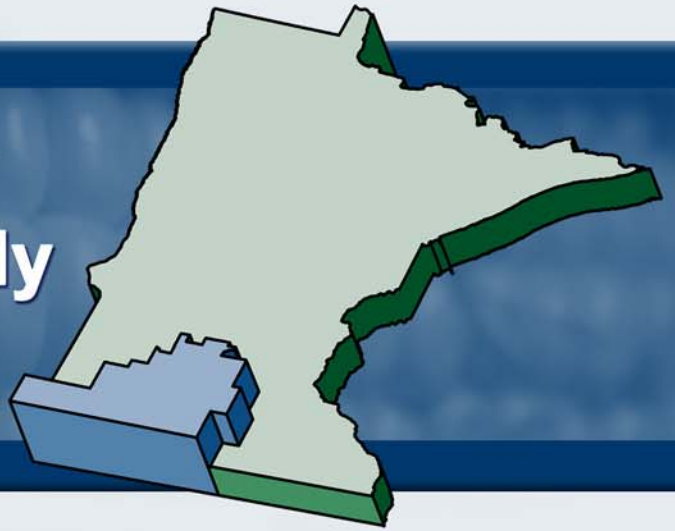


# Southwest Minnesota Regional Freight Study Executive Summary



September 2007



# Introduction

The Southwest Minnesota Regional Freight Study region, comprising Minnesota Department of Transportation (Mn/DOT) District 7, includes 13 counties: Blue Earth, Brown, Cottonwood, Faribault, Jackson, Le Sueur, Martin, Nicollet, Nobles, Rock, Sibley, Waseca, and Watonwan. The region stretches from southwest of the Twin Cities metro area to the Iowa and South Dakota borders. Mankato/North Mankato is the region's major developed area, with a population of approximately 50,000 people. Cities of moderate size include Fairmont, New Ulm, St. Peter, Waseca, New Prague, and Worthington. The region has a stable but aging population and is largely rural and agricultural in nature.

The vast majority of available land in the region is under cultivation, with high quality soil producing high crop yields. The 2000 census identified over 1,100 farmers in the region, and 4.3 million acres in production. Considered to be one of the most productive farm regions in the nation, together these thirteen counties produce one-third of Minnesota's corn and soybean crop, half of Minnesota's total hog production, and half of the state's ethanol (Figures 1, 2, and 3). Other key commodities include: natural resource mining such as sand, clay, and aggregate; concrete and construction materials; and to a lesser extent manufactured goods.

Based upon tonnage carried, 96 percent of inbound freight movements and 89 percent of commodities leaving the area are transported by truck. Truck freight from this area primarily serves neighboring counties in Minnesota and adjacent states. Rail service also plays an important role by transporting large volumes of bulk commodities including grain, ethanol, and non-metallic minerals. While Southwest Minnesota is not directly contiguous with the Great Lakes or Mississippi River commercial waterway systems, road and rail connections from the region to Minnesota's ports provide key access to distant markets. Limited air freight service is provided in Mankato and from other regional airports. Pipelines transport a significant volume of liquid and gaseous products, including petroleum products, natural gas, and liquid fertilizer.



## Findings and Recommendations

### ***Extraordinary growth is occurring in the region's renewable energy industry.***

Renewable fuel production in Southwest Minnesota, particularly ethanol, has grown significantly in recent years. Ethanol plants consume corn grown locally to produce ethanol, a gasoline substitute and octane additive. Biodiesel plants use soybean oils to produce a diesel fuel supplement. In 2005, corn consumed by ethanol plants in the region represented 19 percent of the total corn yield. Distillers Dried Grains (DDG), a by-product of ethanol production, is also being produced in large quantities by area plants and marketed as a livestock feed, with 25 percent going to export. The 186 million gallons of ethanol produced in 2005 in this region is expected to more than double in the next two years, and consume





up to 40 percent of local crop production.

