

1 Overview and Vision

1.1 Background and Purpose of Study

The purpose of the Minnesota Comprehensive Statewide Freight and Passenger Rail Plan (“State Rail Plan”), pursuant to Minnesota Statute Minnesota Session Law 2008, Section 174.03 subd 1b, is to guide the future of the rail system and rail services in the State. The development of the Plan was jointly managed by the Minnesota Department of Transportation’s (Mn/DOT) Office of Freight and Commercial Vehicle Operations, and the newly created Office of Passenger Rail.

This Final Plan Report describes the existing conditions of rail service in the State in 2009 (Section 2.0); forecasts for economic growth in the State, and for the likely demand for freight and passenger rail service in 2030 (Section 3.0); an assessment of investment needs based on these forecasts (Section 4.0); the needs arrayed against key performance measures (Section 5.0); an assessment of institutional issues, strategies, and roles for moving the plan forward (Section 6.0); and a financing plan (Section 7.0). The major findings are highlighted below. Detailed technical analyses can be found separately in Technical Memoranda 1 through 9 which are posted on Mn/DOT’s web site at <http://www.dot.state.mn.us/planning/railplan/resources.html>. Information from the Technical Memoranda which are in the Final Report have been updated and corrected to reflect the newest information and to respond where possible to comments received during the course of the project from stakeholders.

The timing of this plan is critical. Rail has long played a significant role in the movement of freight in Minnesota, much more than in many comparable states and regions. It is essential for the economic well-being of the State that it continues to have the capacity and financial ability to do so. During 2008 and 2009, major new Federal funding support has appeared for rail, particularly for investment in intercity passenger rail. This Plan addresses opportunities for Minnesota to improve both freight and passenger rail in the State. Many of these opportunities overlap as most of the proposed passenger rail services would operate in whole or in part on existing trackage owned and operated by the freight railroads.

Relatively small Federal and state grant and loan programs have existed for many years to support certain types of freight rail investments which have broader public purposes, such as grade crossings. In 2008, Congress enacted the Passenger Rail Improvement and Investment Act (PRIIA) which authorized approximately \$750 million/year in grants for intercity rail projects. In 2009, the American Reinvestment and Recovery Act (ARRA or “Stimulus”) appropriated an additional \$8 billion for passenger rail projects in the PRIIA programs. These actions at the Federal level have set off a lively national competition for current and potential future funding. Figure 1.1 shows the Federal government’s vision for a national high-speed passenger rail network.



Figure 1.1 National Passenger Rail Vision



During the course of the study, the following visions were identified for guiding the strategies relative to investment in freight and passenger rail.

1.2 Freight Rail System Vision

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 for efficient delivery of goods. The rail system is particularly critical in providing efficient connections to markets beyond the State's borders, throughout North America, and to the world through the seaports on the Pacific and Atlantic coasts, and the Great Lakes. Rail provides critical options to shippers in terms of market access, modal economics, and service. With expected higher energy costs, the inherent energy efficiency of rail will make it a more appealing choice for many shippers.

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. A future of increasing regional and international economic competition, constrained highway capacity, environmental challenges, and rising energy costs, calls for effectively developing and utilizing a rail system that can support expanded traffic volumes and a more diverse customer base. Ownership of Minnesota's rail system, which is largely private, presents unique challenges and opportunities, requiring strategies and solutions that are unique to the mode.



The rail industry in Minnesota is a vital and vibrant transportation sector consisting of 24 carriers, ranging from four large Class I railroads to many smaller regional and local carriers. In recent years, growth in traffic hauled by Minnesota's small railroads has outpaced the industry as a whole, and has shown success in locations where prior efforts failed. This success has been recognized by industry, with several receiving awards for innovative marketing and operations. Maintaining and expanding this vitality should be central to the State's involvement with the rail industry.

Therefore, Minnesota should undertake the following steps to accomplish a vision which will develop 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.

1.2.1 Infrastructure

A successful, viable rail industry that meets the future needs of Minnesota's economy requires continued investment and improvement to its infrastructure. As 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 also partnered in both mainline improvements and secondary lines and shipping facilities. Key elements are as follows:

Continue to make improvements to the condition and capacity of Minnesota's primary railroad arterials to accommodate existing and future demand. At present, these lines are in the best condition that they have ever been.

Address critical network bottlenecks that degrade present service and inhibit the ability of the State's railroads to effectively absorb future traffic.

Upgrade main line track (all Class I-III railroads) to 25 mph minimum speed, as warranted. This is needed to ensure commercial viability and safety for rail operators, and current and future shippers that rely on them.

Improve the network (all Class I-III railroads) to support the use of 286,000 pound railcars 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 arterials.

Expand intermodal service access options throughout the State. Presently, rail intermodal (the haulage of containers and trailers) services available in Minnesota are limited geographically and capacity-wise. With one minor exception, existing terminals are all located in the Twin Cities, and the only direct services available connect to Chicago and the Pacific



Northwest. Service to other regions is either unavailable or circuitous, which has made intermodal a relevant and economical choice for only a small subset of shippers. 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, and one or more intermodal terminals in regions distant from the Twin Cities.

1.2.2 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. These needs should be achieved through a range of competitive service offerings, from single carload to high-volume unit train shipments, bulk transloading, intermodal, and innovative solutions that are yet to be developed.

Better integrate rail into the public planning process, including modal tradeoff analysis, local and regional comprehensive plans, modal diversion, industrial development strategies, and public ports planning.

1.2.3 Existing Rail Programs

State assistance for freight rail projects should build upon the existing Minnesota Rail Service Improvement Program (MRSI). While the 30-year-old program has helped to support a strong rail system in the State, funding limits have become inadequate, and a broader program should 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 in excess of the current \$200,000 ceiling.

The Rail/Highway Grade Crossing program should expand 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 has provided 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. Going forward a more dynamic approach to grade crossings will be necessary, as regions of the State continue to urbanize and rail traffic volumes and speeds increase. While grade crossing warning devices and other low-cost improvements will remain an important part of the mix, other, more complex and costly strategies – such as quiet zones, advanced crossing systems and even grade separations – are increasingly being demanded by the public. With resources being insufficient to meet existing program mandates, expanded state involvement will necessitate development of a range of creative solutions.



Preserved rail corridors held in the State Rail Bank should be more actively managed and evaluated 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 rail transportation purposes is very modest. 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 ability to reconstitute some of these trails as rail lines may be desirable. A more nuanced rail banking strategy that 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.

1.3 Passenger Rail Vision

Minnesota currently has one active intercity passenger rail service – Amtrak’s Empire Builder which provides service between Chicago and points west, and one light rail line – Hiawatha – which operates between the Mall of America and downtown Minneapolis. Minnesota’s first commuter rail service – Northstar – providing service between Big Lake and the Twin Cities, started up just as this Plan was being completed in late 2009.

Many conditions exist which make it desirable for Minnesota to develop an intra- and interstate intercity rail system. These conditions include 1) expected continued population and economic growth once the State emerges from the current recession, putting further demands on the State’s capacity constrained highway system; 2) the sudden availability of significant Federal funds dedicated to intercity passenger rail; 3) 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; and 4) the need to strengthen intermodal connections as the population ages over the next 20 years.

Given these conditions, Minnesota should undertake the following steps to accomplish a vision which will develop a robust intrastate and interstate intercity passenger rail system which results in improved travel options, costs and speeds for Minnesota and interstate travelers.

