue, but further improvements to the infrastructure will be necessary, not all of which may be fully self-funded. In recent experience, rail shippers and public entities have partnered in mainline improvements and secondary lines and shipping facilities. Goals for freight rail are as follows:

- **Continue to make improvements to the condition and capacity of Minnesota's primary railroad assets** to accommodate existing and future demand and provide reliable freight rail service to Minnesota's industries. Public-private partnerships, federal grant programs, and other potential state funding mechanisms are necessary to ensure that the state has the ability to make needed improvements and expansions.
- **Address critical rail network bottlenecks** that degrade present service and inhibit the ability of the state's railroads to serve future traffic.
- **Upgrade main line track (all Class I to III railroads) to 25 mph minimum speed, as warranted.** This is needed to ensure commercial viability and safety for rail operators to meet the needs of the current and future shippers that rely on them.
- **Improve the network (all Class I to III railroads) to support the use of 286,000 pound rail cars throughout**. This weight limit has become the industry-wide standard, and the viability of lines and shipper's facilities that do not have this capacity will diminish over time.
- **Implement state-of-the-art traffic control and safety systems** to ensure a safe and efficient rail system on key mainlines.
- **Expand intermodal service access options throughout the state**. Rail intermodal services (the haulage of containers and trailers) available today in Minnesota are limited geographically and by capacity. Existing terminals are all located in the Twin Cities. Quality service to a broader set of markets beyond the state's borders is needed from a competitive and environmental standpoint, as is development of a major new Twin Cities terminal, which will become a necessity if intermodal service is to be developed beyond those lanes currently served.
- **Continue to develop programs promoting safety of freight rail and hazardous material transportation**. Minnesota has made rail safety a top priority, and the legislature has passed several significant bills aimed at understanding and ensuring the safety of crude-by-rail movements. The state should continue to work with industry and stakeholders to improve the safety of freight rail movements.

PASSENGER RAIL GOALS

Minnesota should act in the following ways to meet the Minnesota GO Vision and develop a robust intrastate and interstate intercity passenger rail system that results in improved travel options, lower costs and higher speeds for Minnesotans and interstate travelers:

- **Continue to participate with the Midwest Regional Rail Initiative States** to support the development of minimum 110 mph service for connections from the Twin Cities to Wisconsin and the Chicago Hub Network.
- **Develop an intrastate intercity passenger rail network** connecting the Twin Cities with viable service to major outlying regional centers. These services can be started as stand-alone projects and coordinated as part of a larger regional/national system. These services should use interchangeable and interoperable equipment. Local transit services in the major Metropolitan Planning Organization regions should be coordinated to support the rail system. System speeds should be a minimum of 79 mph, with a short-term goal of achieving 110 to 150 mph where track conditions and market demand permit and warrant. Systems should be built out on existing freight lines where possible, and on new dedicated passenger tracks where desirable and necessary.

- Develop all services with the ultimate goal to connect to both the Target Field Station and St. Paul Union Depot.
- Advance corridors incrementally to build ridership and system advantages, leaving open all future options for viable improvements such as stand-alone branches, through routes, new alignments, potential airport connections, and true high-speed rail.
- Prioritize project qualified corridors based on state of readiness, sequencing depending on financing, right of way acquisition, and agreements with freight railroads.
- Establish rail connections to intercity and commuter rail markets in Wisconsin and Minnesota, to the I-35 Corridor, the Red River Valley, the eastern plains and Canada, as demand warrants.
- Promote energy-efficient technology and efficient transportation through expanded use of rail and intermodal shipping.

PLANNING AND POLICY DEVELOPMENT

- Maintain and ensure broad access to competitive freight rail services for shippers throughout the state. The relevance of rail service to Minnesota's industry is directly related to geographic coverage, trip times, reliability, availability of appropriate rolling stock, and cost. Industry needs should be met through a range of competitive service offerings, from single carload to high-volume unit train shipments, bulk transloading, intermodal, and innovative solutions.
- Better integrate rail into the public planning process, including modal trade-off analysis, local and regional comprehensive plans, coordination with neighboring states, industrial development strategies, and public ports planning.
- Actively pursue public-private partnerships, partnerships with other agencies, and private financing or operations in support of freight and passenger rail corridor development.

EXISTING RAIL PROGRAMS

- Build State assistance for freight rail projects upon the existing Minnesota Rail Service Improvement Program (MRSI). The 30+-year-old program supported a strong rail system in the state; however, funding levels are inadequate, and a broader program is needed to go beyond small loans for infrastructure improvements. The program should include a range of solutions and financing options, including branch and short line preservation, and an increase in the maximum loan amount beyond the current $200,000 ceiling. Consistent with the 2013 Freight Rail Economic Development Study, additional strategies have been proposed for an interagency approach including economic development agency collaboration, real estate registries, a Rail Shipper's Toolkit and a performance-based mix of grants and loan forgiveness.
- Expand the Rail/Highway Grade Crossing program to consider a broader array of strategies beyond active warning devices, and match or exceed device replacement needs. The Federal Section 130 grade crossing program provides an institutional structure and a modest source of funds to improve rail/highway grade crossings primarily through the installation of active warning devices. Substantial reductions in grade crossing

incidents have been the result, and Minnesota has embraced the program and the public/private partnership model that lies at its foundation. A more dynamic approach to grade crossings will be necessary in the future, as regions of the state continue to urbanize and rail traffic volumes and speeds increase. Grade crossing warning devices and other low-cost improvements will remain an important part of the mix, but the public is increasingly demanding other more complex and costly strategies, such as quiet zones, advanced crossing systems and grade separations., Expanded state involvement will require creative solutions because resources are insufficient to meet existing program mandates.

- Actively manage and evaluate preserved rail corridors held in the State Rail Bank for possible future transportation uses. While interim uses of preserved rail corridors, typically as recreational trails, have seemingly maintained their integrity for future transportation use, the likelihood of their reuse for freight rail transportation purposes is very unlikely. Currently, the Blue Ox Trail (104 miles), Central Lake Trail (55 miles), and Lake Wobegon Trail (48 miles) are rail bank corridors used as multipurpose trails, along with seven miles of right of way from Starbuck to Glenwood. Encroachment by abutters, regulations and political considerations make conversion to an active railroad extremely difficult and costly. If demand for rail service continues to increase, the reconstitution of some of these trails as rail lines may be desirable. A rail banking strategy that identifies potential key freight corridors and establishes clear policies for line acquisition and disposition, and that differentiates rail banking for purposes of future rail use versus other indefinite "interim" public uses should be established. This will likely require coordination between MnDOT and the Minnesota Department of Natural Resources.

Institutional Governance Structure of the State Rail Programs

Minnesota's railroads have a broad range of interactions with government agencies at all levels, including the federal, state, and local governments. Collectively these minimal and major interactions significantly affect rail industry behavior and performance in Minnesota. This subsection examines the institutional roles and responsibilities of these agencies and relates the perspectives of rail industry stakeholders to the agencies' current effectiveness and potential for improvement, particularly as Minnesota embarks on a broader vision for rail. Closer partnership with regional stakeholders and railroads is a clear goal, as is removing barriers to private business proposals that serve the state's service needs.

The primary emphasis is on the state departments, programs, and legislative mandates that affect railroads. Beyond the state-level interactions, several federal agencies such as the Federal Railroad Administration and Surface Transportation Board also have important roles in overseeing freight and passenger rail activities within the United States.

FEDERAL AGENCIES

Federal Railroad Administration

The FRA was created by the Department of Transportation Act of 1966. One of 10 agencies within the USDOT concerned with intermodal transportation, the FRA's mission is to enable the safe, reliable, and efficient movement of people and goods in the U.S.

The FRA's Passenger Rail Division provides technical expertise and direction in the development and implementation of rail safety programs applicable to freight, commuter and intercity passenger railroads, as well as advice and oversight in the areas of safety, procurement and other railroad related issues. The Division

also provides technical support to regional staff regarding enforcement matters affecting the United States's rail network.

Surface Transportation Board

The STB, created in 1995 to succeed the Interstate Commerce Commission, is a regulatory agency charged with resolving railroad rate and service disputes, reviewing proposed railroad mergers, line abandonments and construction of new lines. The STB is independent decision-making body that is administratively affiliated with USDOT.

The STB serves as both an adjudicatory and a regulatory body. The agency has jurisdiction over many rail-related issues, including railroad rate and service issues and rail restructuring transactions such as mergers, line sales, line construction, and line abandonments.

MINNESOTA STATE AGENCIES

Six departments in the Minnesota state government, along with a handful of regional agencies, have ongoing roles and responsibilities related to the rail industry.

Minnesota Department of Transportation

With its mandate to manage transportation issues for the state, MnDOT has the most extensive interactions with the rail industry on a regular basis. MnDOT consists of five divisions, 20 offices, and eight districts located throughout the state. Offices that significantly interact with the rail industry include:

- Office of Freight and Commercial Vehicle Operations. Located within the Modal Planning and Project Management Division, OFCVO has primary responsibility in handling freight-related matters for the state, including policy development, multimodal planning, and investment processes. Prior to the creation of the Passenger Rail Office, MnDOT's rail-oriented programs were all located within OFCVO, which presently include the Rail Grade Crossing Improvement program, the Minnesota Rail Service Improvement program, the track inspection program, and management of state-owned rail bank assets. This office has a staff of 70, of which 50 people are assigned to commercial vehicle operations and 20 to other freight and rail functions.
- Passenger Rail Office. This office was established in 2009 under the Modal Planning and Project Management Division. Its purpose is to coordinate and manage MnDOT activities related to intercity passenger rail, including planning, and serve as the state's resource on passenger rail matters. As the passenger rail system matures, this office will coordinate rail infrastructure improvements to maximize limited resources and safety for both freight and passenger rail operations. This office has a staff of five people. The Passenger Rail Office also relies on specific staff expertise from the Office of Environmental Stewardship and the Office of Chief Counsel.
- Office of Transit. Also located within the Modal Planning and Project Management Division, this office administers grant programs for capital and operating assistance to transit services outside of the Twin Cities metropolitan area, and provides coordination and planning support for nonmotorized travel and telecommuting. Although intercity passenger rail services would not generally fall under the Office of Transit, certain elements, such as station improvements and connections with local transit services in outstate locations, could be included under its jurisdiction.
- Office of Environmental Stewardship. This office, located within the Engineering Services Division, conducts environmental reviews for Federal Highway Administration projects, including air/water quality and analysis,

endangered species, noise, regulated materials and waste, and erosion control. Although OES generally focuses on highway projects, more recently it has become involved in FRA rail-related project development.

- Office of Land Management. Part of the Engineering Services Division, OLM provides a variety of services for managing and acquiring real estate for transportation purposes. OLM acquires abandoned rail rights of way under the direction of OFCVO, and maintains extensive records on rail property in the state.
- Office of Chief Counsel. The MnDOT Office of Chief Counsel provides legal counsel to MnDOT offices. It is a resource that advises on legal implications of projects or decisions.

Minnesota Pollution Control Agency

The PCA monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations. Four of eight divisions regularly intersect with the rail industry—Industrial, Remediation, Prevention, and Assistance—however, most interactions are related to hazardous materials releases and facility permitting. PCA's rail-related responsibilities include:

- Permitting and clean-up. Most interactions rail carriers experience with PCA follow an environmental mishap, giving some rail carriers the perception that the PCA primarily focuses on enforcement, rather than working cooperatively to develop effective solutions that minimize risk.
- Emissions reduction. Some states, such as California and Texas, have programs that aid railroads in acquiring emissions reduction technologies, such as genset locomotives and standby systems, usually through grants. Genset locomotives, which shut down automatically when they are not in use, are far less polluting in switching applications. Such a program could be administered through PCA or MnDOT.

Minnesota Department of Agriculture

The Department of Agriculture consists of 10 divisions.The Agricultural Marketing and Development and the Pesticide and Fertilizer Management Divisions most commonly interact with the rail industry. Agriculture Marketing and Development develops new markets and uses for agricultural products, of which the most noteworthy recent development from the perspective of the rail industry is ethanol.

The Pesticide and Fertilizer Division enforces regulation of chemicals used for the control of noxious weeds, which the rail industry became subject to on June 1, 2009, through an amendment to Minn. Stat. 18B.346, Pesticide Application on Railroad Property. Applicants must be properly trained in the use of restricted-use pesticides on railroad property, which must only be used for their intended use as specified on the label. Since the railroads almost entirely rely on third-party specialists to apply pesticides, this is already occurring.

Minnesota Department of Employment and Economic Development

DEED is the state's principal economic development agency, with responsibilities for managing the unemployment and job services programs and retaining and attracting businesses to Minnesota.

Although DEED participates in MnDOT's Rail Advisory Committee, there is little active coordination between DEED, MnDOT, and the railroads in retaining existing or attracting new businesses. At times DEED has had in-house rail expertise, but it has not been a consistent focus, and coordination with MnDOT has generally been infrequent. Stronger focus on this function should be provided, either at DEED or MnDOT.

Minnesota Department of Revenue

Collecting taxes to fund state programs is MDOR's primary function. Most importantly for the railroads, the agency administers the property and corporate tax collection process. While MDOR administers the collection process, revenues are dispersed to local jurisdictions. MDOR also enforces compliance with state purchasing regulations of other state departments, including MnDOT.

Minnesota Department of Public Safety

DPS provides a one-stop shop for most safety-related functions in which the state is involved, including law enforcement, emergency management and driver and vehicle services. Consisting of 12 divisions and offices, DPS's involvement with rail is primarily through law enforcement functions and collection of accident statistics, including grade crossing incidents. At one time, DPS also collected data on railroad accidents, a function that is now handled federally by the FRA. DPS provides the State Duty Officer, who coordinates all major statewide emergency responses, public and private. DPS is also the named recipient of federally-mandated crude oil unit train reporting by the railroads through USDOT.

In the DPS realm, two issues are of concern to railroads: trespassing on rights of way, and the authority of railroad police. Trespassing is not permitted in yards, but along main lines it is only a major misdemeanor. This raises serious safety concerns, and exposes railroads to potential liability. Carriers feel that these risks could be reduced if their own officers had the authority to make arrests. Minnesota and Wyoming are the only two states where railroad police are not deputized and must rely on local law enforcement authorities to enforce the law.

Minnesota Environmental Quality Board

The EQB oversees the state environmental process and ensures compliance with state environmental policy. The Passenger Rail Office works closely with EQB to secure state environmental approval of passenger rail planning projects.

REGIONAL AUTHORITIES AND METROPOLITAN PLANNING AGENCIES

Regional Rail Authorities

Through legislative action in 1980, Minnesota created Regional Rail Authorities for counties to preserve and improve local rail service for both industrial shippers and/or passenger traffic. Twenty-four RRAs currently exist. Minn. Stat. 398A grants significant powers to the RRAs, including the ability to acquire and dispose of property, apply for state and federal funds, exercise eminent domain, and levy taxes.

The performance of RRAs has been mixed. Many authorities are only minimally active and have not developed into robust entities. Only a few of the authorities have a regular funding stream, with the others funded sporadically, if at all. Some RRAs have been very active, however, and have effectively used different elements of the statute. The Twin Cities region RRAs are active to varying degrees in acquiring and preserving rights of way and active facilities, and planning for future transit and regional rail uses; however, many of these rights of way have been acquired for use as recreational trails. Among rural authorities, the Minnesota Valley RRA and the St. Louis and Lake Counties RRA stand out. The Minnesota Valley RRA owns and oversees operation of the Minnesota Prairie Line, a 94-mile line from Norwood to Hanley Falls, while the St. Louis and Lake Counties RRA operates a tourist line (the North Shore Scenic) and is active in freight rail service development elsewhere in its region.

Metropolitan Council

Established in 1967, the Metropolitan Council was created to coordinate planning and development within the Twin Cities metropolitan area and to address issues that could not be adequately addressed within existing governmental arrangements. In addition to being one of the oldest regional planning agencies in the United States, the Metropolitan Council also is unique in having not only planning responsibilities, but also operational responsibility through its Metro

Transit division, operator of the core bus system and the METRO light rail system consisting of the Blue and Green Lines. Metro Transit also oversees the operation of the Northstar Commuter Rail.

Close cooperation with the Met Council is a prerequisite to a successful statewide initiative to improve Minnesota's rail system. Many of the most critical bottlenecks are located in the Twin Cities, affecting both future freight and passenger needs. Efforts to expand regional rail service will draw on much of the same infrastructure as intercity services, and the public's investment will be maximized if the intercity rail services are closely coordinated with Metro Transit.

Minnesota's Authority for Grants, Loans and Public-Private Partnerships

GRANTS AND LOANS

State and local funding commitments to planning, capital investment and operations are already demonstrated in Minnesota. State general fund and bonding funds are dedicated to the existing freight and safety programs (including the Minnesota Rail Service Improvement Program); the MnDOT Passenger Rail Office; projects such as the Northstar Commuter Rail; passenger rail corridors like the Twin Cities to Chicago High-Speed Rail, X, and Zip Rail; and station facilities like the Target Field Station and Union Depot. A $26 million state bonding commitment was made in 2009 to advance and match federally funded projects and future applications. Minnesota counties and RRAs also committed local matches from both general funds and tax levies toward these and other projects.

The 2008 Passenger Rail Improvement and Investment Act created three new passenger rail investment programs for states: the State Capital Grant for Intercity Passenger Rail, Congestion Grants and HSR Grants. The American Reinvestment and Recovery Act of 2009 (ARRA, commonly referred to as "the stimulus") appropriated $8 billion for projects in the three PRIIA programs, and another $2.5 billion was appropriated in 2010. In FY 2011 congress rescinded $400 million of unobligated balances from the program and did not provide any additional funding.[9]

Tools for leveraging private sector investment include:

- Expanding MRSI from a revolving loan program to a combination of loan and grant programs as has been done in states including Iowa, Wisconsin, Pennsylvania and Virginia, and increasing the loan ceiling from the current $200,000
- Offering financial assistance for Railroad Rehabilitation and Improvement Financing applicants (Oregon has such a program)
- Providing state maintenance and investment tax credits for rail improvements
- Broadening access to the Minnesota Revolving Loan Fund for rail projects beyond grade crossing improvements

In addition to these existing or potentially expanded federal funding programs and federal/state programs designed to leverage private investment, a dedicated stream of state and or local/regional revenue is needed to support bonding for capital investment and annual operating subsidies. Otherwise, this program will always be in competition with a broad array of annual state priorities and it will be difficult to achieve the unified system envisioned in the 2015

[9] www.aashtojournal.org/Pages/041511appropriations.aspx

Minnesota State Rail Plan. The constitutional limit of $200 million in debt to support rail projects needs to be amended to achieve full state participation.

PUBLIC-PRIVATE PARTNERSHIPS

MnDOT has authority to design and construct transportation projects through design-build contracts.[10] From 1996 through 2002, MnDOT awarded DB contracts on a lowest bid basis, and changed to a best value award basis in 2002. Since 2002, MnDOT awarded seven DB highway projects totaling more than $860 million. Four more projects funded through ARRA are being procured through DB.

Minnesota statutes do not restrict DB projects to highway projects; however, given the structure of the legislation (which limits the number of DB contracts on an annual basis and requires an annual report on DB contracts), MnDOT might seek more explicit authority to use DB for rail projects.

MnDOT has had authority since 1993 to enter into PPPs for toll roads through a development agreement that "may provide for any mode of ownership or operation approved by the road authority," specifically authorizing BOT or BTO methods.[11,12] This authority does not extend to other transportation projects such as railroad projects.

The Willmar Wye is an example of a PPP actively being developed between the state, the railroad and local partners. In this case, BNSF and MnDOT partnered with Kandiyohi County, the City of Willmar and the Kandiyohi/Willmar Economic Development Council to pursue TIGER Funds for rail improvements to BNSF rail lines and highway improvements to Highway 12 and Highway 40 in the City of Willmar. The rail wye, which is a triangular junction, would connect the Marshall and Morris subdivisions and alleviate congestion in the downtown area of Willmar, which is also where BNSF's Willmar Yard is located. The project includes two highway bridges over the proposed rail line. In total, the project sponsors pledged about $32 million and requested $18 million in TIGER Grants in the 2014 funding cycle. The application was not successful, but will likely be resubmitted for the next round of TIGER. This coordination among all parties has served as an example for other projects in the state.

[10] Minn. Stat., Section 161.3410 to 161.3428.

[11] Minn. Stat., Section 160.84 to 160.98.

[12] Section 160.85 (4) (a).

PAST FIVE YEAR FUNDING

For the period of 2010–2015, Minnesota invested $40,634,000 in rail, as shown in Table 1.1.

Table 1.1: Funding Summary

FUNDING SOURCE	DESCRIPTION	AMOUNT
MRSI	12 projects involving loading facilities,spurs and sidings for shippers and short lines (includes the State Rail Plan and Freight Rail Economic Development studies)	$3,748,000
MRVRRA	Rehab Short Line track to Class II standards over a 20-mile segment from Young America to Winthrop, Minn.	$5,886,000
Grade Crossing/Antiquated Equipment Projects	Upgrade existing grade-crossing active warning devices including obsolete or antiquated equipment	$5,000,000
Passenger Rail Projects	Four passenger rail projects in advanced planning, environmental work and design; rail and signal installations for rehabilitation of St. Paul Union Depot; Phase 1 upgrade of passenger and transfer facilities at Target Field Station	$26,000,000
TOTAL		$40,634,000

Integration with Previous Planning Efforts

SUMMARY OF PREVIOUS RAIL PLANS

In 2010 MnDOT released the Comprehensive Statewide Freight and Passenger Rail Plan at a time when state rail planning guidance from the FRA was still under development as part of the broader PRIIA legislation. In PRIIA, Congress called for enhanced state involvement in rail transportation, and tasked the FRA with providing guidance to state efforts to develop rail plans. These plans, which were to be a prerequisite to gaining federal funding for rail projects, would set policy involving freight and passenger rail transportation within state boundaries, establish priorities and implementation strategies to enhance rail service in the public interest, and serve as the basis for federal and state rail investments within the state. Final guidelines on rail plan content under Section 303, Chapter 227 were not issued until September 2013.

The FRA and other agencies lauded MnDOT for the 2010 State Rail Plan, considering the general intent of the law to be met. The plan included many required elements, although not in the required format, while exceeding other requirements. The 2010 State Rail Plan was subsequently “grandfathered in” and accepted as FRA-compliant in 2013. One requirement of PRIIA is that state plans must be updated every five years, however, so MnDOT is molding the previous plan into a fully PRIIA-compliant State Rail Plan.

Changes in the 2015 Minnesota State Rail Plan

The following sections assess and document the updates in this plan to become compliant with the 2013 FRA guidance by:

- Summarizing 2013 FRA rail plan final guidance
- Summarizing the 2010 Comprehensive Statewide Freight and Passenger Rail Plan

- Summarizing a sample of recently completed FRA-approved statewide rail plans as a point of reference for MnDOT
- Ensuring the 2015 Minnesota State Rail Plan's compliance with Minnesota GO and the state "family of plans" guidance
- Proposing an approach for incorporating 2010 content into 2015 Minnesota State Rail Plan

Integration with Statewide Planning Efforts

During the past several years, MnDOT has developed a "Family of Plans," a set of statewide planning documents that have shaped policies related to the movement of freight in Minnesota. The overarching *Minnesota GO* establishes a 50-year statewide vision for transportation. It is a long-term plan that describes the end goal of what is envisioned in Minnesota and serves as the overarching umbrella for statewide planning. The Minnesota Statewide Multimodal Transportation Plan takes the vision and establishes policy direction and guidance for the integration of all modes. This 2015 Minnesota State Rail Plan uses the framework established by the multimodal transportation plan to document the issues and needs of, and develop recommendations for, the state's freight and passenger rail networks. The findings from this plan will be used by MnDOT as guidance to develop future iterations of the Statewide Multimodal Transportation Plan.

The consolidated findings and recommendations from the previous plans and studies highlight the key issues, needs and opportunities identified in each document, as well as any proposed solutions or recommendations. A total of 21 previous plans and studies were reviewed as part of this exercise, documented in Table 1.2. The focus is on plans that were developed after the publication of the 2010 Rail Plan, although some key statewide and regional studies conducted prior to 2010 are also included. Each document was placed into one of three categories: rail planning documents, freight plans, and supplemental plans, and studies.

An overview and summary of the scope and purpose of each plan is provided in Appendix A.

OVERVIEW OF FINDINGS

Common Rail Issues, Needs and Opportunities in the Minnesota Family of Plans and Related Studies

A number of common statewide rail-related issues, needs and opportunities were identified within the plans and studies reviewed. These "core" rail issues are highlighted below.

RAIL (GENERAL)

- Safety: The need for improved safety at highway-rail grade crossings is a concern due to a history of crashes with crossing vehicles, bicyclists and pedestrians. The safety of rail crossings in Minnesota has improved significantly, but many of the currently installed warning devices will need to be replaced by 2030 and new infrastructure is also recommended. The dramatic growth in freight rail demand puts added pressure on the existing safety procedures and systems.
- Public-Private Partnerships: Improved communication, coordination and formalized partnerships between public and private stakeholders are needed. Freight rail is privately owned and operated, and many of the lines envisioned for enhanced passenger service are privately owned and operated freight lines. Public/private cooperation is essential to addressing many freight and passenger rail needs. Since 2010, public/private and private passenger rail ventures have emerged around the country, including in Florida, Virginia, Texas, and Oklahoma, presenting new alternatives for development. The Willmar Wye project is an example of a PPP that is

actively being developed in Minnesota. This is a partnership between the state, railroad, local partners and possibly the federal government.

- Corridor Reclamation: Many currently unused rail corridors were preserved through interim uses such as trails. Converting these corridors back to active use is often difficult and costly due to encroachment, regulations and political considerations. In Wisconsin, at least two corridors have been successfully reactivated due to shipping needs.

- Rail Capacity: Demand for rail service to transport Minnesota's agricultural products, raw materials and consumer goods are increasingly competing with other rail traffic moving through the state. Infrastructure investment and continued work with rail stakeholders will need to continue to serve Minnesota's industries and passenger traffic. Double tracking and other capacity expansion projects are currently under way on all four Class 1 railroads in Minnesota.

PASSENGER RAIL

- Passenger and Freight Rail Coordination: Passenger rail systems that will share infrastructure with Minnesota's freight network will require coordination between operations.

- Transportation Alternatives: Communities desire passenger rail as an alternative that is direct, convenient and competitive with other modes of transport.

- Funding for Passenger Rail Projects: Advancing passenger rail projects is complex, and competition for limited funding is intense. Great attention needs to be paid to choosing the best projects with detailed and credible supporting analyses, and moving the projects through the project development process.

FREIGHT RAIL

- Crude-by-rail: The North Dakota oil boom resulted in a rapid increase in crude oil and silica sand transported by rail through Minnesota. This increase in traffic has significantly impacted rail and roadway congestion, safety and quality of life. Despite volatility and uncertainty in crude oil prices, current levels of crude-by-rail unit train activity are expected to continue, and could increase significantly with a future rise in worldwide oil prices and increasing crude oil extraction from North Dakota and Canadian sources.

- Intermodal Service: Intermodal container service in Minnesota is limited in geography and capacity. There is increasing demand for improved containerization service, expanded intermodal facilities and intermodal connections, particularly on domestic corridors and to the Pacific Southwest.

A summary of the frequency with each issue is mentioned within the reviewed plans and studies is provided in Table 1.2.

Table 1.2: Common Rail Issues Summary

	SAFETY	PUBLIC-PRIVATE PARTNERSHIPS	INTERMODAL SERVICE	RAIL CORRIDOR RECLAMATION	RAIL CAPACITY	PASS. & FREIGHT COORDINATION	TRANSPORTATION ALTERNATIVES	CRUDE-BY-RAIL	FUNDING FOR PASSENGER RAIL
RAIL PLANNING DOCUMENTS									
Minnesota Comprehensive Freight and Passenger Rail Plan (2015)	✓	✓	✓	✓	✓	✓	✓		✓
Northern Lights Express Tier I EA (2013)	✓				✓	✓	✓		✓
Rochester-Twin Cities Zip Rail Tier I EIS (2015)		✓			✓		✓		✓
Twin Cities-Milwaukee High Speed Rail Tier I EIS (2015 – On Hold)	✓				✓		✓		✓
Commuter Rail Tech Memo 10 (2010)					✓	✓	✓		✓
East Metro Rail Capacity Study (2012)	✓	✓	✓		✓	✓	✓		✓
MnDOT Grade Crossing Safety for Crude-by-rail (2014)	✓							✓	
Southeastern Minnesota Freight Rail Capacity Study (2013)	✓				✓	✓		✓	
Freight Rail Economic Development Study (2013)		✓	✓	✓	✓				✓
FREIGHT PLANS									
Statewide Freight Plan (2005)	✓	✓	✓		✓				
Southwest Minnesota Regional Freight Study (2009)	✓	✓	✓		✓				
Western Minnesota Regional Freight Study (2009)			✓		✓				
N Minnesota/NW Wisconsin Regional Freight Plan (2009)		✓	✓		✓				
Central Minnesota Freight Study (2012)		✓	✓						
Southeast Minnesota Regional Freight Study (2012)		✓	✓		✓			✓	
Twin Cities Metro Area Regional Freight Initiative (2012)	✓		✓		✓				
SUPPLEMENTAL PLANS AND STUDIES									
Supplemental Interregional Corridor Study			✓						
Scenario Planning		✓	✓		✓			✓	
Manufacturers' Perspectives on MN's Transportation System (2014)		✓							
Statewide Ports and Waterways Plan (2014)		✓	✓		✓				
Integrating Freight in Statewide Planning and Programming (2013)		✓	✓		✓				

Common Rail Solutions and Recommendations in the Minnesota Family of Plans and Related Studies

The most common solutions and recommendations shared among the plans and studies are highlighted in this section.

ALL MODES

- Better Integrate Freight into Planning Processes: Freight issues should be a key focus of regional and state transportation planning investment decisions. MnDOT should develop freight system performance measures and strengthen the consideration of freight during project planning.
- Strengthen Partnerships to Address Significant Freight Issues: MnDOT should focus on strengthening and promoting interagency, multi-state and PPPs. Regional freight advisory committees are one proposed solution for gaining private-sector input.
- Expand Intermodal Service: MnDOT should improve intermodal facilities and connections in areas of high demand throughout the state.

RAIL

- Restructure Funding Programs: Programs should be restructured to more adequately address rail improvement projects. The Minnesota Rail Service Improvement Program should allow for larger projects and for performance-based incentives for loan forgiveness. The Rail/Highway Grade Crossing should expand to consider strategies beyond active warning devices.j
- Manage Preserved Rail Corridors: Preserved rail corridors held in the State Rail Bank should be more actively managed and evaluated for possible future transportation uses.
- Improve Rail Safety: MnDOT should implement state-of-the-art traffic control and safety systems throughout the freight system.
- Infrastructure Investments on Key Passenger Corridors: MnDOT should achieve infrastructure improvements on key shared passenger/freight corridors, including station, at-grade crossing and track configuration upgrades.

More detailed information on each of the plans can be found in Appendix A.

2.0 THE STATE'S EXISTING RAIL SYSTEM

Minnesota's Existing Rail System

The institutional structure of the rail industry in North America is quite different from the other transportation modes (highways, air, water, etc.) that have typically been the subject of public planning studies and policy development efforts. While the other modes are generally owned and maintained at public expense and accessible to any licensed operator, rail carriers not only provide the service, but also maintain and control the tracks and other facilities that are required to provide service. Physical conditions, service and institutional structure are closely related.

Understanding how the rail industry is structured and the varying scale, ownership and operating arrangements that are present in Minnesota is critical to developing responsive strategies that will meet the goals set forth in a vision for rail. The North American rail system is an integrated network and the individual carriers, ranging from the largest carriers that service much of the nation to very small railroads that operate in only a county or two, have different perspectives and needs.

This chapter provides an overview of Minnesota's railroads, their economic structure, their major differences, and rail service needs and opportunities in Minnesota. It also includes an estimation of the value of the railroad industry to the Minnesota economy using selected metrics, trends and forecasts.

COMPOSITION OF MINNESOTA'S FREIGHT RAILROAD INDUSTRY

Railroads are typically categorized by measures of size and geographic reach. Carrier size is a critical determinant of the rail services that are available in a region, competitive posture, market access, physical condition, and financial strength.

In the United States, railroads are classified by size following a scheme developed by the Association of American Railroads.[13] This scheme is based on a combination of revenues and carrier characteristics.

- Class I: The largest railroads with revenues exceeding $319.3 million (based on 2004 dollar values). Since 2000, seven such carriers have been operating in the United States, of which four,BNSF Railway, Union Pacific, Canadian National, and Canadian Pacific, have operations in Minnesota.
- Class II: A non-Class I line-haul railroad operating 350 miles or more with operating revenues of at least $40 million but less than $319.3 million. Class II railroads are called regional railroads, although they are often classified with and referred to as short lines. Minnesota currently has one Class II railroad operating within the state. Genesee & Wyoming, Inc. operates the former Dakota, Minnesota and Eastern railroad line west of Tracy, Minn., after its purchase from CP.
- Class III: The remaining railroads that have revenues of less than $40 million and are engaged in line-haul movement. Class III railroads are commonly referred to as short line railroads.

[13] The Surface Transportation Board uses a similar but not identical classification scheme that is purely revenue based.

- Switching or Terminal: A railroad engaged primarily in switching and/or terminal services for other railroads (i.e., they are not typically involved in line-haul moves between two geographical locations). Switching and terminal railroads are often categorized with short line railroads due to their operational and revenue characteristics, except in cases where they are owned by one or more Class I carriers.

Small railroad ownership takes on many different forms including:

- Class I Parent(s): Typically a jointly owned switching or terminal railroad, such as the Terminal Railroad Association (TRRA) of St. Louis and the Belt Railway Company (BRC) in Chicago. Minnesota does not host any Class I Parent railroads at this time.
- Industry: Usually operated for one industry, but can provide service to other unrelated firms. The most common owners are steel and forest products companies. Minnesota has had several significant industry-owned railroads, most notably the Duluth Minnesota and Iron Range (DMIR), which was acquired by CN in 2004 from an affiliate of U.S. Steel. A current example is the Cloquet Terminal Railroad Company, a 3-mile switching railroad located in the City of Cloquet that is owned by SAPPI Paper.
- Holding Company: A railroad that is owned by a corporation holding several short lines. The largest holding company is Genesee and Wyoming, Inc., with 116 properties worldwide, including two in Minnesota, the Rapid City, Pierre and Eastern, and the Otter Tail Valley Railroad. Anacostia and Pacific, another major short line holding company, operates the Northern Lines Railway.
- Public: This includes state- and county/city/municipality-owned railroads, as well as federally-owned (typically for military purposes). At present, there are no publicly-operated railroads in Minnesota; however, several Minnesota short lines operate under a lease agreement over trackage that is owned by Regional Railroad Authorities (RRAs). These include the Minnesota Prairie Line, the North Shore Scenic, and the Minnesota Southern Railway.
- Independent – Railroads that are independently owned and operated (e.g., Progressive Rail, Inc., Minnesota Commercial Railway, etc.), with the underlying infrastructure either directly owned by the operator or by a third party, such as a Class I railroad or public agency. Most of the short lines in Minnesota are independently owned, although several, including the Red River Valley & Western, have multiple operating entities in Minnesota and the Dakotas.

In addition to 19 common carriers, Minnesota also hosts two sizeable “captive” railroads, carriers that only handle traffic on their owner’s behalf. These are the Cliffs Erie and Northshore Mining railroads that connect the iron range with Lake Superior ports. The former is presently dormant but not abandoned, while the latter continues to be in operation.

A list of each of Minnesota’s active freight railroads, their parent companies and miles operated is shown in Table 2.1. In the case where the railroad property is owned by a public entity, the owning agency and parent company of the operator are both indicated.

Table 2.1: Freight Railroads Operating in Minnesota

RAILROAD	SCAC[a]	PARENT COMPANY/ OWNING AGENCY	MILES OPERATED IN MINNESOTA	PERCENT OF TOTAL MILES OPERATED
CLASS I RAILROADS				
BNSF Railway	BNSF	-	1,686	28.5%
Canadian National	CN	-	479	8.1%
Canadian Pacific	CP	-	1,804	30.4%
Union Pacific Railroad Co.	UP	-	665	11.2%
REGIONAL AND SHORT LINE RAILROADS				
Minnesota Northern Railroad, Inc.	MNN	KBN Inc.	257	4.3%
Minnesota Prairie Line	MPLI	TCWR (RRVW); Minnesota Valley RRA	94	1.6%
Minnesota Southern Railway, Inc.	MSWY	Independent; Buffalo Ridge RRA	42	0.7%
Minnesota, Dakota, and Western	MDW	Independent	6	0.1%
North Shore Scenic Railroad	NSSR	Independent; St. Louis and Lakes Counties RRA	25	0.4%
Northern Plains Railroad	NPR	Independent	51	0.9%
Otter Tail Valley Railroad	OTVR	Genesee & Wyoming, Inc.	72	1.2%
Progressive Rail, Inc.	PGR	Independent	97	1.6%
Rapid City, Pierre & Eastern Railroad	RCPE	Genesee & Wyoming, Inc.	46	0.8%
Red River Valley and Western Railroad Co.	RRVW	Independent	32	0.5%
St. Croix Valley Railroad, Inc.	SCXY	KBN Inc.	60	1.0%
Twin Cities and Western Railroad Co.	TCWR	Red River Valley and Western	234	3.9%
SWITCHING AND TERMINAL RAILROADS				
Cloquet Terminal Railroad Company, Inc.	CTRR	SAPPI Fine Paper	3	0.1%
Minnesota Commercial Railway	MNNR	Independent	125	2.1%
Northern Lines Railway	NLR	Anacostia and Pacific	28	0.5%
CAPTIVE INDUSTRIAL RAILROADS				
Cliffs Erie Railroad	LTVX	Cliffs Natural Resources	72	1.2%
Northshore Mining Railroad	NMCZ	Cliffs Natural Resources	47	0.8%
TOTAL MILES OPERATED (INCLUDING TRACKAGE RIGHTS)			5,925	100.0%

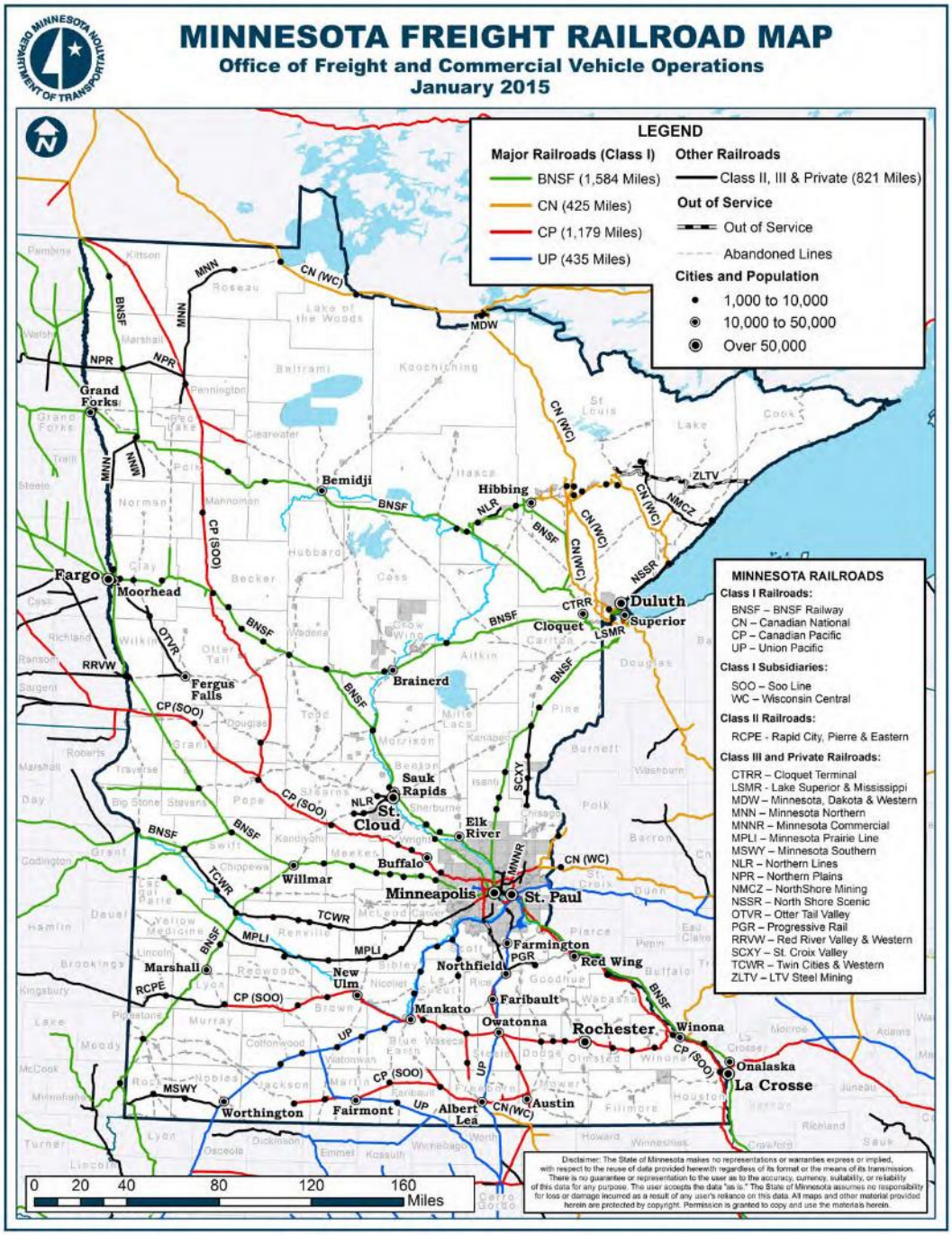
a Standard Carrier Alpha Code, an industry standard two- to four-letter abbreviation

b Mileage shown for each carrier includes trackage rights mileages; thus the total miles shown for all carriers exceeds physical mileage

In Minnesota, four Class I railroads and their affiliates provide the substantial majority of rail service from the standpoint of many key measures such as traffic handled and mileage operated (more than 80 percent). Given their importance, it is useful to take a closer look at the characteristics and recent trends of each of these four Class I railroads. Much less public information is available for the smaller railroads, which in most cases are privately held and therefore not subject to public reporting requirements.

The Class I route system is shown in Figure 2.1.

Figure 2.1: Class I Route System



BNSF Railway

A unit of Omaha-based Berkshire Hathaway since 2010, BNSF Railway is one of the four largest U.S. railroads, along with Union Pacific Railroad, CSX, and Norfolk Southern. It operates in 28 states and two Canadian provinces; has 32,500 route-miles (1,671 in Minnesota); and employs 43,000 people systemwide (2,119 in Minnesota). In 2013, the railroad had total assets of $52.7 billion and annual revenues of $21.5 billion systemwide.[14] BNSF dominates many markets in Minnesota; its business strategy in the state emphasizes bulk freight consisting primarily of crude oil, coal, ore and agricultural commodities, along with intermodal traffic along the northern corridor "High Line" between the Pacific Northwest, the Twin Cities and Chicago. BNSF intermodal service in the Twin Cities is split between St. Paul's Hub Center, which handles domestic traffic, and nearby Union Yard in Minneapolis, which serves the international liner trade. While BNSF is the dominant railroad in Minnesota, its operations in the state constitute only a small part of its total network and revenue.

BNSF's network covers the western half of the United States, serving all of the major markets in the region. The firm connects to eastern markets through all five primary gateways (Chicago, St. Louis, Kansas City, Memphis and New Orleans) and several minor interchange locations, including a southeastern connection at Birmingham, Alabama. North American service is provided through connections with Canadian and Mexican railroads.

BNSF moves more intermodal traffic than any other rail system in the world. In 2013, five million intermodal shipments (truck trailers or containers) were transported on BNSF's rail lines. According to BNSF, the railroad is one of the largest grain-hauling railroads in the United States, transporting more than 900,000 carloads of agricultural commodities in 2013. Among the industrial products carried by BNSF's carload services are lumber, newsprint, printing paper, paperboard, propane, lube oil, motor oil, asphalt, canned beverages, coiled sheet steel, recycled iron and steel, cement, asphalt, gypsum, crushed stone, limestone, iron ore, soda ash for glass, and kaolin clay for paper.