In 2006, the value added from local ethanol production and the effects of higher grain prices directly added an estimated \$1 billion to the area economy, and up to \$5 billion directly and indirectly to Minnesota's economy. Offsetting this is the higher price of grain driven by biofuels demand, resulting in increased costs for food processors and livestock feeders, and ultimately the consumer. Agriculture's response to higher prices and demands will be to increase production significantly, but also divert crop land away from food production and towards corn for ethanol.

**Recommendation:**

- Organize a state-level, interdepartmental working group to monitor biofuel trends and resulting impacts on transportation. These trends include shifts in supply sources, particularly as cellulosic-based (non-grain) supplies and technologies emerge and/or if corn supplies become constrained, changes in destination markets, and resulting changes in transportation volumes, modes, and requirements.

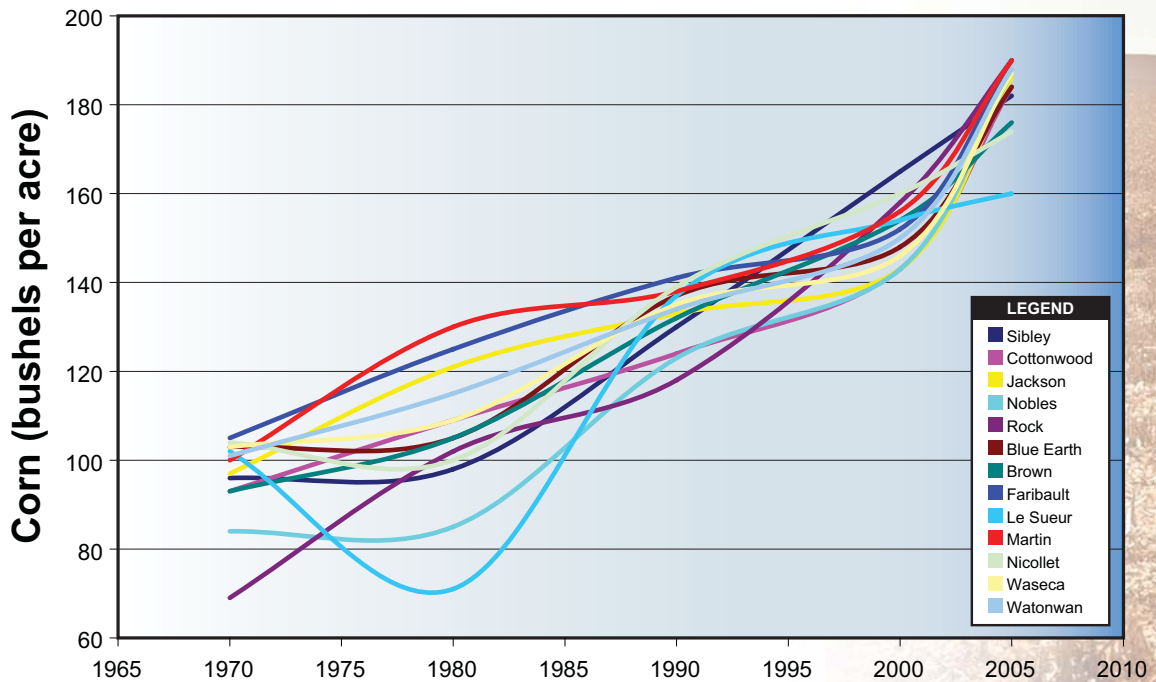
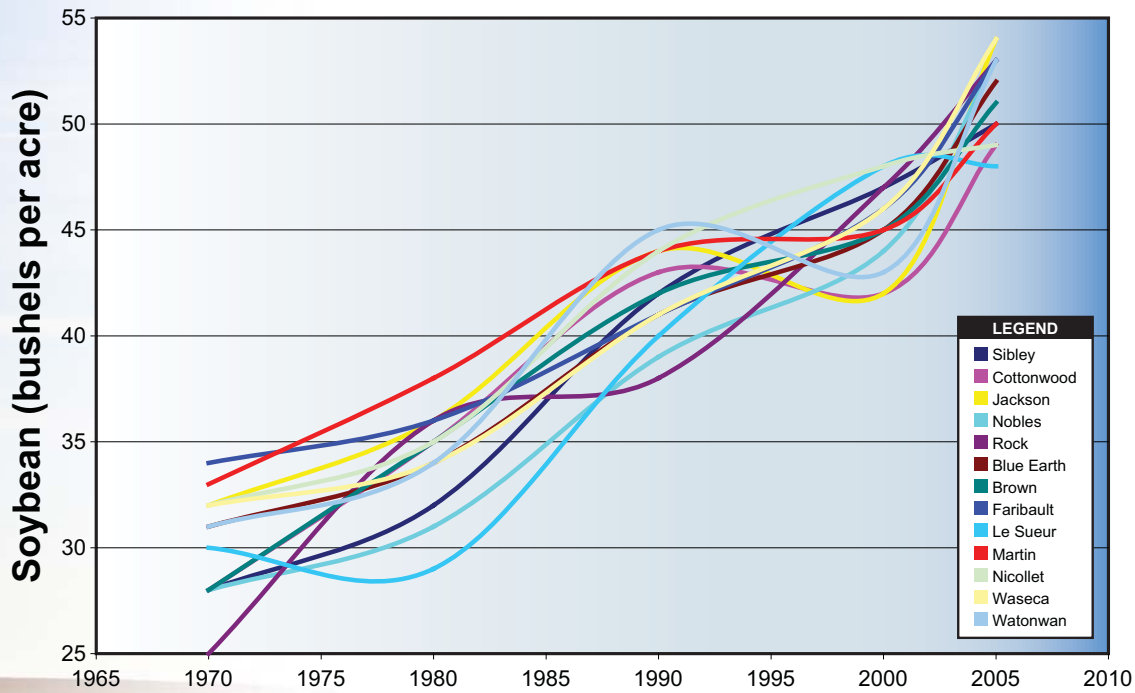
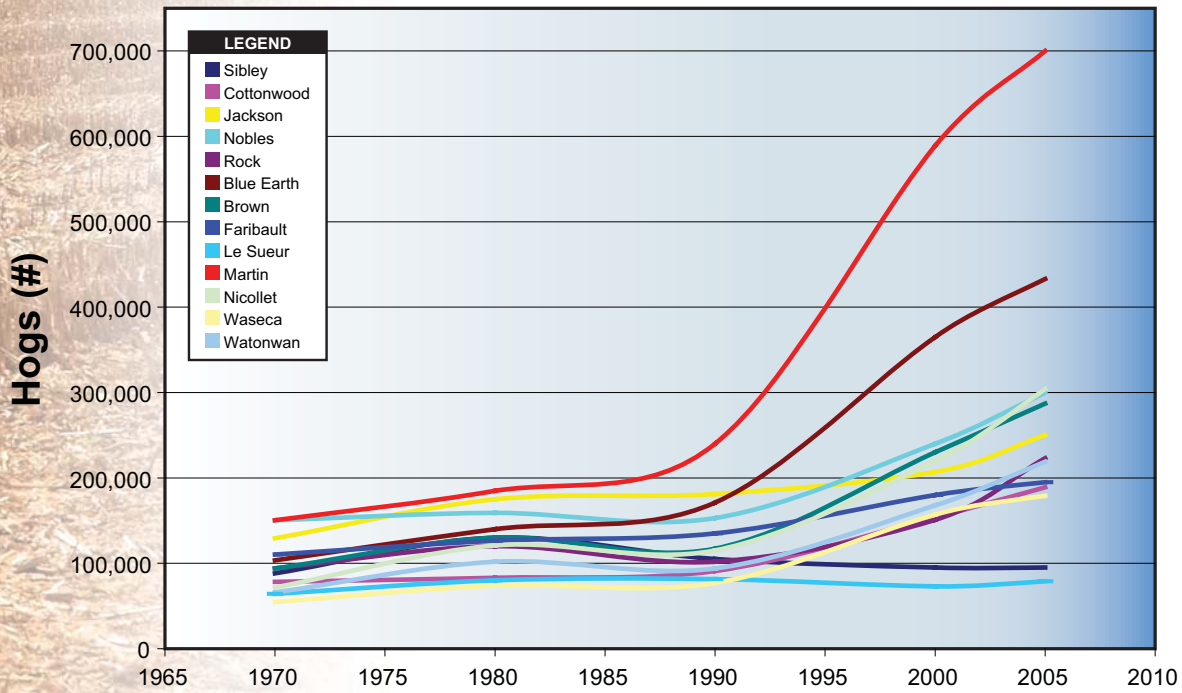


