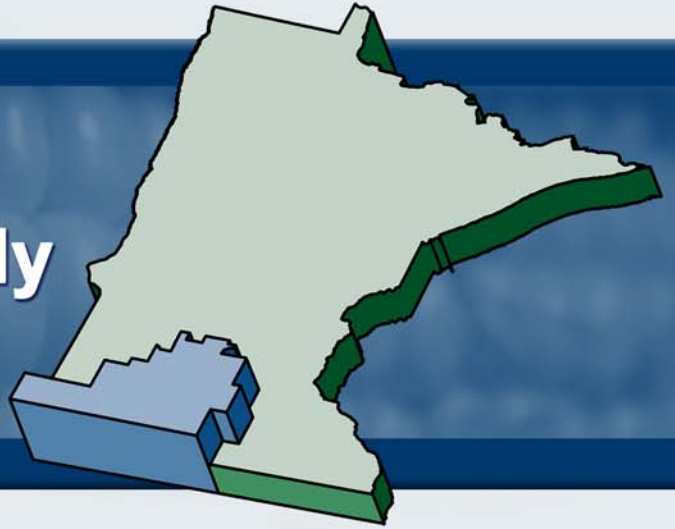


Southwest Minnesota Regional Freight Study Final Report



September 2007

Table of Contents

STUDY SUMMARY

1.0 CURRENT TRANSPORTATION INFRASTRUCTURE

1.1	District Overview.....	1
1.2	Major Freight Generators, Receivers and Providers (Stakeholders)	2
1.3	Freight Infrastructure System Inventory.....	7
1.3.1	Roadways.....	7
1.3.2	Rail System.....	9
1.3.3	Air Freight.....	10
1.3.4	Waterborne/Barge Freight	10
1.3.5	Intermodal Facilities	11
1.3.6	Pipelines.....	12
1.4	Mapping	12
1.5	Summary	12

2.0 FREIGHT SYSTEM ANALYSIS

2.1	Industry Profiling.....	14
2.1.1	Selection and Coverage.....	14
2.1.2	Summary of Interviews.....	18
2.2	Freight Flow Analysis.....	21
2.2.1	Directional Flows.....	21
2.2.2	District 7 Commodity Imports	25
2.2.3	Key Commodity Imports from Metro & other Districts.....	25
2.3	Modes.....	34
2.4	Routes	35
2.4.1	Freight/Intermodal Connectors	35
2.5	Seasonal Patterns	35
2.6	Major Freight Generators.....	36
2.6.1	Shuttle Elevators & Biofuels Plants.....	40
2.6.2	Intermodal Terminals.....	41
2.6.3	Alternate Freight Generator Databases.....	41
2.7	Non-Transportation Factors Effecting Freight.....	46
2.7.1	Demographics	46
2.7.2	Land Use	48
2.7.3	Environmental.....	48
2.7.4	Economic Development.....	48
2.7.5	Industry Trends-Agricultural Yields.....	49
2.7.6	Ethanol-Driven Change in Plant Rotation	50
2.7.7	Ranges of Potential HCAADT Growth to 2030	54
2.7.8	Hog Farming & Pork Production.....	54
2.7.9	Ethanol Production.....	55
2.7.10	Milling and Food Processing	56
2.7.11	Non-Metallic Minerals.....	56

2.7.12	Stone & Concrete	57
2.7.13	Manufactured Goods.....	57
2.7.14	Security – Cargo and Vehicles	58
2.7.15	Safety – Highways	58
2.7.16	Safety – Railroad Grade Crossings.....	59
2.8	Freight System Analysis	60
2.8.1	Geometric Deficiencies.....	60
2.8.2	Infrastructure Condition Impediments.....	60
2.8.3	Operational Impediments.....	62
2.8.4	Functionality-Heavy Duty Network Connectivity & Coverage	62
2.8.5	Analysis of First Priority Upgrades	63
2.8.6	Updates to Current & Conceptual 10-Ton Networks	66
2.8.7	State Aid 10-Ton Network Oversight & Prioritization.....	66
2.8.8	Railroads	66
2.8.9	Waterways.....	67
2.8.10	Air Freight.....	68
2.8.11	Intermodal Containers.....	68
2.9	Freight System Summary.....	68

3.0 TRENDS AND POLICY ANALYSIS

3.0.	Trends and Issues Analysis.....	71
3.1.	Global/International Trends Affecting Freight Transportation.....	71
3.1.1	Globalization & Trends.....	71
3.1.2	Multi-National Trade Agreements.....	72
3.1.3	Supply Chain Management.....	73
3.1.4	Supply Chain Security	76
3.1.5	The Emergence of Food Protocols.....	76
3.1.6	Tracing Grain Shipments	76
3.1.7	World Demand for Agricultural Products.....	77
3.2.	National Trends Affecting Freight Transportation	78
3.2.1	US Economy Transition from Manufacturing to Services	78
3.2.2	The Growth in Freight Traffic Volumes.....	79
3.2.3	Reducing America’s Reliance on Imported Energy	80
3.2.4	Expanding Intermodal Options	81
3.2.5	History of Intermodalism in the US.....	82
3.2.6	Road-Railer	84
3.3.	Regional Trends Affecting Freight Transportation.....	85
3.3.1	Grain Shuttle Trains.....	85
3.3.2	Intermodal Grain Shipping	87
3.3.3	Biofuels & Renewable Energy.....	88
3.4.	State/District-7 Trends and Issues	90
3.4.1	Demographic/Workforce Trends in Southwest Minnesota.....	90
3.4.2	Economic Trends in Southwest Minnesota.....	91
3.4.3	Evolving Agricultural Markets in Minnesota	92
3.4.4	Ag Production Increases	93
3.4.5	Ethanol’s Impact in Minnesota and District 7	94
3.4.6	Cellulosic Ethanol.....	96

3.4.7	Biobusiness Industries	96
3.5.	Trends and Policy Summary	98

4.0 PROGRAMS ANALYSIS

4.1	Minnesota Department of Transportation	99
4.1.1	Minnesota Rail Service Improvement Program	99
4.1.2	Minnesota Railroad Grade Crossing Safety Improvement	102
4.1.3	Grade Crossing Safety Education & Awareness	102
4.1.4	Mn/DOT Commercial Vehicle Operations	103
4.1.5	Truck Size and Weight	103
4.1.6	County State Aid Highway System	104
4.1.7	Waterways Freight	105
4.1.8	Mn/DOT Aeronautics	106
4.1.9	Freight Planning	106
4.2	Potential Future Freight Programs Supported in Federal Initiatives – SAFETEA-LU	107
4.2.1	Planning and Research	108
4.2.2	Financing	108
4.2.3	Freight Program	109
4.3	Programs Relevant to Freight: Minnesota State Departments	109
4.3.1	Department of Public Safety	109
4.3.2	Department of Agriculture	110
4.3.3	Department of Natural Resources	110
4.3.4	Pollution Control Agency	111
4.3.5	Department of Employment & Economic Development	112
4.4	Programs Related to Freight: United States Government	113
4.4.1	Department of Transportation	113
4.4.2	Department of Agriculture	115
4.4.3	Environmental Protection Agency	116
4.4.4	US Army Corps of Engineers	116
4.4.5	US Coast Guard	117
4.4.6	US Customs Department	117
4.5	Transportation Program Analysis Summary	117

5.0 OUTREACH AND PUBLIC INVOLVEMENT

5.1	Project Management Team Meeting and Project Communications	119
5.1.1	Check in Meetings	119
5.1.2	Special Meetings	120
5.2	Key Industry Representative Profiles	120
5.2.1	Supplemental Industry Input and Research	122
5.3	Transportation Industry Outreach	122
5.4	Public Presentation & Outreach	124
5.5	Outreach Summary	128

LIST OF FIGURES

Figure 1-1	US Census Data	2
Figure 1-2	District 7 Top Thirty Freight Generators	3
Figure 1-3	Destination of Truck Tons Outside of D7.....	4
Figure 1-4	Statewide Freight Volumes for Truck and Rail: <i>Selected Trade Association Statistics</i>	5
Figure 1-5	District 7 Agricultural-Related Freight Commodities 2004-05	6
Figure 1-6	District 7 Freight Study: Highway Route Miles Tabulation.....	7
Figure 1-7	District 7 Shuttle Train Elevators	11
Figure 2-1	Business Profile Matrix.....	15
Figure 2-2	District 7 Directional Flows by Weight - Annual Tons	22
Figure 2-3	District 7 Directional Flows by weight – Annual Dollars (millions).....	22
Figure 2-4	District 7 Commodity Origin/Destination Markets	23
Figure 2-5	Top District 7 Export Markets, Excluding Other Minnesota Destinations.....	24
Figure 2-6	Top District 7 Import Markets, Excluding Other Minnesota Origins.....	24
Figure 2-7	District 7 Key Import Commodity Groups	25
Figure 2-8	District 7 Key Commodity Imports from the Metro District.....	26
Figure 2-9	D7 Key Commodity Imports Excluding the Twin Cities Metro Area.....	26
Figure 2-10	District 7 Export.....	27
Figure 2-11	District 7 Key Commodity Exports to the Metro District.....	28
Figure 2-12	District 7 Key Commodity Exports excluding the Twin Cities Metro Area	29
Figure 2-13	Top 30 Freight Generators (STCC Code Data)	36
Figure 2-14	Minnesota Railroad and Trucking Summary Data	37
Figure 2-15	District 7 Export Truck Tonnage	38
Figure 2-16	Agricultural Freight Commodity Volumes	39
Figure 2-17	Transportation Economics for Corn.....	43
Figure 2-18	Ethanol Product Flows.....	44
Figure 2-19	Changes in District 7 Logistics Patterns	45
Figure 2-20	County Demographic Statistics.....	47
Figure 2-21	Corn Yield (MN Department of Agriculture)	49
Figure 2-22	Soybean Yield (MN Department of Agriculture)	50
Figure 2-23	Ag Stats: Acreage cultivated, Production Equivalents, Truckloads Acreage and Farms under Cultivation in District 7	51
Figure 2-24	Grain Transportation per Square Mile	53
Figure 2-25	HCAADT Growth.....	54
Figure 2-26	Hog Production (MN Department of Agriculture)	55
Figure 2-27	Heavy Commercial Vehicle Diversion Costs (Seasonal Load Limited roadways upgraded to realize savings) Truck Diversion Costs-Current 10-Ton Network Gaps/Restrictions.....	64
Figure 3-1	World and U.S. Merchandise Trade	71
Figure 3-2	Growth in US by Border Region	72
Figure 3-3	Exports to NAFTA Trading Partners from D7	73
Figure 3-4	Agricultural Supply Chain Process Flow.....	75
Figure 3-5	GDP Growth for Developing Economies	77
Figure 3-6	Projected 20 Year Regional Growth Rates in Freight Volumes (FHWA).....	80

Figure 3-7	Minnesota Retail Gasoline Prices (September 2000–January 2007).....	81
Figure 3-8	Trailer on Flat Car.....	83
Figure 3-9	Double-stack Containers.....	83
Figure 3-10	Total Intermodal Loads in the US.....	84
Figure 3-11	Road Railer Operations and Service Areas.....	85
Figure 3-12	Intermodal Marine Containers for Grain Hauling on Modified Chassis	87
Figure 3-13	US Ethanol Production	89
Figure 3-14	Geography of the U.S. Ethanol Industry – 2005.....	89
Figure 3-15	Average Yield per Acre in District 7	93
Figure 3-16	Economic Impacts from Ethanol in Minnesota	95
Figure 3-17	Bio-business Sectors	97

BIBLIOGRAPHY

APPENDIX

Figure 1	Freight Network and Generator’s Map
Figure 2	Roadways Map
Figure 3	Railroad Map
Figure 4	Current 10-Ton System Map
Figure 5	Conceptual 10-Ton System Map

SOUTHWEST MINNESOTA REGIONAL FREIGHT STUDY

August 31, 2007

SUMMARY

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. 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.

Key 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 economy¹. 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.

- 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.

Freight traffic growth in the region is substantially outpacing that of Minnesota and the US. 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, 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.

- 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).

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.

¹ Minnesota Department of Employment and Economic Development

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.

- 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.

Ten (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.

- 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.

- More fully evaluate rail infrastructure (e.g., track, bridge, etc.) and service needs in Southwest Minnesota, particularly short-line 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 US agricultural product exports were shipped in containers, up from 9 percent

in 1992. By value, more than 52 percent of all US agricultural trade was shipped via containers. In 2002, it was estimated that over 600 US companies were employing containers to ship grain and grain products to over 130 countries.”²

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.

- 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.

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.

- 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.

² US Containerized Grain and Oilseed Exporters – Industry Profile and Survey – Phase II. Kimberly Vachal, Tamara VanWechel, and Heidi Reichert. July 2003.

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.

BACKGROUND/OVERVIEW

The Southwest Minnesota Regional Freight Study was conceived as a multimodal and industry-oriented examination of freight movements specific to District 7. This includes highway (commercial vehicle operations), railroad, waterway, air cargo, and intermodal transportation. The study provides a better understanding of current economic and freight transportation trends, issues, and needs at the regional and local level (south/southwestern Minnesota). The study also identifies strategies and initiatives for improving the freight transportation system. Efficient and cost-effective movement of goods is essential for maintaining and enhancing the region's economic competitiveness.

The context of this study is as a follow-up to the Minnesota Department of Transportation's 2005 Statewide Freight Plan, the State's first comprehensive study of commercial transportation supporting the businesses operating in the State. The study identified major freight flows into, out of, through, and within Minnesota, essentially providing a macro-level analysis of the benefits, strengths, and challenges of the commercial connections that allow businesses in the State to function, compete, and grow effectively. This study was designed to analyze and evaluate the freight system with a more local or micro-level approach, including the characteristics, demands, and trends of the local economy, and the actual operation of transportation systems and providers.

The current rapid growth of the renewable fuels industry, particularly ethanol production in the District, is documented in this study. An entire cascade of related effects and trends were also tracked, including significant economic growth in the agricultural sector as well as the region, changes in grain prices and distribution patterns, the response of agricultural production to price and demand increases, and the resultant unprecedented expansion in freight traffic. The risk of energy and farm market downturns was balanced against the potential for new commodities and technology from crop genetics to cellulosic ethanol.

This study identifies challenges in managing and upgrading the current 10-ton and heavy duty highway system to meet new freight traffic demands, and also examines the complementary contribution and the needs of the railroad system in maintaining access and capacity. Shipper and short line rail service improvement programs have responded and need to continue to respond to these new demands. Emerging alternatives and supplements to the freight network, including intermodal transportation and containerized movements to international destinations, are also becoming part of the freight system's response.

International markets and transportation are a growing influence in this rural area. Farm products, ethanol byproducts, and manufactured goods are being distributed worldwide on a routine and growing basis. The recent imports of foreign wind turbine components will soon be matched by new regional retail distribution centers and the future potential production and export of wind turbine components from the District.

The growth of freight traffic is being matched by growth in vehicle sizes on the farms, the roads, and the rails, in response to needs for more efficiency and capacity. This not only further extends the demands placed on the current infrastructure that has seen little improvement in design and load carrying ability during the last few decades, but carries with it safety considerations. The width, geometry, and conditions of roads is a factor, and railroad grade crossing safety and higher heavy truck traffic in both rural and developed areas is another area of concern addressed in the study's findings.

These issues are explored in detail in the subsequent chapters: Chapter 1: Current Transportation Infrastructure; Chapter 2: Freight System Analysis; Chapter 3: Trends and Policy Analysis; Chapter 4: Program Analysis; Chapter 5: Outreach and Public Involvement; and, Chapter 6: Findings and Recommendations.

1.0 CURRENT TRANSPORTATION INFRASTRUCTURE

Mn/DOT District 7 is a group of 13 counties in the south and southwest of Minnesota touching on the Iowa and South Dakota borders, and lying immediately to the southwest of the Minneapolis-St. Paul Metropolitan Area (Figure 1). Following the 2005 Statewide Freight Plan, Mn/DOT selected District 7 as a candidate for a more detailed local-level freight study. This study develops usable data to guide transportation investments and policy direction that was not possible with the Statewide Study's high-level overview. This chapter of the Study documents the existing freight system and its role in the regional and national transportation systems (i.e., roadways, railroads, waterways, and airports).

1.1 DISTRICT OVERVIEW

District 7 consists of 13 counties. In alphabetical order, they are Blue Earth, Brown, Cottonwood, Faribault, Jackson, Le Sueur, Martin, Nicollet, Nobles, Rock, Sibley, Waseca, and Watonwan. The only large urban center consists of Mankato and North Mankato, with a metro-area population of approximately 60,000 persons, followed by several regional centers with populations of 10,000 or more, including New Ulm, Worthington, Fairmont, and St. Peter. These and smaller population centers serve as important trade centers for District 7, from Level 2 or 3 Regional Trade Centers (Figure 1-1) down to local or shopping centers. These trade centers serve as a focus for most commercial activity in the area and are included in the mapped Figures 1, 2, and 3 in the Appendix. In general, the population of District 7 is generally stable and sometimes declining especially in rural areas. Figure 1-1 recaps these listings, including total populations and areas of the counties.

District 7 is emphasized by a rural and farm-based economy. Average household income within the District is approximately \$38,600, which averages 26 percent below the Minnesota average. In addition, there are 21 percent more families in poverty than the state average (5.7 percent), although still low by national standards. The median age is 8 percent above the state average (38 years versus 35 years), reflecting a more stable but aging population. The exceptions to this are Blue Earth and Nicollet Counties, with a below average median age reflecting student populations. District 7 education levels are basically on a par with the state for high school degrees but slightly below average on college-level education. Incomes are highest in Nicollet and LeSueur Counties, and are generally lowest in the least-dense, most rural counties such as Cottonwood. These characteristics are all consistent with a predominately rural area with relatively low population density. The people in the area are also known for their work ethic, ingenuity and independence.

The economy of the area is noted for its heavy reliance on agriculture with most of the available land under cultivation. The District is marked by gently rolling or flat terrain with very high quality soil capable of high-crop yields. Agricultural production is for the most part cash crops, primarily corn and soybeans, followed by some livestock production, generally swine, as well as smaller amounts of foodstuffs, produce, and dairy. Most recent available census figures show over 1,100 farmers working approximately 4.3 million acres in the District. Besides some light industry and quarrying, much of the other business and employment in the District revolves around the agricultural emphasis, including elevators, food and feed processing, farm supply, biofuels production, and transportation.

**Figure 1-1
(US Census data)**

DISTRICT 7 Counties and Cities over 1000 in Population

County	Population	Cnty. Seat	Pop.	Area (sq.mi.)	City	Pop.	City	Pop.	City	Pop.	Ag. Distr.
Sibley	15230	Gaylord	2237	800	Arlington	2070	Winthrop	1323			Central
Cottonwood	11961	Windom	4499	649	Mountain Lk.	2048					Southwest
Jackson	11234	Jackson	3464	719	Lakefield	1701					Southwest
Nobles	20477	Worthington	11192	722	Adrian	1230					Southwest
Rock	9579	Luverne	4531	483							Southwest
Blue Earth	57409	Mankato	33925	768	Lake Crystal	2490	Eagle Lake	1944	Mapleton	1670	S. Central
Brown	26763	New Ulm	13401	619	SleepyEye	3416	Springfield	2177			S. Central
Faribault	15842	BlueEarth	3519	722	Wells	2434	Winnepago	1446			S. Central
Le Sueur	27166	LeCenter	2306	474	LeSueur	4220	Montgomery	2869	Waterville	1882	S. Central
Martin	21044	Fairmont	10666	730	Truman	1217	Sherburn	1065			S. Central
Nicollet	30829	St. Peter	10162	467	N.Mankato	12248					S. Central
Waseca	19270	Waseca	9576	433	Janesville	2111	NewRichland	1168			S. Central
Watwan	11390	St.James	4592	440	Madelia	2301					S. Central
Total	277994		114070	7824							

Mankato & North Mankato area, combined Population of >55,000; 20% of D-7

Suggested Geographic Groupings for purposes of study:

Mankato Metro	Northwest	East	South
(Mankato)	Brown	Blue Earth	Faribault
(North Mankato)	Cottonwood	Le Sueur	Jackson
	Nicollet	Waseca	Martin
	Sibley		Nobles
	Watwan		Rock

1.2 MAJOR FREIGHT GENERATORS, RECEIVERS AND PROVIDERS (STAKEHOLDERS)

What are the top movements by weight or value in the District? Where are they moving from or to? These are some of the key questions addressed in Chapter 2 of this study along with a complete freight flow summary for the District. However, a basic goods movement in the District was researched for this chapter, using the concept of freight generators and clusters. A list was created for the top 75 freight generators by tonnage in the region, derived from Transearch data and Mn/DOT’s updated listing of generators producing 50 or more truckloads per day. The list was reviewed for tonnage and value and condensed to the top 30 generators for inventory and mapping purposes (Figure 1-2).

These generators were utilized to determine the top industries for conducting interviews and collecting additional information. To supplement and detail the findings of the freight flow report, state and local reports from the Association of American Railroads and the Minnesota Trucking Association were collected. Reports of both modes emphasize the importance of farm products movement in this region of the state, followed in tonnage by non-metallic minerals (Figure 1-3). As the primary mode for virtually all local transport, and the majority of total freight tonnage moved by the combination of all modes, trucking plays the key role. As an illustration available from some of the reporting detail, volumes of trucked commodities exported from the District shows both the transportation scope and mix of goods handled (Figure 1-4). In terms of economic impact, farm products emerge as the key element for transportation movements in District 7. Production levels of these commodities are well documented by the Minnesota Department of Agriculture and are shown for the most recent reporting year (Figure 1.5).

Figure 1-2
District 7 Top Thirty Freight Generators
In Order of Tonnage, By Commodity Type

Company Name	STCC code/Type	Annual Tonnage, Total for Commodity
Foods and Agricultural Products: STCC Code 20		890,179
Cenex Harvest States Oilseed	20-Foods	
Wis-Pak of Mankato	20-Foods	
Archer Daniels Midland Co.	20-Foods	
Hubbard Feeds Inc.	20-Foods	
Pepsi Cola Bottling Co.	20-Foods	
Cargill Flour Milling Inc.	20-Foods	
Big Gain Inc.	20-Foods	
ADM Soybean Processing	20-Foods	
Pioneer Snacks	20-Foods	
Coca-Cola Bottling Co.	20-Foods	
Hand Maid Sweets	20-Foods	
All American Foods Inc.	20-Foods	
ADM Plant	20-Foods	
Shari Candies Inc.	20-Foods	
Concrete & Stone: STCC Code 32		293,384
Wells Concrete Ready Mix	32-Concrete	
Vetter Stone Company	32-Concrete & Stone	
Hanson Pipe & Products	32-Concrete	
Superior Concrete Block Co.	32-Concrete	
Courtland Industries Inc.	32-Concrete & Stone	
Printed Material: STCC Code 27		42,678
Carlson Craft Commercial Div.	27-Printed Matter	
Carlson Craft Commercial Div.	27-Printed Matter	
Fabricated Metals: STCC Code 34		27,230
Crown Cork & Seal Co.	34-Fabricated Metals	
Jones Metal Products Inc.	34-Fabricated Metals	
Paper & Products: STCC Code 26		35,832
Fine Impressions Inc.	26-Paper & Products	
Atlantis Plastics Inc.	26-Paper & Products	
Royal Stationery	26-Paper & Products	
Rubber & Misc. Plastics: STCC Code 30		19,741
MRCI	30-Rubber & Misc. Plastics	
Atlantis Plastics Inc.	30-Rubber & Misc. Plastics	
Primary Metal: STCC Code 33		8,658
Gopher State Scrap Metal	33- Primary Metal	
Misc. Manufactured Products: STCC Code 39		6,112
Johnson Outdoors Inc.	39-Misc. Manufact. Products	

Note: Listed sites represent plants identified through Transearch data for reference only. Mapped freight generators (Figures 1-3) include Mn/DOT identified plants and clusters.

**Figure 1-3
Destination of Truck Tons Outside of D7**

DESTINATION	REGION	TOTAL
IN MINNESOTA; From District 7	TO:	
	MnDOT Metro District	35,184,514
	MnDOT District 6 (Rochester)	3,497,247
	MnDOT District 8 (Willmar)	2,029,933
	MnDOT District 3 (Brainerd)	549,898
	MnDOT District 4 (Detroit Lakes)	470,851
	MnDOT District 1 (Duluth)	357,837
	MnDOT District 2 (Bemidji)	163,219
	Subtotal	<u>42,253,499</u>
MINNESOTA EXPORT, From District 7	TO:	
	Iowa, Portion of Des Moines, IA BEA	719,064
	Iowa, Rest of	486,176
	Illinois, Portion of Chicago, IL BEA	477,134
	West	201,321
	Kansas, Rest of	176,649
	South	138,082
	Colorado, Portion of Denver, CO BEA	94,308
	Mid West	72,016
	Emmet County, IA	69,398
	Illinois, Rest of	65,458
	Other	603,264
		Subtotal
	Total, Truck Tonnage for Destinations outside D7	<u>45,356,369</u>
	Reported Truck tonnages internal to D7*	7,266,278

* Portion of private haulage may be unreported

**Figure 1-4
Statewide Freight Volumes for Truck and Rail: Selected Trade Association Statistics**

Minnesota Trucking:

Tons:

Total Tons Handled		373,000,000
<i>Originated or Terminated in State;</i>		
Cereal Grains		37,400,000
Non-Metallic Minerals		17,500,000
Gravel & Crushed Stone		33,100,000

Minnesota Railroads:

Tons:

Total Tons Handled (2005)		227,700,000
<i>Originated or Terminated in State</i>		
Farm Products		18,400,000
Food Products		7,700,000
Non-Metallic Minerals		2,900,000
Glass & Stone Products		1,900,000

**Figure 1-5
District 7 Agricultural-Related Freight Commodities 2004-05**

Commodity	Hogs (#)	Milk (000#)	Corn (000Bu)	Soybeans (000Bu)	Hay (tons)	Swt. Corn (tons)	Peas (tons)	Ethanol (000 gals)	Ethanol (000 Bu.*)
COUNTY									
Sibley	231,000	135,000	23,324	4,435	40,700	47,740	3,960	37,000	13,700
Cottonwood	334,000	22,000	30,538	6,453	23,000	0	0	31,000	11,500
Jackson	225,000	10,000	32,292	6,591	16,700	0	0		
Nobles	266,000	76,500	33,001	7,140	36,500	0	0		
Rock	97,000	47,000	20,192	4,918	37,800	0	0	21,000	7,800
Blue Earth	629,000	19,000	32,904	7,247	16,000	0	1,430	50,000	18,000
Brown	506,000	115,500	26,100	4,918	45,600	70,810	11,340		
Faribault	309,000	45,000	36,709	7,132	9,700	32,860	2,940	47,000	17,400
LeSueur	218,000	64,000	15,962	3,268	23,200	0	1,400		
Martin	1,335,000	20,000	41,510	7,715	11,600	14,400	3,230		
Nicollet	357,000	125,500	20,379	3,504	24,500	17,750	1,200		
Waseca	434,000	43,500	20,736	4,082	19,700	24,000	1,840		
Watonwan	208,000	13,500	24,225	4,862	8,500	0	0		
D7 Totals	5,149,000	736,500	357,872	72,265	313,500	207,560	27,340	186,000	68,400
Minnesota	10,302,000	8,102,000	1,120,950	238,175	4,725,000	894,590	99,080	551,000	200,000
% of State	50%	9%	32%	30%	7%	23%	28%	34%	34%

*Bushels of corn consumed for D7 ethanol production equals 19 percent of district harvest

Note: All figures from Minnesota Department of Agriculture

For Conversions: 35.7 Bushels of corn per ton.
 35.0 Bushels of soybeans per ton.
 6.312 pounds/gallon of ethanol or 316.9 gallons per ton
 1.0 bushel of corn converts to an average 2.7 gallons ethanol (current average- dependent on conversion technology and efficiency).

1.3 FREIGHT INFRASTRUCTURE SYSTEM INVENTORY

This section describes the primary freight transportation infrastructure in District 7, which is defined as follows: Roadways; Railroads; Air Freight; Waterborne/Barge Freight; Intermodal Facilities; and Pipelines.

1.3.1 Roadways

Trucks are an important mode for moving high-value goods in Minnesota and nationally, and use designated roadway networks. In addition, because of the predominance of agricultural industries in District 7 (the need to move commodities from the field to storage or processors), the majority of movements involve the regions road system (movement by truck). The roadway system is comprised of state, county, city and township roadways. Route miles for each of these categories within the District are shown in Figure 1-6. The roadway network is shown in Figure 2 (Appendix) and the following sections describe the components of the roadway system. Each of these networks has been mapped for this study.

Interstate/NHS/STRAHNET

The National Highway System (NHS) was developed by the United States Department of Transportation in cooperation with states, municipalities and metropolitan planning organizations. The NHS includes Interstate roadways, the Strategic Highway Network (STRAHNET), which is the system of public highways that provide access, continuity and emergency transportation to military personnel and equipment, some of the roadways designated as principal arterials, STRAHNET connectors and intermodal connectors³.

District 7 has two Interstate highways part of the NHS and STRAHNET, running through its boundaries. These include Interstate 90, running west/east and Interstate 35 (located immediately east of District 7), running north/south. These are shown on Figure 1 in the Appendix.

**Figure 1-6
District 7 Freight Study: Highway Route Miles Tabulation**

Network Category	Route Miles
Interstate System	146
US Trunk Highway	271
Minnesota Trunk Highway	904
County State Aid Highway	4,028
County Road	1,596
10-Ton Network*	659

*Note: Majority of 10-Ton Network overlays trunk highway system, also includes some County highways.

³ Federal Highway Administration, "What is the National Highway System?", <http://www.fhwa.dot.gov/hep10/nhs>

National Truck Network And Minnesota Twin Trailer Network

The National Truck Network (NTN) consists of designated roadways throughout the United States that allow longer combination vehicles and semi-trailer trucks with two trailers and single-trailer trucks with an extra-long trailer. The NTN is supplemented by Minnesota's Twin Trailer Network, a system of other trunk and local highways on which longer trucks may also operate. These networks permit oversize and overweight movements, usually within a specific route and travel time defined by the permit. The Twin Trailer Network is shown in Figure 1 in the Appendix.

The Interregional Corridor System

A statewide, 2,926-mile Interregional Corridor (IRC) System was designated by Mn/DOT in 1999. The goal of the IRC system is to enhance the economic vitality of the state by providing timely, safe and efficient movement of goods and people. As shown in Figure 1 (Appendix), the IRC system is made up of the state's trunk highway system.

The IRC system is divided into two categories: High-Priority Interregional Corridors that connect the Twin Cities Metropolitan Area with primary regional trade centers (e.g., Duluth, Rochester, St. Cloud) throughout the state; and Medium-Priority Interregional Corridors that connect secondary regional trade centers (e.g., Brainerd, Marshall, Owatonna) to each other and to the Twin Cities Metro Area and other primary trade centers.

There are three high-priority IRCs within or near District 7: Interstate 90, Interstate 35 and US 169. There are also three medium-priority IRCs: MN 60, US 14 and MN 23. These IRCs connect three secondary regional trade centers within District 7. These include the cities of Fairmont, Mankato and New Ulm.

The 10-Ton Road Network

The system of heavy duty roadways in District 7 is composed primarily of trunk highways and major roadways on the State-Aid system, but also includes some county roads. The proposed system is shown in Figure 1 (Appendix) and is planned for 10-ton commercial vehicle axle loadings. Year-round 10-ton roadways provide a predictable freight roadway network. All other roadways are subject to axle load limitations, including seasonal load restrictions. Mn/DOT and local jurisdictions have the statutory authority to impose these temporary limitations. These weight-restricted roadway segments are often referred to as the "last mile" of the freight system.

Seasonal or other load limits have a notable impact on farm and commercial access in the District. The low weight capacity of these roadways limits the ability to efficiently move freight in the District. Expansion of the year-round 10-ton roadway network, as identified on the conceptual 10-ton system by State-Aid office, is widely recognized as a need for the area to better serve freight movement.

Ancillary Roadway Facilities

Truck weigh and inspection stations are owned by Mn/DOT and operated by the Department of Public Safety's State Patrol Unit. They are located at most entry points to Minnesota on the Interstate Highway System and several other locations. Enforcement at these sites is intended to implement Minnesota's truck size and weight regulations. Weigh and inspection stations also

serve to ensure commercial vehicles are in safe operating condition and their drivers are complying with hours of service regulations and driver credentials. Minnesota State Patrol also operates several portable scales and conducts inspections and temporary locations throughout the state. In District 7, there is one weigh and inspection station, located on I-90. Another important category of highway support facilities is safety rest areas suitable for commercial vehicles. These facilities allow commercial vehicle drivers to safely pull off the highway for rest and to avoid adverse weather conditions. There are seven safety rest areas within District 7 located on I-90, MN 60 and US 169.

1.3.2 Rail System

District 7 is served by six railroad companies. Despite widespread railroad consolidations and abandonments in the 1980s and 1990s nationally, the majority of communities in this region have retained railroad routes and rail service. The rail companies are divided into three classes (Class I, II and III) assigned by the federal Surface Transportation Board. These classes are based upon the railroad company's gross operating revenues and generally reflect the type of service provided: long haul, regional and local.

Two Class I railroads cross the district from north to south: the Union Pacific (UP) connecting St. Paul with Sioux City, IA via Mankato; and, the Burlington Northern Santa Fe (BNSF) also connects this city pair but traveling further west, crossing the northwest and southwest corners of Rock County at the western edge of the District on a route connecting Marshall, MN through Sioux Falls, SD. The Dakota, Minnesota & Eastern (DM&E) Railroad, the only Class II or regional line serving District 7, operates east and west, parallel to US 14, and its sister railroad, the Iowa, Chicago, and Eastern (ICE) operates from Jackson, MN to Albert Lea, MN and north and south lines from there. Two Class III railroad lines operate within District 7 also: MPLI, a short line and operating subsidiary of the Twin Cities & Western (TCWR), serves Sibley County; and, the Minnesota Southern (MSWY) short line operates in the southwest portion of District 7 between Worthington and Manley, MN. Together they represent over 560 route-miles of line (Figure 3 in Appendix).

The UP, BNSF, DM&E and IC&E are private, for-profit entities, and are currently economically viable. Federal Railroad Administration (FRA) class II or III standards are maintained on much of the main lines, allowing a top speed of 25- or 40-miles per hour respectively, with a few branches of FRA Class I track operating at 10 mph top speed. All are relatively low-volume lines and see peak traffic centering around the grain harvest. Other major commodities include aggregate, clay, and ethanol.

The MPLI and MSWY railroads are leased properties owned by a local public entity. The Minnesota Valley Regional Rail Authority, the public entity which owns the MPLI rail line, is comprised of the five counties, including: Yellow Medicine, Redwood, Renville, Sibley and Carver Counties. The regional rail authority owning the MSWY property includes Nobles and Rock Counties. These two short line railroads are also in fair condition allowing a top speed of 10 mph. They also are low-volume, with the grain harvest providing their peak.

The UP, BNSF, and the DM&E currently offer shuttle train rates for on-line shippers. The names and locations of these shippers and elevators have been catalogued and mapped (Figure 1-7 and Figure 3 in the Appendix). The UP, BNSF, and MPLI all offer connections to barge terminals in Savage, Minneapolis, and St. Paul, while the DME and ICE connect with Mississippi River terminals at Winona and river ports further south. The BNSF has a major intermodal container terminal available in the Twin Cities, as does the Canadian Pacific, although the latter railroad does not serve the District directly.

1.3.3 Waterways

While no navigable waters are located within District 7, they do play a part in the trucking patterns. Navigable waterways that are accessible from District 7 include several major grain elevators at the Port of Savage on the Minnesota River, the public terminal at Minneapolis, and both a public and a private terminal at the Port of St. Paul. Minneapolis essentially is limited to bulk minerals and aggregates due to limited protected storage. Both St. Paul and Savage originate major volumes of bulk grain shipments via barge, with the majority destined for export markets. Barges are fleeted (stored) and shifted prior to consolidation into tows by River Services, Inc., a local towboat service company. Most of the major Mississippi barge lines call on St. Paul and the Upper Mississippi ports during the Spring-Fall navigation season. Besides grain, the barges carry a variety of bulk commodities including sand, gravel, limestone, cement, coal, and petroleum products. While the majority of moves are downriver, a significant base of cargo moves up-river and in inter-city transport on the upper reaches of the river.

The Ports of Red Wing and Winona on the Mississippi River also serve District 7. Historically, much of the export grain traffic from the Districts eastern third moves by truck to elevators of these ports. Fertilizers including lime and urea are also imported to District 7 customers from barges through these cities.

Barge traffic represents the least expensive means to move bulk cargo, with rates roughly one-half that of unit trains and one-fifth that of trucks. While this ensures the barge companies' place in the transportation network, especially for on-river bulk and export moves, the cost of inland collection, transportation to the river via truck or rail, and trans-loading into barges limits the service area of these carriers.

**Figure 1-7
District 7 Shuttle Train Elevators**

Owner	City	Railroad
New Vision Coop	Hills	BNSF
CHS, Inc.	Jasper	
Farmers Coop of Hanska	New Ulm	DM&E
Harvest Land Coop	Springfield	
New Vision Coop	Brewster	UP
Cargill Ag Horizons	Fairmont	
New Vision Coop	Heron Lake	
LaSalle Farmers Grain	Madelia	
Cargill Ag Horizons	Marna	
New Vision Coop	Mountain Lake	
Watonwan Farm Services	St. James	
Watonwan Farm Services	Welcome	

Note: BNSF and DM&E Contracts specify storage and high speed loading for 110-car trains.
UP minimum contract size specifies 75-car trains.

1.3.4 Air Freight

Air freight generally involves the transport of time-sensitive, high-value, and limited-size and limited-weight shipments. District 7 offers one airport at Mankato with scheduled freight and express service, through DHL. This airport is accessible to mid-size jets, with a maximum airport runway length 5,400 feet. A planned 2007 contract letting will expand the main runway by 1,200 feet and make the city much more accessible and viable for larger air freight operations.

Two regional airports in Worthington and Windom have freight or express service available on an as-scheduled basis. Most other air freight shipments into or out of the area are routed via truck through Minneapolis-St. Paul International Airport in the Twin Cities. DHL, UPS, and FedEx all offer scheduled express and freight service, as do the major scheduled passenger carriers and several charter companies.

1.3.5 Intermodal Facilities

“Intermodal” refers to the transfer of freight from one transportation mode to another. There are no intermodal container facilities located within the District; however, the Ports of Savage, Red Wing and Winona are located within a close distance to District 7. Two intermodal terminals for container transfers from truck to rail operate in the Twin Cities, on the Canadian Pacific in Minneapolis and the BNSF in St. Paul.

1.3.6 Pipelines

Pipelines account for a significant tonnage of liquid and gaseous products movements into and through the District. The most extensive network of lines is the natural gas pipeline system, bringing natural gas from the Rocky Mountains as well as the Gulf Coast and Canada for local use and distribution. Much of this product is piped to the end user, ranging from power plants to private residences. Several power and transmission companies account for the line ownership and operation, including Excel Energy, Williams Gas Pipelines, and many others. Local companies hook into the system as customers and further process the gas for LNG (liquefied natural gas), fertilizer, and chemical feedstocks.

Besides natural gas, petroleum products also are moved via pipeline. Magellan Midstream, formerly Williams Energy, operates a petroleum products terminal and truck loading facility in Mankato, shipping under contract as an interstate carrier for several different oil companies. Magellan also operates a liquid ammonia pipeline terminal and rack in Mankato for fertilizer use. The company also has several Iowa terminals and a South Dakota products terminal that supply gasoline, diesel, and kerosene trucks hauling into the District.

Other pipelines in or near the District also carry crude oil to the two Twin Cities refineries, as well as product from them, but do not actually have terminal operations in District 7.

1.4 MAPPING

The maps supplied with the existing conditions and freight system inventory are based on current data available through 2006 from a variety of sources. These include Mn/DOT, Minnesota Department of Agriculture, Association of Minnesota Counties, Minnesota Department of Natural Resources, and private sources including the Ethanol Producers Association, BNSF Railway, Union Pacific Railroad, DME Railway, and Magellan Midstream, Inc. These are shown as Figures 1, 2, and 3 in the Appendix.

1.5 CURRENT TRANSPORTATION INFRASTRUCTURE SUMMARY

The District has good supply of road and rail freight infrastructure. Congestion on these systems is not generally seen as a problem in the District, although future rail service levels and track structure limitations are documented concerns. There are gaps on the 10-Ton Network providing all-season truck transportation across the District. This road system provides good access to the Metro Area, barge and other transfer terminals, and intermodal facilities outside but close to the District. Most major freight generators are on and benefit from this system.

Beyond the 10-ton network, the county and local road system faces the challenge of access for the various segments of the agricultural industry, particularly the farmers and livestock producers. Approximately 1,100 farmers in the area average over 380 acres in size, and can each generate 75 truckloads or more of cash crops in a season. Half of all heavy trucks in the area are licensed to farmers, but face axle-load restrictions on some local roads and during seasonal restrictions, particularly the spring thaw. This impacts their access to buyers during market price opportunities and can limit their profitability to a certain extent. Once these farm haulers reach a 10-ton road, the network's connectivity can also be a problem, forcing indirect routes to an intended destination.

Finally, this inventory of freight generation and infrastructure for District 7 should be characterized as a snapshot in a very dynamic situation. Major changes are occurring in transportation options, including shuttle trains, destination markets for crops, biodiesel and ethanol plant expansion, as well as new traffic patterns for the resulting products and byproducts. These recent changes show many indications of accelerating, while also being redirected by further major technological and market shifts in as little as the next three to five years. Detailed analysis of these markets and trends will be covered in following chapters of this report, as will the connected issues of road and rail system capacity and connectivity.

2.0 FREIGHT SYSTEM ANALYSIS

The analysis identifies the actual workings of the system, including infrastructure, freight flows, and external factors such as market and industry changes and security and safety matters. Key deficiencies in the freight transportation system in District 7 are located and discussed, such as capacity, infrastructure condition, levels of service, access to markets, intermodal needs, cost of service, or other issues related to infrastructure, operations or regulation of the freight system.

The information was collected through a variety of sources including: Transearch data, the Statewide Freight Plan, Mn/DOT and other state agency databases, Mn/DOT's freight generator information, industry publications and sources, and face-to-face interviews with selected businesses located in District 7.

2.1 INDUSTRY PROFILING

The face-to-face interviews involved detailed profiling of a selection of key industry representatives that would provide input on operations, industry trends, insight into private sector perspectives, and a prioritization of local issues that impact their freight movements and their profitability.

2.1.1 Selection and Coverage

In order to maximize the amount and validity of information received from in-depth interviews of a relatively small cross-section of businesses, the selection process itself was developed with a high level of input and consideration given for industry coverage as well as geographical coverage.

Transearch data, along with Mn/DOT's own list of freight generators in District 7, was used to first identify the key industries with major freight flows in the District, and then list the top individual businesses and sites that represented those industries. Mn/DOT Project Managers and members of the Project Management Team supplemented this list with other profiling candidates that could serve the Study's purposes but that hadn't shown up on the commercial data for various reasons. This candidate list was set up on an industry and geographic matrix (Figure 2-1), and submitted to the Project management Team with parameters, recommendations, and rationales for the proposed selections. It was notable that although value of product was investigated in the freight flow analysis and elsewhere, the profile selection revolved around industries transporting significant volumes and weights in all but one instance, reflecting concern by the PMT about infrastructure wear and capacity. Major point sources of secondary traffic, like Wal-Mart's distribution center in Mankato, were seen as being well situated on major trunk highways, with low truckload weights and a dispersed distribution pattern that had little district-wide effects in comparison.