Union Pacific Railroad

Union Pacific operates 32,000 route miles in the western United States, and employs 46,500 people, of which 547 work in Minnesota.[15] UP's 2013 gross freight revenues were $20.6 billion, and carloads totaled 9.022 million. The railroad serves 23 states, every major West Coast and Gulf Coast port, and the five largest gateways between the East Coast and West Coast at Chicago, St. Louis, Memphis, Kansas City and New Orleans. The railroad has one of the most diversified commodity mixes in the industry, divided among intermodal (20 percent of revenue), coal (19 percent), industrial (18 percent), chemical (17 percent), agriculture (16 percent), and auto (10 percent) .[16] UP is the nation's largest hauler of chemicals, much of which originates along the Gulf Coast near Houston, Texas. With access to the coal-rich Powder River Basin in Wyoming and coalfields in Illinois, Colorado and Utah, the railroad moves more than 250 million tons of coal annually. UP's intermodal services, which largely parallel BNSF's network linking the large West Coast ports with major markets in the interior, handled 4.06 million units in 2013, 19 percent less than BNSF. BNSF's longstanding dominance of the nation's largest intermodal lane between Los Angeles and Chicago provided a substantial boost over UP; differences in intermodal market strategy account for the rest.[17]

UP gained entry to Minnesota through its 1995 acquisition of the Chicago and North Western. At present the firm operates 646 miles of track in the state. UP's volume in 2013 amounted to 173,000 carloads of freight originating in

[14] Surface Transportation Board, Class I Annual Reports, 2013

[15] Union Pacific State Guide, Minnesota, 2013

[16] Source: Union Pacific Rail road, 2014

[17] Source: Union Pacific Investor 2013 Investor Fact Book

and 78,000 carloads terminating in Minnesota in 2013. UP's business strategy in the region has focused on developing unit train and carload markets, which are heavily oriented toward agricultural crops, ethanol and coal. Intermodal is not much in the picture at present, with the exception being a twice-weekly Road Railer service between Chicago and Minneapolis that is operated under contract with the Norfolk Southern's Triple Crown subsidiary. There has been some interest in starting service to the southern and southwestern United States.

Canadian National

Canadian National Railway Company, headquartered in Montréal, Canada, operates the largest rail network in Canada and the only transcontinental network in North America. CN operates a network of approximately 20,000 track miles in eight Canadian provinces and 16 states. CN's Canadian operations span across Canada from Nova Scotia to British Columbia. Through a series of acquisitions that began in 1999 with the purchase of the Illinois Central, CN gained control of an extensive network in the central United States along the Mississippi River Valley from the Great Lakes to the Gulf of Mexico. CN's revenue was $9.9 billion in 2012 and the company shipped 5.06 million carloads.

In Minnesota, CN has had a long-standing presence with its Duluth Winnipeg and Pacific subsidiary; however, much of CN's current 380 miles of track came through its acquisitions of the Wisconsin Central (2001) and Duluth, Minnesota and Iron Range (2004). The latter had the well-known operation between the Iron Range and the ports of Twin Harbors and Duluth/Superior, and made the CN the largest carrier of iron ores in North America. The Wisconsin Central acquisition allowed the CN to create a through route to Chicago, forming a transcontinental link from western Canada through the United States The acquisition also gave the railroad access to St. Paul from the east. Volumes on that route are modest, as CN lacks a yard in the Twin Cities and enters the region over trackage owned by CP. CN does not offer intermodal service in Minnesota, although limited service is available through a terminal in Chippewa Falls, Wisc., and several intermodal trains linking Chicago and western Canada by its northern Minnesota main line daily.

Company-wide, the firm employed an average of 23,000 people in Canada and the United States in 2013, with 540 located in Minnesota. In 2012, gross revenues amounted to $9.9 billion Canadian and carloads totaled 5.06 million, placing CN in fifth place among the seven Class I railroads. Commodity mix is dominated by intermodal (20 percent of revenue), petroleum/chemicals (17 percent), grain (16 percent), and forest products (13 percent). Forty-six percent of CN's traffic is U.S. domestic and cross-border, 32 percent is international, and 22 percent is Canadian domestic.

Canadian Pacific Railway

Based in Calgary, Alberta, the Canadian Pacific Railway provides freight transportation services with 15,000 employees over a 13,700-mile network in Canada and the United States, of which 1,724 miles and 1,532 employees (does not include Dakota Minnesota and Eastern/Iowa, Chicago, and Eastern) are located in Minnesota. CP's rail network stretches from Vancouver to Montréal, and also serves major cities in the United States such as Minneapolis, Chicago and New York City. In 2013, 2.69 million carloads generated revenues of $6.1 billion Canadian, placing the firm in sixth place among the Class I railroads, behind CN and ahead of Kansas City Southern (KCS). Over one-half of the CP's freight traffic is in coal, grain and intermodal freight. It also ships automotive parts and automobiles, sulfur, fertilizers, other chemicals, forest products and other commodities. The busiest part of its railway network is along its main line between Calgary and Vancouver.

CP has had a lengthy presence in Minnesota through its controlling ownership of the Soo Line Railroad, which served the upper Midwest. In 1985, CP purchased the remaining assets of the Milwaukee Road, giving it a more direct through route between Chicago and the Twin Cities. Combined with CP's existing lines west of the Twin Cities, a stronger link between Chicago, the upper Midwest and western Canada could be established through gateways at Portal, North Dakota, and Noyes, Minn. Subsequent to the Milwaukee acquisition, CP's Midwestern network shrank considerably through a series of line spin-offs. This trend was reversed in September 2007 when CP initiated acquisition of the Dakota Minnesota and Eastern and its affiliate, the Iowa, Chicago, and Eastern; the latter was spun

off by CP in 1997 and passed through several owners prior to its reacquisition. Combined, the DME and ICE properties added 472 miles of track (564 total, including trackage rights) in Minnesota, and 2,500 route miles throughout the upper Midwest to CP's portfolio. Seven years later, in 2014, CP sold the DME line west of Tracy, Minn., (approximately 660 miles), to Genesee and Wyoming for $210 million. Headquartered in Rapid City, S.D., the newly-named Rapid City, Pierre & Eastern Railroad carries approximately 52,000 carloads of grain, bentonite clay, ethanol, fertilize,r and other products annually.

FREIGHT RAIL INDUSTRY ENVIRONMENT

Economics of Class I Railroads

The railroad industry established itself as the dominant form of land transportation through its ability to move large volumes of passengers and freight much more rapidly and efficiently than any other mode. The railroad industry reached its peak in the 1920s as the system became overbuilt and other modes became competitive for moving freight and passengers. By the 1990s, the size of the rail network declined by almost one-half, and the rail industry's shares of traffic and especially transportation revenue dropped dramatically. Mergers, which began almost as soon as railroads were first constructed, continued until only a handful of major carriers remain.

As the primary railroad network was being consolidated, many lower density lines spun off as small railroads. Short lines have come to perform a critical transportation function for smaller agricultural and industrial product shippers, connecting them to the Class I railroad mainline services, for whom they generate a significant volume of revenue. In addition to rationalizing the network, the industry greatly improved operating efficiency through the use of better technologies for track, equipment, and communications and operations control. For most of the past decades, these investments, along with a trend of long-term economic growth, led to increased traffic measured in tons and ton-miles.

Competitive pricing is a critical factor in the growth of rail traffic. Rail rates to shippers dropped following economic deregulation in 1980, allowing the railroads to hold market share, but at the cost of revenue and profitability. Between 1980 and 2002, railroad freight revenues remained essentially flat in current dollars, and were only partially offset by increases in productivity, asset sales and other business strategies. The result was a relatively low rate of return on investment for the railroads. Adjusted for inflation, average U.S. freight rail rates were 42 percent lower in 2013 than in 1981, according to the Association for American Railroads.

Railroads attain their greatest efficiency and competitive advantage over other modes when handling large volumes of heavy bulk traffic over long distances in point to point service. Coal was the single largest commodity hauled for many years, accounting for around 40 percent of originated tons, followed by chemicals, nonmetallic minerals, and farm products, each with between 7 percent and 10 percent of total tons in 2014. Intermodal is in fifth place with almost 7 percent of originated tons. The actual share is somewhat higher, as figures for the commodity-specific categories include some traffic that moves intermodally in addition to carload and unit train service.[18]

For the first time since the economic deregulation of the railroad industry in 1980, the Surface Transportation Board determined the five U.S.-domiciled Class I railroads to be "revenue adequate" for the year 2013, meaning that these carriers achieved a rate of return equal to or greater than the board's calculation of the average cost of capital to the freight rail industry.[19] Railroads must carry the full burden of building and maintaining their own infrastructure, are

[18] The Association of American Railroads, Class I Railroad Statistics. July 15, 2014.

[19] www.railwayage.com/index.php/freight/class-i/stb-five-class-i-railroads-revenue-adequate.html

among the most capital intensive of all industries and require access to large amounts of capital. A railroad cannot divest itself of mainline track or discontinue maintenance during recessions without ceasing revenue-generating service. This situation encourages railroads to be highly risk-averse. Nevertheless, improved rail earnings in recent years have allowed the large carriers to increasingly afford the massive investments they need to achieve and maintain a state of good repair, improve service, and add new capacity to handle the evolving needs of their customers. Particularly in the years following the recession of 2008–2009, these improved earnings allowed the Class I railroads to substantially ramp up their investments in infrastructure and equipment, which totaled around $25 billion annually from 2011–2013.[20]

In order to deal with this new business environment, the railroads are pursuing a number of strategies:

- Focus on their "hook and haul" business—the high-density, long-haul freight movements where large volumes enable economies of scale in operation and revenue generation—which explains the investments focusing on high-volume unit train-sized movements of coal, intermodal, and other bulk commodities, and the strong interest in developing the crude-by-rail business.
- Encourage consolidation of carload traffic at centers on their main lines. Logistics parks, transload centers and grain consolidation facilities enable the railroads to continue to provide carload service, but only in locations where traffic can be concentrated and interference on their main line operations minimized. The Class I railroads also increased their reliance on short line connections to provide carload service to shippers with more modest volumes of traffic. This is an effective strategy in maintaining rail services in some markets, but at the cost of transferring risk to the short line operators and, where trucks are substituted for rail, increased pavement and bridge maintenance costs to the public sector.
- Increase prices and reduce service by divesting lower-profit traffic. This happened across many rail markets, where growing bulk and intermodal traffic was squeezing out carload traffic. The use of such strategies to allocate rail service makes business sense from the railroads' perspective, but for individual shippers and some short lines that are "captive" to a single railroad, higher rail rates and inferior service mean lower profits, smaller market share and, in some cases, the risk of business failure.

Short Lines

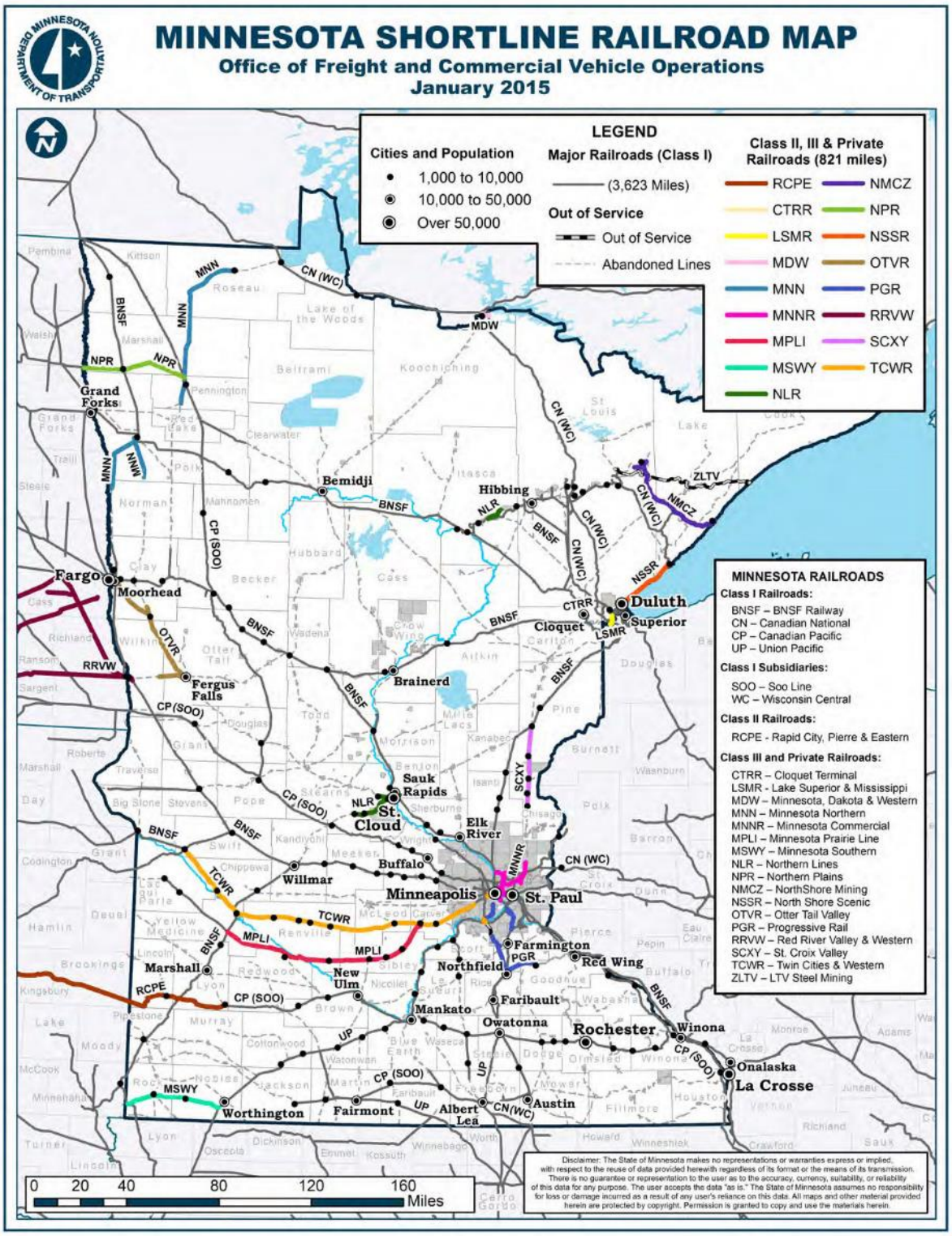
In recent years, the short line industry consisted of a mix of profitable and marginal performers. The short line route network in Minnesota is shown in Figure 2.2.

The volume of traffic handled by a short line has a direct impact on track maintenance levels, speeds, service reliability, and the financial viability of the short line service. High-volume markets and lines have done relatively well; low-volume markets and lines struggled. The national trend toward consolidation of short line ownership and some consolidation of low-density lines and collector/distributor functions improved the business outlook for short lines in some areas. This trend emerged to a lesser degree in Minnesota than elsewhere, which can be attributed to the minimal presence of short line holding company ownership in the state. It is apparent that some short lines operating in Minnesota and elsewhere are not meeting critical volume thresholds, and services and investment in track and equipment are declining. Concurrently, short line railroads are facing pressure for investment as North America's

[20] The Association of American Railroads. *Cost Effectiveness of American's Freight Railroads*. May, 2014.

Class I railroads move to larger and heavier equipment, and market service options such as transloading centers and high-volume shuttle loading along their network. Short lines need to keep up by fully accommodating modern rail cars and offering distinct services that their Class I connections are unable or unwilling to provide.

Figure 2.2: Regional and Short Line Railroads



Beyond volume, short lines face several challenges as an industry. Infrastructure conditions are inferior to those of the large railroads. Track is less well maintained, with lighter weight rail, inferior tie and ballast conditions, and no active signaling system. As a result, mainline train speeds are lower, typically 40 mph or slower for freight trains, and operations are far less automated. Although these conditions are usually adequate for existing business, many carriers struggle to maintain track at minimal commercially acceptable levels, and are unable to accommodate some modern rolling stock. With the large railroads moving from 263,000 to 286,000 pounds as the standard maximum car weight, the ability to handle standard modern rolling stock has become a particular concern. Without accommodation of these heavier cars, the competitive position of many short lines will be substantially compromised. The state could alleviate some of these challenges by adopting the Federal 45G Short Line Railroad Infrastructure Tax Credit, which would provide Class II and Class III railroads the opportunity to get tax credit for 50 percent of their qualified railroad tax maintenance expenditures.

The availability of suitable rail cars for short line shippers can be a problem. Although rail car supply exceeded demand in recent years, some smaller carriers have difficulty obtaining proper equipment on a timely and cost-effective basis. This issue typically occurs when equipment supply is controlled by contractual agreements with the prior owners of the line.

Smaller railroads, with their narrow geographic coverage, must rely far more heavily on connecting carriers to serve the market needs of their customers. The agreements between short lines and their Class I connections, which are the result of a line's prior history and present ownership, are valuable and vital to the Minnesota's economic growth. The agricultural, ethanol, mining, manufacturing, and food processing industries in Minnesota would benefit from improvements to the freight rail infrastructure in Minnesota since they would improve the efficiency of the network and help short lines connect with Class I railroads. Investing in short line railroads with local funds has the greatest potential for local impact.

A short line may or may not have independent rate making authority, which is the ability to negotiate its own revenue levels for local and interchanged traffic. If carloads are interchanged with one or more railroads, traditionally each rail entity would be entitled to individually establish a rate for its participation in transporting a shipment. In the case of several short lines in Minnesota, this ability to make rates is superseded or preempted by agreements with their Class I connections. These agreements, which were established when the line was spun off by the former Class I owner, often restrict independent rate making, car supply and the interchange of cars to the line's original owner, even if connections to other Class I carriers are available. This process was designed to allow the seller to retain some of the benefits of unique access to businesses on the branch, often in return for favorable purchase terms. These rate and operating restrictions, or the ability of the short line to only interchange with one railroad due lack of other connections, creates what is known as a "captive" short line.

Although most of these restrictive terms are contractually-agreed relationships with advantages or compensation accruing to both parties to the agreement, in a few cases the restrictions led to ongoing inefficiencies, such as unintended increases in short-haul switching moves at or near the interchange point, and insufficient revenue yields with detrimental effects on the carriers' ongoing viability. In some cases, short lines had to forego new business that would have been logically routed onto another connecting Class 1, or divert natural rail traffic onto trucks to reach final destinations that are otherwise rail accessible.

VALUE OF THE FREIGHT RAIL INDUSTRY TO MINNESOTA

The economic development of Minnesota was heavily shaped by the railroads, which opened access to its fertile lands and connected the region through an integrated network. The railroads continue to provide considerable value to the state through their services to shippers, employment of state residents and support of state institutions through various taxes.

Direct measures of value include carrier revenues associated with traffic handled in Minnesota, payroll size, services purchased, taxes paid, capital invested, and valuation of plant and property. More indirect measures include the value of goods transported, indirect employment, and the contribution to state GDP of industries served. This section examines three direct measures:

- Employment, wage and payroll taxes
- Plant and property
- Corporate tax contributions to the state

Employment, Wage and Payroll Taxes

Employment is an indication of the importance of the railroad industry to the state's workforce, directly as a career choice and indirectly as a market to which goods and services can be sold. There is also a multiplier effect from employment-driven economic activity. Given the massive contraction in rail employment during the past 50 years, it is useful to note not only current employment, but also the number of retirees and beneficiaries who are drawing railroad pensions.

Data on industry employment and wages are readily available from several sources. The Railroad Retirement Board, a federal agency that administers the railroad retirement system (which is separate from Social Security), maintains statistics on active and retired employees. Information on aggregate wages paid by the state was drawn from AAR's state fact sheets, for which 2012 is the most current year.[21]

In 2012, Minnesota RRB records indicated employment of 4,566 individuals. The average wages and benefits per freight rail employee was $113,270. In addition to the 4,566 active employees, 14,518 retired employees or railroad beneficiaries live in Minnesota. Beneficiaries are spouses and survivors of deceased railroad employees. The net payout to these beneficiaries amounted to approximately $298 million in 2012.

Plant and Property

In Minnesota, railroads pay an annual assessment on the property they use for conducting their business. The Commissioner of Revenue, using data supplied by the railroads, estimates the value of property used for operating purposes annually. The estimate is not based on direct evaluation of each individual property, but rather carrier financial data. For publicly held carriers, property values are calculated on the basis of cost, income, stock price, and debt levels. For privately held firms, original cost and income are used. In Minnesota, these property tax rates are uniform, and the treatment for rail yards and main lines is identical. Property that is not used for operating purposes is assessed and taxed by the local jurisdiction in which it is located.

According to the 2011 ASLRRA Factbook, Minnesota railroads paid a total of $2,016,000 and prevented $33 million in pavement damage and maintenance costs. Each mile of track in Minnesota generates an average of $450 in tax revenue.[22]

Freight also provides value to Minnesota as private railroads make capital investments. All four of the state's Class I railroads—BNSF, CP, CN and UP—made substantial capital investments in recent years and expect to continue to

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[21] www.aar.org/data-center/railroads-states#state/MN

[22] Minnesota Department of Transportation & Minnesota Department of Employment and Economic Development, (2013). Freight rail economic development

do so into the foreseeable future. BNSF announced a number of substantial projects in 2015, including relaying 10 miles of second main track on the Staples Subdivision between Big Lake and Becker, double track on the Midway sub, and triple track on the St. Paul sub.[23] UP ramped up its investment in Minnesota, which presently includes expansion of its South St. Paul yards and completion of the Roseport double track project, while CP is projecting to resume construction of a $60 million expansion of its St. Paul (Pigs Eye) yard. [24] In the Duluth region, CN is undertaking a $30 million capacity expansion project that entails realignment and some second main track on Steelton Hill.[25]

PASSENGER RAIL

Minnesota has one active intercity passenger rail service, Amtrak's Empire Builder. The Empire Builder operates one train per day between Chicago and Seattle/Portland. Stops in Minnesota include Winona, Red Wing, St. Paul, St. Cloud, Staples, Detroit Lakes, and Fargo/Moorehead.

Although Amtrak's presence in Minnesota is limited to one daily train each way, both the Empire Builder and its patronage by Minnesota riders are standouts in Amtrak performance. In recent years, the Empire Builder held the top spot in ridership for any single train on the Amtrak system. In FY 2014, it slipped to second place because of poor timekeeping associated with massive congestion along its route.

A number of studies examined proposed new intercity passenger services in Minnesota. The Intermodal Surface Transportation Efficiency Act of 1991 identified high-speed rail corridors throughout the nation. At around the same time, the Minnesota, Wisconsin and Illinois departments of transportations were completing the Tri-State Rail Study, outlining route and service alternatives among Chicago, Milwaukee and the Twin Cities.

Minnesota is part of the Midwest Regional Rail Initiative, which is working to establish a High Speed Rail network serving the Midwestern states with a hub in Chicago. Throughout the past 20 years, the MWRRI suggested various routes for HSR between Chicago and the Twin Cities. HSR also is being studied for two other corridors in Minnesota—a connection between the Twin Cities and Duluth/Superior (the Northern Lights Express or NLX), and a connection between the Twin Cities and Rochester (Zip Rail).

In February 2009, the United States Congress enacted the American Recovery and Reinvestment Act of 2009, appropriating $8 billion for HSR and intercity passenger rail services. This appropriation followed the enactment of the Passenger Rail Investment and Improvement Act in October 2008, which authorized new programs for high-speed and intercity passenger rail. Both of these programs are expired and no longer a potential source of funding for passenger rail projects. More information about these programs is found in CHAPTER 5.

Categories of Passenger Rail Service

This study focuses on the development of intercity passenger rail service that would link the Twin Cities with outlying locations in Greater Minnesota and the Upper Midwest. Opportunities also exist for the development of overlapping commuter rail and intercity services in the Twin Cities metropolitan area on many of the proposed intercity passenger lines. It is possible that intercity trains could pick up passengers at a few key outlying commuter stops, or at the very least, interchange with the commuter services. If long-distance intercity trains make frequent commuter rail stops,

[23] www.bnsf.com/media/pdf/2015-capital-expansion-map.pdf

[24] UP Governor's Rail Summit PowerPoint presentation, December 2014.

[25] trn.trains.com/news/news-wire/2014/10/cn-wraps-up-track-improvements-on-former-duluth-missabe--iron-range

however, they will cease to provide time competitive quality service to more distant origins and destinations. This study acknowledges the potential for such synergies, but a detailed analysis will need to come out of the individual commuter and intercity rail studies.

Table 2.2 provides a description of the different categories of passenger rail services.

Table 2.1: Types of Rail in Minnesota

PASSENGER RAIL TYPE	MINNESOTA EXAMPLE	AVERAGE SPEED	TYPICAL STATION SPACING	TYPICAL ROUTE LENGTH	TYPICAL FREQUENCY
PASSENGER RAIL					
Conventional Intercity Rail	Amtrak service through Twin Cities, connecting Chicago and Seattle/Portland	Up to 79 mph	10+ miles	100–1,000+ miles	Varies; daily, or up to 2 or more round-trips per day
HSR	No example in Minnesota (corridors under study)	Regional: 80–110 mph	Connects major and moderate population centers 100–500 miles apart with some intermediate stops	500 miles	Varies; up to 20 or more round-trips per day
TRANSIT					
Light Rail Transit (LRT)	METRO Blue Line and METRO Green Line	20 mph	0.5–1 mile	10–20 miles	Every 10 minutes
Heavy Rail Transit	No example in Minnesota	30 mph	0.5–5 miles	10–20 miles	Every 5–10 minutes
Commuter Rail	Northstar Commuter Rail between Minneapolis and Big Lake	18–50 mph	2–7 miles	20–50 miles	Every 30+ minutes

Standards for Passenger Rail Services Currently Operating within Minnesota

Minnesota currently has conventional intercity Amtrak service on the Empire Builder. MnDOT currently does not have standards for the minimum service level, frequency, capacity or projected ridership of intercity service. More information on project prioritization is found in CHAPTER 3.

Existing Passenger Rail Performance and Benefits

The performance of intercity passenger rail in Minnesota has recently been declining. The on-time performance of the Empire Builder in 2014 was 26.6 percent, compared to 77.8 percent in 2010 (Figure 2.3). Freight train intereference was the primary cause of the increase in delays, accounting for 41.9 percent of the total delay time in 2014, compared to 30.1 percent of the time in 2010. This train interference is primarily caused by an increase in traffic associated with the development of North Dakota's Bakken oil fields.

The Northstar Commuter Rail was also negatively affected by the rapid increase in freight traffic and associated congestion along BNSF's Northern Transcontinental corridor. Consequently, as with the Empire Builder, these delays led to a decrease in ridership. Metro Transit, the transit agency that operates the Northstar Commuter Rail, recently started an "on time or your money back" program to increase ridership.

Figure 2.3: Amtrak Empire Builder On-Time Performance

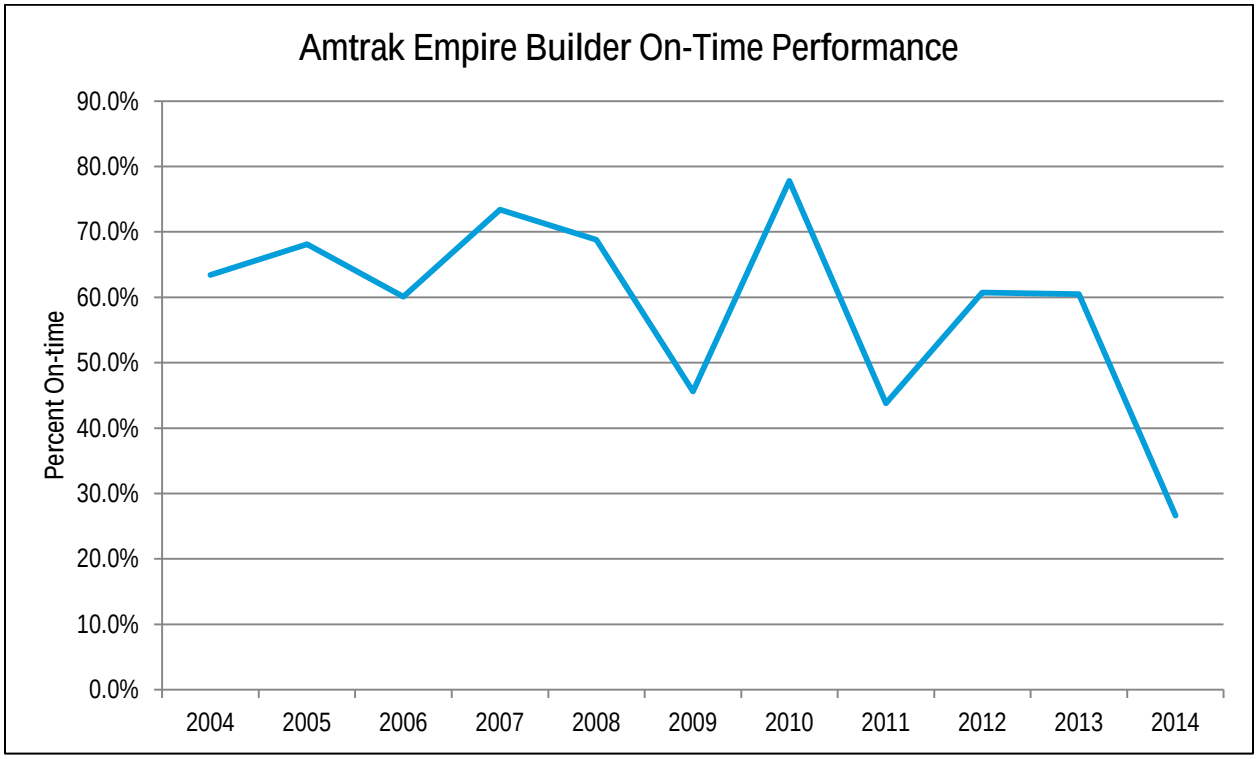
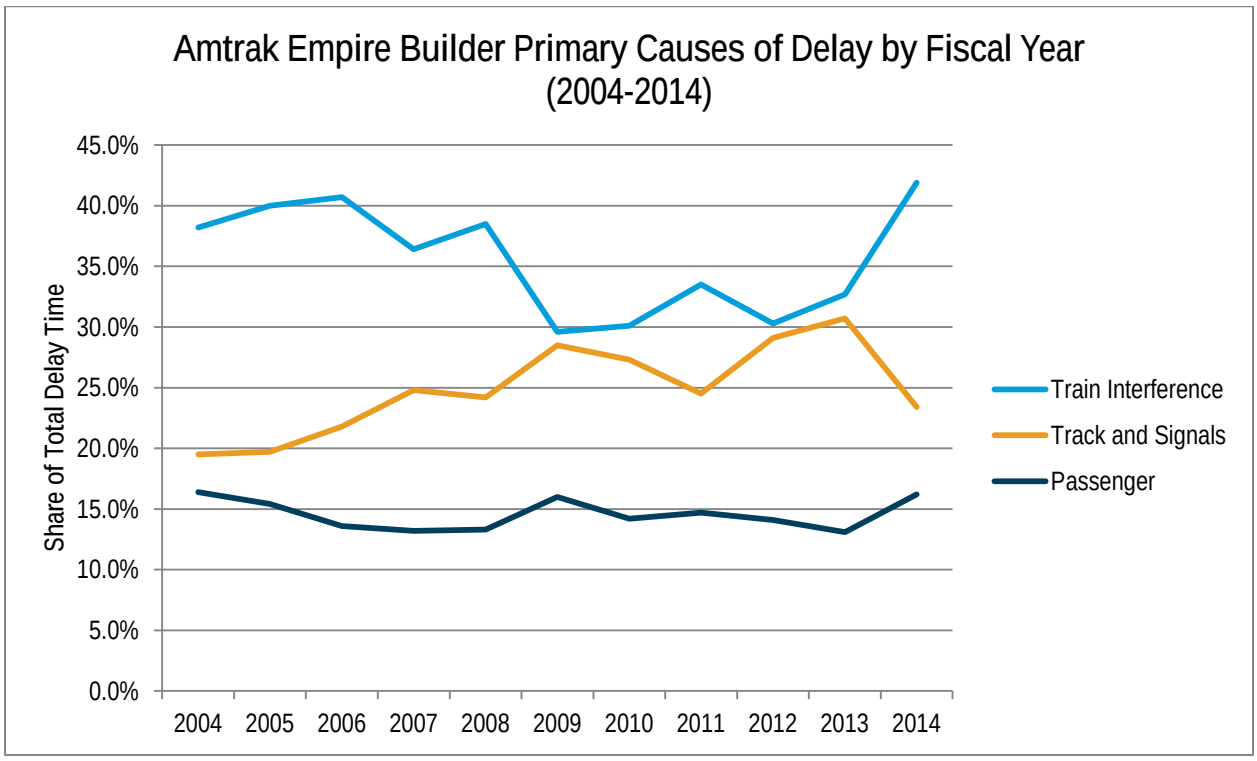


Figure 2.4: Amtrak Empire Builder Primary Causes of Delay by Fiscal Year (2004-2014)



MAJOR FREIGHT AND PASSENGER FACILITIES

There are 14 primary freight and intermodal terminals in Minnesota, listed in Table 2.3. All of these terminals and yards are operated by the Class I railroads, except for Minnesota Commercial's Midway Yard. Three are dedicated to intermodal service for trailers and containers, and one for RoadRailer (UP's East Minneapolis terminal). The other terminals handle carload traffic, of which two— BNSF's Northtown and CP's St. Paul (Pig's Eye)—are system yards that handle substantial volumes of through traffic.

Table 2.2: Major Freight Terminals

FACILITY	OWNER	INTERMODAL
East Minneapolis	UP	✓
Glenwood	CP	
Mankato	UP	
Midway	BNSF	✓
Midway	MNNR	
Minneapolis Union	BNSF	✓
Northtown	BNSF	
Rice's Point	BNSF/CP	
Shoreham	CP	✓
St. Paul (Pigs Eye Yard)	CP	

FACILITY	OWNER	INTERMODAL
South St. Paul	UP	
Thief River Falls	CP	
Twin Ports	CP	
Willmar Yard	BNSF	

There are two major passenger rail stations in the Twin Cities metro area: Target Field Station in Minneapolis and the Union Depot in St. Paul. Target Field Station serves as the terminal for the Northstar Commuter Rail, while the Union Depot is a station for the Amtrak Empire Builder Line. Both of these stations could be used for additional commuter or intercity rail lines in the future. These stations also connect to light rail and bus services, which connect passengers to various destinations throughout the Twin Cities, including the Minneapolis-St. Paul International Airport.

PUBLIC FINANCING FOR RAIL PROJECTS AND SERVICE IN MINNESOTA

Minnesota does not currently have a dedicated funding source for rail. To date, state bonding funds were used to leverage federal funding for passenger rail projects. The governor and legislators prioritized the need for a multimodal transportation funding bill, which could be a prospective funding source. The primary financial program available for rail-related investment within the state is the Minnesota Rail Service Improvement Program. This is a low-interest revolving loan assistance program aimed at helping to finance rail facility improvements, including shipping facilities for private shippers. The impact of this program is limited due to the available funding and a modest maximum loan amount of $200,000, which is insufficient for many of the capital infrastructure projects. More information about the MRSI Program is provided in Chapter 5.

Approximately one-third of the counties in Minnesota have Regional Railroad Authorities, which are another potential financing source for rail studies and projects. Examples of projects supported by RRAs include the Northstar Commuter Rail Study, the Southeastern Minnesota Freight Rail Capacity Study, the Zip Rail Tier I Environmental Impact Statement, the East Metro Rail Capacity Study, and the Statewide Freight Rail Economic Development Study.

Funding was provided for grade crossings in Minnesota through Federal Highway Administration Section 130 grade crossing safety program funds; however, rail grade crossing safety will need a significant program expansion and dedicated funding to respond adequately to the needs forecast for both increasing freight traffic and high-speed/intercity passenger rail implementation. In addition to at-grade crossing improvements, grade crossing closures, grade separations and an active education component all need to be integrated into an expanded program to be effective in the future.

TIGER grants were awarded to rail projects in the past and provide an opportunity to address some of the state's rail investment needs; given that they are highly competitive, TIGER grants cannot be viewed as a primary and certain source of funding.

PROGRAMS AND PROJECTS INTENDED TO IMPROVE SAFETY

Pertaining to safety planning coordination, MnDOT's Office of Freight and Commercial Vehicle Operations is involved in administering several safety-related initiatives, including Operation Lifesaver, and monitoring of grade crossing and right of way trespassing incidents. In 2008, OFCVO was given responsibility to administer two new safety mandates that are defined by statute:

- Walkway legislation (Minn. Stat. 219.501). Effective Aug. 1, 2008, railway companies were required to provide walkways next to portions of rail tracks where employees work on the ground performing switching activities at least one shift per day, five days per week. MnDOT can order modifications to meet set standards for walkways constructed before or after the effective date. Although this mandate is quite limited in scope, the expected benefits have not been quantified, and efforts to expand these provisions could have a disproportionate impact on short lines.

- Track inspection program (Minn. Stat. 219.015). Instituted in July 2008, MnDOT was directed to employ a state rail safety inspector to participate in the Federal Railroad Administration Federal State Rail Safety Partnership Program. This inspector collaborates with existing FRA inspectors to examine track, right of way, civil works, and other facilities, including enforcement of the walkway legislation. The cost of the inspector is funded through an assessment of Class I railroads operating in Minnesota. Having an additional resource to inspect track may provide MnDOT with a better picture of conditions in the field, and improve efforts to manage the MRSI program.

In addition to these statewide planning efforts, the 2015 Minnesota State Rail Plan was updated to reflect local and project-level planning documents. At the beginning of the plan update process, a review was conducted of previous studies completed since the 2010 Statewide Freight and Passenger Rail Plan was adopted. This memo is included in Appendix A.

Rail-Highway Grade Crossing Safety Improvement Program

MnDOT's rail-highway grade crossing protection program was established in 1974 to leverage FHWA's 23 USA Section 130 program. Since then, the program participated in the installation of active warning devices (lights, gates or a combination of the two) at more than 1,400 grade crossings out of the approximately 4,500 crossings located in Minnesota. Through improvements in infrastructure and public education, grade crossing incidents declined substantially. While the state experienced 400 vehicle/train collisions and 50 fatalities in 1972, by 2008 vehicle/train collisions had dropped to 52—an 80 percent decline—and six fatalities.l

Minnesota has 4,300 public at-grade road crossings of railroads throughout the state and approximately an equal number of private grade crossings. Of the public grade crossings, 1,400 have active warning devices consisting of flashing lights, bells, crossing gates or some combination of these mechanisms. As is consistent nationally, the installation cost and location of the active devices and any passive warnings or signs are the primary responsibility of the respective public agency responsible for the road and its traffic safety, with assistance and consultation with the railroad. The actual operation and maintenance of any active warning device is the responsibility of the railroad, while any installation change, upgrade or replacement of an active device generally becomes the responsibility of the party requiring the change.

MnDOT administers the FHWA Section 130 grade crossing safety program funds for Minnesota, which provides about $5.5 million annually. MnDOT staff regularly evaluates and prioritizes grade crossing improvement projects based on accident frequency and safety needs, as well as replacement needs. Given the current cost of grade crossing equipment and design, this allows the funding of about 25 major projects each year. While the cost of new installations has been steadily increasing, federal funding has remained relatively static in recent years, resulting in fewer projects being possible each year.

In addition to the Section 130 program, MnDOT also administers about $600,000 per year in Highway Safety Account state funds for other safety improvements. This funding allows another 30 to 40 projects per year to be completed, consisting of more basic or low-cost enhancements such as line-of-sight corrections, vegetation removal, geometric fixes, sign upgrades, closures, and other betterments. Programming for all of these projects is routed through the eight Area Transportation Partnerships, including the metro area Transportation Advisory Board, and is integrated

into highway project programming. Due to other local transportation priorities, many grade crossing projects are delayed or rejected at this stage, creating deficiencies and inequities in the statewide safety program. The protocol requires a six-year process for planning, programming, approvals, and reviews before any project is funded and awarded for construction. Each project is an independent contract, although this ignores the fact that most work is done by specialty rail contractors and not highway or general contractors. The result of the local prioritization and the programming cycle is to leave 20 to 30 percent of the federal funding unused before expiration, and the contracting requirements are inefficient and administratively complex due to the decentralized and fragmented nature of the process, unlike the more streamlined structure used in other states. Since there is a need to work centrally with the safety evaluation and the railroad's engineering representatives, the MnDOT Rail Office is involved in all rail grade crossing safety even though much of the programming remains decentralized. A workable alternative to this situation is used in many states, such as the Texas program where centralized administration, programming and a master construction contract are used to maximize the program's effectiveness.

MnDOT recently conducted an analysis of grade crossing active warning devices to determine the prevalence of and the need to upgrade aging infrastructure. This analysis estimated that approximately 270 signals are 20 years old or older (as of 2006), while the normal lifespan for an active warning device is 25 years. Aging active warning devices are increasingly difficult to maintain due to being technologically obsolete—often entirely new warning devices must be installed at a cost of $200,000 to $500,000, depending on the complexity of the installation. As many signals were installed in the 1980s and 1990s, MnDOT estimates that within 20 years, almost all of the 1,400 warning devices will need upgrading. At current values, it is estimated that $280 million over 20 years will be needed, with the capacity to install 70 major grade crossing devices each year, not counting new installations for high-speed passenger corridors, quiet zones, and the proposed expanded deployment of an additional 170 devices on paved county roads.

Based on a recommended 25-year replacement cycle, the current grade crossing replacement or upgrade program for major improvements would increase the number of projects three-fold, and require two to three times the funding level in 2009 dollars. HSA funds for basic safety enhancements should be increased under these same assumptions to a level of approximately $1 million per year. FRA requirements for a complete and current grade crossing inventory are an additional draw on grade crossing safety program funds that is being met only in part with present resources. Proposals to eliminate dedicated funding for grade crossing safety improvements in favor of more flexible funds could negatively impact even those limited funds now in use. This may severely handicap any move toward expanding the current program.

In addition to work on active warning devices, Minnesota has not addressed the issue of road closures and grade crossing separations in its current safety program. Both of these strategies will be appropriate in corridors with high-speed trains, or increasing railroad or highway traffic levels, but are significantly more expensive in the case of grade separations, ranging from $3 million to $10 million per overpass or underpass for normal (two-lane) installations. In addition, multiple lane highways and multitrack spans increase the cost significantly.

Concerns regarding grade crossings go beyond simply maintaining and improving what's already present. Industrial development patterns and the urbanization of areas surrounding rail lines necessitate a range of mitigations needed to minimize the interaction between trains, highway vehicles and pedestrians. Pedestrian fatalities in Minnesota due to trespassing are now higher than vehicle grade crossing fatalities, suggesting the need for extended fencing of rights of way and pedestrian warnings and gates at major crossings. Short of grade separations, more advanced barrier systems, such as four-quadrant gates with median barriers and pedestrian amenities are an intermediate alternative, at a somewhat higher cost than a basic active warning installation. These and other technologies for warnings and enforcement are effective at reducing grade crossing incidents. These applications are currently in use in quiet zones and high-speed corridors in other parts of North America.

Undertaking these types of improvements can be substantially more costly than maintaining existing warning systems. As roads are widened and traffic increases, more substantial protection needs to be installed, and double tracking a railroad mainline to accommodate more or faster trains also magnifies the complexity and cost of any

warning installation. Also, the funding of these new installations may be subject to sharing with local jurisdictions, high-speed rail projects or new rail-oriented industrial sites, such as business parks or industrial facilities that will generate both major truck and rail traffic. Centralized and focused planning oversight and approvals that involve MnDOT and an expanded grade crossing safety program would benefit both statewide safety and implementation of a new intercity high-speed passenger rail system.

Grade crossing safety and trespassing also are impacted by public and institutional education. Subjects for public information include informing people who interact with railroad traffic about the increase in train volumes and speeds, the hazards of pedestrians around active railroads, and the surprises that can occur at multiple track crossings with several trains crossing at once. The railroads support the Operation Lifesaver program throughout the United States as a tailor-made program offering this information. MnDOT and other in-state rail associations would be well served to assist in funding and promoting the volunteers working on this national program.

This program functions well, but according to stakeholders, suffers from a number of limitations that reduce its potential efficacy:

- Funding. With Minnesota's rail network being the ninth largest in the nation, the current federal and state funding levels are insufficient to meet continuing needs for new grade crossing projects and replacement of obsolete systems.
- Replacement of signage and obsolete active crossing warning devices. Out of the more than 1,400 active systems currently installed, 270 systems, or 21 percent, are over 30 years of age—beyond their typical design life of 20 to 25 years. Once they reach that age, the electronics are obsolete and parts are often difficult to obtain. MnDOT is in the process of designing a statewide lifecycle planning process, which must address replacing approximately 70 crossing systems each year. Additional funding will be necessary to undertake this effort, the source of which has yet to be identified.
- Program Flexibility. Many stakeholders indicated a desire to see the program broadened beyond its primary focus on active crossing systems to include the full range of options, including quiet zones, sealed corridors, grade separations, etc. Implementation of expanded passenger operations in particular will result in the demand for a greater variety of solutions to address highway/rail interactions and right of way protection, for which expertise is generally not available at local jurisdictions. This does not mean that a state program should necessarily fund these more expensive solutions, but rather act as a clearinghouse and developer of common standards that can be applied statewide.
- Project Prioritization. Although the MnDOT Office of Freight & Commercial Vehicle Operations staff administers the grade crossing program and oversees the evaluation of potential projects, the eight MnDOT districts have considerable autonomy in establishing investment priorities. This leads to inconsistent application of funding to projects and needless delays in implementing improvements at high-priority grade crossings. Planning and distribution of funds should be centralized instead of done by each of the eight MnDOT Districts.

The absence of statewide funding prioritization contributes to the lengthy delays from the time when improvements are initially identified to when they are actually implemented. The backlog is now upward of five years, which is considerably longer than in some other states. Also, once improvements are programmed, it is difficult to adapt funding priorities to changing needs, such as when volumes on a low-density rail line increase substantially.

