Manufacturers' Perspectives on Minnesota's Transportation System

District 2 / *Northwestern Minnesota*

June 2016

MINNESOTA DEPARTMENT OF TRANSPORTATION

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Executive Summary

The Minnesota Department of Transportation's (MnDOT) mission is to "Plan, build, operate and maintain a safe, accessible, efficient and reliable multimodal transportation system that connects people to destinations and markets throughout the state, regionally and around the world." Minnesota-based manufacturers ship their products over Minnesota roads and bridges, rail, air and water, to state, national, and international markets. The transportation system, when aligned with shippers' needs and priorities, can play a significant role in supporting state and regional economic vitality.

Purpose and Methodology

MnDOT collected and analyzed manufacturers' input in MnDOT District 2 to:

- Better understand their business perspectives and priorities.
- Build relationships, to better align the transportation system with shippers' needs.
- Support continuous improvement at MnDOT with on-going input from this customer segment.

The District 2 (northwestern Minnesota) project methodology included interviews with businesses identified by regional cluster analysis that involved collaborative, cross-disciplinary interview teams. Businesses were identified using a traded-industry cluster analysis, as well as input from local economic development organizations, with a focus on identifying manufacturers and related businesses. Manufacturers generally provide relatively stable, higher-paying jobs; and they bring resources into their regions by selling to markets beyond their immediate location. Interview questions were semi-structured to get a variety of input on low-cost / high-benefit transportation system improvements that could likely be met in the near term with existing resources or modest additional investment.

Results

Of the businesses that responded to an invitation to interview, 68 (80 percent) agreed. These businesses included 54 manufacturers, 13 shippers and distributors, and one hospitality and tourism industry business. The region's strongest traded clusters interviewed were:

- Food Processing and Manufacturing (7).
- Wood Products (7).
- Distribution and Electronic Commerce (5).
- Production Technology and Heavy Machinery (5).

The following are characteristics of the businesses interviewed:

- **Employment:**
  - Most (46 out of the 68) businesses interviewed had at least 20 employees.
  - Fourteen businesses (21 percent) had 100 or more employees.
- **Modes used:**
  - All but one business used trucks for at least a portion of their shipping.
  - Sixty-one businesses (90 percent) stated that trucks were their most critical mode.
  - Twenty-five businesses (37 percent) used more than one mode to transport goods.

- **Markets:**
    - Fifty-eight businesses (85 percent) shipped products within Minnesota.
    - Forty-six businesses (68 percent) shipped nationally.
    - Twenty-nine businesses (43 percent) shipped products to Canada.
    - Twenty-five businesses (37 percent) shipped products to countries other than Canada.

Business Priorities, Challenges, and Suggestions

Respondents complimented MnDOT's work in executing road construction and improvement projects and clearing snow and ice from roadways. They also provided feedback on topics that, while not directly under MnDOT's control, provide context for businesses' needs and requests as they relate to transportation. Businesses' shipping priorities included:

- **Sound infrastructure and safety:** Businesses want safe roadways for their employees and products. According to businesses interviewed, visible / controlled intersections, additional lanes (e.g., acceleration, passing, turning, and bypass), shoulders, and prompt snow and ice removal are important highway safety features. Businesses also need materials to arrive at their destination undamaged, so they appreciate smooth pavement.
- **Expedience and cost-effectiveness:** Operating in a remote location makes shipping more expensive, as it can take longer for commercial carriers to travel to and from the region. Businesses say they could ship more efficiently if they could haul products in higher volumes. Trucks also could travel faster with multi-lane highways and higher speed limits.
- **Dependability:** Businesses want timely, predictable access to trucks and commercial carriers to allow them to plan their production with certainty. Accessing carriers on a regular basis is difficult in a region that is far from major transportation corridors. Businesses are also competing with one another for shipping due to increased demand for carrier services. These factors set the context for requests, such as major infrastructure enhancements that businesses said attract carriers and other manufacturers with whom they can share truckloads and, as a result, reduce shipping costs.
- **Access to information:** Information is central to all manufacturers' and shippers' decision-making. Timely, accurate information on road conditions can cost or save a business hundreds of thousands of dollars per day, and it could save truck drivers and manufacturing employees from traveling on hazardous roads. Businesses have noticed that MnDOT has improved communications in recent years, and they look forward to continued improvement in accessing detailed, real-time information.

Next Steps

The District 2 Manufacturers' Perspectives study revealed businesses' regional and statewide concerns and priorities. Businesses provided concrete, location-specific feedback that will inform future improvements in infrastructure, maintenance and operations, communication, safety, and policy. Moving forward, MnDOT will prioritize and implement workable solutions to improve the transportation system in District 2 and across Minnesota.

The following section describes four broad implementation strategies either underway or in the planning stages at the time of this report's completion. These strategies reflect the work of District 2, other districts, and statewide functions to apply the interview findings to ongoing transportation system planning and improvement.

Implementation Strategies

1. Incorporate business feedback into the District 2 short-term and long-term planning processes. Include study findings in the Statewide Transportation Improvement Program (STIP) and modify upcoming road projects and maintenance plans to address business issues.

MnDOT District 2 staff will evaluate:

- Improving pavement quality on stretches of road that businesses identified as having rough pavement.
- Adding advance warning lights or other flashing lights / signals to intersections identified as safety hazards.
- Business requests for additional signage.

Updates: District 2, MnDOT Operations and MnDOT Freight Office (OFCVO) staff met in April 2016 to develop implementation plans that incorporated business feedback into MnDOT planning and projects. The plans included strategies to address suggestions or concerns regarding pavement quality, advanced warning lights, signage, business access improvement, and narrow shoulders.

Possible solutions for improved signage discussed at the planning session include:

- Adding standard signage along highways that are prone to winter weather-related damage (i.e., frost heaves). Signs would encourage motorists to check 511mn.org for up-to-date road conditions.
- Additional, intentional use of signage that warn drivers of especially large bumps in the road.
- Adding "trucks entering" signs in locations with high truck traffic or those identified by businesses interviewed.

District 2 staff is analyzing all business feedback, particularly on routes where businesses identified issues, and will crosswalk the feedback with existing plans and priority routes and modify plans where applicable.

2. Identify and develop opportunities to collaborate with communities and continue to cultivate relationships with businesses, city and county engineers, economic development professionals, and other stakeholders.

MnDOT District 2 staff may:

- Convene groups to develop solutions for businesses' common concerns. For example, staff can share the results from this study and the Highway 11 corridor study to initiate discussions about coordinating shift / school start times and public transit schedules, and develop other traffic-related solutions, to reduce congestion.
- Address specific concerns with snow and ice removal. MnDOT District 2 can work with businesses and city / county engineers to coordinate shift start times with snow-removal timing to accommodate commuters, especially near large employers in the district.
- With other MnDOT functional offices, explore upgrading additional roadways to 10-ton highways in partnership with city / county engineers.

Updates: District 2 staff are analyzing the findings and taking action as appropriate. Some efforts or plans are already underway:

- District 2 maintenance staff currently coordinate with neighboring districts for consistent snow and ice removal along district boundaries. As a result of the business feedback, District 2 plans to expand coordination among districts and to align approaches, philosophies, and route layouts.
- District 2 communications staff used comments from manufacturer's interviews to implement a comprehensive communications plan for an upcoming construction project on Highway 11 in Baudette. The project has a large impact on local businesses and was an ideal candidate to implement some lessons learned. Project staff conducted individual and group meetings with area businesses and residents over two months prior to construction. Along with project insights, MnDOT provided them communication tools and techniques to help them thrive during construction.
- District 2 staff plans to maintain and enhance communications with businesses in the region. Staff hopes to gather direct feedback for further planning and to fulfill MnDOT's department-wide goal to increase its customer focus. Staff intends to examine new or enhanced approaches (especially using technology) to communicate about the design and potential impacts of construction projects in their area.
- Eight city / county engineers attended interviews and talked with businesses about their transportation needs. MnDOT staff will present this study's findings at an annual District 2 city / county engineer meeting in September 2016. Engineers can use this information to guide future transportation planning and implementation decisions.
- District 2 can use the study findings to develop project proposals and expand funding possibilities for local projects. One specific example of where the study's findings could be applied is with a Transportation Economic Development (TED) funding proposal. Although these projects are initiated locally, they are developed cooperatively with MnDOT. The findings from the study will be valuable to help identify potential projects and to reinforce TED proposals.

3. Feedback from District 2 businesses can be assessed and used by appropriate MnDOT statewide functions to improve the system and supporting functions (e.g., communications, materials research, transit and freight planning), and for future statewide planning efforts and development of best practices.

Examples include:

- Assessing the feasibility of changing road ride measures to include frost heaves, and better understand the types of rough roads that rattle vehicles and damage products. This information could be used to determine best practices for additional signage and maintenance solutions.

- Ensuring that the processes for determining spring weight restrictions are consistent and clear, and that communication regarding updates to seasonal restrictions is frequent and timely.
- Feedback can inform 511 improvements, such as increasing the amount of real-time information available regarding conditions / closures and exploring the possibility of adding 511 cameras to more high-volume routes that experience winter weather challenges.
- Including shipper / driver feedback on the shortage of truck parking / rest areas, coupled with recent changes to federal hours of service laws, when assessing safe rest area resource provision.

Update: Central Office staff will synthesize findings from the three completed studies and incorporate improvements in future district projects. Options discussed at the implementation meeting included reviewing additional ways to use technology to communicate with the public about construction projects; evaluating improvements to 511; and improving signage, taking into account state and federal laws and policies.

4. Use the combined findings / recommendations from the Manufacturers' Perspectives Studies in Districts 2, 4, and 8 to better understand business needs to improve the state's transportation system. Incorporate a continuous improvement approach to the Manufacturers' Perspectives Studies.

MnDOT Central Office staff will:

- Analyze and combine findings from the District 2, 4, 8, and future Manufacturers' Perspectives Studies, articulating broader statewide findings, themes, and recommendations. Present findings broadly in public forums, such as conferences. Incorporate information gained in this study into the Statewide Freight System Plan and its ongoing Freight Action Agenda.
- Evaluate the feasibility of developing cross-district planning forums with staff from Districts 2, 4, and 8 to share findings with staff and work to frame broader, collaborative solutions to address statewide issues, and any that are specific to western Minnesota.
- Improve communications about the Manufacturers' Perspectives Study, including developing a communication plan for the study for both external and internal (within a district) communications. The plan could include a Manufacturers' Perspectives Study website to highlight successes and assist in maintaining relationships with businesses.

Update: Central Office staff will synthesize findings from the three studies that have taken place and evaluate incorporating improvements to the projects. A larger communication plan is under development.

District 2 Progress Update – Early Benefits

In several instances, MnDOT, businesses, and communities were able to begin working together on solutions before the drafting of this report. Additional benefits are likely to follow as MnDOT continues to analyze suggestions from businesses to inform future District 2 planning.

MnDOT Direct Follow-up

District 2 staff was able to investigate several business concerns directly following the interviews. In some cases, MnDOT responded to businesses' questions or provided clarification; and in a few instances, MnDOT made connections between the business concern and other larger studies. For example:

- A Bagley manufacturer reported that its trucks have difficulties entering and exiting their facility. This information sparked conversations between the business, MnDOT, the county engineer, and city staff on how the city would approach future planning on a new road in the area. Currently the City of Bagley is looking to construct an additional street access and modify their connection to Highway 2. The state aid engineer is working with the city to identify funding solutions.
- A large business in a rural location northeast of Bemidji expressed that snow plows may not be getting out early enough to clear highways in their region for their morning commuters. The district coordinated directly with business leadership regarding their shift change times to better synchronize snow / ice operations in the area.
- One business was concerned about rough pavement caused by frost heaves, particularly at a dip in the road near a bridge outside Zerkel. After discussing the issue with the district bridge engineer, the interviewer reported to the business that a contract for the repair was already in process, and the pavement would be fixed within the next couple of weeks.
- Businesses along the Highway 11 corridor mentioned that their employees face daily congestion during their commute. The comments provided additional insights to a comprehensive Highway 11 corridor study that was in progress. The combined findings from the corridor study and the Manufacturers' Perspectives Study will provide the basis for future safety enhancements along the Highway 11 corridor.
- A shipping company identified a concern with some curve instances that can create an optical illusion at night, making the curve unsafe. The issue arises at locations that have both a curve in the highway, and a separate road in the distance in which the headlights / taillights of a vehicle on the separate road makes appear as though the highway goes straight rather than curving. The company stated that drivers can have difficulty seeing where the road actually leads, "thinking that the road is straight rather than curving around a corner." The district's traffic department identified 17 of these instances throughout the district and installed reflective chevron signs along the curves to add a better perspective for drivers.

Another project benefit was the building of a regional business contact list for district communication and other staff. Interviewers specifically asked each business how they received information regarding summer construction projects and winter road conditions and followed up with an offer to be added to the district's electronic information distribution lists. With the direct connections that District 2 made with businesses in the region, it is important to keep those lines of communication open in the future. The opportunity to meet directly with each business was vital to enhancing these lists with up-to-date contact information, and building relationships, in general.

Introduction

Among the Minnesota Department of Transportation's (MnDOT)'s most important customer segments are the Minnesota-based manufacturers that ship their products via Minnesota roads and other transportation modes to state, national, and international markets. When appropriately aligned with their needs, the transportation system can contribute significantly to state and regional economic vitality. This has led MnDOT to seek feedback on Minnesota's transportation system from the businesses that create and sustain high-quality jobs and bring resources into the state.

Background

Since 2013, MnDOT has taken a region-by-region approach to gathering the perspectives of manufacturers. To date, MnDOT has completed 246 interviews in three of the eight MnDOT districts.[1] The project's intent is to:

- **Meet with manufacturers to better understand their perspectives and priorities** for the transportation system and improve MnDOT's knowledge of industries that depend most on the system and derive some of its largest benefits.
- **Systematically collect and analyze customer information** to inform practical, near-term planning and operations, policy development, and investment decision making.
- **Build relationships** among MnDOT, economic development professionals, and freight transporters to sustain short-term and ongoing transportation system improvement.
- **Support continuous improvement and develop recommendations** for enhancing transportation systems and practices to better support freight movement.

Project Methodology

The District 2 (northwestern Minnesota) Manufacturers' Perspectives Study methodology was closely modeled after those in Districts 8 and 4. This included a collaborative, cross-disciplinary interview team and semi-structured, face-to-face interviews with businesses identified by regional cluster analysis. Interview questions focused on issues that could potentially be addressed in the next four years and with existing resources. A list of businesses interviewed can be found in Appendix A.

The study included a project team of MnDOT staff and external partners that provided project management and coordination, data analysis, and report writing. External partners also assembled the list of businesses to contact and engaged economic development organizations as partners. Interviewers included MnDOT staff from District 2, MnDOT Central Office, the external project team, and economic development organizations (EDOs). MnDOT also invited county and city transportation engineers to attend interviews.

All MnDOT staff, external partners, and EDOs that participated in the study are listed in Appendix B.

[1] Other districts were District 8 (southwestern Minnesota) in 2013-2014 and District 4 (west central Minnesota) in 2014-2015. See MnDOT district map at www.dot.state.mn.us/information/districts.html.

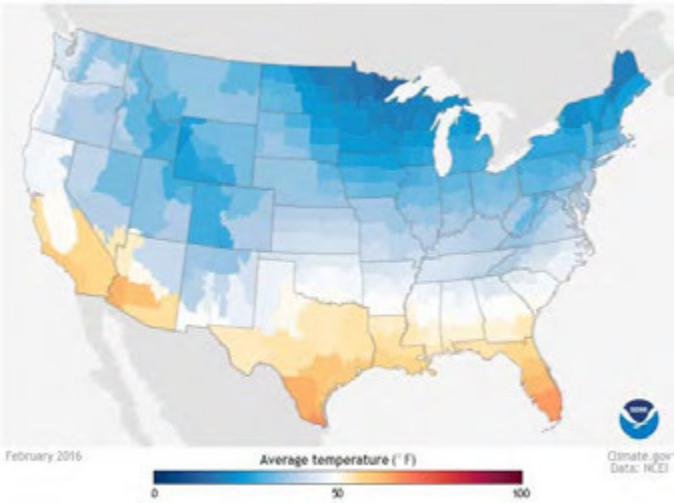
District 2 Background

MnDOT District 2 is located in the northwestern corner of Minnesota and comprises eleven counties.[2] The district also is responsible for the western portions of Cass, Itasca and Koochiching counties. Major cities include Bemidji, Crookston, East Grand Forks, and Thief River Falls. In total, District 2 occupies 14,158 square miles (18 percent of the state) and is home to 164,925 people (three percent of Minnesota's population).[3] District 2 borders North Dakota to the west and portions of Manitoba and Ontario, Canada to the north.

There are 197 manufacturers in District 2, and some are among the largest employers of all businesses in the district.[4]

Figure 1: Map of MnDOT District 2

Figure 2: Average Monthly Temperature, February 2016



In addition, many manufacturers support the area's strong agriculture and forestry industries.

As Figure 2 illustrates, the district is subject to harsh winter temperatures.[5] Northern Minnesota is one of the coldest locations in the continental United States with average winter temperatures between zero and ten degrees Fahrenheit.[6] Temperature fluctuation and cold temperatures can cause pavement to wear faster than in more moderate climates. The overrepresentation of high-volume, low-value commodities that businesses ship to, from, and through District 2 (e.g., timber) puts additional stress on the region's highway infrastructure.

[2] Counties in District 2 include Beltrami, Clearwater, Hubbard, Kittson, Lake of the Woods, Marshall, Norman, Pennington, Polk, Red Lake, and Roseau.

[3] 2014 American Community Survey 5-Year Population Total Estimates (excludes Cass, Itasca, and Koochiching counties).

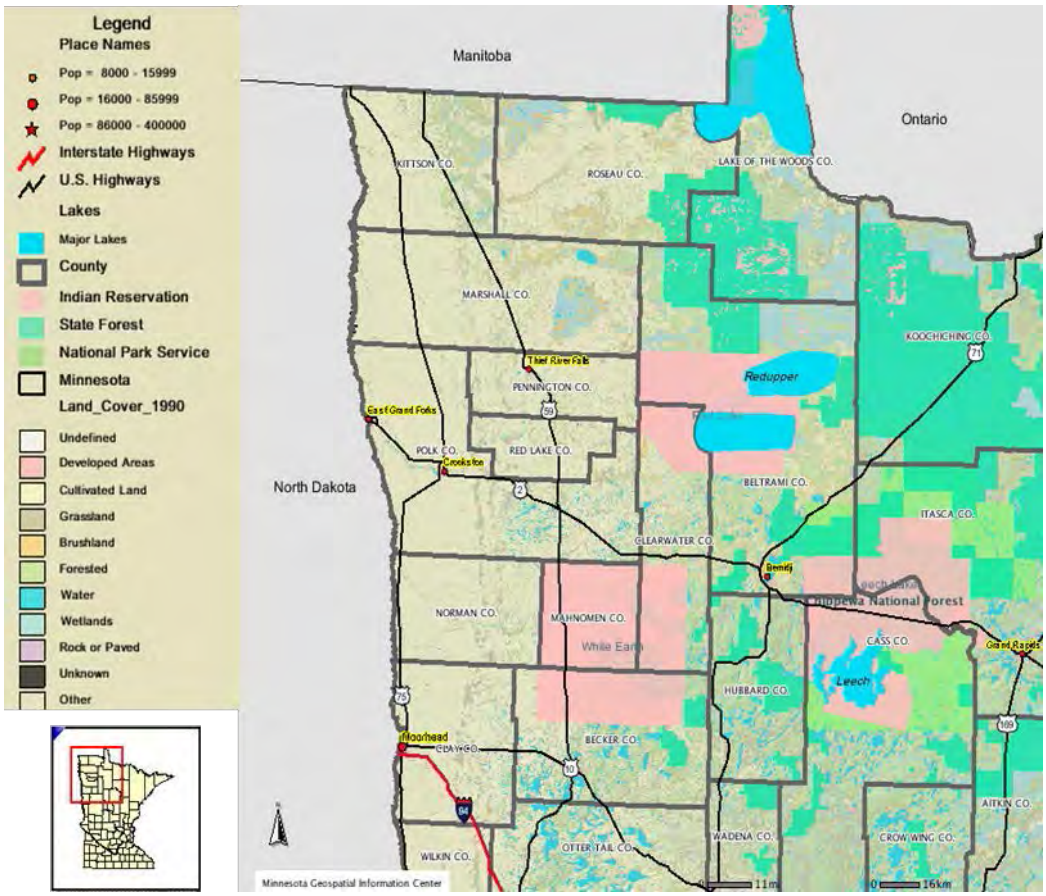
[4] 2013 County Business Patterns.

[5] Average Monthly Temperature. National Oceanic and Atmospheric Administration (NOAA) Climate Center, www.climate.gov/maps-data/data-snapshots/data-source-average-monthly-temperature.

[6] Minnesota Department of Natural Resources. Minnesota Facts & Figures: Climate. Reviewed 2013.