Continue to participate in the Midwest Regional Rail Initiative (MWRRI) and support the development of sustained 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-up 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 MPO regions should be coordinated to support the rail system. System speeds should be a sustained 79 to 90 mph, with a 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.



All services should ultimately connect to both the new Minneapolis downtown terminal and St Paul Union Depot.

Corridors should be advanced incrementally, to build ridership and system advantages, leaving open all future options for viable improvements – stand-alone branches, through routes, new alignments, potential airport connections, and true high-speed rail (HSR).

Corridors should advance simultaneously with Mn/DOT's support; sequencing depending on financing, ROW acquisition and agreements with freight railroads.

In Phase II, rail connections should be established to additional intercity and commuter rail markets in Wisconsin and Minnesota, and to an interstate/I-35 Corridor, Red River Valley, Eastern plains and Canada.

1.4 Categories of Passenger Rail

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. However, if long-distance intercity trains make frequent commuter rail stops 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.

Following is a description of the different categories of passenger rail services and how this study fits into that typology.

1.5 Investment Needs

The analytical methodology used to develop the Rail Plan is shown in Figure 1.2. Demand forecasts were developed for the year 2030 for both freight and passenger rail services in Minnesota. These forecasts were compared to a detailed capacity analysis of the existing and proposed freight and passenger rail networks, including three types of lines: 1) those likely to remain freight only; 2) those proposed for shared freight and passenger services; and 3) those proposed for stand-alone high-speed passenger rail services. An initial screening was conducted of potential passenger services and some were eliminated from further consideration. The remainder of the system was subject to an extensive needs assessment for its ability to meet future freight and passenger demand. Rail lines were rated on a Level of Service (LOS) scale of A-F, where A-C was considered to be adequate capacity to meet future demand. High-level cost estimates were developed and the benefits of the improvements were compared against a set of performance measures. Those projects with the highest ratings were included in the resulting Priority Program.





Light Rail Transit (LRT). LRT is an electrically powered, two-rail technology capable of providing a broad range of passenger capacities, and operating as single vehicles or in short trains on a variety of alignment types. It is a mode combining vehicle technology very similar to that of streetcars, but operating primarily on a partially controlled right-of-way and typically at higher speeds and passenger loadings. LRT typically operates with frequent stops spaced one-half-mile to one-mile apart in dense urban environments at speeds of 20 to 50 mph.

The Hiawatha line from the Minneapolis/St. Paul Airport to downtown Minneapolis is an example of LRT, as will be the proposed Central Corridor line along University Avenue connecting St. Paul and Minneapolis.

Heavy Rail Transit. Heavy Rail Transit is an electric railway with the capacity for a heavy volume of traffic in dense urban areas. It is electrically powered by a third rail which must be separated in its own right-of-way for safety. It is characterized by high-speed and rapid acceleration passenger railcars operating singly or in multicar trains on fixed rails; separated right-of-way from which all other vehicular and foot traffic are excluded; sophisticated signaling; and high platform loading at stops normally spaced one-half-mile to two miles apart. Heavy rail is generally considered to be inappropriate for applications in the Minneapolis and St. Paul area due to lack of very high population densities and high capital costs.



Commuter Rail. Commuter Rail is an urban passenger train service that connects an urban region together over moderate distances; which typically operates on existing freight tracks; and whose primary clientele travels between home and work. These trip-to-work services usually offer concentrated frequencies primarily during rush hour, with suburban station spacing typically every five miles. Commuter rail service may be either locomotive-hauled or self-propelled, and is characterized by reduced fair multitrip tickets, specific station-to-station fares, and usually only one or two stations in the central business district. Average speeds are 18 to 55 mph. The Northstar rail line from Big Lake to Minneapolis is the first example of commuter rail in Minnesota.

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Conventional Intercity Rail. Traditional intercity passenger rail services are typically more than 100 miles with as little as one to as many as 7 to 16 daily frequencies with station spacing from 10 to 100 miles apart. Top speeds of up to 79 miles per hour to as high as 90 miles per hour are common on shared freight track. Current Amtrak service connecting the Twin Cities to Chicago and the Pacific Northwest is an example of this service.

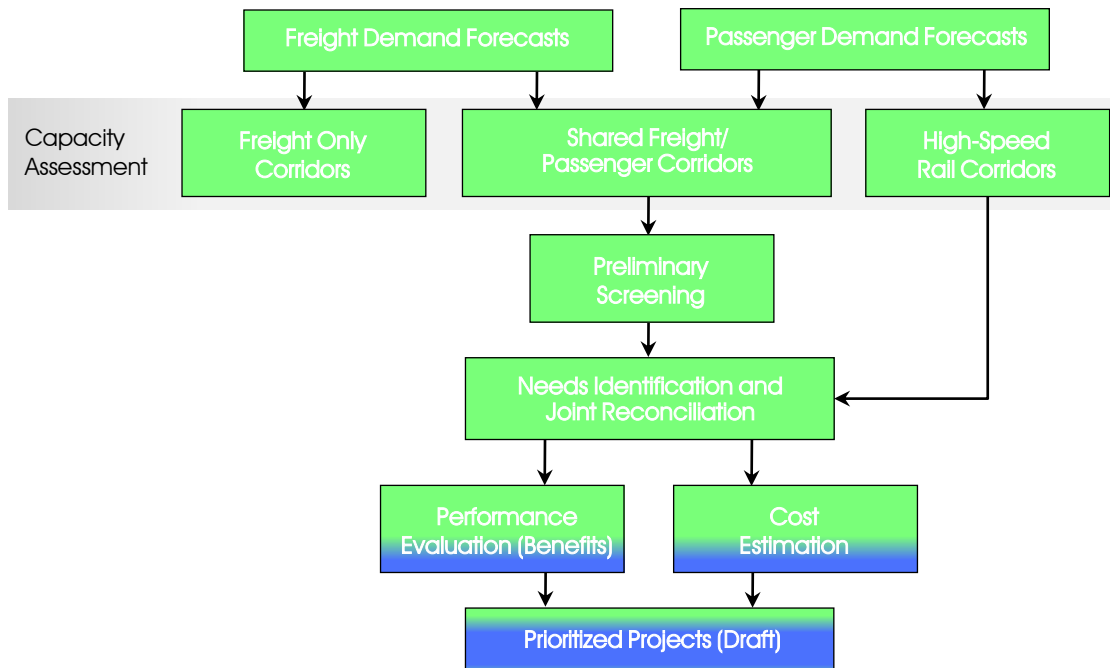


High-Speed Rail (HSR). HSR service has the characteristics of intercity rail service but at substantially higher speeds. It is most applicable in markets where the combination of travel demand and distance justifies the higher investment cost. Operations place an emphasis on significantly improved average end-to-end speeds along a corridor, often with limited stops, offering travel advantages to auto and air travelers. North American practice defines

HSR as being at least 110 mph. Operations can occur over track shared with slower passenger and freight trains at speeds of up to 150 mph, and on dedicated track where speeds in some countries now exceed 200 mph. Amtrak's Northeast Corridor Acela service is the only (partial) operational example of HSR in North America.



Figure 1.2 Needs Assessment Methodology



Ridership forecasts are shown in Table 1.1. All services would be between the Twin Cities and the identified city pair. Cities have been grouped into four tiers based on market size. The base case forecasts come directly out of the modeling process used by this project. The best case forecasts represent a 50 percent higher forecast which could be achieved in a variety of ways – by including the demand from intermediate intercity and commuter rail stops, network effects, or by changes in external variables such as higher than predicted fuel prices.