Report on the Improvements to Highway-Rail Grade Crossings and Rail Safety

Concerned about the large increase in Bakken oil shipments and the associated safety implications, the 2014 Minnesota Legislature directed MnDOT to conduct a study of highway-rail grade crossing improvements for rail corridors carrying unit trains of crude oil and other hazardous materials. The Legislature also appropriated $2 million to make a first round of short-term improvements to key crossings around the state. MnDOT determined these initial improvements will take place at crossings in Big Lake, Clear Lake, Elk River, Perham, St. Cloud, St. Paul Park, Wadena and Winona.

From 2005 to 2014, rail traffic carrying Bakken shale oil originating in North Dakota increased from zero to nine loaded unit trains per day, of which five to seven cross through Minnesota. Recent catastrophic rail incidents associated with Bakken crude oil outside of Minnesota demonstrate the potential safety risk of transporting hazardous materials by rail. At the time of the study, more than 700 miles of route miles in Minnesota actively carried Bakken crude oil.

MnDOT investigated areas along this mileage where safety could be improved to reduce public exposure to derailments, spills and fires. The study identified site needs including grade crossing signal systems and alternative railroad grade crossing improvements. The study noted 683 at-grade rail crossings where Bakken crude oil passes. To find the most at-risk crossings, an aggregate score was calculated using a combination of GIS population analysis near crossings, federal crossing safety standards, and frequency of crude traffic on the respected rail line. Of the 100 crossings, 40 were researched further. Improvement recommendations for these 40 were made based on the aggregate score and cost-benefit feasibility of each crossing.

In the long-term, it was determined that Minnesota needs to invest a total of $244 million to improve at-grade crossings where Bakken oil passes. Depending on the importance and the aggregate score of each crossing, recommended improvements include closing non-essential at-grade crossings, upgrading passive warnings to active signals, improving active signal protection with more effective safety treatments, or constructing new grade separations along the lines.

RAIL TRANSPORTATION'S ECONOMIC AND ENVIRONMENTAL IMPACTS

Economic Impacts

Potential rail investments will generate a range of economic impacts in the areas served by the improvements. This section provides a discussion of the range of impacts these investments may bring about and the methodology by which they are typically quantified.

Impacts are usually categorized into direct and indirect benefits and costs. Direct benefits and costs are those that are directly associated with the investment during planning and construction and subsequent implementation. During construction, typical benefits include construction jobs and direct supplier purchases. Once operational, the range of benefits expand beyond direct system employment and vendor sales to include out-of-pocket cost reductions by system users, time savings, reduced maintenance costs on parallel highways, and gains in safety from a reduction in accidents. Examples include personal time savings for all riders on any train faster than competing auto or air travel, and lowered costs on rail per passenger mile versus automobile use. The largest cost is usually the financial outlay required to build the service, but other direct costs may not be not fully reflected in the financial outlay such as uncompensated construction-related impacts on abutters or revenue losses incurred by a competing service provider. For example, introduction of a new passenger rail service could divert traffic from an existing bus service, with the operator suffering a financial loss.

Beyond the direct financial impacts are indirect benefits and costs, which include the broader economic effects that an investment will have on a region's economy and collateral effects. For example, new passenger rail service may expand tourism opportunities and, with it, increase the amount of investment and jobs in that sector. Changes in a region's economy will occur because of changes in the cost of doing business associated with the cost of freight transportation. Transportation costs affect business productivity and profitability. The value of this cost differs by

industry, depending on the extent to which it depends on rail freight, trucking or "on-the-clock" employee travel. Likewise, improvements in passenger rail service also will result in economic benefits, particularly through increased business and tourism travel.

The direct, indirect and induced economic impacts of a proposed transportation investment are usually examined using an economic impact model.[26] These models provide a framework for evaluating both user impacts and total regional economic impacts of transportation investments, and can account for both short-term and long-term travel cost impacts, and the effects of changes in market access and spending patterns.

Environmental Impacts

Both passenger and freight rail are energy efficient modes of travel that provide fuel and greenhouse gas savings over automobile, truck or airplane travel. The AAR reports that freight railroads move a ton of freight an average of 476 miles on one gallon of fuel in 2012, and rail freight fuel efficiency has more than doubled since 1980.[27] While passenger rail that requires extensive new construction can have harmful environmental impacts, it also has the potential for significant positive environmental impacts, including reducing vehicle miles traveled in single-occupancy vehicles.

There are potentially high environmental impacts associated with construction of new rail corridors, especially . corridors that would require significant new track. This includes high-speed corridors that often need separate track from other services. However, much of Minnesota's passenger rail service is expected to use shared track with freight railroads, in which case it will have a lower environmental impact . These impacts will be calculated and described in greater detail for individual rail proejcts as they move through the planning stages.

Trends and Forecasts

DEMOGRAPHIC GROWTH FACTORS

This section presents a recent snapshot and 10-year trends of Minnesota's population and per capita income. Additionally, the section includes information on cost of living and cost of doing business in Minnesota as compared to its neighbors and the nation as a whole.

Population

Minnesota's State Demographics Center reports the population of the state, as of 2013, to be 5.4 million. The population is expected to grow to 6 million by 2031, and 6.45 million by 2065, at an annual rate of change of 0.5 percent.[28] Approximately 60 percent of Minnesota's population is centered in the Metro District area near Minneapolis-St. Paul. Hennepin, Ramsey, Dakota, and Anoka Counties in the Metro district area are the most populous counties in the state. Other highly populated areas are in St. Louis County (Duluth), Stearns County (St. Cloud), and Olmsted County (Rochester), and along the corridors connecting these regions to the Twin Cities. This

[26] A variety of models are available for this purpose, including the Regional Economic Model, Inc. (REMI), Economic Development Research Group' (EDRG) Transportation Economic Development Impact System (TREDIS), and the University of Illinois' Regional Economics Application Laboratory (REAL).

[27] The Association of American Railroads, 2013. https://www.aar.org/newsandevents/Press-Releases/Pages/The-Nations-Freight-Railroads-Average-476-Ton-Miles-Per-Gallon.aspx

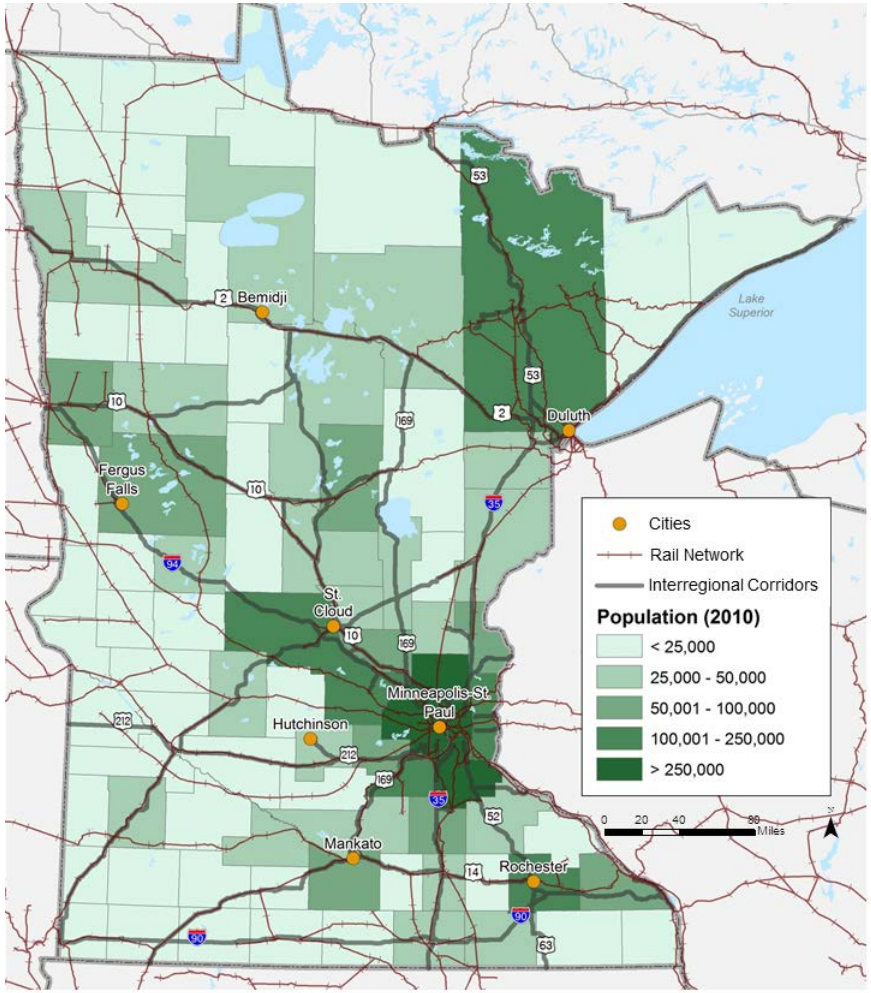
[28] Minnesota State Demographic Center Population Data, 2014.

concentrated nature of Minnesota's population, coupled with the large geographic size of the state, means that although both rail and highway networks serve wide rural areas, much of the freight and passenger activity is concentrated in the Twin Cities and the corridors linking the Twin Cities with other major cities in Minnesota and beyond. The least populated county in Minnesota is Traverse County on the South Dakota border, as shown in Figure 2.5.

Since the 1960s, population growth has shifted from the metropolitan core into the exurban regions of the Twin Cities. Although this trend has slowed down in recent years, the Twin Cities collar counties are expected to continue to see the highest rates of population growth between 2010 and 2040. Much of this growth will be at the commuter rail or shorter intercity rail distance from the Twin Cities. Some lower population density counties have also experienced rapid population growth reflecting retirement relocations near lake areas. The northern and southwestern parts of Minnesota are expected to remain less densely populated, with low to negative population growth (Figure 2.6).

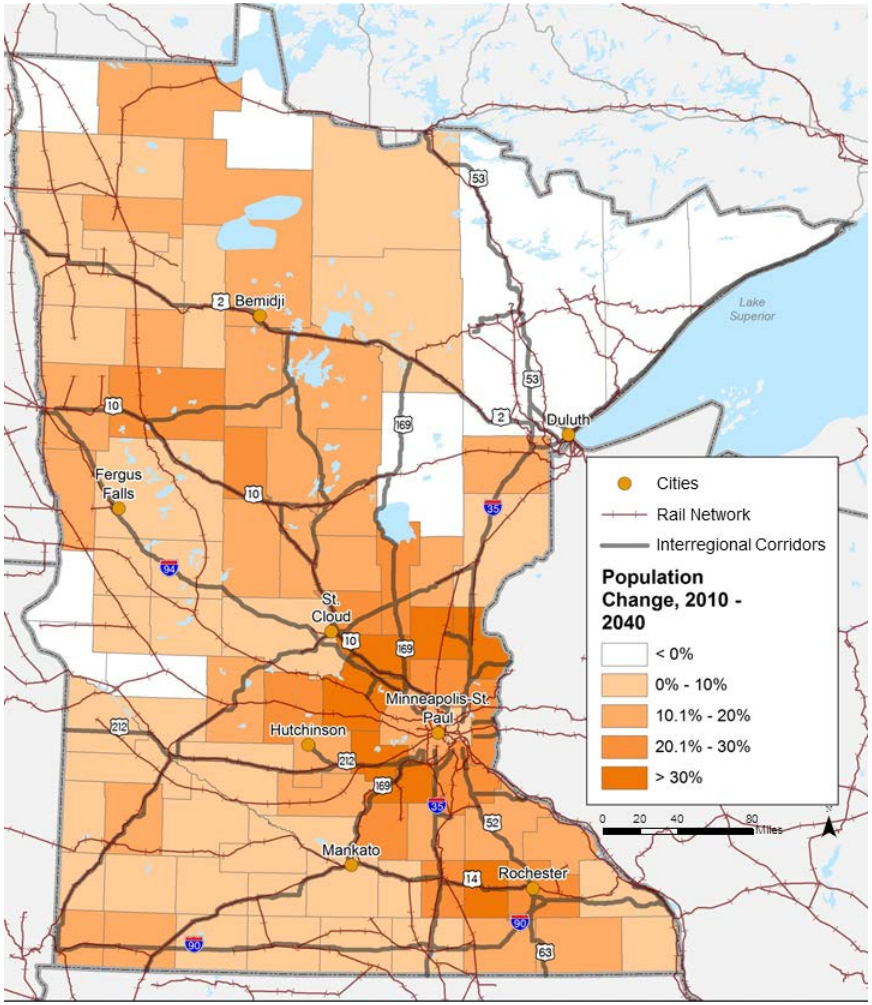
The coming decades could see either a reconcentration of growth in the Twin Cities region or a more diffuse development pattern, especially along key corridors such as I-94 and I-35. For example, changing fuel costs,whether driven by supply and demand or climate change policies,are factors that will continue to influence consumers' choices in transportation and location. Although currently low, if prices resume their rise in future years, it may push more employment and population growth into the Twin Cities region.

Figure 2.5: Minnesota Population by County, 2010



Source: Minnesota State Demographic Center, 2014

Figure 2.6: Minnesota Population Change by County, 2010-2040

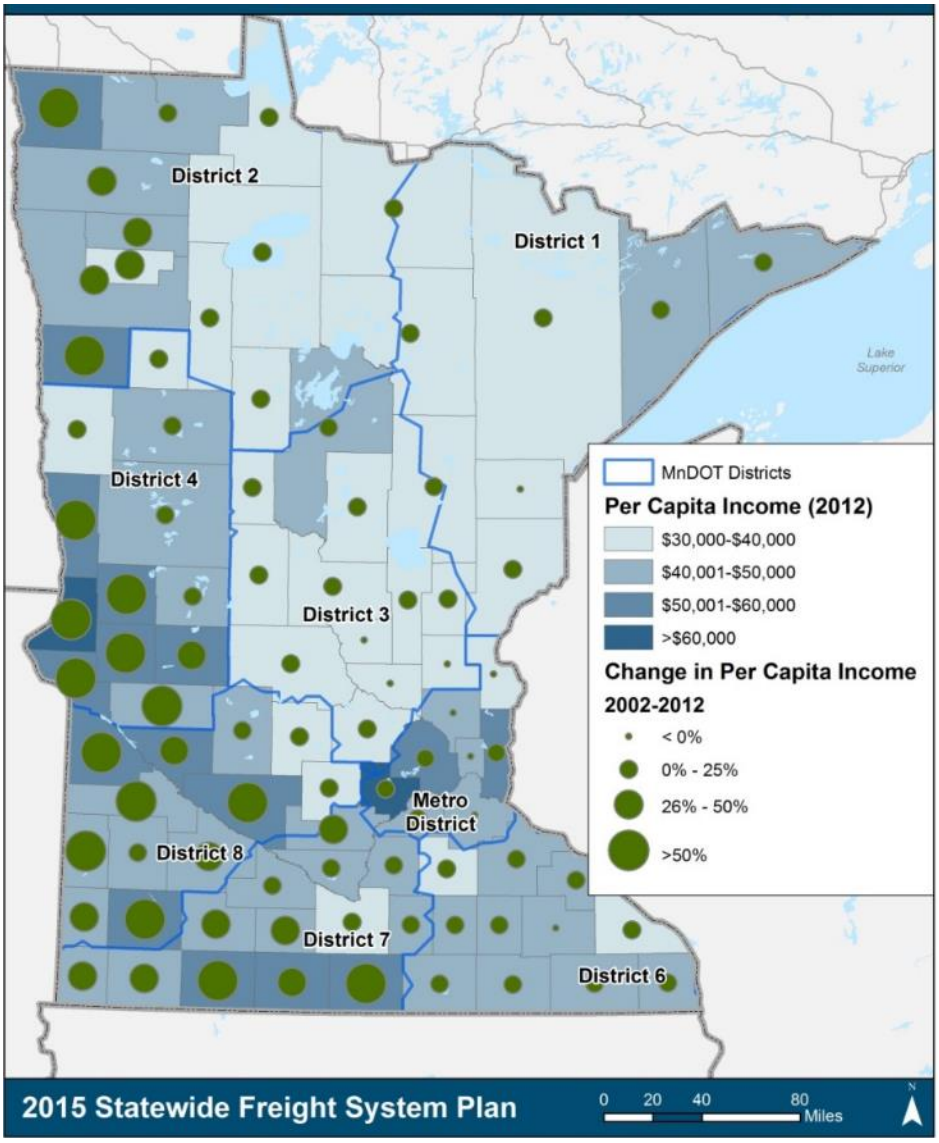


Source: Minnesota State Demographic Center, 2014

Per Capita Income

Minnesota's mean per capita income statewide stands at $46,925 as of 2012, an increase of 4.6 percent between 2002 and 2012 after adjustment for inflation. At the county level, mean per capita income ranges from $30,568 in Pine County to $65,115 in Traverse County. In general, mean per capita incomes are highest in the Metro District, southern and western portions of the state (Figure 2.7). While some counties saw their mean per capita incomes decline during the 2002–2012 period, most experienced a modest increase. Percent changes in income range from a decrease of 4 percent in Anoka County to an increase of 92 percent in Traverse County (adjusted for inflation). Like per capita income, the areas with the greatest percent change are largely in the southern and western portions of the state.

Figure 2.7: Mean per Capita Income by County in Minnesota

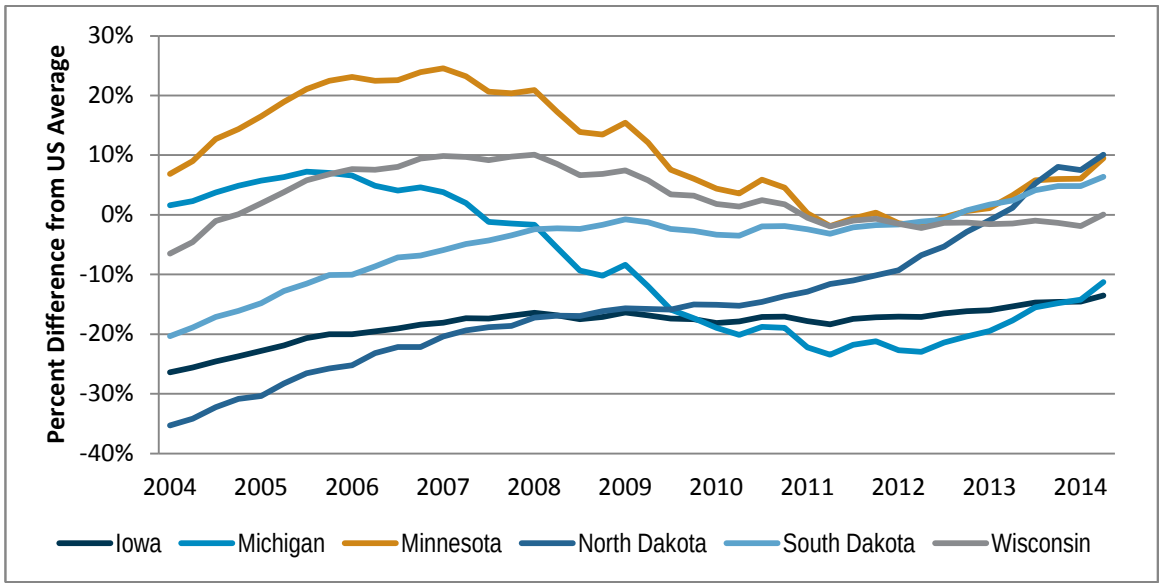


Source: U.S. Bureau of Economic Analysis. Note: Percent change in per capita income adjusted for inflation.

Trends in Cost of Living and Doing Business

Minnesota's housing market continues to be in alignment with peer states in the Midwest region. After being significantly above the national average from the 2004–2010 time period, Minnesota housing prices returned to near average in 2011–2012. A recent uptick in the economy has shown a return to higher than average home prices, as shown in Figure 2.8.

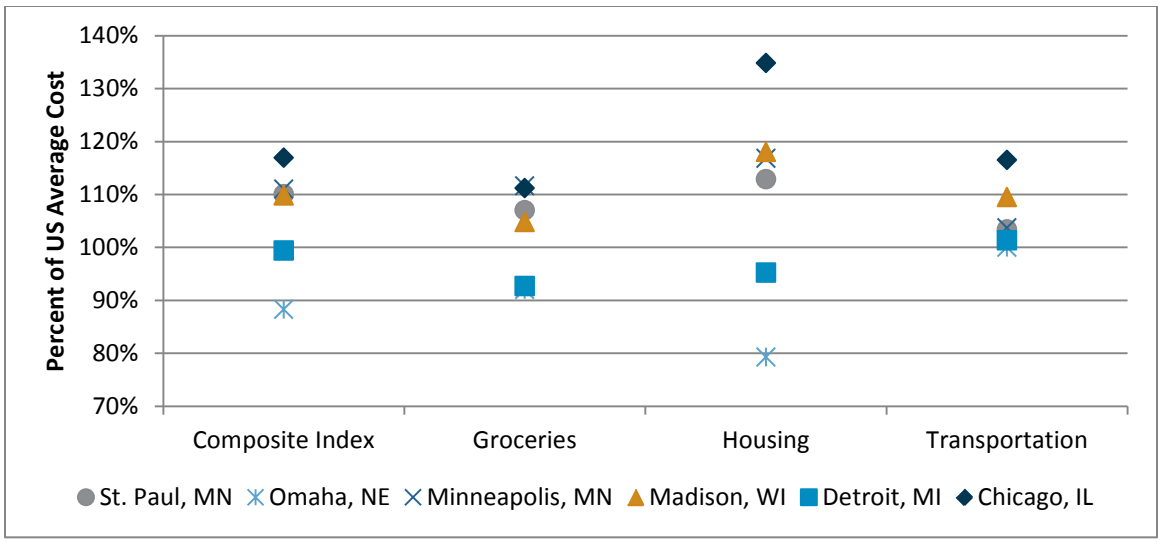
Figure 2.8: Percent Difference in Housing Prices Compared to US Average (By State, 2004-2014)



Source: Federal Housing Finance Agency, Housing Price Index, 2nd Quarter 2014.

Metropolitan cost of living comparisons place Minneapolis and St. Paul both above national averages with respect to the cost of groceries, housing and transportation (Figure 2.9). Compared to peer cities, Minneapolis has lower costs than Chicago, but remains above the national average for groceries, housing and transportation.

Figure 2.9: Cost of Living Index for Urban Areas – Percent Difference from U.S. Average Cost, 2010

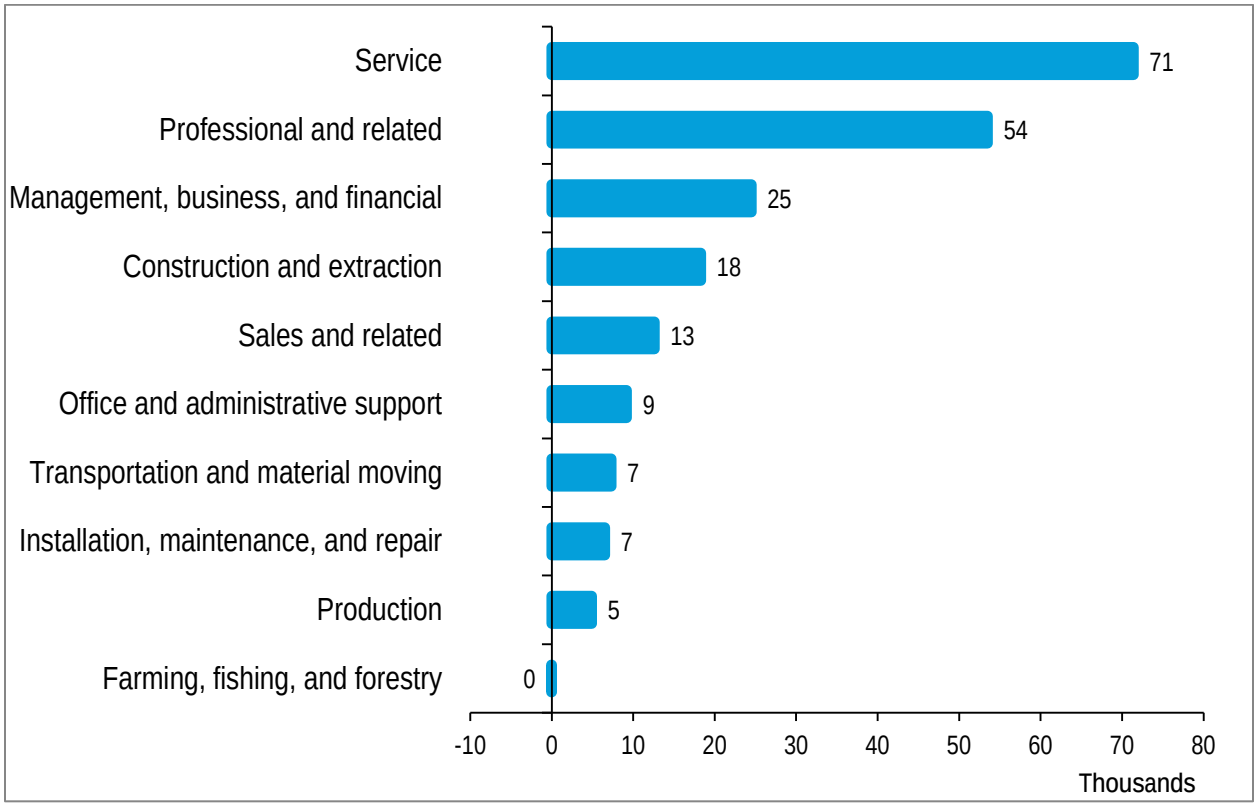


Source: ACCRA Cost of Living Index Annual Average 2010.

Employment

Minnesota's employment rate has historically been higher than the nation as a whole. Although impacted by the recession of 2008–2009 , Minnesota regained many of its jobs by November 2014, and its seasonally-adjusted employment rate of 3.7 percent was two points lower than the national average of 5.8 percent. Minnesota's employment is expected to grow at a slower rate (7 percent) than the nation as a whole (10.8 percent) between 2012 and 2022.[29] Much of the job growth in Minnesota will be focused on service, professional and management jobs, suggesting a continued growth in demand for commuting and business travel (Figure 2.10). This reinforces the importance of connecting the Twin Cities metropolitan economy with Chicago and other regional centers. It also suggests continuing to examine opportunities to link smaller cities around the state to the Twin Cities by passenger rail where the volumes will support sufficiently frequent services.

Figure 2.10: Job Growth in Minnesota, in Thousands, by Major Occupational Group, 2012–2022



Source: Minnesota Department of Employment and Economic Development, 2014

[29] Minnesota Department of Employment and Economic Development, 2014

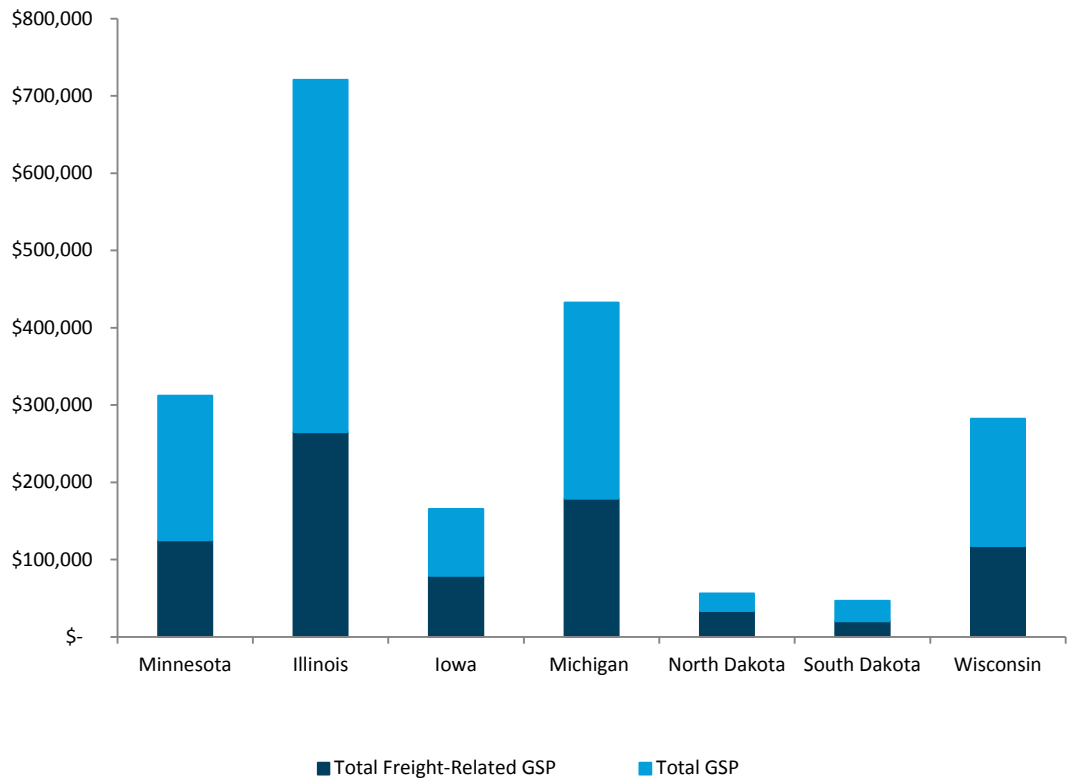
ECONOMIC GROWTH FACTORS

The structure of the Minnesota economy—the types of businesses and industries, their size, location, and trading patterns—determines the volume of freight moving in the state and the potential for passenger rail ridership. Understanding the structure of the economy and how it may change over the next decades provides a foundation for assessing the overall demand for freight and passenger transportation. This section provides an overview of the structure of the Minnesota economy and trends that will affect how it changes in the future.

Minnesota's economy is diverse, and is driven by both "freight intensive" industries— such as agriculture, mining and manufacturing—and other industries, such as business services, finance, and healthcare. All of Minnesota's industries are dependent on the transportation system. Freight intensive industries in particular have historically used and will continue to depend on the rail system; retail and wholesale industries and consumers across the state are increasingly reliant on intermodal rail for delivery of consumer goods, both domestic and imports. Containerized exports are also a growing trend, as agricultural products are shipped from Minnesota and other Midwestern states to international destinations.

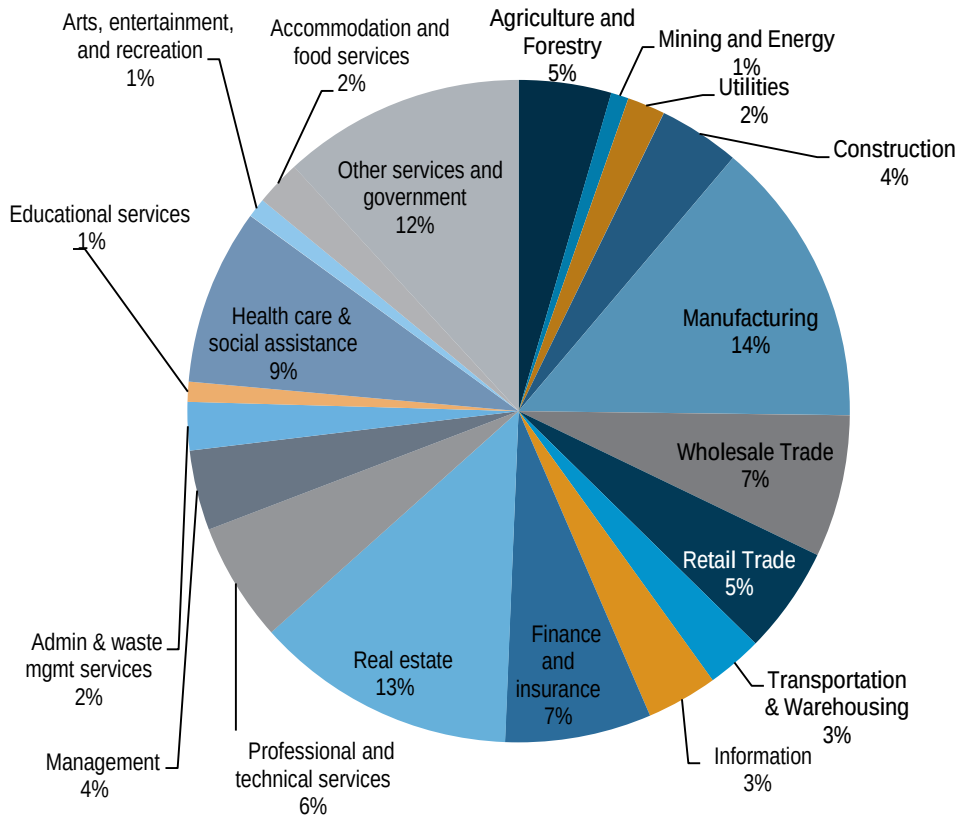
Trade-related industries are also key drivers of the economy in the state. Minnesota is home to the headquarters of 22 Fortune 1000 companies, most of which are located in Minneapolis-St. Paul region. Figure 2.11 shows the contribution of freight-related and other industries to the Gross State Product of Minnesota and neighboring states. Forty percent of Minnesota's GSP is dependent on freight-related industries, a higher percentage than many of its neighboring states. Figure 2.12 details the percentage contribution, by industry sector, to Minnesota's GSP.

Figure 2.11: Gross State Product, Minnesota and Neighboring States (Millions of 2013 $USD)



Source: U.S. Bureau of Economic Analysis, 2013

Figure 2.12: Industry Sectors as Percent of Minnesota GSP with Freight-related Industries in Bold Text



Source: U.S. Bureau of Economic Analysis, 2013

KEY INDUSTRIAL TRENDS AND OUTLOOK FOR MINNESOTA

Freight movements affecting Minnesota are increasingly national and global in scope, and are sensitive to market forces as well as the decisions of supply chain and logistics professionals within and outside the state. Industries may make business decisions based on these national and global trends, which may often result in effects that are felt locally and can have profound impacts on goods movement within the state. Regional or national decisions made by other transportation agencies and operators can also be felt locally. This section discusses key trends that are affecting the shape of Minnesota's industries and need for freight and passenger rail transportation.

Growth of Minnesota's Export Economy

In 2013, Minnesota exported $20.7 billion worth of goods. Much of Minnesota's exported goods are high value goods moving by air. .Leading exported products were machinery ($4.0 billion), optics and medical instruments ($3.3 billion), electrical machinery ($2.5 billion), and vehicles ($2.0 billion). Minnesota's top export market is Canada, and Minnesota's raw materials exports consist largely of iron ores and concentrates, which are primarily sold to Canada. Many of these goods, such as taconite, are dependent on the rail system to move within the state, and some exports cross the border via rail. Even manufactured goods within the state, the fastest growing export market which grew 3.3 percent to $19.3 billion and accounted for 93 percent of exports of goods in 2013, rely on the freight rail system for transport of raw materials and component goods, and on the passenger rail system for movement between cities for commuters and travelers.

Agriculture is another important export for Minnesota, especially corn and corn-derived products, although these products are often not captured in traditional export statistics. The Minnesota Department of Agriculture uses data published by the U.S. Department of Agriculture to estimate agricultural and food-related exports. Based on these estimates, Minnesota exported $6.5 billion of agricultural commodities in 2012, excluding manufactured food exports ($1.6 billion).[30] Corn represents 12 percent of Minnesota's international agricultural exports totaling $941 million in product value, one-third of which moved via rail to the Pacific Northwest or Gulf Coast for export to Latin America and the Asia-Pacific region. The UP and BNSF railroads have added additional shuttle trains to move grains from Minnesota elevators to export destinations as well as inland markets.

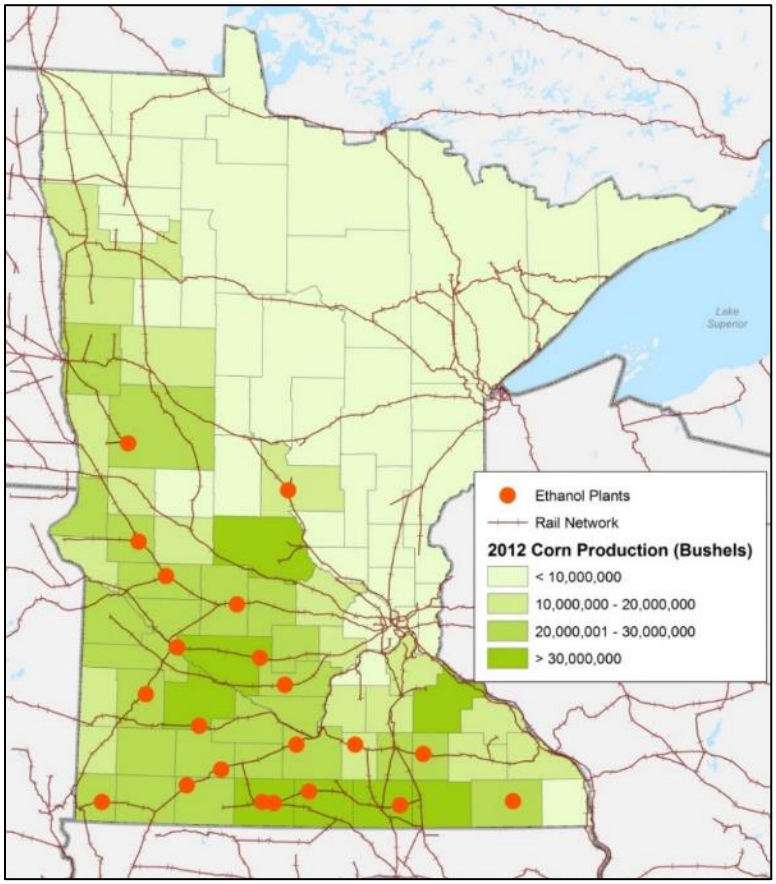
Growth of Corn and Corn-derived Products

Minnesota is the fourth largest producer of corn in the U.S. The combination of abundant water, rich soil, and the right climate for growing corn has been a cornerstone of Minnesota's agricultural efforts throughout the state's history. Minnesota is the nation's fifth leading state in annual farm income, with corn being the state's most valuable crop. More than eight million acres of corn are harvested each year within the state. Harvested corn primarily originates in the southwestern region of the state, as shown in Figure 2.13. Minnesota exports approximately 42 percent of harvested corn to international and other domestic locations, principally used for animal feed. Thirty-nine percent of the corn grown in Minnesota is processed within the state. This local processing includes ethanol production and use in food production supply chains. Seventeen percent of the corn production is used for animal feed uses within the state.

Twenty-one operating ethanol facilities are located within the state. These facilities generally are most reliant on the rail network for processing both inbound corn and finished ethanol products. The locations of these ethanol facilities and the rail network are shown in Figure 2.13. The 21 production facilities account for more than 300 jobs and $500 million in economic activity. The increasing viability and use of bio-diesel has increased the demand for these products, although ethanol demand has recently stabilized and seen declines as world fuel prices and oil production changes. In addition to finished ethanol, a co-product of the processing, dried distillers' grain is also prepared for export and consumption for animal feed production including livestock and poultry feeds, and primarily moves on the rail network.

[30] Minnesota Department of Employment and Economic Development, *Annual Export Report*, 2013.

Figure 2.13: Minnesota Corn Production and Ethanol Plant Locations, 2012



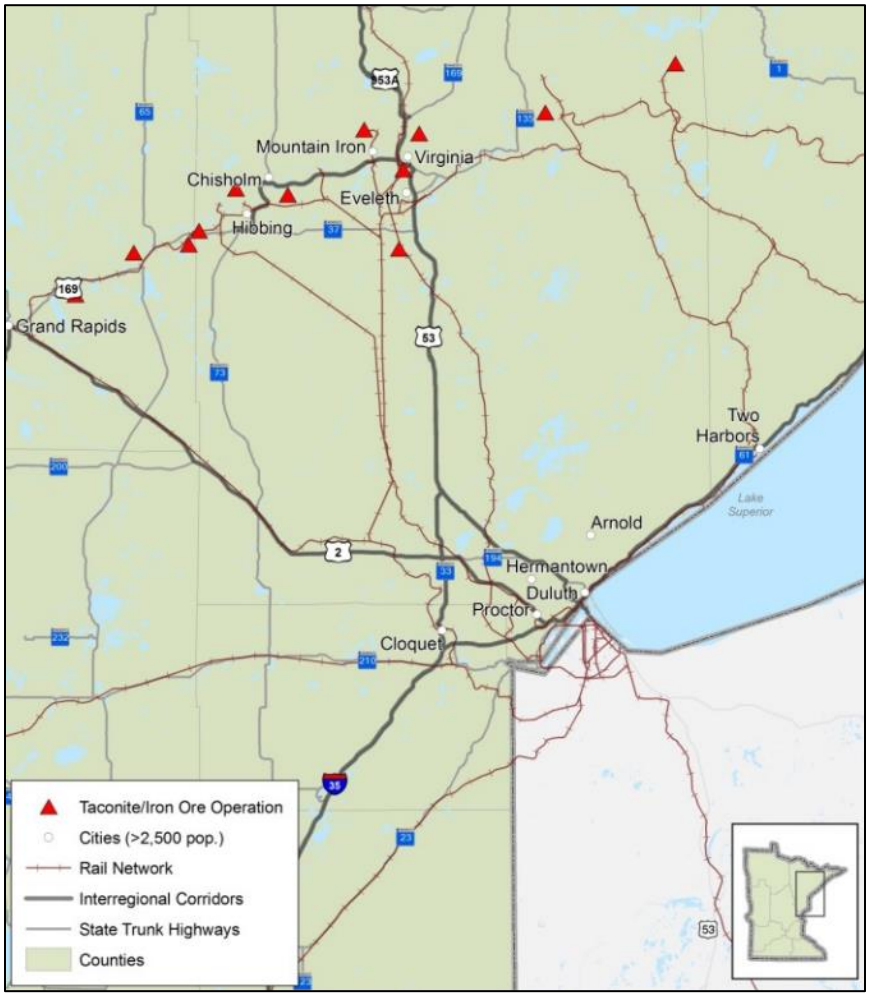
Source: USDA National Agricultural Statistics Service, 2012.

Taconite Production

Taconite is a low-grade iron ore that is mined in northeast Minnesota in the Mesabi Iron Range (Figure 2.14), processed into pellets typically at nearby locations, and shipped to steel mills in Indiana, Ohio and Pennsylvania. The largest taconite production in Minnesota is in Mountain Iron at the U.S. Steel Minntac facility, billed as the Taconite Capital of the world. Although some taconite is transported by rail during the winter, most is transported to the steel mills by ship across the Great Lakes. Within the state, rail is used to transport taconite from the processing facilities to Lake Superior ports. The CN railroad handles most of this product on its lines to Two Harbors and Duluth, where it operates three ship loading docks. The port of Two Harbors receives four to five loaded trains of 116 hopper cars per day from Minntac. Recently, Minnesota's iron ore mines report that they are having trouble getting pellets to market due to a shortage of rail service, leading to heavy stockpiles at industrial facilities in the region. Two Minnesota mines have reportedly begun sending taconite pellets via truck from the Mesabi Iron Range to Duluth.[31]

[31] "Rail congestion hits taconite shipments" Trains Magazine, September 15, 2014.

Figure 2.14: Taconite/Iron Ore Operations in Northeast Minnesota



Source: Iron Mining Association of Minnesota

Bakken Shale Oil & Gas and Unconventional Petroleum Extraction

The emergence over the course of the last 10 years of the economic extraction of oil and gas from hydrocarbon infused shale rock is largely unexpected, as these sources were considered unexploitable before the advent of advanced technology. High speed and highly accurate directional drilling allows the drillers to tap vast horizontal layers of oil and gas shale. Induced hydraulic fracturing, or fracking, of the rock surrounding the resulting well opens up fissures that are propped open with sand or 'proppants' injected with the water during fracking. This 'frac sand' allows the continuous flow of hydrocarbons from the fissures in the impervious rock. The process allows for the economical recovery of "captured" gas and liquid petroleum products from several major oil holding shale formations in the U.S., including the Bakken region of North Dakota and the Eagle Ford shale region in Texas. The proliferation of shale gas exploration in North Dakota created substantial increases in freight movement on key corridors across the Upper Midwest.

For Minnesota, the freight related impacts of shale oil extraction occur in two distinct manners— the increased movement of petroleum products extracted from the new wells, and the movement of direct inputs to the fracking process (sand, water and other chemicals, and drilling pipe). A single horizontal well typically uses between 3,000 and 10,000 tons of sand. A typical rail car of frac sand contains around 100 tons. In 2009, Class I railroads originated nearly 112,000 carloads of sand and at the time of the study were on track to originate approximately 375,000

carloads in 2013, likely driven by increased frac sand use at drilling wells.[32] Nine mines are in production in Minnesota.

Sand processing consists of moving sand though a series of steps to sift it into size groups for market. A single sand mine may produce several products for different markets across the country. Product differentiation requires separate trucks or rail cars and different final destinations. The Mid-America Freight Coalition completed a case study of Chippewa County, Wisc., (east of the Minnesota border), for sand mining related to hydraulic fracturing and the related consequences for the freight transportation network. After the addition of a new sand mine, heavy usage of the roadway infrastructure by sand and gravel haulers, an increase in loaded train cars, and increases in noise were observed.