The district is also home to a variety of topographies that affect transportation (see Figure 3). The Red River Valley on the Minnesota–North Dakota border is prone to flooding each spring. In the western and central portions of the district, wide-open plains are conducive to high winds, and wetlands create highly saturated soil. On the eastern side of the district, roads that traverse lakes and wetlands are sometimes narrow and meander.

Figure 3: Northwest Minnesota Topography[7]



These factors create unique opportunities and challenges for MnDOT District 2 staff to establish and maintain the transportation system in ways that are both efficient and meet the needs of area residents and businesses.

MnDOT staff in District 2 plan, design, constructs, and maintain the state and federal trunk highways within the district. They also manage the aid and assistance provided to local governments that qualify for state and federal transportation funding for roadways, bridges, trails, and transit systems. District offices are located in Bemidji (district headquarters) and Crookston, and there are 17 truck stations across the district.

[7] Minnesota Geospatial Information Office Northstar Mapper.

Methodology

Interview Overview / Purpose

The primary purposes of the interviews were to:

- Gather information about businesses' specific experiences, priorities, and challenges regarding the transportation system.
- Build relationships and communication channels among MnDOT, regional businesses, and economic development professionals.

Interview Teams

Two-person interview teams, consisting of an interviewer[8] and a note taker,[9] visited businesses and asked the questions from the interview guide found in Appendix G. When possible, teams comprised one economic development professional and one staff member from the district office. This brought local perspectives and understanding to the interview and context for MnDOT staff, who will work most directly with the project findings.

Interviews were conducted by a cross-disciplinary group, including:

- MnDOT Central Office and District 2 staff.
- Researchers from the State and Local Policy Program (SLPP) at the University of Minnesota Humphrey School of Public Affairs.
- University of Minnesota Extension Center for Community Vitality (CV) Educators.
- City, county, and regional economic development professionals.
- Consultants from Management Analysis & Development (MAD), a division of Minnesota Management & Budget.

CV educators recruited economic development professionals, and MnDOT selected and invited internal staff to participate. In total, 43 interviewers participated. District 2 staff also invited city and county engineers to attend interviews as observers.

Interviewer Training

In August 2015, two interviewer-training sessions were held in Bemidji and Crookston for all participating MnDOT staff and economic development professionals. Training goals included:

- Explaining the study purpose and process to interviewers.
- Providing qualitative research instruction, including note-taking guidelines.
- Distributing interview materials and practicing interviewing through role-playing.

[8] Usually an economic development professional.
[9] Usually MnDOT District 2 staff.

Regional Industry Cluster Analysis

The SLPP used Regional Industry Cluster analysis to identify key industries and manufacturers in District 2.[10] Clusters are geographically concentrated groups of interconnected companies, universities, and related institutions that arise out of linkages or externalities across industries. The term *clusters* refers to firms within similar industries and their interactions with one another, such as segments of a supply chain. Understanding these relationships informs smarter policy and investment to support regional economies.

Many clusters are complementary in nature, providing services or specialized supplies to firms in other industries. This project focused on a wide array of industry clusters within District 2, each playing a significant role within the regional economy and beyond.

Clusters can be grouped into *traded* and *local* clusters. A traded cluster is composed of traded industries concentrated in a subset of geographic areas that sell to other regions and nations. A local cluster is composed of local industries that primarily sell locally, and are present in most (if not all) geographic areas.[11] Traded clusters are seen as main drivers of growing economies because they draw revenue *into* the regional economy and stimulate growth, as opposed to local clusters, which circulate money *within* a region.[12] Researchers use a traded cluster analysis to assess how strong particular industry clusters in a region are compared to the nation.

Regional economic competitiveness is mostly determined by its most prominent industries.[13] Each industry cluster is defined by a series of sub-clusters.[14] The SLPP used the cluster mapping method to identify industries that formed the economic base of communities in District 2, both in direct employment and in their ability to spur additional economic development.

This project focuses on manufacturers for several reasons:

- They almost always represented traded clusters, thereby bringing resources into the region from other states and often other countries.
- Manufacturing jobs are relatively stable and well-paying ("good jobs"), so the state wants to support manufacturing.
- Manufacturers often have specific needs regarding the transportation system.

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[10] This tool was developed by Michael Porter's Institute for Strategy and Competitiveness at Harvard Business School.

[11] U.S. Cluster Mapping, "Glossary of Terms." Accessed February 1, 2016, www.clustermapping.us/content/glossary-terms.

[12] U.S. Cluster Mapping, "Clusters 101." clustermapping.us/content/clusters-101. Accessed February 1, 2016.

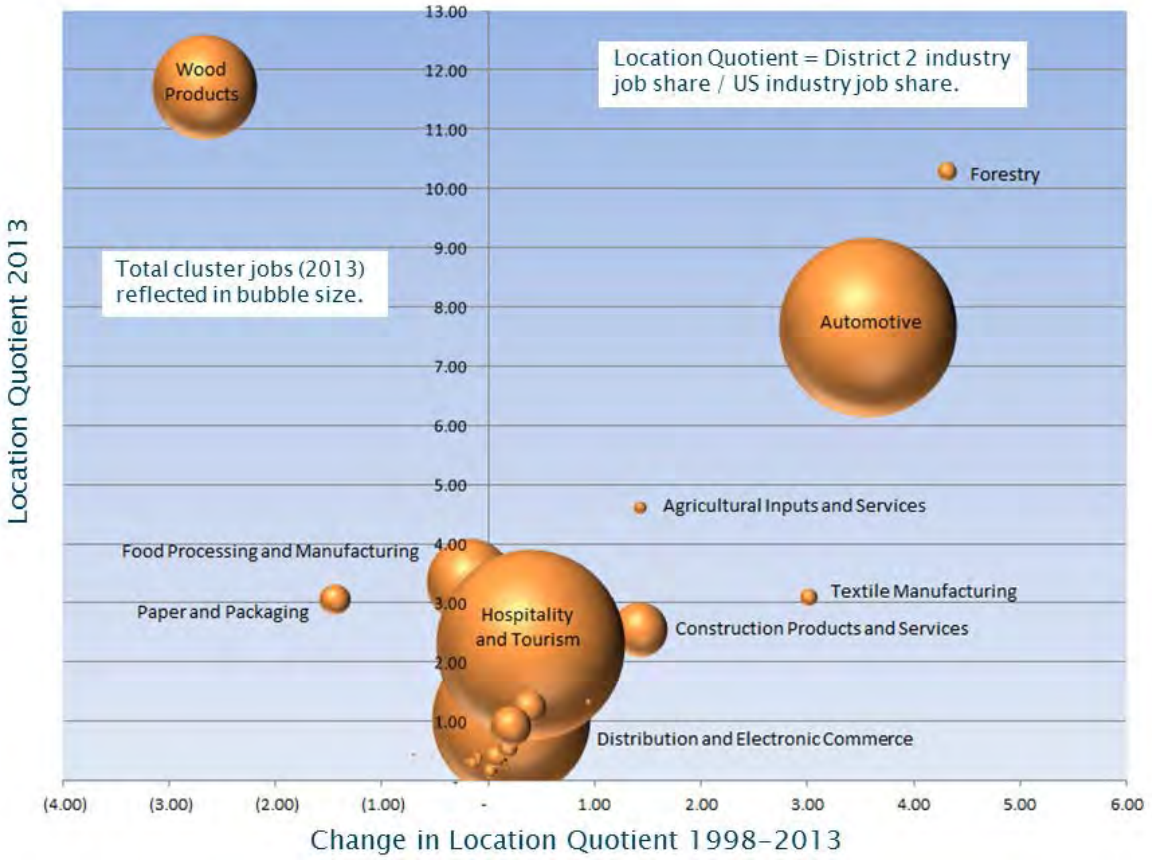
[13] Rosenfeld, Stuart, "A Governor's Guide to Cluster-Based Economic Development." National Governors Association, 2002. www.nga.org/files/live/sites/NGA/files/pdf/AM02CLUSTER.pdf. Accessed April 3, 2015.

[14] Sub-clusters are represented by six-digit NAICS codes. The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies for classifying business establishments to collect, analyze, and publish statistical data about the U.S. business economy. For more information, see "Introduction to NAICS" at www.census.gov/eos/www/naics/. Accessed February 1, 2016.

MnDOT and economic development organizations also suggested a number of businesses in local clusters because of their significant economic contribution to the region or known heavy reliance on the transportation system.

Figure 4 illustrates the largest manufacturing clusters in District 2 based on the location quotient, a comparison of the employment of a particular industry in District 2 to the employment of that industry nationally. Clusters with location quotients greater than one (y-axis) are more concentrated in District 2 than in the nation as a whole.[15] Clusters with a change in location quotient greater than zero (x-axis) are growing within the district. This study focused on manufacturing clusters with the highest location quotients and most growth over time, such as the Automotive and Forestry clusters.

Figure 4: MnDOT District 2 Traded Clusters by Employment and Specialization (Location Quotient), 1998–2012[16]



[15] Appendix B includes MnDOT District 2 location quotients for traded clusters by county. Appendix C Shows MnDOT District 2 employment by traded cluster and county.

[16] Cluster map for District 4 developed by the SLPP with data from the U.S. Cluster Mapping website at clustermapping.us.

Business Recruitment

The SLPP used the Reference USA database to identify businesses that fit the regional industry cluster analysis criteria based on the businesses' NAICS code.[17] In addition, economic development professionals and MnDOT District 2 staff identified other key businesses. The final list of prospective interviewees included businesses that represented a diverse group of District 2 industries from each county.

MnDOT mailed letters in August 2015 to all businesses on the list, inviting them to participate in the study. MAD followed up with businesses via phone, asked them to participate in the study, and scheduled interviews. Interviews were conducted from September 15 to December 8, 2015.

Businesses in Other Districts

In addition to the eleven counties in District 2, the district also includes the western sides of Cass, Itasca, and Koochiching counties (MnDOT Districts 1 and 3). Eight businesses in Cass Lake, International Falls, and Walker were interviewed for this project.[18]

Other Industries Interviewed

Previous studies in Districts 4 and 8 illuminated the opportunity to include perspectives from businesses in non-manufacturing industries that are important to the district's economic vitality. For District 2, MnDOT included shippers and hospitality / tourism businesses as potential interviewees. Businesses in the hospitality and tourism industry were identified using the same database and process as manufacturers. The list of shippers was developed using manufacturer responses to Question 7 in the manufacturers interview guide, which asked whether they contract their shipping, and to whom.[19]

Data Collection and Analysis

Questionnaire

MnDOT and MAD developed an interview questionnaire for manufacturers based on those used in previous districts and input from District 2 staff. The questionnaire was designed for a semi-structured interview, meaning that interviewers followed the questionnaire but could pursue other relevant topics as they arose. MnDOT and external partners developed separate questionnaires for hospitality / tourism businesses and shippers to capture information unique to those respective industries.[20]

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[17] The cluster categories were developed by the Harvard Business School's Institute for Strategy and Competitiveness led by Professor Michael Porter and used in the Economic Development Administration (EDA). The U.S. Cluster Mapping Project is a national economic development initiative that is designed to benchmark the economic performance of U.S. regions. More information can be found at clustermapping.us.

[18] There were no businesses in this portion of Itasca County selected for an interview. MnDOT and external partners will ensure that businesses from Itasca County are represented in the upcoming District 1 Manufacturers' Perspectives Study.

[19] See Appendix G.

[20] See Appendix G for the manufacturer, shipper, and tourism questionnaires.

MAD consultants aggregated and coded interview responses, analyzed results, developed findings, and worked with District 2 staff to track and report early benefits and immediate opportunities for follow-up. MnDOT staff continues to analyze the detailed feedback to identify potential system improvements and share with city and county engineers information relevant to their respective jurisdictions.

Results

Response Rates

One hundred and thirty-one (131) businesses were invited to interview. The response rate was 80 percent.[21] Table 1 shows the number of businesses interviewed, number that declined the invitation, and number that were not interviewed but did not decline an interview.[22]

Table 1: Recruitment Results

Result	Number of Businesses	Contact Rate	Response Rate
Businesses interviewed	68	52%	80%
Businesses that declined invitation to interview	17	13%	20%
Businesses that were not interviewed but did not accept nor decline interview	46	35%	n/a
Total businesses contacted	**131**	**100%**	**100%**

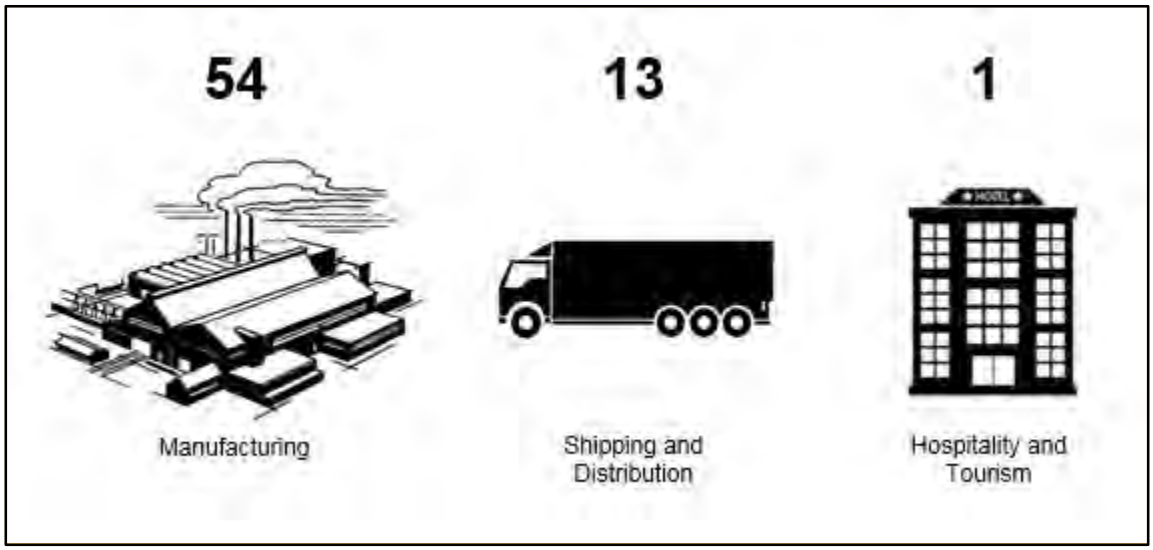
Types of Businesses Interviewed

Most businesses interviewed were manufacturers (54), followed by 13 shippers and distributors that served District 2 manufacturers. Interviewers also spoke with one business in the Hospitality and Tourism cluster. Figure 5 illustrates these figures. While schedulers reached out to more businesses in hospitality and tourism, many were either busy preparing for an upcoming event or closed for the season.

[21] For this report, the response rate is calculated using the number of completed interviews and number of refusals (in American Association for Public Opinion Research terms, Completed Interviews / Completed Interviews + Partial Interviews + Refusals). This calculation excludes the 71 businesses that could not be reached or did not provide a yes or no response. For more information on this calculation, see www.aapor.org/AAPORKentico/Education-Resources/For-Researchers/Poll-Survey-FAQ/Response-Rates- An-Overview.aspx.

[22] "Businesses that did not accept nor decline interview" includes businesses that did not answer phone calls and businesses that spoke to MAD and initially did not decline an interview, but subsequent contact with the business did not result in an interview.

Figure 5: Number of Businesses Interviewed by Industry



Industry Clusters

The clusters represented in interviews closely mirror those found in the regional cluster analysis. The five traded clusters with the highest location quotients were:

- Wood Products (12.03).
- Forestry (10.57).
- Automotive (7.86).
- Agricultural Inputs and Services (4.58).
- Food Processing and Manufacturing (3.44).

These interviews represented 20 of the 68 interviews.[23]

The five clusters with the most employees overall (Automotive, Hospitality and Tourism, Distribution and Electronic Commerce, Wood Products, and Food Processing and Warehousing) were represented in 23 interviews.[24]

Of the five traded clusters that have seen the highest growth in location quotient (Forestry, Automotive, Textile Manufacturing, Construction Products and Services, and Agricultural Inputs and Services), all but two clusters were represented by six interviews. The Construction Products and Services and Textile Manufacturing clusters are both relatively small employers, which may explain why they did not appear on the business interview list, which had a threshold of ten or more employees. Interviews did, however, include construction services and textile manufacturers from local clusters.

[23] See Appendix C for location quotients for District 2 and by county.
[24] See Appendix D for employment information for District 2 and by county.

Several local clusters also appeared in the list of interviewees. Most local clusters were similar to industries in traded clusters, such as Local Industrial Products and Services, Local Logistical Services, and Local Motor Vehicle Products and Services.

Figure 6 illustrates the traded and local clusters represented by the businesses interviews. Table 2 provides descriptions[25] and examples of traded clusters that were most prominent.[26]

Figure 6: Traded and Local Clusters Represented by Interviews

[25] Definitions of industry clusters are taken from the US Cluster Mapping website, "Traded Clusters Appendix." Accessed February 28, 2016, clustermapping.us/sites/default/files/files/page/Traded%20Clusters%20Appendix.pdf.

[26] Clusters defined in this section are traded clusters that were represented by two or more businesses interviewed in District 2. A full list of industry clusters interviewed District 2 and their descriptions in can be found in Appendix E.

Table 2: Descriptions of Most Common Traded Clusters Represented in District 2 Interviews

Cluster Name	Description	Business Example
Food Processing and Manufacturing	This cluster includes firms involved in the processing of raw food materials and the manufacturing of downstream food products for end users. This includes millers and refineries of rice, flour, corn, sugar, and oilseeds. These upstream products contribute in part to producing specialty foods, animal foods, baked goods, candies, teas, coffees, beers, wines, other beverages, meats, packaged fruits and vegetables, and processed dairy products.	Minnesota Dehydrated Vegetables, Inc.
Wood Products	The establishments in this cluster are primarily engaged in making upstream wood materials and manufacturing non-furniture wood products. Upstream establishments include sawmills, plywood and hardwood manufacturers, cut stock manufacturers, and wood preservation services. Downstream establishments produce windows, doors, flooring, wood containers, prefabricated wood buildings, and related products.	Marvin Windows and Doors
Distribution and Electronic Commerce	This cluster consists primarily of traditional wholesalers as well as mail order houses and electronic merchants. The companies in this cluster mostly buy, hold, and distribute a wide range of products such as apparel, food, chemicals, gasses, minerals, farm materials, machinery, and other merchandise. The cluster also contains firms that support distribution and electronic commerce operations, including packaging, labeling, and equipment rental and leasing.	Digi-Key
Production Technology and Heavy Machinery	Establishments in this cluster primarily manufacture machines designed to produce parts and devices used in the production of downstream products. This cluster also includes end use heavy machinery such as air and material handling equipment. The machines are used for industrial, agricultural, construction, commercial industry, and related purposes.	Consolidated Equipment Group
Transportation and Logistics	This cluster contains all air, rail, bus, and freight transportation services. It also includes related operation services and support activities such as inspections, maintenance, repairs, security, and loading/unloading.	Eric Johnson Trucking
Automotive	This cluster includes establishments along the value chain that are necessary for manufacturing cars, trucks, and other motorized land-based transportation equipment (other than motorcycles). This includes metal mills and foundries, manufacturers of metal automotive parts, and manufacturers of completed automobiles.	Arctic Cat
Printing Services	Establishments in this cluster are primarily engaged in commercial printing, digital printing, and binding. The cluster includes upstream products and services necessary for printing (for example, ink and prepress services). It also includes end products such as books, greeting cards, business forms, and related goods.	Arrow Printing Inc.
Recreational and Small Electric Goods	This cluster contains establishments that manufacture end use products for recreational and decorative purposes. These products include games, toys, bicycles, motorcycles, musical instruments, sporting goods, art supplies, office supplies, shades, and home accessories. This cluster also incorporates firms that produce small, simple electric goods like hairdryers, fans, and office machinery.	BB Diversified Services, LTD

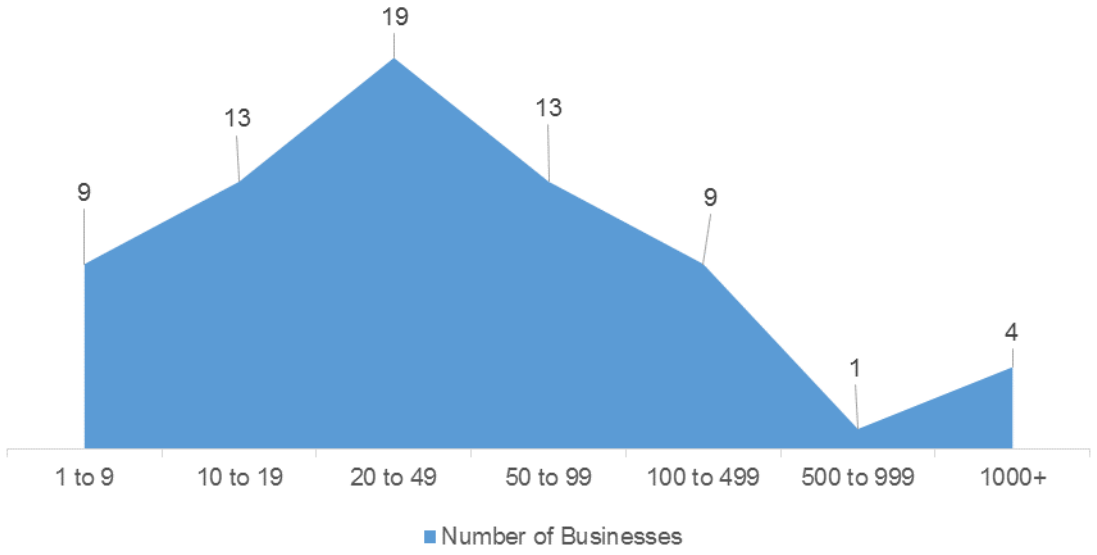
Table 2: Descriptions of Most Common Traded Clusters Represented in District 2 Interviews *(Cont.)*

Cluster Name	Description	Business Example
Agricultural Inputs and Services	This cluster includes establishments primarily engaged in farming and related services. Farming includes soil preparation, planting, cultivation, harvest, fertilizer creation, and post-harvest activities. It also includes services that supply farm labor, support for animal production, and additional operations management.	CHS Northwest Grain
Furniture	This cluster contains establishments that manufacture furniture, cabinets, and shelving for residential homes and offices. It also includes establishments that produce manufactured homes. The products in this cluster can be made of wood, metal, plastic, and/or textiles.	The HOMARK Company

Number of Employees

In District 2 alone, the 68 businesses interviewed employ a combined 11,700 people,[27] which accounts for more than one-fifth of the all jobs in the district.[28] Figure 7 illustrates the distribution of businesses by number of employees. While most businesses interviewed employ fewer than 50 people, interviewers also spoke with four businesses with more than 1,000 employees. The average number of employees was 172, while the median number of employees was 32. This reflects the effect of a small number of businesses that employ a large number of employees, which is characteristic of the economy in District 2.