The performance measures used to analyze the projects were as follows:

- System Performance – Capacity, speed, annual production of ton/miles, ridership;
- System Condition – Track, bridges, crossings;
- Connectivity/Accessibility – Proximity to users, commercial terms, modes;
- Safety and Security – At-grade crossings, hazmat, inspections;
- Environmental – Positive and negative impacts of construction and operations; and
- Financial/Economic – Capital costs, operations, taxes, jobs, economic development, cost/benefit comparisons.



Table 1.1 Ridership Forecasts Results
2030 Annual Trips with Most Favorable Variables Tested

Base Case Forecast	Best Case Forecast
Over 1 million (Selected Cities)	Over 1.5 million (Selected Cities)
<ul style="list-style-type: none"> • Chicago^a • St. Cloud 	<ul style="list-style-type: none"> • Chicago • St. Cloud
400,000-600,000	600,000-800,000
<ul style="list-style-type: none"> • Duluth (NLX) • Rochester 	<ul style="list-style-type: none"> • Duluth (NLX) • Rochester
100,000-300,000	150,000-450,000
<ul style="list-style-type: none"> • Wisconsin Points on MWRRI • Mankato • Eau Claire • Northfield 	<ul style="list-style-type: none"> • Wisconsin Points on MWRRI • Mankato • Eau Claire • Northfield
100,000 or under	100,000 or more
<ul style="list-style-type: none"> • Fargo • Red Wing • Winona • Willmar 	<ul style="list-style-type: none"> • Fargo • Red Wing • Winona • Willmar

^a Includes potential demand from the Treasure Island Casino in Red Wing (Chicago – River Route only) and the Grand Casino Hinckley (NLX) assuming proper service and station stop parameters can be developed.

A significant number of primary rail lines operate over capacity in 2009 and are shown in Figure 1.3. The number of lines experiencing capacity constraints are expected to increase substantially by 2030 given the forecast increases in freight demand and proposed passenger services.

A priority program was developed which would meet the identified needs and achieve the Rail Visions described above. The program contains the following elements:

- HSR passenger service to Chicago, Duluth, and Rochester: Upgrade/develop corridors to Federal Railroad Administration (FRA) Class 6 conditions⁴;

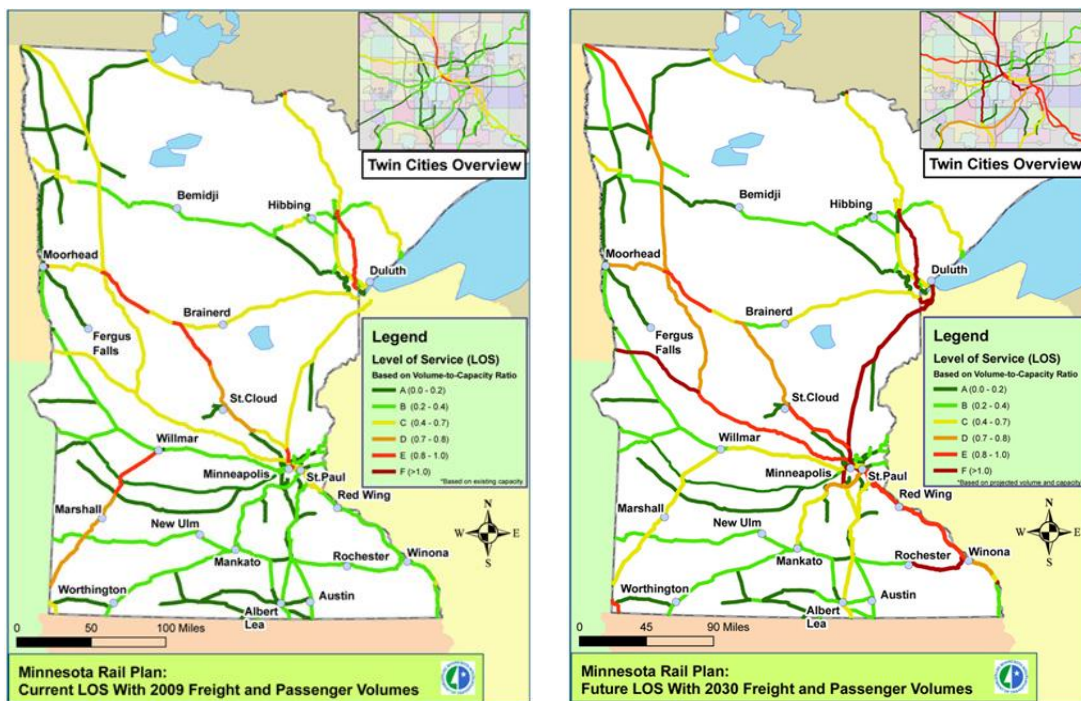
⁴ The Federal Railroad Administration classifies track into a series of categories based on physical condition (i.e., tie and rail condition, surface, cross-level, etc.). For each category, which ranges from I to VIII, trains are permitted to travel up to a set speed, with the higher numbered categories 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.



Minnesota Comprehensive Statewide Freight and Passenger Rail Plan

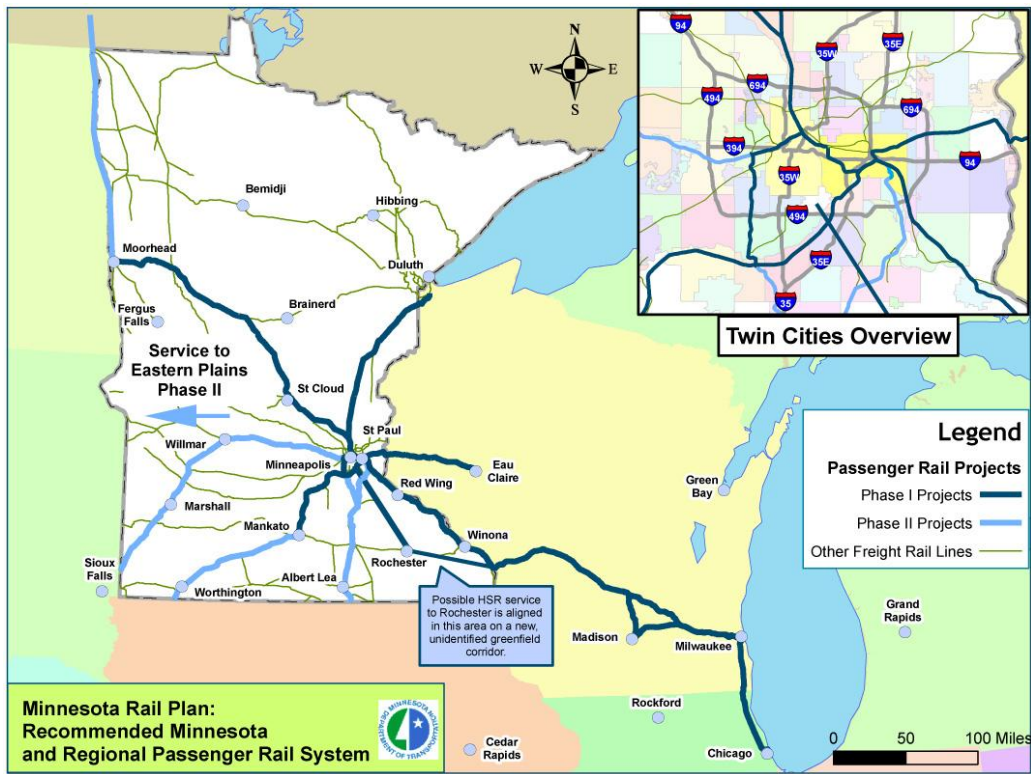
- Enhanced conventional passenger rail to St. Cloud, Mankato, Fargo, Eau Claire and between the Twin Cities: Upgrade corridors to Class 4 (minimum), 5, or 6 conditions as warranted (respectively 79, 90, or 110 mph);
- Positive Train Control (PTC) on all shared corridors and freight-only corridors which may handle certain categories of hazardous material;
- Grade crossing upgrades on all shared corridors;
- Upgrade major junctions and bridges;
- All mainline track upgraded to minimum 286,000 pound capacity and 25 mph condition;
- Programmed upgrades of all active warning devices and signs;
- Additional intermodal facilities; and
- Short line bridge upgrades.