The movement of Crude Oil by Rail

The broad adoption of these new extraction technologies to shale oil formations in the Bakken Region of North Dakota, Montana, Saskatchewan, and Manitoba impacts Minnesota's rail system considerably. This development leads to an unprecedented amount of outbound oil and gas products being shipped by rail, the majority of it across Minnesota destined for refineries in the Midwest and East and Gulf Coasts. Although transportation costs for shipment by train are approximately 50 percent higher than pipelines, rail offers competitive advantages over pipeline transfer. Rail serves major refineries on the coasts, as well as inland and Gulf markets, allowing companies the flexibility to ship their products to the highest-margin market. Since pipelines currently have the capacity to handle only about a third of the Bakken's production of 1.2 million barrels per day, the BNSF and CP Railways that serve the Bakken oil fields now originate 10 or more full unit trains per day, with six to eight of those trains traversing Minnesota rail lines.

Because this sweet, light crude has a low flash point and boiling point, with a significant percentage of dissolved gases (butanes and propanes) and natural gasolines, the crude oil ignites very easily and burns almost explosively if spilled during a rail accident and subsequent tank car rupture. As a result, this crude is considered a Flammable Class 3, Packing Group 1 hazardous material, signifying a highly dangerous liquid. Catastrophic accidents and fires, including Lac Megantic, Quebec where 47 people died, have occurred with some regularity, resulting in emergency FRA rules for 'High Hazard Unit Train' handling and safety inspections, and PHMSA efforts to implement safer tank car designs.

In the case of unconventional Alberta tar sands crude oil, rail allows for less well-head processing than pipelines (including a lesser need for diluents) and the possibility of shipping heated, undiluted crude oil. Based on the extensive proven reserves of tar sands in western Canada, projections suggest that unit trains of this heavy oil will also travel across Minnesota to access U.S. refineries in the foreseeable future. This material has fewer 'light ends' and is considered less hazardous. .

The fracking process also creates demand for substantial volumes of sand and other materials to be shipped to the fields, much of which comes from Southern Minnesota and Central Wisconsin. Overall, the growth curve for crude-by-rail shipments in the U.S. has been dramatic—from about 50,000 carloads in 2010 to about 450,000 today (Figure 2.15). As of late 2014, approximately 50 oil trains per week transport Bakken crude oil across Minnesota, and although short-term drops in oil prices and other trends result in uncertainty regarding near-term growth, it is likely that long-term oil demand and prices will lead to continued growth in Bakken oil production.

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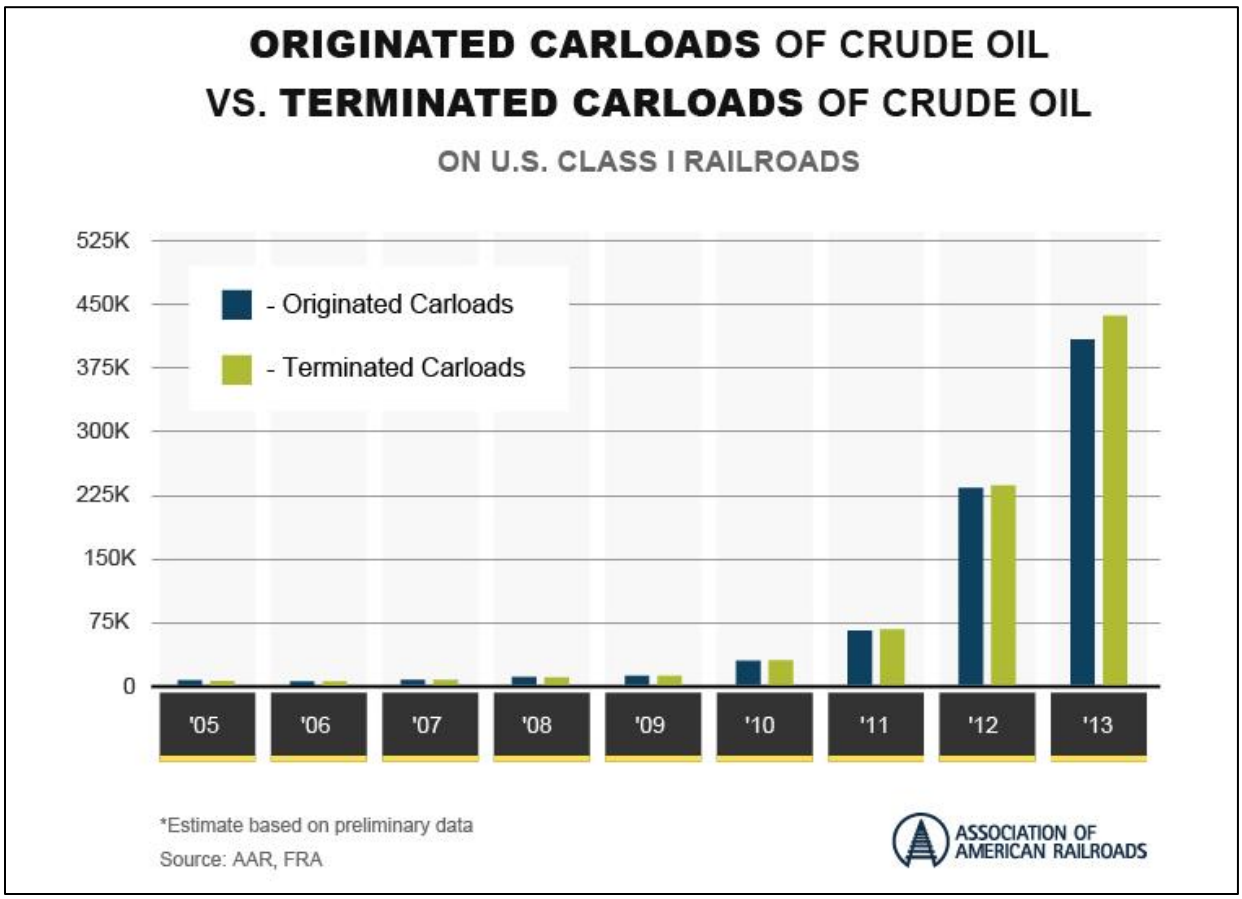
[32] Association of American Railroads, December 2013. *Moving Crude Oil by Rail.* www.aar.org/safety/Pages/crude-by-rail-facts.aspx#.UxdfuIXYO_c.

Figure 2.15: Originated and Terminated Carloads of Crude Oil, 2005 to 2013



FREIGHT RAIL TRENDS AND DEMAND GROWTH

The future needs of Minnesota's rail system are substantially driven by what future freight demand might look like. This section presents existing and future potential demand for rail freight in the state for the plan year of 2040.[33] For this purpose, the Federal Highway Administration's Freight Analysis Framework version 3.5 (FAF3.5) was applied to the 2012 edition of the Surface Transportation Board's Confidential Carload Waybill Sample. This forecast provides a "baseline" against which future demand for goods movement by rail can be considered, and thus is not only a reflection of current macro-economic trends, but also the current trends in logistics, distribution, sourcing etc. within the freight-dependent economic sectors. During the next 28 years there will be unanticipated changes in the economy, freight logistics, technology, public policy, and other factors that will greatly influence the general demand for goods movement and that of the individual modes such as rail.

[33] A more detailed commodity flow analysis can be found in APPENDIX B.

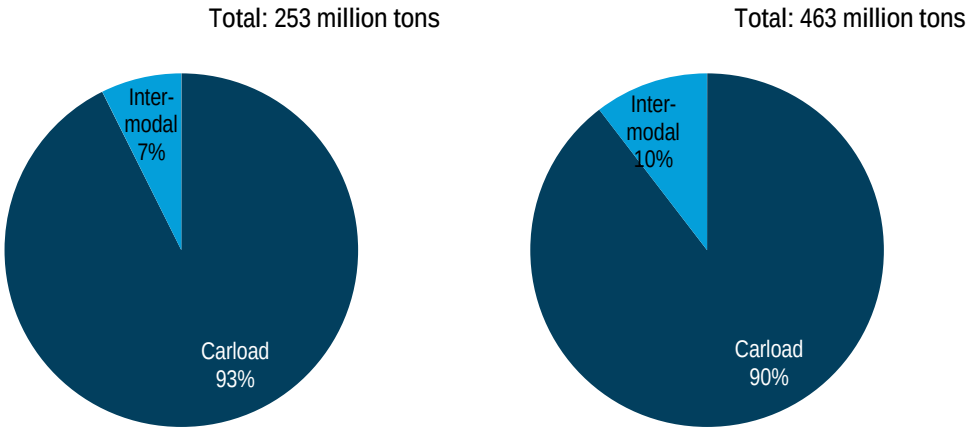
Overview of Freight System Demand

In 2012, one billion tons of freight moved over Minnesota's transportation system. Trucks carried 63 percent of all inbound, outbound, intrastate, and through freight tonnage, while rail (carload and intermodal) carried about 25 percent.[34] By 2040, the FAF forecast indicates total volume to amount to 1.8 billion tons, an increase of 44 percent overall. With mode shares somewhat remaining unchanged through the forecast period, rail volumes are expected to grow proportionately. By value, $912 billion in freight moved over the state's transportation system in 2012, an amount that is expected to grow 161 percent to $2.3 trillion by 2040. Trucks carried 67 percent of the state's freight value; by 2040 this share is expected to decrease to 63 percent. Rail carried 21 percent of the freight value; this share is expected to remain somewhat constant through 2040. These trends are described in further detail in Appendix B.

Overview of Rail Freight Demand

Minnesota's rail system has some of the highest volumes in the nation, and these flows are projected to continue to grow through 2040. Figure 2.16 and Figure 2.17 show the current and future rail system volumes. In 2012 93 percent of tonnage (234 million tons) was carried in rail cars and 7 percent (19 million tons) in intermodal equipment (containers and trailers). When measured in units of rail cars and intermodal equipment, in 2012 65 percent (2.5 million units) were rail cars and 35 percent (1.4 million units) intermodal equipment. Rail intermodal volume growth is expected to continue to outpace rail carload growth through 2040, with intermodal tonnage increasing to 10 percent and units to 45 percent of all traffic.

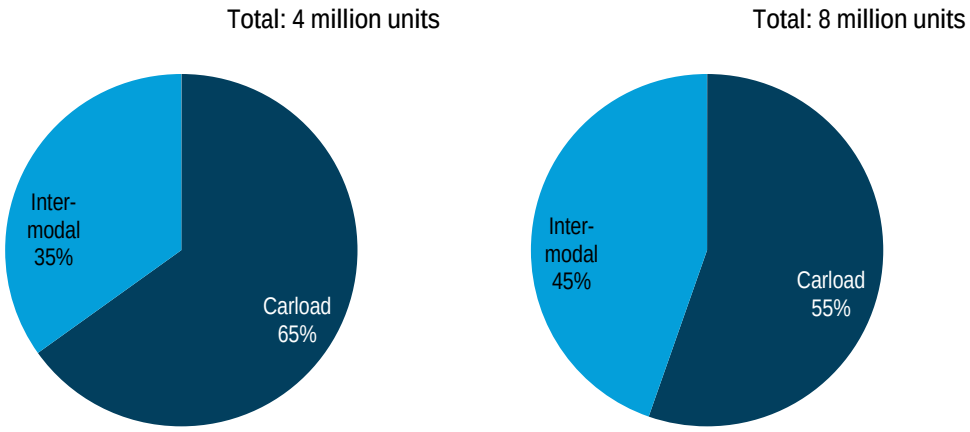
Figure 2.16: Total Rail Tonnage by Equipment Type
2012 (left) and 2040 (right)



Source: STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics.

[34] The data source for freight demand for other modes but rail was FHWA's Freight Analysis Framework version 3.5 (FAF3.5). FAF utilizes a 2007 base year with synthesized 2012 values, and a 2040 forecast.

Figure 2.17: Total Rail Units by Equipment Type
2012 (left) and 2040 (right)



Source: STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics.

Figure 2.18 and 2.19 display the tonnage of freight moving on the national system for goods moving to, from, through or within Minnesota in 2012 and 2040.

Rail Demand by Direction

Figure 2.20 and Figure 2.21 display rail freight flows by direction for weight and value in 2007, 2012 and 2040. Through moves are the largest type of rail flow, accounting for 124 million tons and $129 billion in 2012. In 2040 through moves are expected to continue to make up the majority—59 percent of the tonnage and 72 percent of the value—of rail freight traffic in Minnesota. The top through commodities by weight were hazardous materials (e.g., crude petroleum); coal; farm products; chemicals and allied products; and freight-all-kinds (i.e., miscellaneous mixed shipments moving as intermodal shipments).

Outbound rail freight amounting to 54 million tons and $31 billion in 2012 was the second largest component. Outbound shipments include metallic ores; farm products; food and kindred products; freight-all-kinds; and hazardous materials. Inbound movements account for 12 percent (31 million tons) of the rail tonnage and 14 percent ($26 billion) of the rail value in 2012. These shares for inbound rail are expected to remain constant through 2040. The top inbound commodities are coal; freight-all-kinds, transportation equipment, farm products; chemicals and allied products; primary metal products; and hazardous materials.

Intrastate rail freight amounted to 44 million tons and $6 billion in 2012. Intrastate movements represented a larger share of tonnage than value, reflecting that the primary intrastate commodity group is metallic ores. Much of these shipments move within St. Louis County, Minn.,, and from St. Louis County to Lake County, Minn.. The decline in intrastate rail freight is driven by an expected decline in metallic ore shipments.

Figure 2.18: Rail Flow Volumes, 2012

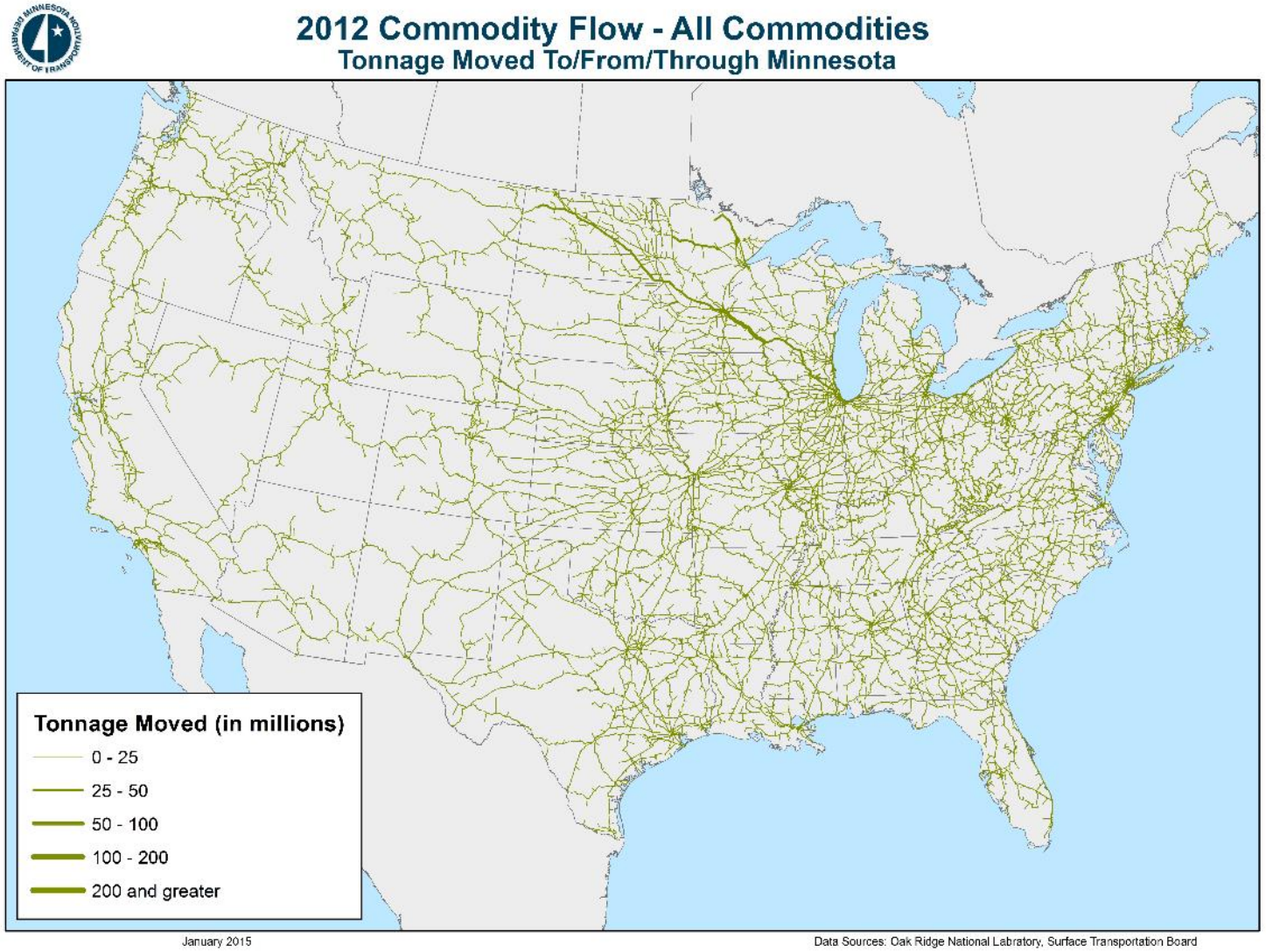


Figure 2.19: Rail Flow Volumes, 2040

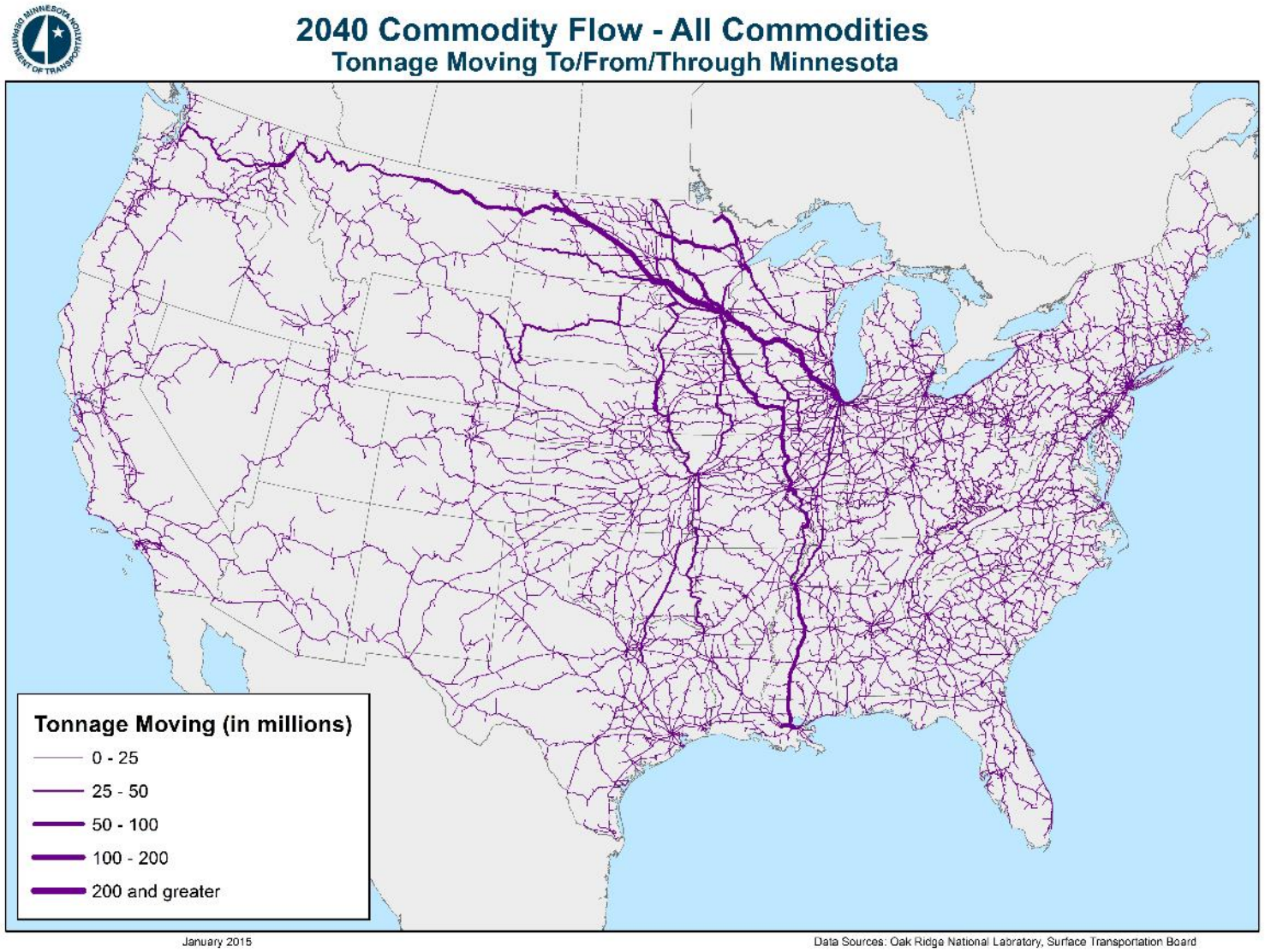
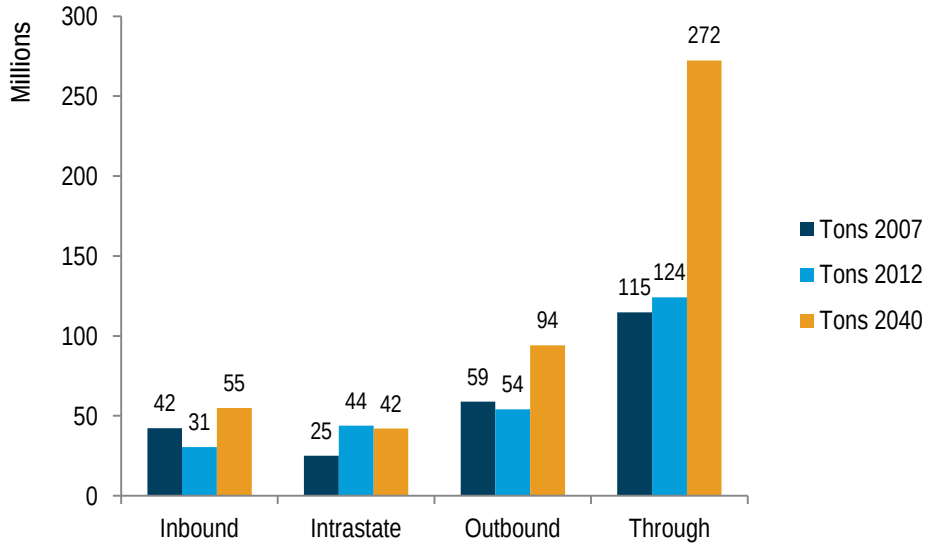
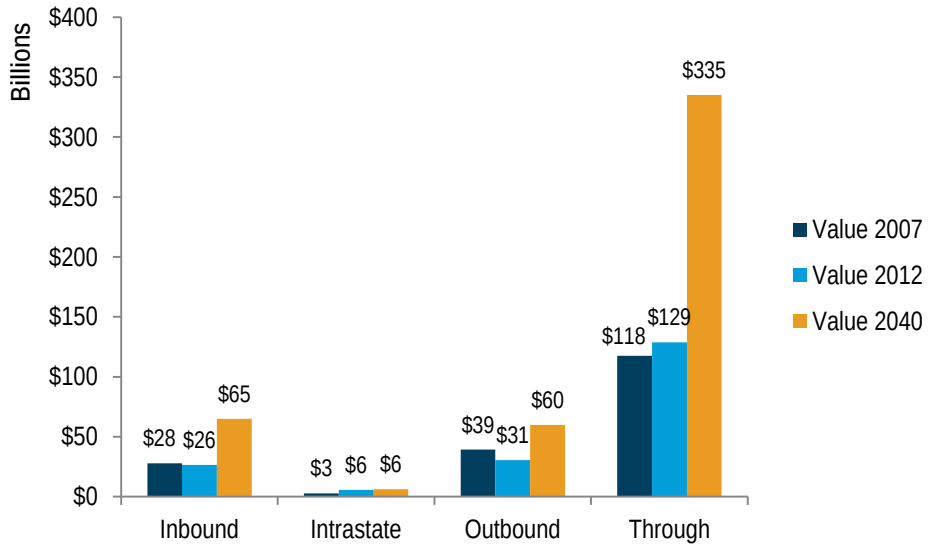


Figure 2.20: Freight Tonnage Growth by Direction
2007, 2012 and 2040



Source: STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics; Minnesota Comprehensive Statewide Freight and Passenger Rail Plan for 2007 rail data.

Figure 2.21: Freight Value Growth by Direction
2007, 2012 and 2040



Source: STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics; Minnesota Comprehensive Statewide Freight and Passenger Rail Plan for 2007 rail data.

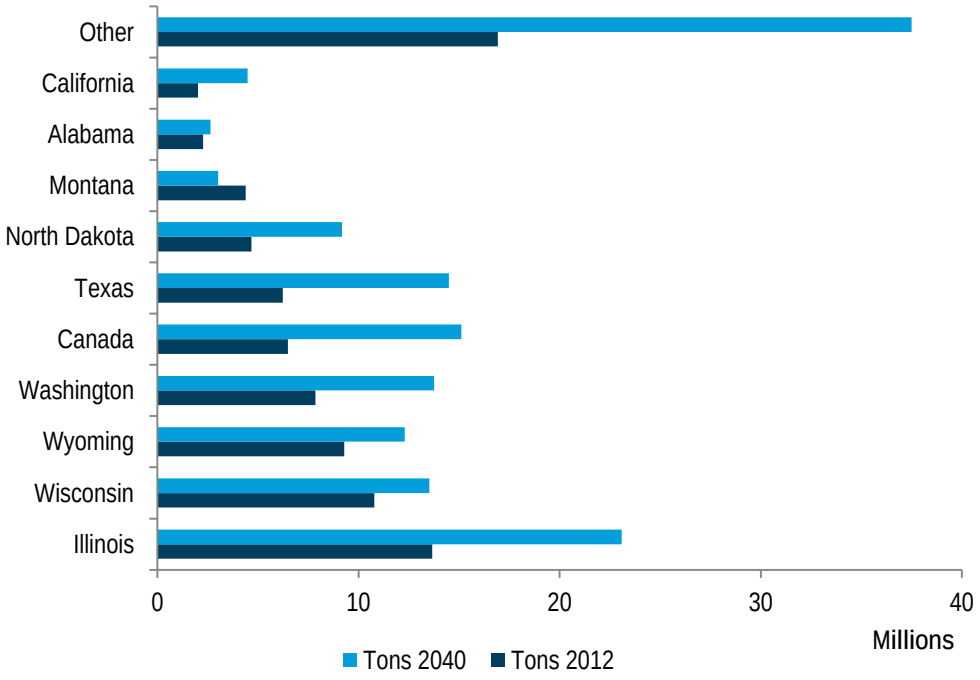
Rail Freight Analysis by Trading Partner

The "trading partners" external to Minnesota are defined as consisting of the states in the United States, and the neighboring countries of Canada and Mexico. Key trading partners are identified by combining the inbound and outbound freight rail flows between Minnesota and the trading partner region. Figure 2.22 displays the current and future tonnage for each of the top trading partners.

Illinois, Wisconsin, Wyoming, Washington, Canada, Texas, and North Dakota were the top rail trading partners in 2012, accounting for 70 percent (59 million tons) of total inbound and outbound rail flows by weight. By 2040 these trading partners are projected to represent 68 percent of Minnesota's rail trade, exhibiting growth of 72 percent to 101 million tons.

Illinois was Minnesota's top rail trading partner in 2012, a position that is expected to remain unchanged through 2040. The top commodity traded between Minnesota and Wisconsin by rail was metallic ores from Minnesota, which reflects the shipment of taconite through Superior's Lake Superior docks. By 2040, metallic ore shipments are expected to grow merely 2 percent. Trade with Wyoming consisted primarily of utility coal. The expected growth of these shipments from Wyoming is a result of the economic recovery from the low volumes of the recession of 2008–2009 . The trade with Washington consisted primarily of farm products (e.g., dried soybeans and shelled corn) shipped from Minnesota. Most of the trade between Canada and Minnesota consisted of a wide range of commodities such as chemicals and allied products, farm products, lumber and wood products (excluding furniture), food and kindred products, hazardous materials (e.g., petroleum and coal products, chemicals and allied products, crude petroleum, and non-metallic minerals), primary metal products and freight-all-kinds.

Figure 2.22: Top 10 Rail Trading Partners by Weight
2012-2040



Source: STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics.

Freight by Railroad Class

Table 2.4 presents the tons and units carried by class of railroad in Minnesota. In 2012, traffic originating, terminating or going through Minnesota's Class I railroads accounted for 251 million tons carried in 3.9 million rail units—more than a 99.5 percent share of the state's rail volume. Traffic on the short lines accounted for 1 percent (2.9 million tons carried in 24,000 rail units). By 2040, the Class I traffic is projected to grow faster than the short line traffic, accounting for 99.4 percent of the tonnage and 99.8 percent of the rail units.

Table 2.3: Rail Freight Volumes by Minnesota Railroad (2012-2040, in Thousands)

RAILROAD CLASS	TONS 2012	TONS 2040	%CHANGE 2012–2040	UNITS 2012	UNITS 2040	%CHANGE 2012–2040
Class I	251,349	460,613	83%	3,898	8,106	108%
Short Line	2,867	5,051	76%	24	38	56%
TOTAL	252,591	463,426	83%	3,904	8,118	108%

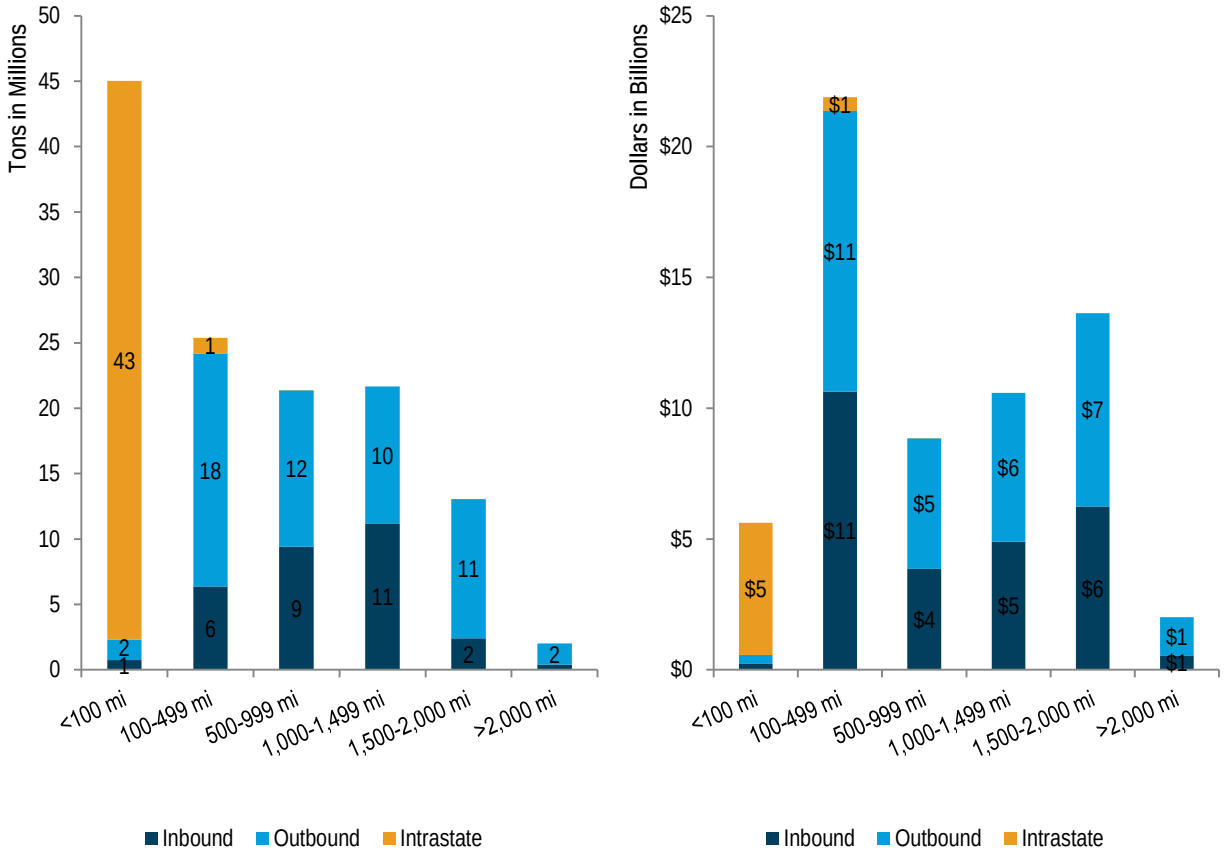
Source: STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040 processed by Cambridge Systematics.

Note: *Numbers do no add up to the totals because there is tonnage that can go on both Class I railroads and Short Line railroads.

Rail Freight by Distance

Figure 2.23 shows the distribution of rail tonnage and value by direction and distance traveled. Approximately 35 percent of rail tonnage shipped to, from and within the state traveled less than 100 miles; however, when measured in value, only 9 percent of the rail value originating and/or terminating in the state traveled less than 100 miles. Thirty-five percent of the rail value originating or terminating in Minnesota travelled within 100 and 499 miles. More than 45 percent of the rail tonnage and 56 percent of the rail value shipped to/from the state traveled more than 500 miles.

Figure 2.23: Rail Volume by Miles Traveled and Direction
2012, Weight (Left) and Value (Right)



Source: STB 2012 Confidential Carload Waybill Sample.

PASSENGER RAIL TRAVEL DEMAND

In the 2010 State Rail Plan, passenger demand was estimated for a number of potential rail markets and used to develop priority corridors for implementation. As part of the 2015 Minnesota State Rail Plan and due to recent planning efforts, these rail corridors have been divided into three categories: Advanced Planning, Phase I and Phase II. Having had substantive planning work, four projects are designated as being in Advanced Planning. Three are High Speed Rail services (at least 110 mph), and consist of Twin Cities to Milwaukee as part of an overall Chicago hub regional service, Duluth (Northern Lights Express or NLX) and Rochester (Zip Rail). The fourth advanced planning effort entails a second Empire Builder between the Twin Cities and Chicago that would complement the existing single daily train. Robust analyses are being performed of passenger ridership for these rail corridors under active development. Passenger demand estimates from these corridors will be included in updates to this document as they become available.

For Phase I corridors, the passenger travel demand and demand for rail service, by market, was estimated in this 2015 Minnesota State Rail Plan using the methodology developed in the 2010 State Rail Plan. As available, the forecasts were updated using the most currently available data. An overview of the methodology used is included in the following subsection. Additional methodological details are available in the 2010 State Rail Plan Technical Memorandum 3.

Methodological Overview

For Phase I corridors, a high-level, sketch planning, spreadsheet-based approach was applied to develop total passenger demand and rail ridership forecasts in both the 2010 State Rail Plan and in the 2015 State Rail Plan Update. Sketch planning has a long history in statewide transportation planning, and is commonly used, particularly when resources do not allow for statewide transportation surveys and models. Ultimately, each project will be responsible for developing its own detailed forecasts to support planning, environmental, and engineering analyses as the projects move forward through approval processes. For the sketch planning forecasts in this document, a conservative, “low ridership” approach was used in order to avoid artificially inflating the benefits of individual rail corridors.

The forecasts below analyzed travel only between the Twin Cities and key outlying markets that were identified as possible intercity rail origins and destinations as part of Phase I and Phase II projects. Most demand was estimated using standard demographic data such as population and employment; however, special generators— such as casinos, medical centers, universities, and tourism markers—have unique demand characteristics and also were considered.

The first step in forecasting demand for rail is to estimate the total potential number of trips for travel between two cities. Four modes of travel were considered: auto, air, rail, and intercity bus. Different approaches were used to estimate the existing use of each mode depending on availability of existing data. For the 2015 Minnesota State Rail Plan, demand was forecasted using currently available data. These four modal demand inputs were added together to generate the total estimated travel between the Twin Cities and all interstate and intrastate tested origin/destinations. The forecast shown assumes 79 mph speed, four trains per day, a rail fare of 20 cents per mile, gas prices of $2.00, personal/business travel splits of 90/10, and the standard state growth forecast. Auto, air, rail and bus demand, developed for the 2030 projections presented in the 2010 State Rail Plan, served as the basis of the 2040 projections. The annual growth rates for the previous 2005–2030 forecast were extended out to 2040. The demand along corridors that were projected to have negative growth in the 2010 State Rail Plan, were assumed to remain unchanged. Additional details on this forecasting methodology can be found in the 2010 State Rail Plan Technical Memorandum 3.

Passenger Rail Demand Forecasts for Phase I – Advanced Planning Corridors

Four projects were designated as being in Advanced Planning. Three are High Speed Rail services (at least 110 mph), and consist of Twin Cities to Milwaukee as part of an overall Chicago hub regional service, Duluth (NLX) and

Rochester (Zip Rail). The fourth advanced planning effort entails a second Empire Builder between the Twin Cities and Chicago that would complement the existing single daily train. Robust analyses are being performed of passenger ridership for these rail corridors under active development. Passenger demand estimates from these corridors will be included in updates to this document as they become available.

Passenger Rail Demand Forecasts for Phase I and Phase II Corridors

Table 2.5 shows the projected 2040 total demand and demand for rail service between the Twin Cities and major origins and destinations along Phase I and Phase II corridors. The highest total travel demand to/from the Twin Cities along these corridors is with St. Cloud, with more than one million forecast rail trips annually and a rail share of about 8 percent. This city pair is followed by a second cluster of city pairs with more than 100,000 annual trips, including Eau Claire, Mankato and Northfield, who have rail shares of between about 4 and 5.5 percent. Willmar has an annual rail demand of about 53,000 and a 3.5 percent rail share. Rail shares are forecasted to be less than 2 percent between the Twin Cities and other destinations, leading to annual rail demands of less than 50,000.

Table 2.4: 2012 and 2040 Annual Passenger Demand and 2040 Rail Demand From/To the Twin Cities (Phase I and Phase II Corridors

CITY	TOTAL ANNUAL DEMAND (TO/FROM TWIN CITIES; 2005)	TOTAL ANNUAL DEMAND (TO/FROM TWIN CITIES; 2040)	RAIL DEMAND (TO/FROM TWIN CITIES; 2040)	RAIL SHARE (TO/FROM TWIN CITIES; 2040)
St. Cloud, MN	11,115,313	13,730,016	1,107,005	8.1%
Eau Claire, WI	5,820,841	6,813,058	268,812	3.9%
Mankato, MN	3,781,513	4,160,051	234,864	5.6%
Northfield, MN	1,685,353	2,139,927	117,746	5.5%
Willmar, MN	1,587,159	1,543,243	53,561	3.5%
Fargo, ND	3,931,143	3,978,633	37,032	0.9%
Des Moines, IA	2,927,518	3,025,124	18,729	0.6%
Sioux Falls, SD	1,680,987	1,504,088	17,987	1.2%
Marshall, MN	622,150	551,251	9,502	1.7%
Sioux City, IA	599,627	628,263	1,907	0.3%

Source: Minnesota Department of Transportation; Cambridge Systematics

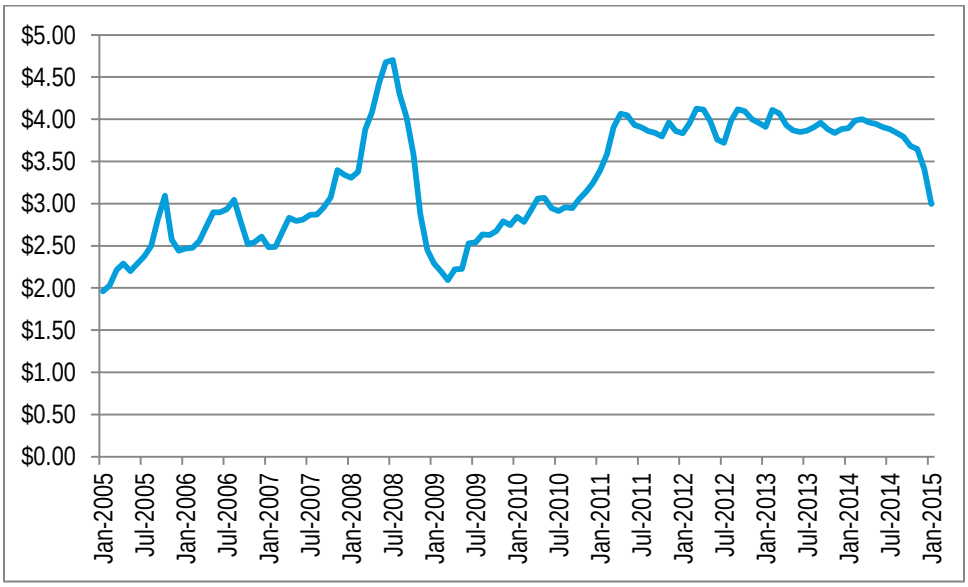
OTHER TRENDS

Fuel Cost

Recent years saw a steady increase in price of all types of fuel. Since the crude oil peak at a record $145 per barrel in 2008 and the subsequent recession-related drop, the price hovered in the range of $90 to $120 per barrel, leading to an extended period of relatively high fuel prices (Figure 2.24); however, oil prices dropped by more than 40 percent in late 2014. In part due to the U.S. shale oil boom increasing the supply on the market, this led to short-term lower fuel prices for all modes of travel, including rail. It also has led to more volatility and uncertainty in the global

fuel market, a trend that is expected to persist through 2015. Nevertheless, the U.S. Energy Information Administration's Short Term Energy Outlook has forecast that prices will begin rising again later in 2015.[35]

Figure 2.24: Historical Cost of Diesel Fuel



Source: U.S. Energy Information Administration, 2014 Rail Congestion

Network Congestion

Rail congestion in the Midwest has become an increasingly important issue over the last decade, particularly in major hubs like Chicago, Kansas City and Minneapolis-St. Paul. The drop-off in traffic during the recession of 2008–2009 temporarily alleviated congestion, but by 2011 many mainlines and key junctions were again experiencing reduced fluidity from growing intermodal, agricultural, metallic and non-metallic minerals, automotive and other traffic. Compounding this traffic growth from a recovering economy is the new traffic that has arisen from the development of North Dakota's Bakken oil fields, the Alberta tar sands, the Eagle Ford oil shale formation in Texas, and others. Geography and the existing rail network place Minnesota between the producing regions in North Dakota and Alberta, and refineries located along the eastern seaboard and the gulf. This places particular pressure on some of Minnesota's primary main lines, which saw large increases in crude-by-rail and related traffic. According to the AAR, in 2008, U.S. Class I railroads originated just 9,500 carloads of crude oil. By 2012, volumes had grown to nearly 234,000 carloads, and were forecast to further increase to around 400,000 carloads in 2013.36

Throughout 2013–2014, the increased crude traffic in North Dakota combined with a record harvest throughout the upper Midwest drove up demand for rail service and led to significant railway congestion. The current "boom" in rail related to extraction of petroleum (not only rail movements of crude itself, but also of the shipping of chemicals and sand components for hydraulic fracturing) diminished the capacity and quality of service that is being provided to Minnesota's own rail-oriented shippers. Producers of grain, paper, ethanol, taconite and forest products expressed

[35] U.S. Energy Information Administration, Short Term Energy Outlook, January 2015.

[36] Association of American Railroads, www.aar.org/keyissues/Documents/Background-Papers/Crude-oil-by-rail.pdf.

concerns about the availability of and access to rail shipping as a result of the capacity consumed by energy development, particularly in North Dakota. Due to slower travel times and longer cycle times leading to a lack of rail cars available for grain shipment, grain is currently being stored on the ground at facilities for extended periods of time while awaiting shipment to an export terminal. A 2014 study by the University of Minnesota's Center for Farm Financial Management estimated delays in railroad shipping cost Minnesota's corn, soybean and wheat farmers nearly $100 million due to lower prices.[37]

Congestion is also affecting short line traffic. Access to the rail system for smaller customers is becoming more challenging as the Class I carriers increase their focus on transporting single commodities in point to point service in unit trains. Across the country, some Class I railroads are encouraging short line railroads and other customers to provide full trainloads. This can be difficult for short line railroads to accomplish due to physical limitations, e.g., lack of track and storage infrastructure, as well as market conditions for particular commodities and industries. In particular, smaller agricultural producers and grain elevators are affected by the diminishing access to rail service. They must increasingly rely on consolidation facilities and/or transloading to maintain this access, and with varying results.

Along with record traffic, the extreme cold weather in the winter of 2014 led to significant delays on intercity and commuter traffic in Minnesota. In early 2014, the on-time performance of Northstar commuter trains averaged 20 points lower than the contractually specified 95 percent.[38] Nationwide, Amtrak on-time performance also suffered. The Empire Builder, which serves the Twin Cities and other Minnesota destinations on its route from Chicago to Seattle, Washington, and Portland, Oregon, ran on time only 21 percent of the time in 2013–2014.[39]

The BNSF and other carriers responded to the increasing congestion through operational changes and a record level of investment in infrastructure. These efforts clearly helped, as performance improved considerably from the low point reached in late 2013 and early 2014. As described elsewhere in this 2015 Minnesota State Rail Plan, additional investments are on tap in 2015 and 2016 to further increase capacity on select routes; however, it is not evident that they will be sufficient to accomodate significant further growth while providing consistently reliable service. Even with the recent drop in oil prices, it is likely that energy-related traffic will continue to put a strain on capacity on Minnesota's core rail network, which will clearly affect rail freight service and efforts to increase passenger rail service in the state. The unreliability and investment needs on the waterway system may also contribute to future demand for rail traffic. Investments in the rail system, including double tracking in some shared freight and passenger corridors with heavy volumes, will be crucial to maintaining service and providing access for Minnesota's passenger and freight rail customers.

