

Southeast Minnesota Regional Freight Study:

Executive Summary

Overview of the Region and its Freight Transportation;

Southeast Minnesota, in particular the area serviced by MnDOT District 6, consists of 11 counties roughly bounded by I-35 on the west, Iowa on the south, the Mississippi River on the east, and the Metro region on the north. Outside of the Twin Cities Metro, it is the second most populous region and the second highest concentration of manufacturing after Central Minnesota. It is the second largest supplier of agricultural products, after Southwest Minnesota, reflecting its long history as an area based on extensive and highly productive farming. Led by Rochester, the second largest urban center in the state, the region is the fastest growing economic area in Minnesota and a key supplier of cutting edge medical technology and services. It is an important observation of the study that while this part of the state reflects the steady shift away from a manufacturing to a service economy; both sectors contribute significantly to the wealth of this region, along with its agricultural production. The region boasts seven secondary regional trade centers, more than any other economic area of the state, in turn signifying a robust, diverse, and well distributed industrial base that supports a healthy local economy, with good income levels and high employment. In all, the region originates and terminates roughly 14 million tons of goods with a market value exceeding \$11 billion, 13% of the commodities attributed to Minnesota enterprise.

The region is well served by the freight transportation network. Interstates and state trunk highways supply heavy-duty and high-capacity routes for commercial trucking. These include I-35 between the Metro and Iowa, I-90 east and west through Albert Lea to La Crosse, Wisconsin, Interregional corridors along Hwy 61 along the river, Hwy 52 from the Metro to Rochester, and Hwy 14 across the area from Winona through Owatonna, and regional connectors including Hwy 63 into Iowa. Extensive rail service is provided by two Class 1 railroads, Canadian Pacific and Union Pacific, and a short line, Progressive Rail. Water transport is served by two public port authorities in Red Wing and Winona, and complimented by the Port of La Crosse. Commercial aviation is available through scheduled service at Rochester, supplemented by other air cargo services at MSP in the Twin Cities and at the La Crosse regional airport.

The region is unique in several ways. Food processing, consisting of everything from meat packing to cereal production and every form of processed and pre-prepared food product, is a key activity in virtually every major city in the area. The Mississippi River shaped the settlement and agricultural market conditions for this region, and continues to be a major economic link for bulk products to a full range of domestic and international markets. Five major highway river crossings along the Mississippi are critical links to Wisconsin, carrying enough commercial and commuter traffic to and from that neighboring state to create a highly inter-dependent economic zone. Unlike Central Minnesota, whose trade is tightly linked to the Twin Cities, Southeast Minnesota exhibits an unusually high profile in

exporting goods to both the U.S and internationally, led by Rochester and including a wide range of other producers and manufacturers across the region. The private sector has excelled in innovative products and processes that include medical technology, genetic products, glass and construction materials, industrial fasteners, fabricated metal and transportation products, and processed foods. The innovation extends to the energy field, from being a major source of wind-powered electrical generation, to a gradual ramping up of alternative fuels production such as ethanol. Cost-effective transportation shares in this attribute as well, with a large number of local third-party logistics (3PL) firms specializing in one-stop expert transportation services, answering the full range of shipping needs for farm and food producers as well as many manufacturers, giving them seamless access across multiple modes and borders to virtually any market in the world.

Findings:

Highway Conditions;

- Road surface and smoothness of ride; A consistent theme shared particularly among equipment fabricators during the interviews and open houses was a concern for pavement condition. While some goods, such as large scale plate glass and machinery sub-systems, were reported to be relatively unaffected by rough pavement, the final assemblies, including wind turbine parts, industrial HVAC units, and electronic assemblies were prone to expensive damage in transit from road-related impacts, stresses, and vibration. Shippers generally rated the current conditions of roads to be good, but had concerns about a possible future decline in highway maintenance on roads at all levels. Most were aware of funding issues and trends.
- Access management and connections to the system; Commercial trucking has steadily grown in the volume of traffic and the size of vehicles. Shippers noted that truck routes and local connections to businesses were adequate for today's needs, and appreciated cooperation from MnDOT and local jurisdictions in designing new accesses and working with business. Concerns were shared about recognizing the size of semi-tractor-trailer rigs now in common use, often with a total rig length of 70 feet or more, and a total wheelbase of up to 67 feet (WB67), and designing safety features and turn geometry recognizing WB65 or WB67.
- Innovative intersection design; MnDOT has been responding to two issues, the high cost and the safety of improving traditional road intersections at grade, with innovative design, including roundabouts and J-turns. Both innovations are recognized for a significant improvement for safety and reductions in accident severity, under proper conditions. The trucking community has been generally very receptive of these innovations, with the caveat that design should be monitored and given public review in order to easily handle long, heavy commercial vehicles safely, and that crossing