Figure 7: Number of Employees at Each Business Interviewed



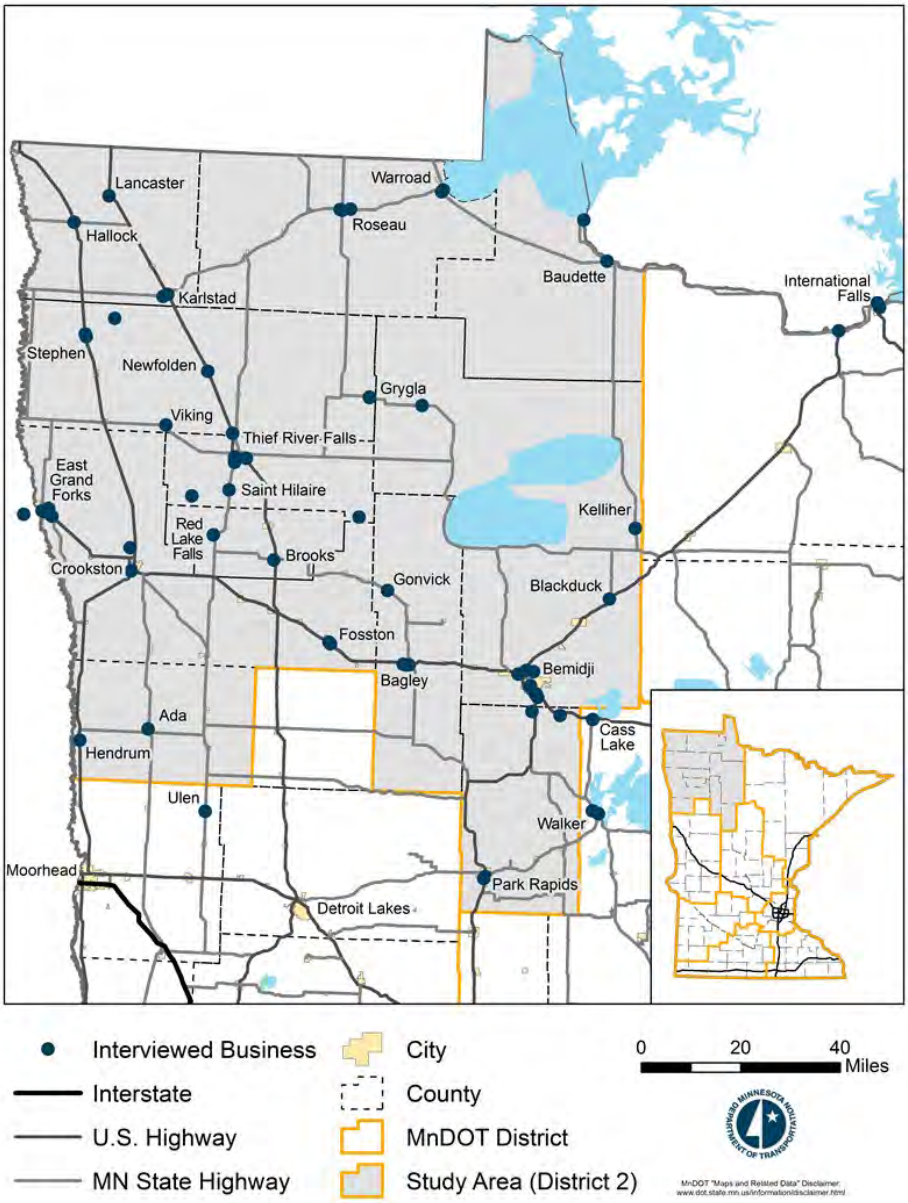
[27] Many businesses also had locations outside District 2. Employees located outside District 2 and not directly serving District 2 were not included in this count.

[28] Source: 2013 County Business Patterns. Data was not available for the cities of Cass Lake, International Falls, and Park Rapids.

Geographic Distribution of Businesses

Interviewers visited at least one business in each District 2 county, except the portion of Itasca County for which District 2 is responsible.[29] Figure 8 is a map of all businesses interviewed in District 2. Counties where interviews took place are shaded. Businesses were widely dispersed throughout the district, and locations with many interviews are consistent with the district's economic centers, such as Bemidji and Thief River Falls.

Figure 8: Location of Businesses Interviewed

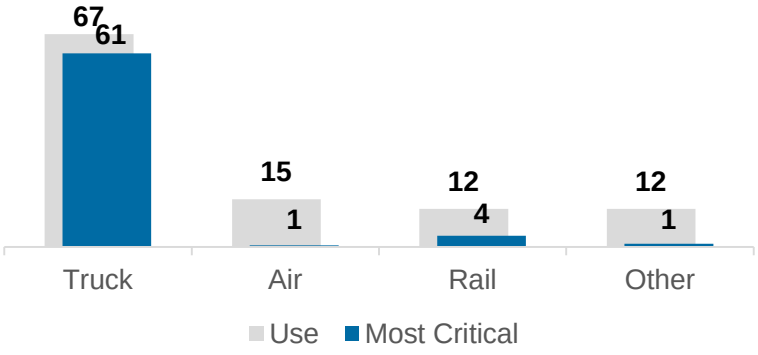


[29] There were no businesses in this portion of Itasca County selected for an interview. MnDOT and external partners will ensure that businesses from Itasca County are represented in the upcoming District 1 Manufacturers' Perspectives Study.

Modes of Transportation Used

While all but one business said they used trucks to either receive supplies or ship products, 25 businesses used more than one mode of transportation. Figure 9 illustrates the modes of transportation and the number of businesses that said they use each mode. Of the 67 businesses that use trucks to do at least some of their hauling, 61 (91 percent) said trucks were the most critical mode of transportation to their business.

Figure 9: Modes of Transportation Used and Most Critical to Business[30]

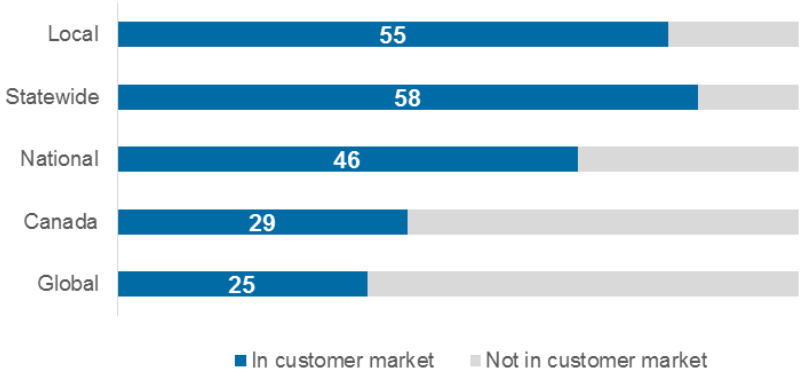


Of the businesses that use trucks for hauling, 28 (42 percent) own their own truck(s) and ship at least some of their product themselves. Nearly all manufacturers (85 percent) contracted at least a portion their shipping out to commercial carriers, while seven manufacturers shipped all their own products.

Customer Markets

Manufacturers in District 2 do not only produce and ship goods to local markets; they ship them throughout the U.S. and around the world. Figures 10 and 11 illustrate the reach of District 2 businesses.

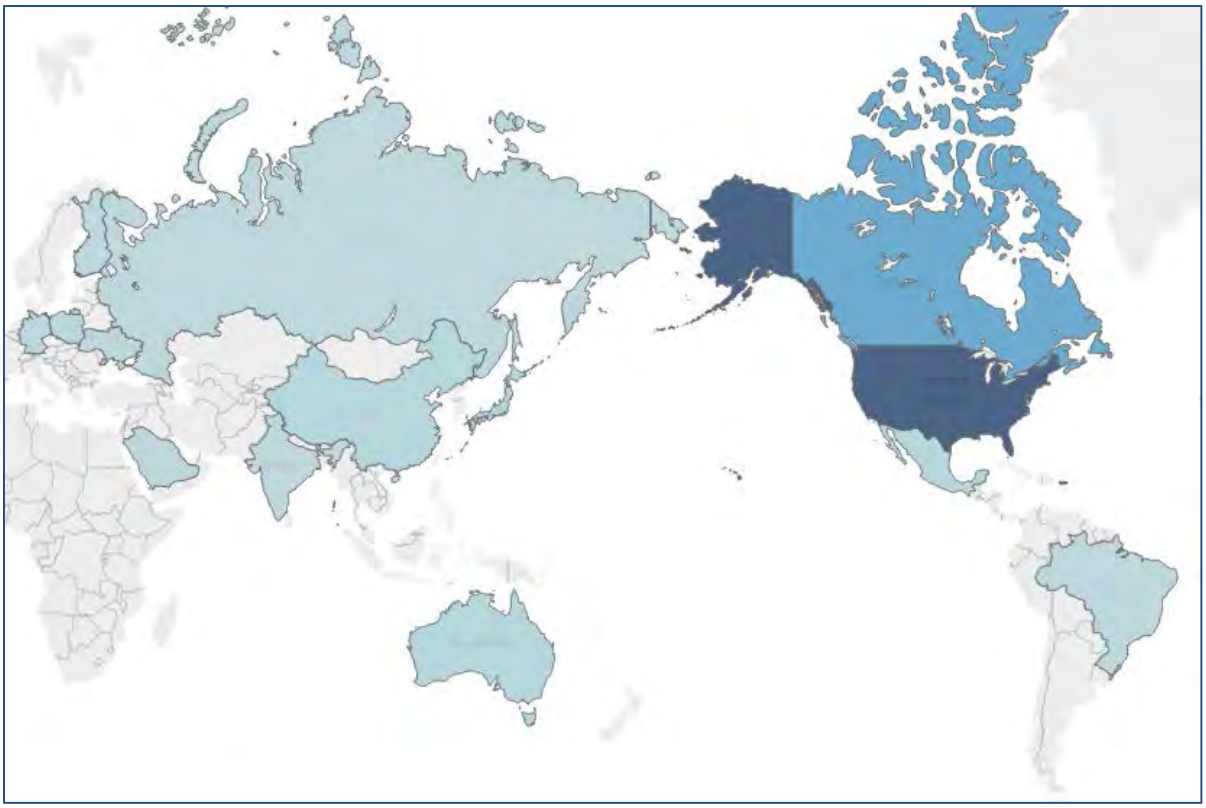
Figure 10: Customer Markets



[30] Not every business answered every question, and some businesses used more than one mode of transportation. Therefore, not all responses will add up to 68 businesses.

Figure 11 is a map of countries that purchase products from District 2 manufacturers. Countries included in the customer markets of District 2 businesses interviewed include, but are not limited to, Australia, Brazil, Canada, China, Finland, France, Germany, India, Japan, Mexico, Poland, Portugal, Russia, Saudi Arabia, and Ukraine.

Figure 11: International Markets Reached by District 2 Manufacturers



In addition, many businesses gave broader responses, such as "Europe" or "all over," and some businesses said they ship internationally but did not provide additional information. These are not represented in Figure 11.

Findings

Feedback related to MnDOT services in District 2 was generally positive. Businesses appreciate road maintenance and expansion, as well as timely snow and ice removal. They also spoke positively about recent enhancements to MnDOT communications and permitting processes.

I would say in our area [MnDOT has] been pretty active visionaries.

Connecting Key Findings to Business Needs

During interviews, manufacturers described their transportation priorities and those of other businesses in the region. Collectively, businesses wanted access to shipping that is safe, expedient, cost-effective, and dependable. Additionally, access to timely, accurate information allows them to effectively use the transportation system and adapt as conditions change.

This section discusses how the key transportation findings of this study relate to businesses' shipping priorities. Most findings tie closely into MnDOT infrastructure, maintenance and operations, policy, and communications areas. Other findings are more closely related to realities businesses face when it comes to shipping to, from, and throughout District 2. While the latter may not lead to recommendations for MnDOT, they can inform MnDOT decision-making by explaining why businesses prioritize certain highway features.

Safety

About half of the businesses spoke directly about safety as it pertains to shipping products via truck.

Intersections

Businesses said stoplights were important for trucks entering busy highways, and most businesses liked advanced warning signs and other lighted or flashing signals because they help drivers make better decisions when approaching an intersection. Several businesses identified intersections throughout the district they perceived as dangerous and needing improvement. See page 28 in Infrastructure for more information on intersections.

Lanes

As one shipper said, "More space is always better." This was the general sentiment regarding additional lanes. Businesses saw acceleration lanes as improvements that allow truck drivers to merge safely into traffic by giving them space to get up to the speed of traffic. Passing, turning, and bypass lanes were appreciated because they allowed other vehicles a chance to pass slow trucks and allowed vehicles that were turning to stop without impeding the flow of traffic. See page 31 in Infrastructure for more information on lanes.

Shoulders

Many businesses valued wide shoulders as a safety feature. They allow trucks to pull over safely in the event of a breakdown or emergency, especially at night. Truck drivers see them as a way to avoid

hazards in the road or as a safety buffer between the road and the ditch. See page 37 in Infrastructure for more information on shoulders.

Snow and Ice

Winter driving is a common safety hazard in District 2. Though businesses generally commended MnDOT's work to keep the roads clear, they also identified areas that are prone to ice and blowing snow and expressed desire for MnDOT to plow roads before the start of the morning shift. See page 43 in Operations and Maintenance for more information on snow and ice removal and page 58 in Safety for specific safety concerns regarding winter roads.

Rest Areas

Recent changes at the federal level have restricted the amount of time a truck driver can travel without resting. Several businesses noted that this has caused a shortage of space at several rest areas. Businesses requested additional areas for trucks to pull over. Not all rest areas need to be full service, but drivers do need a place to stop their truck and rest safely. See page 55 in Policy for more information on increased demand for rest areas.

Expediency and Cost-Effectiveness

Businesses expressed strong interest in the ability to ship more economically, referring both to time in transit and cost.

Size and Weight Restrictions

Several businesses advocated for the ability to haul truckloads with higher volumes of product, which would decrease costs and allow them to supply more products at a time. Most often, businesses indicated they would benefit from hauling heavier loads or more trailers ("doubles") and provided examples of other states that allow these practices on designated routes, if not all routes. Businesses said this would also allow them to be more competitive and pass savings onto their customers. Spring weight restrictions can also complicate delivery for some businesses, but most said they can plan around them when given ample notice. See page 50 in Policy for more information on size and weight restrictions.

Deadhead Miles

A few businesses said that their remote location negatively affects their ability to compete because trucks are only loaded—and therefore only generating revenue—one way on a two-way trip. Some commercial carriers charge fees to travel "deadhead miles," while others refuse to provide services in the area. A few businesses have managed to adapt their practices to reduce additional costs. See page 60 in Other Findings for more information on deadhead miles.

Signage

Many businesses requested signage of various types to increase the efficiency of shipping and receiving of goods at their facilities. Some businesses requested directional signage to better direct trucks. Others thought truck traffic signs, such as signs for truck routes and bypass routes, would be helpful. Signs that raise awareness of trucks entering/exiting roads would help improve the flow of truck traffic and reduce safety hazards. See page 41 in Infrastructure for more information on signage.

Requests for Multi-lane Highways

Businesses also pointed out the need for major transportation corridors through District 2. For example, there are no interstates that run through District 2. There is also no direct route to Fargo or the Twin Cities. Portions of major trunk highways, such as Highway 71 and Highway 2, open up to four lanes in some areas but do not maintain a four-lane connection to an interstate. Businesses perceived multi-lane corridors as faster, safer, more convenient, and preferred by truck drivers. See page 34 in Infrastructure for more information on requests for multi-lane highways.

Speed/Congestion

Increased speed limits would allow trucks to deliver products more quickly. Businesses requested speeds increased to 60 or 65 miles per hour. Businesses also cited examples of where shift changes at large businesses and school hours contribute to congestion and impede trucks in traveling at posted speeds. See page 56 in Policy for more information on speed.

Dependability

Businesses described difficulty in attracting commercial carriers who could fully serve their shipping needs and schedules. Another bottom-line concern is the ability for businesses and their carriers to deliver products to their destination undamaged. Both challenges are more distinct in District 2 than in other districts due to its location outside major transportation corridors and predisposition to extreme weather that damages pavement (e.g., frost heaves caused by temperature fluctuation).

Shipping in District 2

Because District 2 is located in a region that is out of the way of major metropolitan centers, it can be difficult for businesses to find commercial carriers that are able to serve them, particularly at times when demand for truck transportation is high. Over half of District 2 businesses use commercial carriers to ship their products. Commercial carriers have expertise in managing shipping in this area and often partner with smaller "hot shot" or interline trucking companies to fill gaps when necessary. See page 58 in Other Findings for more information on shipping in District 2.

Pavement Quality

Additionally, businesses want to be assured that the materials they receive and products they ship out arrive at their destinations undamaged. Many businesses cited examples of product damage caused in part by rough roads. Rough roads can cause loads or cargo to come loose, damage parts of the truck, and contribute to driver fatigue. All of these factors reduce the reliability of a truck and its cargo reaching its destination unscathed. See page 45 in Operations and Maintenance for more information on pavement quality.

Accessible Information

Businesses generally appreciate MnDOT communication efforts and commitment to improving communication. Plant shutdowns that occur due to unsafe road conditions can costs hundreds of thousands of dollars per day. Therefore, accurate, timely information on road conditions and construction projects is extremely valuable to decision makers. Businesses also are interested in communication about spring weight restrictions and being involved in planning of projects that affect their community.

Businesses requested more direct communication from MnDOT, and many asked to be included in email updates from MnDOT. Businesses that use 511 requested information be as real-time as possible, including during nights and weekends when there is inclement weather. They also suggested expanding 511 to across state borders and be more consistent with bordering states.[31] Businesses also requested that 511 provide more detailed road information. See page 49 in Communications for more information on 511 services.

Detailed Findings

The remainder of the Findings section will provide detailed information under five topic areas: Infrastructure, Operations and Maintenance, Communications, Policy, Safety, and Other Findings. In addition to detail on the key findings listed above, the following sections will include other transportation topics of interest.

Infrastructure

This section includes findings on topics related to infrastructure, including intersections, shoulders and rumble strips, bypasses, bridges, signage, and other highway geometry.

Intersections

Stoplights

As a trucker, I hated them. As a business person, we need another one here … Trucks are going through and getting going by the time they get to 371 and 6th street, and it's hard to stop for pedestrians.

Many businesses said stoplights are important safety features and helpful for entering busy highways, particularly in the summer and during beet harvest. They cited specific areas where they saw added stoplight improvements in Thief River Falls, International Falls, Walker, and Wilton.

Other businesses felt stoplights were helpful only in certain areas. Businesses noted that stoplights can negatively affect traffic flow. For example, one business said that in Bemidji they are typically unable to get through more than one stoplight at a time. Another business identified the stoplight at Highways 200 and 371 as one that causes delays.

In the right spots—no one wants to be going full speed and see a yellow light.

[31] MnDOT's 511 website currently links to other states' 511 websites but does not provide overlapping maps.

Roundabouts

Compared to other districts studied thus far, D2 businesses said relatively little about roundabouts. This may have been because there are fewer roundabouts in District 2 than in other districts. But businesses did discuss roundabouts elsewhere in the state, such as on Highway 59 south of Detroit Lakes in District 4.

In general, businesses said roundabouts need to be larger and people need to be educated on their use. Those against the use of roundabouts said that adding them to District 2 would be a "nightmare." Other businesses thought roundabouts would be acceptable on routes not designated for trucks. Some businesses saw advantages to roundabouts, such as forcing traffic to slow down, reducing the number of stops a truck must make, and improving traffic flow.

