

Midwest Regional Rail Initiative Executive Report

Illinois - Indiana - Iowa - Michigan - Minnesota - Missouri - Nebraska - Ohio - Wisconsin
Amtrak - Federal Railroad Administration



Transportation Economics & Management Systems, Inc.
August 1998

The Midwest Regional Rail Initiative is an ongoing effort to develop an expanded and improved passenger rail system in the Midwest. The sponsors of the Midwest Regional Rail Initiative are Amtrak, the Federal Railroad Administration and the transportation agencies of nine Midwest states—Illinois Department of Transportation, Indiana Department of Transportation, Iowa Department of Transportation, Michigan Department of Transportation, Minnesota Department of Transportation, Missouri Department of Transportation, Nebraska Department of Roads, Ohio Rail Development Commission and Wisconsin Department of Transportation.

This report includes an initial strategic assessment of the Midwest Regional Rail System concept. An extensive range of issues is addressed including infrastructure and operational requirements, level of travel market demand, financing alternatives, and system-wide costs and benefits. The report also contains a preliminary business plan. Both the strategic assessment and business plan are subject to further refinement.

A Steering Committee, composed of key staff from each state agency and Amtrak, provided oversight and direction to the consultant team retained to conduct the study. The Wisconsin Department of Transportation served as Secretariat for the Steering Committee.

Transportation Economics & Management Systems, Inc. of Frederick, Maryland led the consultant team and had primary responsibility for conducting the study and managing the work of the other members of the consultant team. The other consultant team members and their area of responsibility were: PaineWebber Incorporated, review of the financial analysis; Quandel & Associates, assessment of infrastructure requirements; Davis O'Connell Inc., assessment of legal and institutional issues; and, W.L. Gallagher, review of train operations.

This report was financed, in part, by a planning grant from the Federal Railroad Administration under the Next Generation High Speed Rail Program.

Midwest Regional Rail Initiative Executive Report

Prepared for

**Illinois Department of Transportation
Indiana Department of Transportation
Iowa Department of Transportation
Michigan Department of Transportation
Minnesota Department of Transportation
Missouri Department of Transportation
Nebraska Department of Roads
Ohio Rail Development Commission
Wisconsin Department of Transportation
Amtrak/National Railroad Passenger Corporation
Federal Railroad Administration**

Prepared by

Transportation Economics & Management Systems, Inc.

In association with

**PaineWebber Incorporated
Quandel & Associates
Davis O'Connell Inc.
W.L. Gallagher**

August 1998



Midwest Regional Rail Initiative

The Midwest Regional Rail Initiative is a cooperative and collaborative effort among nine Midwest states—Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin, the National Railroad Passenger Corporation (Amtrak), and the Federal Railroad Administration (FRA). The objectives of the initiative were to evaluate the potential for the implementation of a Midwest Regional Rail System (MWRRS) that provides a new transportation option for the Midwest region and to create a business plan for its implementation.

The MWRRS is an expanded and modern regional passenger rail system that:

- Preserves, improves, and expands passenger rail service by significantly reducing travel times and increasing frequencies
- Provides a high quality, reliable passenger rail service that is intermodal and accessible to 80 percent of the region's population
- Creates an appealing transportation "product" that the public will pay for and use, requiring no long-term operating subsidies
- Follows an incremental implementation schedule that can be cost justified and is affordable
- Requires no more than a 20 percent contribution from the states for capital investment
- Supports economic growth and creates business and development opportunities within and around stations
- Increases job opportunities in manufacturing and the service industries.

Midwest Regional Rail System

The regional passenger rail system envisioned for the Midwest region encompasses approximately 3,000 route miles in nine states. It is based on a hub-and-spoke concept to ensure it builds on regional synergies and maximizes economies of scale.