traffic consisting of heavy trucks (on the minor route) not be compromised by these installations if significant new truck volumes appear, in turn discouraging use of some routes by large volume commercial shippers and impacting trade levels.

River Crossings;

- Industry in and near the Mississippi River Valley shared a common concern that that good access to Wisconsin should be maintained and improved as a priority for MnDOT and WisDOT. Much of the awareness of this issue in the business community springs from the I-35 bridge collapse, MnDOT's accelerated bridge inspection and replacement program, and in particular the 10-day shutdown of the Winona Bridge in 2011 for preventive maintenance. The shutdown highlighted the fact that almost a fourth of Winona's labor force commute from Wisconsin, and the concentrated manufacturing and transportation business in Winona faced reduced transportation options, significant cost increases for detours, and reduction in business levels. The local consensus was that these impacts over a long term would be unsustainable, and permanently damage the local economy and lifestyle. Other river communities consistently echoed the concern. The concerns have resulted in MnDOT's upgrade of inspections and traffic monitoring on these bridges, especially Winona with Weigh-In-Motion devices and monitor cameras.

Ports and Waterways Access;

- South East Minnesota has direct access to two of the five river ports in the state, Red Wing and Winona, with Winona handling significant tonnage inbound and outbound, well over a thousand barge loads in 2012. The region also has easy access to another major port in La Crosse, WI. Water-borne freight has always been a major benefit and competitive advantage for Minnesota, and still accounts for 6% of the state's tonnage being moved, notably higher than the national average of 4% of total freight tonnage. Both Minnesota ports have good commercial access via State Trunk Highways, local arterials, and Class 1 railroads. After reductions in traffic in the 2003-2008 period, driven in part by grain diversion to ethanol plants in southwestern Minnesota, the facilities have seen gradual increases in growth over recent years. This has been spurred in large part by increased farm production driven by high prices, especially increased acreage brought under cultivation in Wisconsin. A condition exists with the Upper Mississippi lock and dam system that threatens ongoing cost-effective river transportation that has been instrumental to the health of the region's farm and bulk materials industries. This network of navigation aids maintains a nine-foot deep navigation channel on the river and is the responsibility of the U.S. Army Corps of Engineers. Although authorized for

needed lock and dam expansion to maintain the economies of barge traffic, federal funding has been unavailable to implement the expansion projects.

- Port facilities in the two ports, as well as Minnesota's other public port facilities, collect regular freight tariffs on goods handled across their docks. These are sufficient to pay for operating costs, but do not provide the revenue necessary for major capital improvements. These include items such as replacement dock walls, warehouses, and dock-side dredging. As needs arise, the ports have benefitted from periodic state grants, administered by MnDOT's Port Development Assistance Program, for facility upgrades and modernization. Port Authorities, port tenants (terminal operators), and shippers have all identified a need for a more formalized state assistance program, with an ongoing funding source, project solicitation guidelines, and removal of some restrictions such as one-time-only funding for local dredging.

Railroad Intermodal Access;