Warning Lights and Lighted, Flashing Signals

Many businesses expressed appreciation for modifications to intersections that make them safer and more visible, primarily flashing stop signs, streetlights at intersections, and advance warning lights for stoplights. These features were especially helpful along high-speed corridors, according to several businesses.

One business described that advanced warning signs and lights (see Figure 12 on next page) help drivers make better decisions. If the stoplight will be green, advanced warning lights save money. If the stoplight will be red, they save lives. A shipper suggested that advanced warning lights be set back another 200 feet because it can still be difficult – at times impossible – to stop with existing advanced warning lights if the truck is fully loaded and the driver has "a full head of steam."

Anywhere there is a stop light in the county, there needs to be an advanced warning light. Especially in the winter, they help you make better decisions. It would help save lives.

Figure 12: Advanced Warning Sign

Problem Intersections

Some businesses expressed concerns for safety around intersections. For example, several businesses mentioned the intersection of Moberg Street and Highway 2 near the Bemidji airport. One business mentioned that the advanced warning signs do not give enough notice to fully loaded trucks and should be pushed back another 200 feet from the intersection, as mentioned above. As another business put it:

> *I hear stories from employees that people going west don't stop at that light because they're coming up at the corner and down the hill … Trucks hauling logs are coming up around that corner. They build momentum coming up around the corner (don't see the stoplight way ahead) go up and around the bypass and down the hill and there's a stoplight right here.*

Other intersections that businesses perceived as safety hazards included:

- Highway 71 and Summit Avenue in Blackduck: The business would rather not have a stoplight at the location but believes it may be necessary for safety.
- Highway 89 and Center Street in Roseau.
- Highway 9 and Highway 200 in Ada: MnDOT added flashing stoplights, but a four-way stop would be safer.
- Highway 89 and Marshall County Highway 54 in Grygla:
    - North intersection: A business requested a four-way stop. The business cited many "near misses" from northbound traffic driving too fast and nearly colliding with traffic entering the intersection from 293rd Street.
    - South intersection: Eastbound traffic cannot see the stop sign in foggy weather. One business suggested transverse rumble strips, flashers on the stop sign, or streetlights.

Lanes

Businesses generally favored any additional space on the highway, which could be in the form of acceleration, passing, turning, or bypass lanes or multilane highways. The most common reasons businesses liked additional lanes were that they give trucks the opportunity to get up to speed and merge into traffic (see Figure 13 below), or to pull over and allow others to pass. One shipper summed up his thoughts saying, "More space is always good." Several businesses requested additional lanes near or directly outside their own facilities.

Figure 13: Truck Uses Lane to Merge into Traffic

A few businesses said that the additional space was not important or minimally important. In the middle were a few businesses who said they liked additional lanes when traffic counts and situations warrant them or where they are truly needed. Another business said additional lanes are "more helpful than not having them."

Businesses identified two areas that may need additional lanes to manage traffic patterns. One location was near Hitterdall and Ada, where trucks hauling beets in the fall cause congestion on roadways, particularly near intersections. Another example that businesses repeatedly mentioned was Highway 11 between Greenbush and Warroad. That stretch of highway is frequently used by commuters but does not have adequate space to allow traffic to bypass cars turning into facilities.

Acceleration Lanes

Several businesses discussed the importance of acceleration lanes because they give trucks a chance to accelerate to the speed of traffic. Businesses identified acceleration lanes they saw as improvements, such as the acceleration lane on Highway 2 and Moberg Street in Bemidji, and they suggested that acceleration lanes could be longer.

One business requested an acceleration lane westbound on Highway 11 and 89 at 18th Avenue in Roseau.

Profile: TEAM Industries

TEAM Industries Inc. is an engineering and manufacturing company that focuses on complex driveline solutions for the automotive, agricultural, and recreation markets. At the company's Bagley headquarters, employees work in product engineering and manufacturing, as well as assembling manufactured parts for small engine vehicles like lawn mowers, four-wheelers, and snowmobiles. Customers in District 2 and around the world use TEAM Industries' products and services.

Real-time information related to roadway delays is crucial to TEAM's business because, as one company representative explained, "It is extremely important to deliver on time. When the process works as it should, the finished product can be ready for sale in three days from the time [we get] our supplies." Delays at TEAM Industries cost money and time. A delay that results in a plant shutdown can cost $200,000 per day. More frequent, real-time updates to 511 during inclement weather would help TEAM prevent or prepare for such delays.

The company appreciates a good local road system, such as the recently upgraded 10-ton county roads from Gully to Grygla, but they would also like to have more four-lane highways, which they perceive as a safer option for trucks.

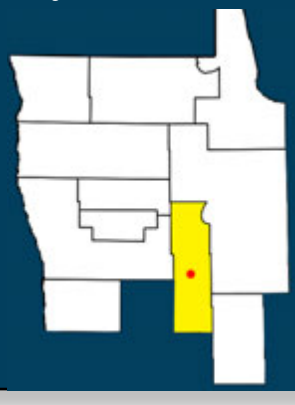
TEAM Industries also hopes that MnDOT can address a particular challenge they are experiencing near their Bagley facility: Park Avenue is a narrow street, and it sometimes gets blocked. The company representative suggested a wider right turn lane from Highway 2 to Park Avenue to improve safety. MnDOT is planning a project in Bagley in the near future and will consider whether this improvement can be included in that project's scope.

Number of employees
300

Cluster
Local Industrial Products and Services

Highways used
2, 59, 71, 92

Location
Bagley, Clearwater County



Passing Lanes

Businesses generally appreciated passing lanes, with one business calling them "more important than driving lanes." Passing lanes make driving safer by allowing slower trucks to move over and allow faster moving vehicles to pass, and they allow trucks to better control their tight schedules. Businesses said passing lanes would be particularly helpful near major manufacturing facilities, in areas where four-lane highways are not viable, and in hilly or curvy areas, where trucks lose momentum more quickly than cars. On long stretches of roadway, one business mentioned passing lanes every six miles would be ideal.

Businesses appreciated recently-added passing lanes in the following areas:

- Highway 2 east of Cass Lake
- Highway 34 west of Park Rapids

Several businesses requested passing lanes along Highway 11, particularly between Greenbush and Warroad and on the Lone Pine Ridge east of Warroad. Businesses also requested passing lanes on Highway 59 from Erskine to Detroit Lakes and on Highway 371.

Turning Lanes

In general, businesses expressed appreciation for turn lanes and requested additional turn lanes in the following areas:

- Highway 11 Greenbush to Roseau, especially Lone Pine Ridge on Highway 11 west of Warroad
- Highway 11 on the west end of International Falls to Highway 332 (there are not many turning lanes for people turning into residential areas)
- From Highway 332, turning left onto Highway 11 in International Falls
- From Highway 1 turning onto 220th Avenue Northeast east of Thief River Falls
- Highway 371

In addition, businesses requested modifications to existing turn lanes to improve safety:

- Lengthen turn lane on Highway 11/89 eastbound coming toward 18th Avenue Northwest in Roseau
- Widen right turn lane from Highway 2 onto Park Avenue Northwest in Bagley (trucks in the right turn lane reduce visibility for cars turning from Park Avenue onto Highway 2)

Bypass Lanes

Businesses spoke favorably of bypass lanes and their ability to improve traffic flow. They identified specific areas and corridors where recently added bypass lanes have improved traffic and where additional bypass lanes would be useful. For example, one business said they appreciated the bypass lane added on Highway 75 and Polk County Road 14 in Crookston. Businesses also identified a few areas where drivers were using shoulders as bypass lanes, such as the intersection of Highway 71 and Hubbard County Highway 15 in Park Rapids.

Thief River Falls

Several businesses in Thief River Falls spoke of the bypass lane on Highway 32 in front of Dean Foods as a significant improvement. One business said that the new bypass lane would keep traffic moving

when employees arrive for work. Another business commented on how much the addition has improved the flow of truck traffic. Businesses also requested additional bypass lanes along Highway 32 to improve traffic flow further.

Requests for Multilane Highways

Businesses requested multilane highways throughout District 2 for multiple reasons, and those located near four-lane highways cited their location as a benefit. Businesses said that commercial carriers prefer four-lane highways because truck drivers perceive them as safer. One business said they prefer four-lane routes for their trucks to two lanes, even if the two-lane road has edge and centerline rumble strips.

> *[Highway] 71: I like that that's now a four-lane. When it was a two-lane, it was anybody's guess when you would eventually pull out in front of someone. It's helped a lot.*

Third Lane Requested

A few businesses requested a third lane on Highway 59 from Erskine to Detroit Lakes. One business requested the four-lane be extended north of Erskine to Thief River Falls. Due to the hilly terrain around that area, there are few opportunities to pass, and the business did not feel that one-mile passing lanes were adequate for trucks.

Other areas in which businesses requested a third lane include:

- Highway 11 inbound toward Roseau.
- Highway 313 southbound from Canadian border to Warroad.

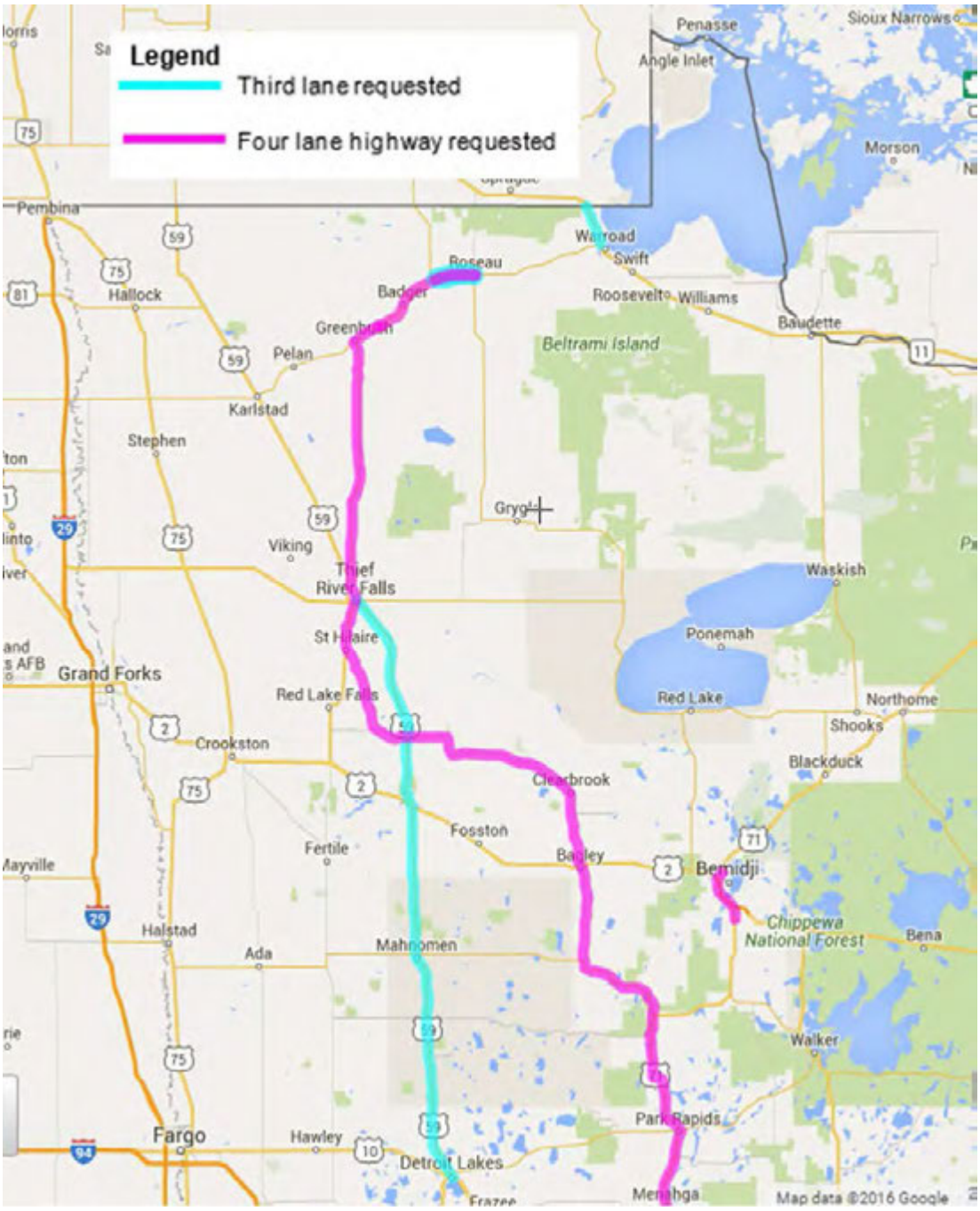
Four-lane Highway Requested

Several businesses requested four-lane highways in District 2. While some requests were general, such as a four-lane option to the Twin Cities and a four-lane option to Duluth, others were specific. Identified routes included:

- Highway 11 from Badger to Roseau.
- Highway 71 in Bemidji.
- Connect Roseau to Highway 71 to create a four-lane route to Jackson, Minnesota, near the Iowa border.

Figure 14 (on next page) illustrates requests for multilane highways.

Figure 14: Requests for Multilane Highways



Profile: Richards Publishing

Established in Gonvick more than 43 years ago, Richards Publishing is a commercial and newspaper printer that prints and assembles four weekly newspapers in northwestern Minnesota. In addition to newspapers, Richards Publishing produces business forms, newsletters, hang tags, and inserts for other products on a regular basis. The company serves businesses and organizations in local and tribal government, automotive, communications equipment, and construction products and service clusters in District 2. The company works with customers in parts of North Dakota and ships products for customers to Canada and other countries.

Getting supplies and finished printed products to and from the Twin Cities is the company's biggest challenge. According to a company representative, "There are not direct routes. It costs a lot to get to and from Highway 10, where lots of businesses need to get their product." Highway 59 is not always a viable option because it can be out of the way, and drivers have to slow down for small towns. Instead, people are using other alternatives to get to Highway 10." Other businesses in the area share the same general concern about getting products in and out of the region in a cost-effective way.

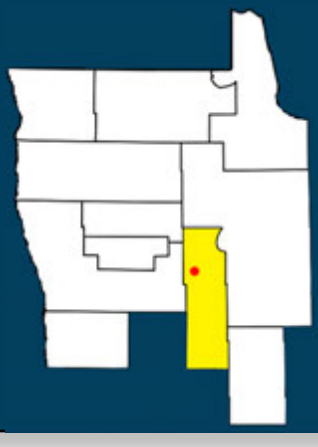
Paper is easily damaged, bending or creasing from impact or disintegrating from moisture, so smooth pavement is very important to Richards Publishing and their suppliers. "We often receive a 1,000 pound pallet of paper; sometimes if the pavement has been rough, or the driver took a turn too sharp, the bands that hold the paper break and slide off, the paper gets ripped or bent, and I do not accept the shipment. The paper needs to be pristine when it goes into the press."

Number of employees
16

Cluster
Printing Services

Highways used
2, 10, 59, 71, 92

Location
Gonvick, Clearwater County



Shoulders, Rumble Strips

When asked about wide or paved shoulders, most businesses said they appreciate them for both safety and convenience. In addition to rural stretches of highway, businesses spoke of the value of shoulders in town to avoid open car doors and allow room for pedestrians, bicyclists, and people in wheelchairs. Businesses also acknowledged recent improvements District 2 has made to shoulders along major corridors.

I like paved, wide shoulders. There's nothing worse than breaking down on the side of the road with no shoulder.

You never know what's going to happen on the roadway. Animals, other vehicles coming into your lane, having a way to be able to move to the right I think is super important … Sometimes if you don't have wide or paved shoulders, the ditches tend to be steeper, it seems like … So at night, if you can't get to a safe spot to pull over, it's nice to be able to get out of the lane of traffic completely. Even though we put triangles up and stuff like that, you still have to count on other people and make sure that they're paying attention, and not texting and driving – or something like that –and rear-end you.

Wide Shoulders

Many businesses saw wide shoulders as important safety features, with some businesses calling them "extremely important" or "critical," and requested wide shoulders "wherever possible." One business mentioned they also improve traffic flow. Businesses mentioned Highway 11 as an important corridor for wide shoulders and appreciate the recent projects to widen shoulders on that highway. Businesses cited the following as safety improvements attributed to wider shoulders:

- Leaves room to avoid possibly dangerous situations.
- Allows a place for trucks to pull off for emergencies or breakdowns.
- Provides extra space for turning.
- Allows for recovery in inclement weather if wind blows the truck to the side of the road or if the roads are slippery.
- Allows room for farm equipment, cyclists, and pedestrians.

From a safety standpoint I would never argue against wider shoulders. They definitely are helpful if you need to pull over for a flat tire or to re-secure a load.

Figure 15: Narrow Shoulder Allows Little Room for Error

Paved Shoulders

Few businesses spoke specifically about whether paved shoulders were necessary. Among those that did, their opinions were split. A few businesses said that if shoulders are wide, they do not necessarily need to be paved, but the gravel must be high quality and shoulder must be level. Conversely, other businesses said that making repairs on gravel shoulders can be impossible.

Issues and Concerns

Businesses identified many areas where narrow shoulders presented perceived hazards for drivers, including:

- Highway 89 from Fourtown through the Red Lake Reservation.
- Highway 87 (90-degree turns present additional issues).
- Highway 59 from Lancaster to Canadian border and Detroit Lakes to Erskine.
- Highway 200 east of Highway 92 (narrow shoulders add to complicated winter driving conditions).
- Highway 172 at Wheelers Point (blind curve, guardrail, and narrow shoulders make the area unsafe for pedestrians).
- Highway 6 (narrow shoulders provide little room for error in navigating hills and curves).
- Highway 73.

One business requested wider shoulders outside their facility.

A few businesses also mentioned that in some circumstances, cars are using shoulders as passing lanes, which creates additional safety hazards.

Significant Safety Concerns

Businesses identified two locations – on Highway 6 and Highway 89 – which have steep ditches and narrow shoulders provide little margin for error, which they said has led to crashes.

Figure 16: Truck Rollover on Narrow Shoulder

Highway 6

Highway 6 is located in both Districts 1 and 2. Several businesses commented on how difficult it can be to navigate Highway 6 between Big Falls and Deer River due to its hilly, curvy terrain, blind spots, and narrow shoulders. These hazards are compounded during inclement weather.

Two businesses have lost customers and suppliers because they refuse to travel this road with trucks. One business shared that they have had two crashes in recent years, where drivers were lucky to escape unharmed. Businesses recommended that rumble strips may be a short-term fix that would allow them to feel safer traversing this stretch of highway.

Highway 6 is a low-volume highway. Given constrained resources, MnDOT has to work first on highways that are used more, where there is a higher return on investment.

You have no margin for error on [Highway] 6. On others you might have a wide shoulder – you have room to play. Over there if you're over, you're done.

Highway 89

Judicial ditches are regulated by counties or district courts, which can present right-of-way issues. On Highway 89, the existence of judicial ditches has resulted in narrow roads and steep ditches. When there are narrow roads and steep ditches, drivers have little room for error, opportunity to avoid hazards – such as animals – in the road, and have no place to pull over and fix a tire or secure a load. According to one of the businesses interviewed, this may have contributed to two rollover incidents.

Figure 17: Judicial Ditches on Highway 89

Rumble Strips

All businesses that spoke of rumble strips said that they appreciate them as an added safety feature. This applies to both centerline and edge line rumble strips.

Bypasses

Businesses located in cities with bypasses generally spoke positively of their effect on traffic flows. City bypasses mentioned include Bemidji, Crookston, International Falls, Roseau, and Thief River Falls. One business mentioned that bypasses in Crookston can be confusing for motorists that are not familiar with the area because there are multiple bypass options.

Bridges

Overall, businesses did not provide a lot of constructive feedback regarding bridges. Many businesses said that bridges were not an issue in that part of the state, while some businesses said MnDOT was doing a good job with bridges. One business said, "[The] state has been doing good with improving, removing old bridges and replacing with newer, wider, and taller bridges."

Clearance

A few businesses commented on bridge clearance, though only one provided any details. That business said that 14-foot clearances are "always nice," and if they haul anything larger, they need a permit to transport the product anyway. Another business said that while they have periodic issues with bridge clearance, they are often local, and bridge clearance is not a "larger state issue."

Capacity

Similar to bridge clearance, few businesses gave feedback on bridge capacity. One business mentioned that permits do not always reroute trucks to avoid low-capacity bridges. Another business said they once came upon a bridge in Norman County they could not legally cross, and it was difficult to turn the truck around. The bridge is now legal and no longer presents challenges to the business.

Figure 18: Baudette-Rainy River International Bridge in Baudette, Minnesota

Other Feedback

Though interviewers asked businesses specifically about bridge clearance and capacity, most of the feedback from businesses was about other matters related to bridges. Several businesses commented on complications resulting from bridge repairs, while a few businesses discussed their perceived need for additional bridges.