Figure 1.3 Current LOS with 2009 Freight and Passenger Volumes and Future LOS with 2030 Freight and Passenger Volumes, with No Improvements



This priority program essentially combines all investments that are needed for implementation of both freight and passenger improvements. Integrating the demand forecasts and the passenger-related projects, the resulting passenger rail system is shown in Figure 1.4. The dark blue lines are included in the Phase I priority program, and the lighter blue lines are identified as Phase II projects but not included in the final cost estimate for the program.

Figure 1.4 Recommended Minnesota and Regional Passenger Rail System



If fully implemented, this program would eliminate all substandard capacities in 2009 and 2030 as shown in Figures 1.5 and 1.6 respectively.



Figure 1.5 Current LOS with Freight and Passenger Volumes versus LOS with Post-2009 Freight and Passenger Improvements

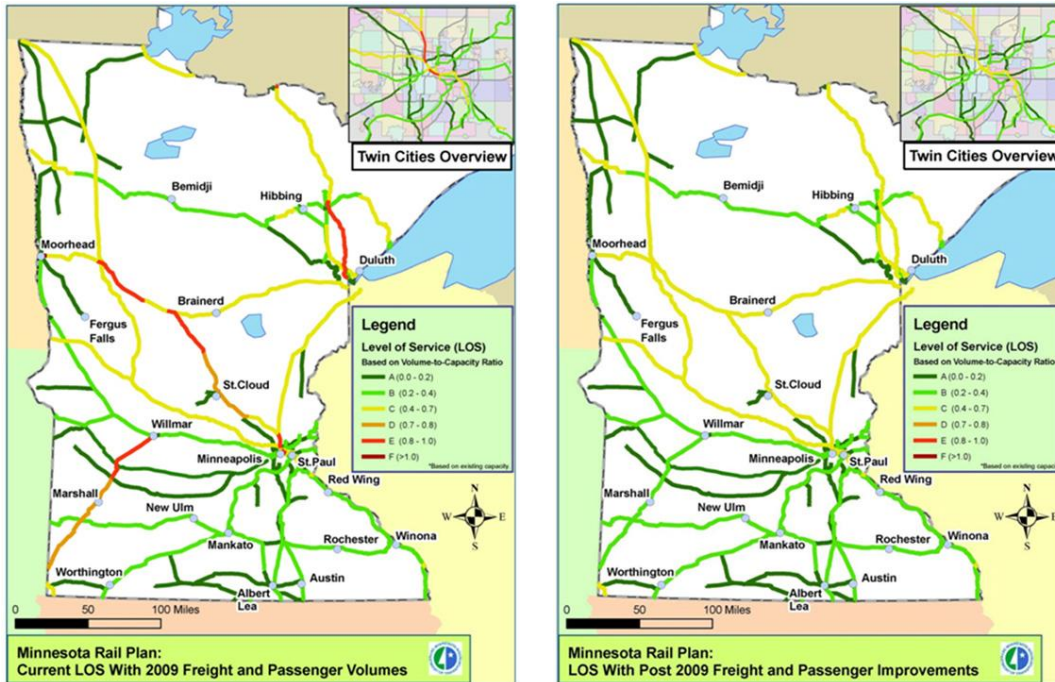
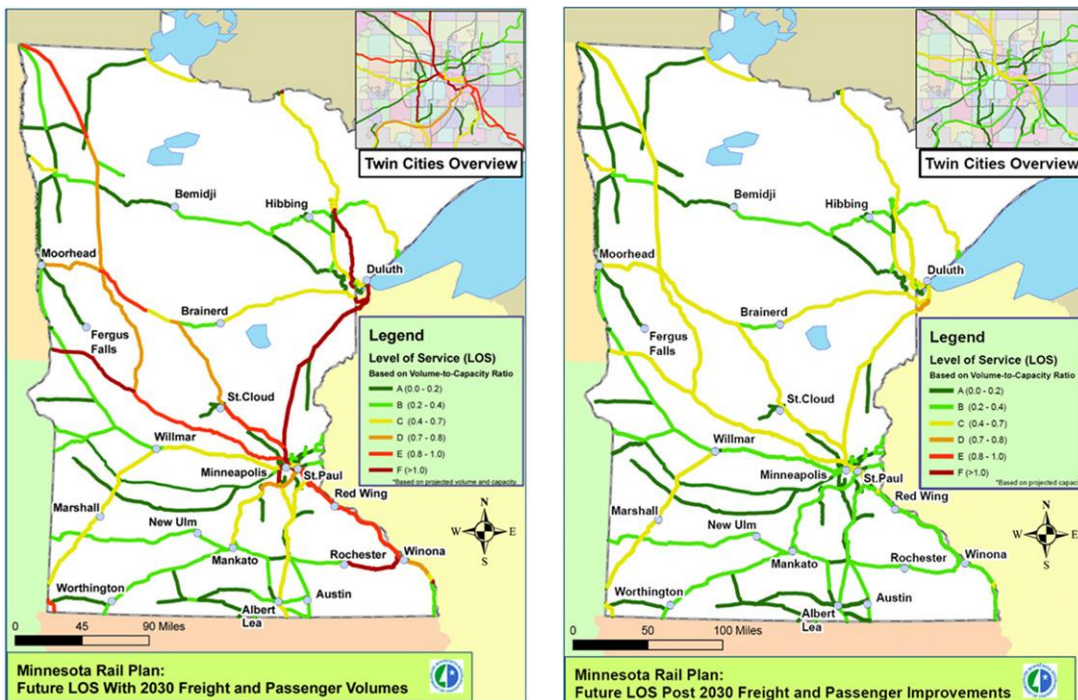


Figure 1.6 Future LOS with 2030 Freight and Passenger Volumes versus Future LOS Post-2030 Freight and Passenger Improvements



The total capital cost of the fully implemented program over 20-years would be between \$6.9 and \$10.2 billion. This amount consists of the \$2.2 to \$4.4 billion for freight-only improvements; and \$4.7 to \$5.8 billion for the priority passenger and shared freight improvements if built as a system rather than as a series of individual, unrelated projects. Substantial synergies across projects can be achieved if planned as parts of an eventual unified system. Section 1.7 discusses how the program could be financed across various public and private participants.