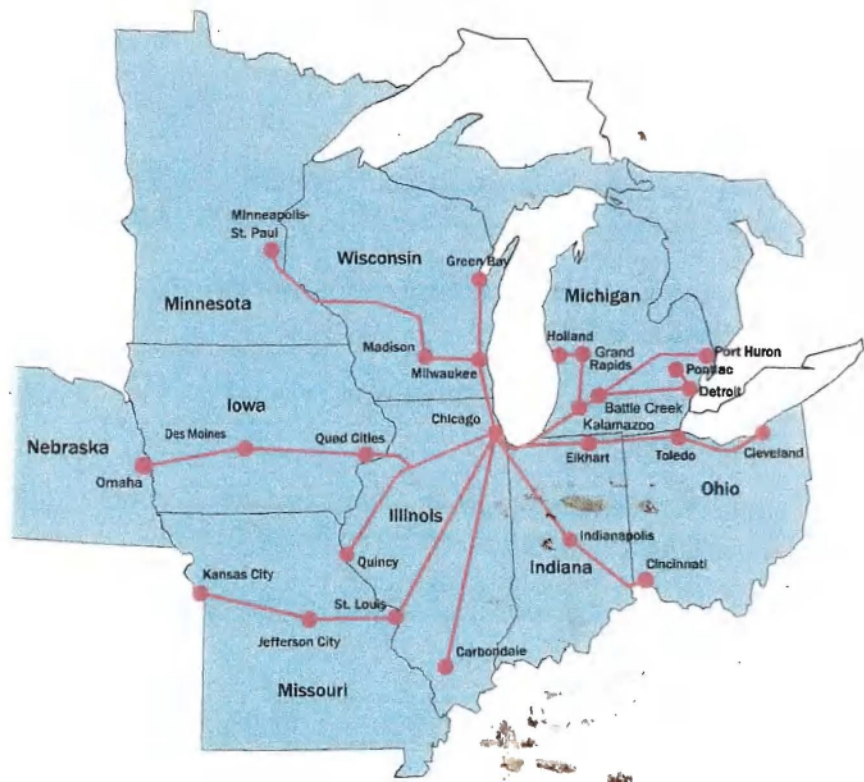
...This study represents a cooperative and collaborative nine-state, Amtrak, and FRA business planning initiative...for an expanded and modern regional passenger rail system...

...The MWRRS encompasses 3,000 route miles in nine states... incorporating new train technology and a feeder bus system...based on a hub-and-spoke system with Chicago serving as the hub...

The MWRRS incorporates new technology, service levels, and amenities like Amtrak's Northeast and Pacific Northwest corridors. The passenger rail service is supplemented by a feeder bus system that serves those communities for which rail is not currently a feasible option. The operating plan for the system is tailored to the specific needs of each corridor, with the goal of minimizing operating costs and maximizing revenues.

Specifically, the metropolitan areas served by the MWRRS include Chicago, which serves as the hub, with spokes connecting Minneapolis-St. Paul, Green Bay, Detroit, Grand Rapids/Holland; Port Huron, Cleveland, Cincinnati, Carbondale, St. Louis, Kansas City, Quincy and Omaha (Exhibit 1). The system also provides scheduled service to other regional centers including Milwaukee, Kalamazoo, Toledo, Indianapolis, Springfield, Des Moines, Madison, Lansing, Jefferson City and Iowa City.

Exhibit 1
Proposed Midwest Regional Rail System



Definition of Scenarios

Three service and equipment scenarios—Conservative, Moderate and Aggressive—were developed for the MWRRS and used as the basis for assessing an array of corridor and system-wide services. The objective was to define three scenarios that incorporated a combination of different levels of infrastructure investment, train technologies and amenities, service characteristics and performance factors to create a regional passenger rail system. The recommended scenario is capable of generating high levels of ridership and revenue and recovering, at a minimum, its operating costs.

...Three service and equipment scenarios were used as the basis for assessing an array of corridor and system-wide services...

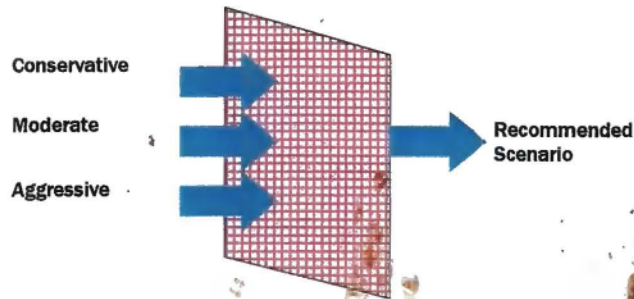
Preferred Service Option

The Conservative, Moderate, and Aggressive scenarios were analyzed using the scenario screening criteria shown in Exhibit 2. The Moderate scenario was selected because it is the most cost-effective infrastructure and equipment option and provides the service attributes necessary to establish and maintain a successful regional passenger rail service. The Moderate scenario yields a positive operating cost ratio, provides the best value for money in terms of revenue generated per dollar invested, and generates a system-wide revenue surplus shortly after completion of the system.