Businesses discussed delays caused by bridge repairs. One business suggested that MnDOT combine bridge projects along high-traffic corridors, such as Highway 59, to minimize the amount of time a highway is restricted to trucks. In International Falls, businesses are concerned about the effects an upcoming bridge project will have on their rigid production schedule. Employees coming to work from Canada will need to take a different route and therefore may be unexpectedly delayed by trains, adding to the businesses' production costs and temporarily reducing competitiveness.

In East Grand Forks, interviewers asked businesses about the effect of an additional bridge across the Red River. This has been a local discussion topic for years. Businesses said they believe any effect would be positive, but they did not quantify it. A business in Thief River Falls suggested an additional bridge across Red Lake River to improve airport access and said that other area businesses would benefit.

Signage

Directional Signage

Several businesses in the central portion of the district mentioned issues with getting trucks to their facilities. Some of these issues were due to errors in navigational services and devices, such as Google Maps or GPS, providing incorrect locations. These businesses felt that directional signage on either side of their facility or at the location that navigational services place drivers would be helpful. Other businesses commented that existing signage leading to their facilities was not clearly visible due to size or position.

Truck Traffic Signs

Several businesses requested signs directing truck traffic. Suggestions and requests included the addition of signs that:

- Designate truck routes in Bagley, Baudette, and International Falls.
- Illustrate routes that trucks are not supposed to use.
- Use signs to direct trucks and improve traffic flow at the Bemidji airport.

Businesses also expressed a need for signs that make motorists aware of trucks entering or leaving their facilities. In Bemidji, one business said trucks wait up to five minutes to cross a four-lane highway leaving the facility because it is difficult to see oncoming traffic. Among their suggestions was to add a "trucks entering" sign along the highway. Another business in Stephen mentioned similar issues, with trucks entering 60-mile-per-hour traffic being unsure whether other drivers can see them in time.

Road Conditions

A few businesses suggested electronic message boards to communicate road conditions, especially during inclement weather. They identified Highways 11, 46, and 72 as areas where message boards would be particularly helpful.

Other Signage

Businesses suggested several other improvements to signage to assist with both public and truck driver safety. Examples of suggestions include:

- Ensure bridges are signed with weight restriction information.
- Signs for pedestrian and snowmobiler safety.
- "Don't text and drive" signs targeted toward youth, possibly posted at the beginning of the school year, during homecoming, etc.
- More notice of changing speed zones (i.e., reduced-speed signs with the reduced-speed posted).
- Deer crossing signs on Highways 75 and 220.

A few businesses also mentioned greater, more intentional use of signs that warn drivers of bumps in the road. Businesses said that while the largest bumps are generally marked well, it is hard to tell by the existence of the sign what to expect. Businesses requested signs for bumps be placed further in advance, so drivers have time to slow down or make other adjustments as needed. As one business said, "[Our] payloads are valued at $500,000, so it is very important to have these signed."

One business requested signs be placed further from the road to accommodate oversized loads.

Other Highway Features

Businesses mentioned other highway features. Hills and curves, like those on Highway 59 from Brooks to Thief River Falls, can create hazardous driving situations because they allow few chances for cars to pass. A few businesses commented on other highway features. Comments included:

- Good striping on roads is important, especially for night driving. It may be wearing more quickly than it used to.
- Highway 2 through Bagley is narrow, and opening car doors are a problem.
- Highway 71 to International Falls has rough culvert crossings.

One business said they would like to work with MnDOT on drainage ditch and truck entrance issues outside their facility.

Operations and Maintenance

This section includes findings on topics related to maintenance and operations, namely snow and ice removal and pavement quality.

Snow and Ice Removal

Prompt and efficient snow and ice removal is very important to businesses in District 2. They depend on good snow and ice removal to operate effectively both with employee commutes and product movement. Businesses understand that winter can make travel challenging and generally feel that the district does a good job with snow and ice removal on state roads. As one business commented, "Weather is a challenge, but the snow and ice control on the roads are very good."

Feedback on winter roads fell into two categories: (1) identification of locations that are problematic and (2) suggestions for improved snow and ice removal.

Problematic areas were generally areas that are prone to blowing snow and ice. Examples of these locations include:

- Highway 11 east of Karlstad and west of the Pelland junction to Baudette: Poor conditions due to frequent high winds cause trucks to slide.
- Highway 2:
  - Westbound lane coming into Bagley is dangerous when icy, with many drivers speeding.
  - Between Solway and Bemidji at open areas and from Ebro corner to Fosston on the hills, blowing snow sticks to pavement and becomes icy.
  - Highway 2 bypass bridge over the railroad tracks in Bemidji gets icy quite often, blowing and drifting along industrial stretch.
  - Between Crookston and East Grand Forks there is typically blowing and drifting snow in the open areas, and it closes frequently.

Figure 19: District 2 Snow Plows

Profile: Digi-Key

From its headquarters in Thief River Falls, Digi-Key ships electronic components to customers around the world. The company typically processes more than 15,000 orders daily – more than 3 million orders annually, with nearly all (99.9 percent) orders shipped the same day. Shipping is done primarily through common carriers, with about 80 percent of products shipped by truck and about 20 percent by air.

Digi-Key has a worldwide customer base that is rapidly growing, with about 45 percent of its customers located outside the United States. One company representative described its Thief River Falls campus as the "center of the world," referring to its location relative to its customers. "We can meet our global customers' shipping needs even though we're not located in their home countries, due to our extremely high order fulfillment turnaround time in Thief River Falls." Digi-Key explained, "We also have a unique relationship with our carriers who go the extra mile for us ... Thief River Falls has become a sweet spot for us and our carriers." Another representative added, "Our competitive advantage is definitely the Digi-Key workforce ... That's our secret sauce that helps us go above and beyond for our customers and grow our worldwide market share."

Digi-Key is very dependent on Minnesota's state and local highways – both for shipping products transportation for employees who routinely travel from East Grand Forks, Crookston, and Bagley. According to one representative, "Our buses will find a way to get employees to work, even in poor weather. We depend on good Minnesota roads to keep these employee buses and our carrier trucks running."

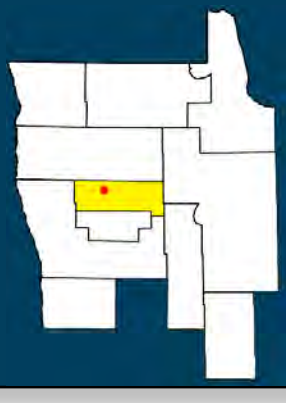
Digi-Key strives for a 12-hour domestic turnaround from order to shipping and two-day turnaround time outside the U.S. to remain competitive. Minimizing construction-related delays and ensuring timely and efficient snow and ice removal are critical issues for Digi-Key. To minimize road construction delays, Digi-Key recommended that MnDOT stage construction projects to ensure that either Highway 10 or Highway 94 is always at full capacity. Digi-Key would also like MnDOT to add County Road 3 and County Road 21 to the state highway system for snow and ice removal to further reduce delays related to winter weather.

Number of employees
3,350

Cluster
Distribution and Electronic Commerce

Highways used
2, 32, 59, 75, 220

Location
Thief River Falls, Pennington County



Most suggestions for improvement focused on areas businesses preferred them plowed sooner – generally for morning commuters – or locations businesses would like plowed more thoroughly. Examples include:

- Highway 2 and Highway 71 near Bemidji, including junction and bypass curve: earlier snow removal (by 5:30 a.m.) requested.
- Highway 371 from Hackensack to Highway 200: improve plowing and salting.
- Highway 32 from Strathcona to Middle River: not always clear of snow.
- Highway 75:
    - Between Hallock and Stephen: earlier snow removal (before 6:30 a.m.) requested.
    - Plows not getting down to bare pavement and icing.

In addition, one business suggested that MnDOT expose more of the shoulder when plowing the state highways. Another business liked the living fence on Highway 71 and requested it be extended.

Pavement Quality

Two-thirds of businesses said smooth pavement is very important to their ability to compete. Rough roads can cause product damage, contribute to driver fatigue, and increase wear and tear on trucks, especially in the winter. One business said, "The smoother the better as far as road conditions when shipping finished product," to minimize product damage. A shipper echoed the importance of smooth roads: "Smooth pavement is very important; the cost of product damage is my responsibility."

Smooth pavement is a major concern, rough roads can cause maintenance problems and product damage ... Hwy 59 from Erskine to Winger is rough, [as are] some areas on Hwy 2. Any gaps in the pavement really pound the truck.

Product Damage

About one-quarter of businesses cited problems with pavement quality, such as product damage or wear and tear on vehicles. They mentioned a variety of products that are damaged over rough roads, such as:

- Livestock can suffer from broken limbs when trucks go over large bumps that the driver cannot avoid.
- Straps holding cases of palletized milk that loosen or break.
- Ripped and bent paper – unsuitable for printing – caused by breakage of bands holding 1,000-pound pallets.
- Bags of perishable food break open, reducing product value.
- Bags of pet food that split open.

Rough roads can also damage:

- Garage doors.
- Custom-made cabinets.
- Fenders for recreational vehicles.

- Driveline components (for recreational, agricultural, and industrial markets).
- Potatoes (bruised).

Several other businesses acknowledged that other occurrences, such as driver negligence, can also contribute to damage.

Locations with Rough Pavement

A few businesses said Highway 200 from Zerkel to Highway 59 is generally rough, with bumps and dips along the way, particularly at a bridge three miles west of Zerkel. One business avoids this stretch of highway to prevent product damage. Businesses also said Highway 75, "needs a little attention in some places, it's rough in spots on the seams," and that there are rough areas between Hallock and Kennedy.

Other highways where businesses identified rough pavement include:

- Highway 59 from Erskine to Winger.
- Highway 72 to Highway 11: "sawed joints are bumpy."
- Highway 11/71 and Highway 6: "more of a safety issue especially in spring when thawing Highway 11/71 throws you all over the place."
- Roads near Gully and just North of Middle River: one business said that their products (fenders and shipping containers) are damaged by trucks driving over frost heaves.

Figure 20: Frost Heaves Lower Pavement Quality

Profile: Bagley Livestock Exchange

Bagley Livestock Exchange is northern Minnesota's largest live-stock auction. Each week, Bagley Livestock holds a cattle auction and ships an average of 2,000 head of cattle on 30 trucks. While most of their customers are ranches in northwestern Minnesota, feedlots and farmers in other parts of Minnesota and other states, including Iowa, Nebraska, and Texas, also work with Bagley Livestock to buy and sell cattle.

Bagley Livestock, their commercial carriers, and their customers count on local roads to get livestock to and from the auction house located on Highway 2 in Bagley. A company representative complimented recent road construction work in the area: "When Highway 92 was fixed, it was a big, big deal!" The north-south transportation routes provided by Highway 59 and Highway 71 are also important to the company, so timely and effective snow and ice removal along those roads is essential. Every company wants to ensure products are not damaged in transit, but smooth pavement is uniquely important for Bagley Livestock. They stated, "In extreme cases, large bumps that drivers cannot avoid [have] resulted in cattle suffering broken legs. This is an animal husbandry and treatment issue, as well as a profit issue."

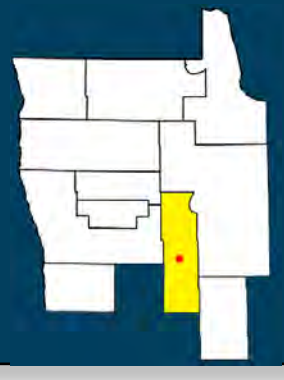
Pavement condition is not the only transportation challenge for Bagley Livestock Exchange – law enforcement delays are a significant concern. When officers stop cattle truck drivers for violations, cattle can become stressed by the additional time spent in transit. This is exacerbated by excess heat in the summer, as airflow stops when the trucks are stopped. In the winter, cattle can overheat in a stopped truck and then become chilled when the truck begins moving again. These types of stress can cause health problems – again, a husbandry and profit concern. Bagley Livestock staff would appreciate any efforts to shorten the violation processing time on the roadway. The MnDOT District 2 Engineer has met with State Patrol officials to develop ideas to address this concern.

Number of employees
20

Cluster
Livestock Processing

Highways used
2, 59, 71, 92

Location
Bagley, Clearwater County



Spring Flooding

Businesses in several areas of the district noted that spring flooding can hinder transportation in their area. Effects of flooding include needing to reroute trucks and poor spring road conditions.

Examples of spring flooding include:

- Highway 2 in Oslo and other state highways that traverse the Red River.
- Highway 172**:** problems with road drainage can cause the surrounding area to flood often.
- Highway 200 from Roy Lake to Mahnomen**:** bumps and S-curves through swamps.

Communications

This section includes findings on topics related to communications and 511.

Positive Feedback

Businesses complimented MnDOT's communications on the road construction and maintenance work and how that work affects the public.

Positive comments on MnDOT's communication practices include:

- *"MnDOT is good with notification when construction projects will be starting. We are very happy with our district."*
- *"MnDOT does a good job and communication is always good. Everyone in [our] community gets releases and communicates them out. They work at the local level with county and city on closures in town."*
- A shipper who hauls sugar beets said about communicating with MnDOT: *"MnDOT has been really good to work with. I have no complaints."*

Suggested Communications

Many businesses said they would like to be added to the MnDOT email list to receive information from MnDOT regarding road construction, road closures due to inclement weather, and other updates.

- Because businesses depend on information to make decisions about travel and shipping, MnDOT communication about road construction or inclement weather can help prevent costly delays. *"We feel communications with MnDOT have improved concerning the spring load restrictions, and we appreciate the effort. It costs us $4,000/hour to shut down the plant, so it is very important to have a generous wood supply during spring load restrictions."*
- *"Before MnDOT builds a project, they need to talk to people that transport in the area about oversized loads and bridge clearance needs. Signs need to be placed further away from the road for oversized loads to get through."*

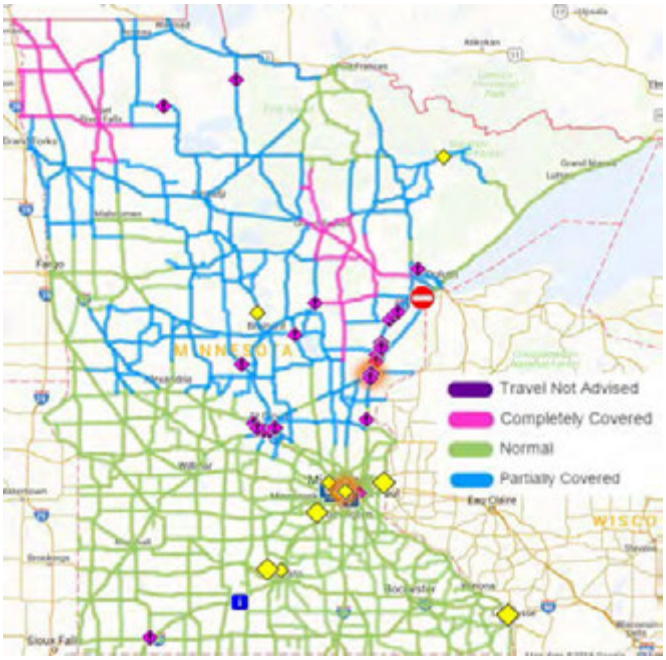
511 Website, Phone Service, and Mobile App

Slightly fewer than half of businesses interviewed use 511[32] for updates on road and weather-related conditions, including road closures. Though most of these businesses use 511 year round, a few use it more often in the winter. One shipper noted, "We use 511 quite often, there is lots of information out there." Several businesses that contract their shipping to commercial carriers were aware that their carriers use 511 regularly.

Some businesses knew about 511 but did not use the website, phone service, or app. These businesses use a variety of other services for traffic information and updates on road conditions and closures, including OnStar, local radio stations, Google Maps, and weather updates or alerts via mobile phone.

For some businesses, the interview was a reminder that 511 was an option, and some planned to revisit the 511 website and explore its new features. Other businesses were not familiar with 511. Interviewers shared information about 511 with these businesses, who were generally interested and planned to share the information with their drivers and commercial carriers. In some cases, respondents were not familiar with 511 but thought that the company's drivers or commercial carriers may be aware of and using it.

Figure 21: 511 Road Conditions Map



[32] 511 is MnDOT's traveler information service. It is available via phone, web, and as an app. 511 provides real-time updates on weather-related road conditions, roadwork, commercial vehicle restrictions, road closures and other travel information. The website for 511 is located at this address: 511mn.org.

511 Feedback

The majority of businesses who used 511 valued the site and its functionality and did not share any constructive feedback or suggestions. Most suggestions were that MnDOT provide more real-time information, such as information on road conditions during inclement weather after business hours. One business requested MnDOT install more cameras to show actual road conditions. Businesses use this information to decide whether to halt production or pull trucks off the roads.

A few other suggestions focused on more specific information and the interface with other entities:

- Provide a more cohesive link from Minnesota to bordering states in terms of information on traffic and road conditions.
- Provide an interface/updates on county road conditions, if possible.
- Provide more specific, less generic road conditions reports.

Policy

This section includes findings on topics related to infrastructure, including size and weight restrictions, permitting processes, carrier policies, and other policies.

Businesses were overall positive about MnDOT policies and understood that regulations were necessary to sustain a usable transportation system. Businesses also reported improvements in permitting processes and communication of spring weight restrictions. Some businesses would still prefer to transport higher volumes of products and voiced questions or concerns with some carrier and permitting policies.

Size and Weight Restrictions

Though relatively few businesses were critical of existing size and weight restrictions, about half expressed desire to ship in larger quantities than are currently allowed. Many businesses identified access to a 10-ton highway system as a strength, with a few businesses thanking MnDOT for upgrading Highway 11, in particular, to a 10-ton highway. Businesses also lauded the upgrade of several county state aid highways to 10-ton, particularly the road that connects Grygla to Gully.

Many businesses said the ability to haul larger loads and more products would reduce shipping costs, making Minnesota businesses more competitive. The district's sparse population and distance from economic centers result in increased shipping costs, particularly deadhead fees.[33] Allowing more product on fewer trucks would reduce the number of trucks that charge deadhead fees.

Most businesses that suggested increased weight limits said that they load their trucks according to current specifications or permit allotments but would like to load more onto each truck. Though not a common perspective, one business supported increased weight limits with the understanding that

[33] Deadhead costs occur when a truck has product to haul into a location but not away from a location, or vice versa. As such, commercial carriers are earning money travelling in one direction, but not both. To recoup these costs, carriers may charge their customer an additional fee to pick up from or deliver to a location. See page 60 for more information on shipping and deadhead costs in District 2.

that may increase transportation costs (transportation-related taxes) to mitigate the additional wear and tear on the roads caused by heavier loads.

Businesses provided similar feedback about more generous length and width restrictions, saying that they could pass savings onto their customers. Among the suggestions were allowing longer trailers, at least along designated routes, or allowing the hauling of double trailers.

In particular, several businesses requested that Minnesota size and weight restrictions be modified to be consistent with other states[34] and allow Minnesota businesses to be more competitive against similar businesses in other states. One business provided an example that its customer is increasing demand, but is likely to purchase from another supplier because the other supplier is in a state that allows "bigger product on bigger trucks." However, businesses also commended the quality of Minnesota's highway system over other states that allow heavier loads.

Spring Weight Restrictions

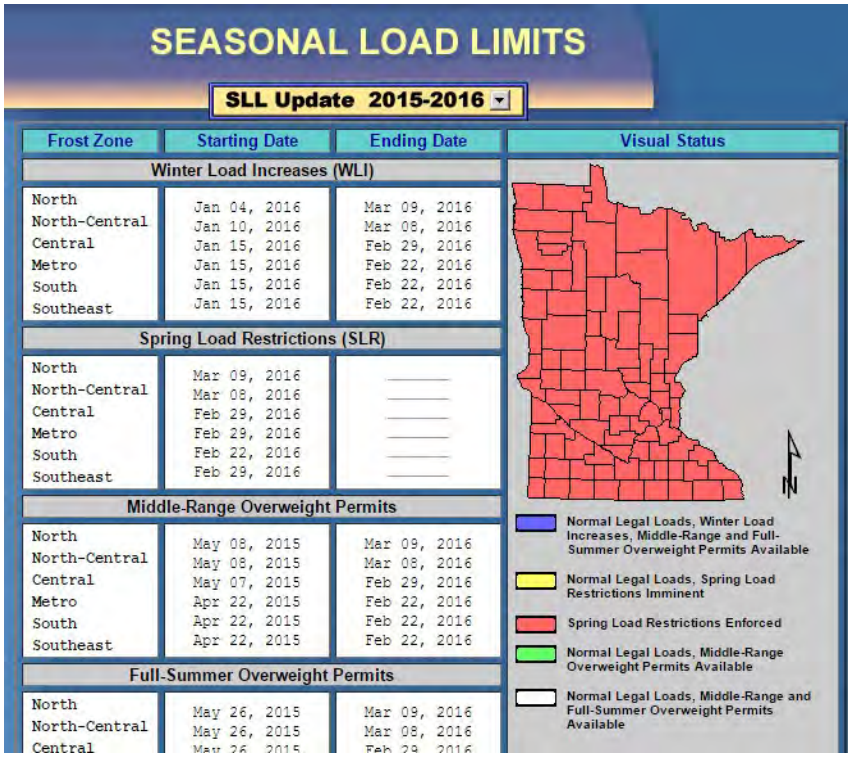
Businesses were generally positive in their feedback regarding spring load restrictions. They mentioned that communication of spring weight restrictions has been improving and, overall, the process for determining load restrictions is good.