**Figure 2-1
Business Profile Matrix**

COMMODITIES:	MANKATO/N Mankato	NORTHWEST COUNTIES	EASTERN COUNTIES	SOUTHERN COUNTIES
Farm (Grains) Production 6,100,000 tons (est.) medium value	Hubbard Feeds	Farmers Coop-Hanska		Gaalswyk Farms-Trimont
	Big Gain Feeds	Watowan F.S.-StJames		New Vision Coop-Hills
		LaSalle Farm Grn-Madelia		Watowan F.S.-Welcome
		Davis Brothers-Nicollet		
Food Processing 4,761,240 tons high value	Cenex Harvest States	Kraft Foods-New Ulm	Seneca -Montgomery	Seneca-Blue Earth
	Pepsi-Cola Bottling	Seneca Food-Arlington	Doane Pet Care	Fairmont Foods
	Cargill Flour Milling		Con Agra-New Prague	Min. Soybean-Brewster
	ADM (soybeans)			
	ADM (corn starch)		Davisco-LeSueur	Soy Beans Proc.-Fairmnt
	Wis-Pak of Mankato		Cambria-LeSueur	
Pork Production 260,000 tons (est.) medium value		Armour Swift-St. James		Swift & Co.-Worhington
		Christensen Farm-S.Eye		
Energy Production (Ethanol) 605,000 tons (est.) medium value		Ethanol 2000-Bing. Lake	Lake Crystal	Corn Plus-Winnebago
		Heartland-Winthrop		Corn-er Stone-LuVerne
Non-Metallic Minerals 37,480,765 tons low value	Co-op Soil Service		Unimin Corp.-LeSueur	W. Hodgman-Fairmont
Petroleum & Chemicals 305,077 tons medium value	Williams Pipeline			

COMMODITIES:	MANKATO/N Mankato	NORTHWEST COUNTIES	EASTERN COUNTIES	SOUTHERN COUNTIES
Transportation Equipment & Manufacturing 211,587 tons high value			Scott Equip-New Prague	Highland Home-Wrthngtn
				AgCo Farm Eq-Jackson
General Merchandise 200,000 tons (est.) high value	Wal-Mart			
	Target			
	Taylor Corp (print)			
Clay, Concrete, Glass, & Stone 1,001,116 tons	Vetter Stone Co.	Sioux Valley rdy Mix-N.U.		Wells Concrete-Wells
		Wells Concrete-Mapleln		

Color codes:

- Top 30 Generators
- PMT Candidate Suggestions
- Ethanol Plants
- Shuttle Train Grain Elevators

The discussion narrowed the final list to six candidates. The following provides information on the six businesses selected and subsequently profiled:

- *Jerry Gaalswyk Farms/Gaalswyk Bros. Trucking, Inc.:* Jerry Gaalswyk operates grain farms on a total of 4,400 acres in the Trimont area. Also operates approximately 28 trucks carrying dry bulk (e.g., grain, fertilizer, crushed rock) within 250 to 1,000 miles of their headquarters located in Trimont, Minnesota.
- *Scott Equipment:* Scott Equipment develops and manufacturers custom-made mixing, drying and processing equipment in New Prague and Arlington, Minnesota.
- *Corn Plus Ethanol:* Corn Plus is a farmer-owned cooperative producing ethanol at a 40-million gallon per year plant in Winnebago, MN. It is an industry leader in innovative production practices, and operates a fleet of over 200 ethanol tank cars.
- *Watonwan Farm Services (WFS):* WFS is the largest farmer-owned cooperative in Minnesota. WFS provides fertilizer, crop chemicals, seed, livestock feed, petroleum products and production financing. WFS has many plants throughout southwestern Minnesota and is headquartered out of Truman, MN.
- *Wells Concrete Products (WCP):* WCP produces two distinct product lines including Ready-Mix construction concrete and pre-stressed concrete. They operate over 70 mixers, crane trucks, and supply vehicles, as well as a large volume of contracted truck operations. Besides Minnesota operations in Wells and several other local plants, they also have a plant in Grand Forks, ND.
- *Archer Daniels Midland (ADM):* ADM manufacturers edible fats and oils, soybean and corn derivatives by taking crops and processing them into food ingredients, animal feed, renewable fuels and naturally derived alternatives to industrial chemicals. Soybean milling and oil processing are performed at their Mankato plant, with corn milling in Marshall, Minnesota, that also sends unfinished oils to Mankato.

Each business was approached by a member of the study team as was appropriate for the initial contact. A phone discussion then took place to explain the Study's purpose as well as their role, and to request the in-person interview. All candidates agreed to the interview. It was stipulated consistently throughout the process that any proprietary information discussed in the interviews, such as customers, pricing, contracts, specific freight volumes, and other material that might be of a competitive nature would be held in confidentiality. A three page discussion topic outline was produced and supplied to all interviewees. Each interview was conducted by two or more members of the Project Team, including Mn/DOT personnel. In every case, two and usually more representatives of the business were interviewed, covering management and transportation functions as well as other relevant aspects covered in the topics outline. Each interview lasted from as little as one hour to over two and a half hours. Following the interviews, a summary of each interview was forwarded to Mn/DOT for the record. Any clarifications needed were followed up by phone contacts as necessary. Each profiled business was promised copies of the final report.

Project Managers and the consultant team, after reviewing the profiles, agreed that two additional but condensed phone interviews would be done to complete the coverage of District industries. Pork producers were covered by contact with Bob Christensen Farms, the largest hog producer in the District and largest private pork producer in the country, headquartered in Sleepy Eye. Non-metallic minerals were covered with Oldcastle Materials (formerly Southern Minnesota Materials), the District's largest producer of aggregate and other quarried materials, located in Mankato.

2.1.2 Summary of Interviews

The profiles as a whole provided a very detailed picture of business in the District, and the freight transportation related to those businesses. The for-profit nature of each business is a key to giving perspective to their responses. The immediate volume, direction, and destination of their commodity movements depends as much on market conditions and the location of customers and outlets as it does on available heavy duty roads, rail, and intermodal connections. Their financial health is in large part dependent on transportation, even though in many cases the presence of adequate infrastructure is considered a given, especially in the case of public roads. In many of the interviews, the role of transportation was fully recognized, and positive changes in the road and rail systems over time was noted regularly.

Other general insights gained from the interviews included the quality of the workforce, the volatility of the markets that affected each business, including construction cycles, energy prices, and agricultural markets, and the importance of the quality of life to the company representatives. Observations on issues and other neighbor industries were offered regularly in the dialogue that served to validate or fill in gaps in information. Sources of current information, from market broadcasts, websites, and industry publications, were often cited and offered for the use of the study team. Future trends, technology, politics, and Mn/DOT's plans for construction and programs were also the subject of interest, opinions, and projections offered by the interviewees.

With the exceptions of ADM and Oldcastle Materials, all are locally owned and operated businesses. Agriculture is the basic economic factor in the area, followed by non-metallic minerals, construction materials, and manufacturing. While trucking is the foremost mode of transportation in the area, the railroad network in the District remains extensive and is used directly or indirectly by all but two of the profiled companies. All except Scott and Corn Plus operated a private truck fleet as well as contracting for trucking. Several of the fleets were relatively large, such as Wells' fleet of concrete mixers, supply trucks, and truck-mounted cranes. Two of the companies also operated fleets of railcars. Access to waterways and the barge system also has a major role in District freight movements, including supplies and market access, particularly in the northern and eastern counties. A list of some of the key profile findings, confirmed in each case by two or more of the interviewees, follows:

- *Ethanol/Biofuels:* The effects of ethanol were felt almost across the board. Grain supplies were being increasingly consumed by these ethanol plants, with half of all Minnesota plants operating in District 7. About 20 percent of current grain production was going to either ethanol or biodiesel, with planned plant expansions soon to push that closer to one third of local grain production. The added demand beyond food, feed, and export needs has erased

the historic oversupply situation and raised prices, with corn almost doubling in price in the last year. This has benefited crop farmers and farm suppliers, but negatively impacted livestock and poultry producers and food processors in terms of both cost and supply. This price increase and the value added by ethanol production has bolstered the local economy. The investment in the plants has also improved the construction and manufacturing sector outlooks, as plants and plant equipment is installed. Distiller Dried Grains with Solubles (DDGS) is an important byproduct of ethanol, and has become an important supplement for soy and corn meal as livestock feed. It also has developed as an export commodity. Grain and DDGS transportation, and liquid ethanol transportation by truck and rail have offset much of the transportation lost from diverting grain away from export and feeder markets.

- *Rail Service and Shuttle Trains:* Rail service in the District was seen to be a mixed bag in the District. The Class I network is well preserved and intact, however, Class II & Class III railroads may need assistance in the future to keep them intact, financially viable, and preserved. While shippers are being directed by Class I railroads to purchase, improve, and expand their sidings and connections at the shipper's expense, other smaller shippers have lost the ability to use rail access because of the financial inability to expand their facilities or sidings. Some railroads are 'de-marketing' carload business in favor of larger shipments, including unit trains. This limits or restricts new access to plants and for new business parks and plants in several cases.

Many of the unit trains are operating in "shuttle train" service. This type of service uses a dedicated block of covered grain hoppers, totaling from 75 to 110 cars for the train. The railroad operates the cars, either shipper owned or railroad owned, under a contract to load at a single elevator and also unload at a single point. The shuttle contract requires that the shipper provide rapid loading and unloading, usually 12 to 15 hours for the entire train, ensuring rapid turn-around and utilization of the entire train of cars. The railroad in turn offers a specified car availability and transit time for the shipment, as well as significantly reduced shipping rates in response to the resulting efficiency and traffic volume. The economic response to lower transportation cost and better service has led to consolidation of grain shipments into a few large elevators, capable of handling trainload volumes and of making the investment in new or expanded track and loading facilities to handle a full train of cars at once. The track, siding, and loading facility investment usually averages one to two million dollars for each location. While ethanol expansion is now threatening some of these major shuttle elevators and their investment, the ethanol plants are now starting to get involved in large-scale rail movements as well. This is extending to full unit trains of ethanol in several cases. Other rail service is judged adequate on the Class I railroads, and better on the regional and short line rail carriers. Offsetting this general satisfaction with service levels is a concern about lack of capacity and frequent service on the short lines.

- *Crop Yields:* Current crop yields in the District are approximately 45-55 bushels per acre for soybeans and 175-185 bushels per acre for corn. Most of the land available in the District is under cultivation, with a corn-soy-corn crop rotation to minimize fertilizer use and costs. Higher crop prices will change the status quo and promote higher yields, based on better genetics, more intensive planting and fertilization, and shifting to more corn and less soybeans on the crop rotation. Five year growth in yields and overall production could match the increased demand for ethanol, livestock feed, and food products, judging from farm

management knowledge and experience in other regions. Increased costs to food processors, pork, and poultry producers are not expected to depress their demand a great deal in the near term. Increased volumes by truck and rail will result across the system.

- *Business Interdependence:* The local businesses as well as the larger companies all exhibited a high degree of interdependence. Although this is understandable in a largely rural, agriculture and natural resource-based, economy where everyone is considered a neighbor, business organizations and structures have developed even stronger ties in this direction. The rural farm cooperative, large and small, offers almost every business service needed by their members. Many residents belong to more than one cooperative, including farm services, energy production, and ethanol plants. Those that don't directly belong are tied by contractual relationships, from equipment manufacture to storage to brokerage and supply arrangements. Many of the businesses, including private companies and individuals, have expanded and integrated their operations across several different functions that complement their core business. Transportation companies and owner-operators (including farmers) also share these business connections and the high level of informal information exchange and networking that exists as a result. It was noted that Mn/DOT and other public officials would be welcomed to connect with many of these business groups.
- *Road Capacity and Restrictions:* The available network of roads is considered to be adequate for most needs. Most traffic levels are well below problem levels and are not a concern. The exceptions are certain stretches of US 14 and MN 60, which are scheduled for future improvement. Every business, with the exception of Scott Equipment, noted some impact from the spring weight restrictions on certain trunk segments and many County and local roads. Farm grain trucks, tank trucks, concrete mixers, and dump trucks all have to be light-loaded during the period, especially on local deliveries, adding to the number of trips and operating costs. Only a few businesses compensate truckers for this situation. Ethanol plants have little storage on site as a rule, and require steady deliveries throughout the restriction period, as do the grain millers. There is a common perception among some local businessmen and officials that more trips with lightly loaded trucks may actually be worse for the roads than fewer fully loaded trips, causing additional rutting and surface displacement in wet or thawing conditions. However, this perception is not born out by engineering experience and data. These parties also noted that their cooperation with local county officials in particular on reporting road problems, and some type of control limiting truck trips to only farm access or local deliveries, could minimize or prevent major damage caused by heavy commercial vehicles under adverse conditions.
- *Size and Weight Enforcement:* Very little response came out on the issue of increasing truck size and weight, other than to ensure that neighboring state regulations are consistent with Minnesota's, and vice versa. Although several businesses saw an economic argument for more weight allowed per axle, or more axles, it was not consistent. Truck safety was more often mentioned. Truck size, particularly length, was mentioned as being a preferred increase, but the efficient Mn/DOT permitting process and policies made that a moot point in some cases. Most profiled businesses noted that they were aware of trucks running overweight during weight restriction periods, and while enforcement was limited, all objected to truckers essentially having to operate illegally in many circumstances when it wasn't called for. When enforcement did take place, it was often inconsistent, capricious, or

performed in such a way that it hampered business, such as mobile scale units setting up at plant entrances. Other problems were noted as well, including overweight long-haul truckers operating over local roads to bypass state scale sites, in turn doing local damage and operating under unsafe conditions in unfamiliar territory.

- *Metro-Area Congestion:* While many of the District businesses would prefer to stay away from the Twin Cities area due to challenging traffic, and congestion, most have regular interaction with the region. Whether traveling to suppliers, the river port complexes, the rail yards, or construction sites, the time investment and unpredictability of freight movement is an unappreciated cost of doing business. Seasonal backups in places like Savage along MN 13, or local municipal permitting rules that restrict truck movement and oversize access, are a steady source of complaint.
- *Containerization:* While the overwhelming percentage of movements that affect District 7 remain on conventional modes of truck and rail, a growing amount of traffic, inbound and outbound, particularly international, is moving via container. Manufactured goods, DDGS, grain meals, specialty grains, and other products are currently being trucked to the Twin Cities or Chicago for container ‘stuffing’ and loading onto container trains. The lack of local intermodal container access and equipment has led several companies, such as ADM, to consider putting in on-site intermodal facilities, up to and including loading the containers onto railroad double-stack container cars. The de-marketing of small and carload rail shipments without this as a replacement option is also seen as a rail service issue.

2.2 FREIGHT FLOW ANALYSIS

What are the top movements by weight or value in the District? Where are they moving from or to? These are some of the key questions that are addressed by identifying the commodity movements in the District. The inventory of commodities is derived originally from commercial reporting based on two and four digit STCC codes. Wilbur Smith and Associates (sub consultant) completed a freight flow commentary utilizing this commodity reporting as recorded in Transearch data. It uses the available data to list District imports and exports ordered by origins and destinations in state and out of state, and modal information linked to the commodity reports.

2.2.1 Directional Flows

The 2005 Statewide Freight Plan estimated the total amount of freight moving on the transportation system in Minnesota to be 636 million tons, valued at \$560 billion. The same TRANSEARCH data set was used to analyze Mn/DOT District 7 commodity movements. The total amount of freight moving on the District 7 transportation system is estimated at 96.4 million tons, valued at \$56.3 billion.⁴ Overall District 7 exports more goods, than it imports, especially in terms of weight. **(Figure 2-2 and 2.3)**

⁴ The commodity value figures are provided as general estimates. Commodity values are based on national averages at the 4-digit STCC level. Commodity movements in the Minnesota TRANSEARCH data base are provided at the 2-digit STCC level, and therefore the values applied to tonnage estimates were average values for a wide variety of commodities. Due to limitations in the Minnesota TRANSEARCH database, commodity movements “through” District 7, that used District transportation facilities could not be determined.

Figure 2-2

District 7 Directional Flows by Weight - Annual Tons

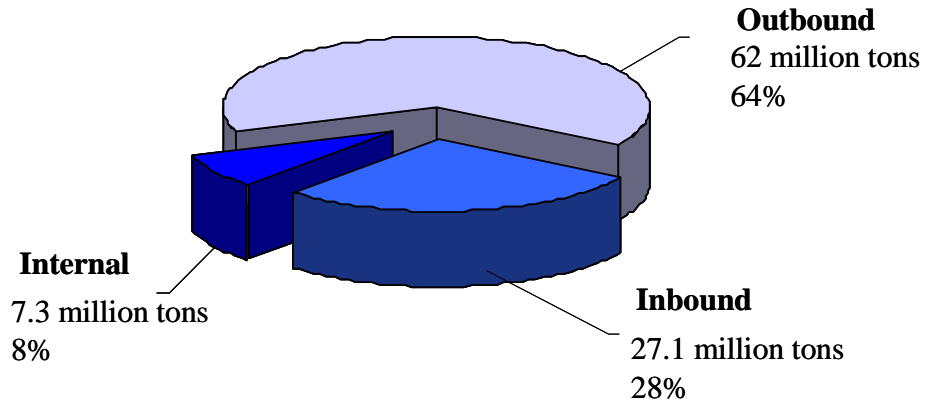
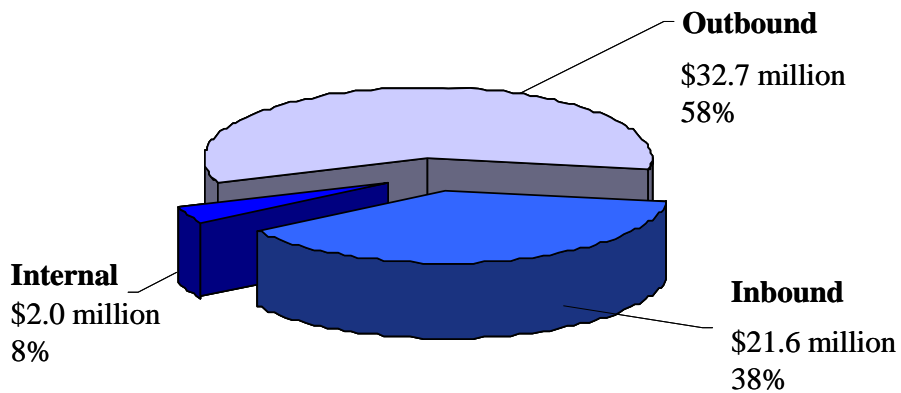


Figure 2.3

District 7 Directional Flows by Value - Annual Dollars (in millions)



**Figure 2-4
District 7 Commodity Origin/Destination Markets**

Transearch data from 2001 estimates that nearly 62 million tons of freight left District 7 for other destinations, more than twice the volume of goods imported into the District (27 million tons).

Figure 2-4 shows the geographic distribution of commodities on a tonnage basis for all modes, leaving and entering the District. The top pie chart shows that the District's exports are highly concentrated to the 7-county Twin Cities Metropolitan Area, capturing 56 percent of the goods leaving the District. It is likely that the Metro District Area serves as a transload point for agriculture and other goods traveling by rail or waterway to more distant markets. Of the remaining top destination markets, only District 6, Rochester captures more than 5 percent of all export movements.

The bottom chart of Figure 2-4 shows the source markets for District 7, which are far more distributed across a variety of locations. South Dakota is the top market for goods entering District 7, followed by the seven county Metro District, North Dakota and the Willmar District.

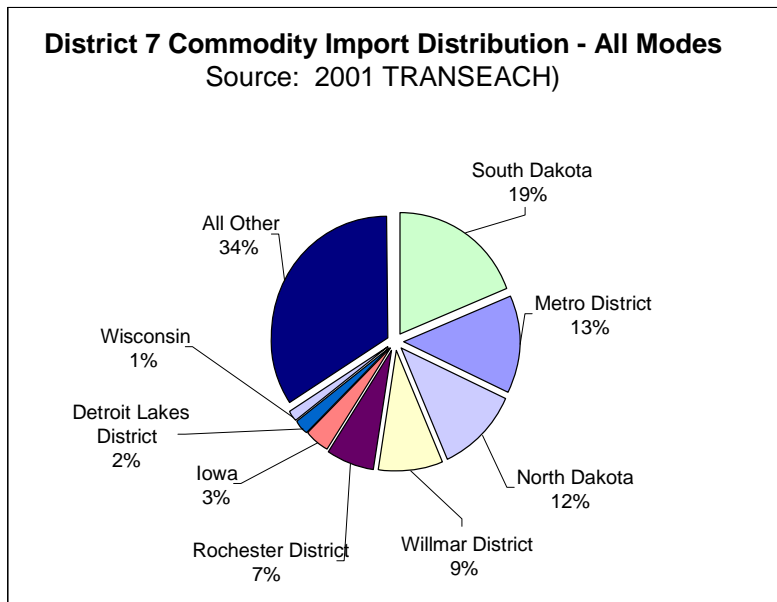
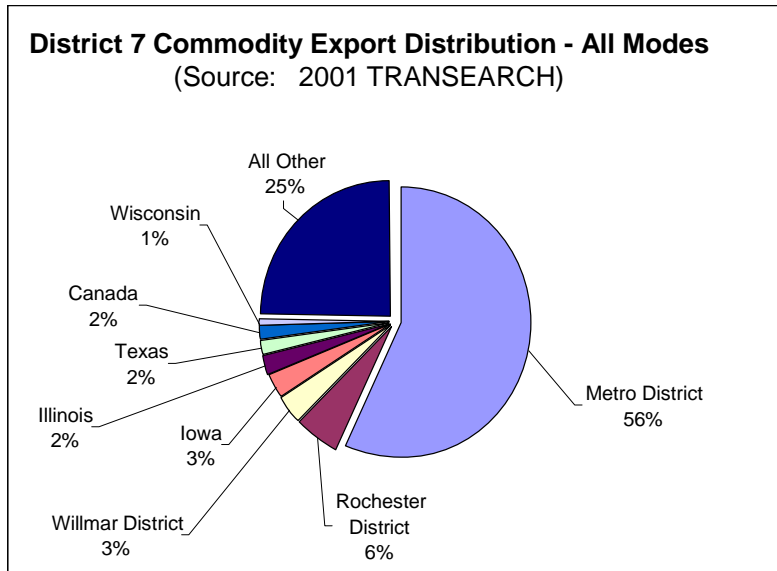
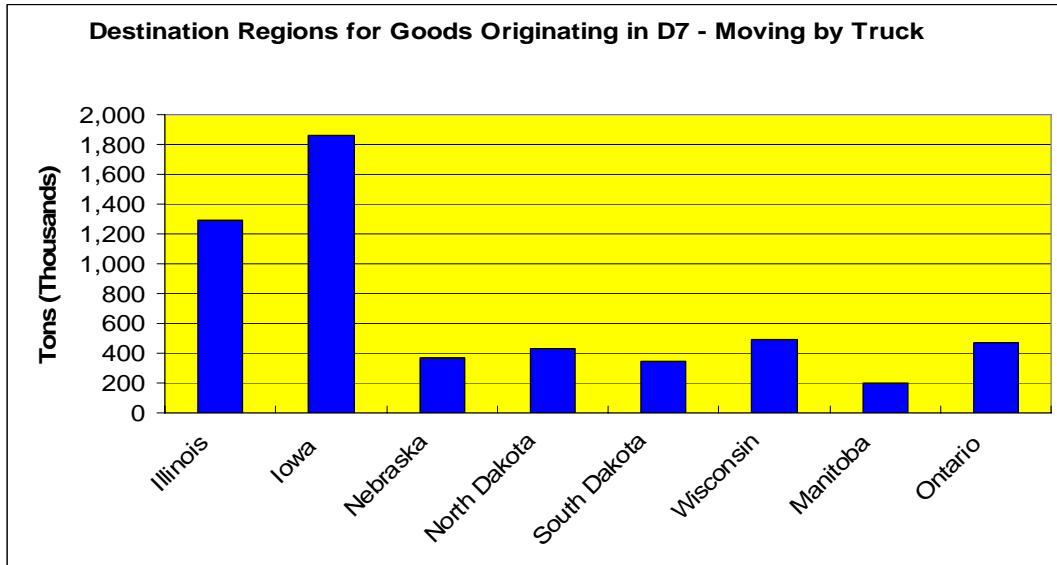


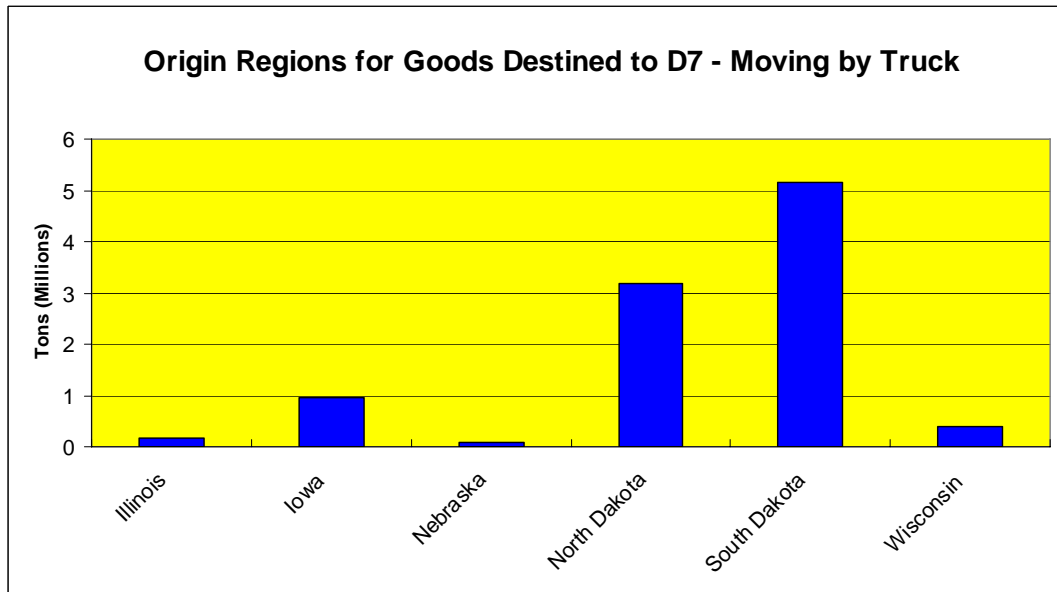
Figure 2-5 presents additional information about key export markets for District 7 beyond Minnesota's borders for goods moving on the highway system. Freight leaving Minnesota from District 7 by truck goes primarily to neighboring states of the Midwest. Iowa and Illinois receive over 3 million tons of freight traveling on highways from District 7.

**Figure 2-5
Top District 7 Export Markets, Excluding Other Minnesota Destinations**



District 7 also receives significant quantities of commodities moving by truck from other Midwest jurisdictions. Figure 2-6 shows origin regions beyond Minnesota for commodities moving on the highway system into District 7. More than 8 million tons of freight, mostly Farm Products and Food or Kindred Products moved into District 7 from its Western neighbors in the Dakotas. The District also imported nearly 1 million tons of mostly agricultural related products from Iowa.

**Figure 2-6
Top District 7 Import Markets, Excluding Other Minnesota Origins**



2.2.2 District 7 Commodity Imports

District 7's key import commodity groups are shown in Figure 2-7. The largest commodity group imported into the District is Farm Products at 14.4 million tons, comprising 53 percent of the total inbound tonnage and 11 percent of its total value. Non-metallic minerals are the next largest import to District 7 totaling 5.6 million tons. Secondary traffic is the highest valued import commodity group moving into District 7 totaling \$15.5 billion, comprising nearly 72 percent of the total inbound value. Secondary Traffic is a growing commodity group in today's multi-modal economy that includes truck movements to and from warehouse and distribution centers, intermodal terminals, and air cargo facilities. Several commodities or mixed shipments can be included in this category, including many mixed shipments of retail goods.

Figure 2-7
District 7's Key Import Commodity Groups

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Value Rank</i>	<i>Total Value</i>
Farm Products	14,446,158	Secondary Traffic	\$15,536,711,796
Nonmetallic Minerals	5,666,323	Farm Products	\$2,443,512,088
Secondary Traffic	2,955,870	Food Or Kindred Prod.	\$1,276,050,216
Food Or Kindred Products	1,497,484	Petroleum Or Coal Prod.	\$320,614,981
Clay, Concrete, Glass Or Stone	822,684	Printed Matter	\$307,224,115

2.2.3 Key Commodity Imports to District 7: Metro District and All Other Origins

As discussed previously, a large percentage of the commodities moving in and out of District 7 either come from the Twin Cities Metro area, or are destined there for transloading point or final destination. Figure 2-8 on the following page shows the top commodity imports to District 7 from the Metro Area by tonnage and value. Secondary Traffic is the leading import from the Metro Area, accounting for 38 percent of inbound volume by weight, and nearly 80 percent by value.

Figure 2-9 displays the top District commodity imports, for all origins excluding the Twin Cities Metro Area. When the Twin Cities is excluded as an origin, the top import commodity group by weight becomes Farm Products followed by Secondary Traffic, Nonmetallic Minerals and Food and Kindred Products. By value, Secondary Traffic remains the top commodity import group, followed by Farm Products, Food or Kindred Products and Transportation Equipment.

Figure 2-8
District 7 Key Commodity Imports from the Metro District

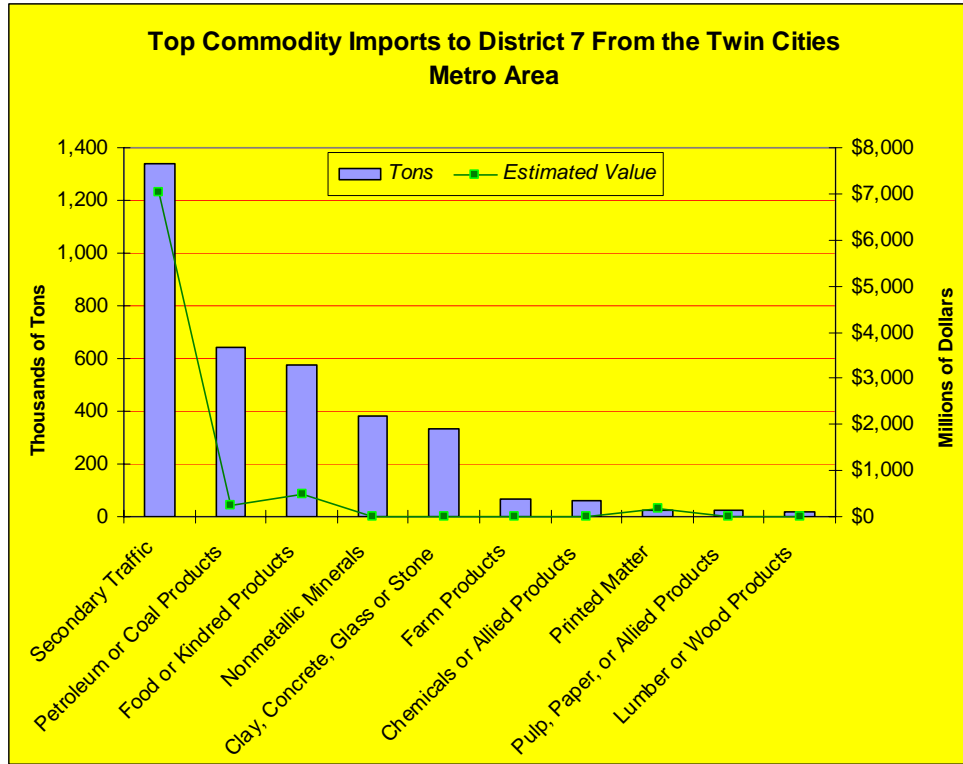
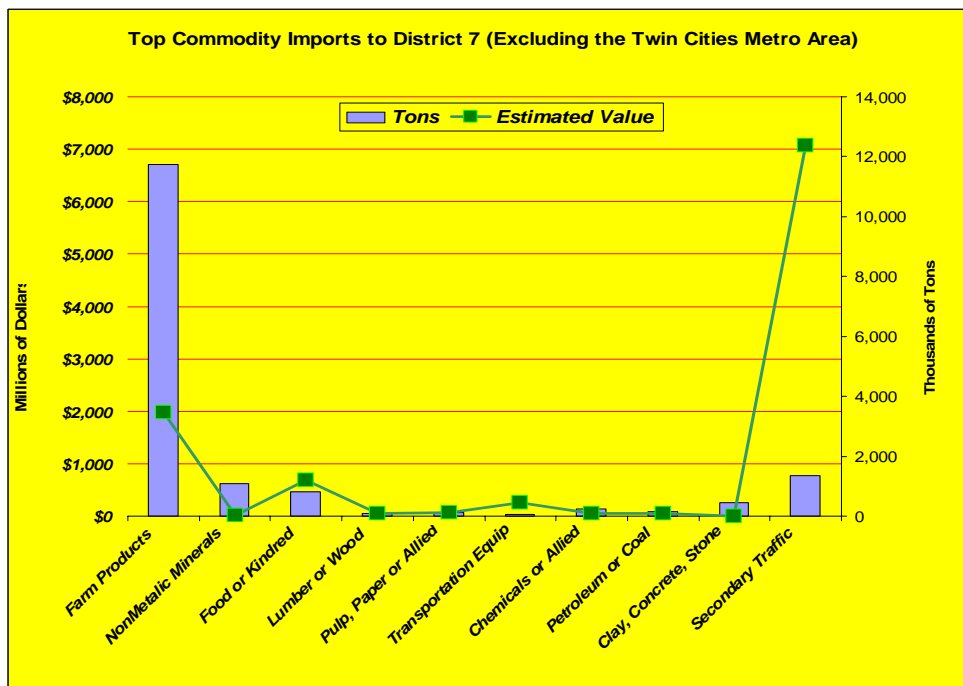


Figure 2-9
D7 Key Commodity Imports Excluding the Twin Cities Metro Area



District 7 Exports

In 2001, Non-Metallic Minerals was District 7's largest export. Comprising 63 percent of the Districts commodity exports of nearly 39 million tons. Non-Metallic Minerals include aggregate (sand, gravel and crushed stone), peat, clay, dimension stone, and silica sand. It is likely that the Non-Metallic Mineral group exported from District 7 includes products associated with Kaolin clay, which is mined in the Minnesota River Valley. Kaolin clay is used in making cement, bricks and tiles. Kaolin clay is also a key additive in the rubber, plastic and paper industries. Paper mills use Kaolin to brighten high-end paper products and enhance paper receptivity to ink. Major producers in this commodity group include Och's Brick and Tile Company, Superior Concrete Block Company, and Wells Concrete Products Company.

The second largest commodity export group from District 7 is Farm Products, totaling 10.5 million tons representing 5 percent of the total export value. The most valuable commodity exported from the District is Secondary Traffic with over \$20 billion annually.

Figure 2-10
District 7 Export

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Value Rank</i>	<i>Total Value</i>
Nonmetallic Minerals	38,778,280	Secondary Traffic	\$20,742,427,722
Farm Products	10,586,763	Food Or Kindred Prod	\$5,349,097,756
Food Or Kindred Products	6,277,330	Farm Products	\$1,790,710,261
Secondary Traffic	3,946,261	Printed Matter	\$1,013,005,798
Clay, Concrete, Glass Or Stone	1,001,223	Transportation Equip.	\$833,944,903

Key Commodity Exports from District 7: Metro District and All Other Destinations

Due to the significance of the Twin Cities Metro Area as the largest single market for District 7, a closer look at District 7 exports includes segregating the Metro District from all other destinations. Figure 2-11 shows the commodity groups moving from within District 7 to the Metro District. By tonnage, Non-metallic Minerals, Food or Kindred Products, and Secondary Traffic are the top export movements. By value, Secondary Traffic, Food or Kindred Products, and Printed Matter are the top commodity exports.

Figure 2-12 shows District 7 exports to all locations excluding the Twin Cities Metro Area. Again the primary commodity groups being exported from the District in terms of weight are Farm Products, Non-metallic Minerals, and Food or Kindred Products. Secondary Traffic is again the top commodity group by value.

Figure 2-11
District 7 Key Commodity Exports to the Metro District

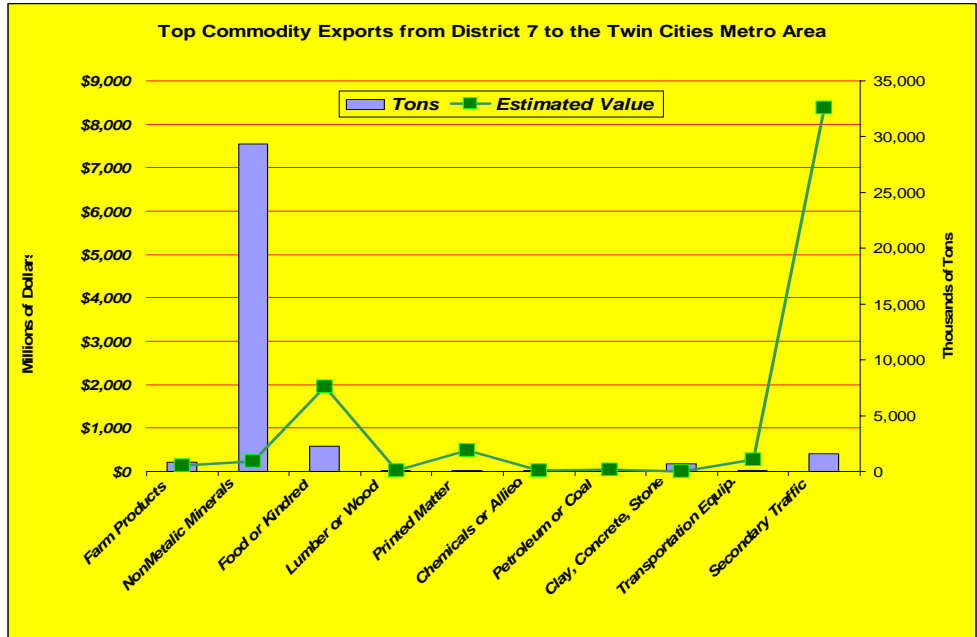
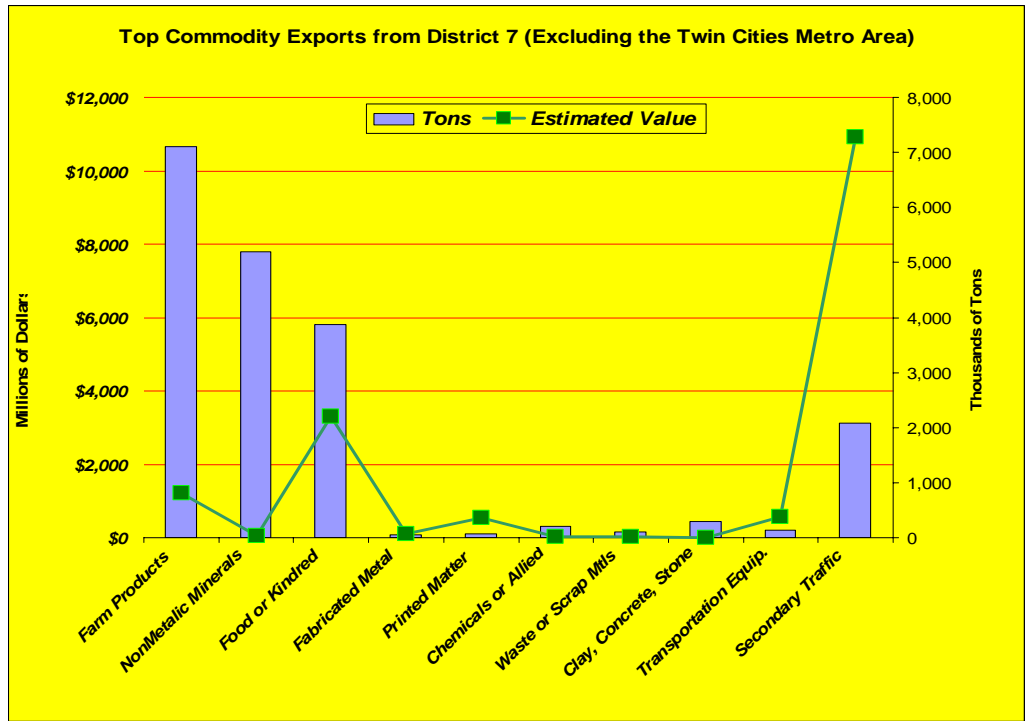


Figure 2-12
District 7 Key Commodity Exports Excluding the Twin Cities Metro Area



District 7 County Commodity Flows And Market Areas Summary

The following section presents a sub-set of information for each county in District 7 about the top five key commodities being exported from that county, and the top five market areas to which freight flows from each of the District 7 counties. This clearly illustrates the importance of farm, food and non-metallic minerals as the region's key commodities on a more localized measure, and also emphasizes the importance of transportation between District 7 and the Twin Cities 7-county Metro Region (Hennepin, Ramsey, Dakota, Scott, Washington, Anoka, and Carver Counties):

Blue Earth County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Food or Kindred Products	1,473,127	Hennepin County, MN	575,054
Secondary Traffic	971,004	Illinois Portion of Chicago, IL	367,049
Farm Products	738,181	Ontario	313,528
Nonmetallic Minerals	299,335	Ramsey County, MN	263,496
Clay, Concrete, Glass or Stone	263,392	West	131,687

Brown County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	1,341,400	Hennepin County, MN	581,547
Secondary Traffic	867,680	Blue Earth County, MN	221,302
Food or Kindred Products	855,686	Washington Portion of Seattle, WA	197,794
Clay, Concrete, Glass, or Stone	262,313	Iowa Portion of Des Moines, IA	189,876
Nonmetallic Minerals	108,772	Ramsey County, MN	166,245

Cottonwood County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	1,170,385	Blue Earth County, MN	208,454
Secondary Traffic	654,126	Hennepin County, MN	208,142
Nonmetallic Minerals	309,680	Nobles County, MN	111,604
Food or Kindred Products	196,812	Lyon County, MN	110,096
Chemicals or Allied Products	41,132	West	85,695

Faribault County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	725,475	Hennepin County, MN	262,576
Food or Kindred Products	461,897	Blue Earth County, MN	231,265
Secondary Traffic	350,754	Illinois Portion of Chicago, IL	170,185
Nonmetallic Minerals	287,231	BEA	123,995
Transportation Equipment	115,269	Iowa, Rest of Iowa Portion of Des Moines, IA	110,067

Jackson County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	1,203,920	West	223,791
Secondary Traffic	243,287	Calif. Portion of San Francisco, CA	223,683
Clay, Concrete, Glass or Stone	85,857	Louis. Portion of New Orleans, LA	184,837
Food or Kindred Products	54,515	Blue Earth County, MN	127,297
Machinery	5,691	Hennepin County, MN	123,301

LeSueur County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	35,321,002	Hennepin County, MN	12,837,478
Food or Kindred Products	743,828	Ramsey County, MN	10,489,173
Farm Products	532,572	Dakota County, MN	2,117,832
Clay, Concrete, Glass or Stone	173,915	Scott County, MN	1,812,013
Fabricated Metal Products	62,038	Washington County, MN	1,588,398

Martin County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	607,814	Hennepin County, MN	233,301
Nonmetallic Minerals	293,604	Blue Earth County, MN	200,929
Secondary Traffic	270,096	Texas, Rest of	93,853
Food or Kindred Products	269,353	Jackson County, MN	75,976
Petroleum or Coal Products	102,644	Louisiana, Rest of	68,453

Nicollet County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	728,463	Hennepin County, MN	303,280
Nonmetallic Minerals	319,077	Blue Earth County, MN	263,756
Food or Kindred Products	66,204	Le Sueur County, MN	48,559
Transportation Equipment	19,948	Renville County, MN	46,607
Lumber or Wood Products	16,326	Ramsey County, MN	42,333

Nobles County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Food or Kindred Products	740,937	Hennepin County, MN	383,682
Farm Products	726,727	Texas, Rest of	202,968
Secondary Traffic	522,443	West	159,522
Clay, Concrete, Glass or Stone	58,785	Iowa, Rest of	134,346
Petroleum or Coal Products	40,587	Calif. Portion of San Francisco, CA	100,547

Rock County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Food or Kindred Products	379,184	Hennepin County, MN	135,408
Farm Products	361,990	Iowa, Rest of	117,912
Nonmetallic Minerals	233,195	Lyon County, MN	91,058
Transportation Equipment	33,431	Nobles County, MN	71,628
Clay, Concrete, Glass or Stone	33,099	Jackson County, MN	52,308

Sibley County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	953,283	Hennepin County, MN	449,642
Nonmetallic Minerals	316,821	Renville County, MN	216,324
Food or Kindred Products	231,948	Blue Earth County, MN	172,179
Lumber or Wood Products	22,759	Ramsey County, MN	165,112
Rubber or Misc. Plastics	11,843	Dakota County, MN	38,800

Waseca County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	317,104	Blue Earth County, MN	172,801
Farm Products	189,024	Hennepin County, MN	123,864
Food or Kindred Products	144,523	Dakota County, MN	71,291
Waste or Scrap Materials	51,357	Scott County, MN	56,661
Printed Matter	49,940	Steele County, MN	28,614

Watonwan County Exports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	895,972	West	336,934
Food or Kindred Products	659,258	Hennepin County, MN	201,385
Nonmetallic Minerals	268,409	Blue Earth County, MN	179,831
Chemicals or Allied Products	11,208	Mountain	85,835
Secondary Traffic	3,535	California Portion of LA	76,776

Also included in this section is an analysis of the top five key commodities being imported from the District's thirteen counties and the top five market areas from which freight originates.