...The Moderate scenario met the criteria of achieving a positive operating cost ratio ...and gave the best value for money in terms of revenue generated per dollar invested...

For study purposes, the Moderate scenario is based on the use of Diesel Multiple Units (DMUs) that are capable of achieving a top speed of 110 mph. DMUs are a proven technology that has been widely used in Europe and is planned for service in the U.S. The use of DMUs, or a similar technology, provides enhanced service reliability and reduced travel times. The Moderate scenario also provides a high level of amenities for both business and leisure travelers on board the trains and at stations.

Exhibit 2 Scenario Screening Process



Screening Criteria

- Achieve positive operating cost ratio
- Minimize capital cost per minute of train travel time saved
- Minimize capital cost per dollar of revenue generated
- Maximize connectivity in Chicago and regional mobility
- Maximize regional cost savings through economies of scale

Required Capital Investment

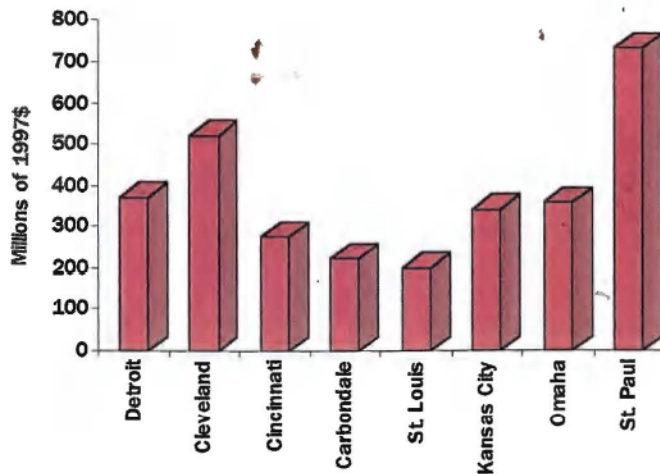
...The total capital investment for the MWRRS is \$3.5 billion...

The capital investment required to implement the Moderate Scenario includes rolling stock procurement, track and grade crossing improvements, modern signaling and control systems, maintenance facilities, and station improvements. The total capital investment for the MWRRS is \$3.5 billion.

The rolling stock for the MWRRS costs approximately \$470 million. This cost reflects a volume discount of approximately 30 percent. This discount is achieved by the collective purchase of rolling stock on a system-wide basis rather than on a corridor basis. The size of this fleet purchase should be sufficient to enable the 328-car fleet to be assembled in the Midwest region.

Infrastructure investment (Exhibit 3) for the MWRRS is estimated at \$3 billion or \$1 million per mile. This compares to \$6-10 million per mile for a 150 mph high speed train service, \$5-10 million per mile for rural interstate construction, and \$10-20 million per mile for urban expressway construction.

Exhibit 3
Infrastructure Costs by Corridor
 (All corridors except St. Louis-Kansas City originate in Chicago)



...Infrastructure investment for the 3,000-mile system is estimated at \$3 billion or \$1 million per mile...compared to \$5-10 million per mile for rural interstate construction and \$10-20 million per mile for urban interstate construction...

MWRRS Advantages

The MWRRS produces user benefits, economic stimulus, environmental improvements, and community enhancements. These are described as follows:

Travel Time and Frequency Improvements

The MWRRS offers travelers an attractive mix of travel times and train schedules to accommodate business as well as leisure travel.

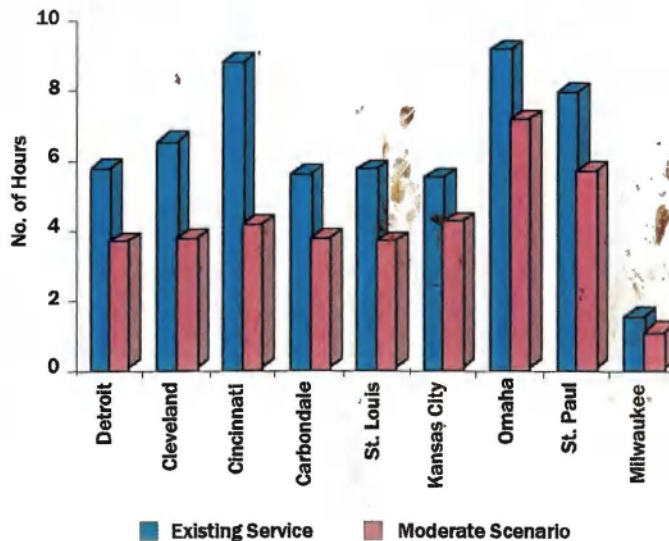
The MWRRS represents a fivefold increase in service, a major step forward for passenger rail operations in the Midwest region. The MWRRS when fully implemented operates over 15 million train miles per year, which is equivalent to approximately 50 percent of all the miles operated by Amtrak today.