Figure 1: "Corn Yield"  
Source: Minnesota Department of Agriculture





**Figure 2: "Soybean Yield"**  
 Source: Minnesota Department of Agriculture



**Figure 3: "Number of Hogs"**  
 Source: Minnesota Department of Agriculture





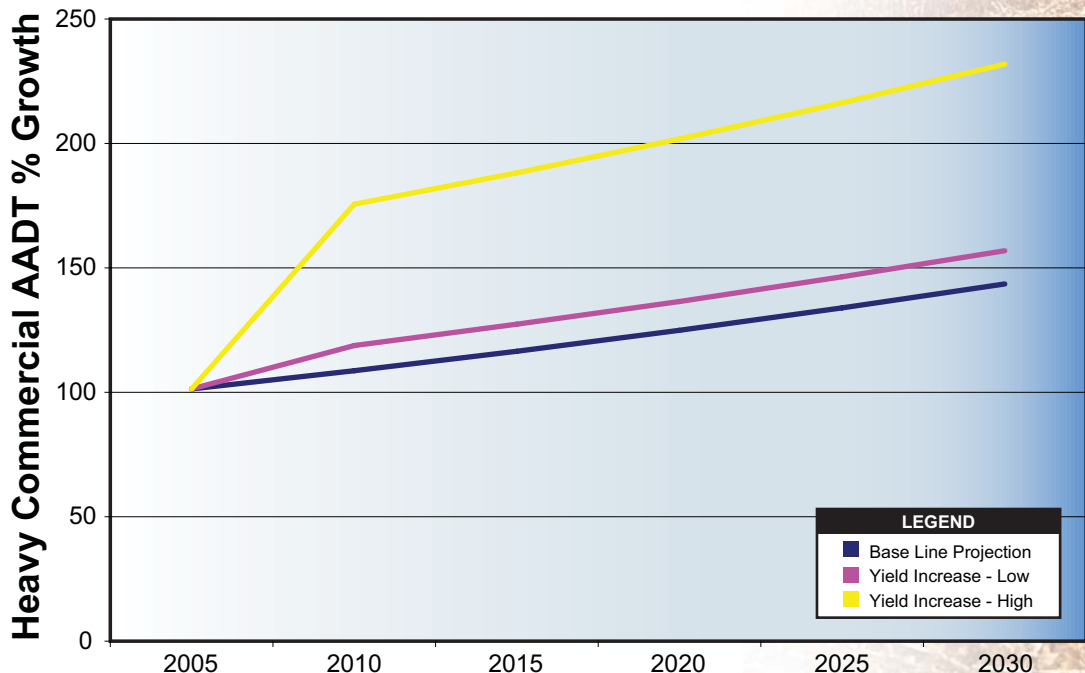
## Freight traffic growth in the region is substantially outpacing that of Minnesota and the U.S.

Freight volumes by tonnage are projected to double in Minnesota, from 664 million tons in 2002, to 1329 million tons in 2035. If current agricultural trends continue, freight traffic in Southwest Minnesota will potentially grow by 200 percent by 2030 (Figure 4), or double the statewide rate. Better crop genetics and improved management practices, including crop rotation, improved chemical management of soils and fertilizers, pesticides and herbicides, less damaging cultivation and soil compaction, and aggressive plant spacing have steadily improved per-acre yields. The result is more agricultural freight traffic on the freight system, particularly trucks. The transportation network serving this area, both roadways and rail lines, is a lifeline connecting many discrete farms and businesses to outside suppliers and consumers. The transportation system is essential to maintaining the region's economic vitality.