Highway and Airport Congestion

Minnesota's highways continue to be congested, especially within the Twin Cities; however, congestion in the region showed some improvement during the last few years. The 2013 Metropolitan Freeway System Congestion Report showed the percentage of congested freeways decreased by 1.5 percent from 2012. MnDOT completed several projects recently aimed at improving traffic flow in the Twin Cities metro area, including upgrading the Highway 169/Interstate 494 interchange, installing Smart Lanes on Interstate 94 to alert travelers to congestion in the Twin Cities area, and constructing new bridges over Interstate 35W.

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[37] *Center for Farm Financial Management.* "Minnesota Basis Analysis: Final Report for the Minnesota Department of Agriculture". July 10, 2014

[38] *Star Tribune*. "BNSF: Blame the weather, not oil trains, for Northstar's delays." February 27, 2014.

[39] *The Washington Post*. "The sorry state of Amtrak's on-time performance, mapped." July 10, 2014.

Trucks carried about 630 million tons, or 63 percent, of goods moving in Minnesota in 2012, a role that is expected to become even larger in the future. The shale oil boom in North Dakota led to an increased demand for sand and raw materials to feed the oil and gas mines. Record harvests in recent years combined with congestion on the rail system also led to an increased need to move grain by truck both within the state and to river and lake ports for export. Increases in manufacturing and demand for goods and services within the population centers are also contributing to increased traffic. As congestion increases on the roadway systems, industry will continue to seek out alternatives, for bulk goods that can move more cost-effectively by rail, and for advanced manufacturing and consumer goods that are more often being moved effectively by intermodal and containerized traffic.

In 2013, the Minneapolis-St. Paul Airport served more than 33 million passengers and accommodated 431,328 landings and takeoffs, making it the 16th largest airport in North America for the number of travelers served. Annual passenger boarding forecasts are expected to grow from 16.4 million in 2009 to 28.4 million in 2030. Over the same time period, total aircraft operations are expected to grow by 40 percent, from 450,000 to 630,000. While runway improvements in the past decade, including the addition of a fourth runway, increased the capacity of the airport, the airport will have to continue to make improvements to its landside and terminal facilities in order to effectively serve increasing airline traffic.[40] Worldwide, airline fleets are moving towards serving more long-haul domestic and international destinations, and reducing their use of regional jets and point-to-point service. Illustrating this trend, the average size of aircraft has grown by approximately 25 percent worldwide in the past 20 years.[41] Minneapolis-St. Paul saw changes in service consistent with these broader trends, such as increased international service. As the airline market continues to grow and shift towards longer trips, it could lead to an opportunity for increased use of intercity rail to serve both as a feeder to long-haul air travel as well as a substitute for short-haul regional air service within the Midwest.

Land Use

In general, population trends show steady growth in metropolitan areas like the Twin Cities, Rochester, Mankato and Duluth in the past several decades, while also illustrating a population decline in rural Minnesota. These trends will continue to influence demand for livable, workable communities that are connected to convenient transportation options. These options will help meet local mobility needs as well as intercity and regional access for people, goods and services.

These trends continued into the 2010s and have other implications on land use. The total number of farms decreased since the 1930s, while the average size of farms steadily increased. The total amount of farmland also decreased near metropolitan areas due to suburban growth. Although suburban growth stagnated in the past five years, farm land in the exurban regions of the Twin Cities and other metropolitan areas increased in value. With the combination of larger, efficient and more profitable farms and a growing demand for agricultural goods, fertile farmland will contain an elevated land value for the foreseeable future.

[40] Minneapolis St. Paul International Airport. *Minneapolis-St. Paul International Airport Final Long Term Comprehensive Plan*, 2010.

[41] Airbus Global Market Forecast 2012–2032.

Minnesota identified a number of identified infrastructure, policy, safety and funding needs and opportunities on the state's freight and passenger rail networks. These, as well as best practice opporunities from other states are described in this section.

INFRASTRUCTURE AND SERVICE GAPS

To maintain the economic advantage of traveling and shipping by rail, various improvements are needed in both the short and long term. Intermodal station development in key areas in central and northern Minnesota, and intermodal station expansion in the Twin Cities area and southeastern Minnesota will help to improve freight movements. Double tracking segments within bottleneck areas will alleviate congestion. Passenger rail expansion should occur on both existing and new separated track to meet the cited demand in Greater Minnesota.

Freight Rail Capacity and Bottlenecks

Demand for rail service to transport Minnesota's agricultural products, raw materials and consumer goods is increasingly competing with rail traffic moving through the state, particularly Bakken shale oil. Infrastructure investment and continued work with rail stakeholders will be needed to continue to serve Minnesota's industries as well as passenger traffic.

Although rail trackage extensively covers all regions of Minnesota, there are some bottlenecks. The Hoffman Junction east of the Union Depot in St. Paul is used by BNSF, CP and UP, and carries 120 trains per day. Bottlenecks in the Minneapolis Junction and corridors to the north caused delays for both the Northstar Commuter Rail service and for freight shipments. The East Metro Rail Study, funded jointly by the three Class I railroads and Ramsey County Regional Railroad Authority, identified specific Hoffman Junction-area capacity improvements that are being systematically pursued. Other bottlenecks near La Crescent and Moorhead worsened statewide system performance. Double tracking segments within the bottlenecks, adding/increasing siding length, improving signal systems, and rehabilitating outdated structures will alleviate these problems as freight shipments and passenger rail demand grow.

Intermodal Service

Intermodal freight stations are areas where cargo can be transferred between transportation modes, such as rail to truck transfer. Since the 1980s, the most consistent and broad increase in demand for rail service was associated with intermodal service, with Minnesota being no exception. At present, intermodal service is only available in the Twin Cities. Several studies have illustrated intermodal service gaps in terms of markets served as well as demand in regions of the state beyond the Twin Cities; however, the sole instance of a terminal located outside the Twin Cities—a BNSF-served ramp at Dilworth—was closed in 2011. The primary reason for its closure— modest traffic volumes and the difficultly and cost of obtaining empty containers for loading products—exemplifies the challenges of implementing intermodal service in regions that lack large populations and/or a large and diversified traffic base.

Passenger Rail

Currently, Amtrak's Empire Builder provides the only passenger rail service in Minnesota. Ridership demand and public support for the service steadily increased in recent years, coinciding with a general increase in Amtrak ridership nationwide.j In Minnesota, the number of passengers has maintained a range between 180,000 and 190,000 passengers, with the highest number of riders using the St. Paul station, followed by Winona. In the near-term, Amtrak and MnDOT are jointly exploring feasibility of adding a second daily Empire Builder train between Saint Paul and Chicago. In the longer term, there is ongoing interest for alternative and complementary passenger rail services.

As described in Chapter 3, Minnesota has three passenger rail projects in advanced planning: ZipRail, NLX, and Twin Cities-Chicago. MnDOT also recognizes strong demand for passenger service in other markets, particularly from the Twin Cities to Northfield, Minnesota and Eau Claire, Wisconsin, as evidenced by outreach efforts described in Chapter 6.

POLICY NEEDS AND OPPORTUNITIES

Multimodal Connectivity

Connections between the rail, road and port systems are key to Minnesota's transportation infrastructure. A number of commodities, from raw iron ore to agricultural exports, rely on these connections to transport their goods from supplier to customer. Minnesota is currently developing a State Multimodal Freight Network. The MFN will include key multimodal hubs, including ports, rail yards, and container facilities, as well as highway and rail infrastructure in the state. The MFN will allow Minnesota to better track freight activity, develop freight performance measures, and potentially prioritize projects or be incorporated into other planning and programming activities.

Corridor Reclamation

Many unused rail corridors have been preserved through interim uses such as bicycle trails. Converting these corridors back to active rail use is often difficult and costly due to encroachment, regulations, and public opposition.

Passenger and Freight System Coordination

Passenger rail systems that will share infrastructure with Minnesota's freight network will require coordination between operations.

Prioritization of Passenger Rail Projects

Advancing passenger rail projects is complex and competition for limited funding is intense; therefore, great attention is necessary for selecting the best projects, having detailed supporting analyses and focusing on moving them through the process.

RAIL SAFETY

The need for improved safety at highway-rail grade crossing is a concern due to a history of accidents with crossing vehicles, bicyclists and pedestrians. Significant improvement has been made with the safety of rail crossings in Minnesota, but many of the currently installed warning devices will need to be replaced by 2030, and improvements beyond active warning devices also will be necessary in some locations. The recent rapid increase in the transport of Bakken shale oil by rail from North Dakota across Minnesota has posed additional challenges to ensuring safety. While the recent drop in oil prices may slow this trend in the short-term, and increased pipeline capacity could have the same effect in the long-term, new safety standards will need to be developed at the national and state levels to better regulate this service. The Federal Surface Transportation Program dedicates $220 million to funding improvements in highway-rail grade crossing protection. A number of states augment this federal funding with state resources, aimed at allocating resources on a safety risk-based process. States and railroads update grade crossing inventory information, which is collected and maintained by USDOT and then used by states in making safety improvement decisions. In most states, grade crossings are maintained by the railroad operator (including the road surface between the rails, and active warning devices), although some states provide crossing maintenance assistance to railroads. Grade crossing funds are administered by the Federal Highway Administration, and the FRA provides assistance for overall grade crossing accident education and prevention. Thirty states cooperate in enforcing federal rail safety regulations and in supporting federally certified rail safety inspectors. These state programs, funded solely with state resources, effectively leverage the efforts of the FRA, and are coordinated through the FRA's eight regional safety offices throughout the country.

FUNDING STRATEGIES AND PUBLIC-PRIVATE PARTNERSHIPS

Funding mechanisms vary significantly depending on the type of service. While public monies would be required to develop new passenger rail lines, private freight companies own and maintain almost all track in Minnesota. Obtaining federal financing is highly competitive and much more limited than was the case at the time of the 2010 State Rail Plan. Although opportunities for funding rail projects have changed significantly over the last few years, a number of state, federal, and private-sector options are available for furthering Minnesota's rail investment needs.

Minnesota State Transportation Bill

In his 2014 State of the State address, Minnesota Governor Mark Dayton said that passing a comprehensive, multimodal transportation bill will be a top priority in 2015. Governor Dayton and various state lawmakers have continued to affirm this statement throughout 2014. Studies, improvements and new development could be funded through state sources if rail-specific funding is included in the bill.

Transportation Investment Generating Economic Recovery Grants (TIGER)

In 2014, USDOT awarded $600 million for 72 projects in 46 states and the District of Columbia through the sixth iteration of its TIGER program. Rail projects have done well throughout the history of this program, offering a substantive opportunity for funding passenger and freight rail development, including infrastructure improvements and technology upgrades; however, there is very intense national competition for a relatively small pool of money of around $500 to $600 million in recent years. Table 2.6 summarizes Minnesota's successful experience with TIGER since the program was initiated in 2009.

Table 2.5: Minnesota TIGER Grants Awarded

PROJECT	YEAR AWARDED	AWARD AMOUNT	DESCRIPTION
St. Paul Union Depot	2009	$35,000,000	Renovate St. Paul's historic Union Depot. Co-locate Amtrak trains with intercity bus services, local transit service, bike, and pedestrian accommodations.
Staples North/South Corridor	2010	$7,650,000	Construct new US 10 bridge over busy BNSF rail tracks where an at-grade crossing existed before.
St. Paul Complete Streets	2010 Planning	$250,000	Survey St. Paul streets to examine alternatives for a city-wide complete streets policy and preparation of a reference Planning Book that will guide future street improvements and design.
Northfield Multimodal Integration	2011	$1,060,000	Construct new walking infrastructure to help pedestrians cross a busy Highway 3 corridor.
Minneapolis Transit Interchange	2011	$10,000,000	Construct a new passenger platform, storage, staging tracks, and public plaza at Target Field Light RailTransit Station in downtown Minneapolis. Separately, replace Dale Street bridge in St. Paul with new bridge under current standards.
Minnesota Rural Roads ITS	2013	$1,457,307	Install intersection conflict warning systems at 15 rural, stop-controlled intersections, which will alert vehicles about oncoming conflicts or dangers.
Port of Duluth Intermodal	2013	$10,000,000	Rebuild and expand 28-acre cargo dick at the Port of Duluth-Superior and connect the site to existing road & rail infrastructure.

PROJECT	YEAR AWARDED	AWARD AMOUNT	DESCRIPTION
US 10 / CSAH 83 Interchange	2014	$10,000,000	Remove signalized intersection and construct full interchange at US 10 and CSAH 83. Construct sidewalk and bike trail where none existed before. Close access to several non-signalized cross streets at US 10.
St. Paul to Multimodal Corridor Plan	2014 Planning	$100,000	Facilitate design study and create master plan to reuse CP Rail Spur as a multimodal corridor for bikes, pedestrians, and potential transit.

Transportation Infrastructure Finance and Innovation Program Loans

The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. TIFIA credit assistance provides improved access to capital markets, flexible repayment terms, and potentially more favorable interest rates than can be found in private capital markets for similar instruments. TIFIA can help advance qualified large-scale projects that otherwise might be delayed or deferred because of size, complexity or uncertainty over the timing of revenues. MnDOT has submitted TIFIA applications for past projects such as the Hiawatha LRT line, in conjunction with the Metropolitan Council.

TIFIA funds have been used to fund rail projects such as the Reno Transportation Rail Access Corridor (ReTRAC) project in Reno, Nevada. The ReTRAC project eliminated 10 at-grade street crossings by replacing them with bridges and constructing one new bridge over the trench, minimizing emergency vehicle delay, vehicular delay, impacts from pedestrian conflicts, whistle warning noise and air quality conflicts. The project allows Union Pacific to improve freight capacity by increasing train lengths to 8,000 feet with double-stacked containers. A $50.5 million TIFIA loan was used, along with other financing methods, to meet the total project cost of $280 million.[42]

Public-Private Partnerships

In order to effectively create PPPs, improved communication, coordination and formalized partnerships between public and private stakeholders are needed. Freight rail is privately owned and operated, and many of the lines envisioned for enhanced passenger service are privately owned and operated freight lines. This makes the need for public/private cooperation essential to addressing many freight and passenger rail needs. Although MnDOT has some authority to use PPPs for Design-Build projects, state legal reform will be required to make PPPs truly viable for rail projects.

As this section discusses the institutional and implementation issues for passenger and freight rail projects, such projects can be examined to determine the extent to which the private sector can or should be involved. MnDOT has limited legal authority to implement some of these PPP approaches, but the state of the practice has changed since MnDOT's PPP authorization legislation was created.[43] This section describes some of these approaches, how MnDOT programs could be expanded, issues raised by PPP implementation and possible applications for projects identified in this Plan.

TYPES OF PUBLIC-PRIVATE PARTNERSHIPS

The 2004 USDOT Report to Congress on Public-Private Partnerships defines a PPP as:

[42] www.fhwa.dot.gov/ipd/project_profiles/nv_retrac.aspx
[43] www.fhwa.dot.gov/ipd/p3/state_legisltation/minnesota.htm.

"A public-private partnership is a contractual agreement formed between public and private sector partners, which allow more private sector participation than is traditional. The agreements usually involve a government agency contracting with a private company to renovate, construct, operate, maintain, and/or manage a facility or system. While the public sector usually retains ownership in the facility or system, the private party will be given additional decision rights in determining how the project or task will be completed." [44]

PPPs vary by the extent to which the public sector transfers project responsibility, risk and ownership to the private sector. Table 2.7 describes PPP methods.

Table 2.6: Public Private Partnerships Infrastructure Approaches

APPROACH	DESCRIPTION
TRADITIONAL APPROACH	
Design-Bid-Build (DBB)	The traditional method of project delivery in which the design and construction are awarded separately and sequentially to private firms.
PUBLIC-PRIVATE PARTNERSHIPS APPROACH	
Design-Build (DB)	Combines the design and construction phases into a single fixed-fee contract, thus potentially saving time and cost, improving quality, and sharing risk more equitably than the DBB method.
Private Contract Fee Services/Maintenance Contract	Contracts to private companies for services typically performed in-house (planning and environmental studies, program and financial management, operations and maintenance, etc.)
Construction Manager @ Risk (CM@R)	A contracted construction manager provides constructability, pricing, and sequencing analysis during the design phase. The design team is contracted separately. The CM stays on through the build phase and can negotiate with construction firms to implement the design.
Design-Build with a Warranty	A DB project for which the design builder guarantees to meet material workmanship and/or performance measures for a specified period after the project has been delivered.
Design-Build-Operate-Maintain (DBOM), Build-Operate-Transfer (BOT), or Build-Transfer-Operate (BTO)	The selected contractor designs, constructs, operates, and maintains the facility for a specified period of time meeting specified performance requirements. These delivery approaches increase incentives for high-quality projects because the contractor is responsible for operation of the facility after construction. The public sector retains financial risk, and compensation to the private partner can be in the form of availability payments.
Design-Build-Finance (DBF), Design-Build-Finance-Operate (DBFO), or Design-Build-Finance-Operate-Maintain (DBFOM)	DBF, DBFO, and DBFOM are variations of the DB or DBOM methods for which the private partner provides some or all of the project financing. The project sponsor retains ownership of the facility. Private sector compensation can be in the form of tolls (both traffic and revenue risk transfer) or through shadow tolls (traffic risk transfer only).
Long-Term Lease Agreements/Concessions (Brownfield, Greenfield)	Publicly-financed facilities are leased to private sector concessionaires for specified time periods. The concessionaire may pay an upfront fee to the public agency in return for revenue generated by the facility. The concessionaire must operate and maintain the

[44] Report found at www.fhwa.dot.gov/reports/pppdec2004/index.htm.

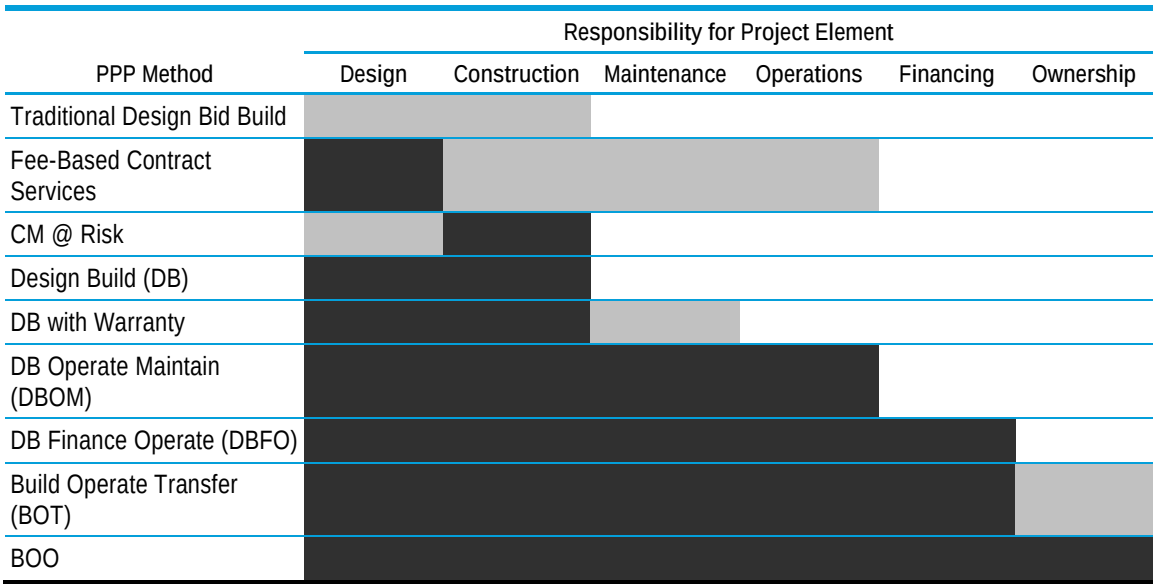
APPROACH	DESCRIPTION
	facility and may be required to make capital improvements. In the case of a new facility, this concession is called a greenfield; for an existing facility, it is called a brownfield.
FULL PRIVATIZATION	
Build-Own-Operate (BOO)	Design, construction, operation and maintenance of the facility are the responsibility of the contractor. The contractor owns the facility and retains all operating revenue risk and surplus revenues for the life of the facility. The Build-Own-Operate-Transfer method is similar, but the infrastructure is transferred to the public agency after a specified time period.
Asset Sale	Public entity fully transfers ownership of publicly financed facilities to the private sector indefinitely.

Source: Public-Sector Decision-Making for Public Private Partnerships, NCHRP Synthesis Report 310, 2009, Table 1.

[a] Listed from least private involvement to greatest.

Table 2.8 describes some of these PPP methods according to the involvement of the public and private sector in elements of surface transportation projects.

Table 2.7: Types of Public Private Partnership Approaches in Surface Transportation Projects



Source: Connecticut Transporation Strategy Board, Connecticut Electronic Tolls and Congestion Pricing Study– Final Report – Volume 2: Background Report, April 2009, Table 4.1, page 4-4, found at http://www.ct.gov/opm/lib/opm/tsb/reports_tsb/final_report_-_tolling_study.pdf.

Legend: Public Sector Public/Private Private Sector.

PUBLIC-PRIVATE PARTNERSHIP GUIDELINES

MnDOT has authority to design and construct transportation projects through DB contracts.[45] From 1996 through 2002, MnDOT awarded DB contracts on a lowest bid basis; from 2002 onward, awards have been made on a best value basis. Since 2002, MnDOT awarded seven DB highway project contracts, totaling more than $860 million. Four more projects funded through the American Recovery and Reinvestment Act of 2009 were procured through DB.

Minnesota statutes do not restrict DB projects to highway projects; however, given the structure of the legislation (which limits the number of DB contracts on an annual basis and requires an annual report on DB contracts), MnDOT might seek more explicit authority to use DB for rail projects.

MnDOT has had authority since 1993 to enter into PPPs for toll roads through a development agreement that "may provide for any mode of ownership or operation approved by the road authority," specifically authorizing BOT or Build-Transfer-Operate methods. This authority does not extend to other transportation projects such as railroad projects.[46, 47]

APPLICABILITY FOR RAIL PROJECTS

A TRB special report, Funding Options for Freight Transportation Projects, describes a number of freight projects funded and implemented through different methods, including some PPPs. [48] The report also summarizes a number of general provisions for public investments in freight transportation projects.

Projects likely to be chosen for public contributions include:

- Projects with construction cost beyond the capacity of private infrastructure owners/operators or local/regional governments
- Institutionally complex projects, as indicated by the number of public jurisdictions and private sector entities
- Likely availability and cost of financing in the private credit markets to fund the projects
- Eligibility for funding through established federal or state programs (lack of such programs may lead to public funding through PPPs)
- Need for extensive upfront planning (including environmental clearance), coordination and seed money (this is the case for new passenger rail services with revenue risk)
- Project risks associated with the novelty of organizational or technological solutions (high-risk, high-return projects may need governmental assistance)

Effective public management of a PPP program for rail also would contain elements of the freight investment programs cited in the TRB study, such as:

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[45] Minn. Stat., Section 161.3410 to 161.3428.

[46] Minn. Stat., Section 160.84 to 160.98.

[47] Section 160.85 (4) (a).

[48] Funding Options for Freight Transportation Projects, TRB Special Report 297, April 2009.

- Strong capabilities to evaluate project benefits and shared costs and standard economic valuation methods
- Decision-making that is transparent and consistent
- Decision-making criteria that defines when state resources are needed (as opposed to regional or local) and when projects qualify for state funding (even if such projects are not uniformly distributed across the state)
- Ability to accomplish state goals:
    - Projects that are part of the state transportation planning process
    - Projects that have measurable external benefits and which would not have been begun or completed without public assistance

PPPs should be subject to periodic reviews to assess the economic value of the completed projects (compared to estimated value) and the projects' success in meeting other goals.

MnDOT has not yet used PPPs for freight or passenger rail projects, but there is precedent set in other states that Minnesota could consider. These practices relate to PPPs for rail line development, as well as operations.

Passenger service between Oklahoma City and Tulsa, Okla. This to-be-initiated service represents an example of privately operated passenger service over a private short line railroad. In May 2014, the state of Oklahoma sold the Sooner Subdivision, a 97.5-mile rail line between Sapulpa and Midwest City, for $75 million to the highest bidder, Stillwater Central Railroad LLC, a unit of Pittsburg, Kansas-based Watco Companies LLC. (Watco/Stillwater Central). Previously the rail line was owned by the state and operations were leased for freight rail service to Watco/Stillwater Central since 1998. The Oklahoma DOT said the proceeds from the sale of the rail line will go into a revolving fund for improvements to other railroad facilities, including crossings. During sale proceedings, several communities along the Sooner Subdivision passed resolutions urging the state not to sell it, fearing that would put an end to any chance for passenger service along the line.[49]

Watco/Stillwater Central partners with Iowa Pacific Holdings to implement scheduled passenger service. While Iowa Pacific Holdings ran test passenger trains along the line to demonstrate line viability, several steps must be taken before full operation, including receiving approval from the FRA to operate the line, which is expected in 2015.

There were numerous terms of the 2014 Sooner Subdivision sale for Minnesota's consideration, including:

- Watco/Stillwater Central must establish a pilot passenger rail service program within five years or face a $2.8 million penalty
- The State of Oklahoma retains the right to acquire a passenger rail easement should Watco/Stillwater Central decide not to operate such a service after 10 years
- The line must be accessible to other rail companies and that within seven years Watco/Stillwater Central upgrade the line to enable trains to safely travel at faster speeds

[49] *Tulsa World*, Oklahoma officials to discuss possible Sooner Sub rail line sale with BNSF, Watco, February 19, 2014

- The track must be improved from a track Class II to Class III; the latter designation will permit freight traffic up to 40 mph and passenger traffic up to 60 mph.

The rail companies pledged to provide twice-daily, round-trip service.

Passenger service between Miami and Orlando, Florida. Currently in development, this $2 billion initiatve is the most ambitious and substantive example of a privately developed, financed, constructed, operated, and maintained passenger rail system. Called All Aboard Florida, the project is being developed by Florida East Coast Industries, LLC, an infrastructure and real estate development company, and parent company of the Florida East Coast Railway. The planned route extends for 230 miles from Miami to Orlando International Airport, with intermediate stops at Fort Lauderdale and West Palm Beach. With speeds of up to 125 miles per hour, a complete trip is expected to take three hours from end to end, and is geared towards business travelers and tourists rather than commuters. Infrastructure improvements will be extensive, and include construction of new stations at all of the planned stops, a new line along Florida State Road 528 between the Orlando International Airport and the FEC main line at Cocoa, and numerous infrastructure improvements to the existing FEC rail corridor. While the project presently plans to rely solely on private funds, the AAF applied for $1.6 billion in Railroad Rehabilitation and Improvement Financing funds, a loan and loan guarantee program administered by FRA. This required preparation of an environmental assessment and environmental impact statement. FRA issued a Finding of No Significant Impact for the Miami-to-West Palm Beach segment in 2013. The EIS for the full alignment was out for public comment through Dec. 3, 2014, with a decision pending by the FRA. The Miami-to-West Palm Beach segment is currently under construction, rolling stock is on order, and the complete line to Orlando is projected to be fully operational by 2021. [50]

Passenger service between Dallas and Houston, Texas. This future service in the early stages of development represents an example of public-private partner collaboration on planning, with construction, operations and maintenance of the passenger rail system funded by the private sector. Similar to the example in Florida, this project pledges not to use Texas tax dollars for the construction of the project. The 240-mile high-speed rail project from Dallas to Houston was proposed by the Texas Central High-Speed Railway, LLC. TCR is a private, for-profit company that desires to transport riders between the cities in less than 90 minutes (faster than auto and competitive with air). TCR is working with Central Japan Railway Company to develop the N700-I Bullet trains, based on the Tokaido Shinkansen that is currently operating in Japan with a 50-year track record and an average annual delay of less than 1 minute. This high-speed line would operate on a dedicated right of way and would not share track or infrastructure with conventional North American rail operations. FRA and the Texas DOT prepared an EIS; public comments were accepted throughout the process that ended on Jan. 9, 2015. A scoping report is under development. The project is estimated to cost $10 billion, with construction beginning in 2016, and service expected to begin as early as 2021.[51]

BEST-PRACTICE OPPORTUNITIES FROM OTHER STATES

RAIL-ELIGIBLE CORRIDOR INVESTMENTS

Minnesota, along with a number of other states, identified major intercity corridors that enable economic activity, and focus infrastructure investment in modes within these corridors. These programs allow for capacity expansion and congestion relief in road and rail facilities. Examples include:

[50] All Aboard Florida - Miami to Orlando Passenger Rail Service, www.fra.dot.gov/Page/P0672

[51] Dallas to Houston High-Speed Rail – Passenger Service from Houston to Dallas, www.fra.dot.gov/Page/P0700

- Interregional Trade Corridors (Minnesota). In 2000, MnDOT designated a primary set of highways for moving goods and people between regional trade centers in Minnesota. This set, called the Interregional Corridor System, is comprised of 2,939 miles of highways. As described in the Minnesota Statewide Transportation Plan, 2009–2028, the IRC represents only 2 percent of all roadway miles in the state, but carries approximately 27 percent of all vehicle miles traveled and the majority of freight traffic. To complement the IRC system, MnDOT also designated a set of Regional Corridors that connect smaller trade centers with larger ones or with IRCs. As highlighted in the STP, "many of the Regional Corridor routes serve as the primary transportation linkage into and out of entire regions, especially in Greater Minnesota, providing critical support to the region's ability to move people and freight in a cost-effective way." These corridors could serve as a primary focus for investment in rail projects as well as highway, and are consistent with many of the major freight rail and potential passenger rail corridors.

- Goods Movement Action Plan (California). California's cabinet agencies for transportation and environmental issues cooperated to identify a program of investment in freight systems that increase capacity, reduce freight-related greenhouse gas emissions and improve security. The program, which allocates $3.1 billion in bond financing, identified and evaluated projects with assistance of stakeholders.[52]

- Strategic Intermodal System (Florida). Florida's Legislature directed the Florida DOT to plan for near- and long-term investments in a network of intermodal transportation infrastructure: commercial airports, ports and waterways, freight rail and transit terminals, passenger and freight rail facilities, and highways. The SIS network carries "more than 99 percent of all commercial air passengers, virtually all waterborne freight tonnage, almost all rail freight and more than 68 percent of all truck traffic and 54 percent of total traffic on the State Highway System."[53]

- Connect Oregon (Oregon). Oregon created a program allocating lottery-backed bonds to transportation improvements to connect the highway system to other modes, including rail, air, marine, transit, and bicycle/pedestrian. The program is currently in its fifth installment and is administered through a performance-based application review process. A total of $100 million in allocations were approved in 2005, 2007 and 2009 and $40 million and $42 million allocations were made in 2011 and 2013, respectively, bringing total program funding to date of $382 million. Including the addition of leveraged funds, the program represents approximately $834 million in direct investment in multimodal transportation improvements. During the first four installments, rail received the largest portion of funds, with 44 percent of the total. A sixth installment of the program is currently being explored for the 2015–2017 biennium.[54]

FREIGHT RAIL IMPROVEMENT PROGRAMS

[52] Business, Transportation, and Housing Agency and the California Environmental Protection Agency, *Goods Movement Action Plan, 2007.* www.dot.ca.gov/hq/tpp/offices/ogm/gmap.html

[53] Florida Department of Transportation, Office of Policy Planning. *SIS Strategic Plan.* www.dot.state.fl.us/planning/sis/strategicplan/

[54] Connect Oregon V, Oregon Department of Transportation. www.oregon.gov/ODOT/TD/TP/pages/connector.aspx

Many states have programs to offer financial assistance to freight railroad operations. In some cases, these programs are focused on short line or regional railroads and can involve public ownership of rail lines with private operators. Other programs offer tax incentives for expansion of facilities, spurs or lines for new or expanded business development. Some states offer assistance through revolving loan programs while others make direct grants. Examples include:

- Freight Railroad Preservation Program (Wisconsin). In addition to a loan program for freight rail improvements, Wisconsin invests appropriated funds in grants to local governments and railroads for public ownership of railroad lines which are operated by private railroads. The program was allocated $30 million in the state's 2011–2013 biennial budget, and $52 million in the state's 2013–2015 biennial budget. The current FRPP program replaced the original rail assistance program in 1992. Since 1980, approximately $175 million in FRPP grants were awarded for more than 75 rail acquisition/rehabilitation projects.[55, 56]

- Stimulus-Funded Freight Rail Improvements (Ohio). Ohio took advantage of modal flexibility in the highway allocations in the American Recovery and Reinvestment Act of 2009, allocating $61 million to 21 rail-related projects in the summer of 2009. The Ohio Railroad Development Commission is administering the projects, identified through the Commission's planning activities.[57]

PASSENGER RAIL INVESTMENT PROGRAM

Most investments in passenger rail capacity by states are expanding the facilities of freight railroads over which the passenger services will operate. In many cases, these passenger rail investment programs provide operating benefits for the freight railroads and can be characterized as investments in shared corridors. Examples include:

- North Carolina Railroad Improvements (North Carolina). The 317-mile railroad between Charlotte, Raleigh and Morehead City is a publicly-owned private railroad. North Carolina has invested $30 million in track improvements on the corridor between Raleigh and Charlotte (the path of state-supported Piedmont Route passenger service), with $35.5 million in projects under way and another $87 million in improvements in planning and engineering stages. The North Carolina DOT prepares design plans and provides construction funds, and Norfolk Southern (which holds an operating lease on the NCRR) produces final plans and performs the construction work.) Improvements since 2001 shortened trip times from Raleigh to Charlotte by 35 minutes.[58]

- Rail Enhancement Fund (Virginia). Virginia created a special fund administered by the Virginia Department of Rail and Public Transportation (collected from a portion of car rental taxes) to apply to projects to expand rail facilities for passenger and freight projects. VDRPT created a public benefit methodology that measures prospective fund applications against a series of performance measures. VDRPT, in conjunction with a Rail

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[55] *Freight Railroad Preservation Program,* Wisconsin Department of Transportation. www.dot.wisconsin.gov/localgov/aid/frpp.htm

[56] "Wisconsin allots $52 million for freight-rail preservation program." Progressive Railroading, July 2013. http://www.progressiverailroading.com/mow/news/Wisconsin-allots-52-million-for-freightrail-preservation-program--36776

[57] www.dot.state.oh.us/Divisions/Rail/Programs/special/Pages/default.aspx

[58] www.bytrain.org/track/

Advisory Board, recommended a six-year investment plan that allocates $150 million in enhancement funds to corridor projects for commuter and intercity passenger rail and freight corridors.

3.0 PROPOSED PASSENGER RAIL IMPROVEMENTS AND INVESTMENTS

As a part of the 2010 Statewide Freight and Passenger Rail Plan, a needs analysis was conducted for all potential passenger rail corridors in Minnesota. A process was developed to derive a clear understanding of needs on the rail system for passenger operations,today and in the future (2040). Key to this process was the understanding of the cumulative effect projects have on each other and how important the underlying freight infrastructure is to the eventual development of a robust passenger rail network in the state (with a few exceptions where entirely new alignments were considered). Overall infrastructure, rights of way, rolling stock and operating and maintenance costs were identified. These improvements are effectively independent of the other improvements.

The 2010 State Rail Plan completed an improvement cost evaluation to identify the prioritized corridors. In the 2015 Minnesota State Rail Plan, improvement costs were carried forward from the 2010 State Rail Plan. The cost estimates are general in nature and are not detailed engineering cost estimates. These order-of-magnitude cost estimates are used for planning purposes, as was done with the ridership forecasts in Chapter 2. Although some corridors provide connections to points beyond the state border, this evaluation only reflects costs for work in the state of Minnesota.[59] Several of the corridors listed have gone through advanced levels of engineering assessment; those cost estimates should take precedence for evaluating subsequent steps of project development. Detailed information on the cost evaluation methodology are found in the Appendix C.

2010 Plan Corridor Prioritization

The 2010 Plan ranked passenger rail corridors as Phase I or Phase II corridors. Phase I corridors included:

- High Speed Rail Service from:
  - Twin Cities to Milwaukee/Chicago,
  - Twin Cities to Duluth (Northern Lights Express), and
  - Twin Cities to Rochester (Zip Rail).
- Enhanced conventional passenger rail service (sustained speeds of 79 to 90 mph) from the Twin Cities to St. Cloud; Mankato; Fargo, N.D.; Eau Claire, Wisc.; and between Minneapolis and St. Paul.

Phase II corridors included:

- Rail connections to additional intercity and commuter rail markets in Minnesota, and to an I-35 Corridor, Red River Valley, the eastern plains, Wisconsin and Canada.

These corridors were carried forward into the 2015 Minnesota State Rail Plan, as described below.

[59] The one exception is the Eau Claire to Twin Cities corridor which is predominantly in Wisconsin. Including only Minnesota costs and benefits would not have been fully representative of that corridor.

2015 Minnesota State Rail Plan Corridor Prioritization

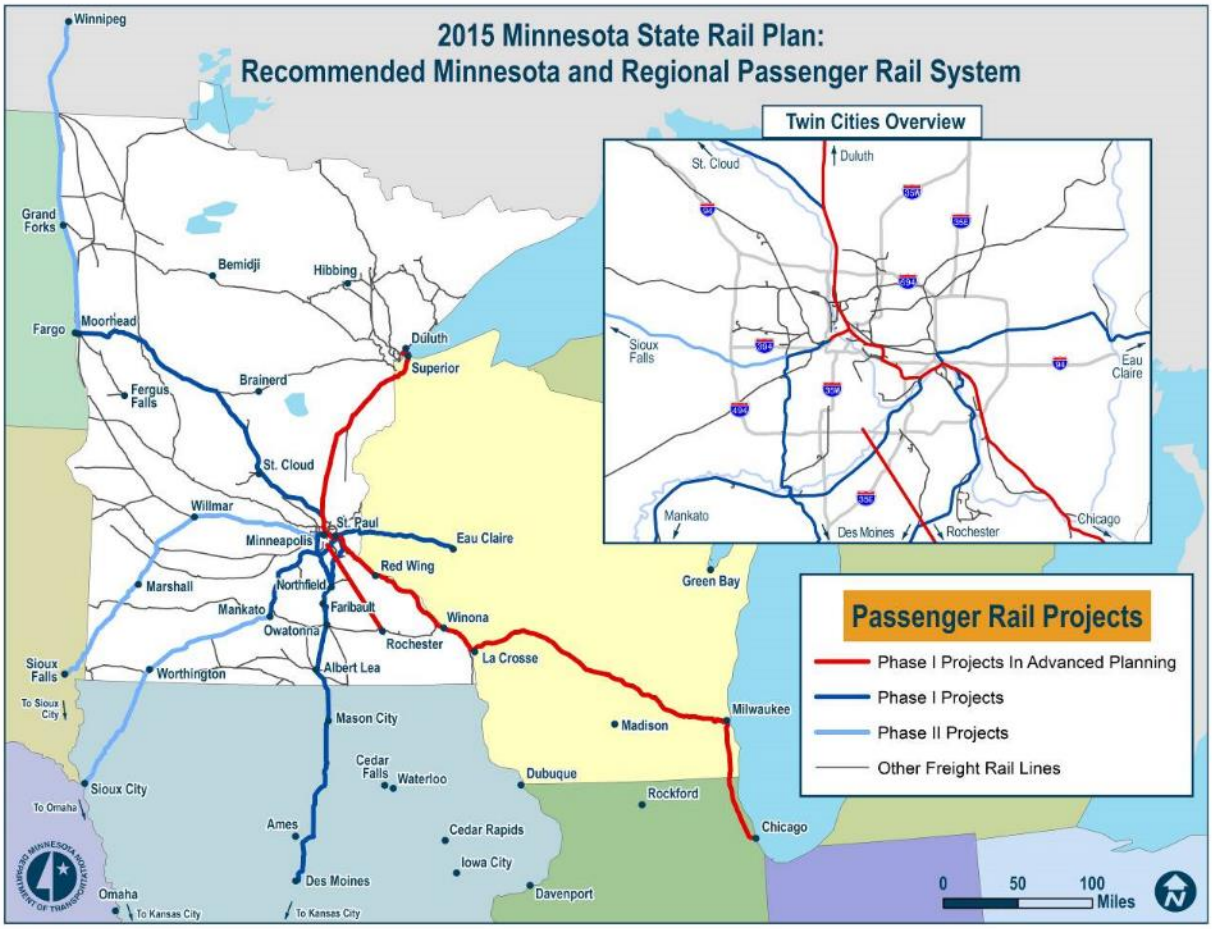
The 2015 Minnesota State Rail Plan establishes three levels of corridor prioritization. The top priority is Advanced Planning—the corridors that have entered focused planning processes. As of 2015, these include a second Empire Builder between Chicago and the Twin Cities, the Milwaukee to Twin Cities segment of the Chicago to Twin Cities HSR, Zip Rail and Northern Lights Express. These proposed services are undergoing in-depth analyses that include engineering, demand analysis, and examination of project costs and benefits .

The next two levels apply to projects that have not yet entered corridor-level planning:

- Phase I: Projects that are within a 0–20 year implementation horizon
- Phase II: Projects that have a 20+ year implementation horizon

Passenger rail corridors prioritized in this plan are shown in Figure 3.1.

Figure 3.1: Passenger Rail Corridors



Phase I Corridors in Advanced Planning

Through the phased prioritization developed as a part of the 2010 State Rail Plan, four corridors advanced into planning activities: a second frequency on the Amtrak Empire Builder between the Twin Cities and Chicago, and HSR (110 mph) service in three corridors that showed significant potential for an upgraded level of service. These corridors include the Milwaukee to Twin Cities segment of the Chicago to Twin Cities corridor, Twin Cities to Rochester and Twin Cities to Duluth. The specific needs for implementing high-speed service are described below for each of these corridors.

The planning process assumes 110 mph service, but further assumes that new construction should not preclude 150 mph service implementation at a later date. In addition to larger radius curves, 150 mph service will require complete grade separation and tighter tolerances in track construction. Electrification also may be desirable depending on rolling stock options procured for higher speed service. Up to 125 mph service may share right of way with existing freight lines or operate on dedicated track.

TWIN CITIES TO CHICAGO

Two studies are currently underway on the Twin Cities to Chicago corridor.

Intercity: Twin Cities to Chicago 2nd Train Feasibility Study

Amtrak is presently conducting a feasibility study for the provision of one additional state-sponsored intercity passenger rail service in the Chicago, Ill – Milwaukee, Wisc – St. Paul, Minn – Minneapolis, Minn – St. Cloud, Minn corridor for MnDOT and WisDOT. With a few modest exceptions, the route being studied essentially follows that of Amtrak's current Empire Builder trains between Chicago and St. Cloud. The study assumes that east of St. Paul, station stops will be the same as those of the Empire Builder service. However, within the Twin Cities area and beyond to St. Cloud, four different terminals (St. Paul, Minneapolis, St. Cloud via Minneapolis, and St. Cloud via Fridley) are being studied to reflect a different combination of station stops. The study will analyze schedules, infrastructure requirements, operating costs, and rolling stock. Ridership and revenue forecasts will be developed based on current timetable speeds up to 79 mph, where practical. The feasibility study is expected to be completed in early 2015.

HSR: Twin Cities to Milwaukee Tier 1 EIS

High-speed rail (110 mph) service is proposed between the Twin Cities and Chicago. This scenario addresses HSR service between the Twin Cities and Chicago for the portions of the corridor that are within Minnesota.

The Minneapolis/St. Paul to Milwaukee corridor is a segment of the approximately 435-mile high-speed passenger rail corridor between the Twin Cities and Chicago, which in turn is part of the Chicago Hub Network, one of 10 designated regional HSR systems in President Obama's vision to build a network of HSR corridors across the United States. The Twin Cities to Chicago corridor is one of several major branches in the hub-and-spoke passenger rail system centered in Chicago as identified in the Midwest Regional Rail Initiative plan.

As part of the broader MWRRI studies, the Minneapolis/St. Paul – Milwaukee HSR project completed an Alternatives Selection Report in 2012 that identified the CP Mail Line route (Amtrak's Empire Builder route) as the best locational alternative for the segment between Twin Cities and Milwaukee. Since that time, the project team completed various modeling studies and will release a scoping document under state environmental regulations in 2015, and then begin work on a Tier 1 Environmental Impact Statement. The EIS would examine service alternatives on the route and examine potential environmental impacts of developing high-speed passenger rail in this corridor.

In addition, the 2012 East Metro Rail Capacity Study recommends rail mainline expansion in rail yards to the north and east of Union Depot as passenger rail develops and expands in the area. Dedicated HSR track through this area is likely.

Minneapolis and St. Paul

This connection is also being studied for HSR as part of the Minneapolis/St. Paul to Milwaukee HSR Tier 1 EIS. Direct service between separated and distinct Central Business Districts also is recommended in the Federal Railroad Administration "Corridor Transportation Plan: A Guidance Manual" (2005).