Blue Earth County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	12,388,272	South Dakota	4,691,504
Nonmetallic Minerals	979,640	North Dakota	2,990,595
Secondary Traffic	564,225	Le Sueur County, MN	737,479
Food or Kindred Products	396,599	Redwood County, MN	308,055
Clay, Concrete, Glass or Stone	188,390	Hennepin County, MN	266,341

Brown County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	763,100	Lesueur County, MN	483,284
Secondary Traffic	469,855	Hennepin County, MN	179,883
Food or Kindred Products	191,215	Ramsey County, MN	123,823
Clay, Concrete, Glass, or Stone	89,453	Lyon County, MN	43,477
Petroleum or Coal Products	86,994	Murray County, MN	43,055

Cottonwood County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	114,959	Hennepin County, MN	40,520
Secondary Traffic	64,610	Ramsey County, MN	20,251
Food or Kindred Products	32,949	Rock County, MN	18,601
Petroleum or Coal Products	26,870	Pipestone County, MN	16,058
Clay, Concrete, Glass or Stone	21,936	Dakota County, MN	13,522

Fairbault County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	582,478	Le Sueur County, MN	429,923
Secondary Traffic	157,383	Hennepin County, MN	80,152
Food or Kindred Products	85,584	Ramsey County, MN	45,574
Farm Products	68,342	Freeborn County, MN	33,934
Petroleum or Coal Products	48,105	Martin County, MN	32,461

Jackson County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	461,360	Nobles County, MN	87,271
Nonmetallic Minerals	243,386	Martin County, MN	75,976
Secondary Traffic	66,417	Iowa Portion of Des Moines, IA	67,311
Clay, Concrete, Glass or Stone	29,558	Murray County, MN	64,211
Petroleum or Coal Products	25,209	Cottonwood County, MN	62,474

Le Sueur County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	584,938	Washington County, MN	320,688
Secondary Traffic	429,324	Hennepin County, MN	171,863
Farm Products	320,053	Ramsey County, MN	113,783
Food or Kindred Products	182,333	Blue Earth County, MN	72,441
Clay, Concrete, Glass or Stone	112,628	Scott County, MN	54,992

Martin County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	509,498	Le Sueur County, MN	340,950
Secondary Traffic	453,317	Hennepin County, MN	166,763
Petroleum or Coal Products	102,105	Ramsey County, MN	115,553
Food or Kindred Products	79,162	Scott County, MN	32,430
Chemicals or Allied Products	53,421	Freeborn County, MN	32,309

Nicollet County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	82,467	Hennepin County, MN	73,367
Clay, Concrete, Glass, or Stone	68,168	Le Sueur County, MN	55,085
Food or Kindred Products	67,389	Blue Earth County, MN	47,014
Secondary Traffic	62,050	Ramsey County, MN	29,042
Nonmetallic Minerals	59,494	Scott County, MN	24,951

Nobles County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	486,928	Murray County, MN	220,731
Nonmetallic Minerals	381,231	Hennepin County, MN	134,994
Secondary Traffic	336,232	Cottonwood County, MN	111,604
Food or Kindred Products	158,597	Ramsey County, MN	89,251
Petroleum or Coal Products	71,790	Rock County, MN	71,628

Rock County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Farm Products	90,702	Hennepin County, MN	65,861
Nonmetallic Minerals	86,448	Murray County, MN	35,972
Secondary Traffic	68,553	Lincoln County, MN	27,767
Food or Kindred Products	60,579	Cottonwood County, MN	23,910
Chemicals or Allied Products	40,205	Ramsey County, MN	22,051

Sibley County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	138,705	Le Sueur County, MN	79,426
Secondary Traffic	63,828	Washington County, MN	50,336
Food or Kindred Products	53,311	Hennepin County, MN	49,084
Petroleum or Coal Products	35,907	Ramsey County, MN	23,394
Clay, Concrete, Glass or Stone	27,286	Scott County, MN	13,724

Waseca County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	131,488	Le Sueur County, MN	90,983
Pulp, Paper or Allied Materials	74,932	Hennepin County, MN	64,716
Clay, Concrete, Glass or Stone	67,935	Ramsey County, MN	20,257
Secondary Traffic	50,449	New England	18,107
Food or Kindred Products	50,014	Scott County, MN	16,885

Watonwan County Imports

<i>Commodity Tonnage Rank</i>	<i>Total Tons</i>	<i>Commodity Market Rank</i>	<i>Total Tons</i>
Nonmetallic Minerals	395,605	Le Sueur County, MN	268,048
Secondary Traffic	137,581	Hennepin County, MN	81,735
Food or Kindred Products	116,787	Ramsey County, MN	44,575
Farm Products	80,526	Cottonwood County, MN	37,800
Clay, Concrete, Glass or Stone	48,521	Blue Earth County, MN	33,759

2.3 MODES

Six distinct modes are present for freight transportation around, through, and near the District. Trucking is the predominant mode of transportation. By tonnage, it accounts for well over half of all reported commodity moves for District 7. It also is a link in almost all other modal movements originating in or destined for the area.

Railroads make up the second most important mode. Total tonnage including moves through the area almost equal trucking, and accounts for a large portion of all large bulk commodity movements. This includes grain, ethanol, clay, and sand. Much of the current customer base is comprised of several very large carload generating industries in the Mankato area, and several dozen large grain elevators and ethanol plants. Many of the grain elevators are equipped to handle and rapidly load large blocks of cars, up to full unit trains in dedicated service, and that trend is being followed by a small but growing number of ethanol plants also loading 75 to 100-car unit trains of ethanol.

Waterborne traffic is provided by barge carriers on the nearby waterways, including the Minnesota and Mississippi Rivers, with elevators and ports at Savage, Minneapolis, St. Paul, Red Wing, and Winona. Grain is the principal southbound commodity, for export through the Port of New Orleans as well as delivery to domestic users on the Southern Mississippi. Products moving upstream and destined for District 7 include lime and urea, a nitrogen source for fertilizer.

Air freight is a minor mode, but important for selected purposes. Mankato has the only scheduled services, primarily for express parcel shipments. Two other regional airports offer charter air freight as needed.

Pipelines play a major transportation role in the area, transporting gaseous and liquid products. Magellan (formerly Williams Pipeline) operates a major south to north petroleum products pipeline, moving gasoline, diesel, and jet fuel from Gulf Coast refineries, with a truck loading terminal for distribution of these products locally located in Mankato. An anhydrous ammonia pipeline from Iowa also delivers this liquid fertilizer material. A third pipeline system, covering the entire District, delivers natural gas through several transmission companies to both industrial users and residents, primarily from natural gas fields in the Rockies. This material supplies heat, power for electric generation, and chemical feedstocks for a range of consumers.

The final mode is shipment by intermodal container. This mode involves both truck and rail with a single, transferable cargo container designed in most cases for international marine transportation. This is now the preferred conveyance for most cargo that can be handled in truckload lot size, including raw materials and manufactured goods. Identity-preserved commodities including DDGS and specialty grains especially lend themselves to this mode. Because of equipment and chassis constraints and lack of local facilities, few of these containers are actually loaded or unloaded in District 7, but rather have commodities trans-loaded into them at or near major container terminals including the Twin Cities, Rockford, IL, and Chicago. This transport method continues to grow rapidly and promises to become more of a presence in the District.

2.4 ROUTES

Most truck freight moves primarily on Minnesota's Interstate Highway System and major IRCs. In District 7 and the immediate area, the majority of through truck freight uses I-90 and I-35. I-90 represents the District's primary national east-west connection to major markets. Other major corridors include US 169 from the Twin Cities south to Mankato; MN 60 to the west and southwest to Iowa from Mankato; and US 14, crossing the state from Winona through Mankato and New Ulm and continuing due west to South Dakota. MN 60 describes the core of the District, and has the highest concentration of ethanol plants and major elevators along this Minneapolis-to-Omaha route. In addition to these highways, TH 71 provides a major north-south intra-state connection between several western Minnesota regional development centers. Taken together, they represent a network of significant freight corridors that serve to connect producers and markets both in the intra-state, inter-state, and international transportation system.

Each of these highway corridors is roughly paralleled by a mainline railroad route, with the Union Pacific linking the Twin Cities through Mankato to Sioux City, and the Dakota, Minnesota and Eastern crossing east to west through Mankato and New Ulm. The BNSF is the other major rail route in District 7, on the western edge. A couple of short line and regional railroads supplement this rail system. This central freight network is supplemented by a system of ten-ton rated highways made up of State trunk highways and US routes, as well as a number of County State Aid Highways (CSAHs) and county roads designed for this load. The total system is completed by the net of county and local roads that serve as collectors for the farm-to-market freight traffic as well as local circulation and mobility. The land-locked nature of the District and the dispersed traffic of the minerals and agricultural businesses mean that virtually all the "last mile" connections are via truck, many on these local roads.

2.4.1 *Freight/Intermodal Connectors*

District 7 does not have the volumes of concentrated freight traffic or freight clusters that would qualify any of the District trunk highways and IRCs as primary Intermodal Connectors, as defined for the Metro area. However, intermodal access for freight in the proximity of District 7 does carry an importance for the businesses in the area. For the purposes of grain export and southbound domestic shipments, barge traffic has been a cost-effective transportation channel for bulk commodities, and must be easily reached by shippers to take advantage of these options. Minnesota and Mississippi River terminals are accessed by US 169, US 14, and I-90. For the Port of Savage in Scott County, MN 13 forms the connection between US 169 and the Minnesota riverfront terminals, and is considered a connector for the subject area. For containerized shipments, US 169 connects the District to north Minneapolis (Canadian Pacific Shoreham Yard) and St. Paul's Midway (BNSF Pierce Butler Yard). Traffic to and from the BNSF yard is also often routed via Pierce Butler and Snelling Avenue, the principal local connectors, to I-94 and then to I-35, then to US 14 or I-90 for access to District 7.

2.5 SEASONAL PATTERNS

Many of the key commodities in this area are transported at specific times of the year. Corn and Soybeans must move off the farm to some extent during the harvest simply because of limited farm storage. Farm supplies, particularly fertilizers, tend to move in the spring during planting

and again in smaller quantities late in the year. Aggregates and concrete move principally during the summer and fall construction season. Many of these moves are constrained, or defined by the Spring Load Restrictions posted on many of the area roads.

Other commodities move on a regular basis year-round. These include manufactured goods, prefabricated products including pre-stressed concrete, clay, silica sand, and livestock, particularly hogs. Grains moving to milling and food processors, and now ethanol plants, must move on a regular, almost daily schedule, and represent a trend away from seasonal grain movement.

2.6 MAJOR FREIGHT GENERATORS

While the STCC coded commodity flows, including Transearch data, give a good basis for general freight movement, the detail of commodity production and movements at the county and local level are less than precise due to sampling rates and aggregations of data in the commodity transport reporting methodology. Because of this, the basic goods movement in the District was also researched using the concept of freight generators and clusters. A list was created for the top 75 freight generators by tonnage in the region, derived from Transearch data and Mn/DOT's updated listing of 71 generators producing 50 or more truckloads per day. The list was reviewed for tonnage and value and condensed to the top 30 generators. These generators were utilized to determine the top industries for conducting interviews and collecting additional information (See Figure 2-13). To supplement and detail the findings of the freight flow report, state and local reports from the Association of American Railroads and the Minnesota Trucking Association were collected. Reports of volumes of shipments on both modes emphasize the importance of farm products movement in this region of the state, followed in tonnage by non-metallic minerals (See Figure 2-14).

Figure 2-13
Top 30 Freight Generators (STCC Code Data)

Company Name	STCC code/Type	City	Tons
Cenex Harvest States Oilseed	20-Foods	Mankato	279,476
Wells Concrete Ready Mix	32-Concrete	Mapleton	97,170
Wis-Pak of Mankato	20-Foods	North Mankato	90,365
Archer Daniels Midland Co.	20-Foods	Mankato	81,405
Hubbard Feeds Inc.	20-Foods	Mankato	81,287
Vetter Stone Company	32-Concrete & Stone	Mankato	68,376
Pepsi Cola Bottling Co.	20-Foods	North Mankato	66,495
Cargill Flour Milling Inc.	20-Foods	Mankato	64,700
Big Gain Inc.	20-Foods	Mankato	61,506
Hanson Pipe & Products	32-Concrete	Mankato	51,594
Superior Concrete Block Co.	32-Concrete	Mankato	50,980
ADM Soybean Processing	20-Foods	Mankato	48,720
Pioneer Snacks	20-Foods	Mankato	34,761
Coca-Cola Bottling Co.	20-Foods	Mankato	32,395

Company Name	STCC code/Type	City	Tons
Carlson Craft Commercial Div.	27-Printed Matter	North Mankato	26,019
Courtland Industries Inc.	32-Concrete & Stone	Mankato	25,264
Crown Cork & Seal Co.	34-Fabricated Metals	Mankato	19,296
Fine Impressions Inc.	26-Paper & Products	North Mankato	18,202
Carlson Craft Commercial Div.	27-Printed Matter	North Mankato	16,659
Hand Maid Sweets	20-Foods	Mankato	16,137
All American Foods Inc.	20-Foods	Mankato	13,845
MRCI	30-Rubber & Misc. Plastics	Mankato	13,844
ADM Plant	20-Foods	Mankato	10,920
Atlantis Plastics Inc.	26-Paper & Products	Mankato	9,837
Gopher State Scrap Metal	33- Primary Metal	Mankato	8,658
Shari Candies Inc.	20-Foods	Mankato	8,167
Jones Metal Products Inc.	34-Fabricated Metals	Mankato	7,934
Royal Stationery	26-Paper & Products	North Mankato	7,793
Johnson Outdoors Inc.	39-Misc. Manufact. Products	Mankato	6,112
Atlantis Plastics Inc.	30-Rubber & Misc. Plastics	Mankato	5,897

Note: Listed sites represent plants identified through Transearch data for reference only. Mapped freight generators (Figures 1-3) include Mn/DOT identified plants and clusters. Selection criteria for profiling includes the above groups as well as nominated industry representatives based on geographic distribution, industry significance, and convergence of commodities and transportation.

Figure 2-14 Minnesota Railroad and Trucking Summary Data

Minnesota Trucking:

Tons:

Total Tons Handled	373,000,000
<i>Originated or Terminated in State;</i>	
Cereal Grains	37,400,000
Non-Metallic Minerals	17,500,000
Gravel & Crushed Stone	33,100,000

Minnesota Railroads:

Tons:

Total Tons Handled (2005)	227,700,000
<i>Originated or Terminated in State;</i>	
Farm Products	18,400,000
Food Products	7,700,000
Non-Metallic Minerals	2,900,000
Glass & Stone Products	1,900,000

As the primary mode for virtually all local transport, and the majority of total freight tonnage moved by the combination of all modes, trucking plays a key role in servicing these freight generators. As an illustration available from some of the reporting detail, volumes of trucked commodities exported from the District shows both the transportation scope and mix of goods handled (Figure 2-15). In terms of economic impact, farm products emerge as the key element for transportation movements in District 7. Production levels of these commodities are well documented by the Minnesota Department of Agriculture and are shown for the most recent reporting year (Figure 2-16).

Figure 2-15
District 7 Export Truck Tonnage

DESTINATION	REGION	TOTAL
<u>In Minnesota</u>		
MNDO	Mn/DOT Metro District	35,184,514
MNDO	Mn/DOT District 6 (Rochester)	3,497,247
MNDO	Mn/DOT District 8 (Willmar)	2,029,933
MNDO	Mn/DOT District 3 (Brainerd)	549,898
MNDO	Mn/DOT District 4 (Detroit Lakes)	470,851
MNDO	Mn/DOT District 1 (Duluth)	357,837
MNDO	Mn/DOT District 2 (Bemidji)	163,219
Subtotal		42,253,499

DESTINATION	REGION	TOTAL
<u>Export From Minnesota</u>		
19001	Iowa Portion of Des Moines, IA BEA	719,064
19000	Iowa, Rest of	486,176
17007	Illinois Portion of Chicago, IL BEA	477,134
4000	West	201,321
20000	Kansas, Rest of	176,649
1000	South	138,082
8001	Colorado Portion of Denver, CO BEA	94,308
18000	Mid West	72,016
19063	Emmet County, IA	69,398
17000	Illinois, Rest of	65,458
	Other	603,264
	Subtotal	3,102,870
	Total, Truck Tonnage for Destinations outside D7	45,356,369
	Reported Truck tonnages internal to D7*	7,266,278

* Portion of private haulage may be unreported

Figure 2-16
Agricultural Freight Commodity Volumes
District 7 Agricultural-Related Freight Commodities 2004-05

Commodity	Hogs (#)	Milk (000#)	Corn (000Bu)	Soybeans (000Bu)	Hay (tons)	Swt. Corn (tons)	Peas (tons)	Ethanol (000 gals)	Ethanol (000 Bu.*)
COUNTY									
Sibley	231000	135,000	23,324	4,435	40,700	47,740	3,960	37,000	13,700
Cottonwood	334,000	22,000	30,538	6,453	23,000	0	0	31,000	11,500
Jackson	225000	10,000	32,292	6,591	16,700	0	0		
Nobles	266,000	76,500	33,001	7,140	36,500	0	0		
Rock	97,000	47,000	20,192	4,918	37,800	0	0	21,000	7,800
Blue Earth	629,000	19,000	32,904	7,247	16,000	0	1,430	50,000	18,000
Brown	506,000	115500	26,100	4,918	45,600	70,810	11,340		
Faribault	309,000	45,000	36,709	7,132	9,700	32,860	2,940	47,000	17,400
LeSueur	218,000	64000	15,962	3,268	23,200	0	1,400		
Martin	1,335,000	20,000	41,510	7,715	11,600	14,400	3,230		
Nicollet	357,000	125500	20,379	3,504	24,500	17,750	1,200		
Waseca	434,000	43,500	20,736	4,082	19,700	24,000	1,840		
Watonwan	208,000	13,500	24,225	4,862	8,500	0	0		
D7 Totals	5,149,000	736,500	357,872	72,265	313,500	207,560	27,340	186,000	68,400
Minnesota	10,302,000	8,102,000	1,120,950	238,175	4,725,000	894,590	99,080	551,000	200,000
% of State	50%	9%	32%	30%	7%	23%	28%	34%	34%

* Bushels of corn consumed for D7 ethanol production equals 19 percent of District harvest

2.6.1 Shuttle Elevators and Biofuel Plants

The study of commodity flows for the District highlighted two additional categories of freight generators that are tied to agricultural production. These categories of generators have developed relatively recently, and are significant in the changing freight traffic patterns for the area. First is a specific class of grain elevators responding to the advent of “shuttle trains” for grain movements in bulk. This concept grew out of the railroad’s experience with dedicated unit trains for intermodal movements and long distance coal hauls, and hinges not only on lower operating expenses due to reduced switching and car handling, but also higher car and system capacity utilization due to the higher speeds and quicker turn-arounds of these full train lots. To handle these full trains and further improve turn-around speeds, elevators and shippers were given rate incentives to upgrade loading speed and facilities, usually with contractual loading time limits and a specified siding capacity imposed in the agreements. The lower transportation rates and high-capacity, improved elevators, “shuttle elevators”, have resulted in export grain movements being concentrated in a few very large facilities, changing the collection area and trucking patterns. Where smaller elevators shipping via car load lots pulled crops in from about 30 miles away, the larger elevators with advantageous rail rates will pull grain from beyond 70 miles of the facility. It is also shifting the use of smaller, uncompetitive elevators collection points in the supply chain into local or intermediate storage.

The economics of these trains has had an effect on waterway traffic and volumes. Where the collection shed for barged, long-haul grain often reached 125 to 150 miles inland from the river terminals, the shuttle trains, combined with rising barge rates, has reduced the rate-driven collection area to under 75 miles in many cases. For crop producers in the extreme southwest of the area, the Missouri River was historically a barge outlet as well, although at much higher operating costs and time penalties than the Mississippi. This option has been all but eliminated by shuttle trains and elevators. A representative schematic of the relative economics of these modal options for corn is shown in Figure 2-17.

The second recent development resulting in a string of new freight generators is the growth of the biofuels industry, including ethanol plants using local corn to produce gasoline substitutes, and biodiesel plants using soybean oils as a diesel fuel supplement. These plants represent another farm-adjacent market for the area’s key crops, and also represent a change in truck and rail traffic patterns to collect the grain, distribute the final product, and disperse the plant’s byproducts. In 2005, corn being used in District 7 ethanol plants represented 19 percent of the area’s corn yield. This expanding alternative fuels industry adds significant value to the corn being raised in the District, and produces Distiller Dried Grains in large quantities that serves as a livestock feed that substitutes for grain meals (Figure 2-18). In 2005 ethanol production in the District totaled 186 million gallons, half of Minnesota’s total output. This is expected to more than double in the next two years.

Even as grain is being diverted from feed, food processing, and export channels, offsetting traffic of a certain volume is being generated for both rail and truck in the form of liquid ethanol, food byproducts, and distiller dried grains, some of which is going to export (Figure 2-19).

The shuttle elevators, biofuel plants, and top 30 freight generators were all catalogued and plotted as freight generators for the District. Other significant facilities not in the District but important to the freight destinations that were identified and mapped were freight transfer and intermodal terminals, including port facilities on the rivers and rail terminals for containerized traffic.

2.6.2 Intermodal Terminals

Any location where a commodity changes from one mode to another is technically considered an intermodal terminal. Any shuttle train grain elevator, or any other elevator loading grain to railcars, qualifies as such. Because of the concentration of freight at such a terminal, they usually qualify as major Freight Generators, especially seasonally during the highest volumes of commodity movements. In District 7, major elevators are the single significant category of intermodal terminal. In close proximity to the District, river terminals qualify for this status, including grain elevators for barge loadings, and bulk terminals handling barge imports such as fertilizer, lime, minerals, and petroleum products. Another significant category of intermodal terminal is the container transfer facility, including the Shoreham Yard on the Canadian Pacific in north Minneapolis, and Pierce-Butler Yard on the Burlington Northern Santa Fe in St. Paul. These each generate (inbound/outbound) over 500 trucks per day, and offer the main access point from District 7 to domestic and international markets served by multimodal cargo containers and moved by rail. These yards are also the main point for loading “piggyback” cargo, essentially conventional over-the-road truck trailers on railroad flatcars.

2.6.3 Alternate Freight Generator Databases

A third source of information concerning freight generators was provided by Mn/DOT during the course of the study and was analyzed for usefulness. The Selectory® database is derived from Dun & Bradstreet data reported on a site-by-site basis, including employment and revenue levels. The intent is to incorporate more detailed financial, employment, plant size, shipping commodity, and manufacturing commodity data into the Freight Generator location process.

As noted, the Mn/DOT Freight Generator list consists of a survey of County Engineers to list those facilities that generate 50 trucks or more of traffic per day. This is done by observation and local knowledge and intelligence, including data from local chambers of commerce and development commissions. This listing captures the obvious plants, quarries, etc. but may miss smaller but still significant freight generators, of plants that use other modes. The second source that was used in this report for identification, selection, and mapping was the Transearch database, a national commercial freight database available to subscribers. It is relatively expensive, but is flexible, frequently updated, and can give excellent results by mode and commodity at non-local levels of freight flows. Its basic data source is a 3 percent statistical sampling of reported commercial freight, including truck and railroad common carrier reporting. Its main weaknesses include a poor statistical coverage and significance for local freight shipments, and limited data on private and/or contract carriage such as that performed by company-owned and private trucks.

The DUNS database offers financial revenue information, employment and square footage by plant site, STCC coding of goods, and NAICC of production. However, it offers no information on freight volumes, unlike Transearch. A further weakness is that despite the detailed STCC and NAICC coding, the number of codes and the wide variance possible in product value and volume per dollar of revenue does not allow a translation of plant or company revenue into a meaningful volume of freight.

The analysis of the DUNS data as a usable information source included a District 7 printout of 1,002 businesses. This was compared to the Mn/DOT Freight Generator list, the Shuttle Elevator list, the Biofuels plant list, and the Transearch data. The comparison is enlightening. Of the top fifty employers listed on Transearch, 27 were not found on the DUNS database. A slightly better but still poor correlation was found between Transearch freight generators by volume and DUNS. Of the Mn/DOT Freight Generators, 40 percent were not listed on DUNS. Shuttle Elevators and Biofuels plants were reflected at about the same rate.

After comparing the databases and their varied content, any attempt to identify freight generators could actually be improved by starting with the local survey and adding any available Transearch and Duns data to their information packet. The largest companies still on the respective databases but not identified on the local survey could be listed separately and resent to the survey participants, the County Engineers in this case, and the additional candidates reviewed for inclusion into the survey list. This additional feedback of information will allow a second tier of companies to be checked for inclusion into the list of companies affecting freight traffic in the local area. This will still be secondary to good HCAADT counts and vehicle classification counts in areas like District 7, where the dispersed nature of agricultural movements, biofuel plants, and low industrial densities would dictate against any other approach such as freight clusters or business center analysis.

Making this approach more difficult in Greater Minnesota is a reported lack of good commercial traffic counts on most county and local roads, a problem that State Aid and the County Engineer Association is working to correct. Although these parties recognize the relative wear that heavy vehicles contribute to their roads, limited resources and a lack of an active comprehensive statewide program to do the counts on county and local roads will hamper good decision making about supporting truck freight traffic in the near future.

**Figure 2-17
Transportation Economics for Corn**

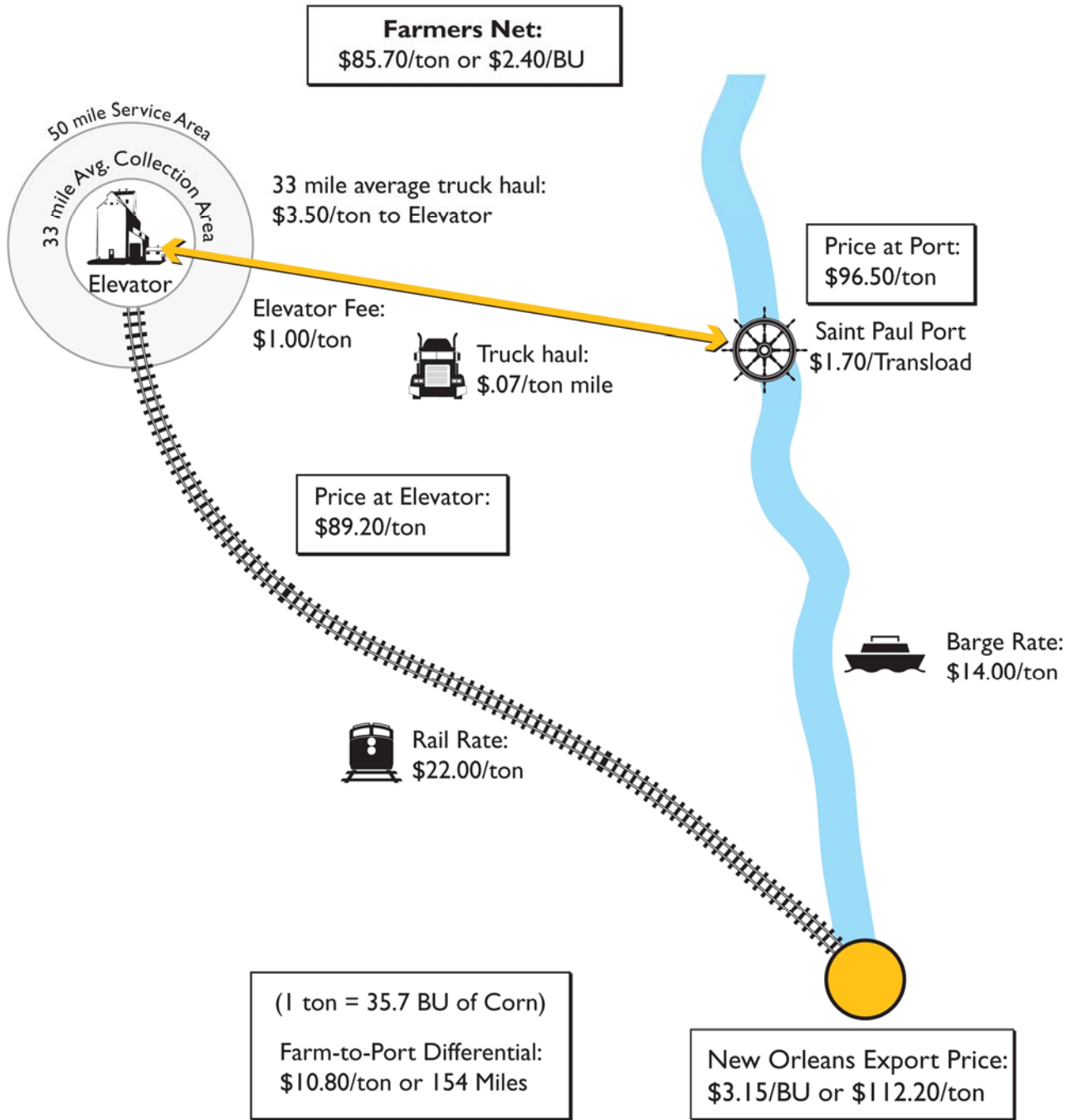


Figure 2-18
Ethanol Product Flows

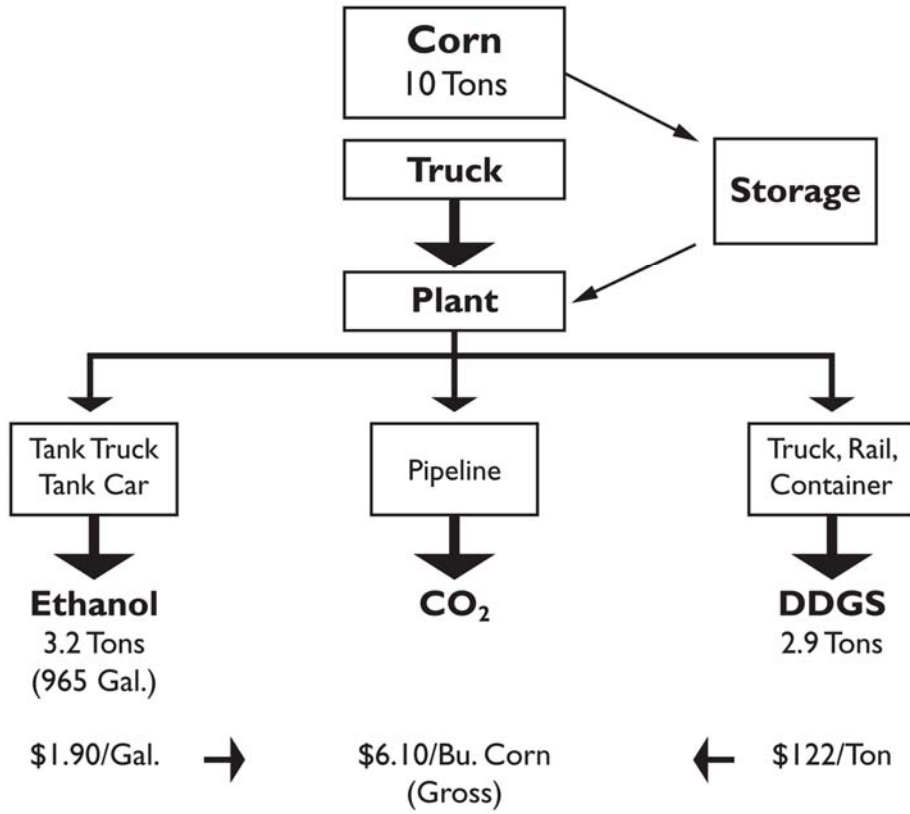
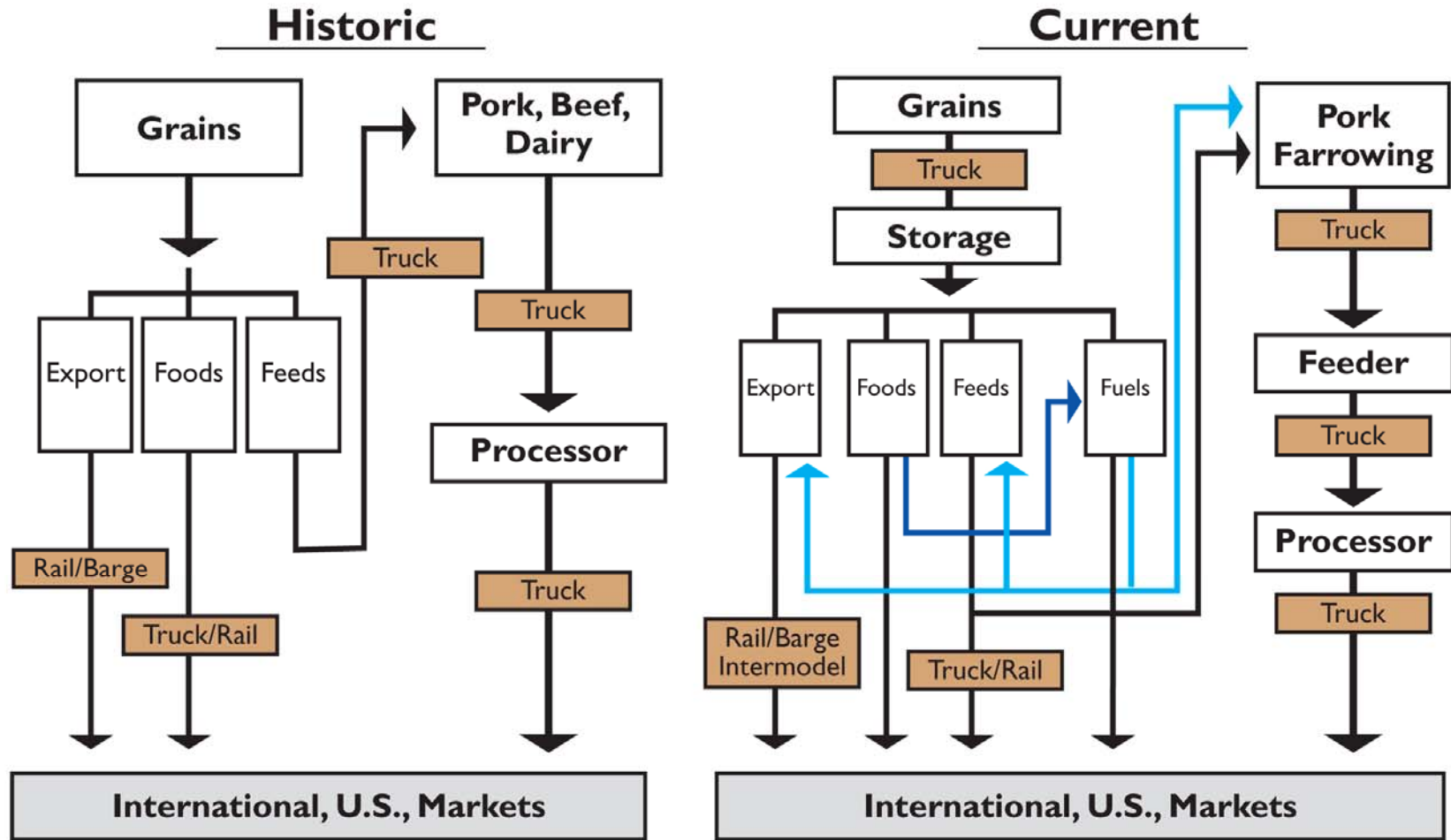


Figure 2-19
Changes in District 7 Logistics Patterns



2.7 NON-TRANSPORTATION FACTORS AFFECTING FREIGHT

Besides highway and railroad system capacity, freight generators, and market considerations, other exterior factors play a part in freight movements and the economy in the region. Several of the most relevant were considered in this section of the analysis.

2.7.1 Demographics

The District can be characterized as being largely agricultural, with low densities of population and a stable population level over time. The major variation in this pattern is the Mankato area, a small urbanized area including a student presence at area colleges. Overall, education levels are lower than the Metropolitan Twin Cities area for post-secondary education but on a par with the state otherwise. The age of the population is generally above the state average. Average household income is below the state average, while unemployment is slightly higher (Figure 2-20). The heritage of the largely homogeneous population derives from primarily German settlers moving into the area as the railroads built southwest from the Twin Cities and west from Rochester in the 1880s, followed by eastern European and Scandinavian immigrants. The most recent changes to this pattern is an influx of Latino workers for farm work, a pattern shared by other Midwest states and especially Iowa on the District's southern border.

This latter trend represents the area's largest immediate challenge if the economy begins to expand due to biofuels or agricultural prices and demand. While both the old and new residents share a very strong work ethic, labor available for new jobs is limited. Also, the aging population is especially affecting family farms, with Department of Agriculture figures showing that the average age of the area farmer is increasing by well over two years for every five year period that passes. These factors of aging and a limited labor pool make it particularly difficult to keep employment levels up to match demands in areas like trucking, railroading, warehousing, and mining.

Figure 2-20
County Demographic Statistics

County	Household Income	Median Age-Years	Percent Unemployment
Blue Earth	\$ 38,940	30	4
Brown	\$ 39,800	38	4.4
Cottonwood	\$ 31,943	42	7.4
Faribault	\$ 34,440	42	5.5
Jackson	\$ 36,746	41	5.2
Le Sueur	\$ 45,933	37	4.8
Martin	\$ 34,810	42	7.1
Nicollet	\$ 46,170	33	4.3
Nobles	\$ 35,864	38	8.2
Rock	\$ 38,102	40	5.5
Sibley	\$ 41,458	37	5.1
Waseca	\$ 42,440	36	4.5
Watonwan	\$ 35,441	39	7.8
Minnesota	\$ 52,024	35.4	4.7

Farmers' Avg. Age 1995	Farmers' Avg. Age 2002	Change in Years for period
50.1	52.2	2.1
48.9	52.2	3.3
49.0	52.0	3.0
50.5	52.5	2.0
49.9	52.8	2.9
52.1	55.1	3.0
49.7	52.2	2.5
48.5	51.9	3.4
49.3	50.6	1.3
47.5	50.2	2.7
48.7	51.0	2.3
49.3	50.2	0.9
50.1	53.6	3.5
52.0	49.5	2.5

2.7.2 Land Use

Agriculture and mining dominate any discussion of land use, with the latter generally restricted to the Minnesota River Valley and the northern and eastern counties. The largely agricultural uses of most of the land area means a very dispersed population and the need for a relatively low-capacity but evenly-spaced and heavy-duty network of local roads, collectors, and trunks that offer good access to individual farmsteads, small towns, and local businesses.

2.7.3 Environmental

The largely agricultural landscape dictates the nature of many of the environmental aspects that affect freight in the area. The road system is environmentally benign for the most part, and its regular patterns and raised roadbeds on a relatively flat landscape serve to contain rainwater, soil, and chemical runoff. The low density of most traffic offers low pollution levels from mobile sources. Livestock production, especially feeder hog operations, have presented pollution problems in the past, but modern management methods, manure disposal regimens, and runoff containment such as practiced by Christensen Farms have reduced their environmental impact to minimal levels. The ethanol expansion, however, poses several threats. Ethanol transportation involves handling the product as a hazardous/flammable material, with risks of potential spills and fires. However, the material is relatively inert as a chemical, and can be easily handled if the infrastructure (road and rail) is maintained in safe and good repair. Depletion of the local water table is another impact of the ethanol plants that may serve to limit production and transportation volumes. Finally, the resurgence of grain farming may lead to more mechanically and fuel intensive, chemical-dependent farming that will in turn impact pollution and energy consumption levels. This will be a shift away from low-cost, low tillage, and environmentally low impact methods currently practiced by knowledgeable farm operators like Gaalswyk Farms. Any environmental degradation and backlash could also limit the growth of these freight generators.

Mining of the non-metallic minerals common to the District also is currently a low impact operation for the most part, with runoff of silt and sediment being the greatest risk. Dust control from the trucks and rail cars is also a factor. Control of the operations should result in no adverse effects that would curtail freight flows.

2.7.4 Economic Development

The industry profiles were excellent in emphasizing the volatile nature of the markets that control economic growth in District 7. While food products have been relatively stable, farming, energy, pork production, and construction (including raw materials supply and equipment manufacture) are all prone to business cycles. Although many of the businesses have entered into diversification and vertical integration to soften the cycles, the core businesses remain somewhat vulnerable. This has bred a healthy restraint in dealing with even a seemingly golden opportunity like the ethanol boom among the businessmen we interviewed. Also, the relatively basic industries involved in the region are not easily affected by conventional economic development tools. Recent new business development in the District has not produced a great number of new jobs, and conversely, the labor market, local institutions, and existing incentive programs would not have an easy time supporting large-scale new development. As such, freight flows would appear to be little affected by efforts in this arena.

2.7.5 Industry Trends – Agricultural Yields

Corn and Soybean Grain Farming: Farming has been almost continuously going through farm consolidations and reduction in the number of farms since World War II. In District 7, average farm size is at 380 acres, with some farms over 4,000 acres. Better crop genetics and better 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 (Figure 2-21 and 2-22). This trend is expected by area farmers to continue for the near future. With larger scale operations, larger equipment is also the rule, including tractors, tillage equipment, combines, and trucks. The larger equipment poses a growing problem in transporting a unit from field to field on public roads, including pavement edge and shoulder damage, ‘rolling roadblocks’ on rural two-lane highways. Because of the large yields, large farm sizes, and the need for these farmers to minimize costs and maximize delivery flexibility as markets change, farmer-owned semi tractor trailers have become the norm on the larger farms.

Figure 2-21
Corn Yield (MN Department of Agriculture)

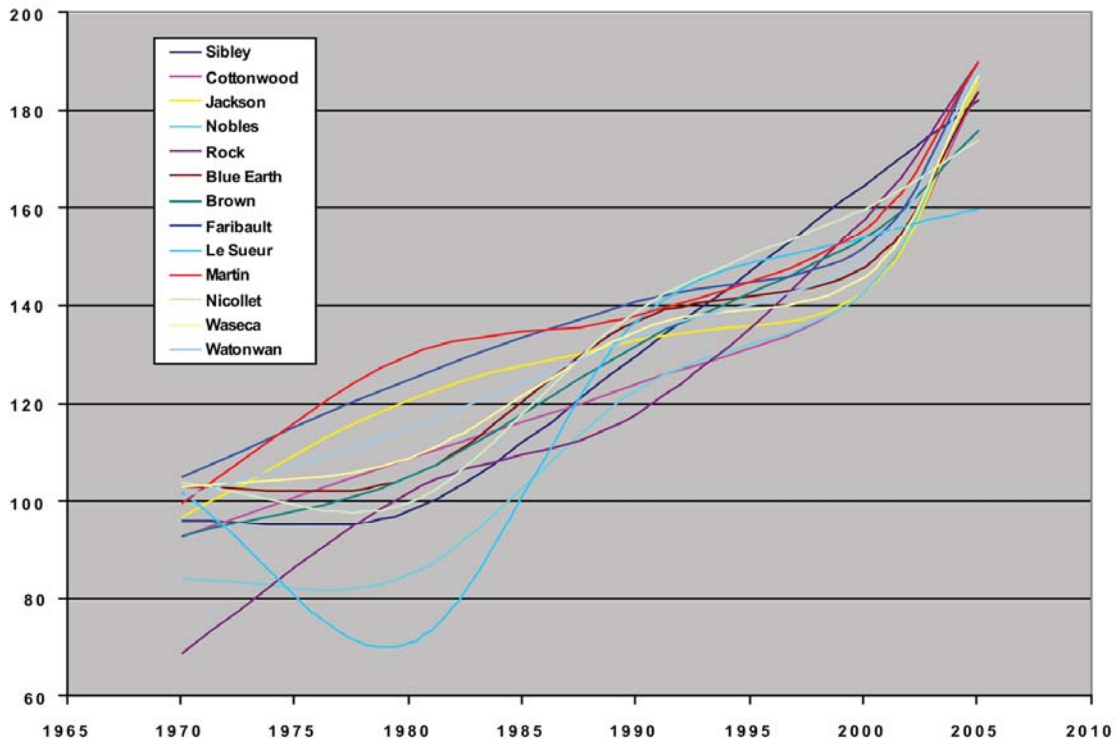
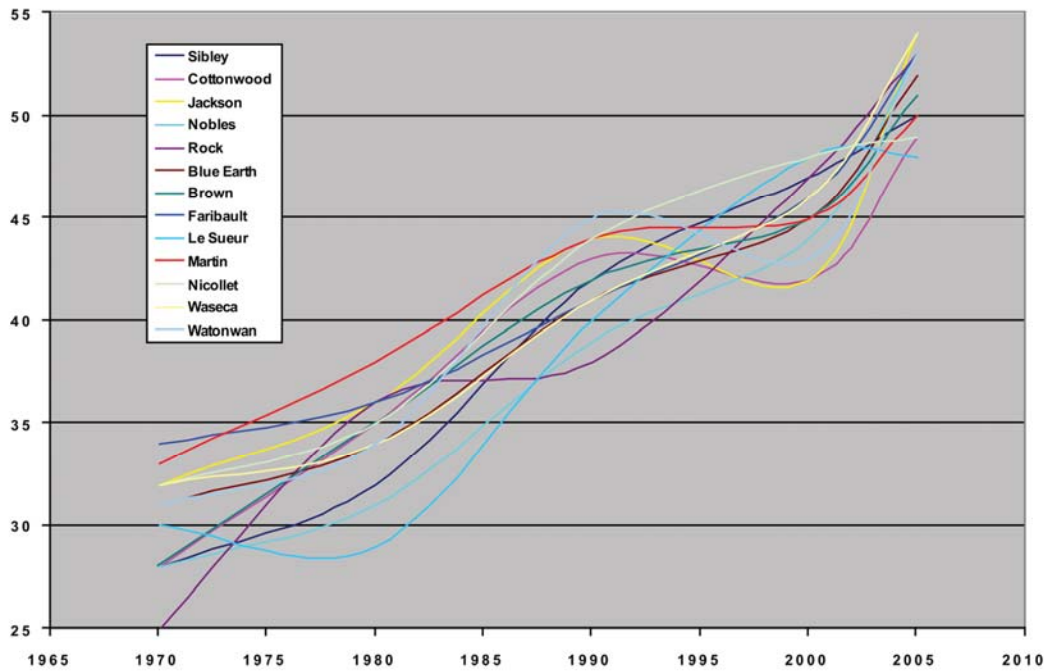


Figure 2-22
Soybean Yield (MN Department of Agriculture)



2.7.6 Ethanol-Driven Changes in Crop Rotation

The trend toward higher yields, and pressure from ethanol production to change crop rotations from 'corn-soy-corn' to 'corn on corn' to maximize total corn production, may have major effects on grain transportation volumes. Theoretical limits for corn yields approach 500 bushels per acre in some university tests and extrapolations, while actual tests and yield contests have seen 300 bushels per acre. Soybean theoretical yields have been put at 150 bushels per acre, with tests at above 90 bushels per acre. Crop management techniques learned from bean farming have been used for the soybean increases, while improved genetic strains and intensive planting and management have been combined to improve the corn production. These yield improvements in the field could increase per-acre yields by around 35 percent, while 'con on corn' rotation could push the total crop tonnage by another 55 percent. In District 7, with high yields and good management already a fact, these increases in response to market prices and demand could double grain production. That in turn would double farm-generated truck trips at harvest, and also cause secondary shipment increases of milled grains, DDGS, and farm supplies. The calculation of production, crop management, and rotation effects is shown on Figure 2-23, while conversion to Heavy Commercial ADTs is shown on Figure 2-24.