### Recommendations:

- **Maintain mobility on the region's major roadways, the Interregional Corridor System, to address growing freight traffic. The need for access to national and international markets and the possible doubling of heavy commercial vehicle (truck) traffic will concentrate freight trips onto these major highways.**
- **The following key roadways are significant freight corridors due to their importance to the region's and State's economy: MN 60 from Iowa to Mankato (for ethanol plants and shuttle elevators); US 14 from South Dakota to I-35 and US 169 from Mankato to the Twin Cities (for grain, port access); and I-90 through the region (for national connections).**

<sup>1</sup> Minnesota Department of Employment and Economic Development



**Figure 4:** "Freight Traffic Growth"  
**Source:** Minnesota Department of Agriculture



## ***The use of larger farm equipment, including 5-axle semi tractor trailers, is increasing.***

Larger farm equipment such as tractors, combines, grain carts, and semi trucks pose a growing problem on public roads, including ‘rolling roadblocks’ on rural two-lane roads, bridge loadings and clearances, and shoulder damage. Farmer-owned semi tractor trailers have become the norm on many farms because of the large yields, large farm sizes, the need for farmers to minimize costs, and the ability to respond rapidly to changes in market prices and destinations.

The length, width, and axle loadings of large equipment create accelerated stresses on road surfaces, substructures, and bridges. Counties have the authority to post weight limits on their roads and enforce them, but they often have limited enforcement activity and lack the data on heavy commercial vehicle volumes and also road strength needed for proper road management.

Safety is an increasing concern, as 70 percent of fatalities in Minnesota occur on rural roadways. Many of these low-volume, two-lane roads have design features such as narrow lanes, limited shoulder widths, and steep embankments that make them subject to rollovers and lane-departure type crashes. Part-time drivers of fully-loaded semis, including farmers, may have limited experience operating such vehicles.

### **Recommendations:**

- **Improve heavy commercial vehicle (truck) volume and vehicle classification programs so as to better identify areas of significant freight traffic growth.**
- **Review roadway design requirements for trunk highway, county, and County State-Aid Highway 10-ton roads. This review would recognize structural, safety, and geometric needs for farm equipment and fully loaded semi trucks on routes with significant truck traffic.**
- **Review State laws governing the lighting, marking, size, and weight requirements and limits of “implements of husbandry”.**
- **Enhance farm/rural safety messages and programs with a focus placed on non-professional drivers, heavy vehicle operation, and railroad grade crossing safety through local and agricultural channels (e.g., farm groups, manufacturers, and dealers).**
- **Expand the State Environmental Quality Board (EQB) development review process to provide broader (State as well as local) transportation impact review (including safety) of all developments of regional significance, such as ethanol plants.**





## ***A limited 10-ton roadway network restricts freight carrying capacity in the region.***

10-ton roads provide the structural capacity and design features needed for five-axle semis to carry full loads up to the maximum legal limit of 80,000 pounds gross vehicle weight, thereby maximizing payloads and lowering transportation costs. An interconnected and functional 10-ton road network helps ensure efficient commercial truck traffic throughout the region and connections to other regions.

Freight and agricultural growth, livestock operations, and ethanol plants have created a demand for more coverage and four-season capability on the 10-ton network. The average ethanol plant production is growing from 40 million gallons to 100 million gallons per year and has only 10 days of on-site storage for corn. As a result, ethanol production facilities rely for much of their supply on regular truck shipments (mostly fully loaded semis) from area farms. Roads rated at or posted at less than 10-tons, with attendant spring load restrictions, require reduced payloads and/or cause circuitous routings that increase overall truck trips and transportation costs for shippers. In addition, there is currently no consistent oversight on system gaps and capacities from county to county, leaving parts of the 10-ton system without the preferred continuity.