Cost estimates are based on high-level systemwide unit costs. More detailed engineering costs developed for specific corridors may vary significantly from these estimates. High- and low-end ranges were developed for most cost elements. The high-end numbers are referred to as the “base case,” and the low-end numbers are referred to as the “best case.” The primary differences in the two sets of estimates are as follows:

- The base case assumes the ridership forecasts developed for this study; the best case assumes a 50 percent increment in ridership and 25 percent increment in revenue.
- The base case assumes a 30 percent contingency and the best case assumes a 10 percent contingency.
- The base case assumes that Positive Train Control (PTC) would be implemented on Class I freight lines in combination with conventional Central Traffic Control (CTC). PTC is a state-of-the-art technology which is intended to prevent train collisions. PTC is an unfunded Federal mandate enacted by the Rail Safety Improvement Act of 2008 (RSIA) and must be implemented by 2015 on all shared passenger and freight lines, and on all Class I freight mainlines which may carry certain classes of hazardous materials. The best case assumes proceeding directly to PTC implementation, with CTC capabilities integrated into the PTC technology rather than as a stand-alone system. Full implementation of PTC accounts for \$2.3 billion of program costs in the base case. The best case assumes a reduced cost of \$335 million.
- The best case reduces the number of trainsets required for the entire system by 20 percent, on the assumption that trains can be through routed across the system once it is in place.
- The base case assumes the cost of operations and maintenance to be \$70/mile based on Amtrak’s fully allocated overhead costs, excluding depreciation and interest. The best case assumes \$55/mile based on actual Amtrak direct costs, excluding infrastructure maintenance and system costs. These estimates are used for costing purposes only; there is no presumption regarding who the ultimate operator of the system will be.
- The base case assumes capacity rights fees on freight railroads of \$85,000/train per mile based on the actual negotiated Northstar rate; the best case assumes about one-half of that or \$40,000 on the assumption that the combination of high freight demand and intensive commuter rail service drove up the Northstar price.⁵

The resulting range of system capital costs are as follows:

- All freight-only improvement needs = \$2.2 to \$4.4 billion;

⁵ This is an annual fee based on total train miles per day, calculated by multiplying the actual route mileage by the number of trains per day.

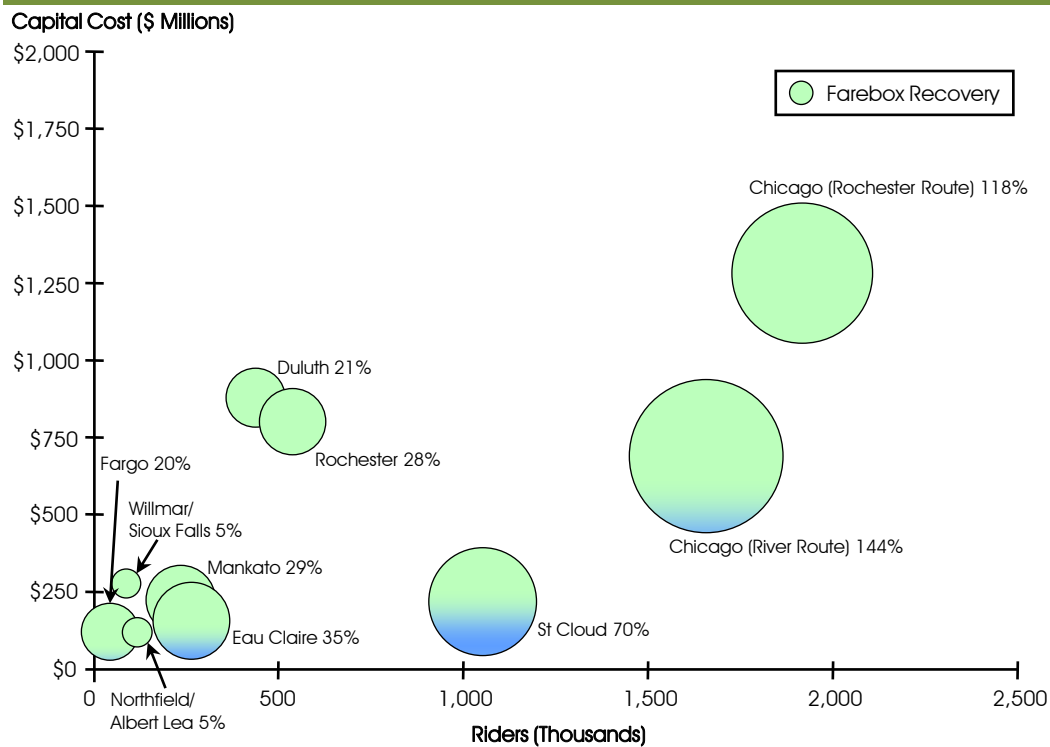


- All passenger and shared passenger/freight improvement needs as individual projects = \$6.8 to \$8.4 billion (passenger needs include all of the lines shown on Figure 1.4);
- All passenger and shared passenger/freight improvement needs as a system = \$4.5 to \$5.7 billion;
- All passenger and shared passenger/freight improvement needs on Phase I passenger rail priority system = \$4.0 to \$5.1 billion (passenger needs include only those lines shown in dark blue on Figure 1.4, including Chicago/MWRRR via the River Route, and services between the Twin Cities and Rochester, Duluth, Mankato, St. Cloud, and Fargo); and
- Total program costs = \$6.2 to \$9.5 billion.

All costs shown in this report are in current real (uninflated) dollars as is typically done in a report of this type so that the difficult to predict impacts of inflation are factored out. However, for the purposes of consistency with Mn/DOT's Statewide Plan, the total program costs inflated over the 20-year life of the program would be between \$12.4 and \$19.0 billion. This estimate is based on an annual inflation rate of four percent through 2020, three percent thereafter, and equal expenditures across the 20-year period. In reality, expenditures would probably start out low, peak in the middle years, and then decline in the out years.

The performance of the various passenger projects in the base case based on forecast ridership, capital cost, and farebox recovery ratio is shown in Figure 1.7. The ideal location of a project would be the lower right-hand corner where a project would have low cost and high ridership. The size of the circle reflects the percentage of farebox recovery. All capital costs (passenger-only and shared freight) are included in the vertical axis.