Figure 2-23

Ag Stats: Acreage cultivated, Production Equivalents, Truckloads Acreage and Farms under Cultivation in District 7

County	Total Cropland 2002 (acres)	Total Cropland 1995 (acres)	% Change	Corn 2005 (acres)	Soybeans 2005 (acres)	Key Grain Crops 2005 (acres)	% Croplands in C/S	Farms # 2002	Farms # 1995	% Change
Blue earth	374158	375047	-0.2%	182800	164700	347500	92.9%	1125	1082	4.0%
Brown	317425	320713	-1.0%	145000	127400	272400	85.8%	1047	1064	-1.6%
Cottonwood	345911	335459	3.0%	174500	157400	331900	95.9%	832	807	3.1%
Faribault	409796	418700	-2.2%	201700	169800	371500	90.7%	909	894	1.7%
Jackson	372634	352120	5.5%	179400	169000	348400	93.5%	989	952	3.9%
Le Sueur	203717	183790	9.8%	92800	81700	174500	85.7%	974	934	4.3%
Martin	398447	401182	-0.7%	216200	183700	399900	100.0%	954	998	-4.4%
Nicollet	234069	236871	-1.2%	117800	92200	210000	89.7%	730	741	-1.5%
Nobles	374443	369479	1.3%	198800	178500	377300	100.0%	1043	1029	1.4%
Rock	268581	257998	3.9%	127800	117100	244900	91.2%	721	708	1.8%
Sibley	310278	287986	7.2%	137200	116700	253900	81.8%	963	987	-2.4%
Waseca	210884	219006	-3.9%	115200	97200	212400	100.0%	759	735	3.3%
Watsonwan	253863	239733	5.6%	127500	110500	238000	93.8%	601	590	1.9%
Totals	4074206	3998084	1.9%	2016700	1765900	3782600	92.8%	11647	11521	1.1%

Figure 2-23 (cont'd)

**Ag Stats: Acreage cultivated, Production Equivalents, Truckloads Acreage and Farms under Cultivation in District 7
District 7 Grain Production Scenarios***

Genetic/Mngmnt. Rotation v	Corn @ 195 bu/ac	Corn @ 225 bu/ac	Corn @ 255 bu/ac	Soy @ 60 bu/ac	Soy @ 80 bu/ac	Soy @ 100 bu/ac	Combined lo harvest	Combined mi harvest	Combined hi harvest
Current	393256500	453757500	514258500	105954000	141272000	176590000	499210500	595029500	569846500
Corn/Corn/Soy	520260000	600300000	680340000	79920000	106560000	133200000	600180000	706860000	653460000
Corn/Corn	780000000	900000000	1020000000	0	0	0	780000000	900000000	1020000000

Truckloads: Full 5-axle Tractor/trailer Equivalents for District 7 Production

Genetic/Mngmnt. Rotation v	Corn @ 195 bu/ac	Corn @ 225 bu/ac	Corn @ 255 bu/ac	Soy @ 60 bu/ac	Soy @ 80 bu/ac	Soy @ 100 bu/ac	Combined lo harvest	Combined mi harvest	Combined hi harvest
Current	393414	453939	514464	108116	144155	180194	501530	598094	694658
Corn/Corn/Soy	520468	600540	680612	81551	108735	135918	602019	709275	816531
Corn/Corn	780312	900360	1020408	0	0	0	780312	900360	1020408

Truckloads: Percent Increases

Genetic/Mngmnt. Rotation v	Corn @ 195 bu/ac	Corn @ 225 bu/ac	Corn @ 255 bu/ac	Soy @ 60 bu/ac	Soy @ 80 bu/ac	Soy @ 100 bu/ac	Combined lo harvest	Combined mi harvest	Combined hi harvest
Current							0.0%	19.3%	38.5%
Corn/Corn/Soy							20.0%	41.4%	62.8%
Corn/Corn							55.6%	79.5%	103.5%

* Production for "current" scenario based on 2005 acreage in designated crops; "corn/corn/soy" scenario assumes 2/3 of total acres in corn; and "corn/corn" scenario assumes 100 percent of 2005 total acres planted to corn.

Figure 2-24
Grain Transportation Per Square Mile

YIELDS: (Genetics+Mgmt.) >	Corn @ 195 bu/ac	Corn @ 225 bu/ac	Corn @ 255 bu/ac		Soy @ 60 bu/ac	Soy @ 80 bu/ac	Soy @ 100 bu/ac		Total lo bu/sq mi	Total mid bu/sq mi	Total hi bu/sq mi
Production Levels: (Bushels/Square Mile) By Rotation Scheme											
Current	66768	77040	87312		17856	23808	29760		84624	100848	117072
Corn/Corn/Soy	83242	96048	108854		12787	17049.6	21312		96029	113098	130166
Corn/Corn	124800	144000	163200		0	0	0		124800	144000	163200

Truckloads per Square Mile: Full 5-axle Tractor/trailer Equivalents

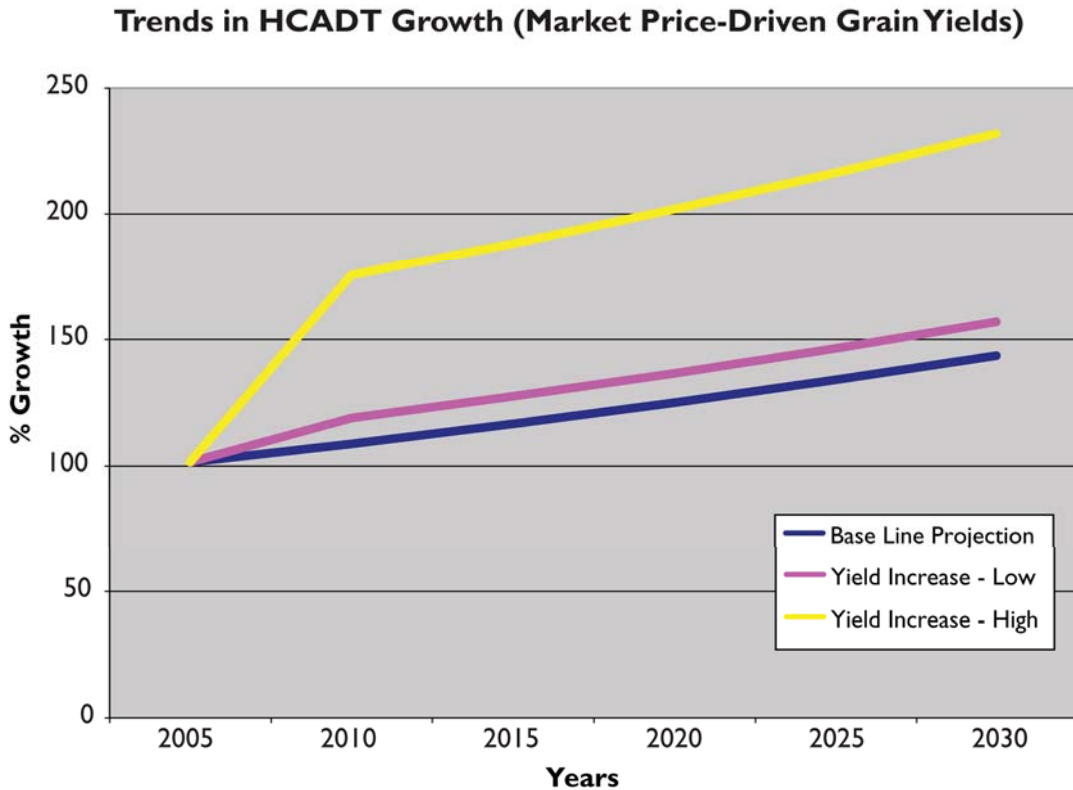
Current Crop Rotation	67	77	87		18	24	30		85	101	118
Corn/Corn/Soy	83	96	109		13	17	22		96	113	131
Corn/Corn	125	144	163		0	0	0		125	144	163

Note: Current crop mix 53.5 percent Corn and 46.5 percent Soybeans by acreage harvested.

2.7.7 Ranges of Potential Agricultural-Driven HCAADT Growth to 2030

Based on Mn/DOT projections for HCAADT growth for rural trunks of about 1.4 percent annually, compounded to 2030 as a baseline, and plotting the low range and high range of possible grain production scenarios (Figures 2-23 & 2-24) and secondary moves, HCAADT could increase to as much as 235 percent of today's traffic levels on rural roads and collectors carrying primarily agricultural production and supplies (Figure 2-25).

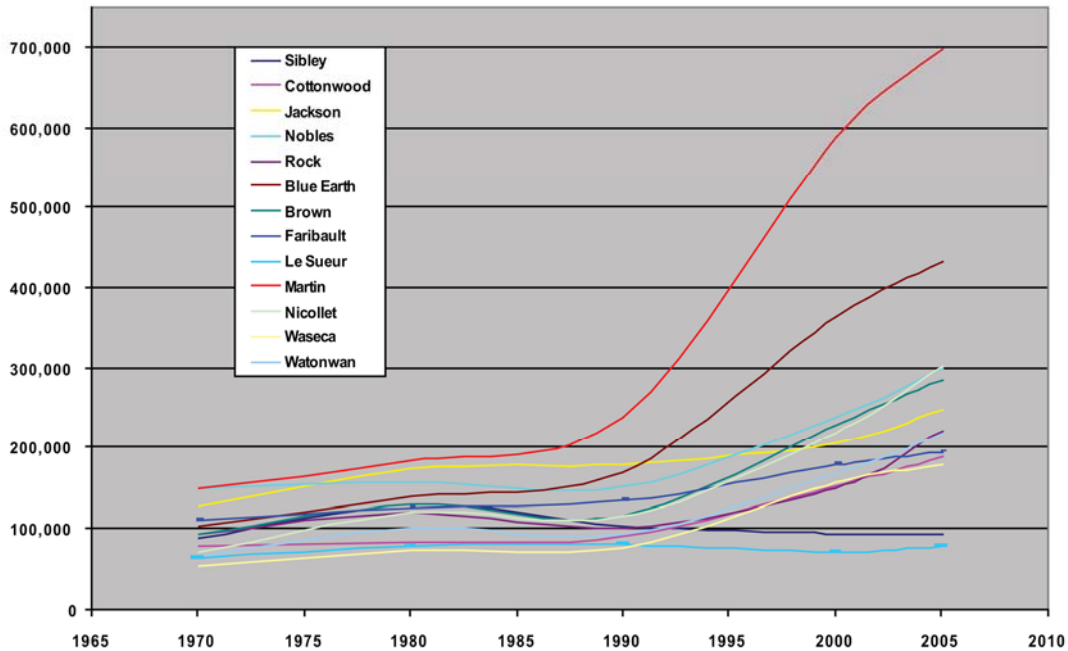
Figure 2-25
HCAADT Growth for Agricultural Production and Supplies



2.7.8 Hog Farming and Pork Production

Hog farming has grown from a general operation handling pigs from birth to market, to highly specialized farrowing, growth/feeding, and market finishing hog operations, with large numbers of animals handled on confined feedlots. The size of the average market hog has grown to 260 pounds, from about 200 pounds in 1970, with leaner meat and computer controlled feeding regimens. The number of hogs marketed in District 7 has increased by 250 percent since 1970, to 5 million hogs sold per year, with Martin County posting the largest gains (Figure 2-26).

Figure 2-26
Hog Production (MN Department of Agriculture)



A large feedlot might have several truckloads of feed delivered per day, consisting of corn meal and soy meal blended with supplemental nutrients. Hogs are matured in just 25 to 33 weeks, with 14 bushels of feed consumed in that time. The manure is usually handled in liquid form in underground lagoons, and used to fertilize neighboring crop farms by surface spreading or injection. Large operators are often tied by contract to other operators including the pork processing plants and feed suppliers. Many operate their own private fleets of hog transport trucks, feed trucks, and mixers. The transporters are configured to carry as many as 170 market hogs on two decks, representing a full load by weight. Hog-related truck movements in the District are estimated to account for 4 percent of total truck traffic. Long term growth in this increasingly integrated industry is expected to continue.

2.7.9 Ethanol Production

District 7 contains half of Minnesota’s ethanol production capacity, and is expected to continue to grow, both because of very beneficial tax treatments and government renewable-fuels policies. This assumes that world crude oil postings and domestic gasoline prices remain relatively high, at above \$2.00 per gallon of gasoline. In 2005, ethanol plants consumed the equivalent of 19 percent of the area’s corn production. This is expected to rise to 33 percent of the District’s corn production in 2008.

Another factor is plant efficiency. Current average conversion of corn to ethanol is one bushel of corn to 2.7 gallons of ethanol. This has improved steadily in the recent past and is expected to continue to improve. The major marketable byproduct of the ethanol process is DDGS, used for feed. For every bushel of corn produced, one-third bushel of DDGS results. At an average plant, all of the corn arrives by truck, and half of the ethanol and DDGS leaves by truck. The balance of the product moves by rail. The steady increases in efficiency, and more long distance rail moves as total production volumes rise, will mean more shipment of ethanol per ton of plant throughput with a larger percentage of product output moving by rail.

DDGS is also finding a niche in international markets, which is also expected to increase. This move is almost entirely identity-preserved, sealed movements in international cargo containers. The cargo containers are alternately loaded at a transloading warehouse near an intermodal container transfer facility (railroad loading yard) and drayed to the railroad for loading on double-stack container trains destined for a coastal port, or trucked to the farm or elevator, loaded there, and then trucked back to the rail yard. For District 7, the nearest transfer facilities are in St. Paul or Minneapolis, although some material gets trucked as far away as container loading facilities in Rockford and Chicago, Illinois when necessary.

2.7.10 Milling and Food Processing

An historic and continuing use of local grain crops is to supply milling and food processors, such as Cenex Harvest States Oilseed (CHS), ADM, and Cargill. They mill corn and soybeans in the area to produce food and fuel grade oils and vegetable fats. The plants are clustered around the Mankato area, with other smaller processed food manufacturers in this area as well as other population centers in the District. These include bottlers, wholesale bakeries, and other food producers.

The milling plants turn out large volumes of milled soy and corn meal, used most often as livestock and poultry feed. Most of the crop supply arrives by farmer-owned or independent-operator trucks to the plants or intermediate collection points, while some of the resulting fats and oils and much of the soy and corn meal move by rail. These large processors are national or international in scope and operate large fleets of rail cars. Because the markets for their end products are tied to relative necessities and the retail food chain, product demand (and commodity volume) is fairly stable.

2.7.11 Non-metallic Minerals

This category of commodities includes three distinct products that are being quarried or mined in District 7. Two (2) of the 13 counties have these materials as their largest tonnage of shipments originating from local businesses. Aggregate, including sand and gravel for general construction and fill purposes, is produced in the northern counties. This industry is seen to be growing with the depletion of Metro Region reserves, although distance and quality are limiting factors for District suppliers. Consolidation in this business has been occurring recently, with Oldcastle Materials, a subsidiary of Dublin, Ireland, based CHQ, buying up Southern Minnesota Materials (the largest local aggregate supply company) and other Midwest producers.

In the same area along the Minnesota River, large supplies of kaolin clay are mined, as binder in fired brick and paper coatings, depending on the quality and characteristics of the individual deposits. Natural Resources Research Institute, a branch of the University of Minnesota, finished a comprehensive mapping of clay deposits five years ago that confirmed the existence of large, untapped supplies, ensuring that the industry should be able to continue mining clay for the foreseeable future. While the aggregate is primarily handled by truck to local users, the clay is moved in covered bulk hoppers by rail to many of its consumers. Brown County has the bulk of these materials being produced. The third product is high grade silica sand, used in glass making and other manufacturing processes. Again, this material is most often shipped by rail. The eastern portion of the District, especially Le Sueur County, is the site for this production. The trend for this industry is expected to be stable or growing, due to the quality of some of the deposits.

2.7.12 Stone and Concrete

The concrete industry, as documented in the industry profile of Wells Concrete, has several facets. The ready-mix concrete business is dependent on local mixing plants and relatively short truck hauls by specialized concrete mixing trucks. The truck fleets of mixers are all company owned, as are some but not all of the supply trucks that bring in sand, gravel, and Portland cement. Although Wells and many competitors own multiple sites and plants, the business, due to its local nature and multiple suppliers, is highly competitive. This business is prone to construction market variations and seasonal lulls. Spring load restrictions do not directly impact this business, but it does define the start of construction season since contractors can't move their equipment into place or move dense materials to sites until the restrictions are lifted.

The other concrete manufacturing business operating in the District is prestressed, prefabricated concrete forms, panels, and products. Wells is a prime producer of these products, and also offers architectural and design services plus full building erection capability. Their market covers a radius of 200 miles and beyond, and is not automatically limited by weather or seasons. Many of the shipments of manufactured concrete panels and forms are oversize but not overweight. Crane trucks and other support gear are owned and transported by the company. This market has shown reasonable strength and stability

2.7.13 Manufactured Goods

This category covers a wide variety of businesses that fabricate or manufacture consumer and industrial products. In District 7, this includes farm implements, trailers, recreation equipment, and products like the custom milling and conveyor systems made by Scott Manufacturing, one of the larger firms in the area. Employing 70 people, they design and construct high-value, heavy-duty feed mill, food processing, drying, and crushing machinery. Although small, their markets are global and entail shipments by truck or container to most industrialized areas in and out of the US. Because of the labor-intensive nature of their business, they ship relatively small volumes of raw material and finished goods, on the order of 2 to 4 trucks total per day. Most of these businesses are located on the trunk highway network and have adequate transportation for their needs. These businesses are often the first to feel economic downturns, and while prone to these swings, remain an important source of skilled and higher-paying jobs for the District.

2.7.14 Security – Cargo and Vehicles

Security issues in District 7 fall into three areas. Conventional cargo security, where trucks, railcars, or containers are sealed or locked to prevent theft and tampering is still the largest concern for shippers in the area. The latest requirement for this type of shipment security is for identity-preserved shipments, where either because of specialty needs, such as genetically engineered or treated grains, including seed, or DDGS having a quality guarantee to be maintained, the vehicle, usually a container will have a high-security seal affixed and recorded to secure access to the cargo. Because of international embargoes and restrictions as well as contractual requirements, this protocol has taken on new importance.

Safety for drivers and their vehicles on the roads and at terminals and stops, and access to trains and railroad property, is the second, conventional security issue. This is largely a policing issue. Criminal activity has historically been low in this area, but issues of trespass and robbery have seen an increase in this District similar to other rural areas due to a rise in drug abuse.

The third and relatively new safety issue concerns homeland security and terrorist-related activities. Although the area does not have any sites that might be considered high-priority targets, including major bridges, public buildings, or facilities or plants with national significance, surveillance, tightened security, and awareness of threats is urged in general by federal and local authorities. Traditionally open access to plants, truck terminals, and rail yards is being tightened where possible, but there is little in the way of resources to help harden potential targets in areas like District 7. In our profiles, none of these security issues has been considered a major risk or hindrance to freight operations locally.

2.7.15 Safety – Highways

Two issues stood out in study work and profiles in the District. Road safety around the operation of heavy trucks is one of those. Several sources noted that heavy commercial vehicles, operating at high speeds on secondary roads, are seen as a risk for light vehicles, drivers, truckers, and farm equipment operators. Business operators noted that other safety issues included narrow, steeply crowned roads and poor shoulders, transitions from four lanes to two lanes at project sites and trunk highways in the middle of long-term construction upgrades, including US 14 and MN 60, and minor but unmarked changes in geometry and open-country, low-visibility intersections, both of which have been known to surprise commercial drivers due to unfamiliarity or fatigue.

Safety played an issue in considering size and weight increases for heavy commercial vehicles in the District. Wells noted that a longer overall truck length would be a minor benefit to their prefab hauls, but considered the oversize permitting process sufficient to handle almost all of their issues. ADM noted that increasing truck weight limits would have a corporate benefit in marginally reducing costs, but all sources consistently noted that the general public would see bigger trucks as a threat and a negative development, in most cases sympathizing with that viewpoint. In the case of Gaalswyk Trucking, they saw any size increase not only as a safety risk, but also a move that would increase wear and tear on their rigs without any increase in revenue to the contract operator to compensate for it.

As part of the study effort, Mn/DOT District 7 performed an analysis of freight vehicles from 1996 to 2005. Crash rates and severity were compared for the full road system, trunk highways, county roads, and local roads and streets. A breakout of collisions with trains was also included. Freight vehicles on average account for between 5.5 to 7 percent of the vehicle fleet, and on the trunk highway system accounts for about 12 percent of AADTs. Conclusions were reached on the following issues:

- The crash rate for freight vehicles does not increase with increasing HCADT on a given class or section of highway.
- Trucks are involved in a significant number of fatal and incapacitating crashes-while commercial vehicle crash rates are comparable to general vehicles, crashes tend to be more severe. Truck fatalities occur at twice the rate of the overall fatality rate.
- 76 percent of fatal truck crashes occur in rural areas, and 61 percent occurred on two-lane roads.
- The majority of collisions with trains occur on local, County, and CSAH roads, indicative of more at-grade crossings and lower levels of protection at a large number of railroad grade crossings.

These coincide with information presented in the joint Mn/DOT/DPS Statewide Heavy Vehicle Safety Plan. This plan sets policy goals to reduce truck related crash fatalities by 25 percent by 2008. The plan proscribes a list of educational, enforcement, and infrastructure improvements to meet the goal.

According to reports and testimony given by Federal Railroad Administration representatives at the 2007 Midstates Rail-Highway Safety Conference in Omaha, Nebraska, the 13 states in the Midstates region account for half of the grade crossing accidents in the US. Much of this is due to the rural nature of crossings and low levels of protection, but other factors were reported as increased farm vehicle travel in large or heavy vehicles and the increase in non-commercial operators. This leads to the next safety concern, Railroad Grade Crossing Safety.

2.7.16 Safety – Railroad Grade Crossings

The data concerning Collisions with Trains discussed above, and rural grade crossing issues would suggest that this remains a major safety concern. From profile input, the perception is that most grade crossings are adequately protected, and trains and signals are generally visible on the level lands of the District. However, occasional grade crossing accidents do continue to occur, and everyone mentioning this issue had some personal connection or observation on the issue. The possible expansion and traffic increases on the DM&E's east-west line that may be hauling dozens of daily coal trains is seen as a very large impending problem for local communities and area highway crossings. Most people appeared to be aware of the grade crossing safety issue and educational programs like Operation Lifesaver. Statistical results from these programs and the ongoing state and federal investments in improved crossing protection have resulted in a steady decline in accidents and fatalities since the early 1980s, with pedestrian and trespassing injuries on railroad property now exceeding grade crossing injuries in Minnesota. The growth in farm-operated heavy trucks and larger, slow farm equipment suggests that Operation Lifesaver and State-supported grade crossing safety education programs would be well served to begin focusing on agricultural areas and the agricultural user. A contributing factor, looking back at District demographics, may also be the aging of both the general and the farm population.

2.8 FREIGHT SYSTEM ANALYSIS

A freight flow constraints analysis was conducted to identify system-level impediments to the flow of freight in District 7. The two major modes of freight transportation within District 7, trucking and rail, are discussed below in terms of the four specific types of impediments to freight flows: Geometric Deficiencies; Infrastructure Condition Impediments; Operational Impediments; and Functionality Issues.

2.8.1 *Geometric Deficiencies*

Several common unimproved rural road configurations were reported in the area. These included poor turning and queuing lanes to handle heavy trucks, and substandard turn radii in local communities and streets. Intersection design and signal cycles were also noted in a few instances. It has been observed by both profiled companies and highway engineers for several different jurisdictions that many local road designs and geometries were set in the fifties and sixties without any further upgrade in the interim period. They allowed for single frame, relatively short wheelbase vehicles with relatively light axle loadings. Current oversize farm equipment and the advent of semi tractor trailers in common farm use, with a 65-foot wheelbase, readily exceed the capacity of these outdated designs.

Highway-rail crossings were another problem area. This included steep approaches on rural secondary roads, and insufficient stopping area between gates and signs at the railroad and parallel highway routes when turning to cross. An example is New Prague's Main Street access to downtown across the Union Pacific mainline track. With a signaled intersection, heavy traffic in three directions and the elevator entrance on the approach to the crossing, one vehicle can snarl and block all the traffic there. At ethanol plants, such as the Lake Crystal plant, the clearance from MN 60 to the Union Pacific tracks is less than a truck length to the crossing gates, with the possibility of backing heavy vehicles onto the main highway during a crossing event.

For the full 13 county area, however, no consistent patterns of deficiencies were noted beyond the challenges imposed by bigger, heavier, and more frequent farm and freight vehicles. Several profiled parties noted the steady improvement of road condition over time, without speculating on future conditions.

2.8.2 *Infrastructure Condition Impediments*

These refer to roadways with weight limits less than 10 tons per axle and/or 80,000 lbs of total weight. The majority of trunk highways within District 7 are year-round 10-ton routes. This means they are not load restricted during the spring load restriction period. However, there are seven trunk highway segments within District 7 that are spring load restricted. This is discussed and mapped in more detail under Functionality Issues.

Infrastructure condition is directly impacted by heavy axle loadings more than any other factor. The road design limits are tied to structure capacity and life calculated on Equivalent Single Axle Loadings (ESALs), which equates traffic and load levels to 18,000 pound single axle loads as the benchmark. An average five-axle semi tractor trailer trip for a vehicle with an 80,000 pound maximum weight limit, assuming a 50 percent empty factor, equates to an ESAL of about 1.1.

A single light personal vehicle will have an ESAL of .001 or less, with more than 5,000 trips to equal the road impact of a single Heavy Commercial vehicle. Road design that accounts for a sufficient traffic and load level should accept those loads with little upkeep or maintenance over a twenty year life, but exceeding the cumulative ESALs during the life of the road will begin to accelerate damage and deterioration.

A significant challenge in this area noted by State Aid and the Minnesota County Engineer's Association is the lack of good data to make informed decisions about current and future traffic levels, particularly heavy commercial vehicles types, sizes, and traffic volumes. Even before forecasting can be done, a base traffic level needs to be established for HCAADT's. This is especially important in rural, agricultural areas like District 7, since the dispersed nature of freight movements is expected to be widespread and evenly distributed. Concentrations of freight traffic onto trunk highways and major connectors follow essentially historic patterns because of this in most forecast models. Current HCAADT counts and vehicle classification data are sketchy or nonexistent for much of the county and local roads, including the CSAH system.

Another deficiency is current actual load capacity on the local and county roads. Testing methods and equipment are still being evaluated, and a consistent comprehensive road load testing program has been designed but not yet implemented beyond the demonstration phase. Capital investment planning as regards the 10-Ton network is hampered by this shortcoming as well.

Overloads are a major cause of road structure damage. As loadings increase, damage rises by the power of four. A truck loaded to twice its legal limit will actually cause 17 times the damage that a legal truck will. This has been well documented in numerous studies nationally and internationally, and is covered in Mn/DOT's Size and Weight Study and Spring Load Restriction Study. This raises the issue of proper enforcement and fine levels. As noted in several profiles and stakeholder input, that enforcement is perceived as inconsistent, sometimes capricious, and generally ineffective in protecting local road infrastructure. Several alternate suggestions, including redirecting weight enforcement resources to mobile units instead of weigh stations, and permitting or limiting heavy vehicle use of local roads to local business access, have been put forward during discussions.

The other connected issue is truck size and weight limits. Central to this District 7 study is the reception and effect of those limits to area freight haulers. Again referencing the ESAL calculations and road design standards, one option of raising maximum vehicle weight from 80,000 pounds to 89,000 pounds would essentially double the ESAL of a fully loaded truck unless the axle loading is held at its current limit. Increasing the axle count, a strategy endorsed by Mn/DOT, would be the primary means of maintaining the cumulative ESALs within current road design capacity.

Roads with less than 10-ton ratings will also be impacted by possible increases in farm-generated heavy truck traffic. These local roads out of necessity need to be used as connectors to reach the 10-Ton and trunk system, emphasizing the fact that many if not most of the truck traffic trends in this primarily agricultural area will negatively impact the 'last mile' of the system directly. As farm-to-market traffic in class 6-8 vehicles moves from the farm onto local roads, and then concentrates onto the higher-traffic collectors, the local, County, and CSAH roads will need

resources to maintain and upgrade the infrastructure. Whether in short-term maintenance, or upgrades in deeper subgrades, better materials and design, and strengthened surfaces, the cost will have to be met one way or another if the District's business activities are to be supported.

2.8.3 Operational Impediments

These are defined as routes where operating speeds are at or below adopted speed performance targets: 60 mph for high priority interregional corridors, 55 mph for medium priority interregional corridors and 50 mph for regional corridors. They also refer to metro area urban freeways that experience peak period speeds below 45 mph. Based on information provided in the Statewide Freight Plan, there are no corridors performing below speed targets in District 7.

Although, corridors within District 7 are operating at or above speed performance targets, there are corridors in close proximity to the District that are not above these targets and are affecting freight flows into and/or out of District 7. The Statewide Freight Plan identified several corridors within the metro area as below targeted operating speeds. These have been noted in the profiles and elsewhere as affecting District 7 resident businesses due to the large amount of traffic interchanged between District 7 and the Metro area.

2.8.4 Functionality Issues – Heavy Duty Road Network Connectivity and Coverage

These issues revolve around gaps in the roadway or truck network that lead to routing inefficiencies, and collector roads that are not rated to carry fully loaded heavy commercial vehicles. DPS registrations and the US Bureau of Statistics note that almost half of all privately registered trucks in Minnesota operate in agriculture-related service, including half of all Class 6-8 multi-axle heavy trucks. This supports the observation from profiles and local officials that in addition to upgrading implement size as farms consolidate, many farms now operate five-axle semi tractor trailers as a matter of course. Farm trade organizations have documented that in the last five years, five-axle trucks have increased their share of on-farm grain deliveries from 30 percent to now over 60 percent. These trucks are often used for grain collection in the fields under appropriate conditions, but also give the farm operator lower costs and full control over crop delivery to market. This is reinforced in exemptions to the new Hours of Service regulations for truck drivers, allowing extended driving hours for harvest periods and within 100 miles of origin for farmers.

An analysis of the existing 10-ton system within District 7 was completed to identify gaps within the system. Of the Trunk Highway system, practically all mileage is 12-month, 10-ton roadways. Recommended upgrades to the 10-ton system were prioritized based on the following schedule:

- 1st priority – spring load restricted 10-ton highway segments (improve from 10-month 10-ton routes to 12-month, 10-ton routes)
- 2nd priority – connectors that tie the existing 10-ton system together (Gaps between trunk highway intersections or end points and other trunks or major freight generators)
- 3rd priority – connections that fulfill a 10-mile grid for the 10-ton system

The analysis of this network is illustrated in Figure 4, (Appendix) Functional Upgrades, Current Ten-ton Network.

In addition to evaluating the existing 10-ton system, the conceptual 10-ton network identified by county engineers was also evaluated for further potential investment. The conceptual network was evaluated similarly to the existing 10-ton system by identifying 1st and 2nd priority connectors. First priority connectors were identified as segments that tie the existing 10-ton system and conceptual system together, essentially eliminating gaps and other problems with system continuity. Second priority connectors were identified as connections that fill in the 5-mile grid that is consistent over the majority of the conceptual 10-ton system. This analysis is illustrated in Figure 5, (Appendix), Functional Upgrades , Conceptual ten-ton Network.

2.8.5 Analysis of First Priority Upgrades

Based on the 10-ton system analysis described above, an economic analysis was derived to determine the cost effectiveness of implementing the recommended upgrades to the 10-ton system. Using the endpoint of the closest existing 10-ton route, a length of the existing trip to the closest heavy duty freight collector was identified. This length was then compared to the length of trip if the upgraded 10-ton road segment was in place. The difference between the original trip length and the new trip length (using the recommended 10-ton upgraded route) was used to calculate the total miles saved. From this calculation a fuel cost saved and driver cost saved was derived to determine cost efficiencies, if any, in implementing the upgraded 10-ton route.

The 2004 HCAADT volumes were used for existing trunk highway spring load restricted routes to extrapolate these cumulative costs, the ability to directly utilize these segments as 10-ton routes versus the costs associated with diverting or detouring a fully loaded heavy commercial truck. A 20-year design life was assumed for a typical 10-ton roadway and a 60-day window was used to quantify the spring load restriction period in determining these calculations. The calculations are shown in Figure 2-27. Again, these are specifically costs associated with indirect routing on the current system versus having available an optimized heavy duty truck route. The highlighted cells indicate first priority upgrades involving strengthening these limited road segments for four-season use by conventional Hot Mix Asphalt (HMA) overlays or lifts.

Figure 2-27
Heavy Commercial Vehicle Diversion Costs (Seasonal Load Limited roadways upgraded to realize savings)
Truck Diversion Costs-Current 10-Ton Network Gaps/Restrictions

ID	SLR*	Original Trip Length (Using Endpoint)	New Trip Length (Using New Segment)	Miles Saved/trip	Fuel Cost Saved/trip	Driver Cost Saved/trip	Total Cost Saved/trip	20 year Cost Saved Based on 100 HCAADT (1)	20 year Cost Saved Based on 300 HCAADT (1)
A		23	5	18	\$13.09	\$32.73	\$45.82		
B		24	18	6	\$4.36	\$10.91	\$15.27		
C		44	27	17	\$12.36	\$30.91	\$43.27		
D		52	37	15	\$10.91	\$27.27	\$38.18		
E		N/A	N/A	N/A	N/A	N/A	N/A		
F		13	5	8	\$5.82	\$14.55	\$20.36		
G		31	17	14	\$10.18	\$25.45	\$35.64		
H		41	34	7	\$5.09	\$12.73	\$17.82		
I		57	12	46	\$33.09	\$82.73	\$115.82		
J		45	22	23	\$16.73	\$41.82	\$58.55		
K		26	31	-5	-\$3.64	-\$9.09	-\$12.73		
L	7-ton	16	9	7	\$5.09	\$12.73	\$17.82	\$2,138,181.82	\$6,414,545.45
M		19	11	8	\$5.82	\$14.55	\$20.36		
N	7-ton	48	25	23	\$16.73	\$41.82	\$58.55	\$7,025,454.55	\$21,076,363.64
O		24	19	5	\$3.64	\$9.09	\$12.73		
P		22	11	11	\$8.00	\$20.00	\$28.00		
Q		21	22	-1	-\$0.73	-\$1.82	-\$2.55		
R		21	17	4	\$2.91	\$7.27	\$10.18		
S	7-ton	48	13	35	\$25.45	\$63.64	\$89.09	\$10,690,909.09	\$32,072,727.27
T	7-ton	34	25	9	\$6.55	\$16.36	\$22.91	\$2,749,090.91	\$8,247,272.73
U		14	12	2	\$1.45	\$3.64	\$5.09		
V	7-ton	35	16	19	\$13.82	\$34.55	\$48.36	\$5,803,636.36	\$17,410,909.09
W		46	31	15	\$10.91	\$27.27	\$38.18		
X	7-ton	31	26	5	\$3.64	\$9.09	\$12.73	\$1,527,272.73	\$4,581,818.18
Y		25	18	7	\$5.09	\$12.73	\$17.82		
Z		N/A	N/A	N/A	N/A	N/A	N/A		
AA	7-ton	32	16	16	\$11.64	\$29.09	\$40.73	\$4,887,272.73	\$14,661,818.18
AB	7-ton	14	10	4	\$2.91	\$7.27	\$10.18	\$1,221,818.18	\$3,665,454.55

NOTES:

*SLR=Spring Load Restricted Route

(1) Review of 2004 HCAADT shows all SLR segments are within a 100-300 HCAADT range

Total Trip Cost

\$757.27

Any conclusions based on these diversion costs are not intended to positively quantify a given road improvement program or project, but illustrates one form of economic impact that occurs. On many of the segments, over one million dollars of costs may be accumulated over a twenty year road life due to the load restrictions. In simplistic terms, the most commonly recognized road upgrade to achieve a ten ton/twelve month capacity on an existing ten-ton/ten month (Spring Load Restrictions applied) is to apply an additional two inch HMA overlay, and adjustment to graded shoulders, needed repairs, etc. Construction practice would be to mill off the top 2 inches, and then apply a 4 inch overlay to gain the necessary thickness and strength. This results in a grade rise of 2 inches, causing narrower, steeper shoulders that will also need to be addressed. Also, some roads will be restricted due to other problems besides pavement strength, such as cracks or joints, or a weak subgrade. In these cases the roadway may still need to undergo more extensive reconstruction or reclamation. The cost of a simple upgrade without complicating factors, using 2005-2006 bid awards for the southern Minnesota area as benchmarks, would range from \$35,000 to \$60,000 per lane mile for a 2-3 inch overlay with a ten year life assumed for the overlay. That would translate to a \$140,000 to \$240,000 equivalent cost in current dollars for the twenty year life used in the diversion calculations, or a 10 to 20 percent cost-to-benefit ratio (that is, road upgrade costs as compared to economic benefit to trucker and shipper) depending on the road segment, its design life and capacity, and specific traffic volumes. This does not net out normal repairs undertaken on a given road during the 20-year period, nor does it recognize any credit for the expected lower repair and maintenance on the road segment due to the upgraded load capacity. Even with a more extensive repair and upgrade utilizing a mill and overlay and with a net 2 to 3 inch added thickness, at a cost of \$75,000 to \$110,000 per lane mile, the economic benefit of the upgrade is still positive.

The relative costs of road improvements will of course rise very rapidly, while the benefits will be relatively static, depending on many contributing factors. Besides pavement and subgrade, underlying soil composition and geology may play a part, as will water tables and hydrologic features. Bridges on the route, their placement, design, and condition, may have a very major part in these cost calculations. Just as in constraints caused by substandard or outdated road design, a weight-limiting bridge structure will need to be replaced with a new bridge that will meet current strength, width, and life factors as well as recognize the size and weight of current husbandry (farm) equipment, and projected freight volume increases and truck size and weight increases. The latter may not increase axle loadings, but will significantly increase total bridge span loadings, up to and beyond some of the loads exhibited by exempted husbandry equipment.

Two alternate methodologies were considered to determine the 60-day impact of spring load restrictions in financial or economic terms. The first alternate methodology considered freight generators located on spring restricted 10-ton routes and would evaluate the cost for intermediate storage during the 60-day restricted period, assuming that deliveries could be delayed, but storage fees would be paid to a third-party elevator or storage site to hold sufficient crops for an alternate delivery plan during the thaw. Although storage fees and rates were obtained, in the end this methodology was judged to contain too many unknowns and variables to assume a representative operating scenario. For instance, the use of farm storage, exchanges, and schedules for delivery allocations could be managed to mitigate much of the storage expense. This calculation would still be valid if more specifics about an area and the road segment were known. The second alternate methodology involved looking at the load restriction itself and calculating the lost payload per truck, then assuming that a number of additional truck trips and

their costs were added to make up the shortfall of capacity. While theoretically sound, it fails to reflect the actual practices of short runs on local roads and other connectors to reach the heavier rated through route, and the general observance that enforcement may be negligible, the shipper or trucker may not be in control of the loading, and specific, observable road damage under many conditions is not apparent to local operators (for instance, travel on gravel roads in dry conditions with solid, coarse-based surface and underlay).

2.8.6 Updates to Current and Conceptual 10-Ton Network Mapping and Analysis

Following circulation of the draft 10-Ton Network mapping and analysis, several comments requested that information be updated to reflect the most current County and local road capacity information. It was noted at this time that State Aid and Mn/DOT had not collected updates to information on the 10-Ton system since regulatory changes in 2004 gave the counties greater leeway in declaring and posting weight limits on their roads, which represent a minority but significant percentage of the Network. A request for updates was circulated to all County Engineers in the District. Five Counties responded with specific informational updates, and these were incorporated in the final mapping of the 10-Ton Network presented in Figures 4 and 5 in the Appendix.

2.8.7 State Aid 10-Ton Network Oversight and Prioritization

In line with the above analysis, State Aid has developed prioritization criteria for investment and upgrade to the CSAH system, which is a vital intermediate link in the 10-Ton Network evaluated and mapped in this Study. After 2004, partly due to legislative changes affecting County authority over non-CSAH roads, State Aid has cooperated with County engineers but provided a reduced level of oversight for this freight network, and let its collection and updating of County highway posting and classification data lapse. Due to past practice and current involvement at the County level, this organization would be the logical entity to provide ongoing analysis and coordination for the entire 10-Ton Network at the County and local levels, to best improve the system's continuity and coverage. Using either the methodology and mapping described here, or the State Aid criteria and combined with comprehensive collection of road load testing data and HCAADT counts, this would allow definite progress in planning and resource allocation to meet the state's growing freight transportation needs.

2.8.8 Railroads

Two aspects of the freight railroad system were analyzed. These were carrying capacity of the track structure for increasing railcar weight limits, and geometric constraints.

Weight Capacity

Class I railroads, including the UP and BNSF, have implemented new maximum gross weight for four-axle freight cars, increasing the recent maximum of 263,000 pounds to 286,000 pounds gross weight per car. They have also required that regional and short lines that interchange cars with them be able to handle the heavier cars. In District 7, this has been a concern for lines such as the Minnesota Prairie Line and Minnesota Southern, already operating with marginal track and bridge structures and 10-mile per hour speed limits. Other regionals such as the DM&E and the IC&E have marginal conditions on many lines but have generally adopted use of the bigger cars. Shippers who own their sidings and yards are also at risk. The upgrade of ties and roadbed,

rail size, and bridge capacity is expected to require financial investments above and beyond the financial capacity of many of these rail operators to pay for or be covered by existing revenue streams. Beyond that, the Class I railroads are considering a further upgrade to 315,000 pounds maximum gross car weight. While many consider the 286,000 pound limit a manageable problem, the same parties consider the 315,000 pound limit completely unworkable for systems with substandard track. Since these new, heavier car designs require larger wheels, bearings, and metallurgical improvements as well as testing and FRA approvals, adoption may be further in the future but highly probable. This poses a potential for reducing the railroad system's capacity and access for shippers at a time when it is most needed for economic expansion. The structural challenges are analogous to those faced by local and county roads under heavier truck and farm equipment loads. The actual track structure may even survive at very low operating speeds and marginal conditions, but bridges in particular may be prone to catastrophic failure under the bigger cars, effectively embargoing the line and shutting down the entire rail operation for all users on that route or branch.

Mn/DOT's Minnesota Rail Service Improvement (MRSI) program, local funding, and federal programs in general, have in the past successfully managed to support both specific shipper and rail carrier needs and larger railroad preservation and upgrade projects, including the Minnesota Prairie Line and the Minnesota Southern in District 7. Mn/DOT has served as the administrator of both state and federal funds in these efforts. The challenge of heavier car weights is expected to put an even greater demand on these programs if shipper facilities and short line railroads are to be maintained. One of the key suggestions from several profiled businesses that have an interest in the MRSI program is to recognize both this increased need and the escalation of construction costs.

It should be noted that several shippers would have lost rail access without upgrading or improving their facilities. In the case of Minnesota Prairie Line, continuing rail service allowed for the expansion of an ethanol plant. With a combination of continued rail service and the plant expansion, unit trains of ethanol for long-haul delivery are routed via the Twin Cities onto the BNSF. This delivery option, access to out-of-state markets, and the success of these plants can be clearly linked to the state's assistance programs.

Geometric Constraints

The main geometric constraint to expanded railroad operations is vertical clearance above the rail. For operation of extra-height equipment like tri-level auto racks and double-stack container well cars for intermodal service, vertical clearances for signals, bridges, and power lines, among other objects, need to be increased to a nominal 21 feet. Many lines in the District still have obstructions to the clearances needed, restricting operations of trains using these cars. Horizontal clearance is a less important problem, but may curtail some oversize/over width shipments, such as wind turbine components, that may need transportation in the near future.

2.8.9 Waterways

Historically, a large volume of grain originating in the District was destined for export markets, and transportation costs naturally funneled much of that traffic to the Minnesota, Mississippi, and Missouri barge carriers as the low cost mode. Although barge availability was temporarily hindered by Hurricane Katrina, capacity to move these volumes still exists on these waterways.

Low water levels, increasing fuel costs, and other operating expenses have driven barge rates up in the last year to where shuttle trains are more than competitive for a growing share of this traffic. The Missouri River in particular has seen an almost complete loss of traffic to the railroads. Also, this represents just one chapter of a trend toward reduced volumes of barge traffic that has continued since 1970. From the barge operator's viewpoint, the single greatest impediment to their growth and competitiveness is expansion of the locks and dams on the Upper Mississippi, which would allow faster transit times and reduction of double and triple locking of tows at each dam.

2.8.10 Air Freight

Air freight for the most part is handled through Mankato airport on the available scheduled service, or forwarded by truck to the Twin Cities for loading to air carriers at MSP. Two regional airports in the District offered chartered freight service as needed. Mn/DOT is regularly considering upgrades to these regional facilities, and local input includes more access to air freight services for District 7.