### **Recommendations:**

- **Coordinate across jurisdictions in the region the development of a “conceptual” 10-ton network, including bridges.**
- **Confirm current roadway strength and truck use.**
- **Develop a prioritization scheme and close gaps in the 10-ton network by upgrading restricted trunk highways and/or county highways.**
- **Centrally track and coordinate upgrades.**
- **Consider revisions to design criteria to ensure adequately designed 10-ton roads and that those not on the conceptual 10-ton network are not built to a higher-than-needed standard.**
- **Strategic truck weight enforcement is needed to protect vulnerable links.**
- **Maintain autonomy for all jurisdictions to manage spring thaw restrictions and load postings.**

## ***The rail network is an integral component of the rural freight transportation system.***

The rail network helps provide a multimodal freight system in Southwest Minnesota, providing competitive options for shippers. Rail service is particularly critical for ethanol plants, transporting about 60 percent of outbound product (ethanol and DDGs) with connections to national markets, as well as for some inbound traffic to plants. Ethanol plants require increasingly long sidings to accommodate unit trains and other rail loading requirements.

Increases in truck traffic or train traffic at highway/rail grade crossings may require enhancements to grade crossing safety, including active warning devices such as flashers and gates. Rail switching operations near plants, new rail crossings of roadways, and increased train speeds may also increase safety concerns. Mn/DOT's statewide grade crossing safety improvement program implements safety enhancements at crossings with existing conditions that exhibit the highest potential risk; the program does not accommodate safety enhancements needed due to newly introduced development.

Mn/DOT's Minnesota Rail Service Improvement (MRSI) Program offers low or no-interest loans for investments to preserve short line and regional rail service, to rehabilitate rail lines, and to provide rail shipper facilities (spur lines, loading facilities). Several rail projects in Southwest Minnesota have received MRSI funding, including the Minnesota Prairie Line rehabilitation. The MRSI Program will likely experience greater demand in the region in the future as larger rail car sizes and wheel loadings may overstress sidings, track structure, and bridges. It may also be important to upgrade shipper's facilities so service levels can be maintained to local elevators and ethanol plants.

### Recommendations:

- **More fully evaluate rail infrastructure (e.g., track, bridge, etc.) and service needs in Southwest Minnesota, particularly shortline and regional railroads, including access to service and connections to national and global markets.**
- **Identify public-private partnership opportunities for addressing rail issues and needs.**
- **Encourage greater coordination between transportation and economic development planners to encourage shipper use of rail, thereby reducing truck demand on roadways.**
- **Evaluate potential safety effects due to new developments so that safety enhancements are provided.**

### ***Demand is increasing for localized access to intermodal/ containerized freight.***

Identity Preserved (IP) food products and the need to trace grain and food through the supply chain to export markets now dictate the use of sealed intermodal containers. "In 2002, by weight, 15 percent of all U.S. agricultural product exports were shipped in containers, up from 9 percent in 1992. By value, more than 52 percent of all U.S. agricultural trade was shipped via containers. In 2002 it was estimated that over 600 U.S. companies were employing containers to ship grain and grain products to over 130 countries."

A new intermodal rail service in nearby Montevideo provides container-based intermodal grain transportation services from Western Minnesota to international ports in Asia, Europe and Latin America via the Twin Cities. Regularly-scheduled shipping services are provided to ethanol producers (for DDGS), to growers and processors of IP food-





grade soybeans and wheat products, and to other value-added soybean feed and specialized grains. Additional intermodal service demand likely exists in Southwest Minnesota. Intermodal containers have also become the mode of choice for most export of manufactured goods, a transportation channel routinely used by businesses in the area.



### Recommendations:

- Evaluate more fully the demand for and potential use of local intermodal container service, including regional container-to-railcar transfer facilities and alternatives such as bi-modal truck/rail service.
- Evaluate the feasibility of implementing improved intermodal service with involvement by railroads, ocean shipping companies, third party providers, and state and local officials.



<sup>2</sup> U.S. Containerized Grain and Oilseed Exporters – Industry Profile and Survey – Phase II. Kimberly Vachal, Tamara VanWechel, and Heidi Reichert. July 2003.



### Adjustments to truck size and weight regulations are needed.

Changes in truck size and weight regulations can increase highway freight system capacity. By allowing some increases in truck weight with a requirement for additional axles, payloads can be increased and damage to infrastructure reduced through fewer overall truck trips. Regulations are inconsistent from state to state. Some businesses and haulers in the area, with borders shared with Iowa and South Dakota, are practically limited from doing business in those states due to these differences. At the same time, there are increasing movements of oversize/ overweight shipments through the region. This trend is increasing with the shipment of wind turbine components to wind farms, and the potential for new wind turbine manufacturing facilities locally.