When compared with current travel times, time savings on the MWRRS range from 30 percent between Chicago and Milwaukee to 50 percent between Chicago and Cincinnati (Exhibit 4).

...The MWRRS operates over 15 million train miles per year...approximately 50 percent of all the miles operated by Amtrak today...

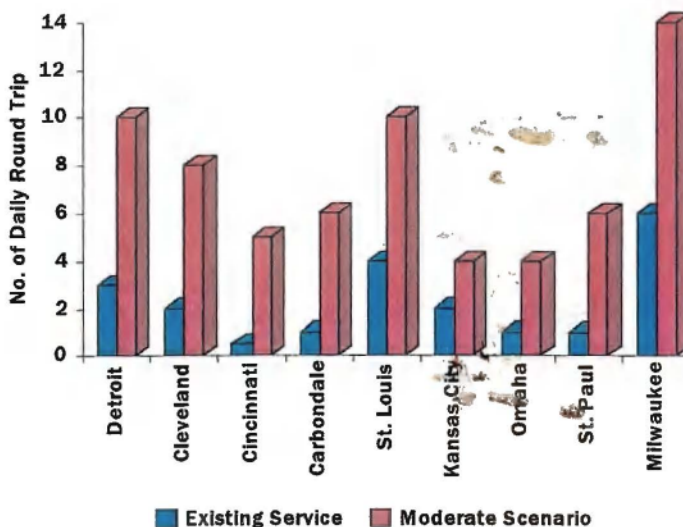
...Travel time savings over the existing service range from 30 percent between Chicago and Milwaukee to 50 percent between Chicago and Cincinnati...

Exhibit 4
Estimated Travel Times by Corridor
 (All corridors except St. Louis-Kansas City originate in Chicago)



The improvement in train frequencies ranges from 100 percent between St. Louis and Kansas City to 200 percent between Detroit and Chicago (Exhibit 5).

Exhibit 5
Train Frequencies by Corridor
 (All corridors except St. Louis-Kansas City originate in Chicago)



...Improvement in train frequencies range from 100 percent between St. Louis and Kansas City to 200 percent between Detroit and Chicago...

Increased Accessibility, Reliability, and Quality of Service

With full implementation of the MWRRS, approximately 80 percent of the Midwest region's population are within a one-hour drive of a MWRRS station or feeder bus connection. All stations have intermodal connections to the feeder bus network, and bus and rail schedules are coordinated to provide easy access for travelers who are unable to or prefer not to drive to stations. In addition, taxi, rental car, limousine, and transit services are available at all major MWRRS stations (e.g., Chicago, St. Louis, and Milwaukee).

New equipment with modular maintenance, an advanced train signaling and control system, and various line capacity improvements help to establish and sustain a high level of on-time performance. Real-time schedule information is available to the public via a state-of-the-art telephone system and the Internet.

While new train stations may be constructed, current plans are to renovate existing stations to offer a pleasant travel experience and full range of traveler amenities. Amenities and services at stations include restaurants and shops, lounges and business clubs, banking facilities, and information kiosks. The new trains are comparable to business class seating on airlines and provide a range of amenities including food services, advanced telecommunications and other business support facilities, and audio-video monitors at seats for news, entertainment and information programs.

Increased Ridership

In 2010, four years after full implementation of the system, the MWRRS is forecast to attract almost 8 million passengers (Exhibit 6). This level of ridership is four times higher than the ridership forecast for the same period if no rail service improvements are implemented. Improved technology and rights-of-way, drastically reduced travel times, increased train frequency, improved station accessibility, and improved train and station amenities are the driving forces behind this ridership increase.