2.8.11 Intermodal Container

As previously mentioned, this mode has become the transport of choice for international shipments and identity-preserved cargo. Nationally, intermodal container transportation has grown by 15 percent a year since the mid-1980s. Domestic cargoes have increased as fast as international movements during this expansion, thanks to freight consolidators, long-distance truck companies contracting for rail carriage, and third party logistics (3PL) freight forwarders, who offer full-service transportation services and management for shipments anywhere in the world. District 7 is constrained in their participation in this trend mainly because of lack of local container loading ramps, and distance to existing major facilities such as the Twin Cities and Chicago. The Twin Cities, while relatively close, offers challenges in traffic congestion and access via the available freight connectors to the container yards at Shoreham and Pierce Butler (CP and BNSF, respectively).

2.9 FREIGHT SYSTEM SUMMARY:

This chapter analyzed the freight system in Mn/DOT District 7 from several different perspectives. In order to maximize local input and private sector information flow, direct input was obtained from industry representatives for the key commodities being transported in the District. These key industry representative businesses were selected and Profile Interviews were designed and arranged by the project team in order to talk directly with company personnel about information and issues. Their input was corroborated with and expanded through additional research from a series of resources, including Transearch freight flow data, Mn/DOT and other state agency reports and databases, US Bureau of Statistics, Dept. of Commerce, USDOT, industry sources and trade papers, academic research, and previous studies. The issues identified in these profiles and supporting work became the basis for additional investigation and reporting.

Freight Flow information was compiled on commodity flows for export, import, and internal traffic levels for the District. Key commodities were identified by both tonnage and value. Information was broken out by individual counties. Modes, routes, seasonal impacts, and trade partners were included in the analysis.

The freight flow data available from several commercial sources were utilized in this study, and while accurate for large, statewide and interstate commodity flows, were found to be consistently incomplete or unreliable for defining local, point source freight traffic flows and major freight generators. The profiling of area businesses and research into specific local industries successfully supplemented this data, and a modified methodology for determining localized traffic patterns around major generators and industries was suggested based on private business and county engineer inputs, and their secondary review of cross-referenced information derived from commercial data sources.

AADT and HCAADT was mapped and reported for the primary highways in the District. Using Mn/DOT growth factors as well as a calculation of possible key commodity traffic growth, future HCAADT volumes were shown as a range of impacts for the area through 2030. The analysis demonstrated that the largest impacts for this potential growth occurred not at point sources, but across the entire system due to the influence of agricultural production at the local level, emphasizing the importance of both private, farmer-operated trucking as well as commercial trucking across the “Last Mile”, the local farm-adjacent roads, in order to reach the collector and trunk highway network. The expanding ethanol business, shuttle elevators, farm service businesses, minerals, aggregate, and construction, as well as the railroads and waterway carriers, all rely on the ability of the local and county networks to carry heavy freight onto the Trunks and Interregional Corridors to allow the continued performance of District 7 business, and the local and state economy. The next chapter points out how this locally-based agriculture is becoming an ever-increasing part of the global economy.

Non-transportation factors were reported, including population, employment, education, environmental issues, safety and security, and the economic development and trends of the area industries. These were consistently related to the freight flows they impacted, and any future variables that might come into play.

Freight Transportation conflicts were analyzed based on the system inventory, freight flow information, and the input from the profiles and research. The analysis looked at infrastructure constraints by mode, and evaluated issues of service levels, congestion, geometric limits, and operational impediments. Rail service coverage and limits to intermodal access were studied and reported. Safety issues, including highway-rail grade crossings and hazardous materials, were included.

Overall satisfaction with the current infrastructure and service levels were noted in the profiles, with specific exceptions with certain road segments, railroads, and traffic levels and access in the adjoining Twin Cities Metro Region. Urban congestion issues and trucking restrictions were a problem that impacted virtually all the shippers to some extent when they needed to interface with freight systems in the Metro region for rail, air, barge, and trucking on regular and necessary occasions. The cost of freight service was also seen as being at satisfactory levels, considered an acceptable cost of doing business for most District industries. The connections

provided by the significant freight network of major highways, as well as the railroad system, were recognized as being a necessity to the District businesses and residents' well being, and given a high priority for capacity and safety upgrades by profiled businesses and stakeholders.

Based on the Profile issues and recurring comments on road design capacity and Spring Load Limits, a network analysis of the current 10-ton road network, and the conceptual 10-ton network, was performed. Potential upgrades on each network were prioritized, and a cost impact analysis was performed to approximately quantify the possible effectiveness of these upgrades. These were mapped in Figures 4 and 5.

Using figures 1, 2, and 3 and the road network analysis maps, updates to the inventory data were completed and incorporated. Possible deficiencies, analysis of alternative databases and traffic flows, and freight generators have been reported.

A consistent problem in studying, managing, and making investment decisions for the current heavy-duty freight highway system is a lack of good data. There is not a comprehensive, consistent, and coordinated effort to collect commercial traffic information on heavy commercial AADT's and vehicle classification counts, identifying traffic levels and vehicle types in current use. Load capacity and load testing of CSAH and county roads is also less than complete and accurate. The county engineers and the Office of State Aid in Mn/DOT are aware of the problem, and are pursuing new efforts to correct these shortcomings.

3.0 TRENDS AND POLICY ANALYSIS

This chapter identifies emerging and ongoing trends in markets, trade, and freight transportation with a focus on their impacts on District 7. These trends, and many of the policies that are directing and impacting them, are presented to illustrate the directions and sensitivity of factors that are actively driving the region's freight flows. This chapter highlights a wide range of issues categorized as follows: Global/International trends; National trends; Regional trends; and State/District trends.

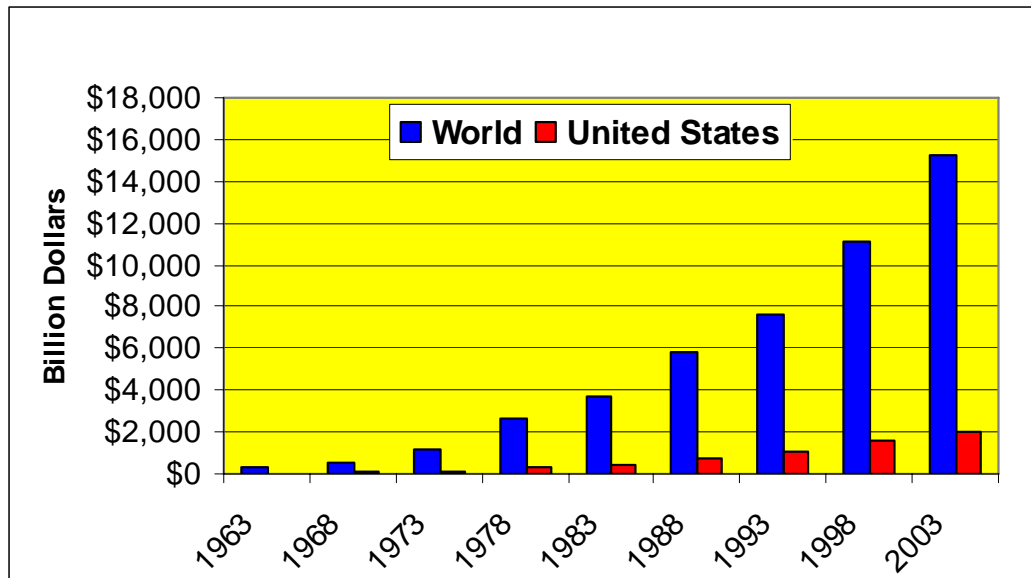
3.1 GLOBAL/INTERNATIONAL TRENDS AFFECTING FREIGHT TRANSPORTATION

Economic, natural, cultural and social trends that are global in scope increasingly affect every aspect of US business, with impacts on District 7 being a case in point.

3.1.1 Globalization of Trade

Trade, as a percentage of the US GDP, has been steadily increasing during the past quarter century, rising from just over 12 percent in the early 1970s to approximately 25 percent in the mid-1990s. Global integration of the US economy has grown at a rapid pace over the past several decades as displayed in Figure 3-1. US manufacturers now shop the world for components and subassemblies to manufacturing processes. Advances in technology and management practices are also allowing US firms to develop strategies that enable customized products for mass market distribution.

Figure 3-1
World and U.S. Merchandise Tradeⁱ



The growth in trade is attributed to three major trends:

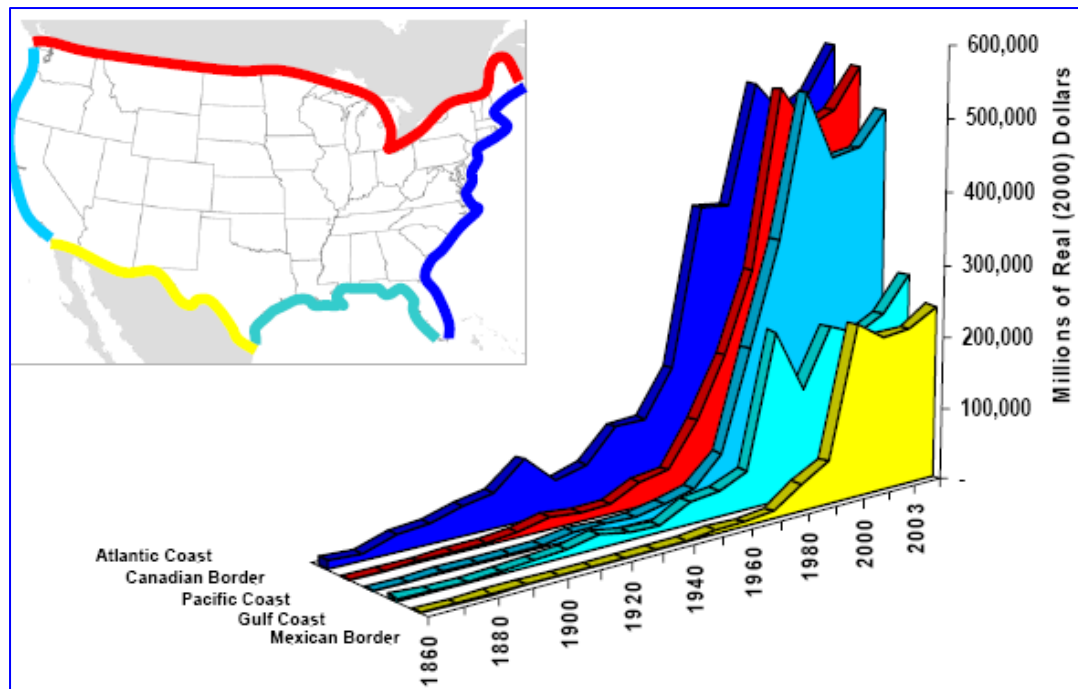
- Increasing world trade policy liberalization allowing nations to leverage trade as a source of economic growth;
- Global supply chains resulting from industries seeking out cost and market advantages offered by various regions of the world;
- Advanced information technologies that allow disparate elements of supply chains and distribution channels to be integrated in time and space.ⁱⁱ

This evolving business environment and associated impacts on transportation networks has significant implications for regional and local economic development. District 7 has numerous businesses working in the international markets, including multinational food processors like ADM and Cargill, manufacturers like Scott Equipment, ethanol plants exporting DDGS, farmers exporting grain and genetically modified seed, and cooperatives importing fertilizers and other farm supplies. Other companies, such as Oldcastle Materials, have been the subject of international investment.

3.1.2 Multi-National Trade Agreements

One of the important trends in international commerce over the past decades has been the creation of common economic markets through the relaxation and elimination of cross border barriers to freight movements. What began as a trend toward bi-lateral trade agreements has evolved into a movement to multi-lateral arrangements among larger and larger trading blocks.

Figure 3-2
Growth in US by Border Regionⁱⁱⁱ



The prime example of this trend is the development of the North American Free Trade Agreement (NAFTA). What began in 1989 as the world’s largest bi-lateral trade agreement, the US–Canada Free Trade Agreement was expanded into North American-focused trade agreement with the inclusion of Mexico in 1994. As displayed in **Exhibit 2** NAFTA has increasingly encompassed a significant amount of trade between the US and its neighbors. NAFTA abolished or reduced all tariffs on exports between the three countries. As a consequence, trade between the US and Canada has increased over 75 percent in the last decade. District 7 sits directly astride the NAFTA corridor from Mexico to Canada.

Figure 3-3
Exports to NAFTA Trading Partners from D7

NAFTA Exports from District 7 2001 TRANSEARCH Data		
Rank	Commodity	Tons
1	Farm Products	125,225,455
2	Nonmetallic Minerals	91,047,319
3	Food or Kindred Products	68,954,166
4	Metallic Ores	68,394,992
5	Coal	58,707,933
6	Secondary Traffic	45,103,019
7	Lumber or Wood Products	35,170,593
8	Chemicals or Allied Products	30,353,052
9	Clay, Concrete, Glass, or Stone	25,541,827
10	Petroleum or Coal Products	24,208,357
	All other products	68,209,267
Total Tons		640,915,979

In 2001, industries located in District 7 exported more than 640 million tons of products to Canada and Mexico (**Figure 3-3**). Farm Products, and Food or Kindred Products, were leading NAFTA exports from District 7, together accounting for 30 percent of all product exports to Canada and Mexico by weight. Non-metallic Minerals and Metallic Ores accounted for another 25 percent of NAFTA exports by weight.

3.1.3 Supply Chain Management as Strategy for Competitive Advantage

A supply chain is the system of organizations, people, activities, information, and resources involved in moving a product or service from suppliers to customers in a cost-effective and time-efficient manner. In today’s global business environment, supply chain management innovation is increasingly a strategy for competitive advantage in manufacturing and service based industries. A major innovation that has made streamlined supply chains a reality are the third-party logistics companies, or 3PLs, that offer expert services in transportation contracting, customs clearances, insurance, letters of credit, warehousing and forwarding, and other essential

transportation services under contract to shippers without this expertise. They offer a single rate and billing for all of the required operations. The Twin Cities Metro Area is a major center for these companies, and District 7 shippers, from farmers to major corporations, have used their services to penetrate international markets as well as distant domestic markets easily and efficiently.

“Supply-chaining is a method of collaborating horizontally - among suppliers, retailers, and customers - to create value... [it] is both enabled by the flattening of the world and a hugely important flattener itself, because the more these supply chains grow and proliferate, the more they force the adoption of common standards between companies...the more they eliminate points of friction at borders, the more the efficiencies of one company get adopted by the others, and the more they encourage global collaboration.”^{iv}

Over the past several decades, US industry, including agriculture, has become less labor intensive and more capital intensive. Today, US manufacturers and farmers in general, tend to produce goods that require extensive capital inputs, such as technology and machinery. To excel in a global marketplace, businesses shop the world for inputs and product components (enabled by liberalized trade) relying on the most cost-effective and reliable sources.

In parallel, just-in-time, or near just-in-time inventory management to reduce idle capital at all stages of the production and staging (distribution) cycle has become the norm. Enterprises hold only minimal “emergency” stocks, relying on reliable transportation services to prevent failures in the supply chain that can lead to missed sales opportunities or a temporary plant shutdown. This “minimalist” trend in inventories has been adopted by ag-based businesses in District 7. During stakeholder interviews for instance, a large ethanol plant reported having only enough corn storage to support approximately 10 days of plant production.

As the US economy becomes more service orientated and US producers’ focus on more high-value or value-added products that are expensive to stock as inventory, companies are adopting modern supply chain management techniques with the following attributes:

- *Demand Pull Supply Chains:* The movement of product triggered by the consumer as opposed to the producer (supply-push)
- *Customer-Focused Logistics:* Tailoring the logistics system so that it responds to the unique needs and profitability requirements of each specific group of customers.
- *Transportation Effectiveness:* Leveraging the ability of integrated transportation to improve customer service, just-in-time inventory control, and total supply chain cost performance.
- *Working Capital Management:* Maximizing the productivity of inventory, accounts receivable, and accounts payable.^v

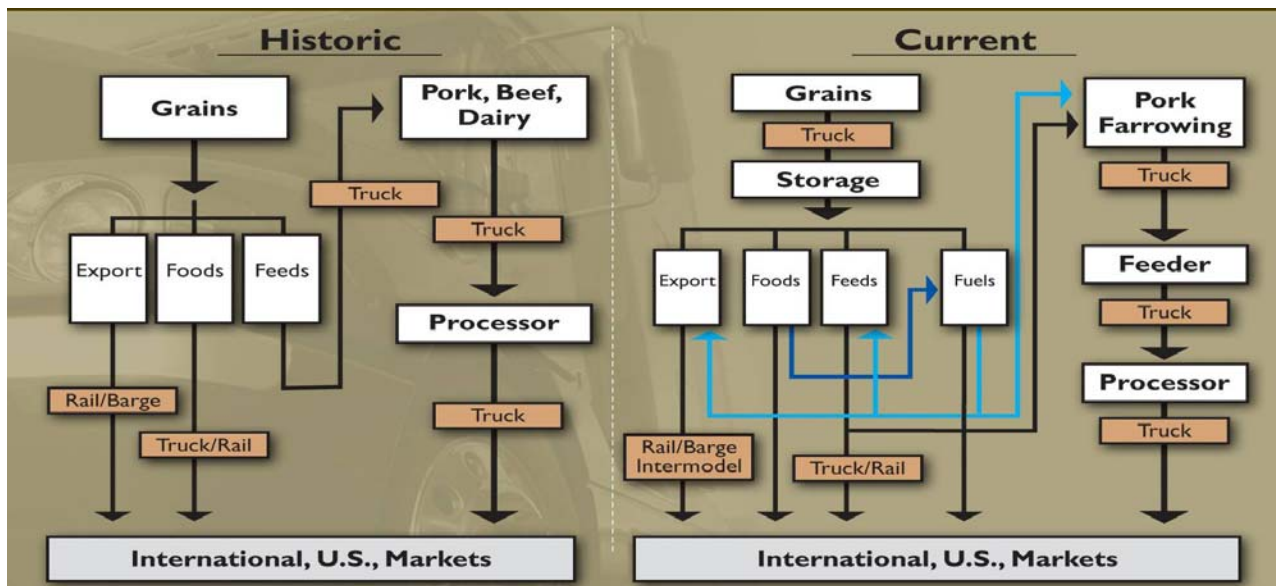
As industries struggle to simultaneously cut costs, improve service levels and increase product diversity, attention is being placed upon the role that innovative technologies play in reducing inventory, responding to customer needs and generating more profit. Unlike the old

inventory-based logistics model that focused on re-stocking a warehouse or silo, the integrated, technology based model of supply chain management views transportation as part of the product offering. The following example provides a case study from the retail sector:

“At Zara, an international clothing manufacturer and retailer, the supply chain is critical to competitive advantage. Zara offers new clothing styles faster than competitors at moderate prices, and Zara owns the majority of its 761 stores in 55 countries. Its managers send customer feedback to in-house designers via handheld devices, keeping designers instantly abreast of fast-changing trends, which helps Zara cull less desirable merchandize more quickly. This built-in visibility and flexibility results in better-managed inventories, tight links between supply and demand and reduced obsolescence costs.”^{vi}

The freight transport system is vital to regional goods movement mobility and industrial productivity, and ultimately economic development. Hence, an efficient and cost effective transport system is vital to the position of businesses and industries competing in a world market. Although operational differences dictate different industries employing different supply chain models, a common focus is to reduce inventory levels and their carrying costs requiring rapid, reliable, and cost-effective movement of goods. Supply chain *velocity* and *agility* are common references in supply chain management referring to the speed at which products move through a supply chain and the ability to respond to changing demand or unexpected disruptions. While the agriculture products produced in Southern Minnesota may not currently demand the same level of velocity and agility as cutting edge clothing retailers, the transportation and marketing for food products is changing dramatically. The graphic in **Figure 3-4** demonstrates the additional complexity that has evolved in grain transportation in recent years, highlighting the need for agility as traditional export markets have now expanded into multiple domestic and export opportunities.

Figure 3-4
Agricultural Supply Chain Process Flow



3.1.4 Supply Chain Security

The security of goods in transit has always been an issue in regard to pilfering and theft. However, the use of transportation systems for terrorist attacks in US and abroad, in recent years has raised concerns over the security of goods moving in transit to new heights. Supply chain *visibility*, i.e. the ability to track or trace shipments through all phases of the supply chain is another focus of modern logistics management. In addition to theft and terrorism, consumer protection is another challenge facing food supply chain security.

“Widespread consumer demand for assurance that their food is safe has become one of the strongest forces impacting global food trade. In the 1990s, Europe experienced an extended series of crises in the food sector, which created widespread public distrust of government regulators and government science, and cost the food industry billions of dollars. The list includes such widely reported incidents as bovine spongiform encephalopathy (BSE, more commonly known as mad cow disease), foot and mouth disease, dioxin contamination, diesel fuel in palm oil, sewage waste in feed, listeria in cheese, salmonella and antibiotics in poultry, and E-coli in animal meat. In Great Britain alone 129 people died in the 1990’s of variant Creutzfeldt-Jacob disease, contracted by eating BSE-contaminated beef.”^{vii}

3.1.5 The Emergence of Food Protocols

In response to the food crises in Europe during the 1990s, several global food companies have developed a set of food production, processing, and distribution protocols coined “EUREPGAP.” The EurepGAP protocols stand for “Euro Retailer Produce Working Group adopting standards of Good Agriculture Processes. While these protocols continue to evolve, traceability of food products in the supply chain is likely to become a pre-requisite to participate in global food product marketing:

“Faced with impending imposition of private sector protocols, American farmers need to understand what they are, what burdens they might entail, and how to turn what could be a threat to their livelihood into an opportunity of more stable profits.”

To meet the challenges brought about by the need to trace food products in the supply chain, some innovative farmers are turning to technology. For example, some French meat producers have developed an electronic ear tag for cattle called “passport.”

“These individualize passports, which cost producers about \$5 per animal for tracing, recording and certification, make it possible for consumers to find out the cattle type, breed, year born, confirmation, color, fat content, country of origin, place of slaughter, location of cutting room, and carcass or lot number.”^{viii}

3.1.6 Tracing Grain Shipments

The need to trace food products through the supply chain is also causing grain marketers world wide to rethink how grain bound for export markets is handled and transported. The traditional bulk grain transportation system treats grain as a fungible commodity, meaning that any quantity of a type of grain could be substituted for an equal amount of the same type of grain. However, in today’s global food markets, European and Asian buyers are today demanding greater

visibility and traceability to ensure that the grains are “identity preserved” (IP). In demanding IP grains, many markets no longer accept grains grown from genetically modified organisms (GMO), i.e., genetically modified seeds, or requiring organically grown products. Consequently, there is move away from bulk shipments to smaller lot-sizes in containers.

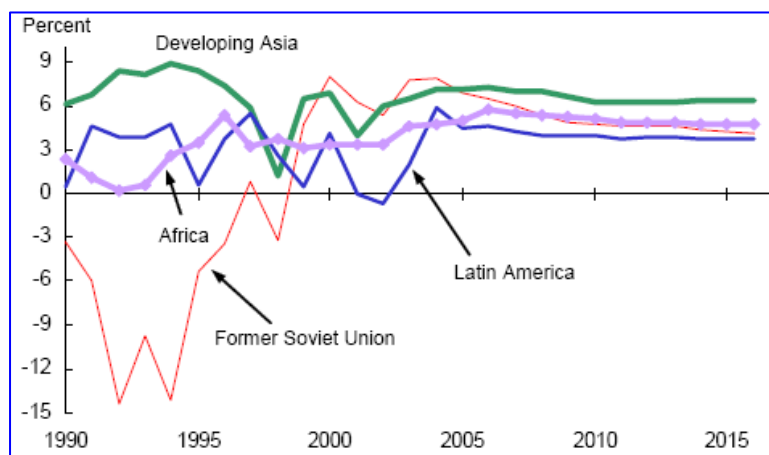
Another reason for Identity Preserved shipments is the growing need to ensure both security and quality. IP protocols not only prevent tampering with containerized shipments, offering more security in clearing imports, but offering quality control on exported products. Distiller Dried Grains from ethanol producers are vary prone to moisture and manufacturing variations, and the growing export market for this product as livestock feed and protein supplement depends on shippers being able to guarantee that the product’s quality at loading is the same that is finally delivered. Payments are often withheld completely if quality is not preserved, threatening any continuation of the trade.

Recent research by the Upper Great Plains Transportation Institute examined the evolution of the containerized agriculture industry over the past decade. Researchers focused the analysis on the trends in containerized transportation use across agricultural sector. In 2002, by weight, 15 percent of all US agricultural product exports were shipped in containers, up from 9 percent in 1992. By value, more than 52 percent of all US agricultural trade was shipped via containers. In 2002, it was estimated that over 600 US companies were employing containers to ship grain and grain products to over 130 countries.^{ix} So long as concerns exist about the integrity of world food supplies, the demand for IP grains shipped via sealed containers is likely to grow.

3.1.7 World Demand for Agricultural Products

Population and economic growth are two major forces that determine long-term agriculture demands. As the world’s population grows, more people need to be fed. As world incomes rise, especially in developing countries, the demand for more diverse diets and value-added agriculture, such as processed foods and protein (i.e., red meat, poultry, and fish) also increase.

**Figure 3-5
GDP Growth for Developing Economies**



World economic growth is projected to average 3.4 percent per year through 2016. Between 2000 and 2006, economic growth averaged 2.9 percent annually.^x Economic growth in developing countries, however, is expected to exceed an average of 5 percent over the coming decade (Figure 3-5).

World population growth has slowed in recent decades to just over 1 percent per year, down from nearly 2 percent in the 1980s. The more modest growth rate of 1.1 percent is expected to continue into the coming decade through 2016. Population growth in developing countries remains well above the rest of the world.

Overall, the trends in world population and economic growth support continued gains in the consumption, trade and prices for agricultural products. Despite diversion of grains to biofuel production in District 7 and the US corn belt, a recently released University of Minnesota study into long-term export food markets indicates that export volumes will only see a minor decrease in percentage of grain production:

The value of U.S. agricultural exports rises in the projections as steady global economic growth and stronger world trade lead to gains for U.S. agricultural export volumes and higher commodity prices. Higher commodity prices due to the expansion of global biofuels demand also contribute to the gains in export values...^{xi}

3.2 NATIONAL TRENDS AFFECTING FREIGHT TRANSPORTATION

Explosive growth over the last ten years, improvements in manufacturing processes, and new technology are continuing this trend and placing ever-greater strain on the capacity of our trade gateways. The USDOT estimates that freight traffic will nearly double in the next 20 years.^{xii}

3.2.1 US Economy Transition from Manufacturing to Services

"Corn and cars may be iconic symbols of American prosperity, but the dominant sector of the U.S. economy is services."^{xiii}

In the early 1980s, manufacturing was the leading sector of the US economy, roughly equal in economic contribution to the Services and "FIRE" (finance, insurance, and real estate) sectors combined. However, over the course of the past two decades the services sector of US economy has significantly outpaced manufacturing growth as a percentage of Gross Domestic Product. By 2005, the service industries sector had increased its share of the national economy to account for 68 percent of current-dollar GDP.^{xiv} This trend towards a service based economy has also affected Minnesota, where services represent 69 percent of sales by Minnesota businesses and employ 77 percent of the workforce. This transition to a service based economy has implications for transportation and logistics. While the agricultural-based businesses in District 7 will not immediately be affected by this trend, the actual increase in supply chain efficiency and supporting infrastructure will drive faster responsiveness to markets and support the longer term diversification of the business base in this rural but near-metro area:

Businesses demand ever-more efficient communication, finance, energy, transportation and distribution services as essential inputs to their production of goods and other services. Innovation in these critical "infrastructure" services boost productivity and growth throughout the economy.^{xv}

During interviews conducted with Minnesota air cargo carriers in 2005 for the Minnesota State Aviation System Plan, express package service integrators such as FedEx, UPS and DHL noted that due to the high number of Fortune 500 companies located in Minnesota, a substantial amount of their business came from the transportation of financial and legal documents. The carriers noted that predictability in service was crucial to meeting customer deadlines driven by processes such as payroll or the execution of contracts.

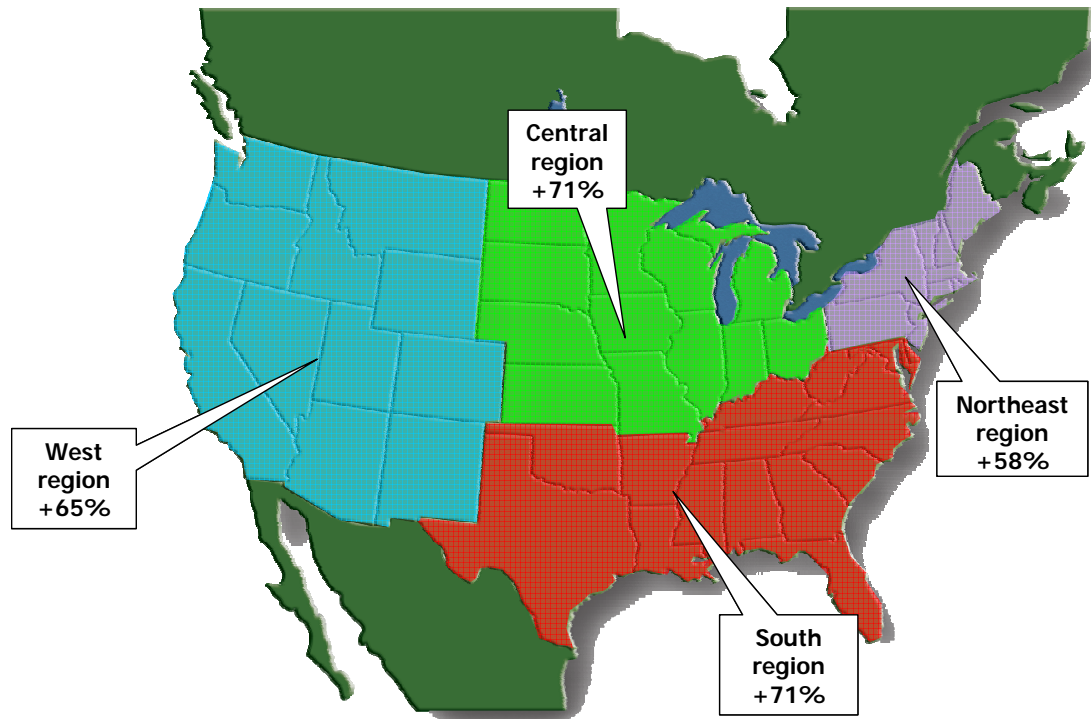
3.2.2 The Growth in Freight Traffic Volumes

In recent years, increases in the domestic freight and international trade have strained the national transportation network in multiple locations. The demand for logistics services has outstripped available capacity at many nodes creating bottlenecks at national gateways, ports, and border crossings. This growth in volumes on major transportation corridors has been maintained at double digit rates for several decades, outstripping general growth in the GNP. This has led to the disappearance of excess freight capacity on Class I railroads and on Interstate truck routes starting in the mid-1990s. This mainstream loss of capacity and flexibility has impacted access to markets even in rural areas, where local carriers may not yet be strained but their connections are. This has been leading to decentralized distribution systems and more reliance on the local freight system to maintain efficiency and access to supplies and markets even as the major ports and urban areas become seriously congested. District 7's hosting of new retail and wholesale distribution centers, and the interest by area businesses in localized container facilities and railroad services are evidence of this change.

According to the USDOT's Freight Analysis Framework (FAF), freight volumes have been growing consistently over time. In 1998, the domestic U.S. transportation system carried over 13 billion tons of freight valued at nearly \$8 trillion.^{xvi} By 2020, the US system is expected to handle nearly 23 billion freight tons valued at almost \$25 trillion.

Domestic freight volumes are projected to continue to grow. The FHWA estimates that in 2002, US freight volumes totaled nearly 20 billion tons. The map in **Figure 3-6** shows the projected regional growth rates in freight volumes through 2020. From 2000 to 2020, freight volumes in the North Central Region are projected to grow by 71 percent. The most recent projections from FHWA which extend through 2035, suggest that freight volume by tonnage will double in Minnesota, from 664.3 million tons in 2002, to 1329.3 million tons in 2035.^{xvii}

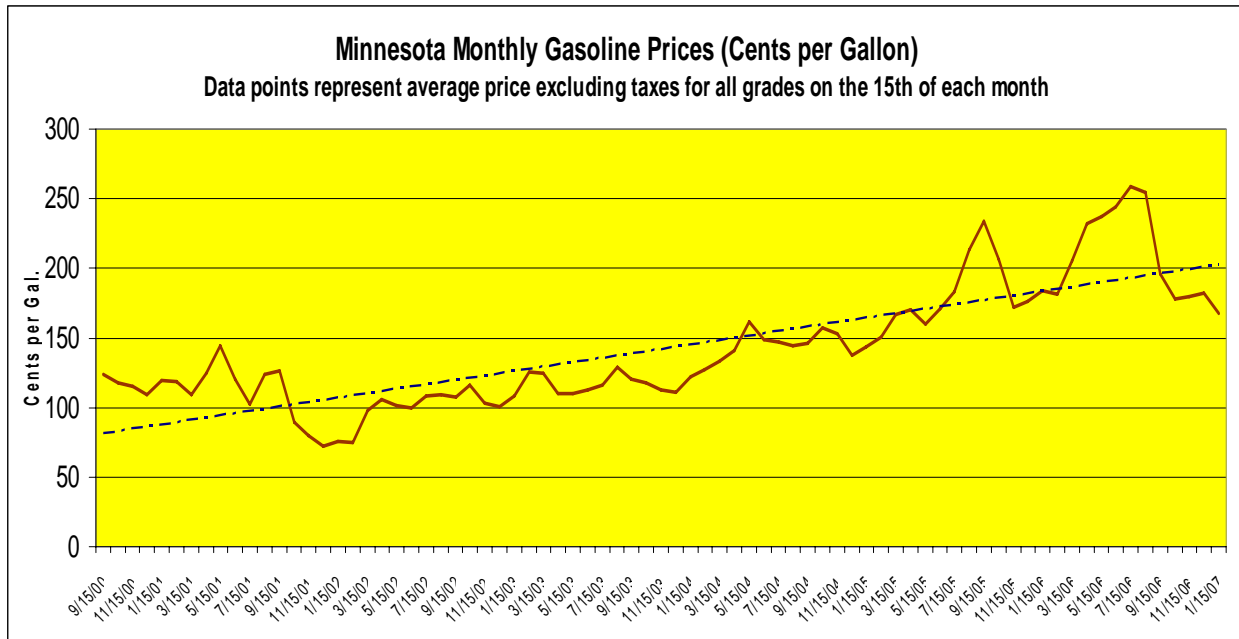
Figure 3-6
Projected 20 Year Regional Growth Rates in Freight Volumes (FHWA)



3.2.3 Reducing America's Reliance on Imported Energy

Historically, the US has relied heavily on low-cost imported petroleum to fuel the US economy, as well as the public's heavy reliance on personal automobile travel. However, the terrorist attack of 9/11 and continued unrest in the Middle East, combined with periodic weather related disruptions to domestic production and prohibitions on expanding domestic refining capacity, have resulted in higher and more volatile gasoline prices. The solid line in **Figure 3-7** displays the average retail price of gasoline, less state and federal taxes, for the 15th of each month from September 2000 through January 2007. The dashed line on the graph shows the overall trend in Minnesota retail prices.

**Figure 3-7
Minnesota Retail Gasoline Prices (September 2000–January 2007)**



Due to the upward trend and volatility petroleum prices, there has been increasing interest in developing domestic sources of alternative energy for transportation, namely “biofuels.”

“[Congress needs] to pass meaningful energy legislation as soon as possible, all aiming at making sure that we promote technologies that, for the sake of our national security and for the sake of good environmental policy ... reduce the usage of gasoline. The goal I laid out of reducing gasoline by 20 percent over 10 years is a realistic goal.”

- President George W. Bush, 3/27/07

“Renewable energy is an important part of Minnesota’s future... Our great nation’s sad addiction to foreign oil exposes the country to a reckless amount of economic and national security risk”

- Governor Tim Pawlenty, Minnesota State of the State Address, 1/17/07

Another effect of this energy supply situation will be a drive toward more efficiency in freight transportation, including shifts to more fuel efficient modes. Barges, the most fuel-efficient freight mode, and railroads, significantly more fuel-efficient than trucking, may take over more truck traffic in carload lots and containers. Railroads are noted as being three times more fuel-efficient per ton-mile than heavy commercial trucks by the Association of American Railroads. The relative costs of fuel used by various operators will also drive rate differentials and accelerate these mode shifts.

3.2.4 Expanding Intermodal Options

Freight “intermodalism” is an approach to the planning, construction and operation of a transportation network that optimally employs transportation resources and connections between modes. Cargo is shifted quickly and efficiently between trucks, railways, barges and air freight

providers according to the transit time needs, value and weight of the goods involved. A given shipment may travel via two or more modes and service providers to deliver the optimum mix of cost efficiency and service. The efficiency and effectiveness of the linkages determines the quality and value of the service.

From the public or private shipper perspective, the exact choice of modes should be relevant only to the extent that cost and service is affected. The optimal mix of transportation elements is determined by quality, cost, timeliness, and safety of the specific trip in question. The ease of interconnection between modes can have a significant impact upon the economy of a company, industry, metropolitan area, state or region. Overall benefits from an efficient intermodal system can be significant:

- Reduced transportation costs
- Increased economic returns on both public and private infrastructure investments
- Improved mobility for all transportation system users
- Reduced energy consumption

Federal transportation policy explicitly recognizes and encourages the development of intermodal transportation. New federal surface transportation funding legislation provides special funding for “freight gateway” investments to improve the interface between different transport modes. The private marketplace confirms the validity of the intermodal approach as erstwhile competitors increasingly team-up to provide the best combinations of service and cost-effectiveness. Major motor carriers such as JB Hunt and Schneider trucking are now among the freight railroads largest customers. Freight rail carriers participate in intermodal services in different forms according to the service needs and commodities involved. District 7 has yet to benefit directly from these options, but new initiatives in both these government programs and with private ventures should begin to change that situation.

3.2.5 A Brief History of Intermodalism in the US

Intermodal transportation can involve any of the modes of transportation. The last 50 years has seen the rise of motor vehicle transportation and the resurgence of the railroads, but the invention of effective containerization in the mid 1950s and it’s almost overwhelming acceleration in freight transportation use beginning in the 1980s has benefited both of these modes and the international marine trade. The increasing recognition that the two modes can complement each other as well as compete, along with the spread of containerization, has revolutionized freight transportation to such an extent that the term “intermodal freight transportation” has taken on the meaning of a container or highway trailer moving on the railroad.

Figure 3-8
Trailer on Flat Car



“Trailer on Flat Car” (TOFC) service, which allows rail cargoes to be delivered on wheels directly to a destination even if not on a rail spur, is a post World War II development of the railroad industry. The business was advanced in order to stem market share losses to the then emerging motor carrier industry. **Figure 3-8** provides an example of a semi-trailer loaded for trail transport on a rail flat-car. However, intermodalism also introduced a

far more complex type of service for the railroads who were heavily regulated at the time. Due to regulation and issues such as equipment balancing, intermodal services were only marginally successful in the first several decades of operation.

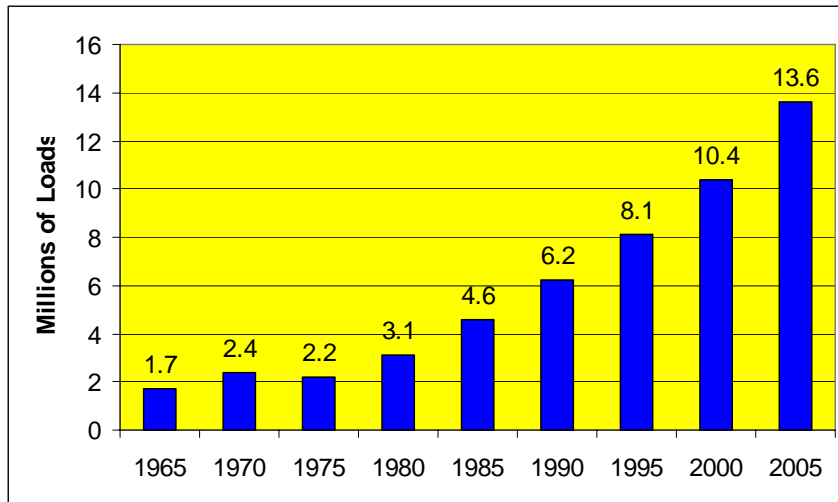
Figure 3-9
Double-stack Containers



The next significant development in the history of intermodalism was “container on flat car” (COFC) service. The use of containers improved the overall efficiency intermodal movements by expediting the exchange of the cargo box, especially at ocean ports. The most important development, however, was the invention of the doublestack freight car in the early 1980s, as it revolutionized the economics of container transportation. Trains doubled in capacity with a minimal increase in cost making intermodal transportation profitable. Articulated double-stack well cars with low

centers of gravity and no “slack action” or surging of cars against one another also reduced cargo damage and allowed higher train speeds. In the early 1980s, railroads began investing in their infrastructure to make possible the use of “double-stack” container transport, including improving tunnel and bridge clearances throughout the country (**Figure 3-9**). Dedicated double stack unit trains running on guaranteed high-speed schedules improved both the efficiency and cost of intermodal train service to the extent that they captured most of the long-haul truck traffic on western US routes, while reducing costs by more than half.

Figure 3-10
Total Intermodal Loads in the US^{xviii}



The ability of the railroads to efficiently transport containers became important because the ocean shipping industry was going through a revolution with the wide scale adoption of containerized freight.

Since the railroad industry was deregulated in the early 1980s, intermodal loadings have increased eight-fold (**Figure 3-10**). In 2006 railroad intermodal in the US exceeded 14.6 million loadings. Successful partnerships fostering intermodal development have been forged between railroads, intermodal marketing companies (IMCs), steamship lines, and motor carriers. In 1991, due to its economic and environmental advantages, intermodalism was adopted as a national policy goal through the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA).

3.2.6 RoadRailer

RoadRailer is a bi-modal system featuring specially equipped highway trailers that can run directly on the rail. These specialized semi-trailers are currently being used by several Class I railroads to provide intermodal service without expensive terminal investments in heavy container handlers and cranes. RoadRailer equipment is a hybrid that is both a highway trailer and a railcar at the same time. On the highway, RoadRailer equipment is hauled by a regular highway tractor on the RoadRailer unit's rubber-tired wheels. These same units can be coupled together into a railroad train, without having to be loaded onto flatcars.

Roadrailer's conversion to rail mode is accomplished by simply adding railroad bogies (similar to the trucks found under normal railcars) between the trailers. Terminals simply require an area where tracks are set into pavement (as on trolley lines) and simple forklifts for moving the rail bogies around. RoadRailer equipment comes in various configurations, much the same as standard highway trailers, and can be operated either in dedicated trains or on the backs of other trains. (RoadRailer units do not have the same structural strength as regular railcars, as the tare weight would be too high for highway use. As a result they are not operated in mid-train between other railcars).

Figure 3-11
Road Railer Operations and Service Areas



No specialized road-to-rail hoist or ramp facilities are required. The trailer is connected directly to a “bogey” (set of rail wheels) by a yard tractor. The road wheels then hoist up under the trailer. The trailers have been approved by BNSF to move in high speed trains (up to 90 mph). The trailers are available in several service configurations, including reefers. The primary marketing company for the Roadrail technology is Triple Crown Services, a subsidiary of Norfolk Southern. This service was recently expanded to the Minneapolis/St. Paul area by Union Pacific Railroad (**Figure 3-11**).

3.3 REGIONAL TRENDS AFFECTING FREIGHT TRANSPORTATION

Regional trends define the economic and business trends impacting freight transportation that are centered on the Upper Midwest and Central Plains regions in particular.

3.3.1 Grain Shuttle Trains

The “shuttle train” concept as it applies to bulk grain shipments was introduced by Class I railroads in the early 1990s. The shuttle train initiative significantly changed how grain from the Northern Great Plains moved by railroad to domestic and international markets.

Grain and coal constitute the two largest commodities handled by railroads. Several decades ago, rail equipment utilization for grain and coal was similar. During the past thirty years, however, Class I railroads have realized dramatic productivity gains in coal transportation. Unit coal trains of 100 or more cars have been common for at least two decades. Today, coal hauls of 2,000 miles or more, and equipment cycle times of seven days are common. In comparison, unit train standards for grain are now 100 or 110 cars, up from only 25 cars little more than a decade ago. The average equipment cycle time for unit trains hauling grain is 18 to 24 days, substantially unchanged from the mid 1970s. Using shuttle trains, the Class I railroads hope to

replicate in grain markets the asset productivity gains they have demonstrated in coal transportation. Most of this increased equipment utilization and service ‘velocity’ has been realized when a comparison of current service levels is made against the severe, multi-month grain car shortages experienced intermittently from the 1970s through the 1990s.