Figure 1.7 Summary of Passenger Route Performance – Base Case

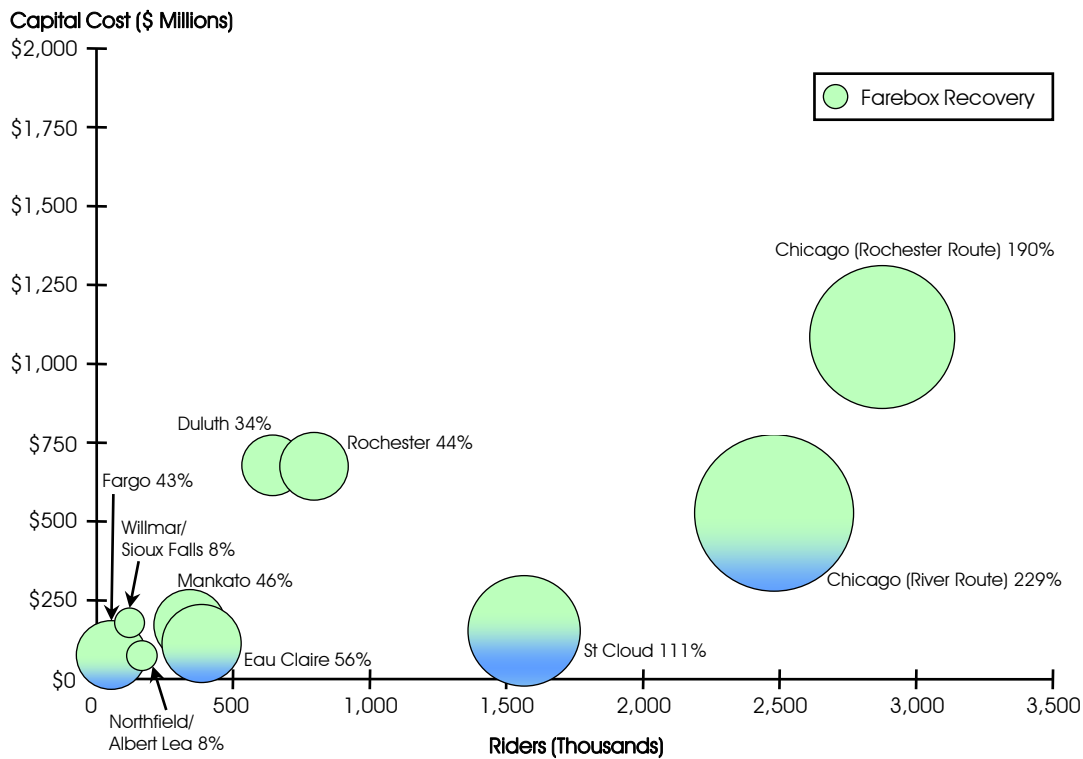


As shown, both Chicago routings are expensive but have high ridership and excellent farebox recovery ratios consistent with Amtrak’s Northeast Corridor Acela service. Note that costs and revenues are prorated to reflect only the Minnesota portion of these services. St. Cloud has relatively modest costs and excellent ridership and farebox recovery for an intrastate service. Both Chicago, through the MWRRI plans, and St. Cloud, as the eventual termination point of Northstar commuter services, have long been in the forefront of passenger rail planning in the State.

Duluth and Rochester have the next highest ridership levels but are expensive to build because they are proposed as HSR lines (unlike St. Cloud). Mankato and Eau Claire are relatively inexpensive conventional lines and show reasonably good farebox recovery ratios. The other projects are inexpensive but with relatively lower ridership, which is why Willmar and Albert Lea were put into Phase II. Fargo, of course, currently has passenger rail service as part of Amtrak’s Empire Builder route, and this service should continue and be enhanced as part of the overall MWRRI program.

Figure 1.8 shows the same analysis based on the best case annual operating and maintenance costs and 25 percent higher revenue based on the higher ridership forecasts. Note that revenue is not increased by the full 50 percent increment in ridership, but by 25 percent, since riders from intermediate destinations would pay lower fares than riders traveling between the end points.

Figure 1.8 Summary of Passenger Route Performance – Best Case



**Table 1.2 Annual Passenger Rail Systemwide Performance Measures
(Annual) – Phase I**

Performance Measure	Base Case Forecast	Best Case Forecast
Train Miles	12,252	12,252
Ridership (thousands)	4,157	6,000
Passenger/Vehicle	154	231
Passenger/Train Mile	1.1	1.61
Vehicle Miles of Travel Saved (millions)	489	733
Greenhouse Gases Reduced (thousands of tons)	318	526
Greater Minnesota Population with Access by County or MPO of Station	1 million (41%)	1 million (41%)
Operations and Maintenance Costs (millions \$ annually)	\$182	\$141
Farebox Revenue (millions \$ annually)	\$89	\$99
Subsidy (millions)	\$93	\$42
Farebox Recovery Ratio	49%	71%
Operating Subsidy/Rider/Day	\$22	\$6.6

Table 1.2 shows a series of systemwide performance measures for both the base and best case forecasts. In general, this system compares favorably on several dimensions with existing national rail performance data. Note that annual operating subsidies for the system as a whole would range from \$95 million per year in the base case (49 percent farebox recovery) to \$41 million in the best case (71 percent farebox recovery). The latter assumes that profit from the Minnesota portion of the interstate MWRRI route could not be applied to intrastate operating deficits. If it can be so applied, the overall operating deficit would almost be eliminated.⁶

The VMT reduction equals between approximately 1-2 percent of statewide VMT depending on the scenario, which is typical of most major public transportation investments. VMT reductions on a corridor specific basis would be higher.

Implementation of the freight program would result in the following metrics being achieved:

- All mainline track speeds would be at least 25 mph;
- All rail lines would have 286,000 pound railcar capacity;
- Significant increases in track to siding ratios would be achieved;
- Positive Train Control (PTC) would be implemented on all Class I mainlines; and
- All active grade crossing devices would be upgraded or replaced.

⁶ This is why a 25 percent increase in revenue for each route does not produce an overall increase in revenue of 25 percent, since the additional surplus from the Chicago route is not applied to the intrastate routes in this calculation.



Transportation investments can generate a range of direct and indirect economic benefits in excess of the cost of the programs. While not quantified in this study, these benefits are discussed qualitatively in Section 5.3.

1.6 Management Approach

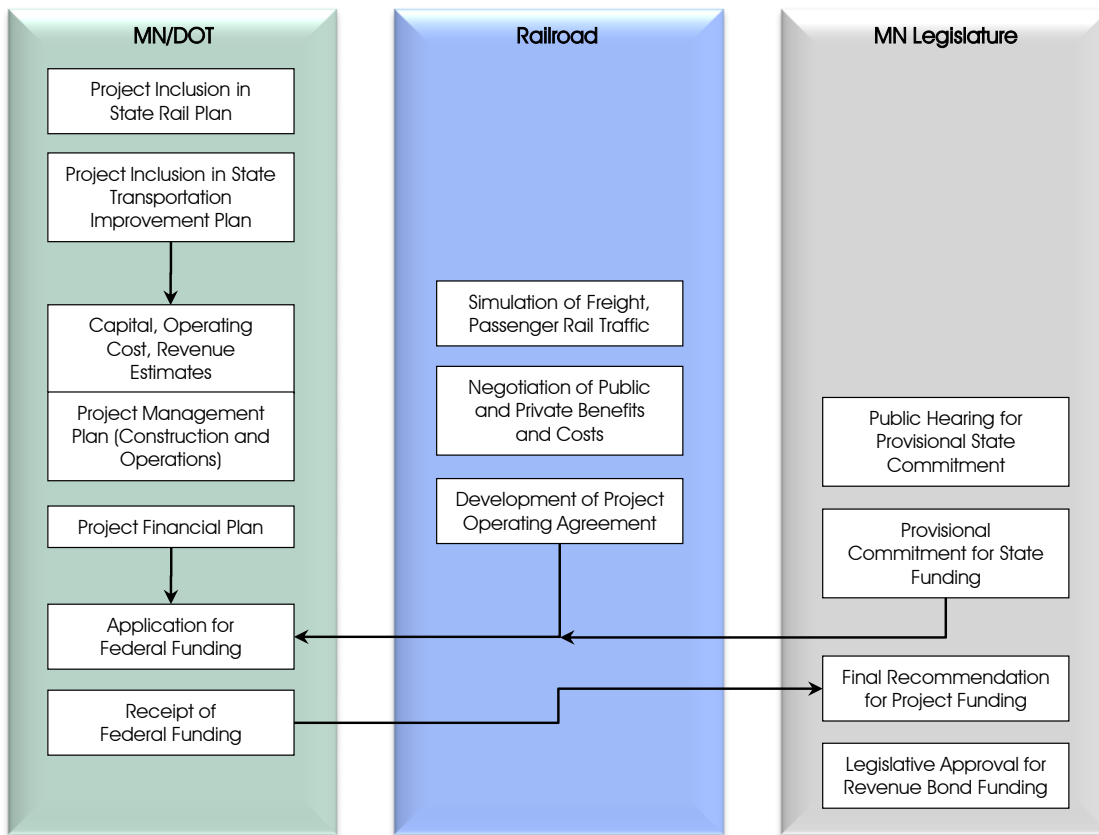
The State of Minnesota, through dedicated Mn/DOT departments, with the active oversight of the Legislature, should take a strong lead in advancing the process forward in order to develop the unified system envisioned in this Plan. Specific steps include:

- Organize the State's response to Federal rail grant programs to maximize the opportunities for Federal funding;
- Coordinate negotiation of actual operating agreements with the freight railroads;
- Analyze public/private benefit/cost allocation for each passenger rail corridor to better position corridors for FRA grants:
 - Ensure third party due diligence of each corridor investment;
 - Clarify capital/operating costs, revenues, financial plan, and project management plan; and
 - Provide for Legislative review/acceptance.
- The State should adopt the following principles in moving forward:
 - Limit state funding of operating subsidies to about 25 percent of total O&M costs; (overall state-supported Amtrak corridors generate revenues that cover more than 85 percent of costs);
 - Assume equal capital cost share of freight investments in shared corridors – actual state capital costs will depend on benefit/cost allocation with freight rail owner; and
 - Public sector pays for passenger-related capital costs.

Other public entities such as Regional Rail Authorities and Joint Powers Boards should partner with Mn/DOT and provide such additional funding as necessary for program elements such as rolling stock, operating subsidies, and local station development. The decision-making framework is shown in Figure 1.9.



Figure 1.9 Passenger Rail Project Decision Process



1.7 Financing

The approach to financing the State Rail Plan presumes the need for multiple partners, methodologies, and years. This is a 20-year program and the full program costs should not be viewed as daunting but rather 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 railroads. 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, and will continue. State general fund and bonding funds have been dedicated to the existing freight and safety programs (including MRSI), the Office of Passenger Rail in Mn/DOT, Northstar Commuter Rail, NLX, MWRRI, and a \$26 million bonding commitment to advance and match Federally funded projects and future applications. Minnesota counties and Regional Railroad Authorities have also committed local matches from both general funds and tax levies toward these and other projects.



On the Federal side, there are a number of program elements within the existing surface transportation program (SAFETEA-LU) which can be used to fund rail projects. SAFETEA-LU has expired and is currently being operated under continuing Congressional resolutions. The future timing and content of full reauthorization is uncertain. Existing rail-eligible program elements include the following:

- Surface Transportation Program;
- Congestion Mitigation and Air Quality (CMAQ) Improvement Program;
- Rail Line Relocation Grant Program;
- Transportation Infrastructure Finance and Innovation Act (TIFIA);
- Private Activity Bonds (PABs); and
- Rail Rehabilitation and Improvement Financing (RRIF) Financing Program.

The 2008 Passenger Rail Improvement and Investment Act (PRIIA) 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 an additional \$8 billion for projects in the three PRIIA programs. The FRA developed a three-track grant process for distribution of these funds. Mn/DOT submitted applications for \$135.8 million in partnership with the Ramsey County Regional Railroad Authority for design and construction of the Union Depot Multimodal Transit Hub; and with the Wisconsin Department of Transportation for \$600,000 to prepare a Service Level environmental document for a HSR route between Milwaukee and the Twin Cities.

The outcome of this application process is pending. What is clear is that there is likely to be significant Federal funding available for rail projects, but that the process for obtaining this funding will be highly competitive. FRA received 214 applications from 34 states for \$7 billion in August 2009, and 45 applications from 24 states for \$50 billion in October. The U.S. DOT received 1,400 applications for \$57 billion in September for the \$1.5 billion for the Transportation Investment Generating Economic Recovery (TIGER) grants. FY’10 appropriations for high-speed and intercity and passenger rail programs authorized in PRIIA are \$2.5 billion. While PRIIA authorizes programs with up to 80 percent Federal funding, consistent with Federal highway funding, actual funding levels may be in the 50 percent range consistent with how the Federal Transit Administration (FTA) now funds urban New Starts projects. For purposes of this analysis, we assumed overall Federal funding contributions of 50 percent and 80 percent.

Options for leveraging private sector investment include the following:

- 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 like Iowa, Wisconsin, and Virginia, and to increase the loan ceiling from the current \$200,000;



- Offering financial assistance for Railroad Rehabilitation and Improvement Financing (RRIF) applicants (Oregon has such a program);
- Providing state maintenance and investment tax credits for rail improvements; and
- 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 should be considered 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 Plan. Full state participation in capital bonding for future rail system construction may be impacted by a \$200 million constitutional limit originally meant to minimally constrain state investment in public or private rail infrastructure, following the 1980 initiation of the MRSI rail improvement program.

Table 1.3 and Figure 1.10 show a strategy for distributing the costs of the \$2.2 to \$4.4 billion in freight-only improvements. As shown, 74 percent of these costs are assigned to be covered by the private railroads, with public contributions primarily in the areas of PTC, 286k lb. compliancy, and grade crossings. The 2007 American Association of Railroads (AAR) National Capacity Study estimated that on a national level, the railroads would be able to finance \$96 out of \$135 billion (70 percent) in identified capacity expansion needs through 2035. The annual public sector cost of this investment over 20 years would be between \$25 and \$50 million. In order to meet this financing level, the private railroads will have to achieve higher earnings through improved productivity, volume, and revenue. Global economic and environmental trends are likely to favor the long-term competitiveness of freight railroads. Certainly, that is what Warren Buffet is betting on with his purchase of BNSF.

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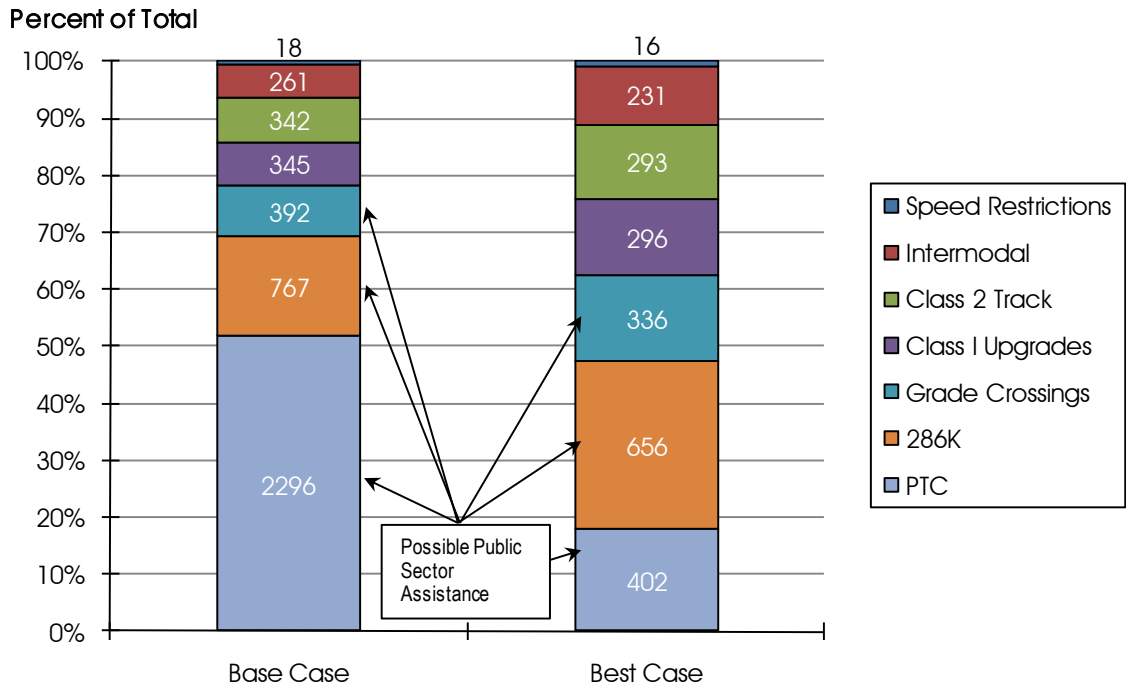
Table 1.3 Freight System Costs, Public and Private Shares
Including Contingencies (\$millions)