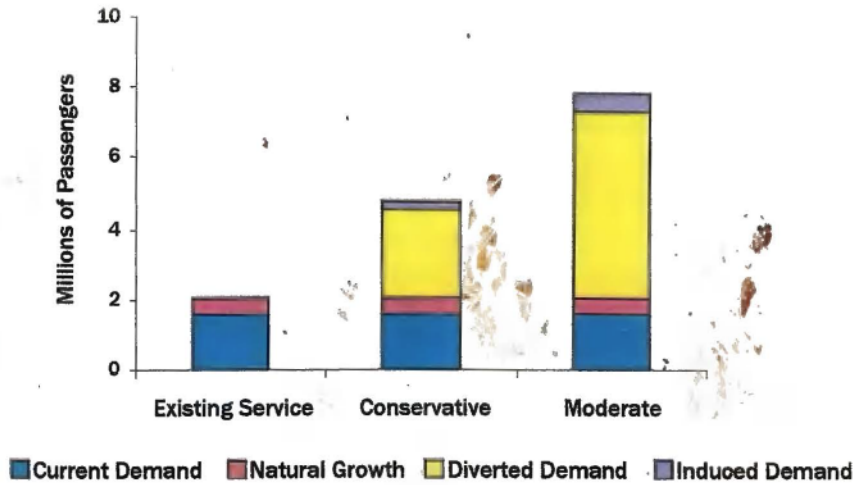
...Approximately 80 percent of the Midwest region's population is within a one-hour drive of a MWRRS station or feeder bus connection...

...In 2010, four years after full implementation of the system, the MWRRS attracts almost 8 million passengers...

...Four years after full implementation of the system, annual revenues are \$471 million...

...Travel time, quality of service, reliability, and intermodal accessibility are the keys to the success of the MWRRS...

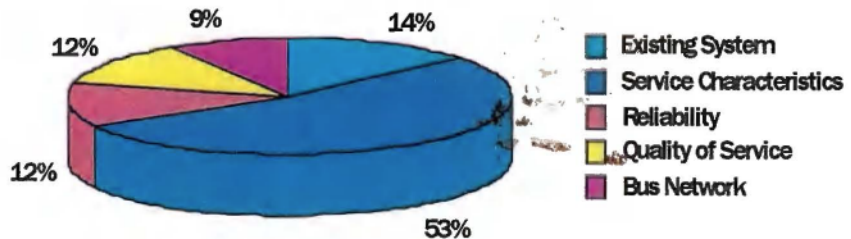
**Exhibit 6
Source of 2010 Ridership**



Increased Revenues

The MWRRS is forecast to generate \$471 million in annual revenues by 2010. Exhibit 7 apportions passenger revenue among the different proposed improvements and highlights the relative importance of each type of service improvement. In addition to travel time, quality of service, reliability, and intermodal accessibility are the keys to the success of the revitalization of passenger rail service in the Midwest region.

**Exhibit 7
Impact of Service Attributes on 2010 Passenger Revenue**



Lower Total Operating Costs

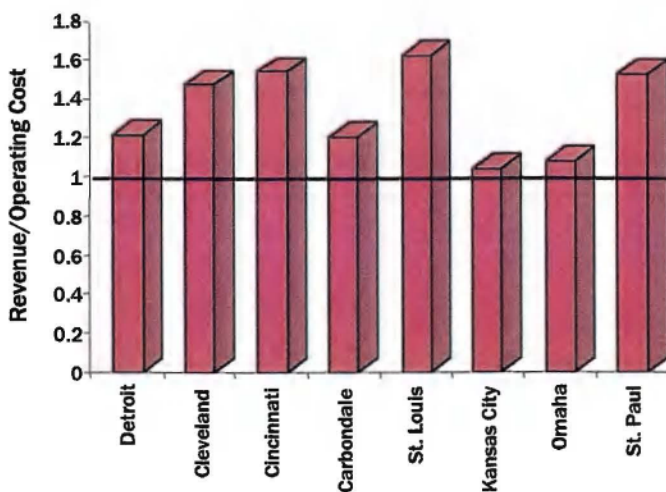
The use of DMU technology produces significant reductions in operating and maintenance costs for the system. Operating a regional system that maximizes synergies between corridors and economies of scale enhances these savings. System operating costs incorporate current Amtrak labor work rules. Annual operating costs are estimated to be \$347 million in 2010.

MWRRS Operating Cost Recovery

After a two-year start-up period, system revenues are forecast to exceed system operating costs. This positive operating cost ratio continues to increase, generating an annual revenue surplus of over \$100 million in 2010. Revenues can be used to recover the initial investment made by the states, as well as pay for system expansion and preservation. The total revenue surplus generated over the 25-year life of the project is over \$850 million in net present value.