In 1999, the Burlington Northern Santa Fe (BNSF) Railroad characterized shuttle train service in the following manner as having the following attributes:

- State-of-the-art facilities
- High volume market segments
- Highly efficient, reliable service
- High velocity/productivity assets^{xix}

To increase equipment utilization, Class I railroads periodically raised “unit train” requirements over several decades to the current shuttle train standard of 100 or 110 cars. For instance, beginning in 1999, BNSF’s lowest grain transportation rates were offered to elevators that could commit to consecutive loading of unit trains of 110 cars. Elevators must also be able to load a shuttle train, within a specified time limit, often 12-15 hours, using hopper cars able to carry 286,000 pounds. Shuttle train elevators must also have track structure such that an empty 110-car train (over a mile long) can be easily placed for loading and minimal switching by the rail carrier.

In Minnesota, three Class I railroads, the BNSF, Union Pacific, and Canadian Pacific, offer similar shuttle train contracts and service. They are joined by several regional and short line rail carriers that participate in these contract terms and structures for several on-line shippers, including the DM&E in District 7.

The 286,000 pound hopper car requirement has also made it more difficult for Minnesota’s shortline railroads to interline grain shipments with Class I carriers. Many of Minnesota’s shortline railroads are unable to carry the heavier cars without substantial track replacement or maintenance, and bridge replacement or reinforcement. Current contract and tariff structures do not allow for any extra short line cost recovery in the revenue sharing formulas to address this problem, and shippers have been averse to paying extra to their local carrier in most cases. The Federal Railroad Administration, the Association of American Railroads, and the Class I’s are also evaluating the feasibility of moving to a heavier car specification for four-axle cars, at 315,000 pounds gross weight. This would further exacerbate the short lines’ infrastructure investment dilemma.

Currently, 61 of Minnesota’s more than 650 licensed elevators can meet shuttle train loading requirements, with 13 of those located in District 7. In order to meet the required loading speeds and hold 75-110 grain hoppers at one time on dedicated sidings, the majority of shuttle elevators have had to invest from \$1 million to \$3 million in capital improvements. In return, the financial incentives for shuttle train loading can run from \$70 to \$100 per car, with similar incentives for qualified unloading facilities. The collection area for grain going to these facilities usually covers a 70 mile radius, as opposed to local elevator collection that historically was within

15 miles. Because of the rail rates and the collection areas they promote, many areas in Minnesota and the Dakotas have experienced 80 percent of their export crop moving through 10 to 15 percent of elevators represented by these facilities.

With the current trend toward more on-farm consumption for value added agriculture products (livestock and poultry), and local consumption for ethanol, some in the industry have raised concerns about over capacity of shuttle train facilities. Given the investment requirements, it is likely that only the largest elevators or those associated with large international grain firms will survive future market consolidations.

3.3.2 Intermodal Grain Shipping

The dramatic increase in demand for intermodal transportation services discussed in the last section has been driven primarily by global trade and imports of consumer goods to the US. However, the food security issues also raised earlier is contributing in part to the growing demand of containerized intermodal shipments. In addition to food security, there are also operational efficiencies that support containerized grain shipping:

- Containerization makes it easier to satisfy consumers with specific shipping needs.
- Containerization allows the producer full control of his product from the field directly to the customer rather than the process from field to local collection terminals.
- By retaining control of container loading, farmers may extract higher prices for premium or specialty products without marketing through an intermediary.

To meet the growing demand for containerized shipments of grain, several efforts are currently underway in the upper Midwest. Recently a business consortium has announced a new service for moving containers of grain from the Canadian Pacific Shoreham Yard. According to materials presented at a recent Minnesota Freight Advisory Committee Meeting, the North Star Rail Intermodal Service will provide:

- Scaleable access for agriculture products to Asian and European export markets in containers
- Significant improvement in raw product pricing at US origins
- Shipping costs that are lower than traditional bulk methods
- Full service loading and transfer of bulk products from rail & truck to containersxx

Mr. Craig Dalstrom, President and CEO of North Star Intermodal Rail, noted that currently the US exports more than 125 million metric tonnes of bulk agriculture products or the equivalent of more than 5 million containers. Under the proposed service, empty intermodal containers will be shuttled on the Twin Cities and Western Railroad (TC&W), a local short line, Twin Cities intermodal facility to Montevideo, Minnesota using RailRunner Technology for the chassis (the road-going truck frames) carrying the intermodal containers (similar in design to Road Railer equipment) (**Figure 3-12**). Once loaded with grain and returned to Minneapolis, the containers are swung by crane off of the short line equipment directly onto double stack container cars destined for West Coast ports.

Figure 3-12
Intermodal Marine Containers for Grain Hauling on Modified Chassis

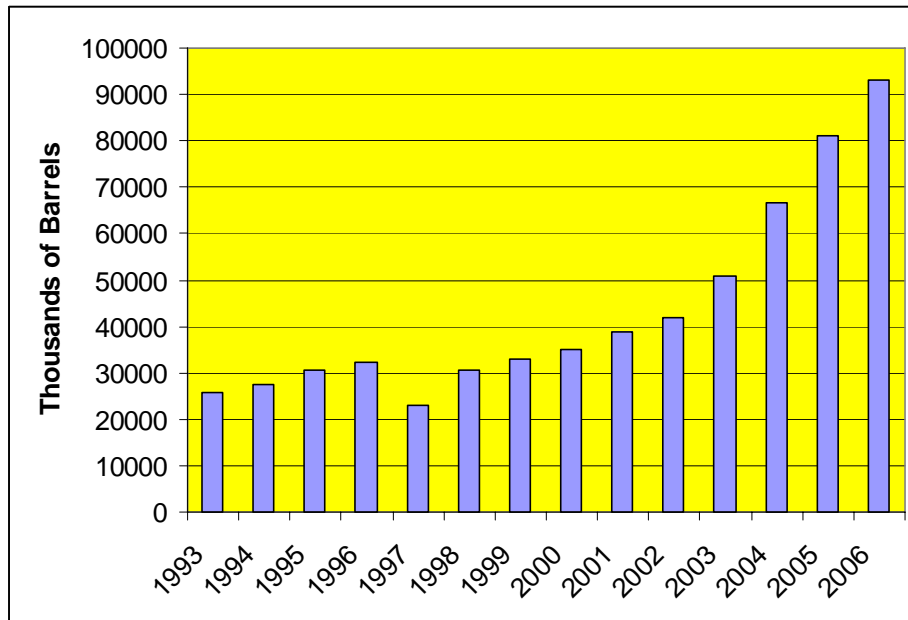


The North Dakota Department of Transportation has also initiated a study of containerized grain service on the Burlington Northern Santa Fe railroad. The feasibility study is examining the prospect of a “co-load” service using the existing intermodal yard in Dilworth, Minnesota and a new yard that may be constructed in Minot, North Dakota. The implication for District 7 agricultural producers is that in order to participate in the growing global food grains market, area producers must continue to examine their grain production, marketing and transportation strategies. In fact, the industry profiles in District 7 identified several businesses with an interest in these innovations and services.

3.3.3 Biofuels and Renewable Energy

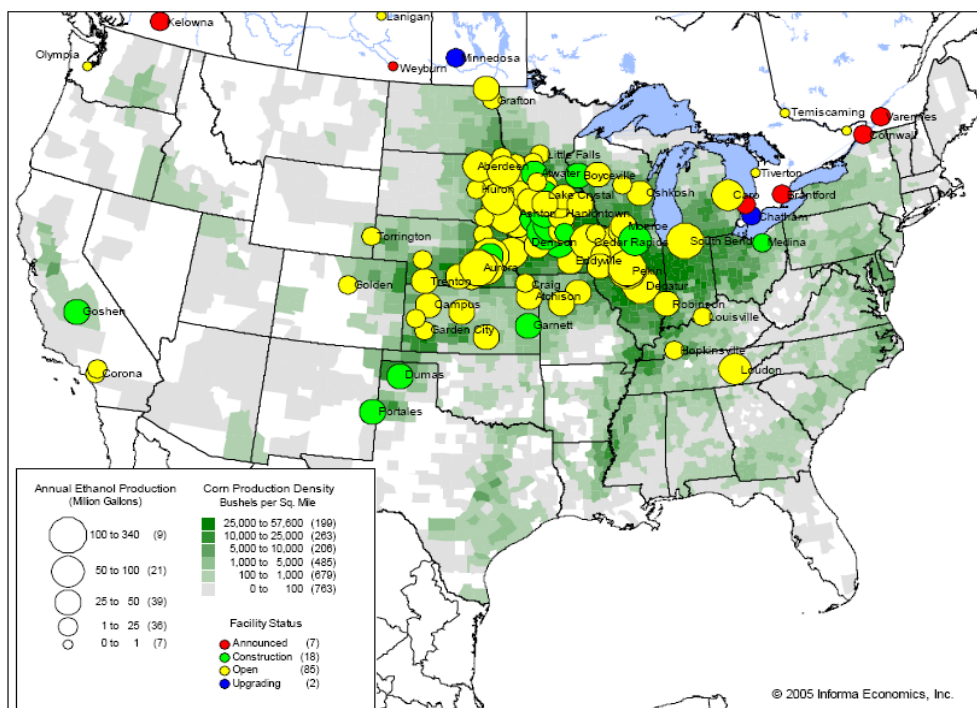
Ethanol and biodiesel are biofuels, i.e., renewable, non fossil fuels. They are produced from biomass sources such as corn sugar cane, and vegetable oils such as canola, and soybean oil. Since the early 1990s, US production of ethanol, the most widely used biofuel in the nation, has more than tripled, from approximately 26,000 barrels in 1993 to nearly 93,000 barrels in 2006 (**Figure 3-13**).

Figure 3-13
US Ethanol Production



The map in **Figure 3-14** shows the geography of the US ethanol industry as of 2005. The map shows that most of the ethanol plants are located in the upper Midwest, with the largest cluster in Southern Minnesota centered on District 7.

Figure 3-14
Geography of the U.S. Ethanol Industry – 2005^{xxi}



The origins of the biofuels industry in the US can be traced back to the oil price shocks of the mid-1970s and early 1980s. During that time, federal and state governments underwrote several research initiatives to accelerate the commercial development of biofuel technologies. In 1980, the Minnesota Legislature passed a tax credit for agricultural alcohol gasoline (more commonly referred to as the “blender’s credit”) that reduced the state fuel tax liability for blenders mixing ethanol and gasoline in Minnesota. In turn the credit reduced state transportation funds while having little effect on the level of in-state ethanol production. When the blender’s credit failed to spawn a sizeable state ethanol industry, lawmakers reworked the subsidy, and in 1986, the legislature created the ethanol development fund to make direct payments to Minnesota ethanol plants per gallon of ethanol produced. The payment amount has changed many times but for most of the 1990s hovered around 20 cents per gallon. As a result of these incentives, Minnesota leads the nation in developing the ethanol industry.

The future of US agriculture will be significantly impacted by the biofuels industry. Since 2000, biofuels have become the largest U.S. renewable energy source, for the massive transportation fuel industry.^{xiii} There are many potential benefits to biomass fuels such as reducing America’s dependence on imported foreign oil, reducing air and water pollution and offering new marketing opportunities for US farmers. The industry’s growth also poses new problems in commodity distribution, resource use including water and power for the plants, competition with food production and livestock feeds, and a continuing vulnerability to petroleum price variations. The impact of the growing ethanol industry is discussed further in the next section of this report.

Other renewable energy trends that impact the District include the growth of wind power generation. Southwest and western Minnesota experience the climatic patterns that are very supportive of wind turbine installations and electric generation. The steady growth of this industry requires the movement of large, oversize, and overweight commercial windmills to rural sites. While the relative number of moves currently are low, the strain on bridges, roads, and clearances caused by this freight is significant. Turbines can be both oversize and overweight, requiring special permitting and routing. Blades are often each 150 feet long, and will soon grow to 210 feet per blade. The Minnesota Department of Employment and Economic Development is actively working with the industry, and has reported in this Study that District 7 is a likely candidate for one or more new wind turbine manufacturing plants, radically increasing the number of oversize moves being hosted by the District’s roadway network. Any consideration of this new traffic also has to account for truck and rail deliveries of the plant’s raw materials and sub-components.

3.4 STATE/DISTRICT-7 TRENDS AND ISSUES

The following section details the demographic, business and economic development trends influencing state transportation and business investments in Minnesota, in particular agricultural areas of rural southwest Minnesota

3.4.1 Demographic/Workforce Trends in Southwest Minnesota

For many rural areas in the Upper Midwest, populations peaked in early in the 20th Century and have continued to decline through the current point in time. The general decline in population is in large part due to our underlying agriculture and natural resource economies of the region. As

US agriculture became more and more mechanized (and productive) to remain competitive in global markets, the number of well paying job opportunities has dwindled. The result has been larger farm operations, but fewer farmers.

Mn/DOT District 7 has two economic development commissions that serve the 13-county area: Southwest Regional Development Commission (SRDC 8) and Region 9 Development Commission (Region 9). While population in Minnesota grew by 12 percent between 1990 and 2000 overall, population growth in the Southwest Minnesota was far more modest at 3 percent or less. In Region 9, senior citizens are the fastest growing segment of the population as Baby Boomers reach retirement.^{xxiii} Both SRDC 8 and Region 9 have experienced significant growth in immigrant populations in recent years. In 2000, approximately 7.8 percent of the population in SRDC 8 had lived in another state or nation in 1995. For Region 9, the comparable figure was 7.3 percent.

The growing diversity in the population of Southwest Minnesota could have implications for how commercial vehicle regulations are disseminated and made accessible as the immigrant population is further dispersed into the work force of the region. This immigrant population is key to the region's growing economy and therefore their language needs regularly need to be accommodated through bi-lingual information materials. The count of Hispanic or Latino populations quadrupled in SRDC 8 between 1990 and 2000 (up 395 percent), and tripled in Region 9 (278 percent).^{xxiv}

A stagnant population growth rate and increasing farm size has implications for the Mn/DOT District 7 commercial vehicle transportation network. In general, as farms have become larger, their transportation needs have changed. Several decades ago it was common for farmers to operate two or three axle straight trucks for hauling grain to elevators or bringing fertilizers and other supplies to the farm. Today, 5-axle tractor semi-trailer combinations have become the commercial vehicle standard for most farm operations. A report in 'Successful Farming', November, 2006, noted that in the last 10 years, Midwest grain hauling to market in semis has increased from 30 percent to over 60 percent. The US Bureau of Statistics notes that current registrations for commercial vehicles in Minnesota indicate half of these vehicles utilized for agricultural purposes. District 7 farmer operated semi-trailer combinations are now commonplace for grain, feed, and livestock hauling as noted in the study profiles and research.

3.4.2 Economic Trends in Southwest Minnesota

Minnesota has been located in the upper tier of state income ratings since the mid 1990s. Between 1980 and 1994, Minnesota usually ranked somewhere between 14th and 17th among states on per capita income. Between 1994 and 1996, however, it climbed from 14th to 8th place and has remained in the top 10. According to the US Bureau of Economic Analysis, over the 1990 to 2000 decade, Minnesota had the 5th highest rate of income growth, and per capita income growth outpaced the national average, 61 percent compared to 53 percent. Income growth substantially exceeded the rate of inflation, estimated at 32 percent for the decade. However, District 7, consistent with other rural areas in Greater Minnesota, falls on average well below these statewide figures.

The economy of Southwest Minnesota is built upon agriculture, but the region also “boasts innovative value-added manufacturing and service enterprises that reflect the past, present and future of Minnesota’s Economy.”^{xxv}

While the economy of Southwest Minnesota is built upon agriculture, the products produced by this economy and the nature of the production have been undergoing some dramatic changes. According to recent analyses conducted by the Minnesota Department of Employment and Economic Development (DEED), the regions “distinguishing industries” include Food Manufacturing and Animal Production.⁵ The DEED report goes on to note that South West Minnesota has emerged as a regional center for wireless technology, and that many of the top-employing industries in the region are service industries such as food service, health and education.^{xxvi}

3.4.3 Evolving Agriculture Markets in Minnesota

“Agriculture is the foundation of Minnesota’s economy. Throughout Minnesota’s history, production agriculture has been the cornerstone upon which the state’s economy has been built. Today, Minnesota remains one of America’s leading agricultural producers in the US. The state ranks seventh in agricultural production, and is among the top 10 exporters of agricultural commodities. With only a small percentage of the state’s population engaged in farming, our agricultural producers provide a reliable source of food and clothing for an ever-growing consumer population.”^{xxvii}

While agriculture has been a cornerstone of Minnesota’s economy, it is also often times risky business. Historically, most of the risk in US agriculture has come from mother nature due to severe weather or insects. In recent decades being a US farmer has also become risky due to a number of major market forces. For the most part, the “family farm” is a nostalgic remnant of the past; today, Minnesota agriculture faces many new challenges from global competition and food safety, to decisions about rapidly developing new non-food markets such as biofuels. It is quite possible that the speed of change in US agriculture markets has never been as fast or dramatic, making it more important than ever to understand the industry and its future challenges.

The implications of change for southern Minnesota are multifaceted: While rapid growth in the biofuels market is likely to be a boon to the regions commodity producers, it may also be a significant drag to the regions large animal production industry:

“The average Minnesota farmer made \$95,828 last year, a 9.3 percent increase over last year’s record earnings of \$86,899, according to the Center for Farm Financial Management at the University of Minnesota. Crop farmers fared even better: Profits jumped 33 percent, to \$106,941. Hog, dairy and beef farmers, meanwhile, saw average incomes fall 13 percent, 32 percent and 45 percent, respectively.”^{xxviii}

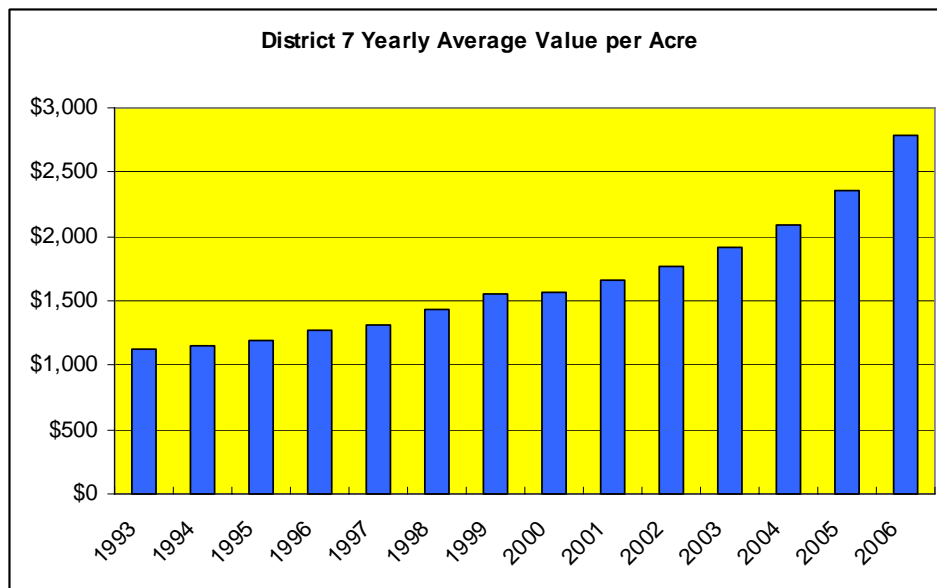
⁵ Distinguishing industries for a region are those industries that have more than twice the share of expected statewide employment.

Early in 2007, corn prices rose to over \$4.00 per bushel as demand for corn to support the ethanol industry have surged. Higher corn prices however have also signaled expected longer term consumer price increases for meat and poultry products.

3.4.4 Ag-Production Increases

One of the responses to the growing demand for corn is expected to come from better seed genetics. Minnesota's District 7 has witnessed steady increases in average yields per acre over the past 14 years (Figure 3-15)

Figure 3-15
Average Yield per Acre in District 7



In District 7, actual yields per acre for corn have increased steadily from under 90 bushels per acre in 1970 to 185 bushels per acre in 2006. Better seed genetics that combat root pests, fungus, disease, and provide hardier plant stock with more prolific ear production have allowed farmers to cut costs while planting in higher plant concentrations and across a larger growing season. This change in crop management enabled by plant science has allowed farmers to steadily push productivity up without similar increases in costs per acre or increases in tilled acreage. In addition, corn yield experiments have indicated that the theoretical limits per acre may be as high as 400 to 500 bushels per acre, based on research performed by seed companies and Midwest universities, including Michigan, Iowa, Kansas, Missouri, and Minnesota. Recent test plots in southern Wisconsin, sponsored by the University of Wisconsin, have recorded yields of almost 300 bushels per acre, and regional yield contests have exceeded that figure under tightly controlled conditions.

Soybean production has seen a similar growth over the same period. The 1970s yields of 25 to 30 bushels per acre have risen steadily to 55 bushels per acre. Many of the same improvements in genetics and crop management apply to this crop. Progress in weed and pest control, and management of flowering and pollination cycles learned from bean and produce growers, indicate potential for over 100 bushels per acre in the foreseeable future. District 7 farmers have been consistently on the leading edge of these developments.

Although current crop management practices and the soybean-corn rotation cycle have been consciously designed to sustain soil nutrients and reduce operating costs, the potential for significant crop production increases exists today if market prices will support more investment in labor, fertilizer, and irrigation, among other cost factors. The effective doubling of corn prices in the last year will promote this boom in actual production if farmers are convinced that these price levels are not vulnerable to sudden collapse. Both the strength of the renewable fuels programs, and the ability to fix prices through the futures market, will allow farmers to benefit from this potential productivity.

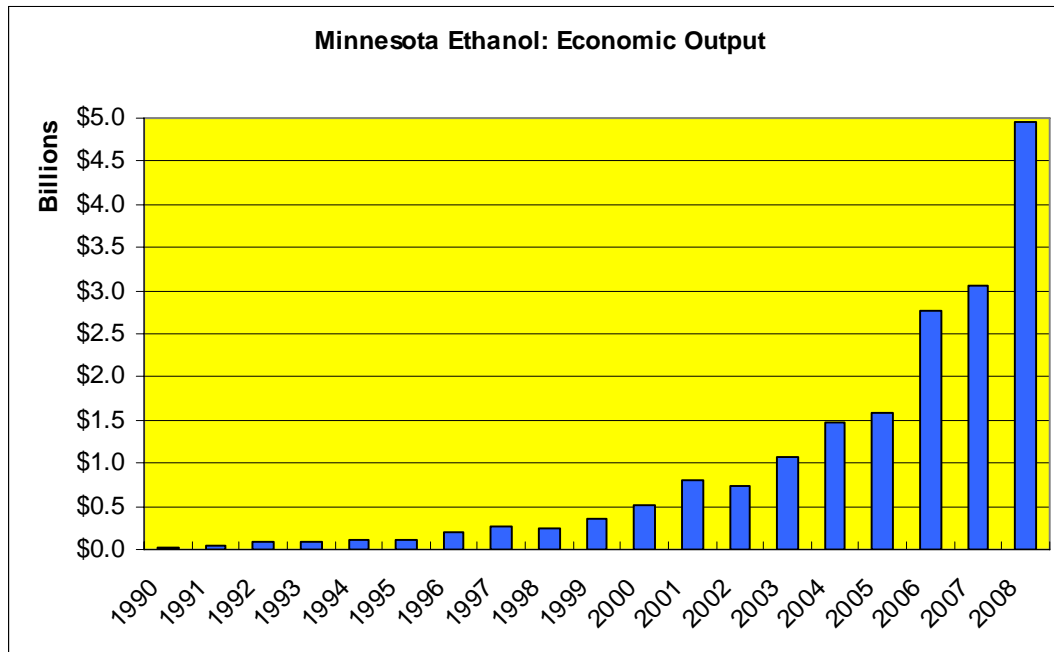
3.4.5 Ethanol's Impact in Minnesota and District 7

Previous sections of this report discussed the overall growth in the biofuels industry. However, no region in the state has been more affected by the “agriculture for food or fuel” debate than Southwest Minnesota. Over the past decade the ethanol industry has changed the shape and structure of the region’s agricultural industry, and will likely continue to do so in to the future.

As of 2005, ethanol's economic impact on Minnesota has created \$1.5 billion in output and has created 5,800 jobs. Over 15 percent of Minnesota's average crop or 200 million bushels of corn are made into ethanol and livestock feed yearly. In 2006, Minnesota had 16 plants that created 550 million gallons of ethanol each year.^{xxix}

The ethanol industry has undoubtedly provided a significant economic boost for Minnesota agriculture (**Figure 3-16**). Isolating just the effects of doubled grain prices, District 7 had an increase in crop revenue of \$850 million in the last year, while value added in ethanol and ethanol byproduct (DDGS) production was an additional \$180 million in District 7. Comparable figures for Minnesota were \$2.7 billion of crop revenue increases and \$350 million of value added ethanol plant production, a total of over \$3 billion statewide or a major percentage of the total economic impact. However, the rush to ethanol production is likely to also have ripple effects on other segments of the industry in Minnesota, many of which could be detrimental. For instance, over the past decade Minnesota elevators have invested heavily in upgrading rail loading capacity at many shuttle train stations. If in the future significant volumes of corn and soybeans are diverted from domestic and international food/feed export markets, additional elevator facilities will be forced to cease operation. It is also possible, however, that some of these facilities might be used for imported corn or soybeans, as some industry analysts predict that Midwestern states such as Minnesota and Iowa may need to import corn and soybeans to support biofuel investments in the near future.

Figure 3-16
Economic Impacts from Ethanol in Minnesota



Other effects that are becoming apparent are the water usage of the ethanol plants, for preparing the grain into a fermentable mash or slurry, as well as other cleaning and handling. This has required Department of Natural Resources permitting for water drawdown at the local and state level, and has led to some conflict with farming and industrial interests around new construction and major plant expansion. Energy use of the plants also has caused concern on transmission and environmental fronts, with expensive natural gas for process heat and byproduct drying being supplanted in some cases by co-generation, a plus for environmental and cost issues. In other cases, conversion to oil and coal power to cut process costs is raising concern about new rail traffic, safety, and increased pollution.

In addition, many commentators in the food vs. fuel debate have noted that even if all US corn production is devoted to ethanol production, there is not enough corn to meet the alternative fuel goals being set by policy makers. To meet those goals, new forms of feedstocks and new processing technologies will be required. Until alternate feedstocks are developed, the rise in prices for corn and soybeans driven by biofuel demands will cause incremental increases in food processing costs and livestock feed costs, with the latter being somewhat offset by increasing supplies of DDGS. These historic grain uses are being protected through long-term contracting and variable-pricing schemes devised by buyers, which also serves maintain a portion of the existing freight flows including shuttle trains and waterway traffic.

3.4.6 Cellulosic Ethanol

For ethanol and biodiesel production, cellulosic feedstocks are being researched as a complement or replacement for corn and soybeans. Cellulose is the “natural plastic” or hydro-carbon compound that provides the mass and structural strength of all plant materials at the cellular level, including everything from grass to trees. Unlike starch and sugars, simple hydro-carbons that can be fermented and converted to ethanol (grain alcohol) by a simple yeast-based process and distillation, cellulose is not readily broken down into simple compounds that can be further processed. Several lines of research are pursuing solutions to this problem, including processes that employ bacteria, enzymes, and hydrolysis.

Several advantages exist if these processes can be scaled up to commercial production levels. First, the use of corn and soybeans, which are food staples for both humans and livestock, can be controlled or reduced to minimize the competition between food use and fuel use of these grains. The sources of cellulose are much more common, in larger quantities, and not limited as much by soil condition or climate restrictions that define current agricultural areas. Minnesota’s Natural Resources Research Institute is developing fast-growing strains of Aspen trees for just this purpose, and the Great Plains Institute is evaluating prairie and switch grass for this application. Corn ‘stover’, the plant material left in the fields after corn harvest, as well as straw and sawdust, are other sources of cellulose that are readily available. Other advantages of these feedstocks are relatively straightforward conversion of existing plants to utilize these materials, and an established market and technology for ethanol use. Diversifying feedstocks will also make fuel sources less vulnerable to plant “mono-culture” issues, where entire production and ecological systems rely on one plant species and may be prone to future catastrophic plant diseases or blights.

Production volumes of these cellulosic feedstocks are estimated to be anywhere from equal to or more than five times greater per acre than corn, depending on plant types and management techniques. This would enable a sustained growth in the ethanol industry beyond that possible with corn alone. Transportation of the feedstocks and the finished product would increase proportionately. Based on current technology, status of pilot plants, and research progress, conversion to cellulosic feedstocks could become practical in as little as five years, or more realistically, within ten years. With much of the expected source materials such as corn stover (stalks and waste) and prairie grasses available locally, and existing plants theoretically able to convert to using this material, total freight volumes in District 7 could conceivably increase dramatically during a second wave of increased ethanol production if petroleum prices and market demand continue to support biofuels expansion.

3.4.7 Biobusiness Industries

“Biobusiness is economic activity devoted to the development or commercialization of bioscience or bioscience-related technologies, products or services. In other words, biobusiness is technology-based economic activity that utilizes or is informed by biology.”^{xxx}

**Figure 3-17
Biobusiness Sectors**



Biotechnology is one of the fastest growing industry sectors in the US. In 2006, the industry was valued at \$33.6 billion, having quadrupled in size since 1992.^{xxxii} The broader area of biobusiness is directed primarily toward applications of biological systems that incorporate technical means from any field of technology, including biotechnology, but it must be directed toward applications in living systems or biology-related contexts. Examples would include controlled fermentation systems for the food or energy industries, or advanced biomaterials production systems.^{xxxiii}

Statewide in Minnesota biobusinesses and biotechnology are big business, as the home to Medtronic Inc., Guidant Corp. and 3M-Health Care to name a few. However, not many people associate food processing companies like Hormel with biotechnology, yet the Hormel Institute located in Austin, MN is a research facility devoted to conducting biomedical research in partnership with collaborators located around the globe.

Near the beginning of the District 7 Freight Study, the study team was invited to a meeting of the Southern Minnesota Initiative Foundation. The SMIF was created by the McKnight Foundation to “initiate programs and actions that would stem the flow of rural migration and help change the local economic picture to one of success and prosperity.”^{xxxiii} The SMIF has made the biobusiness sector a focus of its economic development efforts. The Bio-Industry Marketplace Initiative was initiated in late 2004 with a \$125,000 grant award from The McKnight Foundation.

As noted at the outset of this report, the US economy overall is moving toward industrial processes and services that require, agile, expedient transportation services. Economic development efforts such as the biobusiness initiative supported by SMIF are likely to reap

significant returns in jobs and economic impacts, but they also increase the challenges being faced by transportation planners who must reactive to a wide spectrum of needs from business related transportation demands.

3.5 TRENDS AND POLICY SUMMARY:

District 7 is impacted by a wide range of trends and policies ranging from International trade and politics to local business developments, investment decisions, and emerging industry sectors. Because of its heavily agricultural base, the District has historically been affected by world grain and other commodity prices and flows, and that trend if anything is accelerating in areas like manufactured products and DDGS.

Changes in safety and security requirements and procedures are impacting the area both directly and indirectly as is containerization and intermodal traffic. The logistics patterns have become increasingly complex over time even as trade has boomed, further multiplying the volumes of freight being generated in the District and the region.

New transportation concepts and an evolution of vehicles and modes have created significant new efficiencies as well as new issues. The growth of freight volumes has strained the capacity of the national road and railroad systems, but is being answered by unit and shuttle trains, RoadRailer and intermodal services, larger trucks and railcars, and better handling facilities and management systems. The local freight network has the challenge of offering access to the national freight system and maintaining flexibility, coverage, and efficiency to offset some of the challenges being faced at the national level. These changes create the need for stronger and higher capacity infrastructure, particularly at the local level for farm-to-market and collector roads, and with Class II and short line railroads.

Certainly the most significant emerging trend is the recent extraordinary growth of biofuels, renewable energy resources derived from grains and plant matter. Due largely to the maturity and availability of the technology and the rise in crude oil, diesel, and gasoline prices, ethanol production in particular has experienced a boom, with District 7 solidly in the middle of the action. The economic effects of higher crop prices, new jobs, and higher demand for farm and transportation services have created notable positive results for the region, even as the growth gives rise to new problems in a range of areas from the cost of food, facility and infrastructure investment, and resources and the environment.

4.0 PROGRAMS ANALYSIS

This chapter catalogues all current and projected governmental programs that affect the workings of the freight network in District 7. These include an emphasis on particular Mn/DOT programs. In particular, the analysis looks at integration between Mn/DOT program activities and their effectiveness in supporting freight transportation, especially in regards to District 7. A significant opportunity in Mn/DOT's programs and effectiveness lies in the recently authorized federal transportation legislation, SAFETEA-LU. While the majority of this federal reauthorization is still largely in the public input, guidance formulation, and pre-implementation stages, there are numerous areas of opportunities that may exist for Mn/DOT in these program and funding initiatives.

A portion of this memorandum also reports and discusses programs affecting District 7 freight transportation originating in other state departments, including Department of Public Safety, Department of Employment and Economic Development, Department of Natural Resources, and Department of Agriculture. Other programs having a direct impact include US Department of Transportation activities.

Changes and improvements that may be possible in several of the programs and interactions between departments, local stakeholders, and businesses are noted in the specific program discussions and the summary and recommendations. These are drawn from study observations, input from the Project Management Team, internal government sources, and of course input from the profiled businesses and outreach participants.

4.1 MINNESOTA DEPARTMENT OF TRANSPORTATION:

Mn/DOT has a full range of freight-related programs that offer planning and services to all modes of transportation in the State. These are related to operating regulations and information, safety, carrier services, plans and policies, and both public and private facilities and infrastructure investment. While much of the work is focused on trucking and highway operations, railroad preservation and upgrades and waterway and airport facility improvements and support are also covered. Most of these programs directly impact District 7 internal freight circulation as well as commodities imported to and exported from the District. The study found three areas in particular within Mn/DOT that have significant impacts in regards to local interests and freight operations. These services include the Minnesota Rail Service Improvement program (MRSI), Commercial Vehicle Operations (CVO), and the County State Aid Highway (CSAH) program. Other Mn/DOT program areas with relevance to District 7 are also listed.

4.1.1 Minnesota Rail Service Improvement Program

Mn/DOT OFCVO administers the Minnesota Rail Service Improvement Program (MRSI), established in 1976, which helps prevent the loss of rail service on lines potentially subject to abandonment by railroads. Using State-developed eligibility rules, the State and rail users enter into contracts with railroads for rail line rehabilitation or contractors for rail service improvements. For rehabilitation projects, when the project is completed, the railroad repays the

state and rail users out of the operating revenues produced on the line. These reimbursements are returned to the Minnesota Rail Service Improvement Program account to fund future projects. For capital improvement projects, the shipper repays the State over a period of 10 years.

The Minnesota Rail Service Improvement Program (MRSI) provides funding for projects in the following categories: Rail Purchase Assistance – financial assistance for Regional Rail Authorities in acquiring rail lines; Capital Improvement Loans – provide rail users with loans to improve rail service and strengthen the financial condition of the associated line; Rail Rehabilitation – provide low or no-interest loans to rehabilitate and preserve rail lines; Rail User & Rail Carrier Loan Guarantee – guaranteeing up to 90 percent of a loan, to assist rail users and carrier in obtaining loans; State Rail Bank – acquire and preserve abandoned rail lines for a future transportation use. Two of the sub-programs have not been applied in District 7 and so only have potential for future benefit if activated. These are the Rail User & Rail Carrier Loan Guarantee Program and the Rail Bank Program. Funding for the MRSI Program is provided by the legislature through bonding or general fund appropriation. The MRSI programs relevant to rail operations in District 7 are as follows:

- *Capital Improvement Loans:* This is a revolving loan program where loans are offered for capital improvements related to an increase in rail transportation, either to improve service or facilities. This may include construction of extended sidings to allow shuttle train operation, trackside storage and equipment such as scale, dryers, tanks, and conveyors, or loading facility expansion and upgrades. Since about 1992, the loans have had a \$200,000 cap per project. If the rail line has not been rehabilitated with state funds, there is a ten percent service fee. This is because if a line has been rehabilitated with state funds, the shippers along the line are required to fund at least 10 percent of the project costs. The project must be competitively bid and supported by the servicing railroad. Since inception of the program, 34 loans have qualified and been issued in District 7 under this program to date. They have included a range of improvements from loading and siding upgrades, to major siding extensions and additional storage.
- *Purchase Assistance:* If a railroad line has not been abandoned and is to be used for continued rail service, the MRSI Program can provide regional rail authorities funding up to 50 percent of the costs in the purchase of railroad corridors, if the rail authority is willing to operate the railroad line for rail freight transportation. There are two properties located within District 7 that have used the MRSI Program for this purpose. The property between Norwood-Young America and Hanley Falls, currently owned by the Minnesota Valley Regional Rail Authority (MVRRA) was purchased with state funds in 1983. In 1989, the property located between Agate and Manley in Nobles & Rock Counties was also purchased by a partnership between the State of Minnesota, and the Buffalo Ridge Regional Rail Authority.

- *Rail Line Rehabilitation:* A rail authority, rail line owner, or carrier may qualify for a 15-year loan at negotiated rates. If a rail authority owns the property the state can provide up to 80 percent of the project costs with the rail authority providing 10 percent and the shippers providing the other 10 percent of the project costs. If the rail line is owned by a private carrier the state can provide up to 70 percent of the project costs, 20 percent by the railroad and 10 percent by the shippers to complete the project costs. State funds can be used for a rehabilitation if the line is in a deteriorated condition and the improvements have the probability of keeping the line in operation and viable, both for the railroad and for the on-line shippers. The line must be returned to at least FRA Class1 standards, 10 mile per hour safe operating speeds with 263,000 pound cars and continuously maintained during the 15-year loan term.

In District 7, the prime example of this program was the rehabilitation of the Minnesota Prairie Line (MPL). The MPL was originally a Minneapolis and St. Louis Railroad and later a Chicago and North Western Railroad branch from Norwood, just southwest of the Twin Cities, to Hanley Falls, MN. It covers a distance of 94 miles and cuts across the northern section of District 7. The line is owned by the Minnesota Valley Regional Railroad Authority (MVRRA), a public sub-division of the state which entails five counties where the railroad transpires through. The five counties include Carver, Sibley, Renville, Redwood, and Yellow Medicine Counties. MVRRA acquired the line in 1983 when the Chicago and North Western Railroad decided to abandon the line. In 2000, after several failed attempts by short lines to operate the branch line, MVRRA sought to bring the line back into operation on behalf of the towns and businesses along the line, which included quarries, food processors, feed mills, and several grain elevators. Prior to this time, the railroad line had been embargoed, or blocked from moving traffic for safety and engineering reasons.

In 2002, the State funded a \$4.8 million rehabilitation of the line with the MVRRA providing \$600,000 and the MNRail, Inc (the shipper's association) providing another \$600,000. MVRRA also succeeded in securing federally assisted funding of \$1 million from the federal government. This project brought service back to the line at Class I track standards, allowing 10 mile per hour service on the line. Prior to receiving the funding, MVRRA arranged a lease to the Twin Cities and Western Railroad, a regional railroad operator, to operate the line beginning in the fall of 2002. Since the initial rehabilitation in 2002, MVRRA has succeeded in receiving an additional \$1.987 million and \$2.0 million from the Federal Government to continue further upgrades to the line.

Since the MVRRA is a public entity, this essentially equates to an investment in public infrastructure, albeit a railroad for freight purposes. Most of the on-line industries moving bulk products currently ship via the MPL. MVRRA administrators testified in 2002 that preserving the MPL would ultimately save 80,000 truck trips into the Twin Cities metro region every year, reducing road wear and congestion in the process. Since the rehabilitation and subsequent upgrades, an ethanol plant in Winthrop, Heartland Corn Products, expanded their facility to process local corn into 95 million gallons a year of ethanol, thanks in large part to available railroad transportation option for long-haul distribution. While this has diverted some elevator shipments of corn away from local elevators and off of the railroad, Heartland Corn Products began shipping tank car loads of ethanol by rail in the last quarter of 2006. Most of their production now moves by rail

in unit trains to the west coast, more than offsetting the original lost traffic. This one business alone will account for \$250 million or more of annual business revenue added to the area, as well as providing a high profit outlet for local corn growers. The rail rehabilitation project has exhibited significant positive results for District 7 and neighboring areas in the form of retained and added business to this railroad corridor.

4.1.2 Minnesota Railroad Grade Crossing Safety Improvement Program

The purpose of the Minnesota Railroad Grade Crossing Safety Improvement Program is to enhance the safety of the traveling public by correcting, removing and improving unsafe conditions at railroad-highway grade crossings. Eligible projects include installation of active warning devices, signs and pavement markings, lighting, improved roadway alignments, crossing closures/consolidations, and grade separations (highway over railroad).

Potential railroad-highway grade crossing safety improvement projects are identified in a number of ways including statewide and district-wide safety rankings; requests from local road authorities, railroads, local organizations, and Mn/DOT districts; and through the solicitation processes of the Districts/Area Transportation Partnerships (ATPs). Mn/DOT's Office of Freight and Commercial Vehicle Operations (OFCVO) reviews these potential projects and forwards recommendations to the Mn/DOT District Offices for consideration for inclusion in the Area Transportation Improvement Programs (ATIPs).

Between 1996 and 2006, Mn/DOT improved safety at over 54 individual locations in District 7, at an investment of approximately \$5.5 million. Mn/DOT, local highway engineers, and the railroads all cooperated in this effort to improve grade crossing safety.

4.1.3 Grade Crossing Safety Education and Awareness

Mn/DOT is an active partner in the Minnesota chapter of Operation Lifesaver, in cooperation with railroads, the Federal Railroad Administration, members of the law enforcement community and concerned citizens. Operation Lifesaver, Inc., is a private, non-profit educational organization dedicated to ending these crashes, deaths, and injuries at railroad-highway grade crossings and on railroad property. Educational programs include providing free railroad safety presentations to schools and civic groups, training and information for professional drivers, law enforcement officers, and emergency responders. Public service announcements, news releases and media resources, rail safety tips, and messages and statistics are also available through OLI to raise public awareness of the dangers on and near railroad property.

These safety programs have exhibited results by recorded steady decreases in grade crossing accidents since the 1980s. However, the Midstates area of the US, including Minnesota, is shown by the Federal Railroad Administration as still accounting for half of all the nation's grade crossing accidents and fatalities. The large number of rural and minimally-protected crossings is one factor, and the presence of large semi tractor-trailers owned and operated by non-commercial operators on an increasing basis, including farmers, is another contributing factor. The Midstates Rail & Highway Annual Safety Conferences, sponsored in partnership by the FRA, Railroads, and states, have regularly documented both the problems and corrective activities and technology. Mn/DOT's programs rank very well in this forum, but increased OLI education and especially more information targeted to rural and farm groups could see increased effectiveness for Mn/DOT and District 7 in this area.

4.1.4 Mn/DOT Commercial Vehicle Operations (CVO)

Trucking in District 7 is the foremost means of transporting freight in the area, and is the primary mode for the vast majority of local delivery and distribution even for those commodities moved by rail, barge, or air freight. Although deregulation under the federal Staggers Act in 1980 freed much of commercial trucking from dictated rates, tariffs, and operating authorities previously controlled by the Interstate Commerce Commission, allowing more pricing and contracting freedom, the industry still operates in a regulatory environment that increasingly requires stringent safety programs, driver performance controls and reporting, and corporate accountability. CVO offers services under Mn/DOT's auspices that materially assist Minnesota trucking firms in compliance with these conditions, including a large number headquartered in or operating through District 7. In many cases, this consists of sourcing essential information for these carriers and drivers. In other cases, intrastate permitting and operations are covered, and CVO also provides a portal and service center for many federal programs and reporting channels.

Some of the relevant CVO activities that are offered include: Information (e.g., New Operator information; Federal Hours of Service regulations and reporting requirements; training opportunities, Commercial Carrier regulations, including FMCSA Safety regulations and reporting; road and vehicle restrictions, including size/weight and spring thaw; and business information, including tax agreements, tax tables, etc.); Forms and Reports (e.g., Safety and Fitness forms (FMCSA); Fuel Tax Waivers; Taxes); Vehicles (e.g., Registration; Inspection; DOT Numbers); Company Compliance (e.g., New Carrier/Operator Guidance; Reports Requirements; Workers Compensation; and Interstate and Intrastate Carrier Registrations, including Household Goods Movers); and Commercial Drivers Licenses (Define, qualify, and approve Medical and Physical waivers as is deemed appropriate for intrastate drivers).

4.1.5 Truck Size and Weight

The Commissioner of Transportation has the statutory authority to issue (or deny) permits authorizing movement of a vehicle or combination of vehicles, with or without a load, that exceed maximum legal size and weight allowances. In general, legal dimensions are 8-feet, 6-inches wide; 13-feet, 6-inches in height, up to 75-feet in length, and up to 80,000 lb. gross vehicle weight. Loads exceeding these limits require a Mn/DOT permit to travel on the Interstate and State Trunk Highways. Movement on local roads may require permits from local road authorities. The Truck Size and Weight group has the specific charge for exercising this state authority, including highway operations that involve some of the following operations:

1. Oversize & Overweight Permits-Mn/DOT is responsible for special commercial vehicle operating permits including oversize and overweight, farm implement and equipment, seasonal weight, mobile crane, construction equipment, and other annual and single trip permits on Interstates and state trunk highways.
2. Oversize Routing and Accommodations for oversize movements on state trunk and US highways.
3. House Moving permits.

Permit requirements are designed to minimize exposure to risks for the general traveling public and to workers on highway construction projects. Permits, and their restrictions, are also intended to minimize possible damage to the highway infrastructure, such as bridges and pavements, and to better accommodate and manage the flow of extra-large, indivisible freight shipments within the State.