- Rail intermodal traffic, including containers-on-flatcars (COFC) and trailers-on-flatcars (TOFC), represent the fastest growing sector of rail traffic, in particular COFC traffic utilizing double-stacked containers in articulated 'well cars' for both international containers and domestic containers, usually moving in dedicated, high-priority trains. The domestic container trade continued its year-to-year growth even during the worst period of the recent recession. Intermodal traffic has the multiple advantages of saving fuel, taking trucks off of highways, and maintaining fast, reliable shipment schedules with little loss or damage. Minnesota has two major intermodal container terminals, both in the Twin Cities, sitting astride the Chicago-to-Pacific Northwest corridor. Many businesses in the region, in particular food processing and wholesale distribution, utilize containerized transport, often coordinated through a 3PL, but have to truck the container cargo to Chicago or Kansas City to access supplies or markets coming through the Ports of Long Beach/Los Angeles, the largest in North America, or the East Coast ports. This presents a real cost and service barrier to many shippers.
- Several intermodal terminal proposals have been identified in the region to address this issue. Class 1 railroads normally site terminals after determining a market potential of 50,000-100,000 lifts (container or trailer moves on or off of a train car) to justify their investment. Alternately, existing trackside road access and a dedicated large customer may justify a smaller operation with minimal investment needed, similar to Canadian National's small yard operation in Chippewa falls, WI. A private intermodal terminal in Winona has been built on a similar business model, but continues to face challenges of attracting major customers and having only limited support from the servicing railroad. Other proposals by business development agencies in logical 'crossroads' areas such as

Albert Lea face the same challenges, as well as competitive terminal development interests nearby in Iowa and Minnesota.

Over-Size/Over-weight Permitted Truck Transport;

- South East Minnesota terminates an unusually large number of over-size/over-weight (OS/OW) truck loads that require special permits for routes and curfews, and often require special services including escorts and heavy equipment such as cranes to accomplish their moves. This includes virtually all moves needed for wind turbine installations, a large and growing electrical energy producer centered in this area and the far southwest of the state. Single shipments can exceed 40 tons per piece, or stretch to 180 feet in length for a single component of the turbines, including generator nacelles, blades, and masts. The south east region also offers routing by default for many loads that may not qualify for shipment across Iowa, for instance, or are detouring through Wisconsin to bypass the Twin Cities' restricted clearances and congestion. A major national OS/OW carrier is headquartered in the region, and a similarly large OS/OW carrier from St. Cloud also has a high presence in the area. With the aid of these carriers, MnDOT's Office of Freight and Commercial Vehicle Operations (OFCVO) permit section and planning embarked on an extended project to identify currently preferred routes and their specific characteristics. The resulting map illustrates routes that should not be degraded during local or state-initiated highway projects, and is a resource to help support the OS/OW permit process on both repetitive and new moves. In the case of District 6 and some other local areas, it also points out discontinuities in the current preferred routes, specific physical barriers, and the potential for incremental route improvement during upgrades or reconstruction projects.

New and emerging commodity trends;

- **Increase in containerized traffic through the Panama Canal, via the Mississippi River;** With the expansion of the Panama Canal to be completed no later than 2014, many projections of new routes for international container shipping have been conjectured. One of the major impacts is a potential for Pacific Rim trade to increase through Gulf Coast ports instead of California, in particular through the Port of New Orleans. Containers for import or export may be trans-loaded between vessels in New Orleans and river barges, than moving throughout the Mississippi and Ohio River systems in the Midwest. This may open new potential barge traffic in Winona and Red Wing as well as the Twin Cities. Given the complexity of possible multi-modal routings through various ports and onto competing railroads and highways, and the volatile nature of transportation pricing, it remains difficult to accurately model how much if any, this major development will impact Minnesota, the southeast region, and the ports.