As illustrated in Exhibit 8, all corridors achieve a positive operating cost ratio because of system-wide synergies and economies of scale. Exhibit 9 shows the revenues and operating expenses estimated for the first 20 years of the system in 1997 dollars.

Exhibit 8
Revenue to Operating Cost Ratios
(All corridors except St. Louis-Kansas City originate in Chicago)

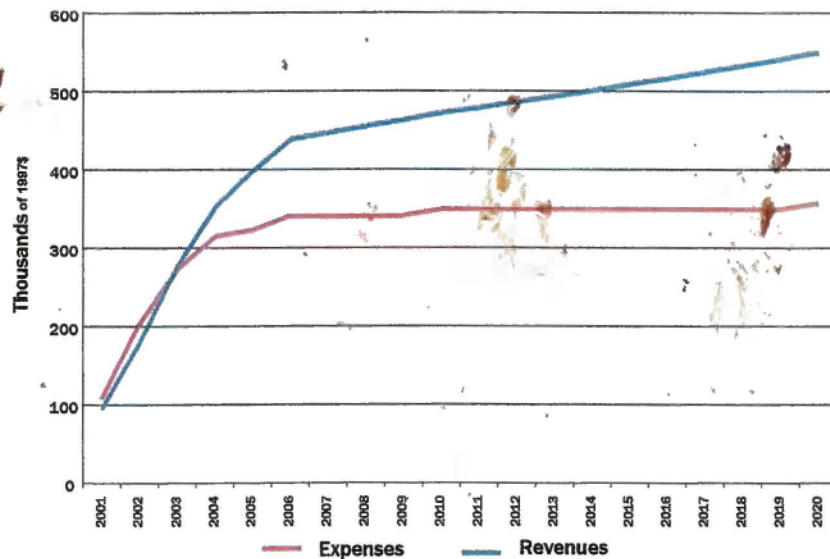


...After a 2-year start-up period, system revenues exceed system operating costs...

...All corridors achieve a positive operating cost ratio...

...The MWRRS' positive operating cost ratio continues to increase and generates annual revenue surpluses of over \$100 million in 2010...

**Exhibit 9
Total Revenues and Operating Expenses**



Capital Funding and Implementation

Capital Funding

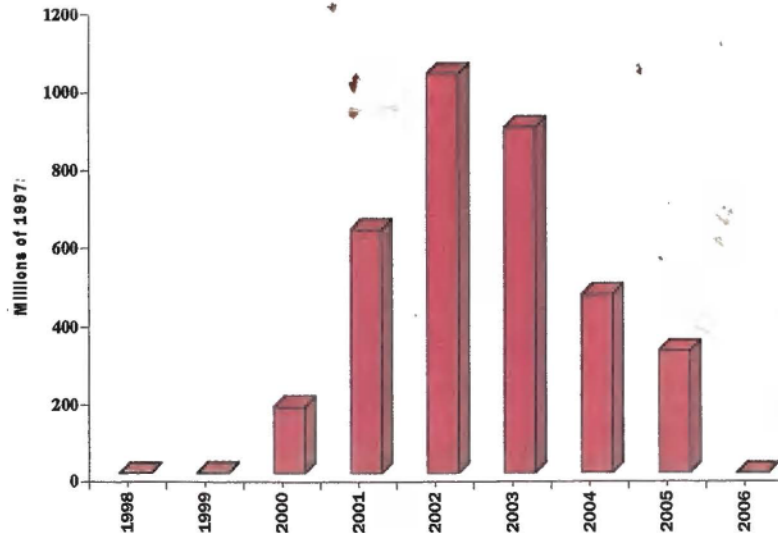
...A realistic and reasonable funding plan has been developed...80 percent federal funds for infrastructure...and 20 percent state matching funds that are predominantly for the procurement of rolling stock...

A \$3.5 billion capital investment is required to implement the MWRRS. A funding approach has been developed to ensure the receipt of federal, state, and private funding to support capital requirements consistent with the MWRRS implementation plan. Key elements of the capital funding plan include:

- 80 percent federal funds predominantly for infrastructure
- 20 percent state funds predominantly for rolling stock
- State issued bonds to finance state share.

While implementation costs are incurred over a six-year period, capital payments by the states can be amortized over 20 years. Exhibit 10 shows the implementation capital costs for the MWRRS.

Exhibit 10
Implementation Capital Costs



Implementation Schedule

Implementation of the Moderate service option occurs in six phases. The MWRRS implementation schedule is shown in Exhibit 11.