The "Target Field Station to St. Paul Union Depot Alternatives Screening Report," released in 2014, further explores the viability of a passenger rail connection between the two downtown stations. Although no costs were analyzed, the report will be used as a reference for the Tier 1 National Environmental Policy Act analysis for the Twin Cities-Milwaukee HSR line. From a system standpoint, this connection is an absolute necessity for a statewide passenger rail network since it provides system efficiencies and advantages gained from run-through routing, rider convenience and time advantages.

The Alternatives Screening Report analyzed three reasonable routes: the North, Central and South Routes. Moving from Minneapolis to St. Paul, all three routes use existing BNSF's Wayzata and Midway Subdivisions between Target Field Station and St. Anthony Junction near Minnesota Highway 280. From there, all three routes diverge into their respective alignments.

The South Route runs from St. Anthony Junction onto Minnesota Commercial Railroad track, where it connects with CP's Merriam Park Subdivision en route to Union Depot. The South Route is single tracked for its entire length, but contains sufficient right of way for relaying a second mainline track. This routing contains 23 curves greater than two degrees, nine at-grade crossings and 11 existing rail bridges. It is believed that all at-grade crossings meet current FRA standards for 79 mph corridors. Currently, Amtrak's Empire Builder service to the Twin Cities travels along the South Route and includes a stop at the Union Depot in St. Paul.

The North Route and Central Route both operate on mostly BNSF right of way from St. Anthony Junction to Hoffman, where they connect with the UP Albert Lea Subdivision into Union Depot. The North Route uses the St. Paul Subdivision, while the Central Route continuously uses the Midway Subdivision past St. Anthony. Both of these corridors contain much wider rights of way and hold more mainline track than the South Route. Both alignments also have fewer at-grade crossings and contain fewer critical rail bridges than the South Route, but also bear more freight congestion. These two routes would also require a longer dwell time at Union Depot than the South Route, increasing overall travel time on those routes.

The Screening Report recommends carrying the South Route forward for additional analysis in the Twin Cities–Milwaukee Tier 1 EIS, as it contains the fastest possible travel time between the two downtown areas. The report also provides the ability to construct additional capacity to accommodate passenger train frequencies and potential freight growth. The report recommends that the North and Central routes be excluded from any further consideration as they do not meet the project's purpose and hold significant physical, engineering and operational challenges.

The three routes analyzed in the Screening Report are shown in Figure 3.2.

HSR: TWIN CITIES TO ROCHESTER (ZIP RAIL)

High-speed rail (186+mph) service is proposed between the Twin Cities and Rochester. This corridor is also known as the Zip Rail project. A large portion of this alignment is greenfield—meaning no existing rail lines run here—which would require significant investments for HSR implementation.

The Zip Rail Tier I EIS is scheduled for completion in late 2015. The proposed 100-mile corridor travels through seven counties and trains would operate at speeds as high as 186+ mph on dedicated track along the corridor. The system would shorten the travel time between the Twin Cities and Rochester, and will provide more travel options for the growing population in the Twin Cities and southeastern Minnesota. The University of Minnesota and Mayo Clinic are predicted to attract travel demand, and both would benefit greatly from a multimodal transportation network. Based on several factors of evaluation, eight corridor alternatives progressed from the scoping stage of the project to the Tier 1 EIS, where they would be compared with a no-build alternative. A Service Development Plan also will be developed as part of the Tier 1 EIS.

The Zip Rail Final Scoping Decision document was released in January 2015, but did not include any additional specific cost estimates for various alternatives. The Zip Rail Tier I EIS will include detailed cost estimates for the preferred corridor alternative identified.

The results of the EIS will impact the 2015 Minnesota State Rail Plan since it will provide further insight on the viability of HSR service between Rochester and the Twin Cities and will identify a corridor for further study in a Tier 2 EIS.

HSR: TWIN CITIES TO DULUTH (NLX)

The Northern Lights Express is a proposed high-speed intercity passenger rail service that would operate between Minneapolis and Duluth. The NLX project includes planning, environmental review, engineering design and construction of the infrastructure required to implement daily intercity passenger train service at speeds up to 110 mph along a 152-mile corridor on track owned by the BNSF Railway. Terminal stations would be located in Minneapolis at Target Field Station and in Duluth at the historic downtown station known as the Depot. Intermediate stations are planned in Coon Rapids, Cambridge and Hinckley, Minn., as well as in Superior, Wisc. Included in the project will be procurement of intercity passenger rail equipment, construction of layover and maintenance facilities, selection of an operator, development of a system safety plan, and completion of all necessary agreements to operate over BNSF tracks.

The 2010 State Rail Plan identifies this corridor as a Phase I project for high-speed intercity passenger rail service, providing up to eight round trips per day with speeds up to 110 mph. The NLX corridor meets the definition of ”emerging HSR” as defined in the FRA HSR Strategic Plan. The NLX Service Development Plan and Tier 1 Service Level Environmental Assessment were completed in March 2013. A Finding of No Significant Impact and state Negative Declaration were issued in August 2013. The NLX Project is now in the Preliminary Engineering/NEPA phase, which includes preliminary engineering, ridership forecasts, identification of station and facility locations, a financial plan and completion of the Tier 2 EA. The PE/NEPA phase is expected to be completed in the first quarter of 2016.

A screening analysis conducted as part of the Tier 1 EA identified 17 alternative routes. The screening criteria included population, route distance, presence of route defects, and other factors. Additional consideration was given to travel time, proximity to markets, conflicts with freight or future rail projects, conflicts with existing ownership, system connectivity, capital costs, and public support. The preferred route, the BNSF mainline between Minneapolis and Duluth, was selected as the result of this screening process.

As part of the current PE/NEPA phase, MnDOT is examining several alternative operating plans to optimize ridership, revenue and benefit-cost. Variables being examined include the number of round trips (four, five, six and eight), maximum speed (90 or 110 mph), station locations and facility locations. Each alternative operating plan is associated with a set of infrastructure improvements necessary to ensure schedule reliability and minimize the impact on freight operations. Stations in Minneapolis at Target Field Station and in Duluth at the Duluth Depot both require modification to accommodate the NLX service. New stations need to be constructed in intermediate cities. Layover and maintenance facilities will be required at locations consistent with the operating plan. Capital costs related to

track include upgrade from Class 4 to Class 5 or 6 to accommodate higher speeds, extension of sidings to allow freight trains to pull off the main track for passenger trains, special track work such as crossovers to improve operational flexibility and in some locations new track. All grade crossings would be provided with warning devices, including such features as gates, flashers and medians.

Final design, construction and vehicle procurement would take place upon completion of preliminary engineering and Tier 2 project level environmental review, if sufficient funding is secured. Operations could begin in 2019–2020.

Costs for this project are being developed in the current Tier 2 EIS and will be released upon completion.

Phase I Corridors

For the Phase I corridors, several cost values were estimated. A definitive cost is difficult to establish because any passenger rail service operating on a freight route would need to be negotiated between the passenger rail provider and the freight railroad. The estimated cost values include:

- Infrastructure Cost. This value represents the infrastructure needs for passenger service in 2040 above and beyond the total infrastructure needs identified for freight. Track, signal systems and crossings are included in this cost.
- Rolling Stock. This is the cost to purchase rolling stock to operate these services. In general, it is assumed that new rolling stock will be required for each new route, with the exception of the Twin Cities Connection, which can readily be operated as part of another service. As there may be opportunities for synergies among the services, a 20 percent discount to the systemwide cost of rolling stock was applied to the best case forecast.
- Capacity Rights Cost. Because the actual cost must be negotiated with the freight railroad for use of the network, it is likely that the freight railroad will expect passenger rail to pay more than just the additional infrastructure cost. Since the owner (freight railroad) has invested in their own reserve capacity, they likely would attempt to maintain the same level of reserve capacity after implementation of passenger service. There is no guarantee that all of the freight needs will be addressed prior to implementing passenger rail service. To account for this, a "capacity rights cost" was estimated based on the negotiated public investment made as part of the Northstar service—roughly $85,000 per train mile for the base case and $40,000 for the best case. This represents a best guess for a potential negotiation and is useful only in helping to qualitatively assess costs.
- Operations and Maintenance Costs. This value represents the costs required to operate the service and maintain the track and rolling stock. This is reported as an annual cost. Operating and maintenance costs were estimated at $70 per train mile of service and were estimated for the entire distance of each route.

INTERCITY: TWIN CITIES TO ALBERT LEA (I-35 CORRIDOR)

This corridor is proposed for standard (79 mph) passenger rail service with accommodation for up to four round trips per day. The corridor includes segments from downtown Minneapolis and/or downtown St. Paul to Northfield, Northfield to Albert Lea and Albert Lea to Des Moines. The segment from Minneapolis to Northfield would use the CP MN&S subdivision, while all other service would use the UP "Spine Line" from St. Paul to Des Moines. The Iowa State Rail Plan envisions this route to continue on to Kansas City and other rail connections. For the purpose of this analysis, costs are only provided for the segments within Minnesota between the Twin Cities and Albert Lea. Improvements are summarized in Table 3.1.

Table 3.1: 2040 Passenger Service Needs – Twin Cities to Albert Lea [a]

NEED		COST TO UPGRADE (MILLIONS)
Infrastructure		$30.2
Other Costs	Rolling Stock	$72.0
	Positive Train Control	$11.5
	Capacity Rights – Twin Cities to State Line [b]	$76.8
	Operations and Maintenance Costs [c]	$19.0

a Passenger service need estimates include engineering and contingency costs.
b Negotiated on a case by case basis.
c Annual cost is post implementation.

INTERCITY: TWIN CITIES TO EAU CLAIRE, WISCONSIN

This corridor is proposed for standard (79 mph) passenger rail service between the Twin Cities and Eau Claire, Wisc.. This route has potential to be a bi-state, intercity commuter corridor. While ridership for both states was reviewed, costs are summarized by state. Since most of this alignment is in Wisconsin, Wisconsin data is essential to evaluating this corridor. Improvements are summarized in Table 3.2.

Table 3.2: 2040 Passenger Service Needs – Twin Cities to Eau Claire, Wisconsin [a]

NEED		COST TO UPGRADE (MILLIONS)
MINNESOTA		
Infrastructure		$14.8
Other Costs	Rolling Stock	$72.0
	Positive Train Control	$1.9
	Capacity Rights [b]	$12.2
	Operational and Maintenance Costs [c]	$3.0
WISCONSIN		
Infrastructure		$73.2
Other Costs	Positive Train Control	$7.0
	Capacity Rights [b]	$46.9
	Operations and Maintenance Costs [c]	$11.6

a Passenger service need estimates include engineering and contingency costs.
b Rolling stock may not be necessary if other corridors are implemented.
c Negotiated on a case by case basis.
d Annual cost is post implementation.

INTERCITY: TWIN CITIES TO FARGO/MOORHEAD

The route of the existing Amtrak Empire Builder, this corridor is proposed for standard (79 mph) passenger rail service. This corridor also overlaps the existing Northstar service to Big Lake, and the proposed Northstar Cambridge Extension. Segments on this line include Minneapolis to Coon Rapids, Coon Rapids to Big Lake, Big Lake to St. Cloud and St. Cloud to Fargo/Moorhead. Improvements are summarized in Table 3.3.

Table 3.3: 2040 Passenger Service Needs – Twin Cities to Fargo/Moorhead [a]

NEED		COST TO UPGRADE (MILLIONS)
Infrastructure		$50.6
Other Costs	Rolling Stock	$18.0
	Positive Train Control	$24.3
	Grade Crossing Improvements	$3.6
	Capacity Rights – Minneapolis to Fargo/Moorhead [b]	$41.1
	Operations and Maintenance Costs [c]	$10.2

a Passenger service need estimates include engineering and contingency costs. It is possible that from Coon Rapids to St. Cloud rolling stock could be shared with Twin Cities to Duluth.
b Negotiated on a case by case basis.
c Annual cost is post implementation.

INTERCITY: TWIN CITIES TO MANKATO

The Minnesota Valley Line, providing service between the Twin Cities and Mankato, would host four daily round trips of standard (79 mph) passenger rail service. Required improvements for this corridor are summarized in Table 3.4.

Table 3.4: 2040 Passenger Service Needs – Twin Cities to Mankato [a]

NEED		COST TO UPGRADE (MILLIONS)
Infrastructure		$157.4
Other Costs	Rolling Stock	$72.0
	Positive Train Control	$8.5
	Capacity Rights – Twin Cities to the State Line [b]	$57.1
	Operations and Maintenance Costs [c]	$14.1

a Passenger service need estimates include engineering and contingency costs.
b Negotiated on a case by case basis.
c Annual cost is post implementation.

INTERCITY RAIL: TWIN CITIES TO ST. CLOUD

This corridor is proposed for standard (79 mph) passenger rail service. This corridor overlaps Amtrak's Empire Builder. Improvements for this corridor are summarized in Table 3.5.

Table 3.5: 2040 Passenger Service Needs – Twin Cities to St. Cloud [a]

NEED		COST TO UPGRADE (MILLIONS)
Infrastructure		$116.0
Other Costs	Rolling Stock	$144.0
	Positive Train Control	$7.4
	Grade Crossing Improvements	$3.5
	Capacity Rights – Minneapolis to St. Cloud [b]	$91.1
	Operations and Maintenance Costs [c]	$22.5

a Passenger service need estimates include engineering and contingency costs.
b Negotiated on a case by case basis.
c Annual cost is post implementation.

Phase II Corridors

INTERCITY: TWIN CITIES TO SIOUX FALLS, SOUTH DAKOTA, VIA WILLMAR

This corridor is proposed for standard (79 mph) passenger rail service via the proposed Little Crow route. The corridor includes the segments from Minneapolis to Willmar and Willmar to Sioux Falls, S.D. For the purpose of this analysis, costs are only provided for the segments within Minnesota between the Twin Cities and the state line.

INTERCITY: FARGO, NORTH DAKOTA, TO WINNIPEG

This corridor is proposed for standard (79 mph) passenger rail service.

INTERCITY: MANKATO TO SIOUX CITY, IOWA

This corridor is proposed for standard (79 mph) passenger rail service via the proposed Minnesota Valley Line. The corridor includes segments from Mankato to Worthington and Worthington to Sioux City, Iowa. Service between Mankato and Worthington is projected to have low ridership potential due to the relatively small metropolitan area around Sioux City, as well as the significant distance (more than 250 miles) from the Twin Cities. Making this service viable would require having a larger market such as Omaha or Kansas City as the endpoint, along with options for connecting services to other markets.

Station Improvements

Currently, only stations along the Amtrak Empire Builder and the Northstar Commuter Rail are in operation for passenger service. New stations will need to be built as passenger rail service is developed in Minnesota. In the long term, existing passenger rail stations will need to be improved to accommodate increased passenger traffic.

Improved Intermodal Connections to Other Passenger Modes

The Union Depot in St. Paul and Target Field Station in Minneapolis are existing intermodal connections that connect commuter and intercity rail to public transit and other interurban transportation modes. Additional large intermodal connections will not be needed in the short term, but as passenger rail is developed throughout the state, station capacity upgrades will be required to accommodate the increased passenger traffic.

State of Good Repair Projects

As freight demand continues to increase and proposed passenger rail demand grows, ongoing maintenance to rail infrastructure will be required to maintain optimal service. Since Amtrak and the Northstar Commuter Rail operate over facilities owned by private rail companies, public-private partnerships and other funding mechanisms will assist in improving infrastructure. As separated track is developed for new passenger rail lines, improvements in the long term will be required to ensure timeliness and safety within the corridor.

Grade Crossing Safety and Configuration Improvements

As a matter of dealing with grade crossing safety while increasing train speeds on passenger routes, several potential strategies have been considered and discussed with stakeholders during public outreach. The NLX project is planning protection at all private crossings and possible four-quad gate protection with trapped vehicle detection on high speed segments of the route. For speeds up to 110 mph, these improvements should signal an enhanced level of safety for both train passengers and drivers.

FRA rules require full grade separation of crossings at speeds above 125 mph. The ZIP Rail project will require this treatment at all crossings. Crossing spacing has been a particular concern by farmers and other land owners along this alignment. Consistent with the Commissioner's authoruity to close selected crossings, and reflecting established practice with rural crossings and freeway designs, a potential spacing of not more than two miles between grade separations was suggested by planners and considered by stakeholders. The actual placement of grade separations is subject to negotiation between partners and stakeholders as design work progresses.

Rolling Stock Improvements

Amtrak's Empire Builder and the Northstar Commuter Rail use rolling stock that differ in energy usage, capacity and design. As new passenger rail corridors are developed, rolling stock will need to be purchased or obtained to meet projected ridership. In addition, new rolling stock for Amtrak long distance and regional services will improve safety and the visual appeal of the trains, and new, energy-efficient locomotives will help Minnesota achieve climate change goals.

Opportunities for Improved Coordination or Integration with Freight

The St. Paul Union Depot is projected to see 68 passenger train movements by 2040. Optimized train operations could see the need for activating both downtown-to-downtown routes, which would still concentrate more than 70 weekday passenger train movements and more than 20 average freight movements on the segment from Minneapolis Junction to St. Anthony Junction. This indicates a possible configuration of two to three through tracks and a multiple track high speed interlocking at St. Anthony Junction.

Target Field Station is projected to see 86 revenue movements by 2040. This would require up to eight tracks to allow for fluid and flexible operation. Approach and main-line track capacity also would need to be maximized to achieve this goal and accommodate up to 20 freight train movements through the complex. To accommodate this increase in revenue movements, Target Field Station facilities at track grade at the current site would need to be expanded, or a second Minneapolis station stop would have to be created in the vicinity, possibly on the through main-line at Minneapolis Junction or near the University of Minnesota.

Cost of Project Implementation

As previously noted in this study, Minnesotans are active in the pursuit of passenger rail service from studying corridors to actual service implementation. Much groundwork was laid to help development of the 2015 Minnesota State Rail Plan. A number of passenger rail studies developed cost estimates for line construction, capacity rights and annual operations and maintenance costs. This study's estimates are not intended to supersede engineering studies that were already conducted using more detailed data. As discussed previously, transportation funding for passenger rail projects is scarce and competitive. While grants have been awarded for corridor planning studies and some infrastructure improvements, the remaining capital and operating expenses for passenger rail projects in Minnesota are currently unfunded.

4.0 PROPOSED FREIGHT RAIL IMPROVEMENTS AND INVESTMENTS

As noted in CHAPTER 3, the 2010 rail plan included a needs analysis for all freight and potential passenger rail corridors in Minnesota. This process was developed in a manner that allowed for a clear understanding of rail system needs for both current and future (2030) freight and passenger operations. A full needs analysis was not undertaken for the 2015 Minnesota State Rail Plan. Instead, projects identified on freight-only corridors in 2010 were brought forward as a basis for the update, and were complemented with crossing safety improvements and a qualitative description of capacity improvements in the past five years. The latter category incorporates projects recently identified in the 2014 Grade Crossing Safety Report compiled by MnDOT.

For the most part, cost estimates presented in this document are general in nature, are reflected in original 2010 dollars and are not detailed engineering cost estimates. Although some corridors provide connections to points beyond the state border, this evaluation only reflects costs for work within Minnesota.[60] More detailed information about the cost evaluation can be found in Appendix C, which also contains the detailed project list.

This section is organized around previously identified capacity improvements on freight corridors—track, signal and bridge; weight, speed and track restrictions; and other major Class I improvments, followed by discussions of other potential investment areas including major capacity improvements, intermodal service expansion, positive train control, rail service relocation, and hazardous materials. Lastly, grade crossing safety needs across key crude oil corridors are specified. Overall rail needs and improvements are organized by freight rail operator and then by subdivision. The investments are summarized in Table 4.1.

Table 4.1: Summary of Freight Investments for 2030

NEED	COST TO UPGRADE (MILLIONS)
TRACK, SIGNAL, BRIDGE	
BNSF	$68.0
CN	$68.0
CP	$331.8
UP	$35.4
OTHER MAJOR CLASS I IMPROVEMENTS	
Bottlenecks *(incl. in passenger line costs)*	–
Bridges *(incl. in passenger line costs, except for Roberts Street Bridge)*	$51.0
Intermodal Facilities	$150.0
WEIGHT, SPEED AND TRACK RESTRICTIONS	
286,000 Pound Upgrades	$548.0

[60] The one exception is the Eau Claire to Twin Cities corridor, which is predominantly in Wisconsin. Including only Minnesota costs and benefits would have been meaningless.

NEED	COST TO UPGRADE (MILLIONS)
Bridge and speed restrictions	$13.0
FRA Class II to I Upgrades (less 286,000 overlap)	$244.0
GRADE CROSSINGS	
Active Warning Devices (1,400)	$280.0
Cost of Upgrades	$50.0
10% Engineering/30% Contingency	$132.0
Total Cost (shown in 2010 dollars)	$462.0

Capacity Needs

Capacity needs for all four Class I railroads are summarized by subdivision in Table 4.2. An overview of issues surrounding each operators freight-related capacity needs are discussed below.

BNSF

BNSF is among the most aggressive Class I railroads in reinvesting in its network in the past several years. This is largely in response to unprecedented demand for rail services across the United States. While Bakken oil shale–related growth in the northern tier receives a lot of publicity, BNSF saw growth across nearly all service areas. The need for capacity expansion led to an annual capital investment programs in excess of $5 billion in recent years, and $6 billion in 2015.

In Minnesota, increased Bakken oil shipments and record agriculture harvests put a heavy strain on several of BNSF's primary main lines since 2010, specifically on the Staples Subdivision from Dilworth to St. Paul and the St. Croix Subdivision from St. Paul to La Crosse, Wisc. Improvements throughout both subdivisions are necessary to avoid ongoing traffic congestion. BNSF has announced plans to invest in safety improvements and add a second mainline track in portions of both subdivisions in the near future.

Increasing crop yields and recent record harvests compounded the impact of Bakken-related traffic. These impacts strained BNSF's network across many regions of Minnesota. As described in the 2010 State Rail Plan, improvements are recommended for the Marshall Subdivision. The Wayzata, Morris and Brainerd subdivisions also are recommended for investment based on congestion and current weight restrictions.

Originally the Great Northern mainline between St. Paul and Minneapolis, the BNSF line—now known as the "south main"—is a high-speed alignment historically allowing 70 mph service over the majority of the route. Double track is still in place from the Hoffman Junction wye to St. Anthony Junction, where it joins CP and Minnesota Commercial. The line is grade separated for the majority of its length. From St. Anthony Junction to Minnesota Junction, the line

involves multiple interlockings and single track, an area requiring significant upgrades. The right of way and bridges are sufficient to allow all needed expansion.[61]

The CP line is single tracked for its entire length, but originally was double tracked and capable of 50 mph speeds over the majority of the route. The right of way and all overpasses are still sufficient for relaying double track, with the exception of two single track rail bridges over Snelling and Prior Avenues. The City of St. Paul is attempting to condemn part of the right of way for trail use, which would severely damage the ability to restore the speed and capacity of this route. The Minnesota Commercial portion of the route contains two sharp 7-degree curves, one of which can be eased completely in Commercial's "A" yard, and one that could be moderately eased just north of Prior Avenue. As noted with the BNSF route, the track from St. Anthony Junction to Minneapolis Junction will need double tracking and upgrades. While much of the line is grade-separated, there are six at-grade crossings on the CP segment in St. Paul that will require upgrading.

Freight improvements are noted within this corridor, with most investment going towards St. Anthony and Minneapolis Junction upgrades for both BNSF and CP railways.

CANADIAN NATIONAL

The CN's Minnesota network is concentrated primarily in the northeast between Duluth and International Falls, with some segments in the Twin Cities area and near the Iowa border, plus a transcontinental line in the far northern part of the state. Three freight-only corridors demonstrate an immediate need for improvement, two in the Duluth region and one east of the Twin Cities. The Rainy Subdivision, which connects Duluth to International Falls and Ontario, shows an elevated volume-to-capacity ratio, due primarily to lack of modern signalization. Additionally, both the Dresser and Osage subdivisions have weight restrictions that necessitate investment. At present, CN is investing in its freight capacity between Duluth and International Falls.

CANADIAN PACIFIC

The CP's rail operations generally run southeast to northwest across the state, with Minnesota acting as a linchpin between CP's major operations on Canada's west coast and its operations in the Midwest and Montreal. In fact, a CP train could enter the far southeastern tip of the state near Minnesota Slough on the Marquette Subdivision, which is owned by a CP-affiliated railroad, and exit into Canada at Noyes in the far northwest.

The Bass Lake Spur Subdivision between Minneapolis and Hopkins is proposed to be modified and improved with the construction of the METRO Green Line Extension Project. Several new bridges and new mainline track are proposed to be constructed on the Bass Lake Spur and the tracks where Twin Cities & Western Railroad operates in Minneapolis. This infrastructure will be financed by METRO Green Line Extension Project monies.

Due to the Bakken oil boom and record crop yields, the Paynesville Subdivision between Glenwood and Minneapolis saw increased traffic and requires safety and capacity improvements. CP plans to upgrade track in the Paynesville Subdivision.

[61] In January 2015, BNSF announced a capacity expansion project between Minneapolis Junction and the St. Paul intermodal yard that entails installation of second main track and reconfiguration of several interlockings along most of this route. Work on these improvements is anticipated to be substantially completed in 2015.

Five CP subdivisions demonstrated a need for investment in the 2010 State Rail Plan. The two corridors demanding immediate needs, Bemidji and MN&S, had improvements since 2010 and additional improvements are planned.

UNION PACIFIC

In Minnesota, UP's service is concentrated in the state's south, with connections to Iowa, Nebraska, Chicago and points beyond. UP also has invested heavily in its eastern connection to Chicago through Wisconsin. Four UP subdivisions demonstrate a need for immediate improvement and all four lines are lightly used collection/distribution routes where various restrictions are found. The Hartland, Montgomery, Rake and Winona subdivisions share many similarities. All are short in length, ranging from the 1.8-mile Winona Subdivision to the 21-mile Montgomery Subdivision, and all are used as branch lines.

Table 4.2: Twin Cities Core Freight Totals

NEEDS	COST TO UPGRADE (MILLIONS)
BNSF	
Browns Valley	$54.6
KO	$0.5
Marshall	$6.2
P-Line	$1.0
St. Croix	$1.4
St. Paul	$4.2
Cost of BNSF Freight Upgrades	$67.9
CN	
Dresser	$13.1
Osage	$20.6
Rainy	$34.0
Cost of CN Freight Upgrades	$67.7
CP	
Bemidji	$29.6
Detroit Lakes	$84.0
Elbow Lake	$38.5
MN&S	$24.4
Noyes	$28.2
Paynesville	$48.2
DM&E Waseca	$77.5
ICE Owatonna	$1.4
Cost of CP Freight Upgraes	$331.8
UP	
Hartland	$18.7

NEEDS	COST TO UPGRADE (MILLIONS)
Montgomery	$10.4
Rake	$4.1
Winona	$2.2
Total UP Freight Upgrades	$35.4
TOTAL FREIGHT UPGRADE COSTS (IN 2010 DOLLARS)	$502.8

Crossing Safety Improvements

In December 2014, MnDOT released a Grade Crossing Safety Report that identifies sites where safety can be improved by reducing public exposure to derailments, spills and fires in areas with the highest risks for personal injury and property damage. Four possible crossing improvement strategies were considered: closing at-grade crossings, upgrading passive warnings to active signals, improving active protection with more effective safety treatments, and constructing grade separations. Three corridors were focused on due to high volumes of Bakken crude oil unit trains:

- BNSF mainline from the Twin Cities to Fargo/Moorhead via St. Cloud, Staples and Detroit Lakes
- CP's mainline from La Crescent to the Twin Cities and then to North Dakota via Glenwood
- BNSF corridor from Fargo/Moorhead to Willmar to the South Dakota border via Marshal and Pipestone

Results of this report with associated crossing safety improvement costs are shown in Table 4.3.

Table 4.3: BNSF and CP Crossing Safety Improvements

LOCATION/CORRIDOR	COST TO UPGRADE (MILLIONS)
BNSF Crossing Upgrades	
Downtown Moorhead	$40.0
Moorhead to Iowa Border	$49.8
Moorhead to Willmar	$1.3
Twin Cities Core	$25.0
Twin Cities to Duluth	$62.0
Twin Cities to Fargo/Moorhead	$170.5
Twin Cities to North Dakota Border (Morris Subdivision)	$10.0
Twin Cities to St. Cloud	$3.5
Twin Cities to Sioux Falls, SD	$3.6
Willmar to Iowa Border	$0.7
10% Engineering/30% Contingency	$146.6
COST OF BNSF CROSSING SAFETY UPGRADES	$513.0

LOCATION/CORRIDOR	COST TO UPGRADE (MILLIONS)
CP Crossing Upgrades	
Twin Cities to North Dakota Border	$12.7
Twin Cities to Chicago (River Route)	$13.2
Twin Cities to La Crescent (River Route)	$14.2
10% Engineering/30% Contingency	$16.0
COST OF CP CROSSING SAFETY UPGRADES	$56.5*

Weight, Speed and Track Restrictions

In the volume-to-capacity analysis of the state's rail network in 2010, several of the non-Class I railroads exhibited elevated volume-to-capacity issues. In some cases, train volumes on these lines are modest. There are, however, a number of conditions that affect 2014 freight flows, including 286,000 pound compliance, bridge restrictions, track restrictions, and FRA Class I track (see Table 4.4). Several improvements on Class I and short lines alike in the near future will upgrade existing lines. No 2030 restrictions were found on these lines, indicating that these repairs, for a total investment of more than $772.1 million, will carry these segments' needs through 2030.

As of 2010, 453 miles of railroad in Minnesota were non-286,000 pound complaint. Most noncompliant lines are restricted from carrying any heavy railcar in excess of 263,000 pounds. Based on this study's assessment, the cost to upgrade these noncompliant lines to carry 286,000-pound railcars is nearly $550 million, roughly 8 percent of the national total.

Table 4.4: Weight, Speed and Track Restrictions

OWNER	SUBDIVISION	286K	BRIDGE	SPEED	TRACK CLASS	TOTAL COST (MILLIONS)
BNSF	Browns Valley	X	X			$54.6
CP	Bemidji	X	X		X	$29.6
CP	MN&S Spur				X	$24.4
CP	Owatonna			X		$1.4
CP	Waseca	X	X			$77.5
CTRR		X	X	X	X	$6.7
MDW				X		$5.6
MNN	P-Line			X	X	$61.5
MNN	Warroad	X	X	X	X	$146.6
MNN	Ada			X	X	$21.9
MNNR	Hugo			X	X	$19.0
MNNR	St. Paul-Fridley			X	X	$18.1
MPLI	Redwood Falls	X	X	X	X	$110.3
MSWY	LaVerne	X	X	X	X	$56.4

OWNER	SUBDIVISION	286K	BRIDGE	SPEED	TRACK CLASS	TOTAL COST (MILLIONS)
NLR	Cold Spring		X	X	X	$24.0
NLR	East Side			X	X	$2.7
NLR	St. Joe			X	X	$7.0
OTVR	Barnsville		X			Unknown
PGR	Cannon Falls			X	X	$12.3
PGR	Dan Patch		X	X	X	$12.8
PGR	Eagandale		X	X	X	$12.3
PGR	Faribault			X	X	$2.5
PGR	Jesse James			X	X	$28.9
SCXY	Amber		X			$0.6
UP	Hartland	X	X		X	$18.7
UP	Montgomery	X	X			$10.4
UP	Rake	X	X			$4.1
UP	Winona				X	$2.2
					Total Cost	$772.1

Other Major Capacity Improvements

A number of other major capacity project needs were identified to alleviate present day or projected bottlenecks. While these projects are each on the freight system today, many of these upgrades only become critical as passenger service is introduced. CHAPTER 3 discusses specific passenger corridors that require these major capacity improvements.

Not included in these identified structural improvements are the issues and potential costs associated with limited capacity in downtown Minneapolis on the BNSF Wayzata Subdivision, specifically at the site of Target Field Station. The constricted right of way at the Target Field Station currently allows one through freight track, used by BNSF and TC&W for increasing volumes of through train movements, and two passenger tracks on either side of a center platform. The track, approaches, signals, and overpasses were upgraded to accommodate Northstar commuter rail service in 2009. This plan assumes freight traffic will continue to grow and that there is currently no easily accessed alternative for rerouting freight in this corridor. A large projected increase in intercity and commuter trains at this site exacerbates capacity needs. Rail studies since 2010 also list Target Field Station as a potential terminus for NLX, Zip Rail and a potential HSR route to Chicago. Although the construction of additional infrastructure at Target Field Station helped with local transit rail vehicle storage, additional track capacity will be needed as freight and passenger train movements increase in response to growing demand.

Coon Creek Junction/BNSF Third Main

Coon Creek Junction is the location on the Staples Subdivision where the Hinckley Subdivision begins and heads north toward Duluth. Besides the need to improve speed and capacity at this junction, this bottleneck extends south approximately seven miles to International Junction, where BNSF and CP transcontinental routes from Chicago to the Pacific Northwest cross. This track segment and the junction sits astride BNSF's busiest freight route and also is used by CP and UP to serve Duluth and Superior. It is the route for Northstar Commuter Rail and the Empire Builder. The NLX high-speed passenger service to Duluth would use this track and junction to enter the Hinckley Subdivision

and access the proposed double track between Coon Creek Junction and Sandstone. It also is the site of a proposed north suburban station at Foley Boulevard, which would include freeway access and the Twin Cities' largest park-and-ride facility. This site would be consistent with FRA guidance for key suburban stops for intercity service to enhance urban service coverage and convenience for riders, similar to proposals for Rosemount or Hastings in the southeast. The possibility of an additional third mainline track from Coon Creek Junction to International Junction would significantly improve the capacity of this location.

Savage Interchange

In order to provide passenger service from Mankato to Minneapolis, a connecting track between the UP Mankato Subdivision and the CP MN&S Subdivision would need to be built. The two railroads are grade separated at this location, which would require a new connecting grade and track. Several rail-dependent bulk terminals currently abut or occupy the right of way that would need to be acquired.

Hoffman Interlocking

Hoffman Junction is one of the current major bottlenecks in the state of Minnesota. Three of the four Class I railroads operating in Minnesota traverse this junction. UP crosses the CP and BNSF main lines to access the Pigs Eye area. This movement limits capacity for all three rail carriers. The identified improvement will provide for grade separation between the UP movement and the CP and BNSF mainlines, which would increase capacity through the junction. In cooperation with the railroads, passenger projects, MnDOT and the Metropolitan Council, the Ramsey County Regional Rail Authority completed a study that positively identifies the demands, alignments and investments needed in this area.

Minneapolis Junction

Minneapolis Junction is a major emerging bottleneck in the state of Minnesota. The potential capacity of the junction could be increased with the addition of a second main around the west leg of the wye. This improvement would not satisfy the lack of speed through the west leg of the wye. The curve is currently a seven degree curve, which restricts the speed of passenger trains to 25 mph. A true fix to the current bottleneck would include property acquisition and the easing of the curve around the west leg of the wye; however, many businesses within the affected area would need to be acquired and demolished to accommodate the new alignment. Several bridges, particularly the Hennepin Avenue overpass, would need to be reconstructed as well to implement this easing of curvature.

Moorhead Junction

Larger turnouts are needed to increase speed for diverging traffic.

City of Shakopee Track Realignment

To increase the speed through the city of Shakopee, a bypass may need to be constructed for UP's Mankato Subdivision. The rerouting would provide 10 miles of track around the downtown area of Shakopee, bypassing an area of what is largely 10 mph street running on city-owned right of way.

St. Anthony Junction

The CP alternative to connect commuter and intercity rail from St. Paul to Minneapolis requires traveling through the Minnesota Commercial Railroad's A yard, before joining the BNSF mainline leading to Minnesota Junction. An option to increase speed through the A yard is to relocate some of the track. This would minimize existing curvature and increase speeds. A multiple-track, high-speed interlocking also would need to be installed.

St. Louis Park Interchange

As a part of the METRO Green Line Extension Project, Hennepin County is improving the interchange between the TC&W and the CP alignment. Previous studies to improve major geometric challenges of grade and curvature in St. Louis Park proved to be too difficult politically, so the expanded route options will not be realized.

County-commissioned engineering estimates suggest a cost of $48 million for improvements to the mainline TC&W line, and with a variety of assumptions on potential grades, curvatures, and line displacements, final costs are approximated between $40 million and $70 million.

University Interlocking

University Interlocking is a station location on the BNSF. The speeds through this junction are adequate for the BNSF, but the CP has slow speeds as it leaves the BNSF and enters the Paynesville Subdivision. A track could be built to the east for the CP to exit the BNSF at higher speeds and potentially avoid congestion on the BNSF line. In order for the CP to continue at higher speeds on the Paynesville Subdivision, there would need to be either easing of the curve leading to the bridge or construction of a new bridge for CP over BNSF that is not as perpendicular to the BNSF as the current bridge.

Willmar Wye

The Willmar Wye is a proposed new rail alignment and industrial park access on the west side of the city of Willmar. The project would also include the construction of two new highway bridges on Highway 12 and Highway 40 over the proposed new rail line, along with other associated local road modifications. The existing local rail configuration impedes local traffic and train service. The project would alleviate crossing blockage due to train and locomotive maneuvers related to BNSF's Willmar Yard. Currently, trains entering Willmar from the northwest or southwest destined for locations on the other subdivision must first travel into the yard over several at-grade intersections and stop in the yard to reverse direction by reallocating power. The engines are moved from the front of the train to the back of the trains, which then travel back out of the yard to connect with the other subdivision. This movement creates excess emissions, blocks crossings in Willmar and consumes yard and mainline capacity that would otherwise be used for switching local business and handling through trains. This movement results in trains blocking intersections in Willmar's Central Business District for up to 30 minutes at a time. Stakeholders, including BNSF Railway, MnDOT, City of Willmar, Kandiyohi County and the local economic development council are working in partnership to advance development of this project.

Bridges

Railroad bridges provide key connections between a number of important rail lines in Minnesota. Many of these have been in place and operable with little maintenance or investment for decades. The 2010 State Rail Plan identified a number of key bridge improvements, highlighting five bridges owned by BNSF, four owned by UP, one owned by CP and one owned by the Minnesota Valley Regional Rail Authority. The following cost estimates do not include demolition of the current bridges and assume that the new bridges would be constructed at least 25 feet from the existing structures. Approach construction, engineering and contingencies are not included in the cost. Parts of bridges on either side of the spans described below are assumed to be constructed using plate girder spans.

BNSF Bridges on Hinckley Subdivision

Four single track bridges on the BNSF's Hinckley Subdivision will require replacement. The cost to replace all four bridges on the Hinckley Subdivision would be $25 million.

Grassy Point Bridge

The Grassy Point Bridge crosses the St. Louis River on the BNSF's line between Superior, Wisconsin and Duluth, Minn.. The current bridge is a steel through truss center pivot swing span. A proposed replacement bridge would be a 240-foot single track vertical lift span. This bridge would serve the proposed NLX project and is estimated to cost $51 million. A relocated channel crossing between Superior and Rice's Point (Duluth CP and BNSF yards) could potentially improve HSR travel times into Duluth and open up Duluth Port to through intermodal container services.

Hastings Bridge

The Hastings Bridge crosses the Mississippi River on CP's River Subdivision. The current bridge, completed in 1981, is a through truss vertical lift span. A proposed replacement bridge would be a 324-foot double track vertical lift span. The estimated cost of the bridge is $90 million.

Hudson Bridge

The Hudson Bridge crosses the St. Croix River on the Union Pacific's Altoona Subdivision. The current bridge is a steel through truss center pivot swing span. A proposed replacement bridge would be a 160-foot single track vertical lift span. The estimated cost of the bridge is $87 million.

La Crescent Bridge

The La Crescent Bridge consists of four different bridges that cross the Mississippi River, the east channel of the Mississippi, the Black River, and the French Slough. The bridges are located on CP's Tomah Subdivision and are, respectively, a steel through truss center pivot swing span, a steel deck plate girder, a steel through truss draw span, and a steel deck plate girder. The proposed replacement for all four bridges would be a fixed span, perhaps on a different alignment. The estimated cost for all four bridges is $117 million.

Mendota Heights Bridge

The Mendota Heights Bridge crosses the Mississippi River on UP's Mankato Subdivision. The current bridge is a steel through truss swing span. A proposed replacement bridge would be a 200-foot-long single track vertical lift span. The estimated cost of the bridge is $44 million.

Pigs Eye Bridge

The Pigs Eye Bridge crosses the Mississippi River on UP's Albert Lea Subdivision. The current bridge is a steel through truss center pivot swing span. A proposed replacement bridge would be a 240-foot-long single track vertical lift span. The estimated cost of the bridge is $76 million.

Robert Street Bridge

The Robert Street Bridge crosses the Mississippi River on UP's State Street Industrial Lead. The current bridge is a through truss vertical lift span. A proposed replacement bridge would be a 200-foot single track vertical lift span. The estimated cost of the bridge is $51 million.

Savage Bridge

This former MN&S bridge in Savage, Minn., crosses the Minnesota River. Presently out of service, the bridge is a steel through truss center pivot swing span. A proposed replacement bridge would be a single track 160-foot-long through truss vertical lift span. The estimated cost of the bridge is $34 million.

Intermodal Services

In its present form, rail intermodal (the haulage of containers and trailers) services available in Minnesota are geographically and capacity limited. Existing terminals are all located in the Twin Cities, and the only existing direct services connect to Chicago and the Pacific Northwest. Efforts to provide service in other parts of the state were not successful, with a public terminal opening and closing in the western part of the state at Dilworth. Elsewhere, a private intermodal operation at Montevideo handled grain products intermittently.

Conversations with stakeholders revealed a strong desire for additional terminal capacity in the Twin Cities and access to intermodal service in other parts of the state. From the Twin Cities, service to regions other than Chicago and the Pacific Northwest is either unavailable or circuitous, which has made intermodal a relevant and economical

choice for only a small subset of shippers. Terminal capacity is adequate for the markets that are currently being served, but it would be difficult to accomdate service to new markets. Providing new terminal capacity is a challenge, as was evident during an ultimately unsuccessful effort in the 1990s by MnDOT to locate a new terminal in the Twin Cities. With large volumes of truck traffic, terminals are not attractive neighbors, and drayage costs make their geographic location sensitive to shippers, particularly for domestic traffic. The existing central locations of the BNSF in St. Paul and CP in Shoreham are hard to beat.

Offering intermodal service beyond the Twin Cities in locations such as Duluth or western Minnesota may be beneficial given the size of the state; however, intermodal service is heavily density driven, and, given that direct access is only provided to a few major markets, there must be sufficient demand in those lanes to justify daily service. For a terminal served by a Class I railroad, the minimum annual volume threshold is around 50,000 units, while for a short line 10,000 and sometimes fewer units are sufficient. Smaller volumes are usually insufficient to justify a daily frequency that represents the minimum threshold for quality service that is attractive to a range of shippers. For specialty purposes, such as containerized grain for export, less frequent or even seasonal service may meet the need, but the clientele for such a service will be quite limited.

A major influence on the competitiveness of a terminal is the availability of empty containers and trailers for loading. For export moves, empty containers are generally concentrated in major markets such as Chicago. If a western Minnesota shipper requests equipment for a West Coast export move, it is quite possible that an empty container must be repositioned 700 miles from Chicago to the point of loading. The cost of this move is significant, and can increase the cost of an intermodal move to a level that exceeds the equivalent all-truck move. Adding to that are volatile equipment management strategies that can quickly change the economics of using intermodal from attractive to unattractive. This was the case at the Dilworth terminal, as well as the seasonal operation out of Montevideo.

Public ownership of the terminal raises competitive issues for railroads, who strongly prefer to control their own terminals. In the Twin Cities, this issue is most clearly manifested by the lack of service along the I-35 corridor between Minnesota, Iowa, Kansas, Texas, and Mexico. Although volumes are sufficient to support competitive service in this corridor, it does not exist largely because UP, the carrier that has the most direct route paralleling I-35, does not have a suitable site for an intermodal terminal in the Twin Cities.

Despite these impediments, expansion of intermodal service is important and a collaborative effort among stakeholders should be initiated to ensure expanded intermodal service options in Minnesota.

Positive Train Control

Positive Train Control refers to technology that is capable of preventing train-to-train collisions, overspeed derailments and casualties or injuries to roadway workers (e.g., maintenance of way workers, bridge workers and signal maintainers) operating within their limits of authority as a result of unauthorized incursion by a train. The technology combines GPS locating of all trains; lineside infrastructure such as switches, crossings and junctions; automated cataloging of speed restrictions and traffic conditions; and real-time wireless communications with locomotives and other operating equipment, dispatchers and work crews. The Rail Safety Improvement Act of 2008, Public Law 110-432, mandated the widespread installation of PTC systems by December 2015 on all lines handling passenger trains or hazardous materials, a network totaling approximately 80,000 miles.[62]

[62] Source: Federal Railroad Administration, www.fra.dot.gov.