A consistent process and communication of spring weight restrictions allows businesses to plan accordingly, often stockpiling supplies or modifying production schedules. It is not always feasible to haul smaller loads of supplies to a business. For some businesses, a sudden change in weight limits can delay construction projects or cause the manufacturer to shut down entirely. For example, one business in the Wood Products cluster said it costs them $4,000 per hour to shut down, but if they do not have a generous supply of wood to manufacture, they have no other choice.

Figure 22: MnDOT District 2 Weigh Station

[34] States mentioned include Michigan, Nebraska, North Dakota, South Dakota, and Wisconsin.

Figure 23: MnDOT Seasonal Load Limit Website (March 10, 2016)



SEASONAL LOAD LIMITS

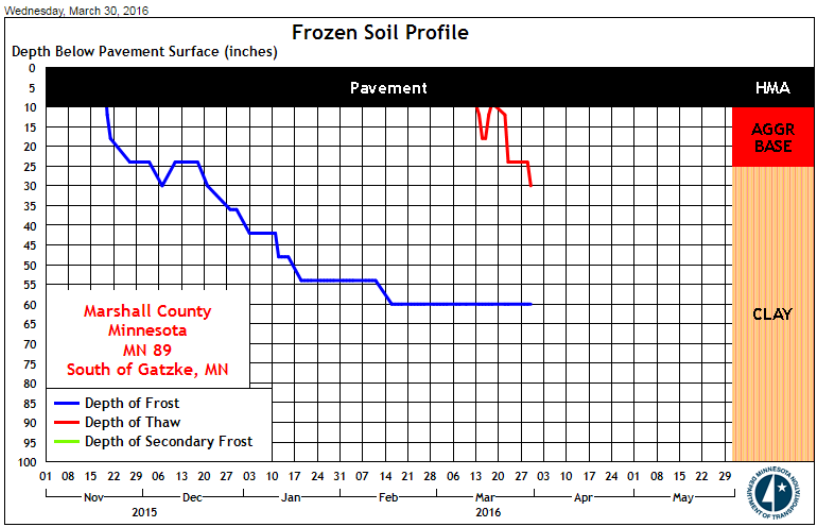
SLL Update 2015-2016

Frost Zone	Starting Date	Ending Date
Winter Load Increases (WLI)		
North	Jan 04, 2016	Mar 09, 2016
North-Central	Jan 10, 2016	Mar 08, 2016
Central	Jan 15, 2016	Feb 29, 2016
Metro	Jan 15, 2016	Feb 22, 2016
South	Jan 15, 2016	Feb 22, 2016
Southeast	Jan 15, 2016	Feb 22, 2016
Spring Load Restrictions (SLR)		
North	Mar 09, 2016	———
North-Central	Mar 08, 2016	———
Central	Feb 29, 2016	———
Metro	Feb 29, 2016	———
South	Feb 22, 2016	———
Southeast	Feb 29, 2016	———
Middle-Range Overweight Permits		
North	May 08, 2015	Mar 09, 2016
North-Central	May 08, 2015	Mar 08, 2016
Central	May 07, 2015	Feb 29, 2016
Metro	Apr 22, 2015	Feb 22, 2016
South	Apr 22, 2015	Feb 22, 2016
Southeast	Apr 22, 2015	Feb 22, 2016
Full-Summer Overweight Permits		
North	May 26, 2015	Mar 09, 2016
North-Central	May 26, 2015	Mar 08, 2016
Central	May 26, 2015	Feb 29, 2016

Visual Status

Businesses have developed ways to work with seasonal weight restrictions. The Timber Association provides three-day alerts to businesses related to the timber industry to prepare them for upcoming weight restrictions. One business said they watch the frost tube reports on the MnDOT website (see figure 23 below). Suppliers pass this information on to customers, so they can prepare and submit orders prior to restrictions when necessary.

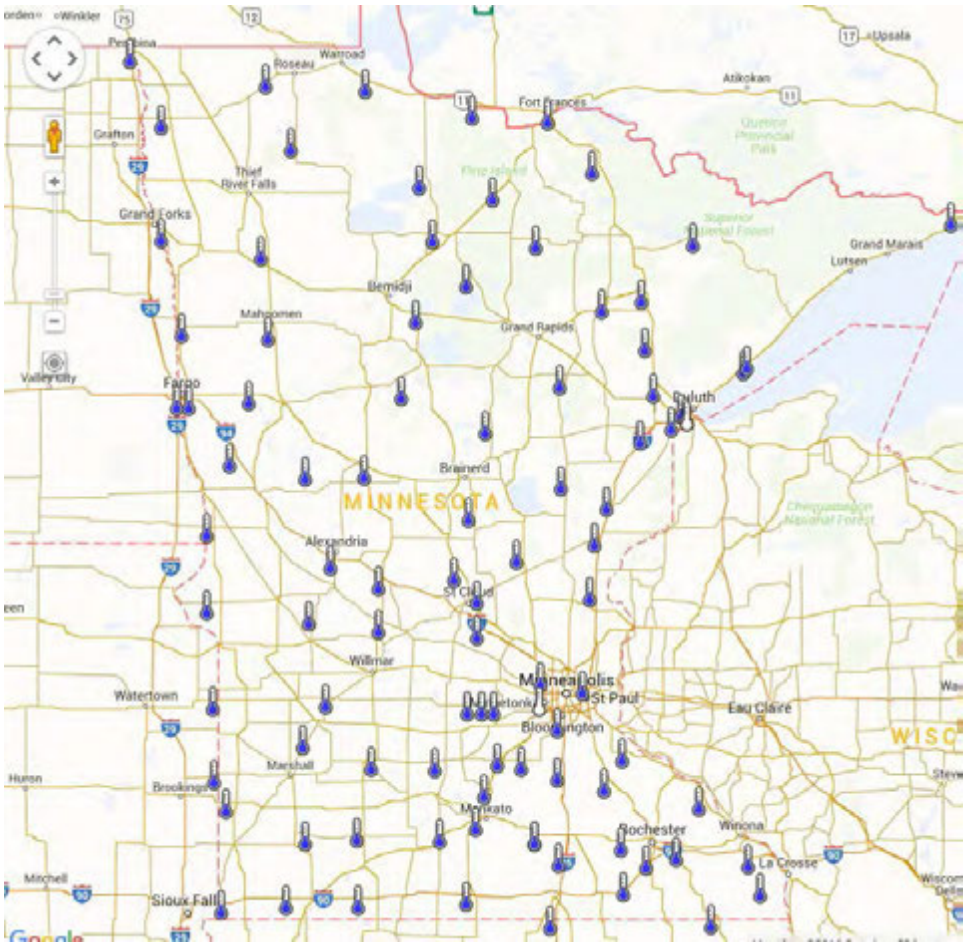
Figure 24: Frost Soil Profile for Marshall County from MnDOT Website



In terms of continuous improvement, businesses would like access to more information regarding the timing of spring weight restrictions. In particular, businesses requested:

- Frost tube placement at all Road Weather Information System[35] locations in the state.
- One central location for all spring weight restriction information.
- Information on spring restrictions for county roads.

Figure 25: Map of Road Weather Information Sites



A few businesses also suggested process improvements. One business in the northernmost portion of the district suggested that MnDOT increase the number of zones to tailor spring restrictions to localized temperature fluctuations. Particularly, the business would like later start dates for restrictions because frost does not lift as quickly in that portion of the zone as it does in others. Finally, one business would like to see stricter enforcement of spring weight restriction violations and expressed that using more frost tubes and further defining restrictions dates would facilitate such enforcement.

[35] These stations measure atmospheric, pavement, and / or water level conditions. For more information, visit www.ops.fhwa.dot.gov/weather/faq.htm.

Permitting Process

Most feedback regarding the permitting process was positive and noted that it has improved in recent years. Businesses said applying for and obtaining a permit has been "pretty simple" and that the online application system has greatly simplified the process, particularly for those in remote locations. A few shippers used the terms "awesome" and "phenomenal" to describe the permitting process and MnDOT staff that assisted them. Another business found MnDOT was supportive and timely with their requests.

> *The changes with the electronic system and stuff that's been done over the last few years has made permitting awesome ... I remember sitting on the phone for a half an hour waiting for somebody; it was a nightmare. Now, you still have to wait sometimes during the heavy seasons, but I can understand that, but honestly doing it the way we do it now is great. Even this year I've talked to people in the permit office and they're willing to help you and they're receptive to you.*

A few businesses mentioned long waits and difficulties with navigating the permitting system and knowing who to contact and how to reach them. One business called the process a "nuisance." Another suggested that Minnesota model its system after North Dakota's system. Businesses also identified instances when suggested permit routes present challenges, such as:

- Routing on permit directs trucks onto highways with low-capacity or low-clearance bridges.
- A permit route is so circuitous that a business, hauling drivable machinery, opts to drive the slower-moving machinery – which isn't built to travel on roads – to avoid the costs associated with the permitted, but indirect, route.

Businesses also suggested simplifying the permitting process to permit a truck for 90,000 pounds automatically when licensing the truck and providing an annual permit for legal wood haulers. One business requested a smartphone application for logging permit trips, while another mentioned that the permitting office should engage more with carriers.

Carrier Policies

Relatively few businesses provided feedback on policies that relate to the shipping of freight. A few businesses commented on commercial vehicle and driver licensing and compliance inspections, while several others discussed the need for more rest areas due to recent changes in federal hours of service regulations.

Commercial Vehicle and Driver Licensing

Some businesses had questions or feedback regarding the licensing of commercial vehicles and drivers. Businesses say licensing vehicles and drivers can be a difficult process, and they frequently have questions they need answered. One business said there are not enough Driver and Vehicle Services regional offices to meet their needs.

Strict regulations on Commercial Driver's License holders make it difficult for businesses to insure drivers whose records are not pristine, which exacerbates the general commercial truck driver shortages facing the trucking industry. The U.S. Department of Transportation also scores businesses based on their compliance with commercial driver regulations. Multiple violations can lower a carriers' Compliance, Safety, and Accountability score and ultimately affect their ability to compete.[36]

Inspections

Businesses identified a few specific challenges they have encountered with commercial vehicle inspections. A few businesses saw a particular vehicle inspector as over-zealous with low-level violations and disruptive to drivers conducting business. One business commented that regulations and how they are interpreted are not clear, and being cited for a violation is the only way to learn about them. Another business asked that inspectors be made aware that lengthy inspection stops can be dangerous for live cargo.

Increased Demand for Rest Areas

Several businesses, particularly shippers, commented on Minnesota's rest areas. One business complimented the quality of Minnesota's rest areas, saying they are "some of the nicest in the nation." Most of the comments expressed the need for more rest areas, with drivers sometimes having to drive 80 miles out of their way to the nearest rest area. Drivers need more locations that are safe—possibly patrolled by law enforcement—to park their truck and rest, even if the location is not a full-service rest area. Businesses said this is especially a concern in the western portion of the state. A few businesses tied the need for rest areas to recent changes in driver hours of service, which increased demand for rest areas throughout the nation. Ideas for sustaining rest areas included privatizing them or partnering with counties in their design, patrol, and maintenance.

Shortage of rest areas ... This is especially important because of the new logbook regulations. We need to find places to rest/sleep. Or at the very least need a place to pull off and park, it doesn't need to be a full service stop.

Cost of designating a safe haven [referring to rest areas] is minor and the benefits are major.

Other Policies

Policies for Agricultural Vehicles and Drivers

Some businesses, primarily shippers, expressed frustration with inconsistent policies that apply to vehicles and drivers that use the transportation system for agricultural purposes versus all other commercial activities. This topic also arose in Districts 4 and 8, but was more prominent in District 2.

[36] For more information, visit the Federal Motor Carriers Safety Administration website: https://csa.fmcsa.dot.gov/.

Most comments were about agricultural permitting. A few businesses also protested the exemption of farmers from Commercial Driver's License and log book requirements and mentioned that they think education for farmers about transportation should be more prevalent.

Agricultural Permitting

One point of frustration for some businesses was that select products can be hauled in higher quantities, particularly agricultural products. A few businesses felt the qualification of "raw or unprocessed agricultural commodities" may be too vague. New interpretations of the agricultural permit include both timber and unprocessed byproducts of processing raw agricultural goods, and businesses cited them as examples. Other businesses spoke against the agricultural permit altogether, saying, "We should be able to haul any commodity; the road doesn't know difference in product."

Speed

Several businesses requested increased speed limits. A few requested speed limits of 60 miles per hour, while a few others requested speed limits increase to 65 miles per hour. Most requested that speed limits increase on all routes. One business requested that speed limits increase on Highways 11 and 72, in particular.

Businesses mentioned two concerns regarding speed. One business suggested that speed limits for freight trucks and cars be the same, noting that a slower speed limit for trucks causes road rage and creates a safety hazard. Another business mentioned that speeding is a concern on Highway 71 in Blackduck and can make travelling unsafe for pedestrians.

Safety

When asked about their safety concerns, businesses cited several perceived hazards. The most commonly expressed concerns included:

- Problem intersections *(see page 30 for more information on problem intersections).*
- Narrow shoulders *(see page 38 for more information on shoulders).*
- Pedestrian safety.
- Distracted driving, particularly use of mobile devices.
- Winter driving.
- Drivers unfamiliar with the area.

A few businesses also cited unsigned rail crossings, drivers speeding, and trucks hauling hazardous materials as safety concerns.

Profile: Greg Hanson Trucking

Greg Hanson Trucking hauls a wide range of products, including agricultural goods, beverages, paper products, automotive supplies, and retail goods. Their primary customer is a District 2 manufacturer in the automotive cluster, which ships products throughout the United States and Canada.

Greg Hanson Trucking values recent improvements to highway infrastructure, such as advanced warning signs and wider shoulders, important safety improvements. As the company representative explained, "Anywhere there is a stop light, there needs to be an advanced warning light. Especially in the winter, they help you make better decisions. It would help save lives." Another highly appreciated improvement was the upgrading of the county state aid highway between Grygla and Gully to a 10-ton route, also cited by several area businesses. The Greg Hanson Trucking representative noted that the route's increased use may warrant additional snow and ice removal.

The company's largest transportation challenge is federal changes to truck drivers' hours of service, which cause drivers to need a safe place to stop their truck and rest more often. This has increased demand for crowded rest areas. Full-service rest areas are not necessary, but areas to pull over and rest are "essential." The Greg Hanson Trucking representative provided feedback on other policy areas too, including speed limits and permitting. The trucking firm suggested that MnDOT not "split speed limits" for freight trucks and other vehicles because it causes road rage and creates a safety hazard. Regarding permitting, a company representative also observed that automating the online system for obtaining permits is "more convenient than it was."

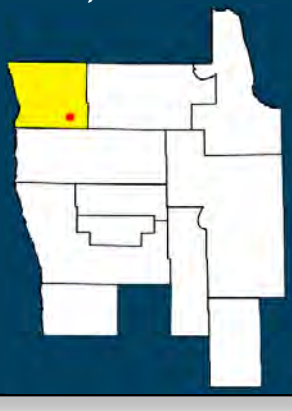
A strong benefit to the company's Karlstad location is its ability to serve customers in close proximity. Given that, Greg Hanson Trucking is undergoing an expansion of its facility, workforce, and fleet, deepening its investment in the owner's hometown.

Number of employees
40

Cluster
Transportation and Logistics

Highways used
11, 32, 89, 59, and many others

Location
Karlstad, Kittson County



Distracted Driving

Businesses often stated that distracted driving was a safety concern. Most often businesses who spoke of distracted driving also mentioned mobile phone use. One business even suggested MnDOT install portable signs at youth events to remind them not to text and drive. Truck drivers pulled over along highways with narrow shoulders, especially at night, fear that another driver may be too distracted to see their truck and cause a crash. While most businesses who cited distracted driving as a concern were referring to passenger vehicles, a few mentioned distracted driving as a concern from a liability perspective.

> *I would love it if your cell phone would get locked out when you start your vehicle. If they had that technology, [we] would install it in all our trucks.*

Winter Roads

Several businesses mentioned winter road conditions as a safety concern. Specifically, businesses said icy conditions were the most hazardous. They identified the following highways:

- Highway 11: logging trucks occasionally slide.
- Highway 2 westbound into Bagley: dangerous when icy and many drivers have not completely reduced speed when entering town.
- Highway 6.
- Highway 87.

Drivers Not Familiar with the Area

A few businesses mentioned that drivers not familiar with the area can create hazards, particularly in the winter. Out-of-state suppliers and seasonal tourists may not be aware of hazardous driving conditions or how to maneuver in such conditions.

> *I think that the majority of crashes that happen on Highway 71 and Highway 2 are from people that are not from around here; it's not the locals getting in these crashes.*

Other Findings

This section highlights other business input, pertaining to location-specific challenges, intermodal issues, and local congestion and traffic concerns.

Shipping in District 2

About two-thirds of businesses discussed shipping as it affected their ability to compete. Businesses collectively said shipping challenges were caused by the interrelationship among being located far from large economic centers, lack of major shipping corridors nearby, and difficulties obtaining high-

quality commercial carriers and truck drivers. Some businesses, however, have found opportunities to take advantage of their location in terms of shipping goods.

Shipping Challenges

About one-quarter of manufacturers and a few shippers and distributors mentioned challenges related to shipping. Businesses cited several reasons why shipping is challenging in District 2. The primary challenges they noted were:

- Remote location increases costs and complicates shipping process.
- Increased demand for commercial carriers and truck drivers, along with other factors, creates a shortage.

Being way up North, if we need something such as a specialized repairman, they generally come from the Cities and it takes them a long time to get here.

We all like to live here, but it's a long ways to the Cities.

D2 Location as a Challenge

Much of District 2 is located outside of main corridors connecting its larger surrounding cities, such as Minneapolis and St. Paul, Fargo, and Duluth. As a result, most businesses in District 2 are out of the way of normal truck routes. Because the area is also sparsely populated in terms of both individuals and businesses, District 2 is also isolated from retail and transportation hubs. These factors make it difficult for businesses to find commercial carriers willing to travel the long distance. Contracting with carriers is further complicated by deadhead miles, when the carrier can only haul cargo one way. Distance and other factors discussed below contribute to the high cost of shipping goods to and from District 2.

Both manufacturers and shippers have adapted their businesses to this challenge. Several businesses said they use interline or "hot shot" trucking companies to fill gaps. Hot shot companies are typically smaller trucking firms that are based throughout the district, often in the company's hometown. When larger commercial carriers are unable to provide services to a manufacturer, the commercial carrier or the manufacturer itself will work with a hot shot service. While they are generally more expensive, they can provide services on shorter notice and are more willing to haul to and from remote locations. Another example of adaptation is a business that relies on its own employees using their personal vehicles to travel 100 miles or more to the nearest transportation hub for day-to-day parcel shipping because there is no common carrier hub in their city.

There's a major transportation hub in the upper Midwest, but we're not in it.

To complicate shipping challenges further, some businesses explained that there are no direct routes from their business to a larger city, such as Duluth, Fargo, or Minneapolis and St. Paul. For example, one business said a truck travelling from Bemidji to St. Paul would most likely have to take Highway 2 and travel through Duluth, which adds 60 miles and nearly one hour to a one-way trip. Businesses expressed similar concerns accessing Highway 10 from the northwestern corner of the state.

Deadhead Miles

> *The main challenge for us actually ties into location. Because of our rural location it means a lot of 'dead head' mileage for truckers to get here. It's not easy for them to schedule loads both into and out of the area.*

Deadhead miles are common to the shipping industry; but according to some manufacturers, it presents a pervasive challenge for businesses in District 2. Deadhead miles occur when a truck is empty and travelling to pick up a shipment.[37] They are referred to as "deadhead" because a truck is not carrying cargo, and therefore cannot cover the cost of travelling with revenue. Commercial carriers prefer to backhaul goods from a business, in order to generate revenue traveling to and from the business, rather than only generating revenue one way.

If the business the carrier is delivering to does not have a backhaul, carriers will look to nearby businesses' shipping needs. Businesses said some carriers charge a deadhead fee if they cannot find a backhaul. In District 2, where businesses are more geographically disbursed, carriers are less likely to find goods to backhaul, and a carrier will have to travel more deadhead miles.

A few businesses have found opportunities to use trucks deadheading to Fargo, the North Dakota oil fields, or other places to deliver their products. Businesses that have benefitted from creating backhauls for carriers were more positive about their location.

> *One of our strengths is we're located in Grand Forks-East Grand Forks. When you have trucks coming from a variety of locations around here where they just emptied their load, we get a first shot at them. Further north it's another hour of travel time for the trucks to go up there and get the load. So we're in a good location in terms of empty trucks coming to us.*

[37] Source: U.S. Department of Transportation, Federal Motor Carrier Safety Administration.