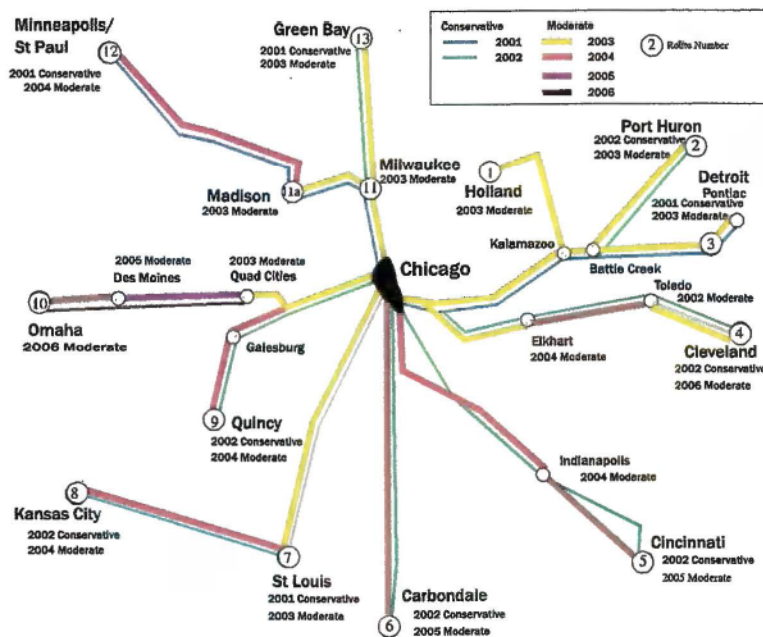
System phasing is based upon the following five objectives:

- Service is to be implemented as quickly as possible consistent with system demand
- Corridors with the highest ridership and level of service are to be implemented first
- Broad geographic coverage is to be achieved as early as possible
- Project phasing is to be paced according to state affordability and market demand
- Passenger railcars are to be manufactured in the Midwest to generate economic benefits for the region.

...Implementation of the Moderate scenario is incremental...and occurs in six phases...

As shown in Exhibit 12, implementation of the MWRRS begins with the introduction of new train equipment and the infrastructure improvements of the Conservative scenario on selected corridors (Phases 1 and 2). Implementation then progresses to include the infrastructure improvements of the Moderate scenario on all corridors (Phases 3, 4, 5, and 6).

**Exhibit 12
MWRRS Implementation
All Phases**



...Implementation begins with the introduction of new train equipment and the infrastructure improvements of the Conservative scenario on selected corridors...then progresses to include the infrastructure improvements on the Moderate scenario on all corridors...

Economic Benefits

...In addition to user benefits, the MWRRS generates substantial levels of resource savings in automobile operating costs, airport and highway congestion relief, and reduced energy usage and emissions...

MWRRS Economic Benefits

An economic analysis was completed for the MWRRS using the same criteria and structure as the FRA used in its 1997 study, *High-Speed Ground Transportation for America*. The results of this analysis for the MWRRS are shown in Exhibit 13.

Exhibit 13
MWRRS Economic Benefits
for 2000 to 2030
Expressed as 30-Year Net Present Value
(Billions of 1997\$)

Benefits	
MWRRS User Benefits	
Consumer Surplus	\$ 5.9
System Revenues	6.7
Other Mode User Benefits	
Airport Congestion	0.7
Highway Congestion	1.3
Resources Benefits	
Air Carrier Operating Costs	0.4
Emission	-0.3
Total Benefits	\$15.3
Costs	
Capital	\$3.5
Financing	0.2
Operating and Maintenance	5.0
Total Costs	\$ 8.7
Ratio of Benefits to Costs	1.8

The system not only generates significant user benefits but also provides substantial levels of resource savings in automobile operating costs, airport and highway congestion relief, and reduced energy usage and emissions. The FRA study *High Speed Ground Transportation for America* also confirmed that a Midwest passenger rail system offers the highest level of economic benefit associated with rail investment anywhere in the U.S. except for Amtrak's Northeast Corridor. This is a strong justification for federal investment in the MWRRS.

MWRRS Community Benefits

The MWRRS generates significant economic impact in the Midwest region as the system supports the development of new service and recreational industries. The MWRRS generates, in addition to the 1,500 new rail operations jobs and 4,000 construction jobs that result from this investment, significant increases in employment in the manufacturing, service and tourism industries throughout the Midwest region. In particular, significant opportunities will be generated for redevelopment around station locations, including public and private sector joint development projects for the construction of new terminals in major metropolitan areas.