According to the AAR, as of January 2015 freight railroads invested approximately $5.2 billion in PTC, with the following results:[63]

- 60 percent of the required locomotives are fully or partially equipped with PTC
- Half of the required PTC wayside units are installed
- One-third of the required PTC radios (base station, wayside and locomotive) are installed
- As of May 2014, one-third of the required PTC antennas are installed

The Association of American Railroads projects that full implementation of PTC will cost approximately $9 billion. Once the full system is in place, it is predicted that it will cost hundreds of millions of dollars per year to maintain the entire system. BNSF anticipates that they will be able to meet the 2015 deadline; however, other Class I railroads indicate they may not have PTC fully implemented until 2017 or later.

Class I railroads are bearing most of the burden associated with installing PTC, but some Class II and III railroads also are affected by the mandate. These smaller railroads are similarly required to implement PTC on tracks that carry passenger trains over a certain threshold or have a significant volume of toxic or poisonous-by-inhalation hazardous materials. In addition, some locomotives operated by Class II and Class III carriers may need to be equipped with on-board PTC systems to operate on PTC-equipped Class I track, a situation encountered by at least two Minnesota short lines, the Twin Cities and Western, and Minnesota Commercial. The amended final rule issued by the FRA extended the deadline requiring Class II and Class III locomotives traveling further than 20 miles on PTC required track to be equipped with an onboard PTC system until Dec. 31, 2020. Locomotives of Class II and Class III railroads traveling less than 20 miles, and with fewer than four movements per day on track with PTC, are exempt under the amended final rule *Equipping Locomotives Operating in PTC Territory*.[64] However, Class I Railroads may impose stricter conditions than FRA guidelines require, such as requiring any locomotive operating over PTC-equipped territory to have the necessary on-board technology. The $100k+ cost of retrofitting older locomotives that are typical of short line fleets is beyond the financial ability of many carriers.[65]

The cost of implementing PTC is not included in the 2015 Minnesota State Rail Plan, as the implementation is well along and the Class I railroads are largely bearing the implementation cost. It does include (in CHAPTER 5), an estimate for equipping 20 locomotives operated by Class III railroads with on-board PTC systems.

Line Relocation

Freight rail tracks and associated infrastructure represent significant capital investments at fixed locations; however, under certain circumstances the relocation of freight rail lines may be warranted. Similarly, freight rail traffic itself can be deployed differently across the network. States, cities and the railroads pursued changes in the freight rail network

[63] AAR: Current Implementation of Positive Train Control; www.aar.org/Pages/Status-of-PTC-Implementation.aspx

[64] Equipping Locomotives Operating in PTC territory: www.gpo.gov/fdsys/pkg/CFR-2010-title49-vol4/pdf/CFR-2010-title49-vol4-sec236-1006.pdf

[65] The 2010 State Rail Plan included estimated costs of implementing PTC in Minnesota totaling $1.6 billion. However, with PTC implementation substantially underway and in varying states of completion, an updated cost estimate was not included as part of this plan. Implementation of passenger services will require some additional investment in PTC to accommodate passenger traffic along these lines. These costs are included as part of the investment plan (see Chapter 5).

and freight rail operations in order to accomplish a variety of objectives including:

- Rationalizing network operations to reduce freight rail operating costs and improve service reliability, particularly through enhanced speed, capacity, connectivity and flexibility.
- Freeing up rail line capacity to accommodate passenger rail operations.
- Mitigating the impacts of rail operations in communities, including noise, vibration and aesthetics.
- Minimizing risk exposure of hazmat freight rail operations.
- Providing service to freight facilities such as new intermodal (container) terminals or improving access to water ports.

The relocation of freight rail lines or operations can ease rail bottlenecks, reduce vehicle traffic delays at grade crossings, improve safety, and spur economic development opportunities. At the same time, when rail service is introduced to newly served areas or significantly increased along existing lines, those communities may experience negative impacts, including on land use, safety and environmental concerns. These impacts may require mitigation, such as noise walls, grade separations and other strategies.

Substantial freight rail relocation projects, such as a bypass, a new line or significant increases in train volumes, require the review and approval of the federal Surface Transportation Board. Such projects may be initiated either by a private entity, such as a railroad, or a public agency. Typically the STB requires extensive environmental documentation and assessment to be completed for major projects. In addition, other state and federal environmental requirements apply to such projects, particularly when public funding is involved.

In Minnesota, the issue of freight rail relocation will become increasingly important as the passenger rail network develops, freight traffic increases, and as communities grow. Currently, several relocation projects in the state are under consideration.

In Rochester, the Southern Rail Corridor Coalition,including the Olmsted County Regional Rail Authority, the City of Rochester and the Mayo Clinic,proposed a 48-mile freight rail bypass south of Rochester to replace downtown freight rail service operated by CP. In 2013, MnDOT conducted a feasibility study and alternatives analysis of the existing alignment and proposed bypass alignments. The Southeastern Minnesota Freight Rail Capacity Study, completed in 2013, recommended maintaining the existing alignment through downtown Rochester. Incremental improvements could further improve safety in the corridor if implemented in advance of any capacity need.

In Hennepin County, the Twin Cities and Western Railroad currently operates freight rail service along the Kenilworth Corridor through the city of St. Louis Park and the city of Minneapolis, providing a connection into downtown Minneapolis. This alignment was chosen as the locally preferred alternative for the METRO Green Line Extension Project and will require the TC&W freight tracks to be rebuilt. After several years of discussion and public engagement, full municipal consent was provided by all municipalities for a plan to build a tunnel for the METRO Green Line tracks in the Kenilworth Corridor. TC&W service will reopen in 2018, and the METRO Green Line Extension service is planned to begin in 2019.

Both the Rochester Southern Rail Corridor and the Hennepin County Kenilworth freight rail relocation examples suggest the need for full consideration of:

- A public and transparent planning process that allows all affected stakeholders to fairly represent their interests.
- State, regional and local comprehensive, transportation and land use plans, including those for passenger rail

development.

- The impacts, costs and benefits of proposed relocation projects, including the "no-build" alternative.
- Equitable sharing of costs and benefits for the project amongst governmental units, the railroad and other stakeholders as warranted.
- The need to preserve and enhance freight rail service and to provide adequate capacity to meet current and future demand.
- The need to preserve and enhance communities through which freight rail lines pass by means of effective mitigation and design strategies.

Railroads and Hazardous Materials

Following a rash of severe releases of hazardous materials in the 1970s, the individual railroads, together with the Association of American Railroads, the U.S. Department of Transportation and the chemical industry, are actively engaged to improve the safe transport of hazardous materials by rail. Substantial progress was made in the design of and materials used in tank cars, reporting, custody, education, communications, and safe handling. The railroads and car builders responded with better steels and coatings, higher build quality, repositioned vents and valves, shelf couplers, and puncture shielding that made tank cars more able to survive an accident without spillage. Concurrently, the rail infrastructure improved materially, reducing the incidents of equipment failures and derailments to the lowest levels in history. The net result was that injuries and fatalities related to rail transportation of hazardous materials to be just one-eighth of those related to truck transportation for the same year, with comparable miles and tons moved.

In spite of the excellent safety record, the most dangerous of these commodities, Toxic Inhalation Hazards, caused increasing concerns among the railroads and governments in recent years. Although a very small part of the rail traffic mix (with 5,000 carloads on Minnesota's railroads in 2007, of which 240 were handled by short lines), the security and operational risks associated with handling TIH are viewed as increasingly difficult and insufficiently compensatory for the risks incurred. Although all of these incidents were determined to be industrial accidents, the risks associated with the handling of these commodities were brought into stark relief. As a result, the industry has become increasingly reluctant to handle TIH and embarked on efforts to not only increase the safety of their transport, but also to greatly reduce the volumes being handled. Since 2005, new initiatives are aimed at further car improvements, facility and track upgrades and other safety improvements. Presently, new hazardous materials routing standards, tied to systematic risk assessments by the railroads and shippers, were designed and implemented since 2010.

Since 2010, the increased transport of Bakken oil raised another concern regarding hazardous material hauling. This concern is especially concentrated along BNSF tracks, where in July 2014 more than 50 train cars moved volatile oil shipments through heavily populated areas in the Twin Cities, including Anoka, Fridley and several dense neighborhoods in Minneapolis and St. Paul. Although few accidents in the United States involving oil explosions have occurred in recent years, a December 2013 train derailment caused a large explosion near Casselton, N.D., and another July 2013 derailment in Lac-Megantic, Quebec, resulted in 47 deaths. To prevent disasters from occurring in Minnesota, MnDOT hired two full-time rail inspectors, and Gov. Mark Dayton held a rail summit in October 2014 with freight company representatives to discuss, among other topics, the current and future condition of rail safety procedures. Following these recent oil train incidents, new car standards will go into effect.

Due to the nature of interstate commerce, the constitutional responsibility of the federal government and the large distances and volumes transported in bulk via rail, federal authorities oversaw the regulation and control of the transport of these materials. Both the economic costs and public exposure aspects suggest that rail transport of

these materials should remain as the preferred method of transport where applicable. The state of Minnesota relies on the FRA Hazardous Materials Inspector for inspections of facilities and methodologies involving the movement and storage of hazardous materials. In addition, the state also uses the services of the state Motor Carrier Hazardous Material Inspector in the event of a complaint or a significant release of hazardous materials.

The federal program provides a dedicated Hazardous Material Inspector for the state of Minnesota and portions of Wisconsin. The federal inspector is expected to enforce all federal regulations regarding the movement of hazardous materials by rail. Inspections are conducted at railroads, intermodal facilities, freight forwarders/agents, chemical shippers, and tank car manufacturers and repair facilities. Inspectors also review methods of construction and testing of specification containers used for the transport of hazardous materials. Finally, inspectors review and observe procedures used by those who offer hazardous materials for transportation by rail and a review of rail carrier documentation, and procedures for loading, unloading, switching and transportation of rail cars containing hazardous materials.

The federal inspector also participates in investigations of hazardous material spills that result in evacuations or casualties resulting from a release. Federal inspectors have the authority to issue citations when violations of federal regulations are discovered during inspections. The FRA also cooperates with the railroads and local emergency response agencies in ongoing education as to characteristics of materials and threats, response methods and inter-organizational coordination.

5.0 THE STATE'S RAIL SERVICE AND INVESTMENT PROGRAM

Vision

Minnesota GO, the first long-range transportation adopted for Minnesota in 2011, is the driver of the Statewide Multimodal Transportation Plan, the State Rail Plan, and other transportation planning efforts over the next 20 years. The Minnesota GO Vision serves as an overarching set of principles guiding the development of freight and passenger rail service, along with other modes of transportation, within the state.

The 2010 State Rail Plan promoted a vision for freight rail in Minnesota that called for the development of a balanced multimodal freight system which can respond to increased regional and international economic competition, constrained highway capacity, environmental challenges, a diverse customer base, and rising energy costs. The vision for passenger rail is that Minnesota should develop a robust intercity passenger rail system which results in improved travel options, costs and speeds for Minnesota and interstate travelers.

Since the 2010 Plan was adopted, changes in industry, public interest and funding opportunities resulted in a reconsideration of some of the specific actions that were adopted. Affecting both freight and passenger, these changes include:

- Increased emphasis on safety, caused by general traffic growth across the state's core network, and the rapid growth of crude oil shipment by rail.
- Continued development and refinement of Chicago – Twin Cities, Twin Cities – Rochester (Zip Rail) and Twin Cities – Duluth (NLX) corridors, and some shift in priorities among other corridors.
- The scarcity of federal funding for passenger and freight rail projects.

As a result, the need for some actions has accelerated, particularly those addressing the more rapid than expected growth in traffic along Minnesota's core network, while others will be drawn out over a longer period of time. To provide an indication of their relative timing, the proposed actions were divided into near term actions—those that can be accomplished by 2019—and long-term, those which can be accomplished over by 2035, a 20-year horizon.

4-YEAR ACTION PLAN

During the next 4 years, the following actions are necessary to implement the vision for rail.	
Freight	**Passenger**
• Develop and implement a comprehensive plan that addresses key safety vulnerabilities across Minnesota's rail network • Continue development and investment in reducing rail/highway conflicts, including upgrading rail/highway grade crossings, grade separations, and crossing closures • Complete initial deployment of state-of-the-art traffic	• Implement a second frequency along the Empire Builder route between Chicago and the Twin Cities and reduce service delays • Continue development of the High Speed Rail services listed as Phase I in Advanced Planning through environmental and permitting processes including the Twin Cities to Milwaukee segment of Chicago HSR; Zip Rail between the Twin Cities and Rochester; and NLX

During the next 4 years, the following actions are necessary to implement the vision for rail.	
Freight	**Passenger**
control and safety systems on Minnesota's high-density main lines • Better integrate rail into the public planning process • Build upon the existing Minnesota Rail Service Improvement Program (MRSI), including raising the maximum loan amount beyond the current $200,000 ceiling • Initiate advanced planning and construction of solutions to the state's most critical network bottlenecks	between the Twin Cities and Dululth

20-YEAR ACTION PLAN

During the next 20 years, the following actions are necessary to implement the vision for rail.	
Freight	**Passenger**
• Improve the safety of the freight rail system in all aspects, and ensure the ability of the rail infrastructure to safely support growing traffic volumes • Make improvements to the condition and capacity of Minnesota's primary railroad arterials to accommodate existing and future demand • Address all critical network bottlenecks • Upgrade main line track (all Class I to III railroads) to 25 mph minimum speed, as warranted. • Improve the network (all Class I to III railroads) to support the use of 286,000 pound railcars throughout • Implement state-of-the-art traffic control and safety systems • Expand intermodal service access options throughout the state • Maintain and ensure broad access to competitive freight rail services for shippers throughout the state, and	• All projects currently not in Advanced Planning will fall into Phase I (implementation within 20 years), or Phase II (implementation beyond 20 years). Further study will be required to fully determine into which phase projects are placed. Currently, public support appears to be greatest for service to Northfield, eventually continuing on to Des Moines and Kansas City. Also, service to St. Cloud reflects a combination of intercity service and an extension of the existing Northstar Commuter Rail service, and as such has strong performance. Enhanced service to Fargo is included in the improvements to the Empire Builder. Other potential Phase I markets include Mankato, Willmar and Eau Claire, Wisconsin • Advance corridors incrementally depending on analysis results, financing, right of way acquisition, and agreements with freight railroads • Connect all services (including the Advanced Planning projects) to both Target Field Station and St. Paul Union Depot

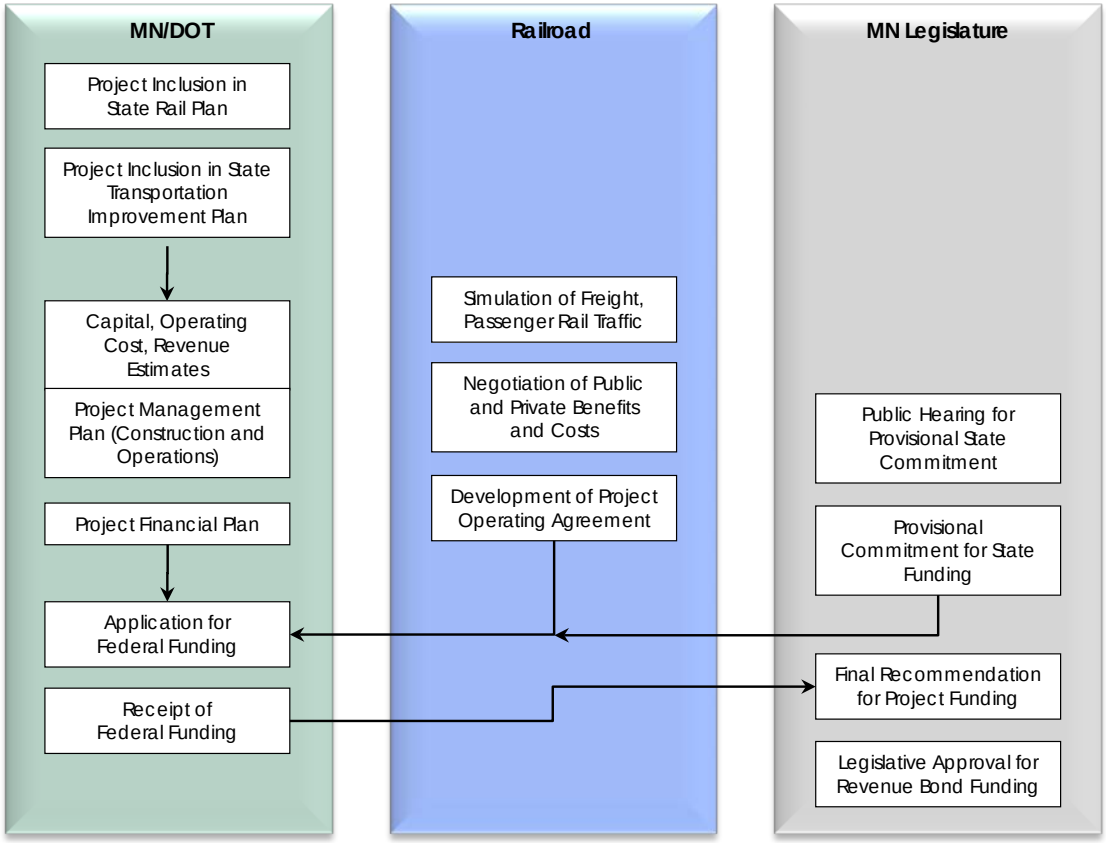
During the next 20 years, the following actions are necessary to implement the vision for rail.	
Freight	Passenger
leverage the state's rail network for desirable economic development • Actively manage preserved rail corridors held in the State Rail Bank and evaluate for possible future transportation uses • Support the implementation of Positive Train Control (PTC) on short line corridors which handle certain categories of hazardous material[66]	

[66] It is assumed that the Class I railroads will implement PTC at their own cost as federally mandated.

Program Coordination

A multistep process is recommended for making decisions on investing in passenger rail corridor projects, shown in Figure 5.1.

Figure 5.1: Passenger Rail Project Decision Process



Since the development of the 2010 State Rail Plan, and continuing with the 2015 Minnesota State Rail Plan, Minnesota has pursued a variety of strategies for moving individual projects forward. These strategies should continue. These steps are being led by the MnDOT Office of Freight and Commercial Vehicle Operations and Office of Passenger Rail:

- Include projects in the state's long-range transportation plans. Once projects are included in the state plans, environmental analyses can begin that further refine the routes for passenger rail corridors. In particular, service-level environmental assessments and alternatives analyses should be prepared for all identified components of the passenger rail system.
- Pursue funding through the three-legged stool of federal grants, state and local appropriations and bonding authority, and private investment. The funding environment has changed substantially since the adoption of the 2010 State Rail Plan, with the availability of federal funding greatly diminished, requiring a more creative and multi-faceted strategy on the part of the state.

- Work with the freight railroads that own the track or rights of way to be used for the passenger rail projects. Reaching formal agreements with the freight railroads is necessary to move projects forward, and will force discussions to move beyond high-level conversations to detailed financial obligations.
- Continue to authorize and empower corridor-level special purpose authorities or joint powers authorities, much like the Northstar Commuter Rail system was originally planned by MnDOT, delivered by the Northstar Commuter Rail Development Authority and operated by Metro Transit.

Program Summary

The 2010 State Rail Plan identified a priority program that would achieve Minnesota's vision for rail. Most of the elements of this program are retained or slightly modified in the 2015 Minnesota State Rail Plan as follows:

- Support short-term improvements and a second frequency on the existing Amtrak Empire Builder service
- Develop High Speed Rail passenger service to Chicago, Rochester and Duluth by upgrading/developing corridors to FRA Class VI conditions[67]
- Enhance conventional passenger rail service to St. Cloud, Eau Claire, Mankato, Fargo and potentially other markets to be analyzed more fully in coming years. Upgrade corridors to Class IV (minimum), V or VI conditions as warranted (respectively 79, 90 or 110 mph)
- Support the implementation of PositiveTrain Control on short line locomotives that must operate over PTC-equipped lines and short line corridors which handle certain categories of hazardous material[68]
- Upgrade grade crossing on all shared corridors
- Upgrade major junctions and bridges, particularly on short lines
- Upgrade all mainline track to minimum 286,000 pound capacity and 25 mph condition
- Upgrade all active warning devices and signs
- Support the development of additional intermodal facilities as market conditions warrant

Implementation of this program would result in the following achievements:

[67] The Federal Railroad Administration classifies track into a series of categories based on physical condition (i.e., tie and rail condition, surface, cross-level, etc.). For each category, which ranges from I to VIII, trains are permitted to travel up to a set speed, with the higher numbered categories allowing higher speeds. Permissible speeds generally differ for passenger and freight trains; thus, while freight trains can travel up to 40 mph on FRA Class III track, passenger trains can reach 60 mph. Typical short line track is maintained to FRA Class II (24 mph maximum for freight), and Class I (10 mph maximum). For more information, see 49 CFR 213.9 and 213.307.

[68] With PTC implementation well underway on the Class I railroads, this plan does not include the cost of deployment.

- A robust intercity passenger rail system that serves intercity travel between major population and activity centers within the state, and between Minnesota and other Midwest hubs
- All mainline track speeds would be at least 25 mph
- All rail lines would have 286,000 pound rail car capacity
- Significant increases in track to siding ratios;
- All active grade crossing devices would be upgraded or replaced
- All substandard capacities would be eliminated

This program does not address other improvements made independently by the Class I railroads that have a more robust investment program today than was envisioned in the 2010 State Rail Plan.

Prioritization of the passenger rail program will be formalized further in the coming years as additional analyses are completed. Prioritization will be based on a consistent methodology for benefit/cost analysis applied in completed or upcoming Environmental Impact Statements and detailed project planning studies. In the meantime, MnDOT is proceeding with project prioritization, both freight and passenger, being determined based on the following:

1. Advanced cost-benefit analysis on the proposed services
2. Mutual benefits to both freight and passenger through the safety, capacity, and operational improvements identified along the corridor
3. Public-private and public-public partnership opportunities related to project development funding and operations
4. Deliverability as a project reaches final federal approval stages.

Each project will be screened through the above criteria and prioritized. Phase 1 projects in the Plan will remain the focus of work. All projects will continue to advance incrementally with available funding necessary for the next phase of development. In the planning and project development phase. Several projects may be advanced simultaneously. In the latter stages of development (i.e., final design, construction, etc.) the availability of financial resources may limit project implementation to one project at a time.

The top priorities are the four projects that are already in advanced stages of planning and environmental review: A second daily Empire Builder train to Chicago reached project approval stage and is supported by a partnership with Wisconsin DOT. The three other projects involve the development of HSR between the Twin Cities and Chicago, Rochester and Duluth. Multiple public-private and private funding and development initiatives are emerging and being presented to MnDOT. The Rochester and Chicago corridors in particular are actively being advanced in planning and environmental analysis toward project qualification. Other passenger system elements identified in the 2015 Minnesota State Rail Plan are advancing including connections between Target Field Station and St. Paul Union Depot, and the NLX project.

All other projects will fall into Phase I (implementation within 20 years), or Phase II (implementation beyond 20 years). Further study is required to fully determine into which phase projects are placed. Currently, public support appears to be greatest for service to Northfield, continuing on eventually to Des Moines and Kansas City. Also, service to St. Cloud reflects a combination of intercity service and an extension of the existing Northstar Commuter Rail service, and as such has strong performance metrics. Enhanced service to Fargo is included in the

improvements to the Empire Builder. Other potential markets include Mankato, Willmar and Eau Claire, Wisc., the latter of which has strong public support but lacks political support in Wisconsin.

Project Costs

The capital cost of the fully implemented program would be approximately $6.6 billion. This amount consists of $3.5 billion for freight-only improvements, and $3.1 billion for passenger improvements for Phase I projects, but does not include costs for projects in the Advanced Planning stage. More detailed engineering cost estimates will be produced for these projects as studies are completed. On the whole, if built as a system rather than as a series of individual, unrelated projects, substantial synergies across projects can be achieved.

Cost estimates are based on high-level system wide unit costs. These estimates are based on the following assumptions:

- Infrastructure cost represents the needs for passenger service in 2040 above and beyond the total infrastructure needs identified for freight. For example, if the level of freight investment identified in Chapter 4 also can accommodate four passenger trains per day, that scenario would produce no additional infrastructure cost for passenger rail. Track, signal systems and crossings are included in this cost.
- Capacity rights fees on freight railroads are assumed to be $85,000/train/mile.[69]
- Rolling stock is the cost to purchase trains to operate these services. In general, it is assumed that new rolling stock will be required for each new route. There may be opportunities for synergies among the several services; therefore, a 20 percent discount to the system wide cost of rolling stock was applied.
- The ridership forecasts developed for this study are the basis for revenue estimates, which were credited against the overall costs. Potential revenue for each of the services is based on the fares used to estimate ridership. The model includes fare estimates on a per mile basis. These were multiplied by ridership by segment to calculate revenue.
- A 10 percent engineering and 30 percent contingency cost was added to each project.

All costs shown in this report are in current real (uninflated) dollars as is typically done in long-range planning studies, so that the difficult-to-predict impacts of inflation are factored out.

[69] Based on the negotiated Northstar Rage

PASSENGER SYSTEM PROJECTS EVALUATION

This section describes the potential system performance benefits of expanding passenger rail in Minnesota as discussed in the needs assessment.

Phase I – Advanced Planning Projects

Four projects are designated as being in Advanced Planning. Three are HSR services (at least 110 mph), and consist of Twin Cities to Milwaukee as part of an overall Chicago hub regional service, Duluth (Northern Lights Express or NLX) and Rochester (Zip Rail). The fourth Advanced Planning effort entails a second Empire Builder between the Twin Cities and Chicago that would complement the existing single daily train. Robust analyses are being performed of passenger ridership for these rail corridors under active development, and information will be included in the 2015 Minnesota State Rail Plan, as available.

Phase I Projects

Performance measures were used to evaluate each of the criteria areas described in Table 5.1.

Table 5.1 Passenger Performance Measure Estimation

CATEGORY	MEASURE
System Performance	**Ridership.** Total ridership by corridor
	System efficiency. Passengers per train mile
Livability	**System accessibility.** Minnesota residents outside of the Twin City metro area with access to the rail system.
Environmental	**Environmental impact.** Qualitative assessment of the impact of new track or right of wayon the environment.
Financial/Economic	**Cost/Cost per Rider.** Cost of implementing each scenario.
	Revenue/Farebox Recovery.

Ridership forecasts are summarized in Chapter 3. Overall ridership was calculated assuming 300 service days per year. Livability was calculated as the total population living outside of the Twin Cities Metropolitan area that would have access to rail service in the future. County and metropolitan area population projections from the Minnesota State Demographic Center were used to evaluate this measure. Every county or metro area with a station was considered to have access to the rail system. Metropolitan estimates were used for stations in St. Cloud. County-level estimates were used for the remainder of the Phase I corridors. Finally, a qualitative assessment was made of environmental impacts. Corridors using new alignments have a high potential of impact. Passenger services (including all of the Phase I corridors) that would use shared track with freight railroads are expected to have a low potential for environmental impact.

Table 5.1: Phase I - Passenger Project Performance Measures – Benefits *in Millions*

CORRIDOR	SCENARIO EVALUATED	DAILY ROUND TRIPS	DISTANCE	RIDERSHIP	POPULATION WITH RAIL SERVICE OUTSIDE TWIN CITIES	ENVIRONMENTAL
Twin Cities – Albert Lea/Des Moines (I-35 Corridor)	Intercity Rail	4	113	136,475	104,877	Low
Twin Cities – Eau Claire, WI	Intercity Rail	4	87	268,812	-	Low
Twin Cities – Fargo/ Moorhead	Intercity Rail	2	242	37,032	67,079	Low
Twin Cities – Mankato	Intercity Rail	4	84	234,864	66,049	Low
Twin Cities – St. Cloud	Intercity Rail	8	67	1,107,005	267,420	Low

Table 5.2 shows these project metrics for the Phase I corridors. Major findings are as follows:

- The Twin Cities – St. Cloud corridor has the potential for the highest ridership, at more than one million annual riders, and provides access to the passenger rail system for more than 250,000 residents.
- Three routes have ridership better than one passenger per train mile—St. Cloud, Mankato and Eau Claire. St. Cloud has more than three riders per train mile, indicating a high likelihood of success for this line.
- As each of the Phase I alignments uses existing track, the environmental impacts are judged to be low.

Phase II Projects

Projects designated at Phase II are described in Chapter 3, and have an implementation horizon of 20+ years. A robust evaluation of these projects has not been started.

PASSENGER SYSTEM COST EVALUATION

Phase I Projects

Cost, revenue and cost-effectiveness values were estimated for each Phase I corridor. Cost estimates are detailed in Chapter 3. Because any passenger rail service operating on a freight route would need to be negotiated between the passenger rail provider and the freight railroad, it is difficult to establish a definitive cost.

Potential revenue for each of the services is based on the fares used to estimate ridership. The model includes fare estimates on a per mile basis, multiplied by ridership by segment to calculate revenue. In addition, cost-effectiveness was evaluated using several metrics, including:

- Capital Cost per Mile of Service. This is the total capital cost divided by the corridor length. This shows the average cost of implementation of each new route and allows a normalized comparison of routes.
- Farebox Recovery Ratio. The farebox recovery ratio is the total ticket revenue divided by operations and maintenance costs. It captures the extent to which a new service, once implemented, can pay for itself. According to Fiscal Year 2014 Amtrak data, farebox recovery ratios for single or bistate corridors range from 14 percent for the Hoosier State service to 156 percent for Washington–Lynchburg service, with an average of 58 percent. Long-distance, multistate Amtrak routes average about 48 percent. Only the Northeast Corridor (Boston-NYC-DC) Acela has consistently covered its operating costs through revenues.
- Operating Subsidy per Rider. In addition to the farebox recovery ratio, an average operating subsidy per rider is estimated. In combination with the capital cost, this captures the magnitude of public expenditures required to support each service.

Table 5.3 shows these metrics of cost-effective performance by passenger line.

Table 5.3 Phase I Passenger Project Performance Measures – Costs and Cost-Effectiveness

CORRIDOR	SCENARIO EVALUATED	DAILY ROUND TRIPS	CAPITAL COST (MILLIONS ONE-TIME)	MAINTENANCE COST (MILLIONS ANNUALLY)	REVENUE (MILLIONS)	FAREBOX RECOVERY (PERCENT)	CAPITAL COST PER MILE (MILLIONS)	CAPITAL COST PER RIDER	OPERATING SUBSIDY PER RIDER
Twin Cities – Albert Lea/Des Moines (I-35 Corridor)	Intercity Rail	4	$119	$19.0	$1.0	5%	$1.0	$868.29	$131.82
Twin Cities – Eau Claire, WI	Intercity Rail	4	$156	$14.6	$5.1	35%	$1.8	$580.33	$35.26
Twin Cities – Fargo/Moorhead	Intercity Rail	2	$120	$10.2	$2.0	20%	$0.5	$3,229.64	$220.26
Twin Cities – Mankato	Intercity Rail	4	$223	$14.1	$4.1	29%	$2.7	$949.48	$42.80
Twin Cities – St. Cloud	Intercity Rail	8	$ 218	$ 22.5	$15.7	70%	$3.3	$196.93	$6.19

Major findings include:

- Service to St. Cloud, Mankato and Eau Claire have higher capital and operating costs, yet the higher levels of ridership allow costs per rider on these lines to be significantly lower than those for Albert Lea/Des Moines or Fargo/Moorhead. Annual operating subsidies are highest for Fargo (more than $200 per rider), and Albert Lea (more than $130 per rider). All other routes have subsidies less than $100 per rider, with St. Cloud's operating subsidy per rider less than than $10 annually.

Phase II Projects

Projects designated at Phase II are described in Chapter 3, and have an implementation horizon of 20+ years. A robust evaluation of these projects has not yet been started.

Freight Element

Being privately owned, the sources of funds to operate, maintain and improve a freight railroad are largely drawn from private capital. Freight railroads provide significant public benefit, however, and are often shared corridors with passenger service. There are exceptions and cases where public financing of freight railroad projects are undertaken. This is particularly the case with short lines, where some degree of public funding is common. Table 5.4 lists the typical sources of funding for operations and maintenance, and the primary categories of capital investment by carrier type.

Table 5.4 Typical Sources of Funding for Freight Railroads

COST CATEGORY	CLASS I CARRIERS	CLASS II AND III CARRIERS
Operations and Maintenance	Private capital – Cash flow	Private capital – Cash flow, loans, etc.
Capital Maintenance and Expansion	Private capital – Cash flow, loans, stock, etc. Tax credits and public grants	Private capital – Cash flow, loans, stock, etc. Tax credits, public loans and grants
Cars and Locomotives	Private capital – Direct ownership, third-party lease	Private capital – Direct ownership, third-party lease
Grade Crossings	Private capital – Cash flow	Private capital – Cash flow
Customer Facilities	Private capital – Customer cash flow, loans, etc. Freight rail and economic development assistance programs	Private capital – Customer cash flow, loans, etc.

Table 5.5 shows a strategy for distributing the costs of the $4.3 billion in freight-only improvements. As shown, 72 percent of these costs are assigned to be covered by the private railroads, with public contributions primarily in the areas of 286,000 pound compliance and grade crossings. Existing investment trends indicate that Class I railroads may be able to cover a higher share than previously thought; however, the railroads at best may be able to make investments which can accommodate existing traffic, but not future growth.

Table 5.5: Freight System Costs, Public and Private Shares
Including Contingencies ($millions)

NEED	TOTAL COST	PUBLIC SHARE	PRIVATE COST
Class I upgrades	$2,875.2	$718.8	$2,156.4
Other Class I improvements	$201.0	-	$201.0
PTC (Short Line Locomotive Retrofits)	$3.0[70]	$0.75	$2.3
286K restrictions*	$548.0	$54.8	$493.2
Non Class I bridge and speed restrictions*	$13.0	-	$13.0
Class II track upgrades*	$244.0	-	$244.0
Grade Crossings	$441.3	$441.3	-
Total	$4,325.5	$1,215.7	$3,109.8
Percent of Total		%28	%72

Note: Contingencies include 30 percent contingency and 10 percent engineering costs in base case; 10 percent contingency and 10 percent engineering cost in best case.* indicates values carried forward from 2010 State Rail Plan.

SHARED FREIGHT/PASSENGER IMPROVEMENTS

The financing plan for the shared passenger and freight improvements (including the stand-alone HSR passenger lines) assumes three levels of federal funding support (0, 30 and 50 percent). The 80 percent federal share shown in the 2010 State Rail Plan was eliminated as unrealistic. The distribution of costs is shown in Table 5.6. Total non-federal public sector capital costs range from $2.09 billion (50 percent federal share) to $4.18 billion (0 percent federal share)

Table 5.6: Total Possible Improvement Costs, State Rail Plan

NEED	NO FEDERAL FUNDS (MILLIONS)	30% FEDERAL MATCHING FUNDS (MILLIONS)	50% FEDERAL MATCHING FUNDS (MILLIONS)
Freight Infrastructure Costs	$3,010.7	$903.2	$1,505.4
Passenger Improvement Costs	$977.6	$310.0	$517.0
Crossing Safety Improvement Costs	$441.3	$132.4	$220.7
Total Improvement Costs	$4,429.6	$1,328.9	$2,214.8

[70] ASLRRA Estimates that retrofits can cost between $70,000 to $150,000 per locomotive, based on age and model. Assumption: 20 locomotives will be retrofitted.

Financing

The approach to financing the 2015 Minnesota State Rail Plan presumes the need for multiple actors, methodologies and years. This is a 25-year program and the full program costs should be viewed as a long-term goal, which can be achieved incrementally over the life of the program. A range of financing tools will be needed among the public sector stakeholders—federal, state, regional/local—and the private sector, including railroads and investor/developers. Unlike the interstate highway program to which this national rail initiative is often compared, there is no single dedicated source of funding.

State and local funding commitment to planning, capital investment and operations has already been demonstrated in Minnesota. State general fund and bond proceeds were dedicated to the existing freight and safety programs (including the Minnesota Rail Service Improvement Program), the Passenger Rail Office in MnDOT, Zip Rail, NLX, MWRRI, and station facilities at Target Field Station and St. Paul Union Depot. Minnesota counties and Regional Railroad Authorities also committed local matches from general funds and special purpose tax levies toward these and other projects.

On the federal side, the funding picture changed considerably since 2010. SAFETEA-LU was supplanted by MAP-21 in 2012, and while it did not include any substantive changes to potential funding sources for intercity passenger rail service, actual appropriation levels dropped substantially. With an initial duration of only two years, MAP-21 was set to expire in 2014, but was extended through May 2015 under a continuing Congressional resolution. Existing rail-eligible program elements include:

- Surface Transportation Program
- Congestion Mitigation and Air Quality Improvement Program
- Rail Line Relocation Grant Program
- Transportation Infrastructure Finance and Innovation Act
- Transportation Investment Generating Economic Recovery discretionary grants
- Private Activity Bonds
- Rail Rehabilitation and Improvement Financing Financing Program

Since 2010, Congress has not appropriated any further funding under the PRIIA programs; PRIIA's authorization expired at the conclusion of FY 2013. Current draft legislation does not include any substantive direct funding for passenger rail program development outside of the Northeast Corridor.

The one federal program that has continued to be a consistent source of funding for freight and passenger rail projects is the USDOT's Transportation Investment Generating Economic Recovery,discretionary grants. This program is highly competitive for a relatively small pot of money. The 2014 program received 1,400 applications for $57 billion in project costs for only $1.5 billion in available grants.

Tools for leveraging private sector investment include:

- Expanding the Minnesota Rail Service Improvement Program from a revolving loan program to a combination of loan and grant programs as done in some other states such as Iowa, Wisconsin and Virginia, and to increase the loan ceiling from the current $200,000
- Offering financial assistance for Railroad Rehabilitation and Improvement Financing applicants (Oregon has such a program)
- Providing state maintenance and investment tax credits for rail improvements
- Broadening access to the Minnesota Revolving Loan Fund for rail projects beyond grade crossing improvements

In addition to these programs designed to leverage private investment, a dedicated stream of state and or local/regional revenue is needed to support bonding for capital investment and annual operating subsidies. Otherwise, this program will always be in annual competition with a broad array of state priorities and it will be difficult to achieve the unified system envisioned in the 2015 Minnesota State Rail Plan. To achieve full state participation, the constitutional limit of $200 million in debt to support rail projects needs to be amended.

Public and Private Economic Benefits

Potential rail investments will generate a range of economic impacts in the areas served by the improvements. Though not quantified in this study, this section provides a discussion of the range of impacts that these investments may bring about.

Economic benefits are usually categorized into direct and indirect categories. Direct benefits are directly associated with the investment during planning and construction, and subsequent implementation. During construction, typical benefits include construction jobs and direct supplier purchases. Once operational, the range of benefits expand beyond direct system employment and vendor sales to include out-of-pocket cost reductions by system users, time savings, reduced maintenance costs on parallel highways, and gains in safety from a reduction in accidents. Examples include personal time savings for all riders on any train faster than competing auto or air travel, and lowered costs on rail per passenger mile versus automobile use.

Indirect benefits and costs refer to the broader economic effects that an investment will have on a region's economy. For example, new passenger rail service may expand tourism opportunities and, with it, increase the amount of investment and jobs in that business sector. For freight, changes in a region's economy will occur because of changes in the cost of doing business associated with the cost of freight transportation. Business costs affect productivity and profitability, and ultimately also the competitiveness of a region's businesses. The value of this cost differs by industry, depending on the extent to which each industry relies on rail freight, trucking or "on-the-clock" employee travel.

Rail Studies and Reports

A description of completed planning studies related to freight and passenger rail is included in Chapter 1 and Appendix A. The need for additional studies of freight and passenger rail are discussed, as applicable, in Chapter 3 and Chapter 4.

Passenger and Freight Rail Capital Program

A complete list of projects identified in the 2010 State Rail Plan and current efforts is included in Appendix C. Freight, passenger and crossing safety projects are organized by corridor. Phase I and II corridors include Twin Cities to Albert Lea/Des Moines (I-35 Corridor), Twin Cities to Eau Claire, Twin Cities to Fargo/Moorhead, Twin Cities to Mankato, Twin Cities to Saint Cloud and Twin Cities to Sioux Falls, South Dakota. Advanced planning projects for the Twin Cities to Duluth (NLX) Corridor, and Twin Cities to Rochester (Zip Rail) Corridor also are included using 2010 estimates. In addition, a number of projects are included that are not part of specific corridors, but are important to freight and passenger mobility and public safety. In total, there are 62 freight projects, 57 passenger projects and 45 crossing safety projects.

6.0 COORDINATION AND REVIEW

Public Participation

Throughout the 2015 Minnesota State Rail Plan development process, various strategies were used to engage the public, stakeholders and other agencies. These strategies were outlined at the beginning of the project in a Public Involvement Plan. The PIP developed an involvement strategy, including roles and responsibilities, goals and objectives, activities, and outcomes. It is included as Appendix D. The goals and objectives of the engagement process were to:

- Create opportunities for involvement
- Provide opportunities for education and information about the state's rail system
- Use the input to identify opportunities to guide MnDOT's vision for rail
- Integrate and coordinate stakeholder and public involvement with technical tasks

The intended outcome was for stakeholders to actively participate in the project process and assist MnDOT in creating an overall plan that is implementable. To achieve this outcome, the following strategies were implemented:

- Public open house meetings – statewide
- Passenger Rail Forum meetings
- Minnesota Statewide Freight Summit
- Targeted meetings
- MetroQuest online survey
- Website and online engagement

PUBLIC OPEN HOUSE MEETINGS – STATEWIDE

Two rounds of open houses were held to engage the public. The first round occurred October through December 2014, and the second round was in January and February 2015. The purpose of the first round was to introduce and educate attendees on the State Rail Plan and provide opportunities to influence plan development. Throughout the second round, a draft of the State Rail Plan was shared with attendees and there were limited opportunities to influence the final State Rail Plan. A summary of open house dates and locations is shown in Table 6.1, along with the number of attendees and comments received at each open house.

Table 6.1: Open House Locations and Participation

DATE	LOCATION	ATTENDEES	COMMENTS
ROUND 1			
Oct. 16, 2014	Northfield, Minn.	19	10
Nov. 5, 2014	Saint Cloud, Minn.	19	2
Nov. 6, 2014	Eau Claire, Wisc.	98	10
Nov. 10, 2014	Saint Paul, Minn.	13	1
Nov. 12, 2014	Red Wing, Minn.	26	5
Nov. 13, 2014	Mankato, Minn.	17	7
Nov. 17, 2014	Duluth, Minn.	29	10
Nov. 24, 2014	Moorhead, Minn.	14	3
Nov.r 25, 2014	Winona, Minn.	12	0
Dec.r, 8, 2014	Willmar, Minn.	15	4
ROUND 2			
Jan. 21, 2015	Red Wing, Minn.	7	0
Jan. 22, 2015	Mankato, Minn.	16	3
Jan. 26, 2015	Winona, Minn.	35	4
Jan. 29, 2015	Saint Cloud, Minn.	19	4
Feb. 2, 2015	Saint Paul, Minn.	8	0
Feb. 2, 2015	Northfield, Minn.	27	9
Feb. 3, 2015	Duluth, Minn.	6	0
Feb. 5, 2015	Eau Claire, Wisc.	55	9
Feb. 9, 2015	Willmar, Minn.	15	0
Feb. 26, 2015	Rochester, Minn.	7	0

PASSENGER RAIL FORUM MEETINGS

Following the adoption of the 2010 State Rail Plan, Minnesota rail stakeholders remained engaged in rail planning issues through the formation of an Intercity Passenger Rail Transportation Forum. The Passenger Rail Forum meets on the first Monday of every month. For this update to the Minnesota State Rail Plan, the PRF was engaged at two

points in plan development at standing meetings. The purpose of these workshops was to inform stakeholders of plan progress, gain stakeholder input on the draft plan, and gain input on rail system needs to be considered.

Workshops occurred at the Nov. 3, 2014, and Feb. 2, 2015, PRF meetings.

MINNESOTA STATEWIDE FREIGHT SUMMIT

MnDOT and the Center for Transportation Studies at the University of Minnesota held a Statewide Freight Summit on Dec. 5, 2014. Speakers included:

- Commissioner Charles Zelle, MnDOT
- Caitlin Rayman, Federal Highway Administration
- Bill Goins, FedEx
- Jeffrey Rainey, Greater MSP
- Erika Witzke, Cambridge Systematics

Members of the project team for the 2015 Minnesota State Rail Plan were present to listen to participant feedback as it pertained to rail. Notes were compiled from the breakout conversations and used to guide this update to the 2010 State Rail Plan.

TARGETED MEETINGS

Within the first 3 months of plan development, targeted meetings were held with high-level industry leaders throughout the state to discuss general industry needs and issues important to plan development. The purpose of these meetings was to engage industry experts on the technical content development for the 2015 plan. A full list of stakeholder engagement is provided later in this chapter.

METROQUEST ONLINE SURVEY

The State Rail Plan was updated at the same time Minnesota was writing a Statewide Freight Plan, which allowed for public and stakeholder outreach efforts for each plan to work together. An interactive, online survey called MetroQuest was developed to gain input on the Statewide Freight Plan. The survey included an exercise that allowed participants to identify issues on Minnesota's multimodal freight system. Feedback pertaining to rail was captured for use in this plan update.