Profile: Polaris

Polaris is a Minnesota-based, worldwide company that produces a wide range of off-road vehicles, snowmobiles, motorcycles, generators, electric vehicles, and vehicles for commercial and military use. At its Roseau facility, Polaris produces snowmobiles and off-road vehicles. The facility also houses segments of Polaris's plastics manufacturing, product engineering, and product testing work.

Polaris is a strong example of how companies in northwestern Minnesota have adapted to the characteristics of their location. Though there are some benefits to their remote location near the Canadian border, the large number of deadhead miles from the Twin Cities, Fargo, and other more densely populated areas made it difficult for Polaris to ship products via truck. A company representative explained how they adapted, saying, "We switched our practices to get better coordination of inbound/outbound loads. So carriers are now loaded both in and out, and now shipping is better."

The company says that they still struggle to get trucks to their facility because of the lack of directional signs on Highway 89. Signage near the Polaris plant to direct traffic would significantly help the 110 trucks that come in and out of the plant each day.

With 700-800 employees starting work at 6:45 each morning, congestion is an ongoing challenge for Polaris and neighboring businesses. The traffic challenges are compounded by inclement weather. Congestion along Highway 11– and the inability to pass on many stretches –are the biggest complaints. According to the company representative, additional passing lanes, particularly on the Greenbush to Warroad stretch, would be a major improvement.

MnDOT also spoke with a number of businesses in District 2 that supply materials and carrier services to Polaris. Many of their concerns mirror those of Polaris, including the need for transit options for employees, wider shoulders, and solutions to congestion and safety hazards on Highway 11. Suppliers and carriers also valued smooth pavement because some of the materials they ship to Polaris are prone to damage from rough roads, which adversely impacts operations for both Polaris and its suppliers.

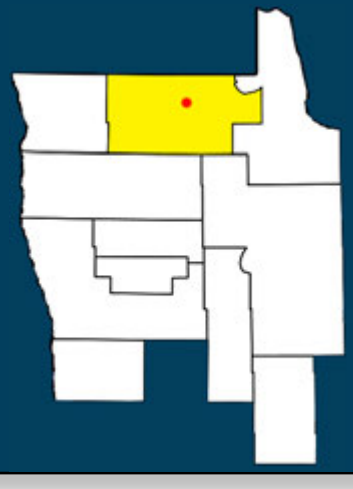
MnDOT is currently conducting a comprehensive study of the Highway 11 corridor, which is examining the concerns that Polaris and other businesses in the region have raised about the Highway 11 corridor.

Number of employees
1,200

Cluster
Automotive

Highways used
11, 89

Location
Roseau, Roseau County



Carrier and Truck Driver Shortage
In recent years, a number of factors have reduced the ability of carriers to meet customer demand. Businesses cited factors including:

- North Dakota oil drilling increased shipping demand.
- Rail expense increased demand for trucks.
- Stricter regulations on driver hours of service, fuel standards, and licensing requirements; and increased operating costs for carriers.
- Increased shortage of truck drivers.

As one business put it, "Transportation the last couple years has been exceedingly difficult—last year was almost a bidding war for each truck." Another business related that every truck on the road has a "now hiring" advertisement and that they have flown in a truck driver and rented a truck to deliver their specialty products.

One business diverged from the rest, saying they felt that trucking companies were competing for their business and felt their demands were being met.

District 2 Location as Strength

Some businesses said their location provided them an advantage. In most circumstances, these businesses were either close in proximity to their suppliers or customers, or they ship goods throughout the United States and valued their central location. A few businesses also saw access to 10-ton roads and four-lane highways as two major advantages. One business ships to Minneapolis daily and liked that they could ship to Minneapolis for $60 per trip.

[I] think it's real strong that we're right across the road from [our customer] and it's a short distance, with their timelines and stuff. It's critical to be real close with delivery. You know whether it's storms that delay.

I think we are in a good area, as we are right in the middle of the country so it makes it easier to quote prices for our customers on both the east and west coasts. It's about the same distance either way.

Intermodal Transportation

Air

Seven businesses provided feedback or additional information on air transportation in District 2. Some said they use air "only in certain situations," while others said they use it daily. Uses are not limited to shipping goods – businesses also fly people: material experts, equipment repair technicians, and customers into their local airports. Three businesses said air transportation was critical to their ability to compete.

Feedback from businesses was largely positive, with all of them saying air services are currently meeting their needs. Suggestions for improvements to air transportation were disparate, with each business providing different input. Examples of suggestions include:

- Ability to use drones in the future.
- Longer airport runway to accommodate larger planes in Thief River Falls.
- More cohesive planning of airport, carrier services, and manufacturer locations in Bemidji.
- Assurance that carriers will maintain commercial air service to regional airports.

Rail

Among businesses that used rail as a mode of transporting goods, those that provided feedback used rail to varying degrees. Some businesses saw it as the most critical mode, while others use it seasonally or only when trucks are unavailable.

Businesses that said rail service is critical valued affordable mileage and were located on or very close to a rail line. One business even invested in a local rail line to ensure continued service.

About two-thirds of businesses that said they used rail cited challenges or barriers to its use. The most commonly cited barriers were access and cost, including deadhead fees for rail. Demand for rail has increased over the past few years, which has affected rail companies' capacity to serve all business. Businesses cited several other barriers. In particular, businesses said rail service in recent history has lacked:

- Efficiency and dependability.
- Quality of product delivered.
- Predictability of shipments.
- Enough cars allotted to each business.

Transit

Several businesses located throughout the district mentioned the need for a more robust transit system. Employees often come from many miles away. Additionally, many employees do not have drivers' licenses or their own vehicles, so they need to find other means of getting to work. Businesses in cities with public transportation said they appreciate the resource, but the bus schedules do not align well with all of the businesses' shift schedules.

Businesses that cited transit concerns were geographically disbursed throughout the district: in Beltrami, Cass, Koochiching, Marshall, Pennington, and Roseau counties. These businesses also represented many of the industry clusters, with no more than two in the same cluster. Most businesses cited transportation concerns. Over half of these businesses employed less than 100 people, and a couple employed more than 500 people.

Some businesses have examined opportunities to transport their employees internally. A few businesses are looking into purchasing their own buses. One business has already contracted with a bus service to transport its employees and has received good feedback. Another business provides its employees with company vehicles to rideshare.

Congestion

About one-fifth of businesses provided feedback regarding congestion. The most common congestion issues were caused by either shift change at large businesses, school hours, or a combination thereof. The most commonly cited areas for congestion around shift change were Thief River Falls, Bemidji, Highway 11 from Warroad to Roseau, and Bagley. Manufacturers suggested turn and passing lanes where congestion creates bottlenecks,[38] while shippers and distributers said they generally try to be aware of and work around those times.

Other times when businesses notice congestion is both seasonal and regional. Businesses in the western portion of the district noted an increase in congestion during harvest season, while those in the eastern portion listed tourist season (summer), and hunting season (autumn).

Businesses also mentioned a few specific changes they feel have improved congestion, such as:

- Stoplights in Walker.
- Changes to the intersection of Highways 59 and 1 in Thief River Falls.
- Highway 2 bypass in Bemidji.

Next Steps

Note: This Next Steps section is repeated from the Executive Summary section of the report.

The District 2 Manufacturers' Perspectives study revealed businesses' regional and statewide concerns and priorities. Businesses provided concrete, location-specific feedback that will inform future improvements in infrastructure, maintenance and operations, communication, safety, and policy. Moving forward, MnDOT will prioritize and implement workable solutions to improve the transportation system in District 2 and across Minnesota.

The following section describes four broad implementation strategies either underway or in the planning stages at the time of this report's completion. These strategies reflect the work of District 2, other districts, and statewide functions to apply the interview findings to ongoing transportation system planning and improvement.

Implementation Strategies

1. **Incorporate business feedback into the District 2 short-term and long-term planning processes. Include study findings in the Statewide Transportation Improvement Program (STIP) and modify upcoming road projects and maintenance plans to address business issues.**

   MnDOT District 2 staff will evaluate:

   - Improving pavement quality on stretches of road that businesses identified as having rough pavement.
   - Adding advance warning lights or other flashing lights / signals to intersections identified as safety hazards.
   - Business requests for additional signage.

Updates: District 2, MnDOT Operations and MnDOT Freight Office (OFCVO) staff met in April 2016 to develop implementation plans that incorporated business feedback into MnDOT planning and projects. The plans included strategies to address suggestions or concerns regarding pavement quality, advanced warning lights, signage, business access improvement, and narrow shoulders.

Possible solutions for improved signage discussed at the planning session include:

- Adding standard signage along highways that are prone to winter weather-related damage (i.e., frost heaves). Signs would encourage motorists to check 511mn.org for up-to-date road conditions.
- Additional, intentional use of signage that warn drivers of especially large bumps in the road.
- Adding "trucks entering" signs in locations with high truck traffic or those identified by businesses interviewed.

District 2 staff is analyzing all business feedback, particularly on routes where businesses identified issues, and will crosswalk the feedback with existing plans and priority routes and modify plans where applicable.

2. **Identify and develop opportunities to collaborate with communities and continue to cultivate relationships with businesses, city and county engineers, economic development professionals, and other stakeholders.**

   MnDOT District 2 staff may:

   - Convene groups to develop solutions for businesses' common concerns. For example, staff can share the results from this study and the Highway 11 corridor study to initiate discussions about coordinating shift / school start times and public transit schedules, and develop other traffic-related solutions, to reduce congestion.
   - Address specific concerns with snow and ice removal. MnDOT District 2 can work with businesses and city / county engineers to coordinate shift start times with snow-removal timing to accommodate commuters, especially near large employers in the district.
   - With other MnDOT functional offices, explore upgrading additional roadways to 10-ton highways in partnership with city / county engineers.

Updates: District 2 staff are analyzing the findings and taking action as appropriate. Some efforts or plans are already underway:

- District 2 maintenance staff currently coordinate with neighboring districts for consistent snow and ice removal along district boundaries. As a result of the business feedback, District 2 plans to expand coordination among districts and to align approaches, philosophies, and route layouts.
- District 2 communications staff used comments from manufacturer's interviews to implement a comprehensive communications plan for an upcoming construction project on Highway 11 in Baudette. The project has a large impact on local businesses and was an ideal candidate to implement some lessons learned. Project staff conducted individual and group meetings with area businesses and residents over two months prior to construction. Along with project insights, MnDOT provided them communication tools and techniques to help them thrive during construction.
- District 2 staff plans to maintain and enhance communications with businesses in the region. Staff hopes to gather direct feedback for further planning and to fulfill MnDOT's department- wide goal to increase its customer focus. Staff intends to examine new or enhanced approaches (especially using technology) to communicate about the design and potential impacts of construction projects in their area.
- Eight city / county engineers attended interviews and talked with businesses about their transportation needs. MnDOT staff will present this study's findings at an annual District 2 city / county engineer meeting in September 2016. Engineers can use this information to guide future transportation planning and implementation decisions.
- District 2 can use the study findings to develop project proposals and expand funding possibilities for local projects. One specific example of where the study's findings could be applied is with a Transportation Economic Development (TED) funding proposal.
- Although these projects are initiated locally, they are developed cooperatively with MnDOT. The findings from the study will be valuable to help identify potential projects and to reinforce TED proposals.

3. **Feedback from District 2 businesses can be assessed and used by appropriate MnDOT Statewide functions to improve the system and supporting functions (e.g., communications, materials research, transit and freight planning), and for future statewide planning efforts and development of best practices.**

Examples include:

- Assessing the feasibility of changing road ride measures to include frost heaves, and better understand the types of rough roads that rattle vehicles and damage products. This information could be used to determine best practices for additional signage and maintenance solutions.

- Ensuring that the processes for determining spring weight restrictions are consistent and clear, and that communication regarding updates to seasonal restrictions is frequent and timely.
- Feedback can inform 511 improvements, such as increasing the amount of real-time information available regarding conditions / closures and exploring the possibility of adding 511 cameras to more high-volume routes that experience winter weather challenges.
- Including shipper / driver feedback on the shortage of truck parking / rest areas, coupled with recent changes to federal hours of service laws, when assessing safe rest area resource provision.

Update: Central Office staff will synthesize findings from the three completed studies and incorporate improvements in future district projects. Options discussed at the implementation meeting included reviewing additional ways to use technology to communicate with the public about construction projects; evaluating improvements to 511; and improving signage, taking into account state and federal laws and policies.

4. **Use the combined findings / recommendations from the Manufacturers' Perspectives Studies in Districts 2, 4, and 8 to better understand business needs to improve the state's transportation system. Incorporate a continuous improvement approach to the Manufacturers' Perspectives Studies.**

MnDOT Central Office staff will:

- Analyze and combine findings from the District 2, 4, 8, and future Manufacturers' Perspectives Studies, articulating broader statewide findings, themes, and recommendations. Present findings broadly in public forums, such as conferences. Incorporate information gained in this study into the Statewide Freight System Plan and its ongoing Freight Action Agenda.
- Evaluate the feasibility of developing cross-district planning forums with staff from Districts 2, 4, and 8 to share findings with staff and work to frame broader, collaborative solutions to address statewide issues, and any that are specific to western Minnesota.
- Improve communications about the Manufacturers' Perspectives Study, including developing a communication plan for the study for both external and internal (within a district) communications. The plan could include a Manufacturers' Perspectives Study website to highlight successes and assist in maintaining relationships with businesses.

Update: Central Office staff will synthesize findings from the three studies that have taken place and evaluate incorporating improvements to the projects. A larger communication plan is under development.

District 2 Progress Update – Early Benefits

In several instances, MnDOT, businesses, and communities were able to begin working together on solutions before the drafting of this report. Additional benefits are likely to follow as MnDOT continues to analyze suggestions from businesses to inform future District 2 planning.

MnDOT Direct Follow-up

District 2 staff was able to investigate several business concerns directly following the interviews. In some cases, MnDOT responded to businesses' questions or provided clarification. In a few instances, MnDOT made connections between the business concern and other larger studies. For example:

- A Bagley manufacturer reported that its trucks have difficulties entering and exiting their facility. This information sparked conversations between the business, MnDOT, the county engineer, and city staff on how the city would approach future planning on a new road in the area. Currently the City of Bagley is looking to construct an additional street access and modify their connection to Highway 2. The state aid engineer is working with the city to identify funding solutions.
- A large business in a rural location northeast of Bemidji expressed that snow plows may not be getting out early enough to clear highways in their region for their morning commuters. The district coordinated directly with business leadership regarding their shift change times to better synchronize snow / ice operations in the area.
- One business was concerned about rough pavement caused by frost heaves, particularly at a dip in the road near a bridge outside Zerkel. After discussing the issue with the district bridge engineer, the interviewer reported to the business that a contract for the repair was already in process, and the pavement would be fixed within the next couple of weeks.
- Businesses along the Highway 11 corridor mentioned that their employees face daily congestion during their commute. The comments provided additional insights to a comprehensive Highway 11 corridor study that was in progress. The combined findings from the corridor study and the Manufacturers' Perspectives Study will provide the basis for future safety enhancements along the Highway 11 corridor.
- A shipping company identified a concern with some curve instances that can create an optical illusion at night, making the curve unsafe. The issue arises at locations that have both a curve in the highway, and a separate road in the distance in which the headlights / taillights of a vehicle on the separate road makes appear as though the highway goes straight rather than curving. The company stated that drivers can have difficulty seeing where the road actually leads, "thinking that the road is straight rather than curving around a corner." The district's traffic department identified 17 of these instances throughout the district and installed reflective chevron signs along the curves to add a better perspective for drivers.

Another project benefit was the building of a regional business contact list for district communication and other staff. Interviewers specifically asked each business how they received information regarding summer construction projects and winter road conditions and followed up with an offer to be added to the district's electronic information distribution lists. With the direct connections that District 2 made with businesses in the region, it is important to keep those lines of communication open in the future. The opportunity to meet directly with each business was vital to enhancing these lists with up-to-date contact information, and building relationships, in general.

Appendices

Appendix A: List of Businesses Interviewed

A & L Potato Company
Air Corps Aviation
Anderson Fabrics
Arctic Cat
Arrow Printing Inc.
BB Diversified Services, LTD
Bagley Livestock Exchange Inc.
Bemidji Woolen Mills
Bergstrom Wood Products Inc.
Boise Paper
Border View Lodge
Cass Forest Products
Cenex (Farmers Union Oil Co)
Christmas Point Wild Rice
CHS Northwest Grain – Grygla
CHS Northwest Grain – St. Hilaire
ConAgra Foods Lamb Weston / RDO Frozen Foods
Consolidated Equipment Group
Custom Wood Products
D & D Commodities Ltd.
Darchuk Fabrication Inc.
Dean Foods
Digi-Key
Eickhof Columbaria
Eric Johnson Trucking
Ericco Manufacturing
Erickson Timber Products
Folson Farms, Inc.
Greg Hanson Trucking
H & S Manufacturing Company, Inc.
Heatmor
Hillside Lumber
Johnson Oil
Karriers
Kelliher Forest Products
Label Mark-It, Inc.
Lake Agassiz Ag Service
Lakes Concrete Plus
Lampert's Cabinets Inc
Log Homes Minnesota, Inc.
Machinewell, Inc.
Marvin Windows and Doors
Mattracks (LITEFOOT Division)
Mayo Manufacturing Co.
Minnesota Dehydrated Vegetables, Inc.
Minnesota Wood Products
Nagurski Transportation
Newfolden Machining Co
Nortech Systems, Inc.
North Central Door Co Corp
Northern Valley Machine, Inc.
Paradis' Inc.
Peatland Reds
PoDCo LLC
Polaris
Potlatch
Richards Publishing Inc
Skeen Trucking
Spee-Dee Delivery Service Inc.
Steiger Manufacturing
TEAM Industries Inc.
Techniques QC
Terog Manufacturing Co
The HOMARK Company
Titan Machinery Inc
Transystems L.L.C.
Weave Got Maille
West Central Ag Services

Appendix B: List of Project Team and Interviewers

Minnesota Department of Transportation

MnDOT Project Team

- JT Anderson, Assistant District Engineer - Operations, MnDOT District 2
- Craig Collison, District Engineer, MnDOT District 2
- Jim Curran, Assistant District Engineer - Program Delivery, MnDOT District 2
- Donna Koren, Market Research Director, MnDOT Operations Division
- Darren Laesch, District Planning Director, MnDOT District 2
- TJ Melcher, Public Affairs Coordinator, MnDOT District 2
- Laurie Ryan, Strategic Freight Partner Relations, MnDOT OFCVO and Operations Division
- Lou Tasa, District State Aid Engineer, MnDOT District 2

Additional MnDOT interviewers

- Ted Coulianos, Oversize / Overweight Permits Supervisor, OFCVO
- Duane Hill, District Engineer, MnDOT District 1
- Rob Holschbach, Permit Technician, OFCVO
- Steve Hufnagle NW Sub Area Supervisor, Maintenance, MnDOT District 2
- Gary Kennedy SE Sub Area Supervisor, Maintenance, MnDOT District 2
- Curt Larson, District Maintenance Superintendent, MnDOT District 2
- David Larson SW Sub Area Supervisor, Maintenance, MnDOT District 2
- Marcia Lochner, Communications and Web Coordinator, OFCVO
- Jacob Mortvedt, NE Sub Area Supervisor, Maintenance, MnDOT District 2
- Beth Petrowske, Public Affairs Coordinator, MnDOT District 1
- Bill Pirkl, District Traffic Engineer, MnDOT District 2
- David Tomporowski, Freight Planner, OFCVO

Economic Development Partners

- Mick Alm, City Councilman, City of Hendrum
- Christine Anderson, Economic Development Director, Pennington County
- Rose Aune, City Clerk, City of Grygla
- Megan FitzGerald, Development Specialist, Headwaters Regional Development Commission
- Paul Gorte, Economic Development Director, City of East Grand Forks
- Kari Howe, Economic Development Specialist, Minnesota Department of Employment and Economic Development
- Nicole Lalum, Executive Director, Park Rapids Chamber of Commerce
- Michelle Landsverk, Economic Development Director, City of Fosston
- James Leiman, Economic Development Director, City of Ada
- Ryan Mathisrud, City Planner, City of Park Rapids
- Sid Michel, Mayor, City of Bagley
- Sean Ranum, Economic Development Specialist, Northwest Regional Development Commission
- Christina Regas, City Clerk / Treasurer, City of Blackduck

- Todd Sawrey, EDA Chairman, City of Ada
- Troy Schroeder, Transportation Director, Northwest Regional Development Commission
- Shannon Stassen, City Administrator, City of Crookston
- Kurt Wayne, Development Specialist, Headwaters Regional Development Commission
- Ryan Zemek, Economic Development Director, Headwaters Regional Development Commission

Project Partners

State and Local Policy Program, Humphrey School of Public Affairs, University of Minnesota

- Frank Douma, State and Local Policy Program Director
- Joseph Mueller, SLPP Research Assistant
- Lee Munnich, Senior Fellow

Extension Center for Community Vitality

- Rani Bhattacharyya, Community Economics Educator
- Merritt Bussiere, Community Economics Educator
- Michael Darger, Director Business Retention & Expansion

Management Analysis & Development (MAD), Minnesota Management & Budget (MMB)

- Lisa Anderson, Management Consultant
- Karen Gaides, Management Consultant

City and County Engineers

Eight city and county engineers participated in interviews for the District 2 Manufacturers' Perspectives Study as observers rather than full interviewers and talked with the businesses about local transportation concerns.