### Recommendations:

- Participate in regional and national discussions about truck size and weight issues.
- Harmonize regulations with adjacent states and provinces so as to facilitate the movement of freight while protecting infrastructure.
- Pursue changes for allowable truck weights with more axles under a state permitting arrangement to ensure safety. Such changes would benefit agricultural transportation in particular.
- Identify and consider potential impacts of proposed truck size and weight changes on rail service.
- Examine routes via road and rail for compatibility with moves of oversize and overweight loads.



## ***Freight information and planning improvements are needed to effectively address freight mobility issues.***

To address the region's freight issues and trends, changes will be needed in several key areas within Mn/DOT and with its transportation planning partners. These changes include improvements to data and information gathering and sharing methods, and better integration of freight into the overall transportation planning process. Information from this study and other research can and should be used as input to formulate potential policy and process changes. A key part of this improved integration is to also have better freight information readily available for planners, engineers, and decision-makers to use for developing future transportation improvement plans.

*Through extensive data gathering, industry outreach and Technical Advisory Committee assistance, the Southwest Minnesota Regional Freight Study recognizes several extraordinary conditions and trends emerging in the area that are likely to have significant impacts on the region's transportation systems for years to come. The recommendations developed in response to these conditions and trends attempt to remain realistic about the potential volatility of some trends, while recognizing the limits of public investment, and the role of public policy. Both the private and public sectors will need to work together to ensure that the freight transportation system can adequately support the rapid economic growth projected for the Southwest Minnesota region.*

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The full report can be found at: <http://www.dot.state.mn.us/ofrw/freightProj.html>

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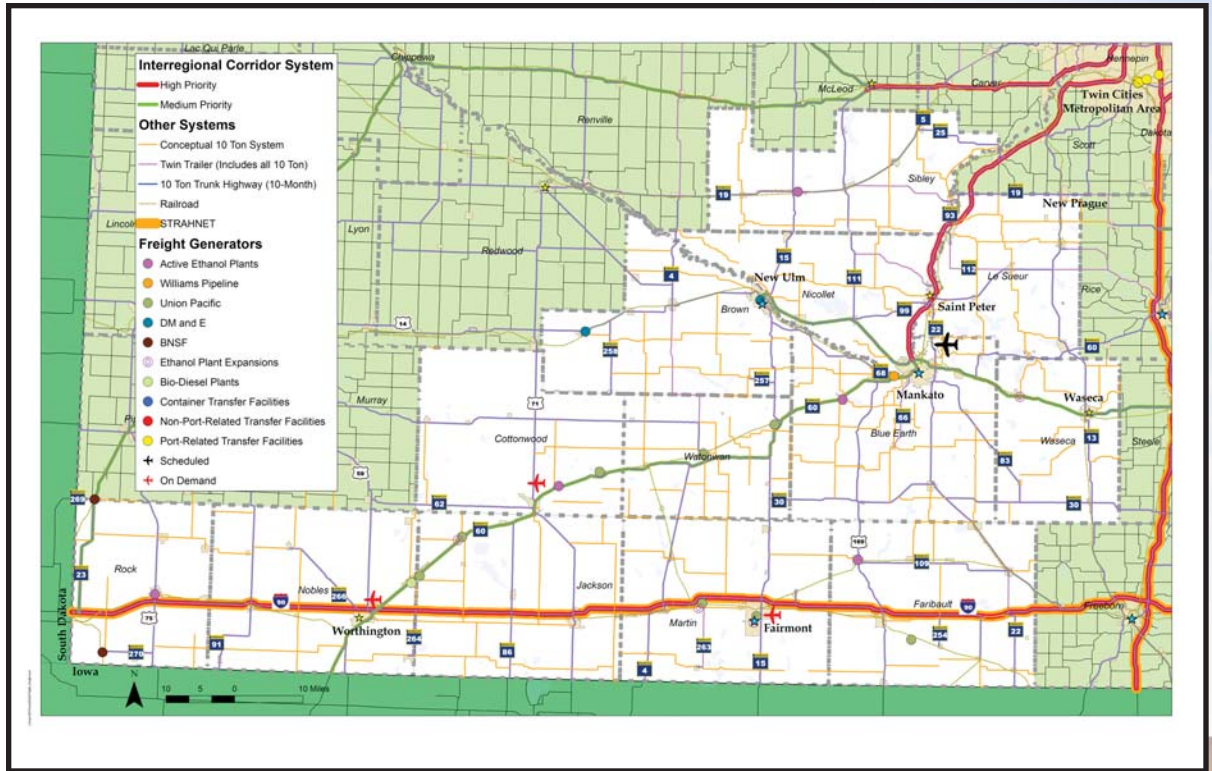