Mn/DOT Permit technicians approved and issued almost 90,000 permits in calendar year 2006. An additional 52,385 permits were issued automatically by the system to carriers who ordered online. Few permit moves are identical, and the challenge is to quickly and accurately review and issue permits for a wide variety of freight movement. Mn/DOT has a permit issuing and routing computer system called RouteBuilder, which greatly helps in the evaluating of permit requests and approval and issuance of permits. In many cases, customers can request their permits, and receive them, online.

Certain types of movements, such as super-loads in excess of 20-feet wide or 150-feet long or very heavy weights require additional coordination and approvals from offices such as Mn/DOT districts, Mn/DOT Bridge Office, MN State Patrol and/or local jurisdictions. During spring thaw, additional coordination is required with Mn/DOT's Office of Materials & Road Research to keep overweight loads away from posted road segments and bridges.

Extra-large loads may require escort vehicles to precede or follow the load as an additional safety-warning mechanism. Loads exceeding 15-feet 6-inches high requires that a pilot car physically go out and survey the route to ensure no contact with low-hanging power lines, traffic signal heads, or other obstructions before a permit will be granted. Requests for permits can be made by phone, fax, in-person, or online. Permit types are: single trip, annual, seasonal, and emergency. Minnesota statutes governing movement of oversize and overweight loads are found under MS § 169.80 – 169.88.

These services of CVO and Mn/DOT are considered by carriers and shippers interviewed during the District 7 Freight Study's Business Profiles and Outreach to be well-established, and offered very adequate support for truckers. Their consensus opinion that the total level of regulation was becoming onerous did not reflect on their opinion of the effectiveness of Mn/DOT and CVO services. The on-line single trip and annual oversize/overweight permitting procedures currently active in the system were particularly appreciated by operators who have registered to use these web-based tools.

4.1.6 County State-Aid Highway System

Mn/DOT administers County State-Aid Highway Funds for designated County Highway maintenance and construction. This funding stream and channel is specified in the State Constitution. Established criteria allow for a system of County-operated roads that serve as a consistent and connected series of traffic collectors to serve as a functional level of highways to complement the State Trunk Highway system in connecting local roads and jurisdictions to major market, business, and population centers.

The CSAH funding is distributed by the Office of State Aid, which also serves as liaison with the Counties in coordinating projects and joint activities. One of the freight highway networks historically tracked and coordinated by Mn/DOT and State Aid has been the 10-Ton Network, the series of heavy duty roads that are designed to handle heavy commercial vehicles with maximum axle loadings. This network includes virtually all Federal and State Trunk highways, a large proportion of the CSAH system, and many County roads. Since 2004, when the Legislature gave the Counties a large amount of autonomy to designate road load capacity and postings, State Aid has relaxed any active tracking of the detailed 10-ton local network.

The District 7 Freight Study found a wide disparity between each County's handling of their portion of roads in the 10-Ton Network, which as reported has become a very significant issue in the District in terms of handling agricultural movements and supporting the biofuels boom. The repository of information on this network was notably outdated and incomplete at the State level, but was incomplete or inconsistent in reporting when requested from the Counties as well.

Given the importance of this 10-Ton Network to efficiently move freight on a connected, consistent, and all-season system of highways as freight volumes expand, the State Aid office in Mn/DOT can play a very productive role by improving coordination with the Counties. State Aid has already been instrumental in supporting the County Engineers in moving toward a comprehensive load testing program to identify the actual load capacity of existing roads, and is assisting in discussions about improving Heavy Commercial AADT counts, as well as Heavy Vehicle Classification Counts. All three of these data sets are critical to making decisions about improving the heavy duty road system, and answering future business needs for freight transportation by truck, the foremost and key local mode for moving commercial production. Mn/DOT State Aid, the County Engineers, and other stakeholders have a logical interest to support and accelerate activities in these areas if knowledgeable and effective infrastructure investment decisions are to be made to support freight and business growth.

4.1.7 Waterways Freight

Mn/DOT Port Development Assistance Program: The Minnesota Legislature began funding this program in 1996 to assist public ports on the Mississippi River and the Great Lakes in modernizing infrastructure. Mn/DOT administers and prioritizes proposals from the Ports based on urgency of need and availability of funding, and requires at least a 20 percent local match for fixed facility improvements. To date, the State of Minnesota has invested \$17.5 million into 25 projects of the Port Development Assistance Program. A long list of needed project proposals still exists, but current funding and limitations at the state level have slowed project assistance. District 7 benefits from the existence of this assistance program due to the grain, agricultural product, and non-metallic minerals shipments through Upper Mississippi River barge facilities for exports and several major downstream domestic users. These movements are expected to remain significant to the District for the foreseeable future.

4.1.8 Mn/DOT Aeronautics

Aeronautics incorporates air freight into its planning processes in developing and maintaining the Minnesota State Aviation System Plan (SASP). Mankato ranks as one of fourteen airports in the system that has scheduled air freight or express cargo services, and will be expanding the main runway. In addition, Fairmont, Windom, and Worthington are three of eighteen airports that offer on-demand air cargo operations in the State.

Because of carrier consolidations and proximity to the Twin Cities, much of the air freight from the District is trucked to MSP or Chicago, and air freighted from those major hubs. Air freight as a mode has seen decreasing volumes in the last few years, both because of more effective just-in-time distribution techniques that rely heavily on intermodal and truck deliveries, and heightened security measures now in place. An International Air Cargo Regional Distribution Center (RDC) is being explored by the Greater Metropolitan Area Foreign Trade Zone Board to provide alternate air cargo service option to meet the rapidly increasing demands of Minnesota companies conducting business internationally.

Mn/DOT Aeronautics actively funds and operates the Airport Construction Program, which seeks to improve the safety, capacity, and operations of general aviation and commercial airports in the state. While this program does not have a specific air freight component, the general system improvements tend to also improve the ability of various facilities to handle scheduled and chartered freight operations.

4.1.9 Freight Planning

Mn/DOT provides a primary service in freight planning and research by mode, by region, industry, and issue for the State. This ongoing effort strives to keep Minnesota in the forefront of solutions for problems that may affect the competitiveness and efficiency of various business sectors and the State as a whole. In the recent past, Mn/DOT has completed studies and plans covering the long-range Statewide Transportation Plan and Freight Plan, the Commercial Vehicle Size and Weight Project, the Spring Thaw Restriction Study, the Twin Ports Intermodal Study, and many more. These have formed the basis for much of the data used in the District Freight Study. Freight Planning continues to foster needed research on trucking efficiency, highway safety, and modal and intermodal policy and investment.

The initiation of the District 7 Freight Study by Freight Planning has given rise to several observations by the Study Team during the course of this project. Based on the Team's experience with and continuing exposure to the private sector's freight operations, bolstered by the Study's profiling and outreach, have demonstrated the veracity of the Study's direct approach and communication with business interests. This lesson has been well received by the project management team, and suggests a core approach for any future District-level studies. State-level freight planning and policy discussions also need to incorporate this direct communication with the private sector as much as possible.

The large library of studies and plans for the most part have been well thought out in identifying problem areas in Minnesota, and for the most part have been productively executed. They form a very solid base of public information, and in several cases have recommended significant actions and improvements to Minnesota freight transportation operations, policy, and regulations that

appear to make sense and have been adopted in other areas and jurisdictions. However, data limitations and the thwarting of several of the initiatives in the political arena have made implementation difficult. Better enlistment of support from other affected state agencies, local jurisdictions, and private sector partners should be a high priority in future work, as it has been with this exercise. This broad level of ongoing communication, and a consensus on possible action, needs to receive adequate attention in the Freight Planning Office. This extends to the activities of the Minnesota Freight Advisory Committee, District planners and engineers, and communications with business representatives, trade groups, and transportation companies.

4.2 POTENTIAL FUTURE MN/DOT PROGRAMS AS SUPPORTED IN FEDERAL FREIGHT PROGRAM INITIATIVES – SAFETEA-LU REAUTHORIZATION

In October 2006, Congress passed the Safe, Accountable, Flexible, Efficient Transportation Equity Act—a Legacy for Users (SAFETEA-LU), a six year transportation program for the USDOT and the federal government. This document has an unprecedented amount of attention paid to freight movement as a portion of the nation’s transportation picture. A significant amount of funding follows these program components as well. Because of delays in the legislative process, this bill was delayed several years beyond when it was first scheduled to supersede the last six year program, and by 2009 follow-up legislation will be due. Its recent passage also means that most of the initiatives outlined in the legislation are still in the formative stages, with suggested rulemaking, public input and comments, and other procedural requirements being performed. There are three major exceptions to this program status. The first is the list of earmarked projects. These include the majority of projects named under four categories:

- Projects of National and Regional Significance (1301)
- National Corridor Infrastructure Improvement Program (1302)
- High Priority Projects Program (1701)
- Transportation Improvements (1934)

Many of these earmarked projects are freight-related, including the Alameda Corridor in Los Angeles and the CREATE rail diversion project around Chicago.

The second and third exceptions consist of two commissions that were formed prior to the bill’s final passage, and have been charged to report to Congress in the near future. The first is the National Transportation Policy and Revenue Study Commission. This is a 12-member panel charged with developing a 50-year plan for transportation policy, improvements, and funding. The plan covers all modes of transportation and includes freight as an integral part. Their final report is due to Congress by July 1, 2007.

The second commission is the National Surface Transportation Infrastructure Financing Commission. This is a group of 15 members who are roughly paralleling the work of the first commission, with an emphasis on actual financing analysis and strategies to make implementation of the policy plan feasible. Their report is due in late 2008.

The other freight provisions of SAFETEA-LU can be roughly grouped into three areas. These are Planning and Research, Financing, and Freight Programs.

4.2.1 *Planning and Research:*

- Section 5209; National Cooperative Freight Transportation Research Program. This will be a \$15 million program administered by the National Academy of Sciences specifically to research freight.
- Section 9007; Study of Rail Transportation and Regulation. The TRB will use \$1.8 million to study and report on rail service levels, rates, constraints to growth, and competition.
- Section 5503; Motor Carrier Efficiency Study. The Federal Motor Carrier Safety Administration (FMCSA) will conduct a study on inefficiency in freight movement, ITS applications, and possible field testing.
- Section 4149; National Intermodal System Improvement Plan. USDOT's Office of Intermodalism will conduct a study of trends and needs, and recommend actions to further enhance intermodal traffic in the U.S.
- Section 1925; Community Enhancement Study. This study will determine the effects of transportation improvement on economic development, including freight transportation aspects.
- Section 6001; Transportation Planning. This promotes transportation planning at the state and MPO levels and includes requirements to include freight integration and the participation of freight shippers in the planning process.

4.2.2 *Financing:*

- Section 1601; Transportation Infrastructure Finance and Innovation Act (TIFIA). The TIFIA is a loan program currently in existence, but with important changes. It is extended to public and private freight rail facilities and intermodal yards that demonstrate public benefits to highway users. It also reduces the minimum project size to \$50 million dollars, and allows grouping of similar or related projects under the loan qualification.
- Section 9003; Rail Rehabilitation and Improvement Program (RRIF). This loan program is intended to enhance rail service and capacity, and is authorized for a \$35 billion loan portfolio.
- Section 9002; Capital Grants for Rail Line Relocation Projects. These are grants to states for relocation and improvement projects.
- Section 1602; State Infrastructure Banks (SIB); This program is now authorized for use by all states, and multi-state banks. SIB funds may be used for capital projects, credit assistance, subsidies, and refinancing, including rail projects.
- Section 11-1143; Private Activity Bonds; this amends IRS rules to allow tax-exempt bonding for privately owned or operated highway and intermodal facility projects.

4.2.3 Freight Program:

- Section 1306; Freight Intermodal Distribution Pilot Grant Program. This program will select six pilot programs for state-level grants to improve circulation, access, and expansion of both inland and port-related intermodal facilities.
- Section 1305; Truck Parking Facilities. This will select pilot programs for applications and construction of long-term parking for commercial vehicles on the National Highway System. It dovetails with and is related to the Interstate Oasis Program (Section 1310) and the Idling Reduction Facilities Program for Interstates (Section 1412).
- Section 5204(h); Freight Planning and Capacity Building Program. Although this program has research and planning components, it also allow for training and education, peer exchange, and public-private partnership building, a key ingredient to effective freight planning and operations.

These programs will offer significant opportunities for Mn/DOT in funding demonstrations and expansions. In particular, the Research areas, Planning and Capacity Building, Intermodal Facilities projects, and the Commercial Vehicle Parking, Idling Reduction, and Interstate Oasis programs will be areas where freight in general and the issues reported for District 7 specifically will have new resources available for improvements. The Rail Loan, Rehabilitation, State Infrastructure Banks, and Private Activity Bonds offer other financial potential for supporting upgrades to private and public facilities.

4.3 PROGRAMS RELEVANT TO FREIGHT TRANSPORTATION: MINNESOTA STATE DEPARTMENTS

4.3.1 Department of Public Safety

The Department of Public Safety serves as the enforcement agency for a host of State transportation regulations. Commercial drivers have regular interface with DPS for some of the following activities:

- DPS reviews and establishes basic requirements for the Minnesota Commercial Drivers License.
- Develops and administers examinations and testing for the license.
- Qualifies and approves drivers for Hazardous Materials hauling in the State, especially for intrastate transport, and maintains and record endorsement status and data.
- Maintains driver records and status, including accidents, violations, and insurance. This now includes CDL Disqualifications required by law in the event a designated non-commercial violation is recorded.

Carrier registration, including applying for and verifying USDOT numbers, is managed by DPS. Vehicle fleets, operating authorities, and a range of carrier services under the “Explore” program are tracked or maintained by the Department in its commercial services sector.

DPS oversees the Mandatory Vehicle Inspection System to ensure safe vehicle conditions for commercial vehicles. It is responsible for enforcing vehicle weight and size limit regulations, and includes the operation of weigh stations on the State Trunk and Interstate Highway systems. It participates in some local area weight enforcement measures, and works with Mn/DOT on initiatives to test and develop enforcement capabilities of Weigh-In-Motion installations, including a site in District 7. In the area of vehicle, driver, and carrier safety at the Federal and interstate commerce level, DPS serves as a portal for the Federal Motor Carrier Safety Administration. It also maintains crash rate statistics including those for heavy commercial vehicles and railroad grade crossing accidents.

DPS operates the Office of Pipeline Safety, and handles inspections, accident records, and enforcement activities in this area. It is a designated agent for Homeland Security measures, and is a key respondent in the National Incident Management System (NIMS) and especially the Minnesota Incident Management System (MIMS).

4.3.2 Minnesota Department of Agriculture

The Department of Agriculture, because of the agricultural nature of this area and its key commodities, is deeply involved in major industry aspects of the District. Its' Extension Services provide technical and educational assistance to farmers, one of its major historic roles, and disseminates current information on many subjects from business management, crop management, animal husbandry, to land management and erosion control. It sponsors or co-sponsors research programs and field implementation demonstrations and programs in many of these areas. It also works closely with federal agricultural programs in coordinating these efforts locally. The Department handles licensing of facilities including grain handling and milling, food manufacturing, and has a role in fertilizer and pesticide use, both significant commodities being transported to and within agricultural areas. The Department of Agriculture works with many companies and co-ops that have multiple sites throughout the counties, and coordinates oversight at this local level.

The Department keeps detailed records on agricultural production, acres under cultivation, number and makeup of farms, and demographic, income, and other information on farmers as well as rural areas in general. These records provide a consistent and very detailed database with which to track trends, commodity production, and freight activity. This also covers truck (produce) farming and food processing. The Department, as an extension of its agricultural industry investigation, also keeps track of the expanding biofuels business, including biodiesel and ethanol production. Aside from industry trade publications and association compilations, this forms the most complete and current base of information available on this growing business segment. Their data is mirrored by and often combined with other states' data and federal information from the US Department of Agriculture, the US Commerce Department, and the US Bureau of Statistics.

4.3.3 Minnesota Department of Natural Resources

The Department of Natural Resources (DNR) plays a role in two key areas that affect District 7. First is its role in non-metallic minerals production, the second largest freight commodity category by tonnage in the region. It plays a major role in minerals mining assessments, including surveys of accessible and commercially viable deposits, these surveys run the gamut

from sedimentary aggregate deposits, for construction-grade sand and gravel quarrying, to more specialized and valuable mineral deposits. Aggregate supplies in District 7 are represented by numerous sand and gravel quarrying operations, as represented by some of the supplemental profile research done on Oldcastle Materials and Unimin. District 7 aggregate supplies have historically been used for construction within the District, by local contractors and constructors. This follows the industry's basic business model where transportation costs restrict the use of most materials to a small delivery radius. In particular, this restricts the use of the area's aggregate in the State's largest construction market. The Metropolitan Council's 2000 study of Twin Cities aggregate supplies notes as estimated usage of 20 million tons per year in the seven-county Metro Region. It projected that local economically-accessible aggregate supplies would be exhausted by approximately 2029. The replacement of these supplies will depend on finding a supply with adequate quality, and the adjustment of market prices due to material scarcity that will allow transportation from greater distances. Many of the District deposits are considered of lower grade than presently available in the Metro, and the exceptions of crushed granite and dolomite that are found in pockets in the area have so far been used only for high grade, high value projects such as runway construction. DNR is actively updating and expanding its mineral surveys, and these will undoubtedly have value in future private-sector initiatives to find new sources for this nearby demand.

Recently completed surveys by the National Resources Research Institute for the DNR of higher value non-metallic minerals define the location of materials that represents major exports from the District, including silica sand and kaolin clay. Silica sand is used in everything from electronics and glass manufacturing to sandblasting, depending on its purity and quality. District 7 is home to some of the highest quality silica deposits in the country. Kaolin clay is used in paper coatings and whitening, ceramics, and as a binder in fired products such as brick. The mineral surveys conducted five years ago in cooperation with the University of Minnesota and NRRI catalogued numerous undeveloped deposits of commercial-grade clays along the Minnesota River valley, indicating resources that should sustain this industrial activity many decades into the future. Except for trucking to some local users, much of these materials are transported longer distances by rail in bulk, in covered hoppers.

The second significant role that has developed for the DNR is water management. While agricultural irrigation has been tracked for water use and aquifer depletion for some time, the water needs of ethanol plants has placed a much greater strain on water supplies, in southern Minnesota in particular. The DNR has the charge and authority to issue Water Appropriation Permits to major users, including mining and manufacturing facilities. Ethanol distillation processes use a very large volume of water in producing the fermentation mash as well as in other parts of the processes, and represent the most significant change to occur in water use patterns since field irrigation came into common use. Several new plant expansions have been delayed over this issue, and water conservation measures are being advanced as a result.

4.3.4 Minnesota Pollution Control Agency

The Minnesota Pollution Control Agency's (MPCA) regulations affect industrial, agricultural, and freight operations in several areas. With its formation under the onset of federal and state pollution control measures in the 1960s and 1970s, the MPCA undertook a wide range of measures to control and improve air and water quality. Chief among these in District 7 has been the control of water quality in three areas (industrial, agricultural, and freight operations).

The first area of MPCA involvement is control of industrial runoff from mining and quarrying into wetlands and general watersheds. Two issues are handled under inspection and permitting procedures. First is control of sediment discharge, to prevent filling in of watercourses and lowland/wetland areas. Second is chemical discharge, including leaching of damaging compounds from mine sites and processing plants into the watershed.

The second area under the control of the MPCA is waste and manure handling and disposal. In this agricultural area, manure handling especially at the concentrated hog feedlots is a major concern. Livestock manure must be fully contained, and stored in pits or tanks fully isolated from the surrounding surface and ground water supplies. These concentrations of animal waste have also given rise to air quality concerns in the past, especially ammonia and methane discharges. Revised feeding, storage, disposal, and cultivation techniques have solved the majority of these problems. Animal manure remains an important source of plant nutrients, and controlled concentration, sub-surface injection processes are regularly used to limit air exposure, smells, runoff, and seepage through the soil. The other MPCA waste disposal concern and also a subject for business licensing and permitting, is industrial waste disposal. Again, ethanol plants have become a recent point of emphasis for these controls, to ensure that waste water and solid wastes are either cleaned to allowable standards or disposed of in an approved manner. As the plants become larger and more numerous, this also becomes a major point of industry/government interaction.

The third area of MPCA involvement is in Hazardous Materials management and compliance. Aside from hazardous material transportation regulation which falls under Mn/DOT and USDOT authority, the regulation of storage, emissions, and process permits, as well as inspections and enforcement is within the purview of the MPCA. Again, ethanol plants in particular have become the major new point of compliance efforts. Ethanol itself is a flammable liquid, and carries a requirement for proper handling and storage that prevents and controls both spills and ignition. Plant permitting by the MPCA also offers a data and documentation source for tracking industrial activities in the District.

4.3.5 Minnesota Department of Employment and Economic Development

The Minnesota Department of Employment and Economic Development (DEED) plays a part in freight movement in District 7 in three distinct areas. First, it enhances the business and development environment in the area through a full program of business development services. DEED has the ability to offer training in small business startups, business finance, operating guidelines, and referrals to business resources including training, trade groups, and investment resources. In some situations and industries, particularly services and manufacturing, job training and placement is available to the subject companies and prospective employees.

DEED also administers several local and Small City redevelopment grant programs that offer rehabilitation for housing, commercial property, and infrastructure. While many of these are targeted to local governmental units and their redevelopment efforts, these grants are often used for specific business development proposals that will help site more employment, but also offer incentives for business to relocate or expand. While most of these will not generate significant freight traffic over the short term (the exception being some large warehousing and distribution centers), these efforts have been active in District 7 as well as other areas in Greater Minnesota.

The third activity encompassed by DEED is the Minnesota Trade Office (MTO) and export assistance. Many of the manufacturing ventures (a prime example being Scott Equipment) are operating in a globalized market, and sell a significant percent of their output to foreign clients. The MTO also helps to channel foreign investment into Minnesota businesses, and offers new trade contacts as available. Grain exports have always been a major outlet for corn and soybeans from the District, and the ethanol industry's primary byproduct, Distillers Dried Grains (DDG) and Distillers Dried Grains with Solubles (DDGS) have become a new item for export as a livestock feed supplement. Industry reports show DDGS exports accounting for approximately 25 percent of this byproduct's output. This export volume, unlike domestic movements that employ bulk trucks and rail cars, is shipped via container loads in an identity-preserved, sealed status to deliver specified quality to the buyers.

4.4 PROGRAMS RELEVANT TO FREIGHT TRANSPORTATION: UNITED STATES GOVERNMENT

4.4.1 United States Department of Transportation

The federal Department of Transportation provides a wide range of services and activities that directly impact on freight movement in District 7. As with Mn/DOT, the USDOT covers all modes and regulatory, safety, technical, and operating issues, but specifically handles by congressional and constitutional mandate all aspects of interstate commerce and also federal involvement in international transportation as is appropriate.

Federal Motor Carrier Safety Administration:

The Federal Motor Carrier Safety Administration (FMCSA) provides national oversight for commercial motor vehicle operations, especially but not exclusively regarding safety issues. It regulates and provides assistance over a wide range of activities and programs, including driver fitness, carrier programs and permits, hazardous materials, equipment, and safety programs. Some of its key program components include the following:

- **Hours of Service Regulations:** The FMCSA was charged with promulgating and implementing a set of regulations that would reduce driver fatigue and unsafe rest practices, as well as setting a national standard for interstate truck commerce and a model for states. While drivers now have to drive shorter days and have tighter restrictions on logging their hours, other changes have helped to mitigate some of the negative effects on productivity and lend more clarity to the rules. Another feature has been tighter restrictions on age and training for interstate CDLs. While these are still being met with opposition by many in the trucking industry, the rules are in place and being enforced after a very long rulemaking process.
- **Hazardous Materials Transportation:** Hazardous materials endorsements for truckers and registration by the carriers are part of this program, as is a national Route Registry for approved routings.
- **Drug and Alcohol Programs:** The agency oversees federal requirements, assists in setting up programs, and records incident statistics.

- **Safety Training:** FMCSA provides guidelines and programs for driver training and company programs in the effort to reduce accidents and deaths among commercial drivers.
- **New Carrier licensing and probationary entry permits:** For companies entering interstate trucking, the FMCSA issues a probationary permit to allow the start of operations with approved safety and compliance programs, and reserves the right to end the operating permit if programs, accident rates, violations, or compliance becomes sub-standard for the new carrier.
- **Equipment safety:** Approved parts specifications, repair protocols and inspection intervals, and systems and vehicle inspection are all provided to some extent.
- **National Commercial Motor Vehicle programs:** Formal safety and education programs are maintained, including public and industry efforts such as ‘Share the Road Safely’ and the ‘Safety Belt Partnership’.
- **Rail Grade Crossing Safety:** The FMCSA provides support and education for motor vehicle awareness, and supports rail safety programs like ‘Operation Lifesaver’.

Overall, the FMCSA provides a necessary function at both the national and the state level, with a reasonable and achievable reduction in commercial accident rates as its goal. The greatest negative effect is the large number of individual programs, forms, and reporting requirements for the trucking companies, which are sometimes duplicated or overlap with other federal agency and state requirements. Trucking companies also are skeptical of the long-term effects on their labor pools caused by higher age limits for licensing and insuring long-haul truckers, and onerous reporting regimens.

Federal Railroad Programs

Beyond the programs already discussed in this analysis, several federal agencies are involved in rail operations and financing that affect District 7. The **Federal Railroad Administration** oversees most operating and safety aspects of railroads. This includes track and grade crossing inspections, equipment inspections, accident investigations, and hazardous material transportation programs. It also administers the two major established rail loan programs noted in the SAFETEA-LU discussion, TIFIA and RRIF.

Interstate regulation of the railroads, which covers virtually all of their regulatory exposure, is provided by the **Federal Surface Transportation Board**. This agency was founded under the Staggers Transportation Deregulation Act of 1980, to replace the Interstate Commerce Commission which had held full veto power over railroad rates, mergers, and abandonments since the early 20th century. It oversees tariff rates, rate contracts, and route and line rationalization, although at a less intrusive level than the ICC exercised.

Federal Aviation Administration:

The FAA serves as the regulator, operator, safety coordinator, and administrator of the national airways system. Through the Airport Improvement Program (AIP) federal grants are provided to twelve National Plan of Integrated Airport Systems (NPIAS) airports in District 7. The FAA

works actively with state agencies and the carriers to provide consistent and safe air transportation. Because of the integration of air freight on major facilities and air routes, the FAA also extends the same services to largely freight-oriented airport hubs. The Transportation Safety Administration (TSA) provides Homeland Security services largely for passenger transportation, but also oversees some cargo operations as well as facility security and other anti-terrorism aspects.

4.4.2 United States Department of Agriculture:

The Department of Agriculture (USDA) operates several programs that impact freight flows in the District, or are affected by the operations of the agricultural commodity flows in the area and the industry. Specific to crop exports and bulk shipments to the marine ports on the West and Gulf Coasts, the USDA administers the Foreign Food Donation Program, which is directed to purchase grain for hunger relief and other food needs in depressed countries, at federal support price levels and transported on US Flag cargo vessels. This has essentially provided an export outlet for surplus grain regardless of international market fluctuations, which have at times dropped to destructively low levels. This has also buffered the freight traffic volumes moving by both rail and barge from District 7.

The USDA also operates general Price Support programs which serve to subsidize or otherwise protect farmers from low domestic markets. A variation of these programs is the Land Bank or cropland retirement programs that take tillable acreage out of cultivation for extended periods, also to eventually affect prices by limiting supply. While these programs do not directly affect freight volumes, they work over the long run to keep a larger number of farmers in business, in order to be available for upturns in demand and also stabilize the rural economy.

USDA administers a Food Storage Facilities Program, which provides funding for storage of surplus grains and foodstuffs in response to bumper crops or purchases of price-supported commodities that need to be held until demand or market conditions provide a suitable outlet.

Also as part of the program to ensure long-term stability and health in agriculture, the USDA regularly conducts Crop Surplus Auctions, to reduce any surplus stocks at times and at prices that will not materially affect the active markets for crop harvests and other food stocks. It is indicative of the current supply situation concerning biofuels that the most recent rounds of Crop Surplus Auctions for the key grain crops produced in District 7 have been delayed or canceled.

All of these programs and actions have had an effect in maintaining the farm community and agricultural production in the District through some very severe downturns in markets, tied to both oversupply and the vagaries of international markets. The most recent trend toward ethanol and biodiesel production that has buoyed prices in the area and outstripped demand has also caused a reduction in demand and the need for price supports under these programs. These improvements in agricultural markets have had the positive effect of reducing the financial demands on the USDA for their support programs for grain farmers in the Midwest.

Lastly, USDA is involved in Homeland Security measures that could have far reaching effects on freight transportation in the event of any bioterrorism targeted against food crops. They are sponsoring research and coordination centers, one of which is in Ames, Iowa, to develop disease

containment strategies and animal disease control methods. Some of these strategies may involve quarantine and suspension of commodity movements, as well as sealed shipments and tighter freight reporting and control. This would directly affect the entire supply chain and the connected industries.

4.4.3 Environmental Protection Agency:

The United States Environmental Protection Agency (EPA) is charged with controlling and reducing environmental pollution at the national level. Many of their activities are closely coordinated with the activities of the MPCA. Because of their national perspective, and the federal responsibility for interstate activities and commerce, the EPA since its inception has exerted major control over mobile source emissions, those pollutants emitted by vehicles of all modes, including automobiles, trucks, trains, boats, and airplanes. For the first three decades of its existence, the EPA concentrated on automobile emissions as the major mobile source of large volumes of pollution in impacted urban areas. By the late 1990s, significant progress had been made with automotive emissions, and the EPA began to look at tighter controls on mobile sources of pollution that had previously been deemed a lower priority. This focused particularly on diesel engines for commercial trucks and railroad locomotives. Tightened controls are being systematically implemented to reduce sulfur dioxide, nitrogen oxides, and particulates in diesel emissions. These are noted here particularly for their cost impacts on freight movement. The formulation of low-sulfur diesel fuels and the incorporation of biodiesel blends into the fuel mix have increased the cost of supply, hampered fuel distribution methods and volumes, and generally made the fuel's supply and cost less predictable and economic. New engine technologies have increased the cost of these power plants, and caused short-term disruption in vehicle manufacture in a limited number of situations. These measures will continue to move ahead, but will continue to be a challenge for freight transporters over the near term.

Additionally, the EPA shares responsibility for hazardous materials not only at plants but also in the realm of transportation, when spills and contamination occur. This latter responsibility overlaps with the federal transportation regulatory agencies, the safety administrations, the states, and local responders and regulators.

4.4.4 Army Corps of Engineers:

One of the Army Corps of Engineers' major responsibilities is the operation and maintenance of the system of navigable inland waterways. This includes the lock and dam systems on the Mississippi and Missouri Rivers, dredging the navigation channels, and supplying and maintaining navigation aids, all of which allow commercial barge operations. The Corps operates as a branch of the Army, technically controlled by the Pentagon, but also reporting to a Public Commission as concerns its waterway and flood control programs. The employees of the organization are largely non-military in makeup.

Like the highways, the infrastructure investment and some of the operating funds for the Corps' inland waterway programs come from public sources, including fuel taxes and general appropriations. While barge transportation represents the most fuel efficient and cost effective means of bulk freight movement, several factors reduce this effectiveness. The size and general predictability of barge tows on the Lower Mississippi and the Intercoastal Waterway make this

mode extremely cost competitive against rail and truck. The large number of size-restricted locks and dams on the Upper Mississippi, and even more on the Missouri River, slow the transit time, increase hours of operation for the boats and crews, and limit the overall size of the tow. These upper river operations also are prone to the effects of low water levels during periods of limited rainfall, reducing payloads, and are completely closed during winter months due to freezing. These limitations require extra storage capacity at river ports, and the transload operations from truck or rail to barge also adds a cost.

The high price of improving inland waterway facilities has hampered any efforts in recent years to improve these capacity and cost impacts. The 2007 session of Congress is now considering a landmark waterways management bill that would address some of these ongoing issues. Another concern has been the impact of increased competition from railroads for long-haul bulk movements. The advent of shuttle grain trains originating at large, improved inland elevators, their lowered freight rates and speed, and the increasing freight rates on the river have noticeably reduced traffic volumes on the Upper Mississippi, and removed most of the barge traffic from the Missouri. This competition being provided by private railroad common carriers with privately capitalized infrastructure has given some leverage to waterway investment opponents. However, the fuel efficiency, energy conservation, and extremely large capacity of the inland waterway freight operations continue to argue for their preservation and improvement.

4.4.5 US Coast Guard

Aside from the previously discussed role of the Army Corps of Engineers, and the status of the federal Water Resources Development Act of 2007, the other major presence on the waterways is the US Coast Guard. The Coast Guard is charged with the maintenance of channel and navigation systems, and now also Homeland Security issues on the inland waterways.

4.4.6 US Customs Department

US Customs controls the movement and documentation of all commodity imports and exports across national borders, and as such has a presence in the District because of foreign exports, international air traffic and containers, and foreign imports. US Customs originally was put in place to collect import and export tariffs as a revenue and trade control device. Although this is still their chief mission, they also cooperate in Homeland Security, drug interdiction, hazardous materials documentation, and trade reporting among other support functions.

4.5 TRANSPORTATION PROGRAM ANALYSIS SUMMARY

Mn/DOT freight transportation programs by and large are well received by industry as necessary but well-executed and supportive to private operations. Commercial Vehicle Operations is particularly effective both for licensing and permits as well as being an information and reporting conduit for several federal programs.

Freight Planning has been and is active in identifying and researching Freight Transportation issues. Efforts have often been in the forefront of state-level and industry discussions on regulatory changes and policy direction. The Truck Size and Weight Project, the Spring Thaw Restriction findings, driver fatigue and rest area work, and investment evaluation and modifications in areas like the MRSI program all testify to a conscientious effort to generate progress and effectiveness. Integration of their recommendations has been less than consistent or effective when it has come to implementation and inclusion into transportation policy. Developing a role as a source of information on freight issues and planning with other departments should be a focus, as should an enhancement of communications with the private sector through both established channels such as MFAC, and new efforts at District and Statewide levels.

The MRSI program has shown a very positive payback for investments made, and should serve as the foundation for more discussion on public investment in public or private freight railroad infrastructure.

Mn/DOT and State Aid should expand their role in facilitating and coordinating County-level initiatives to define and upgrade their highways in use for heavy commercial vehicles, especially the 10-Ton Network components. Comprehensive state-wide load testing and bridge inventories need to be completed before planning and investing in system upgrades for continuity, connectivity, and coverage can be enhanced where needed. Another aspect of needs for better data that should be addressed is accurate HCAADT and vehicle classification counts on these highways. With good information and the methodology and oversight suggested in the Study's Systems Analysis section for the current and conceptual 10-Ton Network, productive advancements can be made in closing gaps and expanding coverage of the Network where it is most beneficial. This in turn will accomplish the twin goals of supporting new industry expansion, especially biofuels growth, and improving the competitiveness of the State in terms of freight infrastructure.

Mn/DOT should provide input and cooperate with federal agencies where possible to streamline and integrate federal programs. There is an obvious overlapping of authorities, programs, and reporting requirements across several federal departments. The most obvious problems exist with the following:

- Commercial vehicle and driver safety programs.
- Hazardous Materials permitting, enforcement, and response.
- Road and Rail safety programs - The proliferation of programs like Operation Lifesaver, Toward Zero Deaths, Share the Road, and the Safety Belt Partnership are all well-founded, but lack cooperation and tend to dilute program effectiveness with the public due to their many different messages.

Mn /DOT has the opportunity and should immediately investigate new SAFETEA-LU programs as they have guidance formulated and are implemented, to expand some key emerging efforts including truck rest and service areas, intermodal access, rail improvements, and research.

5.0 OUTREACH AND PUBLIC INVOLVEMENT

This chapter documents the outreach effort with selected stakeholders including key industry representatives, regional shippers and carriers, and policymakers interested in the freight and business activities of District 7 and the surrounding areas. During this outreach, distinct industry-related information was collected for inclusion in the report, as well as feedback and input from a wide range of stakeholders at the federal, state, county, and local government levels, transportation company representatives, and business operators and managers. Background information was shared, as was in-depth and knowledgeable discussions of needs, issues, and solutions.

Part of the scope of the District 7 Freight Study was to disseminate the study findings as they developed, both for the purposes of informing stakeholders, and receiving input and comments on the Study in order to direct and modify the Study investigations. A great deal of input was collected in these public outreach sessions, including information on county engineering problems and initiatives, business development, road and rail safety, freight carrier issues, and new data on areas such as ethanol plant efficiency and cellulosic feedstocks. In several cases, the discussion of freight in the context of agriculture, rural affairs, and energy proved to generate new and significant interest in transportation issues ranging from the local to the national level.

5.1 PROJECT MANAGEMENT TEAM MEETINGS AND PROJECT COMMUNICATIONS

Project Management Team meetings were held regularly during the Study to inform Project Management Team members of the latest activities, review progress on technical memoranda and recommendations, review next steps, and especially provide a forum for the various representatives for comments, questions, feedback, and suggestions for lines of investigation. The meetings were usually held in Mn/DOT's District 7 offices in Mankato, but also held in St. Paul as schedules and invitees dictated. Consultant team recorded and distributed minutes. This group also formed the core of intra-agency contacts as data gathering and internal interviews were needed. Following is a list of the dates of these meetings:

- PMT-1, 9/18/06
- PMT-2, 10/23/06
- PMT-3, 1/11/07
- PMT-4, 3/5/07
- PMT-5, 5/22/07

5.1.1 *Check-in Meetings*

Check-in meetings were held approximately every two weeks to work out details of PMT meetings, review correspondence and current issues, confer with consultant team members on budget and timeline status, make necessary changes in direction of investigations and interviews, work on edits and reports, and review deliverables.

5.1.2 *Special Meetings*

Special meetings were held several times during the Study to facilitate conversations with stakeholders and project managers on specific issues, including Mn/DOT programs, Railroad safety and assistance issues, County and State Aid input, content for testimony, CVO, Size & Weight, and operating procedures, and other key points.

5.2 KEY INDUSTRY REPRESENTATIVE PROFILES

As noted in Chapter 2, a significant effort went into developing a local and relevant source of industry data. The result that proved successful involved targeted face-to-face interviews with representatives of at least one major business in each of the top six commodity and enterprise areas for District 7. A conscious and intensive selection process balanced industry and geographic areas in the District, and wherever possible, profile candidates represented more than one interest or a dovetailing of areas of investigation, such as agricultural products combined with truck or rail movements. Research into the industry sector and the individual businesses preceded the interviews, and follow-up contacts were made as necessary for clarifications. The input, insights, and observations on issues and trends gained from the profile interviews became a constant reference for every aspect of the study. This line of communication filled in an otherwise unavailable amount of detailed and relevant information. It also offered ongoing contacts and a pattern for future freight discussions and studies. Several of the officers and senior managers involved have actually taken on advisory roles with local groups and the Minnesota Freight Advisory Committee as a result.

As discussed in earlier chapters, six key industries were selected for profiling. Specific business-oriented information was from each of the profile candidates: Archer Daniels Midland Company, Mankato; Corn Plus Ethanol, Winnebago; Jerry Gaalswyck Farms, Trimont; Scott Equipment, New Prague; Watonwan Farm Services, Truman; and Wells Concrete Products, Wells.

Archer Daniels Midland Company was interviewed on January 22, 2007, in Mankato. Managers Craig Willis and Kent Soellner represented the Mankato Soybean processing plant in Mankato and the corn milling plant in Marshall respectively. ADM is a worldwide agricultural and food products processor with headquarters in Decatur, IL. While they operate a chain of corn elevators and several private trucks in their fleet, most trucking is customer provided. A large volume of rail traffic is also generated in Mankato. ADM represents agricultural processing and the Mankato area in the profile cross-section. Their wide range of food and feed products overlaps with other profiled operations and helps define the rural agricultural economy and its trends and changes. Issues included rail service improvement opportunities that could benefit them, trucking operations, and highway upgrades, especially Hwy. 14.

Corn Plus Ethanol was interviewed on December 20, 2006, in Winnebago. General Manager Keith Kor and his operating managers represented the company and offered excellent insights into the current state of the ethanol industry and developing technologies and trends. Corn Plus is an industry leader in plant energy generation, cost efficiencies, and working for their cooperative members to maximize profits through some unique innovations. They illustrated the interaction between their members, other area cooperatives and services, truckers, and the railroads. Issues

included the escalation of construction costs, needed rail improvements to handle the leased car fleet and satisfy railroad service dictates, and effects of long-distance hauls and highway load restrictions, including spring thaw postings, on member revenues and return.

Jerry Gaalswyk Farms and Gaalswyk Bros. Trucking was interviewed on December 6, 2006, in Trimont. Jerry represented the farming sector, and also commercial trucking for bulk goods. Gaalswyk Farms operates 4400 acres for corn and soybean production, and has 28 trucks working for them in contract and commercial service as well as handling their own needs. They illustrated the growing use of large equipment and semi trucks by consolidated farms, and offered good feedback on local transportation issues and the effects of crop yields, exports, and the biofuels industry growth. Issues included the availability of 9- and 10-ton roads to move heavy loads to market, road restrictions, seasonal and local access for farmers to the heavy duty network year-round, the available labor pool of drivers, and the need for funding, designing, and building road upgrades.

Scott Equipment was interviewed on December 14, 2006, in New Prague, representing the northern part of the District and the Manufacturing sector. Jim Chromy and several managers represented the company and gave a good overview of the manufacturing of feed mill, food processing, and conveyor systems supplied to a worldwide market. Scott ships supplies in and products out almost entirely by truck, with international shipments usually transloaded to containers in the Twin Cities for export. Issues include local backups of traffic in the vicinity of their plant on MN 21 and MN 19, and the negative effects of Metro area congestion and access to rail yards there. Overall, however, their supply network operates outside the urban areas and the transportation system generally fills their needs well.

Watowan Farm Services was interviewed on January 16, 2007, in Truman, represented by Craig Killian and four operating managers. WFS is a full service farm cooperative serving more than 4000 producers in southern Minnesota and Iowa, making it the largest farmer-owned cooperative in Minnesota. They operate an extensive network of grain elevators, including shuttle elevators, fertilizer and farm supply distribution, trucking, and technical services. They ship 30 to 35 million bushels of corn by rail per year, and also have contractual and supply arrangements with ethanol plants. Issues include facilities on non-10-ton roads, and spring thaw restrictions, with WFS being the only profiled business adjusting rates to reflect light truck loadings for its customers and truckers. Feed deliveries are especially affected, with detours and light loads costing money. Access from and to barge terminals on the Mississippi, and access to better rail service for fertilizer and bulk deliveries are also an issue.

Wells Concrete Products was interviewed on January 22, 2007, in Wells. They were represented by Dave Buessing, President, and Steve Kloos, Asst. Mgr. Ready Mix as well as others. Wells has two basic product lines one being Ready-Mix concrete for roads and construction, a partially seasonal business, and pre-stressed, structural, and architectural concrete products. They operate throughout southern Minnesota, with several ready-mix plants and construction projects throughout a three state area. They, like many of the others, value their local relationships, reputation, and contracts in making them viable over the long term. Wells operates an extensive fleet of trucks and cranes, with the cranes and structural products usually requiring oversize

permits. Issues include posting limits on local and county roads that limit access by their heavy equipment and concrete trucks, and congestion and local permit restrictions in the Metro area that can often delay or even totally disrupt their projects' construction and erection schedules.

5.2.1 Supplemental Industry Input and Research

Although the six representative profile businesses provided a wealth of information and insight, several key commodities, including hogs, aggregate, and non-metallic minerals were not covered. Supplemental research was conducted through a combination of public information where available, and limited phone contacts where possible, in collecting additional information relevant to the study. Future local freight studies may benefit from a targeted but expanded round of business profiles. The supplemental investigations included information on the following businesses: Oldcastle Materials, formerly Southern Minnesota materials, a major supplier of quarried materials including sand and aggregate for paving and construction in the region; Unimin, specializing in sands, aggregate, kaolin clays, and other major minerals mining and quarrying, with major expansions underway in District 7 operations; and Bob Christensen Farms, the Region's largest privately owned hog and pork production operation, with vertically-integrated operations, including feed, trucking, processing plants.

5.3 TRANSPORTATION INDUSTRY OUTREACH

The transportation sector was cooperative throughout the study in providing statistics, historical information, and data on trends that helped to frame the Study's work on the freight infrastructure and the workings of the freight network. Both competitive and cooperative issues surfaced, and interaction and interdependence of the various modes was discussed in depth. The following is a list of some of the formal presentations, conferences, and meetings that were involved in these discussions.

Minnesota Railroads Presentation, 1/25/07

Growth issues, safety, capital investment, short line relationships discussed.

The Minnesota Regional Railroads Association (MRRA) is an advocacy organization dedicated to promoting the interests of small railroads to the public and to all levels of government. MRRA membership includes, among others, the Twin Cities and Western Railroad Company, BNSF, Canadian Pacific Railway, and Boise. The organization also provides technical assistance and training for its diverse membership.