- **Agricultural production gains;** The southeast region has enjoyed a steady increase in agricultural production from year to year, and produces a third of all Minnesota produce as well as being the state leader in dairy production. This is due largely to improved crop genetics and farm management practices, and is further bolstered by price-driven farming expansion in western Wisconsin that finds a ready outlet through Minnesota. Although a few ethanol plants have been constructed recently in the southeast, the majority of product still goes for food production, animal feed, and export, unlike the southwest Minnesota region. While much of the product is trucked to other areas in processed form, or shipped by truck to plants, rail elevators, and ports outside the region, the river remains the single largest outlet for bulk movements in this area. This emphasizes the combined importance of the ports and bridges to the region, in combination with the rail and trunk highway system for the balance of the area for this key industry.
- **Silica sand for hydraulic fracturing of oil and gas fields;** South East Minnesota has historically been a major producer of high-quality sand from several different geologic formations for over a century, supplying high-purity silica sand for foundries, glass making, construction, and even electronics. Several million tons a year have been produced from both surface and underground mines. Beginning in 2000, new technologies of horizontal drilling and advanced hydraulic fracturing opened up vast new reserves of oil and gas in deep deposits of heretofore impervious and unproductive shale beds in several areas of the U.S., including Pennsylvania, Texas, Oklahoma, and the Bakken fields in North Dakota. Pure silica sand in Wisconsin and Minnesota proved to have ideal properties to prop open the fractured shale in these deep wells, including consistent size, roundness, and hardness, able to withstand over 12,000 PSI of pressure (previous sands sourced from Arizona and Texas were able to withstand 4,000 PSI in comparison). Sand with these unique properties is now dubbed ‘frac sand’, referring to its use in hydraulic fracturing. Beginning in 2010, the acceleration in shale drilling outstripped the frac sand supply, driving up prices, and created a boom in Wisconsin and Minnesota sand production that extended until the summer of 2012. Sand production in Wisconsin grew from 5 million tons to about 33 million tons annually in 2012, while Minnesota grew but remained with only a fifth of Wisconsin’s active mines and processing plants. Sand began to flow into Winona from Wisconsin to load into rail cars at the Port’s public terminal, supplementing sand being produced from two Winona mines, and originating from 1-3 100-car unit trains per week for destinations around the country. Wabasha is also planning on trans-loading Wisconsin and local sand to rail starting in 2013. The traffic levels of loaded sand trucks across the river bridges, while of local concern by opponents of frac sand and the petroleum industry, consist of legal weight, tarped loads that still represent only a minor fraction of total heavy commercial

truck volumes across these bridges. The trunk highway system is designed to carry these loads, but local, light-duty roads have been seriously impacted by high wear levels on the designated routes. MnDOT has supported efforts by local county engineers and officials to negotiate road use maintenance agreements (RUMA's) with the sand companies to defray their extraordinary costs, based on examples of best practices researched by Winona County and CFIRE, and used in Wisconsin and Ohio. Silica dust has been another point of contention in transporting sand with opponents and environmentalists, with the potential in heavy exposures to cause silicosis and lung cancer. Current industry and state-mandated practices, along with local conditional-use-permit conditions, are adequate to contain all primary and fugitive dust production within all federally-defined particulate contamination levels.

Resulting Actions:

- **Road Conditions;** OFCVO and District 6 are actively engaging in public outreach, information sharing, and design review with internal agency and local road and intersection project designers.
- **Ports and Waterways Access;** MnDOT along with the Port Authorities may support a revised Ports Assistance Program, based on policy directions developed in the state's first Ports and Waterways Plan to be finished by June 30, 2013, and integrated into the State Transportation Plan. The Plan initiative was begun as a result of input provided in large part during the research phase of the freight study.
- **Railroad Intermodal Access;** OFCVO and the District have been and will continue to work with client agencies such as the Albert Lea Development Agency, private shippers and transporters, developers, and the railroads to determine the business potential of several different terminal business models that may result in establishing rail intermodal service from South East Minnesota to a southern California gateway, and other domestic markets.
- **Over-Size/Over-Weight Transport;** OFCVO Permit Group, District planners and engineers, and several OS/OW carriers have cooperated in a preferred route mapping exercise, to institutionalize some of the operational knowledge in this subject area and to inform others in and beyond MnDOT who are effected by OS/OW considerations. The map will be posted as information to the MnDOT website in conjunction with this study.
- **Emerging Commodity Trends;** MnDOT will continue to actively monitor developments in the containerized traffic corridors as the Panama Canal improvements come on stream, in order to respond to new distribution patterns that may emerge. The District and OFCVO will also remain in close touch with the agriculture sector and shipping

associations to evaluate the ongoing trends in produce markets and modal selections of the shippers, locally, nationally, and internationally. The transportation of bulk frac sand from mine to processing plant to oil field will continue to be an area of intensive concentration. MnDOT has established formal working associations with Wisconsin and North Dakota to stay abreast of the issues and best practices, and is participating in an interagency task force to evaluate state policy options. MnDOT and the District will provide all possible assistance to local jurisdictions, review mine and plant permits, and aid in traffic and road use studies as requested and appropriate. In OFCVO's role in providing industry interface with freight shippers, trucking firms, ports, and the railroads, the agency will continue to facilitate discussions and disseminate factual information.