WEBSITE AND ONLINE ENGAGEMENT

For the course of this update, MnDOT hosted a website for the State Rail Plan. Members of the public could access information on public outreach, online resources and contact information for the plan on the website. This included a place to submit comments online. The website was available at www.dot.state.mn.us/planning/railplan.

Coordination with Neighboring States and Canada

Minnesota is at the center of the continent, bordered by North Dakota, South Dakota, Iowa, Wisconsin, and Canada. Rail connections are made to all of these neighboring states and Canada. Throughout plan development, the point

was emphasized that private railroads do not look at the system from a lens of state boundaries. The State Rail Plan should not limit regional connections. Coordination efforts with neighboring states and Canada were made to ensure the 2015 Minnesota State Rail Plan represents Minnesota's regional position.

Several of Minnesota's proposed passenger rail corridors terminate in or move through areas outside of Minnesota. Coordination with these states' respective Departments of Transportation will be critical to developing passenger service. This coordination began on projects such as the Northern Lights Express and the study of a second daily Empire Builder train between Minnesota and Chicago. The Tier I Draft Environmental Impact Study between the Twin Cities and Milwaukee, Wisc., moves forward in a coordinated effort between MnDOT and the Federal Railroad Administration. These coordination efforts are captured in the passenger rail planning components of the 2015 Minnesota State Rail Plan.

Coordination with other states occurred through open house outreach. In the first round of open houses, MnDOT facilitated a meeting in Eau Claire, Wisc. There were 98 people in attendance. Most were there to express strong interest in a passenger rail connection between Eau Claire and the Twin Cities. At the Moorhead open house, representatives from the North Dakota Department of Transportation were in attendance to learn about the 2015 Minnesota State Rail Plan. North Dakota will be writing its State Rail Plan in 2015. Officials discussed items of coordination moving into the future.

Minnesota is concurrently completing a statewide freight plan update, which involves interviews with agency freight experts at each of the neighboring states and provinces including Iowa, North Dakota, South Dakota, Wisconsin, Manitoba, and Ontario. This exercise focuses on learning key trends and issues, current/near-term needs, infrastructure bottlenecks, operational bottlenecks, performance measures, and freight planning efforts as they pertain to Minnesota.

Stakeholder Engagement

The consultant team and MnDOT worked closely with rail carriers, local governments and various other agencies in the composition of the 2015 Minnesota State Rail Plan. State Rail Plan team members attended the Minnesota Rail Summit and the Minnesota Freight Advisory Committee in 2014 to listen to rail stakeholders and receive comments on what the Minnesota rail infrastructure system needs in the future. Various city and metropolitan planning organization officials attended the open house meetings around the state, and their suggestions were expressed through the public process. Stakeholder comments were taken into consideration while making short- and long-term recommendations for the 2015 Minnesota State Rail Plan.

A list of public and private stakeholders engaged throughout the 2015 Minnesota State Rail Plan development is listed in Table 6.2.

Table 6.2: Stakeholder Group Engagement

STAKEHOLDER GROUP	DATE	ATTENDEES
Twin Cities & Western	12/3/2014	• Mark Wegner • Dave Long
Midwest Shippers Association	12/3/2014	• Bruce Abbey
Minnesota Grain & Feed Association	12/3/2014	• Bob Zelenka
Minnesota Regional Railroad Association	12/4/2014	• John Apitz
Minnesota Commercial Railroad	12/4/2014	• Wayne Hall • Joe Kellner
Canadian Pacific Railway	12/12/2014	• Herb Jones • Judy Mitchell
Union Pacific Railroad	12/16/2014	• Wes Lujan • David Rector • Jeff Chapman • Mark Bristol
BNSF Railway	2/27/15	• Brian Sweeney • Colleen Weatherford
Progressive Rail	*not complete	• Layne Leitner

Public and Stakeholder Feedback

This section documents public and stakeholder feedback collected through the methods discussed at the beginning of this section. Issues raised and recommendations made throughout plan development were taken into consideration by the project team. The trends discussed in Chapter 1 and Chapter 2 of this plan were developed from public comments. Specific comments were addressed, where appropriate, throughout the plan.

PUBLIC FEEDBACK

Open House Round 1

Public open houses for the 2015 Minnesota State Rail Plan were held throughout the state in October, November and December 2014. The open houses aimed to educate attendees on the 2015 Minnesota State Rail Plan, receive public feedback on rail topics for both freight and passenger service, and provide opportunities for participants to influence plan development. Materials at the open houses included display boards, presentations specific to the location, Statewide Freight Plan stations, comment forms, and various project handouts. Meetings generally ran from 5 to 7 p.m. A complete summary of each open house by location is provided as Appendix D and an inventory of written comments is provided as Appendix E.

- Rail Improvements: A recurring theme at most open houses was the desire to increase safety standards both for rail siding infrastructure and freight rail cars themselves. Many respondents at various open houses were concerned with rail safety and congestion related to the recent Bakken oil boom. Attendees expressed desires to make freight companies disclose commodity information in rail cars to the communities they pass through, to construct double track segments in congested rail corridors, and to update safety standards for oil tankers. Several respondents also frequently identified passenger rail as a need throughout the state, but the open houses in towns with Empire Builder service expressed frustration with recent Amtrak delays. Other recommended improvements included expanding system capacity and upgrading rail for increased speed.
- Passenger Rail: Many respondents at each open house expressed support for passenger rail development in Minnesota and the Upper Midwest. Although questions and comments about passenger rail were usually specific to the city in which the open house was hosted, many citizens were also interested in statewide passenger rail development. Most project-specific comments were about the proposed Zip Rail and Northern Lights Express lines. Large, widespread support was expressed for studying passenger rail to Eau Claire, Wis., while generally good support was expressed for studying passenger rail to Northfield and expanding Northstar Commuter Rail to St. Cloud. Some respondents were opposed to any passenger rail development, citing capital cost and land impacts as major deterrents. Respondents almost unanimously expressed frustration regarding Amtrak delays and expressed a desire to add a second daily Empire Builder train for both eastbound and westbound movements.
- General: Several respondents gave detailed suggestions to the 2015 Minnesota State Rail Plan specifically. Other comments received included requests to develop a rail system that supports renewable energy sources, mitigate noise and heavier train weight impacts, ship more diverse commodities, and pair passenger rail with economic, and land development opportunities.

Open House Round 2

A second round of public open houses for the 2015 Minnesota State Rail Plan were held throughout the state in January and February 2015. The open houses were intended to educate attendees on the 2015 Minnesota State Rail Plan and receive public feedback on rail topics for freight and passenger service. The second round also allowed respondents to comment on the draft plan. Materials at the open houses included display boards, a presentation, a Freight Plan station, and comment forms. Most meetings ran in the evening from 5 to 7 p.m., with some running in the afternoon and during the lunchtime hours. A complete summary of each open house by location is provided as Appendix D. An inventory of written comments is provided as Appendix E.

- Rail Improvements: Similar to the open houses held in fall 2014, rail safety was a primary concern from respondents. Safety concerns related to the recent Bakken oil boom and subsequent freight rail shipment was still noted by attendees; however, concerns dealing with stopped freight trains blocking roads near at-grade crossings was a larger topic in this round. Several respondents cited instances where stopped trains near at-grade crossings placed safety hazards on their communities, and asked to prioritize the implementation of highway-rail grade separations at key bottlenecks throughout the state.
- Passenger Rail: Continuing from the original round of open houses, many respondents expressed support for passenger rail development in Minnesota. A large grassroots contingency from Northfield and southern

Minnesota demonstrated major support for a Twin Cities to Northfield passenger rail line. Large support for passenger rail development continued to be expressed in Eau Claire, and a large majority continued to support Northstar Commuter Rail expansion to St. Cloud. Several respondents were opposed to overall passenger rail development around the state, citing high implementation costs.

- General: Respondents continued to express widespread support for freight rail safety improvements, specifically along lines carrying silica sand and Bakken oil shipments. While many were concerned about rail safety and congestion, several respondents noted that they were pleased to see the rail industry growing, and recognized the positive economic impact that railroads have on the state of Minnesota.

Public Hearing

A public hearing for the Minnesota State Rail Plan was held on Feb. 10, 2015 from 3 to 4:30 p.m. in the MnDOT Conference Room G13-14 in St. Paul, Minnesota. The hearing was advertised through MnDOT communications, including a press release, on the project website and at project open houses. Attendees were invited to provide testimony on the draft State Rail Plan. Two individuals provided comment. Testimony included general concern regarding the planned Zip Rail project and requests for specific changes and additions to the plan. A full transcript of the public hearing is provided in Appendix D.

Online Comments

Online comments were received throughout plan development. Respondents submitted comments on the State Rail Plan website and submitted feedback via email directly to the project manager. Key themes included freight rail congestion, rail impacts, Amtrak delays, and passenger rail. Other comments received were about Northstar commuter rail expansion, open house suggestions, and the update of 2015 data. A full inventory of comments received online throughout plan development is provided in Appendix E. Key themes are summarized here.

- Rail Congestion: Many respondents expressed economic and safety concerns regarding recent freight rail traffic increases. Feedback was provided on how to expand system capacity.
- Rail Impacts: Multiple comments were received about traffic impacts associated with blocked crossings by freight cars in greater Minnesota. Other comments were received on vibration impacts experienced by property owners along existing freight rail corridors. Some respondents indicated concerns with noise impacts along routes.
- Amtrak Delays: Several online commenters identified recent Amtrak schedule delays as preventing them from taking the service even though they used and enjoyed the service before.
- Passenger Rail: The majority of comments regarding passenger rail were in favor of developing the system. Some respondents were opposed to passenger rail development. Many online submissions were received in favor of connections from the Twin Cities to Eau Claire and Northfield.

LETTERS AND RESOLUTIONS

Throughout plan development, MnDOT received letters and resolutions from various stakeholder groups regarding plan development. Various cities, authorities and groups within the Twin Cities/South Central Minnesota passenger rail corridor expressed support for elevating this route to Phase I development status. These letters and resolutions are provided in Appendix F and summarized in Table 6.3.

Table 6.3: Letters and Resolutions

LETTER/RESOLUTION	MAIN POINTS
Albert Lea Economic Development Agency	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Albert Lea-Freeborn County Chamber of Commerce	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
All Aboard Minnesota	• Broaden focus to five-state region approach for passenger rail corridors • Focus on passenger rail corridors that are greater than 100 miles • Refine ridership modeling • Invest in public-private partnerships with railroads on capital projects • Secure a double track mainline between Minneapolis and St. Paul for passenger rail use • Consider long distance through trains
Bike Northfield	• Elevate Twin Cities – Northfield corridor to Phase I development status
Carleton College	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
City of Albert Lea	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
City of Dundas	• Elevate Twin Cities – Northfield corridor to Phase I development status
City of Faribault	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
City of Farmington	• Elevate Twin Cities – South Central Minnesota (through Northfield) corridor to Phase I development status
City of Lonsdale	• Elevate Twin Cities – Northfield corridor to Phase I development status
City of Mankato	• Maintain Tier I status of Mankato – Metro Twin Cities line
City of Northfield	• Elevate Twin Cities – Northfield corridor to Phase I development status
City of Northfield Economic Development Authority	• Elevate Twin Cities – Northfield corridor to Phase I development status
City of Owatonna	• Elevate Twin Cities – Northfield corridor to Phase I development status
City of Rosemount	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
City of Saint Paul	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status • Support connection at Union Depot in downtown Saint Paul

LETTER/RESOLUTION	MAIN POINTS
City of Savage	• Elevate Twin Cities – South Central Minnesota (through Northfield) corridor to Phase I development status
City of Savage Mayor	• Elevate Twin Cities – Northfield corridor to Phase I development status
City of Shakopee	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Dakota County Regional Railroad Authority	• Consider comments on safety, capacity, passenger service, and other
Faribault Area Chamber of Commerce	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Farmers Union Industries	• Encourage the state to continue funding and finish the work of the publicly owned railroad in Redwood County
Freeborn County	• Elevate Twin Cities – South Central Minnesota (through Northfield and Albert Lea) corridor to Phase I development status
Friends of the Mill Towns State Trail	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Minnesota Farm Bureau	• Make system improvements to accommodate existing and future demand • Resolve bottlenecks • Improve safety • Prioritize freight movements on rail • Discontinue high speed rail in the plan
Minnesota State Legislators David Bly, Frank Hornstein, Alice Hausman, Rick Hanson, Rina Liebling, Dan Sparks, Clark Johnson, and John Considine	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Northfield Convention and Visitors Bureau	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Northfield Hospital and Clinics	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Northfield Public Schools	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Ramsey County Regional Railroad Authority	• Supports additional analysis of intercity passenger rail between Twin Cities (Union Depot) and South Central Minnesota • Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Ramsey County Regional	• Supports additional analysis of intercity passenger rail between Twin Cities

LETTER/RESOLUTION	MAIN POINTS
Railroad Authority, Chair	(Union Depot) and South Central Minnesota • Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Renville County	• Consider including the Minnesota Valley Regional Rail Authority to complete the rail and bridge rehabilitation remaining on 60 miles of track that stretches from Winthrop to Hanley Falls
Rice County Board of Commissioners	• Elevate Twin Cities – Northfield corridor to Phase I development status
Saint Cloud Area Planning Organization	• Prioritize passenger rail investments based on project demand and cost-benefit analysis • Show St. Cloud – Twin Cities as highest priority corridor for Greater Minnesota investment
Scott County Association for Leadership and Efficiency	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Shakopee Mdewakanton Sioux Community and Tribal Chairman Charlie Vig	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
St. Croix Valley Rail Group	• Call the Eau Claire passenger line stop “Hudson-River Falls” • Modify the passenger rail map • Consider the Fox River Valley in future planning • Conduct Hudson and River Falls public meetings
St. Olaf College	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
Steele County Board of Commissioners	• Elevate Twin Cities – South Central Minnesota corridor to Phase I development status
U.S. Highway 169 Corridor Coalition	• Maintain Tier I status of Mankato – Metro Twin Cities line

STAKEHOLDER FEEDBACK

As a component of the outreach plan, a number of individual stakeholders were interviewed to provide input on key trends that have arisen since the last rail plan and to highlight concerns moving forward. This process revealed a number of common themes. In the last five years, the industry experienced substantial change, along with unforeseen growth and their associated challenges. In Minnesota, recent trends principally revolve around increased traffic, economic growth and safety. Rail volumes expanded across most of Minnesota’s traditional commodity groups, while energy sector volume,particularly crude-by-rail shipments,saw massive increases. In addition to a growth in volume, rail traffic mix adapted to meet industry demands. This is particularly true in agriculture, where the types of crops produced and methods of shipping used have shifted since 2010.

To accompany growth and expansion trends, industries associated with energy and freight transportation sector increased substantially in the state, with most Class I railroads continuing to hire at unprecedented levels. Increased traffic and demand also have pushed safety to the forefront of public discussion. Higher volumes of rail traffic led to increased exposure at highway-rail crossings in many Minnesota communities, while emergency response capabilities became more of a concern due to increased shipments of hazardous materials on railways. Response to safety concerns engaged public stakeholders, as many states, including Minnesota, are actively evaluating crossing safety, training hazmat response teams and exploring new means of promoting safety within their communities. From a private perspective, Class I operators in Minnesota are investing at historic levels, and while most investment is aimed at capacity expansion, safer operations are a key focus. Within the next several years, positive train control will be deployed across major portions of the state, which will increase safety for railroad employees and citizens alike. Additional trends expected over the next several years include:

- Positive Train Control: Essentially, the Class I Railroads are well on the way to implementing PTC; however, implementation remains an issue for short lines. Affected carriers may include Twin Cities and Western Railroad, Minnesota Commercial, Red River Valley, and Progressive Rail. Installation of PTC on a pre-third generation locomotive is expected to cost more than $100,000, which is beyond the financial ability of many short lines.
- Impacts of the Minnesota Rail Safety Bill: The bill includes elements for safety training, rail yard lighting and expanded inspections, was passed by the legislature in 2014 and imposes significant burdens on industry. The rules, which were supposed to be released in October, have yet to be seen, even though compliance must be achieved by March 2015.
- Railroad police authority in Minnesota: Railroad police authority is problematic for Class I operators, who employ independent law enforcement staff charged with protecting railroad assets and promoting safety for employees as well as the general public in and around railroad property. Minnesota is one of two states in the U.S. where railroad police don't have full police authority. Furthermore, trespassing along a rail right of way is only a misdemeanor offense, which does not properly reflect the risks association with this infraction.
- Rail and rail-related funding from the public sector: The Minnesota Rail Service Improvement Program needs expansion. MRSI was founded in 1976, and has seen little modification since then, particularly in terms of the overall funding amounts. Their members use it regularly and current restrictions and funding levels impede its use. Compared to other states in the Midwest and other parts of the United States, MnDOT's rail funding mechanism tends to present limitations for railroads looking for grant and loan funding sources. In addition, many rail projects also qualify for Minnesota Port Development Assistance Program, which could also benefit from expansion in funding.
- Capacity constraints: There is interest among all parties for finding consensus and funding for Hoffman Junction improvements, of which the Westminster trench is of primary interest to UP, as it would separate their traffic from BNSF, and improve CP's access to its St. Paul Yard. There are physical and political constraints to developing rail-served industrial space in the metro area. General pressure to increase capacity by expanding yards, sidings/double tracks, and increasing centralized traffic control signal coverage among the Class I railroads in and around Minnesota.
- Access to major freight centers and consumer markets: For Minnesota agricultural producers, efficient access to the West Coast efficiently is paramount. The river is only a relief valve, and producers need good

transportation to the west. There is a growing feed market in California, western Canada and Texas, while the traditional southeastern feed market is shrinking. For Minnesota intermodal traffic, efficient access to Chicago and other Midwest intermodal facilities, such as Kansas City, is paramount.

- Using rail to promote economic development in the state: With recent and rapid increases in rail demand, there is a lot of opportunity for Minnesota to capitalize on rail services. One reference for MnDOT and other Minnesota public agencies, which was recently completed, is the Freight Rail and Economic Development Study. Collaborating with MnDOT and other agencies through PPPs to promote mutually beneficial capacity improvements.
- Volatility in agricultural markets: Multiple variables in agricultural markets can cause huge disparities in how and when products get shipped. Record harvests combined with ag market prices led to producers holding back much of their production from distribution channels. Minnesota will continue to be a major player in agricultural markets, but may not be prepared for peak demand/shipping of certain commodities.

METROQUEST REPONSES

As a part of a concurrent planning effort for the Minnesota Statewide Freight Plan, MnDOT created an online, interactive survey called MetroQuest for stakeholders and members of the public to provide input on the existing freight system. The survey was available from Sept. 23, 2014, to Dec. 23, 2014. It was developed as a supplemental method for gaining information in conjunction with open houses and targeted meetings.

The survey included project information and opportunities to provide feedback on the various freight modes, current freight priorities and identify where freight needs are located throughout the state. A total of 600 people took the survey, of which 414 provided additional information about themselves. Approximately half of those responding to the survey are involved in freight movement, and approximately 60 percent of respondents work in the private sector.

Feedback received regarding Minnesota's rail network is summarized here. The following questions pertaining to the 2015 Minnesota State Rail Plan were asked:

- How important is rail to you or your organization?
- What needs are there for Minnesota's rail system?

Rail Importance

Survey respondents were given an overview of Minnesota's freight system and each of the modes used for freight shipment. They were then able to rank the importance of each mode to them or their organization on a scale of 1 to 5 (with 1 being not important/don't use, 3 being average importance/use with other modes, and 5 being very important/use exclusively) and provide any comments they had on each specific mode. Rail was ranked as the second-most important mode, after the highway system. The average ranking for each system is listed in Table 6.4.

Table 6.4: Freight Survey Mode Importance Results

SYSTEM	AVERAGE RANKING	TIMES RANKED
Highway	3.91	544

SYSTEM	AVERAGE RANKING	TIMES RANKED
Railroad	2.94	517
Waterway	2.38	508
Aviation	2.80	501
Pipeline	2.70	203

In addition to providing a simple ranking, respondents could choose to provide comments for each mode. Comments received pertaining to rail are below:

- Not a shipper - but an engineering design firm. Important for clients and communities.
- As a retired private citizen I do not think that this survey is intended for me.
- How current is this data—have oil and sand trains in past 1-2 years gotten into top 3?
- No student transportation
- Rail is a growing piece of transportation for people to jobs, events, etc. However, as we have seen growth in 2014 for freight shipment of goods, how can we balance the impacts on both freight and people movement?
- I am not an "organization." So I am not answering some of the questions. How to answer (for a person) is ambiguous, e.g., the importance of trains. Important to me for freight? Or for travel? You can't tell from the 1-5 system. The trains are important to me, but they should NEVER carry products like fossil fuels or chlorine, etc., that can harm citizens. Preemption, you say? That should END.

Investment Needs

Respondents highlighted investment needs for Minnesota's freight network by placing pins on an interactive map. There were a combined 813 needs identified for all freight modes—208 of these were identified for rail. Results are shown in Figure 6.1 and Figure 6.2, with an inventory of needs provided in Table 6.5.

Figure 6.1: MetroQuest Rail Investment Needs Map

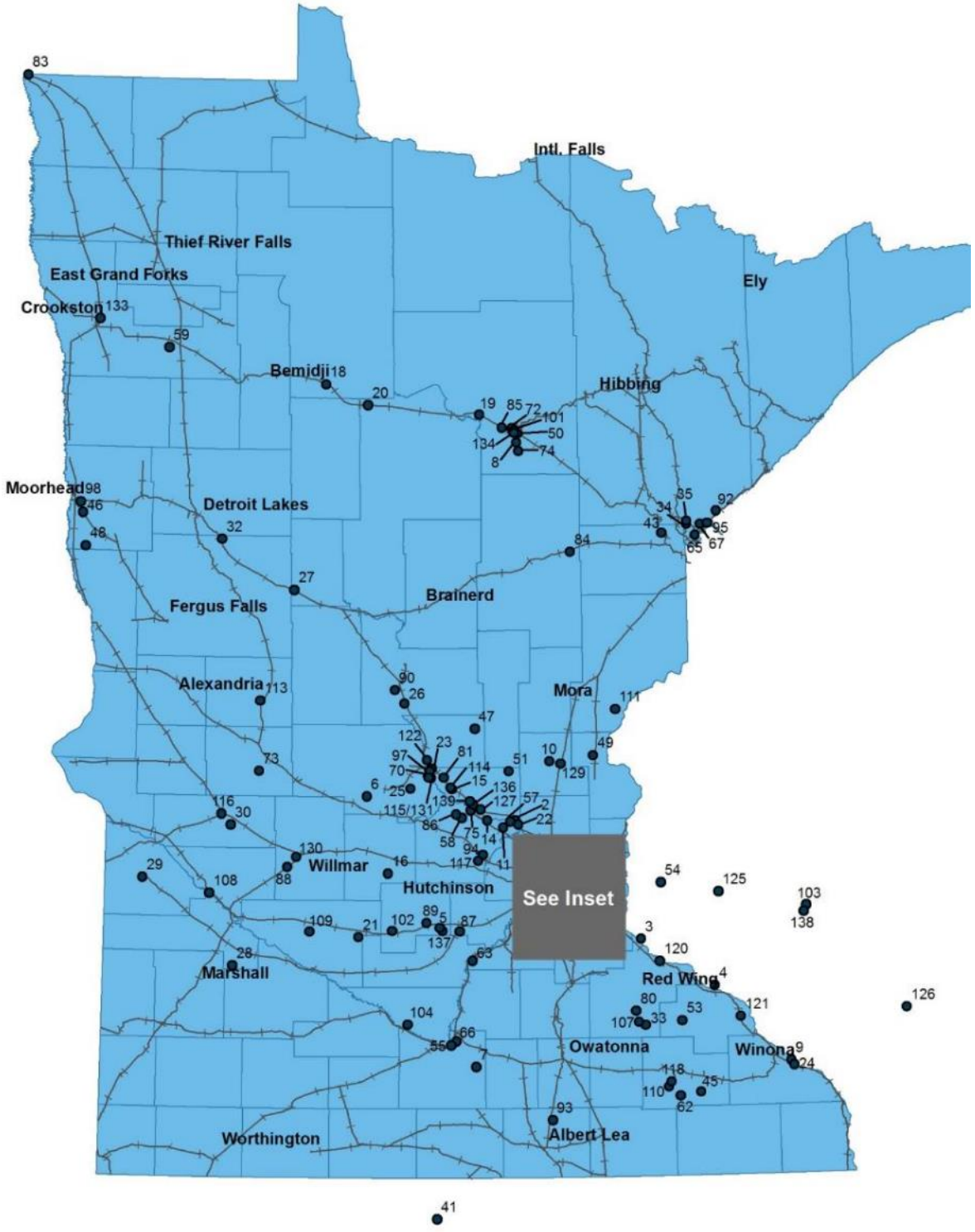


Figure 6.2: MetroQuest Rail Investment Needs Twin Cities Region Inset Map

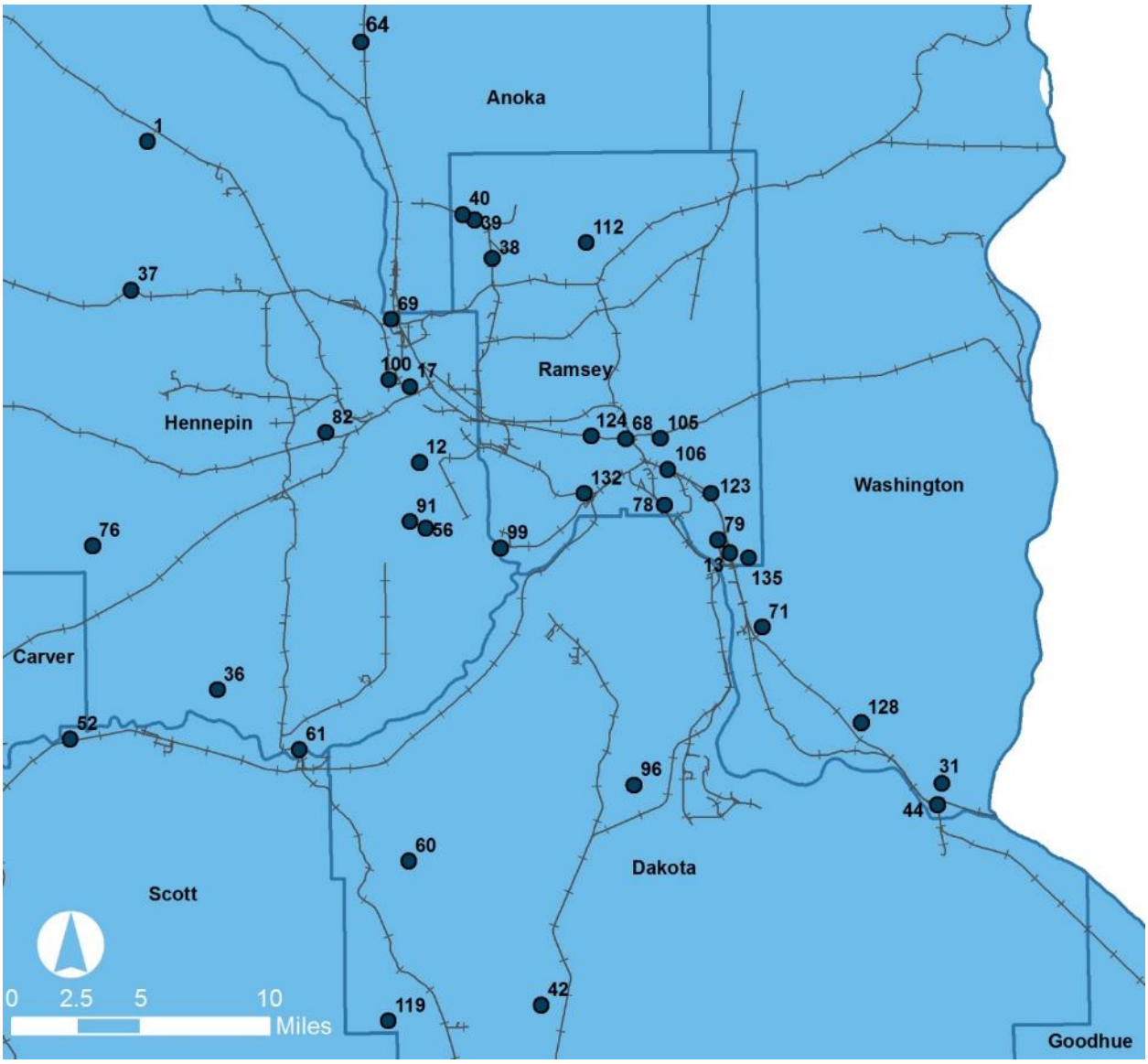

Anoka
Ramsey
Hennepin
Washington
Carver
Scott
Dakota
Goodhue
64
1
40
39
38
112
37
69
100
17
82
124
68
105
106
12
132
123
78
91
56
99
79
13
135
71
76
36
52
61
128
96
31
44
60
42
119
0 2.5 5 10
Miles

Table 6.5: MetroQuest Rail Investment Needs

NO.	COMMENT
1	Would like commuter option from downtown to Maple Grove area
2	With passenger and freight trains using the same tracks, the congestion is growing. We need to look at a better way for both to be on same tracks.
3	Wisconsin too: Degasify, safety training and equipment, and second rail line in addition to pull offs
4	Wisconsin too: Degasify, safety training and equipment, and second rail line in addition to pull offs
5	Will help economy we have tracks use them more wisely
6	We..essentially...need the BNSF served 'High Line' northern corridor to be double tracked (or as near to double-tracked as possible) from Chicago to the PWN ports. But short of that, we need it to be as fast moving as possible through our state.
7	We need light rail to the south metro, or we need to get out of the Met Council.
8	We need a reliable and competitive rail system. If we can't get our raw materials in a timely and cost effective manner. We go out of business.
9	We need a reliable Amtrak schedule with 2 trains a day each way between the Twin Cities and Chicago.
10	We have a spur but the train blocking traffic on Hwy 95 when it stops is unsafe and causes congestion
11	We have 2 tracks running through Elk River and with the amount of trains that are currently being used there can be back ups of traffic at rush hours
12	We depend on timely delivery
13	Unreliable service
14	Train delays impact coal delivery to Sherco power plant!
15	Too many trains travel through day and night sometime holding up traffic for 20 minutes or longer causing consumers to sit in long lines of traffic wasting fuel while their cars idol.
16	Too many oil trains coming from North Dakota into MN...causing safety issues,.
17	To encourage public to use this efficient transportation; hence reduce worload to other transportation means especially highway
18	Three Rails all the way to Duluth Ports for grains and farm products
19	Three rails all the way to Duluth port
20	Three rails all the way to Duluth for goods movement
21	This rail line needs to have a program to replace its jointed rails with continuously welded rails, and also needs to construct rail passing sidings
22	The Staples subdivision is very congested.
23	The second rail line between St. Cloud and the twin cities should be reconnected to allow for more rail transportation and less rail delay.
24	The railways through town need to be redirected around the city or over passes need to be built. In addition carrying fuel and gases through the town on rail is dangerous. Crossing need to be upgraded as well.
25	The railroad system through St Cloud and across the rickety old bridge in downtown St Cloud don't always feel safe to me and my family!!! They need replacing or improvements!!
26	The railroad congestion in this area is horrible. They back up and end up blocking crossings for over an hour. The noise in Rice from the blaring horns is unbearable, especially during the summer. The crossing in Rice is too narrow for pedestrians to safely cross. I will not let my kids ride bike to school because of it.

NO.	COMMENT
27	The railroad bisects our town; frequent congestion backs up traffic and cuts the southern half of the town from access to the hospital in the northern half of town during emergencies. Create an overpass so that the increasing train traffic does not increase road congestion or safety of residents.
28	The Rail Line from Hanley Falls to Winthrop needs to have its 100 year old rails replaced and bridges upgraded so that the pent up demand for economic development in this area can be achieved
29	The existing Rail is only LQP Regional Rail. Pavement upkeep and replacement is not feasible. More rail is needed to move the existing farm commodities and the soon to be increased production yeids of corn and soybeans.
30	Stopped trains routinely block access in and out of Benson.
31	St. Croix Jct. Grade Separation
32	Speed, major curve in the rail, safety is the concern
33	Somewhere along HWY 52 there is an at grade crossing that should be eliminated if possible
34	Should be a bridge at this railroad crossing
35	Should be a bridge at this railroad crossing
36	See nearby Highway recommendation -- re improved road access for trucks entering and leaving the two Twin Cities intermodal rail yards.
37	Safety - for motorists as the crossing has a terrible dip in elevation, which also creates a water/icy crossing condition. Also, the train stops and creates major delays for motorists
38	Safety
39	Safety
40	Safety
41	Safe crossings, switch yard capacity, passenger rail to mpls with freight
42	Reliable rail service can bring in goods otherwise trucked from Chicago and can then backload with agricultural produce for export.
43	Raw materials delivery
44	Raise BNSF and CP Rail Lines along River
45	Railroads are a necessity and if used appropriately they should be able to make money.
46	Rail/road congestion and delays in Moorhead
47	Rail traffic along the US 10 corridor from Detroit Lakes to the Twin Cities is often backed up impacting freight and passenger rail alike. This should almost be a four track corridor.
48	Rail service has been delayed in this area, costing farmers and ag businesses money and marketing opportunities, specifically grain for exports. The Northwest area has been hit hard.
49	Rail service between the twin cities and duluth. would reduce congestion and improve safety. primarily movement of people rather than goods.
50	Rail runs through the heart of Grand Rapids which causes traffic congestion and emergency response delays while trains are moving through town. Also, we have issues getting reliable rail service due to rail congestion.
51	Rail or light rail to St. Cloud.
52	Rail needs to be rerouted out of cental shakoppe downtown. Not only does it significantly slow down the train. I have seen pedestrians cross even if signals are on.
53	Rail needs to be made more reliable. I attempted to take Amtrak to Chicago, but the train had been delayed in states to the west, due to freight traffic. Amtrak hired two busses from Minneapolis to Chicago. This was in the last 6

NO.	COMMENT
	months. Upgrade the tracks. Add another line beside the freight, so the passenger trains Han run on schedule. It works in Europe; why can't it work here?
54	Rail line between Eau Claire and Minneapolis would be a tremendous asset to our business, JAMF Software, and in my opinion, it would have a great economic impact on both cities in general. There are many individuals in the Eau Claire area that would utilize the rail system for shopping and entertainment in addition to the rail being used for commuters during the week.
55	Rail is one of the most efficient ways to move goods, I think we should keep developing this from a central major hub sent out to all major and minor cities.
56	Rail freight and passenger/transit traffic on the same tracks hinder both applications. Freight development and trackside TOD are both hindered.
57	Rail expansion is necessary to move goods and people on mainline routes.
58	Rail congestion has created problems for Northstar, as well as delays at crossings.
59	Rail car shortage, congestion
60	Rail car shortage
61	Rail bridge should be upgraded and capacity increased
62	Rail access that avoids Chicago can get goods to LA faster for export.
63	Preserve capacity on UP for future intercity passenger rail. Without increase in capacity, additional frac sand traffic will preclude passenger rail option. Make improvements in Shakopee and St. Paul to support interchange efforts and preserve potential passenger routes to downtown stations.
64	Passenger service needed all the way to St Cloud
65	Passenger rail would be REALLY helpful from Twin Ports to MSP
66	Passenger connection to twin cities.
67	Passenger connection to Duluth
68	Passenger connection to Chicago
69	Northtown rail yard too congested last 12+ months
70	Northstar station in Saint Cloud
71	Newport BNSF/CP crossover Improvements
72	Need to speed up trains going through grand rapids. Major gridlock for cars whenever trains go through
73	Need to get the products to market
74	Need second railroad line and carrier
75	NEED SECOND RAIL LINE BETWEEN BIG LAKE and CLEAR LAKE (COULD BE ST. CLOUD)
76	Need safe rail line for TCW Railroad to continue to transport goods through the twin cities
77	Need more direct line to get oil out without increasing rail congestion
78	Need increased rail access to Southport River Terminal
79	Need additional rail access from Red Rock River Terminal
80	Need additional freight capacity and passenger rail (commuter, not zip rail) between Rochester and Twin Cities
81	Need additional capacity in this area
82	Need "drop arms" at intersections

NO.	COMMENT
83	More Rail lines to increase capacity
84	More rail lines
85	More rail capacity for delivery of coal
86	More light rail in this area to mpls may loosen up congested roadway systems
87	Minnesota Valley Regional Rail Authority owns 94.7 miles of track from Norwood Young America west to Hanley Falls, MN. This infratructure impacts 16 communities and the businesses including all the ag businesses and ag producers who feed the world and provide commodities for ethanol, biofuels, salt, tallow and other products used all over the country. We contract with Minnesota Prairie Line who is our contract operator. MVRRA is a publicly owned railroad statutorily authorized by the State of Minnesota. We have complete approximately 34 miles of rehab from Norwood Young America to just west of Winthrop with 115 lb continous welded rail, and these improvements are benefiting the communities with new business development occuring along those 34 miles of track. We have 60 miles yet to go and some major developments that can happen when the rest of the track is rehabbed along with the bridges that cross the Minnesota River. Every carload we ship replace 3 semis not tearing of our MN Highways!
88	Make the Wye connection west of Willmar to direct rail traffic out of the main rail yard in willmar.
89	Make sure rail delivery/transport remains viable
90	Lots of trains daily. I have seen some sit waiting to go thru Little Falls. Crossing is just west of the Mississippi River bridge. Backs up traffic many times thruout the day.
91	Light rail in North South corridor from Minneapolis to Southern suburbs.
92	Less Congestion
93	Intermodal rail service needed to give MN & Twin Cities access to LA/Long Beach container shipping ports. UP container rail service on the Spine Line through K.C. to southern California. A much needed development that would strengthen Minnesota's global trade capability and our international trade economy.
94	Intermodal is backed up and very time consuming for drivers to retrieve containers - need infrastructure improvements to ramps
95	Intermodal access
96	Intermodal access
97	Intermodal Access
98	Intermodal access
99	Integrate transit options, such as commuter rail, within freight corridors.
100	Install 5 additional Main Tracks with CTC Signals
101	Improve rail service especially in winter. Need to receive rail cars on time and get switched when needed. Most rail cars are obsolete designs with difficult to operate doors and valves. Need improved ergonomics for loading and unloading of cars. Need new designs for cars which require less manual labor to operate. Need general improvements to railroad operation. It's 2014, GPS can tell exactly where we are while driving or walking, but rail cars are spotted by hand, identified by reading numbers instead of scanning tags, switches are operated manually. It's time to embrace new technology the 1800's are over. Please improve safety, ergonomics, reliability and provide service options for cost control. The railroad is a monopoly with truck as the only alternative they strangle manufacturing.
102	I wish we could have a passengers train to go to the cities to work and get better jobs instead of commuting. Not possible in winter to commute because of weather
103	I need to go to the Cities (and Chicago) to consume their products!
104	I have a rail spur on my property for unloading rail cars of lumber. When MNDOT made an upgrade on the right of

NO.	COMMENT
	way next to my building, they tore out the tracks servicing my building. Now that I want to bring in rail cars I cannot because of the break in the rail line.
105	Hoffman junction is incredibly congested
106	Hoffman Interlocking capacity/fluidity improvements
107	Hi-speed rail between Rochester and Twin Cities
108	Grain Shipments in this area have been hampered by access to grain cars for transportation. It appears that priority for shipping has gone to tanker cars for crude oil instead
109	Grain shipment to harbor and terminals
110	Grain and coal
111	Good rail is essential.
112	Freight Capacity and Safety Issues at Hoffman Yard and Others identified in the East Metro Freight Railroad Capacity Study
113	Faster rail speeds
114	Expansion of NorthStar Commuter Rail to St. Cloud.
115	Eliminate congestion of line from Saint Cloud to Minneapolis.
116	Due to the increased shipments by rail we continue to have increased stoppage of trains on all of the rail crossings in our town, affecting schools, economics, emergency vehicles, etc.
117	Double main railroad to ease up freight and passenger traffic
118	Develop intercity passenger rail service between Rochester and Twin Cities
119	Develop intercity passenger rail service
120	Degasify, safety training and equipment, and second rail line in addition to pull offs
121	Degasify, safety training and equipment, and second rail line in addition to pull offs
122	Create multiple rail lines to increase the volume capability for freigh rail lines and mass transit rail opportunities.
123	CP/BNSF/UP Yard Improvements
124	Connections for Pass!
125	Connect Minneapolis (through Eau Claire) to Madison!
126	Connect Minneapolis (through Eau Claire) to Madison!
127	Concerned about rail safety at or near critical junction of highway and power infrastructure.
128	Collocation of BNSF and CP mainlines
129	Bridge or underpass required for traffic flow.
130	BNSF currently has to go into Willmar and turn their train around to go southerly toward Marshall. BNSF/MnDOT/City/County are proposing a RR bypass to reduce this congestion, improve safety, improve access to the industrial park for economic expansion.
131	Better passenger & commuting trains
132	Assure good condition of tracks, freight and passenger needs are met.
133	Another rail line and Consistant RR times especiaslly for passenger trains
134	ADDITIONAL RAIL LINES TO MOVE ITEMS OTHER THAN OIL
135	Additional Mainline Capacity, Union Depot to Hastings

NO.	COMMENT
136	Add track to BNSF rail line or add pipeline. Rail congestion blocks roadways, safety hazard.
137	A rail yard needs to be built near Glencoe so that switching performed in the sw suburbs can be relocated to a rural area
138	A passenger rail line from Altoona to the Twin Cities would help relief I-94 of traffic.
139	2 rail road tracks instead of one

Planning Coordination and Integration

Minnesota coordinates state rail planning with other transportation planning activities at the statewide and local levels. This plan is a part of MnDOT's "Family of Plans"—beginning with a statewide transportation visioning process in 2012 and followed by the Statewide Multimodal Plan. Minnesota's Family of Plans includes plans for each mode of transportation. They are coordinated to follow the same direction and vision called Minnesota GO. The 2015 Minnesota State Rail Plan was updated to follow Minnesota GO standards. It takes into consideration policies and priorities outlined in the Statewide Multimodal Plan.

Prior to Minnesota GO, planning efforts that incorporate rail as a mode traditionally occurred outside of the standard MnDOT planning processes. This placed rail at a distinct disadvantage, particularly for project funding, long-term transportation investment strategies and needs assessments. Under Minnesota GO, however, MnDOT made a concerted effort to include multimodal freight in its Minnesota Statewide Transportation Plan. There is a freight dimension to the Infrastructure Preservation Policy, which includes freight objectives and performance measures. These new initiatives were started in mid-2009 to enhance multimodal planning and the centralized coordination of investments and performance evaluation of all modes in a consistent, agency-wide process.

MnDOT can improve recognition of rail-related needs as well in day-to-day highway engineering activities. The agency has been slow to adopt current standards, such as overpass clearances (the federal standard is 23 feet, 3.75 inches), and taking into consideration future needs during the design of highways. For example, when projects are proposed that entail constructing highway structures over rail lines, future capacity needs should be taken into consideration. In instances where a line currently is single track, if traffic projections indicate potential need for a second track, sufficient clearance should be provided to do so.

APPENDIX A: SUMMARY OF EACH DOCUMENT REVIEWED

APPENDIX B: COMMODITY FLOW ANALYSIS

APPENDIX C: IMPROVEMENT COST EVALUATION

APPENDIX D: PUBLIC INVOLVEMENT

APPENDIX E: INVENTORY OF COMMENTS RECEIVED

APPENDIX F: LETTERS AND RESOLUTIONS

APPENDIX G: ENVIRONMENTAL JUSTICE

ENVIRONMENTAL JUSTICE ANALYSIS

The Minnesota State Rail Plan provides a framework for MnDOT decision making and prioritization of rail-related projects. As project development advances through environmental review, each project is required to consider environmental justice impacts specific to the project. This appendix provides a systems-level analysis of the potential beneficial or adverse impacts the objectives and strategies identified in Chapter 4 of the Statewide Multimodal Transportation Plan may have on the state's environmental justice populations: racial and ethnic minorities, households without vehicles, and persons who are low-income, are age 65 or older, are age 16 or younger, or who have limited English proficiency. Since this analysis occurs at the statewide system-level, the analysis is general and qualitative in nature. MnDOT will complete additional environmental justice analyses on its modal investment plans, as an element of other plans and studies, and for its individual capital investment projects. Those individual project analyses identify specific impacts on communities and neighborhoods and work to avoid or mitigate adverse impacts through the project planning process and related project design decisions.

It should be noted that railroads in the State of Minnesota have historically had both significant posutive and negative environmental justice impacts on potentially affected communities. Particularly for blacks, railroads provided unique employment opportunities that were not available elsewhere in the 19th and early 20th centuries, but also were industrial neighbors to communities that were not allowed to settle in the region's more desirable property. While rail employment has declined significantly over the last 50 years, predominantly black neighborhoods continue to have boundaries defined by transportation and industrial areas, and are sensitive to negative impacts of rail-related transportation projects.

ENVIRONMENTAL JUSTICE OVERVIEW

Presidential Executive Order 12898, issued in 1994, directed each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations." The order builds on Title VI of the Civil Rights Act of 1964 which prohibits discrimination on the basis of race, color or national origin. The order also provides protection to low-income groups.