	Total Cost	Public Share	Private Cost
Base Case			
Class I upgrades	\$345.52	\$86.38	\$259.14
Other Class I improvements	\$261.00	–	\$261.00
PTC	\$2,296.00	\$574.00	\$1,722.00
286K restrictions	\$767.20	\$76.72	\$690.48
Non Class I speed restrictions	\$18.20	–	\$18.20
Grade Crossings	\$392.00	\$392.00	–
Class 2 track upgrades	\$341.60	–	\$341.60
Total	\$4,421.52	\$1,129.10	\$3,292.39
Percent of Total		26%	74%
Best Case			
Class I upgrades	\$296.16	\$74.04	\$222.12
Other Class I improvements	\$231.00	–	\$231.00
PTC	\$402.00	\$100.50	\$301.50
286K restrictions	\$657.60	\$65.76	\$591.84
Non Class I speed restrictions	\$15.60	–	\$15.60
Grade Crossings	\$336.00	\$336.00	–
Class 2 track upgrades	\$292.80	–	\$292.80
Total	\$2,231.16	\$576.30	\$1,654.86
Percent of Total		26%	74%

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.



Figure 1.10 Freight Rail System Improvement Costs Including Contingencies, (\$millions)



Note: Contingencies are 30 and 10 percent base/best cases; and 10 percent engineering.

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, 50, and 80 percent), and base and best case cost estimates.

Total annual non-Federal public sector costs under all scenarios, including capital and operating, are shown in Table 1.4 and range from \$125 million (best case financial assumptions, 80 percent Federal share) to \$433 million (base case financial assumptions, zero Federal share).



**Table 1.4 Total Possible Annual Costs, State Rail Plan
(\$millions)**

	No Federal Funds	50% Federal Matching Funds	80% Federal Matching Funds
Base Case			
Phase I Infrastructure Costs	\$252.34	\$126.17	\$50.47
Freight Only Improvements, Public Share	\$50.86	\$50.86	\$50.86
Phase I Operating Costs	\$129.83	\$104.49	\$89.28
Subtotal Annual Cash Costs	\$180.69	\$155.35	\$140.14
Total Annual Costs, Capital and Cash Costs	\$433.03	\$281.52	\$190.61
Best Case			
Phase I Infrastructure Costs	\$217.92	\$108.96	\$43.58
Freight Only Improvements, Public Share	\$29.86	\$29.86	\$29.86
Phase I Operating Costs	\$84.85	\$63.89	\$51.31
Subtotal Annual Cash Costs	\$114.71	\$93.75	\$81.17
Total Annual Costs, Capital and Cash Costs	\$332.63	\$202.71	\$124.75

Best Case includes discounted rolling stock, reduced O&M costs, reduced capacity rights costs, higher revenues.

Passenger rail Phase I costs presume traditional MN public debt, 20-year term, 5 percent annual interest.

Annual Operating Costs include RRIF debt for rolling stock and capacity access, 25-year term, 4.8 percent annual interest.

Note: Contingencies are 30% and 10% respectively for the base and best cases.

1.8 Stakeholder and Public Outreach

Public involvement has always been part of a successful public agency’s mission. The challenge of a project such as the State Rail Plan is that it must address multiple needs over a wide geographic area, while maintaining a data-driven approach in a politically charged atmosphere. Mn/DOT’s approach to public outreach is guided by the *Hear Every Voice* philosophy, which encourages a transparent project development process which allows opportunities for public input early and at key points throughout the project process. In the spirit of *Hear Every Voice*, the project team engaged stakeholders and the public in the proposed project and the process of decision-making; and collected stakeholder and public input to make a better project.

It was determined that the most effective outreach techniques to accomplish the *Hear Every Voice* guidelines was a program which included active participation by policy and technical advisory committees, opportunities for general public participation through open houses, and identification of additional specific issues and concerns through stakeholder meetings. Each of these outreach components are discussed below.



1.8.1 Advisory Committees

Policy Advisory Committee (PAC)

The PAC met four times throughout the course of the project (March 20, May 29, August 14, and November 13) and served as a communication link to constituents and elected officials regarding the project. The PAC functioned at a broad policy level, providing input at key project milestones as well as discussing project issues and concerns from a policy standpoint. Since this is a legislatively mandated study, the PAC included five legislators who were formally assigned as legislative liaisons by Minnesota House and Senate leadership. PAC membership is shown in Appendix A.

Freight and Passenger Rail Technical Advisory Committees (FTAC and PTAC)

To better facilitate and streamline discussions, two separate technical advisory committees (TACs) were formed for the project – one for freight rail (FTAC) and one for passenger rail (PTAC). The two TACs convened separately on the same day, three times each throughout the course of the project (May 28, August 13, and November 12). The purpose of the TACs was to review project progress and issues from a technical point of view. Members provided input into the development of assumptions and methodologies, and served as liaisons to the agencies they represented. Membership of each TAC is shown in Appendix A.

Overriding themes from the meetings included:

- Strong support for new passenger rail service and belief that demand will be sufficient;
- New passenger rail services cannot degrade existing freight services, which need more investment;
- Decisions should not only be driven by existing land use patterns, but by growth forecasts and energy assumptions;
- Concern about how to balance data-driven approach and inevitable political influence on ultimate decisions; and
- Costs of project implementation should be assumed by both public and private sectors.

1.8.2 Public Open Houses

Two rounds of public open houses were held during the drafting of the State Rail Plan, in April 2009 and October 2009. During each round, meetings were held in the same seven locations across the State: St. Cloud, Rochester, Red Wing, Twin Cities, Duluth, Mankato, and Moorhead. In the second round, Willmar also was added as an eighth location. Press releases and web site updates were the primary tools for advertising public open houses. The Open Houses and themes which emerged from each are shown in Appendix A.



1.8.3 Stakeholder Meetings

Multiple stakeholder meetings were held to discuss needs and concerns of specific groups representing freight, passenger rail, and other financial and economic interests in the various corridors considered. Some stakeholder meetings were set up by the project team to solicit specific information important in the development of technical assumptions, while others were held at the request of various groups. Over 78 stakeholder groups were addressed in these efforts as shown in Appendix A. All committee and public meetings were held at accessible locations.

Opportunities for public input will continue until the Plan is adopted in February 2010. Mn/DOT will continue to present plan information to stakeholder and interest groups as requested. In addition, Mn/DOT will host another round of public meetings in January, after the Plan is released for public review. The final Plan document will be available on the project web site (<http://www.dot.state.mn.us/planning/railplan/resources.html>).