Figure 5: "Freight System"

Source: Minnesota Department of Agriculture

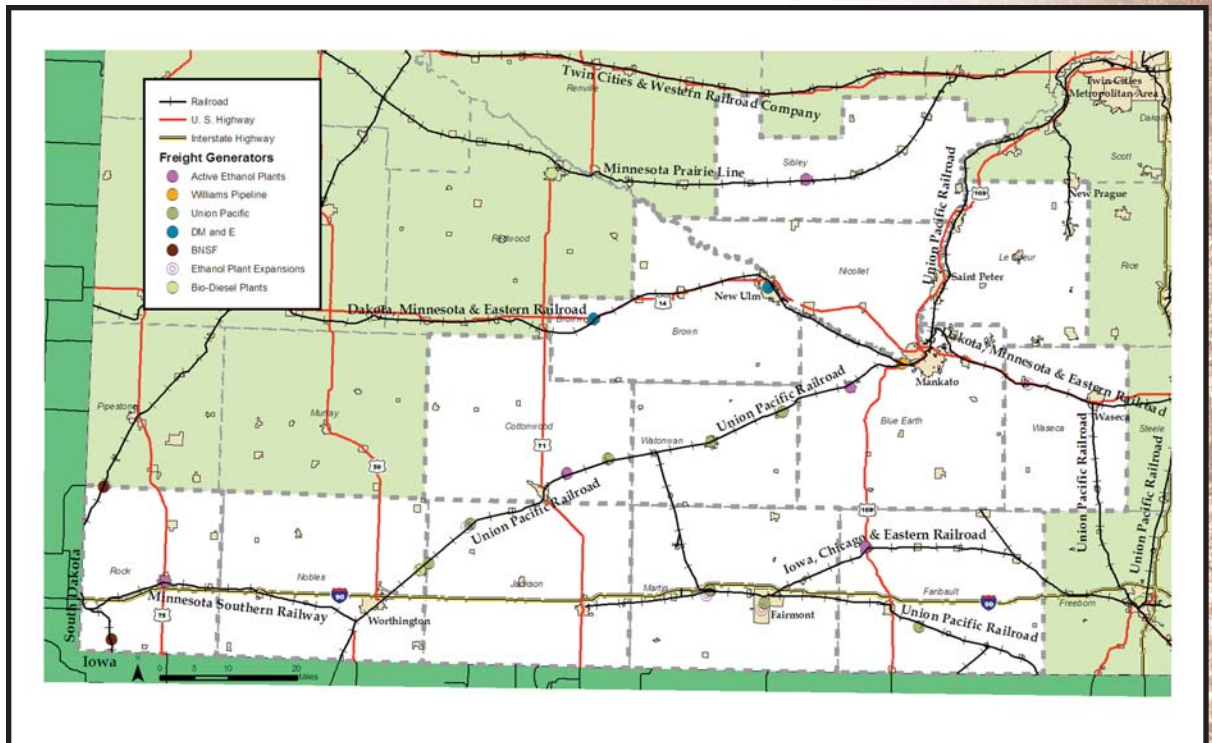


Figure 6: "Freight Rail Network"

Source: Minnesota Department of Agriculture







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