*...The MWRRS generates
1,500 new rail
operations jobs and
4,000 construction
jobs...and significant
increases in employment
in other industries
throughout the Midwest
region...*

MWRRS Analysis Validation

The findings of the MWRRS analysis were compared with the findings of the FRA's analysis of the Chicago hub—Chicago-St. Louis, Chicago-Milwaukee and Chicago-Detroit corridors—in its study of *High Speed Ground Transportation for America*. This comparison is summarized in Exhibit 14. The figures given for the MWRRS are for these three corridors only and not the entire MWRRS system. The MWRRS assumptions with respect to ridership, revenues, and operating costs were more conservative than those of the FRA study. As a result, the MWRRS has a lower operating cost ratio than that forecast by the FRA study and a slightly lower benefit-cost ratio. Overall, the FRA analysis supports the conclusions of the MWRRS assessment, recognizing the potential financial return and economic benefits of a Midwest Regional Rail System.

*...The FRA analysis
supports the
conclusions of the
MWRRS assessment,
recognizing both the
potential financial
return and economic
benefits of a Midwest
Regional Rail System...*

**Exhibit 14
Comparison of FRA and MWRRS Analysis**

Chicago - St. Louis - Detroit - Milwaukee Corridors		
Parameter	FRA	MWRRS
Ridership (millions)	6.6	4.3
Revenue (millions)	\$227	\$215.7
Train Miles (millions)	9.5	7.8
O&M Costs (millions)	\$138	\$171.5
Operating Cost Ratio	1.64	1.26
Capital Costs (millions)	\$1,591	\$852
Benefit-Cost Ratio	2.46	2.10

Challenges

...While the MWRRS will encounter a series of challenges...bringing each to positive resolution is achievable...

The MWRRS will encounter a series of challenges as the project proceeds. Bringing each of these challenges to positive resolution is achievable. These challenges include:

- **Funding:** Securing federal funding requires the states to form a strong coalition to advocate funding needs to the U.S. Department of Transportation, its agencies and the U.S. Congress.
- **Debt Financing:** Issuing bonds and the use of other funding mechanisms requires advanced financial planning and coordination among the states.
- **Freight Railroads:** A critical component of the MWRRS plan is the use of rail lines owned by the freight railroads and Metra. Consequently, capital investment in, and operation of, the MWRRS must be carefully integrated with the needs of the railroads to mitigate potential conflicts, and to ensure their cooperation and support for the project.

Conclusions

Based upon the results of the technical, financial, and economic analyses conducted as part of this study, the MWRRS is a viable system in that it:

- Generates revenue surpluses after paying its operating costs
- Provides a competitive passenger rail system with vastly improved travel times, service frequencies, and regional connectivity
- Offers passengers a level of comfort and convenience that is comparable to that of air at a competitive price
- Provides a regional passenger rail system for a capital investment of \$1 million per mile for infrastructure.

The MWRRS also:

- Improves the safety and productivity of existing freight services through track, signaling, and grade crossing improvements, thus keeping the Midwest competitive as a major transportation hub for the nation
- Improves the performance and travel times of any separate Amtrak services using the same improved track infrastructure and station facilities provided by the MWRRS
- Generates significant economic benefits for the Midwest region including increased employment, urban redevelopment, commercial revitalization, and an array of long-lasting user benefits
- Lessens congestion along a number of major highway corridors during peak travel times, thereby reducing automobile emissions.

...Based on the results of the technical, financial, and economic analyses, the MWRRS is a viable system and generates significant mobility and economic benefits...

Next Steps

Short, medium and long-term actions are identified as the next steps in the Midwest Regional Rail Initiative:

- Short-term
 - Plan endorsement by the states
 - Finalization of the implementation plan
 - Securing federal/state funds for advanced project planning
 - Building grassroots support for the project
 - Discussions with the freight railroads.
 - State issued bonds to finance state share

- Medium-term
 - Securing federal/state funds for preliminary engineering and design and required environmental reviews
 - Securing federal/state funds for construction
 - Refinement and finalization of the operating plan
 - Development of marketing program
 - Selection of construction projects.

- Long-term
 - Construction of Phases 1 through 6 of the MWRRS over a six-year period
 - Manufacture and assembly of rolling stock
 - Introduction of full MWRRS service by the year 2006.