Discussions following the presentations revealed that Class 1 service levels were being driven by an historically record-setting level of ton-miles and carloadings particularly in coal and intermodal traffic. Three of every four dollars in profits were being re-invested in capital projects for expansion and capacity improvements. This growth was causing shortages in equipment and manpower that cannot be corrected overnight, leading to a conscious effort to divert efforts away from labor-intensive short hauls and local switching demands. Grain shuttle trains and ethanol unit trains are one of the answers to this effort to meet shipper needs. Short lines and regionals are answering local demands to grow their businesses, but rely on the interchange with the Class 1's to deliver their shipments for long distance destinations.

Minnesota Trucking Association, 5/1/07

Size and weight issues, hours of service impacts, environmental regulations on diesel engines, competition, and labor pool issues.

Located in Roseville, the Minnesota Trucking Association (MTA) is a non-profit trade association representing the interests of Minnesota's motor carrier industry. The stated mission of this organization is to provide advocacy, information, and services to ensure safe transportation and a successful Minnesota trucking industry. MTA's membership includes over 700 companies.

The MTA provided a wealth of information on trucking statistics and trends in Minnesota. A key point in their efforts is to work for an improved transportation network for use by commercial carriers, noting that freight growth is outstripping the growth in truck size and weight and the driver pool, especially in light of more restrictive federal regulations for hours of service and safety. Metro area congestion and the need for more trucker services are prime concerns as well as cost factors.

Minnesota Freight Advisory Committee, 2/9/07 and 6/8/07

Intermodal operations, government program interfaces, state transportation policy and plans, input on investment issues and safety.

The Minnesota Freight Advisory Committee serves as a forum to address issues and exchange ideas between the Minnesota Department of Transportation and the private sector. The focus of the committee is to develop and promote a safe, reliable, efficient, and environmentally responsible freight transportation system for Minnesota. The committee meets quarterly.

MFAC has consistently advised for better freight transportation as a key element of Minnesota's success in a competitive business world. Road investment, equitable policies toward short line and regional rail operators, and more and better access to intermodal container corridors connecting major markets have been put forward as issues.

University of Minnesota Center for Transportation Studies Annual Research Conference, 5/2/07

Effects of ethanol and cellulosic feedstock development, waterways, road and pavement life, trucking information.

The Center for Transportation Studies (CTS) is a research, outreach, and education center housed within the University of Minnesota. The center is known on a national level as it attracts more than \$18 million annually for its research, outreach and education activities. CTS was created in 1987 to improve cooperation between the University of Minnesota's faculty and various state and federal transportation agencies.

The CTS conference presented a comprehensive body of information on agricultural and ethanol growth, biofuels technology and trends, and the economic effects driving the markets and the current explosive growth in the renewable fuels industry. The transportation needs for rural areas, both road and rail, were discussed in several forums.

MidStates Rail & Highway Safety Conference, 5/8/07

Grade crossing safety, new federal regulations, rail signaling improvements, short line issues.

The MidStates Rail & Highway Safety Conference was held in May of 2007 in Omaha, Nebraska. The conference brought together agencies dedicated to highway and rail safety from all levels of government and included railroad officials, suppliers and consultants. The MidState geographic region consists of states from Minnesota to Texas and from Wyoming to Ohio.

Presentations at the Safety Conference generated responses about the need for better grade crossing safety education particularly in rural and agricultural areas, given the growth in truck size and traffic volumes caused by the farm boom. The crossing accident rates in these areas are well above the national average and deserve more visibility, better crossing safety installations, and expanded safety programs.

5.4 PUBLIC PRESENTATIONS AND OUTREACH

Presentations were made to stakeholder groups and other interested parties throughout the span of the Study, and particularly in the latter stages of the study's development. These provided the roles of both public education and public participation in discussions about the relevant issues involved. Consultant staff and Mn/DOT representatives from District 7 and Central Office all participated in giving presentations and receiving comment. The following are the requested presentations that were made by the Project members and managers.

Southern Minnesota Initiative Foundation, 10/5/06; Freight issues important to expanding business line in rural Minnesota, need more emphasis.

The Southern Minnesota Initiative Foundation focuses on 20 counties in Southern Minnesota by investing in their future growth through grants and loans. The organization also provides technical assistance, especially in the bio-medical, bio-agriculture, and alternative energy areas.

Also known as the Southern Minnesota Leadership Circle, the group emphasized that improvements in freight transportation are seen as a lynchpin issue for economic expansion in their areas.

Area Transportation Partnership-7, 11/26/06; Study to include road funding, capacity issues, rail and road access and service.

The Area Transportation Partnership (ATP) program was established in Minnesota following passage of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) to help prioritize the spending of federal transportation dollars. In general, ATP membership consists of elected officials, planners, engineers and other representatives from within the counties represented by the partnership.

The ATP was very vocal about the Study's evidence of agricultural production growth and related transportation needs. They especially noted that the County road systems are not keeping up with this freight growth, and that a recognition of the role that the biofuels and agricultural industries play in the State's economy is needed.

Southwest Regional Development Commission, 1/31/07; Appreciation for timeliness of study, freight access issues including containerization.

Located in Slayton, Minnesota, the Southwest Regional Development Commission serves a nine-county area of Southwest Minnesota. It is the stated mission of the commission to address the economic, social, physical and governmental needs and opportunities of Southern Minnesota. The commission also serves as an advocate for change in local, regional, state, and federal policies, programs, and regulations.

The Commission noted that road and rail access to distant markets as well as to new businesses and industrial parks is one of their largest challenges, especially for local rail service. Movements in and out of the region are not keeping up with the access enjoyed by the Metro region and some neighboring states.

Region 9 Development Commission, 2/08/07; Farm equipment and freight effects on transportation discussed.

Region 9 Development Commission has worked since 1972 on behalf of the counties, cities, townships and schools of South Central Minnesota. The commission seeks to develop programs in, and identify solutions to problems regarding aging, economic development, business development, healthy communities, transportation, and community development. The commission maintains a future-oriented vision as it promotes the region's development through intergovernmental cooperation, community and human development, long-range planning and technical assistance.

The Development Commission sees the effects of more large trucks and farm implements as an issue for rural traffic flow and safety that will impact economic growth and livability. A degraded transportation system that is not being maintained and improved at key intersections and population centers will tend to slow efforts toward economic health that has been the biggest long term problem.

District 7 County Engineers, 3/15/07; Importance of knowing and designing local roads to accommodate actual truck movement.

District 7 is one of eight Minnesota Department of Transportation (Mn/DOT) operating districts in the state of Minnesota. The County Engineers of District 7 represent the 13 counties stretching from southwest of the Twin Cities Metro area to the Iowa and South Dakota borders.

The County Engineers noted that coordination between county road departments and Mn/DOT could be improved, and should be in light of the recent growth in agricultural traffic. Gathering consistent and comprehensive data on road capacity, heavy vehicle AADT's, and vehicle classification counts is a first step that needs to be advanced, and then acted on with conscious, targeted investment decisions that can handle freight growth.

Minnesota Transportation Alliance Board, 3/26/07; need to recognize and integrate freight issues and effects into state transportation policies and discussions.

The Minnesota Transportation Alliance provides information and policy initiatives to its member organizations as they advocate for a safe and effective transportation system as well as additional funding for highways, transit systems, waterways, aviation, and rail systems. The Board consists of 22 members. The current President of the Board is Mr. Richard Thomas of Ames Construction.

The issue of rural and freight transportation had not previously been one of the Alliance's high priorities, but the findings and data surrounding industry growth in agriculture and biofuels highlighted this additional transportation need. Despite competing with their other priorities for limited resources, the Alliance saw this as an additional argument for transportation investment by the State if the Minnesota quality of life is to be maintained.

District 7 Stakeholders Meeting, 4/13/07; Relative importance of freight and agricultural growth in prioritization of District work, including trunk highway improvement projects.

District 7 is one of eight Minnesota Department of Transportation (Mn/DOT) operating districts in the state of Minnesota. The Stakeholders of District 7 represent the 13 counties stretching from southwest of the Twin Cities Metro area to the Iowa and South Dakota borders.

Mn/DOT's stakeholders, both public and private, ranked the need for freight transportation improvements second only behind completion of two major multi-lane trunk highway improvements that have been under partial construction for extended periods of time.

National Transportation Policy and Revenue Commission, 4/18/07; National and local significance of rural, agricultural freight issues to transportation and the economy.

The National Transportation Surface Policy and Revenue Study Commission was created by Congress through passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) to “preserve and enhance the surface transportation system to meet the needs of the United States for the 21st Century.” The Commission, which is chaired by the U.S. Secretary of Transportation, Mary Peters, consists of 12 members. The main focus of the Commission is to assess the condition and futures needs of the nation's surface transportation system. Additionally, the Commission is investigating alternatives to the fuel tax as the primary funding stream for the Highway Trust Fund.

USDOT Secretary Mary Peters and members of the Commission noted that after several months of testimony mostly in urban centers, the testimony about rural transportation issues and needs derived from the Mn/DOT study and other presentations from neighboring states and groups gave them a new appreciation for rural, agricultural, biofuels, and freight aspects of the national transportation picture.

Minnesota County Engineers Association Board, 5/10/07; Input on road load testing, HCAADT's, investment priorities, statewide coordination.

The Minnesota County Engineers Association's (MCEA) membership consists of County Engineers representing all 87 counties of the State of Minnesota. The organization exists to promote the county engineer profession as well as uphold a code of ethics by which county engineers can operate. The Board of Directors, with Washington County Engineer Don Theisen as President, is responsible for the administration and business of the association.

The Engineers participated in a several hour discussion following the Study presentation, noting that comprehensive quantitative data on roads and commercial traffic volumes are lacking for local and county roads statewide. The existing (partial) data was shown to be inaccurate and in many cases unusable for road investment and construction planning, and there needs to be a state-level coordination effort to direct County work in these areas in Greater Minnesota so that the best use of resources can be planned in response to the trends.

Association of Minnesota Counties, District 7, 5/30/07; Added importance of local improvements, funding due to freight, agricultural, biofuels trends.

The Association of Minnesota Counties (AMC) is a voluntary statewide organization of Minnesota's 87 counties. The AMC's focus is the provision of effective county governance and advocating for favorable legislation and policies. District 7 of the AMC consists of 10 counties in South Central Minnesota.

The AMC participants noted that the loss of State revenue sharing due to recent legislative actions came at the time when accelerated highway spending is most needed. Most of the members recognized the local positive impacts of the ethanol industry, as well as the issues that are arising from it. The consensus was for a need to break the investment logjams at the state level, even as many are planning to proceed with local construction and improvements funded by local bonding and budget diversions.

Mn/DOT Managers Conference, 6/14/07; Statewide interest in new information, relevant input from study.

Minnesota's Department of Transportation was created through legislation in 1976 to oversee the state's transportation policies, plans, and programs for aeronautics, highways, motor carriers, ports, public transit and railroads.

Participants at the Manager's Conference, particularly District-level managers, were very interested in the local-level freight transportation analysis performed in District 7, with the most common comments being questions about the relevancy of findings to their District, and a desire to have a similar study performed in their region and involving their particular industries.

5.5 OUTREACH SUMMARY:

The District 7 Freight Study relied heavily on both detailed and focused local information from the Industry Profiles, and a high level of interaction and input from both internal agency and inter-agency sources, and a wide audience of stakeholders. Much of this information uncovered unpredicted trends, relationships, and impacts of both historic and extraordinary growth in District businesses. The interaction of the various modes, the communities, local businesses, and state and national trends and policies was very effectively highlighted by these investigations and discussions. It has been evident to most of the active participants that these sources have been invaluable in framing and informing the content of the Study. The profiling was particularly effective in collecting data for the study and could benefit from an expansion in the number of profiled businesses in any future effort. The cooperation and communication between the private sector and the public sector throughout this outreach process was a significant benefit that provides a basis and pattern for any ongoing efforts in this vein.

6.0 FINDINGS AND RECOMMENDATIONS

Major changes in the District's economy and freight movements are being led by growth in the renewable industry, and the agricultural sector's response to higher demands and market prices. Recognizing and communicating these effects, integrating the information into planning processes and policy, and implementing responsive infrastructure investment and operational decisions will serve to maintain the freight network's viability and effectiveness. This chapter identifies key findings from background information and provides recommendations to improve freight mobility in the District. These findings are organized into three categories: Effects of industry and freight growth; Freight network and infrastructure enhancements; and, Freight integration and planning improvements.

6.1 EFFECTS OF INDUSTRY AND FREIGHT GROWTH

Extraordinary growth is occurring in the region's renewable energy industry. Renewable fuel production, in particular ethanol, has shown significant growth over the past decade in District 7. Ethanol plants in the District consume corn grown locally to produce ethanol, the popular gasoline substitute and octane additive. Biodiesel plants in the area use soybean oils to produce a diesel fuel supplement. These plants represent another farm-adjacent market for the area's key crops, and also represent a change in truck and rail traffic patterns to collect the grain, distribute the final product, and disperse the plant's byproducts. In 2005, corn being consumed by ethanol plants in District 7 represented 19 percent of the area's total corn yield. The expanding alternative fuels industry adds significant value to the corn being raised in the region. Distiller Dried Grains (DDG and DDGS), 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 via containers. In 2005 ethanol production in the District totaled 186 million gallons, half of Minnesota's total output. This 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 prices⁶ directly added an estimated \$1 billion to the District 7 economy, and up to \$5 billion directly and indirectly to Minnesota's economy⁷. Offsetting this is the higher price of grain driven by bio-fuels demand, resulting in more 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.

While the growth in biofuels may have large benefits for the local economy, transportation investments to handle the large increases in freight movements will need to be made based first on immediate need and then on long-term sustainable trends. This long-term infrastructure investment will need to include the 10-ton network of roads, as well as railroad and short line preservation, both of which have taken on new importance in sustaining biofuels growth. Energy and agriculture have historically been very volatile industries, although world petroleum demand and the advent of new biofuel technology, such as cellulosic feedstocks, provide an indication that this current growth may be sustainable.

⁶ Chicago Board of Trade; annual 'planter' benchmark

⁷ Minnesota Department of Employment and Economic Development

In addition to bio-based alternative fuels, the study also identified a significant growth in electricity generated from wind turbines in the District. Large wind generating facilities can present significant transportation challenges due to the size and weight of the turbines and blades. Currently, wind farms constructed in District 7 rely upon imports of foreign wind turbine components. However, there is good potential for production and export of wind turbine components from the District in the near future. Another freight generator that has been announced is a new regional retail distribution center in the Mankato area.

Recommendations

- 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.
- Establish the sharing of local-level interagency information prior to site selection on permits, new developments, and about land use and transportation planning. Communities, agencies and industries can optimize expenditures and increase safety by communicating early on about future plans and infrastructure needs.

Freight traffic growth in the region is substantially outpacing that of Minnesota and the US. Recent projections from FHWA which extend through 2035, suggest that freight volumes by tonnage will double in Minnesota, from 664.3 million tons in 2002, to 1329.3 million tons in 2035. Many of the current trends in agriculture, if continued, suggest strong growth in District 7 freight traffic at as much as double this statewide rate, potentially over 200 percent by 2030. The transportation network serving District 7 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 and quality of life. Significant challenges exist for managing and upgrading the current 10-ton road network in the District that are likely needed to meet new and changing freight traffic demands. The railroad system's ability to provide meaningful access and capacity to rural shippers is critical for freight transportation. The Minnesota Rail Service Improvement (MRSI) Program has played a crucial role in shaping the current rail service network, but as the system continues to evolve, the program must be able to respond to new demands. Emerging alternatives and supplements to the freight network, including intermodal transportation and containerized movements to international destinations, are becoming part of the District's freight system needs.

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).

The use of larger farm equipment, including 5-axle semi tractor trailers, is increasing. With larger scale operations comes larger equipment such as tractors, combines, and trucks. The larger farm equipment poses a growing problem in transporting a unit from field to field 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 these 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. Evaluate and obtain better existing and future HCAADT counts with Weigh-in-Motion and classification counts.
- 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”. Increasing farm implement size and weight is cause for review in regards to possible update of exemptions or road design accommodations.
- 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.

6.2 FREIGHT NETWORK AND INFRASTRUCTURE ENHANCEMENTS

A limited 10-ton roadway network restricts freight carrying capacity in the region. The functional 10-Ton road network is essential to provide efficient commercial truck traffic throughout District 7 and on connectors beyond the area. 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 current 10-ton road network consists of State Trunk Highways, much of the CSAH system, and some of the County road network. 10-ton roads,

particularly the Trunk Highways, provide reasonable coverage on roughly a ten-mile grid, but with notable gaps and containing segments still subject to weight restrictions. Some of the county road network is also capable of sustaining 10-ton year-round loadings, but most county and local connectors are not presently designated as 10-ton. Reduced loads and/or circuitous routings increase industry costs, fuel use, and environmental impacts that are associated with more trips. Investment in closing gaps in the network by upgrading restricted trunk highways and/or county highways will likely return positive value to the economy. For example, Nicollet County is already designating all but a few of its roads as 10-ton routes, and posting only the ones that have experienced frost problems. However, many jurisdictions at the local and county level don't have the funds to upgrade large portions of their system to meet the 10-ton demands, nor do they have current and accurate data on measured road strength, load capacity, HCAADT, and vehicle classification counts. Without this data, planners and engineers cannot make a usable determination of their system condition and their needs. In a wider context, there is also no consistent oversight on system gaps and capacities from county to county, leaving parts of the 10-ton system without the preferred continuity. The methodology and analysis developed and utilized in the Freight Study provides an illustration and starting point for prioritizing improvements to the current 10-ton network's coverage, and also offers an approach for developing a better grid of 10-ton State, CSAH, and County roads to serve the needs of Freight transporters. These priorities range from the most cost-effective options for low-cost pavement reinforcement and short-distance connections to bridge current system gaps, up to and including major road reconstruction. A non-constrained system would extend a four season, 10-ton network down to a consistent 5-mile grid in intensively cultivated agricultural areas.

Spring Weight Restrictions on the 10-ton system will have a larger impact as the biofuel industry increases production. The average ethanol plant distills 40 million gallons per year and has only 10 days of storage for corn. As a result ethanol production facilities rely on regular truck shipments to their facilities where much of the supply comes direct from area farms. Most of these trucks are five-axle semis loaded to capacity. With 18 ethanol plants already in production in Minnesota and more coming on-line, weight restrictions on seasonal 10-ton roads and on many county and local roads may have significant impacts on the cost of production. Restricting a 10-ton road to 9 tons reduces the truck's payload by up to 20 percent, assuming the truck's tare or empty weight remains the same. Seasonal weight restrictions are likely to add more trips, require more driver hours, and more fuel usage. Farm-to-market access for this delivery of grain to ethanol plants, and feed to livestock feedlots, is expected to continue or possibly even become more critical with the transition to cellulosic feedstocks in approximately the next five years. Greater tonnages of cellulose feedstock may be used to supplement or replace corn, with higher production volumes of ethanol possible. Trucking and railing the product and byproducts back out may also increase, with a greater need for daily transport year around. A major element in managing this situation for the best outcome rests with the Counties and local jurisdictions. They currently have the autonomy to post their roads according to condition and need. They can react to local weather and roadbed conditions quickly, and should be encouraged to work more closely with local enforcement officers and the effected plants to minimize damage while maximizing truck loadings wherever possible.

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.

Grain and coal constitute the two largest commodities handled by railroads. Following rail deregulation in the 1980s, Class I railroads made dramatic productivity gains in coal and container transportation by utilizing unit trains of 100 or more cars. Equipment cycle times of 5 to 10 days or less became common. In comparison, grain trains averaged 50 to 70 cars in the 1980s and 1990s, with equipment cycle time of 18 to 24 days, substantially unchanged from the mid 1970s. Using grain shuttle trains, Class I railroads are now achieving productivity similar to what they have achieved in coal and intermodal markets.

Common attributes of the shuttle train concept include: Farm delivery to elevators by 5-axle tractor semi-trailer combination trucks; average farm to elevator haul of up to 75 miles; elevators load high capacity railroad hopper cars. Elevators must be able to load an entire 100 to 110-car unit train in 15 hours or less.

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.

The demand is increasing for localized access to intermodal/ containerized freight. Freight security has always been an issue in regard to pilfering and theft, but several high profile food crises (e.g. mad cow disease, genetically altered seed, etc.) during the 1990s resulted in new protocols that now apply to food and grain shipments to many international markets. 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."⁸

The containerized, IP grain delivery is typically accomplished in one of two ways: 1) Bagged or packaged grain from the farm is palletized, trucked to a transload warehouse, and loaded into containers; 2) Bulk grain from the field is loaded directly in to a container that has been sanitized and lined with a plastic bag, then sealed. At that point, containers are drayed (locally trucked) to the nearest intermodal rail ramp from where it moves by container trains to a seaport. Utilizing containers, the specialized grain producer can control the individual shipment from the farm to its final overseas destination rather than merely from the farm to the first elevator.

⁸ U.S. Containerized Grain and Oilseed Exporters – Industry Profile and Survey – Phase II. Kimberly Vachal, Tamara VanWechel, and Heidi Reichert. July 2003.

Intermodal containers have also become the mode of choice for most export of manufactured goods, a transportation channel routinely used by businesses in District 7. Transportation brokers and logistics specialists, many located in the Twin Cities, have evolved this traffic into a relatively seamless option.

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.

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 also 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. 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.

Federal hours of service rule changes have created safety and facility concerns. Federal rules regarding trucker's hours of service and minimum age requirements have limited the labor pool and caused some issues with respect to nighttime truck parking: Study observations pointed out that while the Federal Motor Carrier Safety Administration's hours of service rules have not been found to be too restrictive, other issues tied to these regulations may have a long-term negative effect. The 21-year-old minimum age requirement for an interstate-rated CDL, insurance, certification requirements, and other mandated reporting are all seen as adding to costs, and potentially reducing the available pool of drivers to below sustainable levels. The very high average age of commercial drivers (57 years), program probation and other barriers to new companies entering the interstate industry, and increasing security and safety oversight, are all potentially destructive to the long term sustainability of the industry.

The hours of service rules also have created a greater need for truck rest stops, idling abatement services, freeway oasis, and other facility demands that are currently not being met. District-based freight haulers and shippers have expressed the concern that shorter driving periods and miles, and longer mandated rest periods coupled with more stringent enforcement, have forced their drivers into using rest stops, freeway, ramps, and unsafe shoulders and lots to take their mandated rest stops. Enforcement officers have been hesitant to move the truckers out of unsafe or illegal parking areas knowing that they will be forcing the trucker into a potentially employment-threatening federal violation. SAFETEA-LU has some provisions for countering these problems but they remain to be implemented. State policies and strategies should be reviewed in recognition of these problems, and District actions on siting, designing, or supporting local facilities should be considered in light of local responsibility for facility maintenance and business interests.

Recommendations

- Review rest area policies for commercial vehicle parking, rest area, idling, and driver services. Increasing freight volumes and more restrictive hours of service requirements, are leading to overuse and unsafe conditions in existing facilities.

6.3 FREIGHT INTEGRATION AND PLANNING IMPROVEMENTS

Freight data and information can and should be significantly enhanced. A significant amount of useful information about general trends and business practices was gained through discussions with key businesses and local agencies in the District. These discussions provided insight on interaction of different markets and vertical integration of businesses in the region: The Study's business profiling, and work with the redevelopment agencies and the ATP have demonstrated possible channels to make public/private freight conversations more productive and routine. Similar to the traffic and shippers clubs in the past, a structured forum for these issues would have long-lasting benefits. Of particular benefit would be a structured approach to improving communications at the District level between local business and business managers and the County and Mn/DOT engineers and planners, possibly something as simple as a monthly breakfast or coffee meeting. On the state level, the Minnesota Freight Advisory Committee is an established forum for communications that could be enhanced with assigned duties or charges from the agency or the legislature that will give it the ability to influence freight policy and attract more business participation.

Current Information on local freight generators in the District is limited and is relatively basic. Commercial databases can be expensive and usually can only be used to establish overall patterns of freight-flow trends into and out-of the area by commodity type. Much of the information is limited to public financial data, and information on specific agricultural movements is limited. The freight generators identified by Mn/DOT's county engineer survey, Transearch data, the DUNS database, and carrier and industry listings are inconsistent, and each source lacks important information that may or may not be available from other sources. The County Engineers identified major Freight Generators, with 50 or more trucks per day of traffic, in 2005 by observation and local input. Transearch data, which uses a national statistical sampling of reported freight movements, such as waybills and customs documents, is excellent for national trends but weak in coverage at a local level. It identified candidates for major Freight Generators that included rail traffic but was inconsistent with the Mn/DOT lists. Dun & Bradstreet data noted financial, employment, and plant information on over a thousand businesses in the District, but has no freight volume information, and also missed a significant portion of major generators noted by the other sources. Individual industry sources, such as the railroads, have shuttle elevator listings, and Department of Agriculture and the Ethanol Producers Association, have biofuels plant information. Many privately held firms, from major companies to farm operations, often fail to show up at all.

A methodology beginning with the county surveys, supplementing and comparing commercial data, and then secondary review at the Mn/DOT District and County level, holds the best promise for improving the information on major freight generator's tonnage, value, and characteristics. It does not, however, replace direct communication and observation of traffic levels and operations when specific design and construction work has to be conducted. The nature of freight as a conduit for private sector operation and production means that the volume, direction, and mode of shipments can change radically at a moments notice in response to market or contractual relationship changes. Mn/DOT will need to maintain active monitoring of the freight system and generators, and support good lines of communication, to supplement any reliance on commercial databases and one-time surveys. The ease of access and the ability to obtain updates of the commercial data, however, provides a useful tool to see changes in patterns over time. This information should be supplemented by working with other state agencies, including the Department of Agriculture and the Department of Employment and Economic Development.

Recommendations

- Maintain relationships with key industries and local agencies to stay abreast of emerging freight issues in the District. Contacts established with industry and local leaders during the Study, both through the Profiles and the outreach, should be utilized and expanded as possible.
- Follow developments and trends through key trade publications and websites for freight and industries. Ethanol Producers magazine, farm journals, coop newsletters, AURI, etc. routinely report on industry and global trends including transportation issues.
- Apply a refined process and methodology to freight planning to enhance local information and observations. The Freight Office should compile and consolidate the County Engineer's surveys, HCAADTs and classification counts, review of commercial data, and industry and

individual business input on a regular basis to improve the content of Freight Generator information. This process, including review from RDC and MPO planners, will enhance the database from these combined and expanded sources.

Improved integration of freight planning activities into Mn/DOT planning, operations, and policies is needed to benefit responses to significant freight issues. Research during this study relied heavily on a wealth of established information within Mn/DOT on truck size and weight, road restrictions, rail programs, port assistance and support, intermodal initiatives, air freight, road design, commercial vehicle characteristics and impacts, enforcement programs, freight connectors, Interregional Corridors, and many other documents. Freight as noted in this Study is playing an increasingly important part in national and international commerce and the State's competitiveness. As such, the implementation of these findings should be given more importance and visibility.

Information from this study and other research can and should be used as input to formulate potential policy and process changes, including those that will be considered for inclusion into the update of the Statewide Transportation Plan. 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 at the County, District, State Aid, and statewide levels.

Performance-based planning and management should have a wider application concerning freight movements, rural issues, and at the District level. Mn/DOT has moved toward performance-based planning and management. Freight performance measures have been difficult to develop due to lack of data, complexity of issues and systems that move goods. This, however, does not reduce their local and national significance or the need to better measure and manage progress and performance in this transportation sector.

Existing performance measures have been essentially directed at metro area congestion, statewide mobility, system preservation, safety, and operations. While a number of these measures impact freight movements, additional measures or refinements have been suggested to better account for freight movements. These include developing passenger car equivalents to provide better operational considerations for high-volume truck routes.

Current measures such as traffic speed and service levels on Interregional Corridors indirectly affect a portion of District 7's transportation, but do not address local issues for road, rail, and intermodal connections, system preservation, and capacity and safety improvements. Using the 10-ton conceptual framework, safety and grade crossing statistics, enhanced local road construction standards and their application across the system on an annual or regular basis, bridge and road capacity, and preservation of both the current rail and road network, their on-line industries, and the establishment of new freight generators on-line, are all possible measures that are applicable statewide and in a rural environment.

Recommendations

- Integrate freight information into State and District planning, programming, and design. Mn/DOT should include freight considerations in performance-based plans and in its

programming and plan development processes, including Statewide Transportation Planning and interagency programs.

- Enhance District feedback on Statewide Transportation Planning and policy development. Freight data should be used to support needs established in Statewide and District planning. This could affect funding allocations among Districts and projects.
- Improve cooperation with interdepartmental contacts in project planning regarding freight data and issues at the local level. Partnerships between Mn/DOT and other public agencies or private entities are likely to be part of future planning and programming scenarios.
- Continue to develop performance measures applicable to regional and rural freight transportation issues. Statewide investment criteria should consider freight issues and impacts, particularly heavy commercial vehicle volumes in the IRC performance measure; crash rate and severity reduction; intersection and railroad grade crossing improvements; reductions in benchmarked delay, detours, or cost; access to intermodal terminals, etc. are examples of possible new measures.

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.

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

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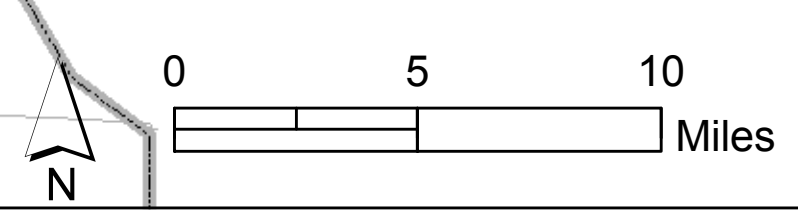
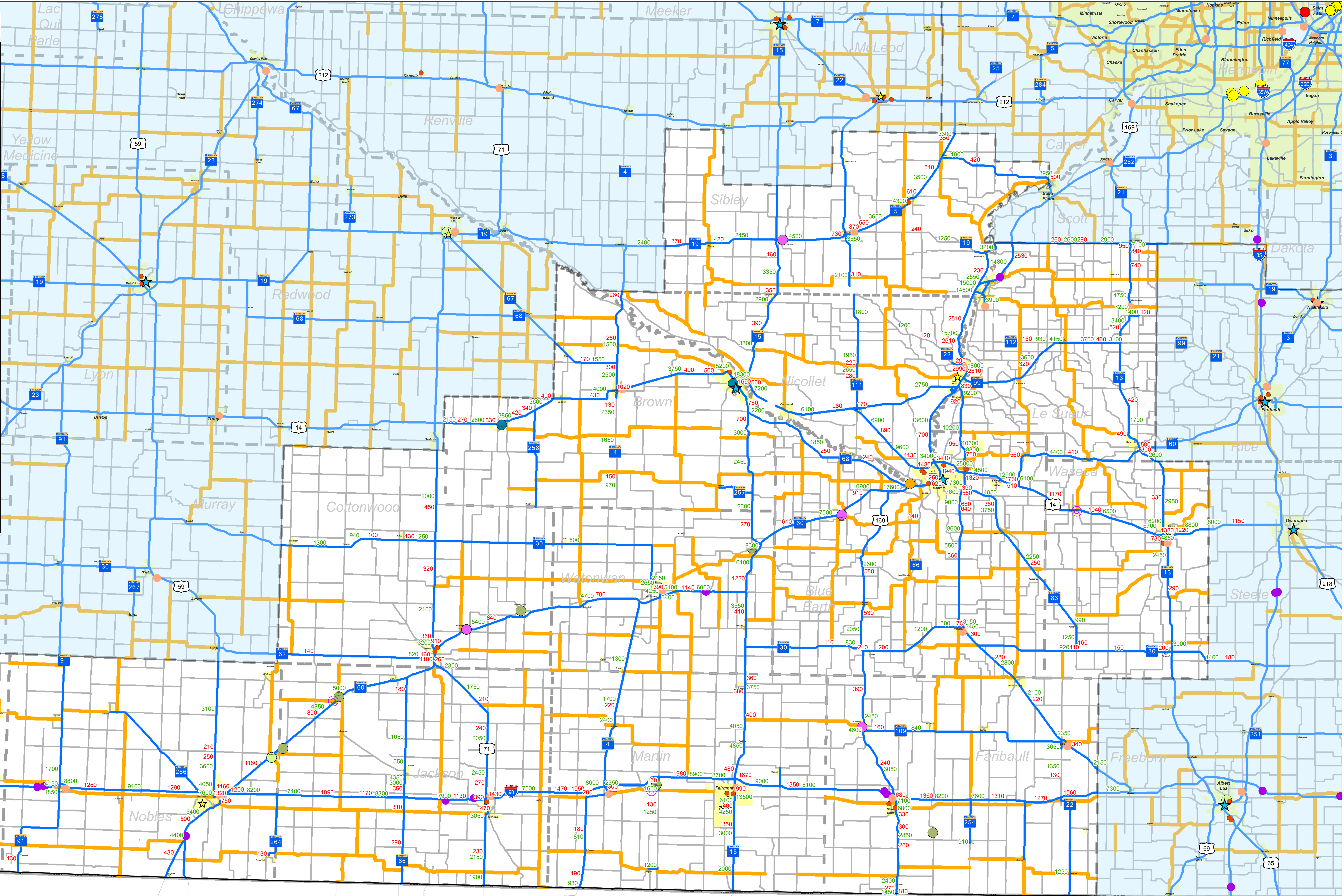
APPENDICES

- **Figure 1 Freight Network and Generator's Map**
- **Figure 2 Roadways Map**
- **Figure 3 Railroad Map**
- **Figure 4 Current 10-Ton System Map**
- **Figure 5 Conceptual 10-Ton System Map**

DISTRICT 7 FREIGHT PLAN

Legend: Roadway Map (Figure 2)

- Truck Weigh Stations
- Rest Areas with Truck Parking
- Regional Trade Centers**
- ★ Primary
- ★ Secondary
- ★ Shopping
- Intermodal Facilities**
- Container Transfer Facilities
- Non-Port-Related Transfer Facilities
- Port-Related Transfer Facilities
- Greater Minnesota Freight Generators
- Map Points 1**
- Ethanol Plants in Operation (03/06)**
- Active Ethanol Plants
- Petroleum Products Pipeline Terminal (Distribution)**
- Williams Pipeline
- Shuttle Train Grain Elevator**
- Union Pacific
- DM and E
- BNSF
- Other Plants**
- Ethanol Plant Expansions
- Bio-Diesel Plants
- Boundaries**
- Mn/DOT ATP Districts
- Roadways**
- Existing 10 Ton System (12-Month)
- Conceptual 10 Ton System
- Other Trunk, CSAH, County Roads
- 2004 AADT Labels**
- Red = Heavy Commercial
- Green = ADT



DISTRICT 7 FREIGHT PLAN

Legend: Current 10-ton, 10-month System Additions (Figure 4)

Regional Trade Centers

- Primary
- Secondary
- Shopping

Airports

- ✕ Scheduled
- ✕ On Demand

Truck Stations

- ▲ Rest Areas
- Greater Minnesota Freight Generators

Map Points

Ethanol Plants in Operation (03/06)

- Active Ethanol Plants

Petroleum Products Pipeline Terminal (Distribution)

- Williams Pipeline

Shuttle Train Grain Elevator

- Union Pacific
- DM and E
- BNSF

Other Plants

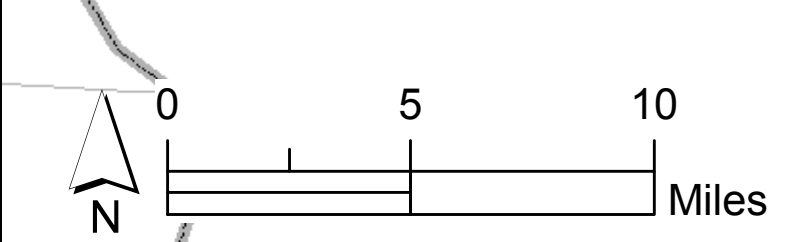
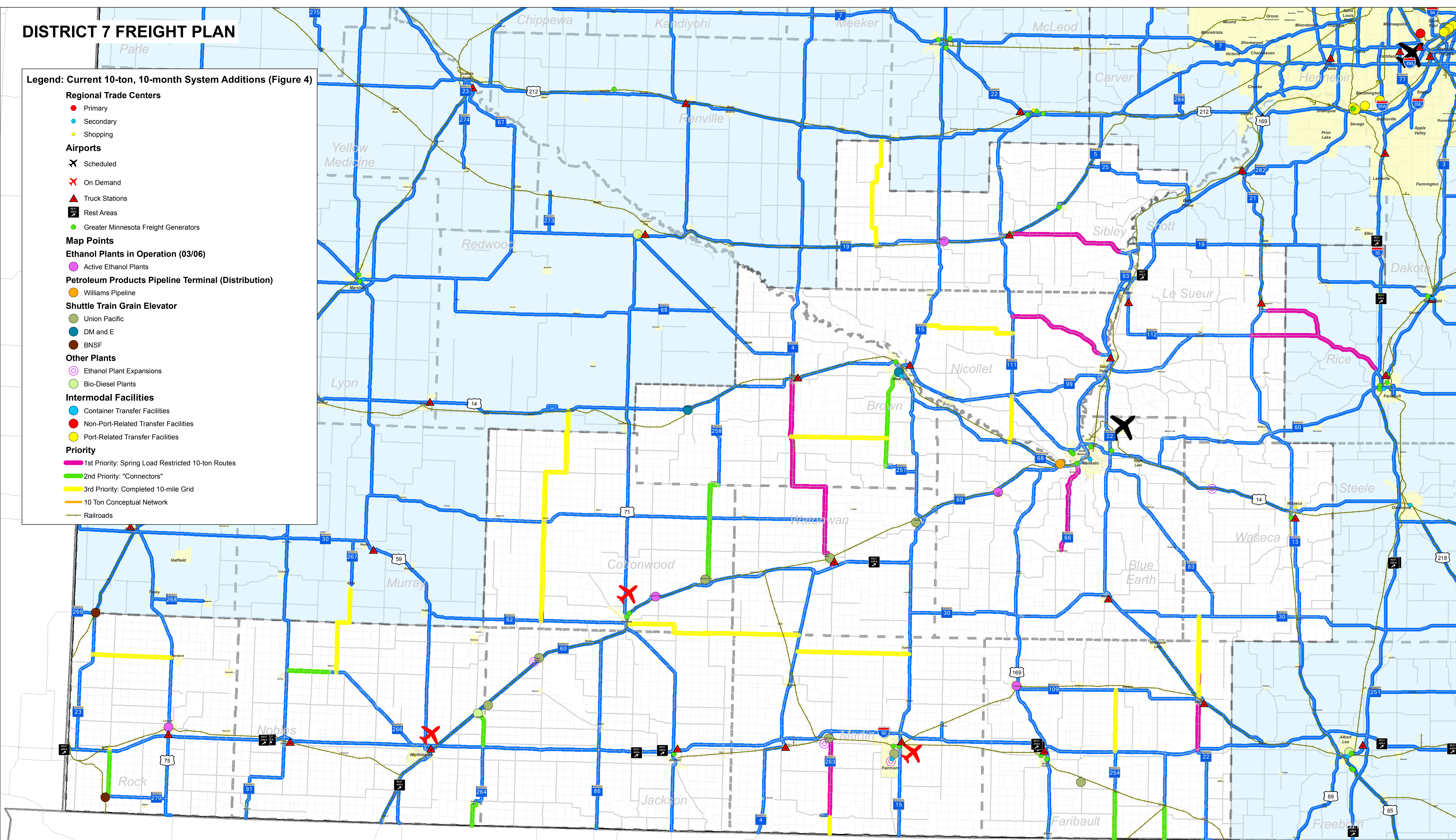
- Ethanol Plant Expansions
- Bio-Diesel Plants

Intermodal Facilities

- Container Transfer Facilities
- Non-Port-Related Transfer Facilities
- Port-Related Transfer Facilities

Priority

- 1st Priority: Spring Load Restricted 10-ton Routes
- 2nd Priority: "Connectors"
- 3rd Priority: Completed 10-mile Grid
- 10 Ton Conceptual Network
- Railroads



DISTRICT 7 FREIGHT PLAN

Legend: Conceptual 10-ton Road Additions (Figure 5)

Regional Trade Centers

- Primary
- Secondary
- Shopping

Airports

- ✕ Scheduled
- ✕ On Demand

Truck Stations

- ▲ Rest Areas
- Greater Minnesota Freight Generators

Map Points

Ethanol Plants in Operation (03/06)

- Active Ethanol Plants

Petroleum Products Pipeline Terminal (Distribution)

- Williams Pipeline

Shuttle Train Grain Elevator

- Union Pacific
- DM and E
- BNSF

Other Plants

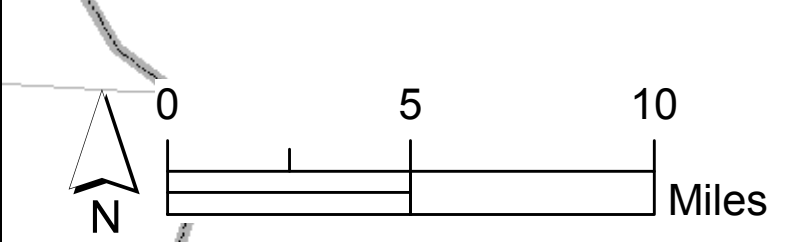
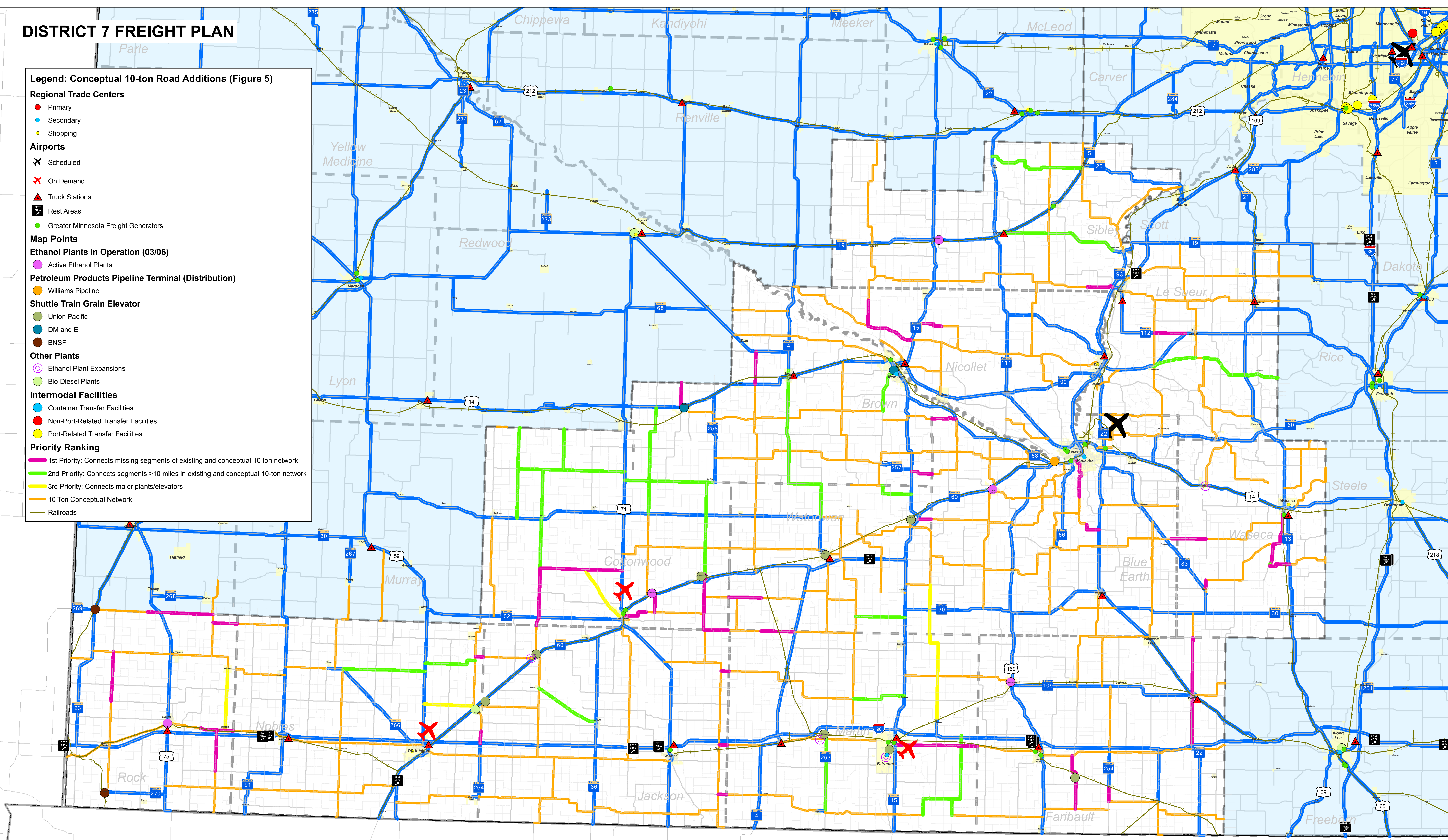
- Ethanol Plant Expansions
- Bio-Diesel Plants

Intermodal Facilities

- Container Transfer Facilities
- Non-Port-Related Transfer Facilities
- Port-Related Transfer Facilities

Priority Ranking

- 1st Priority: Connects missing segments of existing and conceptual 10 ton network
- 2nd Priority: Connects segments >10 miles in existing and conceptual 10-ton network
- 3rd Priority: Connects major plants/elevators
- 10 Ton Conceptual Network
- Railroads





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