Appendix C: MnDOT District 2 Location Quotients[39] for Traded Clusters, 2013

Traded Cluster	District 2	Beltrami	Clearwater	Hubbard	Kittson	Lake of the Woods	Marshall	Norman	Polk	Pennington	Red Lake	Roseau	Cass (part)	Koochiching (part)
Wood Products	**12.03**	8.35	1.56	22.53	-	10.34	-	-	0.38	-	-	48.32	5.67	11.29
Forestry	**10.57**	9.68	12.95	16.10	-	8.65	-	15.75	1.92	-	-	1.24	21.34	74.42
Automotive	**7.86**	-	11.21	1.75	-	-	0.69	-	8.03	15.90	-	18.58	-	0.27
Agricultural Inputs and Services	**4.58**	-	-	5.31	17.33	-	12.55	76.36	2.66	7.44	12.87	1.91	3.40	-
Food Processing and Manufacturing	**3.44**	1.94	1.91	10.79	7.83	0.60	8.06	8.98	14.85	0.66	1.29	0.19	0.17	-
Textile Manufacturing	**3.18**	24.03	-	-	-	-	3.12	-	1.32	-	-	-	-	-
Paper and Packaging	**3.16**	-	-	-	-	-	-	-	-	-	-	-	-	49.03
Construction Products and Services	**2.60**	5.98	26.85	0.96	-	-	1.51	-	0.64	0.20	-	0.12	0.41	0.59
Hospitality and Tourism	**1.97**	2.21	0.17	1.15	0.54	7.82	0.39	-	0.78	2.20	-	0.82	7.27	1.15
Recreational and Small Electric Goods	**1.36**	0.79	-	1.63	-	-	-	-	6.51	-	-	0.58	1.04	3.01
Production Technology and Heavy Machinery	**1.27**	0.88	0.26	0.52	-	-	4.89	-	1.81	0.48	7.53	3.49	0.17	-
Fishing and Fishing Products	**1.20**	3.26	-	-	-	15.15	-	-	-	-	-	-	4.30	-
Distribution and Electronic Commerce	**1.07**	0.71	0.37	0.64	1.93	0.10	2.04	3.01	0.97	2.76	1.76	0.20	0.83	0.34
Trailers, Motor Homes, and Appliances	**1.01**	1.03	-	-	-	-	5.03	-	-	-	-	-	8.17	-

[39] A location quotient measures the share of an industry cluster's employment in a region as a ratio of the share of the cluster's employment in the U.S. as a whole. This generates an indicator of industry concentration or specialization within a region. A higher location quotient significantly exceeding 1 can indicate that an industry cluster is exporting a significant share of its products or services outside of the region and is referred to as a traded cluster. On this table, location quotients of 1.3 or higher are shaded in green to indicate the most competitive clusters for the region, relative to other areas of the United States, and each county.

Traded Cluster	District 2	Beltrami	Clearwater	Hubbard	Kittson	Lake of the Woods	Marshall	Norman	Polk	Pennington	Red Lake	Roseau	Cass (part)	Koochiching (part)
Furniture	**0.94**	0.77	0.81	3.96	-	-	1.87	-	0.40	-	23.04	-	1.01	1.46
Transportation and Logistics	**0.92**	1.15	0.32	1.50	0.51	2.49	0.37	0.65	1.22	0.88	6.12	0.44	0.10	1.60
Downstream Metal Products	**0.88**	-	0.66	-	-	-	1.52	-	-	1.20	-	0.46	5.35	-
Nonmetal Mining	**0.74**	1.51	-	3.12	-	-	7.37	-	1.56	-	-	-	-	-
Performing Arts	**0.64**	1.49	-	0.77	2.50	3.46	-	-	0.38	0.24	-	0.28	0.98	0.71
Marketing, Design, and Publishing	**0.56**	2.17	0.41	0.40	-	-	0.94	1.63	0.20	-	2.88	0.50	0.38	0.37
Apparel	**0.56**	0.91	-	5.62	-	-	4.43	-	-	-	-	-	-	-
Environmental Services	**0.52**	-	-	-	9.51	-	-	-	-	-	14.13	-	1.87	-
Downstream Chemical Products	**0.50**	-	-	1.05	24.01	-	-	-	-	-	-	-	-	-
Leather and Related Products	**0.49**	-	-	-	-	-	-	-	-	-	-	2.95	-	-
Metalworking Technology	**0.46**	1.51	-	-	-	-	-	-	1.81	-	-	-	0.66	-
Biopharmaceuticals	**0.45**	0.53	-	-	-	14.68	-	-	-	-	-	-	-	-
Financial Services	**0.43**	1.03	0.14	1.33	1.73	0.30	0.63	1.09	0.73	0.08	-	0.10	0.17	0.12
Oil and Gas Production and Transportation	**0.41**	0.35	2.59	-	2.36	-	2.56	1.48	0.18	0.11	1.75	-	0.23	-
Electric Power Generation and Transmission	**0.40**	-	-	1.68	-	-	-	-	-	-	-	-	1.08	3.11
Printing Services	**0.40**	1.74	-	0.51	-	-	-	-	0.26	0.32	-	0.18	0.33	-
Plastics	**0.34**	0.19	-	0.38	-	-	5.41	-	-	0.12	-	-	1.46	-
Livestock Processing	**0.31**	-	-	-	-	-	-	-	0.26	0.97	-	0.19	0.33	0.48
Information Technology and Analytical Instruments	**0.30**	2.02	-	-	-	-	-	-	0.24	0.07	-	-	0.15	-
Insurance Services	**0.30**	0.16	0.17	0.17	0.54	-	0.39	0.68	0.17	0.10	-	0.12	-	2.69
Medical Devices	**0.23**	0.47	-	-	3.17	-	-	-	0.49	-	-	-	0.62	-
Business Services	**0.18**	0.31	0.19	0.34	0.15	0.21	0.22	0.19	0.32	0.17	-	0.03	0.10	0.11
Education and Knowledge Creation	**0.14**	0.12	-	0.08	-	0.19	-	-	0.13	-	-	-	1.03	-
Upstream Metal Manufacturing	**0.11**	-	-	0.63	-	1.42	-	-	-	0.20	-	-	-	-

Traded Cluster	District 2	Beltrami	Clearwater	Hubbard	Kittson	Lake of the Woods	Marshall	Norman	Polk	Pennington	Red Lake	Roseau	Cass (part)	Koochiching (part)
Communications Equipment and Services	**0.10**	0.52	-	-	-	-	-	-	0.27	-	-	-	-	-
Upstream Chemical Products	**0.09**	-	-	-	-	-	-	-	-	-	-	-	-	1.33
Lighting and Electrical Equipment	**0.05**	-	-	-	-	-	-	-	0.45	-	-	-	-	-
Aerospace Vehicles and Defense		0.23	-	-	-	-	-	-	-	-	-	-	-	-
Music and Sound Recording		-	-	-	-	24.67	-	-	-	-	-	-	-	-
Vulcanized and Fired Materials		-	-	-	20.63	-	-	-	-	-	-	2.27	-	-

Source: U.S. Cluster Mapping (clustermapping.us), Institute for Strategy and Competitiveness, Harvard Business School.
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Calculations prepared by State and Local Policy Program, Humphrey School of Public Affairs, University of Minnesota.

Appendix D: MnDOT District 2 Employment by Traded Clusters, 2013

Traded Cluster	District 2	Beltrami	Clearwater	Hubbard	Kittson	Lake of the Woods	Marshall	Norman	Polk	Pennington	Red Lake	Roseau	Cass (part)	Koochiching (part)
Automotive	4,525	-	375	60	-	-	10	-	550	1,750	-	1,770	-	10
Hospitality and Tourism	4,037	554	20	140	20	422	20	-	189	860	-	278	1,383	151
Distribution and Electronic Commerce	3,971	320	80	140	130	10	190	161	425	1,950	80	120	285	80
Wood Products	2,646	225	20	295	-	60	-	-	10	-	-	1,760	116	160
Food Processing and Manufacturing	2,169	150	70	405	90	10	128	82	1,114	80	10	20	10	-
Construction Products and Services	1,365	385	820	30	-	-	20	-	40	20	-	10	20	20
Business Services	1,307	283	80	150	20	40	40	20	280	233	-	40	71	50
Transportation and Logistics	978	150	20	95	10	70	10	10	155	180	80	78	10	110
Production Technology and Heavy Machinery	825	70	10	20	-	-	80	-	140	60	60	375	10	-
Paper and Packaging	750	-	-	-	-	-	-	-	-	-	-	-	-	750
Financial Services	540	160	10	100	40	10	20	20	110	20	-	20	20	10
Marketing, Design, and Publishing	475	225	20	20	-	-	20	20	20	-	30	70	30	20
Forestry	463	52	33	42	-	10	-	10	10	-	-	9	87	210
Textile Manufacturing	405	375	-	-	-	-	10	-	20	-	-	-	-	-
Insurance Services	305	20	10	10	10	-	10	10	20	20	-	20	-	175
Agricultural Inputs and Services	290	-	-	20	20	-	20	70	20	90	10	20	20	-
Education and Knowledge Creation	270	30	-	10	-	10	-	-	30	-	-	-	190	-
Downstream Metal Products	230	-	10	-	-	-	10	-	-	60	-	20	130	-
Information Technology and Analytical Instruments	215	175	-	-	-	-	-	-	20	10	-	-	10	-
Furniture	200	20	10	50	-	-	10	-	10	-	60	-	20	20

Traded Cluster	District 2	Beltrami	Clearwater	Hubbard	Kittson	Lake of the Woods	Marshall	Norman	Polk	Pennington	Red Lake	Roseau	Cass (part)	Koochiching (part)
Oil and Gas Production and Transportation	190	20	70	-	20	-	30	10	10	10	10	-	10	-
Metalworking Technology	150	60	-	-	-	-	-	-	70	-	-	-	20	-
Plastics	150	10	-	10	-	-	60	-	-	10	-	-	60	-
Performing Arts	140	40	-	10	10	20	-	-	10	10	-	10	20	10
Recreational and Small Electric Goods	140	10	-	10	-	-	-	-	80	-	-	10	10	20
Printing Services	130	70	-	10	-	-	-	-	10	20	-	10	10	-
Vulcanized and Fired Materials	120	-	-	-	60	-	-	-	-	-	-	60	-	-
Livestock Processing	100	-	-	-	-	-	-	-	10	60	-	10	10	10
Downstream Chemical Products	80	-	-	10	70	-	-	-	-	-	-	-	-	-
Trailers, Motor Homes, and Appliances	80	10	-	-	-	-	10	-	-	-	-	-	60	-
Biopharmaceuticals	70	10	-	-	-	60	-	-	-	-	-	-	-	-
Apparel	50	10	-	30	-	-	10	-	-	-	-	-	-	-
Electric Power Generation and Transmission	40	-	-	10	-	-	-	-	-	-	-	-	10	20
Medical Devices	40	10	-	-	10	-	-	-	10	-	-	-	10	-
Nonmetal Mining	40	10	-	10	-	-	10	-	10	-	-	-	-	-
Communications Equipment and Services	30	20	-	-	-	-	-	-	10	-	-	-	-	-
Environmental Services	30	-	-	-	10	-	-	-	-	-	10	-	10	-
Fishing and Fishing Products	30	10	-	-	-	10	-	-	-	-	-	-	10	-
Upstream Metal Manufacturing	30	-	-	10	-	10	-	-	-	10	-	-	-	-
Aerospace Vehicles and Defense	10	10	-	-	-	-	-	-	-	-	-	-	-	-
Leather and Related Products	10	-	-	-	-	-	-	-	-	-	-	10	-	-

Traded Cluster	District 2	Beltrami	Clearwater	Hubbard	Kittson	Lake of the Woods	Marshall	Norman	Polk	Pennington	Red Lake	Roseau	Cass (part)	Koochiching (part)
Lighting and Electrical Equipment	10	-	-	-	-	-	-	-	10	-	-	-	-	-
Music and Sound Recording	10	-	-	-	-	10	-	-	-	-	-	-	-	-
Upstream Chemical Products	10	-	-	-	-	-	-	-	-	-	-	-	-	10
Total Traded Clusters	27,656	3,494	1,658	1,697	520	752	718	413	3,393	5,453	350	4,720	2,652	1,836
Percent of Total Traded Clusters	100%	13%	6%	6%	2%	3%	3%	1%	12%	20%	1%	17%	10%	7%

Source: U.S. Cluster Mapping (clustermapping.us), Institute for Strategy and Competitiveness, Harvard Business School.
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Table prepared by State and Local Policy Program, Humphrey School of Public Affairs, University of Minnesota.

Appendix E: Descriptions of Clusters Interviewed

Below is a complete list of all clusters interviewed with descriptions of each cluster

Table 6: Definitions and Examples of Traded Industry Clusters in District 2[40]

Cluster	Definition	Business Example
Agricultural Inputs and Services	This cluster includes establishments primarily engaged in farming and related services. Farming includes soil preparation, planting, cultivation, harvest, fertilizer creation, and postharvest activities. It also includes services that supply farm labor, support for animal production, and additional operations management.	CHS Northwest Grain
Apparel	The establishments in this cluster are focused on manufacturing clothing and fabric accessories (for example, hats, gloves, and neckties) for men, women, and children.	Bemidji Woolen Mills
Automotive	This cluster includes establishments along the value chain that are necessary for manufacturing cars, trucks, and other motorized land-based transportation equipment (other than motorcycles). This includes metal mills and foundries, manufacturers of metal automotive parts, and manufacturers of completed automobiles.	Polaris
Distribution and Electronic Commerce	This cluster consists primarily of traditional wholesalers as well as mail order houses and electronic merchants. The companies in this cluster mostly buy, hold, and distribute a wide range of products such as apparel, food, chemicals, gasses, minerals, farm materials, machinery, and other merchandise. The cluster also contains firms that support distribution and electronic commerce operations, including packaging, labeling, and equipment rental and leasing.	Digi-Key
Food Processing and Manufacturing	This cluster includes firms involved in the processing of raw food materials and the manufacturing of downstream food products for end users. This includes millers and refineries of rice, flour, corn, sugar, and oilseeds. These upstream products contribute in part to producing specialty foods, animal foods, baked goods, candies, teas, coffees, beers, wines, other beverages, meats, packaged fruits and vegetables, and processed dairy products.	Minnesota Dehydrated Vegetables, Inc.
Forestry	Establishments in this cluster are those that involve growing and harvesting trees. It also includes support services for these activities.	Potlatch
Furniture	This cluster contains establishments that manufacture furniture, cabinets, and shelving for residential homes and offices. It also includes establishments that produce manufactured homes. The products in this cluster can be made of wood, metal, plastic, and / or textiles.	The HOMARK Company
Hospitality and Tourism	This cluster contains establishments related to hospitality and tourism services and venues. This includes sport venues, casinos, museums, and other attractions. It also includes hotels and	Border View Lodge

[40] U.S. Cluster Mapping, "Traded Clusters Appendix." Accessed February 28, 2016, clustermapping.us/sites/default/files/files/page/Traded%20Clusters%20Appendix.pdf.

Cluster	Definition	Business Example
	other accommodations, transportation, and services related to recreational travel such as reservation services and tour operators.	
Livestock Processing	This cluster contains establishments engaged in processing meat from livestock and livestock wholesaling.	Bagley Livestock
Paper and Packaging	This cluster contains the paper mills and manufacturers of paper products used for shipping, packaging, containers, office supplies, personal products, and similar products.	Boise Paper
Printing Services	Establishments in this cluster are primarily engaged in commercial printing, digital printing, and binding. The cluster includes upstream products and services necessary for printing (for example, ink and prepress services). It also includes end products such as books, greeting cards, business forms, and related goods.	Arrow Printing Inc.
Production Technology and Heavy Machinery	Establishments in this cluster primarily manufacture machines designed to produce parts and devices used in the production of downstream products. This cluster also includes end use heavy machinery such as air and material handling equipment. The machines are used for industrial, agricultural, construction, commercial industry, and related purposes.	Consolidated Equipment Group
Recreational and Small Electric Goods	This cluster contains establishments that manufacture end use products for recreational and decorative purposes. These products include games, toys, bicycles, motorcycles, musical instruments, sporting goods, art supplies, office supplies, shades, and home accessories. This cluster also incorporates firms that produce small, simple electric goods like hairdryers, fans, and office machinery.	BB Diversified Services, LTD
Transportation and Logistics	This cluster contains all air, rail, bus, and freight transportation services. It also includes related operation services and support activities such as inspections, maintenance, repairs, security, and loading / unloading.	Eric Johnson Trucking
Upstream Metal Manufacturing	The establishments in this cluster manufacture upstream metal products such as pipes, tubes, metal closures, wires, springs, and related products. The cluster includes iron and steel mills and foundries, as well as related metal processing techniques.	Nortech Systems, Inc.
Wood Products	The establishments in this cluster are primarily engaged in making upstream wood materials and manufacturing non-furniture wood products. Upstream establishments include sawmills, plywood and hardwood manufacturers, cut stock manufacturers, and wood preservation services. Downstream establishments produce windows, doors, flooring, wood containers, prefabricated wood buildings, and related products.	Marvin Windows and Doors

Table 7: Definitions and Examples of Local Industry Clusters in District 2[41]

Cluster	Definition	Example
Local Commercial Services	This cluster contains local professional establishments that provide legal services, accounting services, temporary help, and office administrative activities. This cluster also contains building support and security services, commercial printing and sign making, professional laundry services (including dry cleaning), testing laboratories, and office supply stores.	Air Corps Aviation
Local Food and Beverage Processing and Distribution	This cluster contains firms that sell food and beverages at the wholesale and retail levels. Products sold include meat, seafood, fruit and vegetables, general groceries, tobacco, alcoholic beverages, and specialty foods. The cluster also includes related distribution methods such as vending and direct selling.	Peatland Reds
Local Household Goods and Services	This cluster contains local establishments and services designed to support individual households such as landscape services, electronics repair, as well as retail stores for appliances, hardware, gardening, and furniture.	Heatmor
Local Industrial Products and Services	This cluster primarily consists of firms that provide maintenance, wholesaling, and distribution for local industrial goods and services. This cluster also includes consumer rental and leasing for electronics, appliances, and general equipment.	TEAM Industries Inc.
Local Logistical Services	This cluster primarily contains establishments that offer local passenger transportation and local transportation of freight and goods, including moving companies and couriers. This cluster also includes local storage facilities, truck and RV leasing, and passenger car rental services.	Greg Hanson Trucking
Local Motor Vehicle Products and Services	Establishments in this cluster consist of local motor vehicle wholesalers and dealers, as well as auto repair services, gas stations, parking lots, car washes, and vehicle towing.	Johnson Oil
Local Personal Services (Non-Medical)	Establishments in this cluster provide local personal services including self-service laundry, hair care, photofinishing, repair services, and child care. This cluster also contains pet stores and retail stores for certain personal merchandise such as cosmetics.	Minnesota Wood Products
Local Real Estate, Construction, and Development	Establishments in this cluster primarily provide local real estate services, general contracting, and specialty contracting for the building, purchasing, and renting of homes and related local infrastructure. This cluster also contains firms that support land development, concrete manufacturing, highway and street construction, as well as building equipment distribution.	Lakes Concrete Plus

[41] U.S. Cluster Mapping, "Local Clusters Appendix." Accessed February 28, 2016, clustermapping.us/sites/default/files/files/page/Local%20Clusters%20Appendix.pdf.

Appendix F: Business Invitation Letter

Minnesota Department of Transportation
District 2 – Northwest District
3920 Highway 2 West
Bemidji, MN 56601

Telephone: 218-755-6500
Fax: 218-755-6512

August 28, 2015

<Name>
<Business>
<Address>
<City>, <State> <Zip>

Dear <Name>:

I would like to invite you to participate in an 1-hour interview regarding your freight, shipping, and transportation infrastructure needs. My goal is to hear directly from manufacturers and other businesses across northwestern Minnesota about specific concerns, needs, and priorities that MnDOT could work to address within the next four years.

For example, as we prioritize our resources for maintenance and operations, my staff and I want to understand the relative values of: smooth pavement, snow and ice maintenance, passing lanes, highway design features, and any other factors important to your business as you manage your freight shipping. We also are interested in feedback you may have regarding MnDOT policies and regulations. With limited resources, I cannot promise that we will be able to meet all of your business needs; but I do want to ensure that we understand what they are.

A secondary goal of this effort is to increase familiarity between MnDOT District 2 staff and area businesses, to open lines of communication. Our district serves all or portions of 14 counties across northwestern Minnesota and we want to ensure that we are responsive, by providing access points for area manufacturers/shippers to raise issues in a timely manner. Our project team also will include staff from local economic development organizations, to further develop connections amongst our organizations.

MnDOT has completed two previous studies using this interview model, in southwest Minnesota in 2013, and west-central Minnesota in 2014. Conversations with manufacturers revealed specific challenges and requests regarding infrastructure and maintenance. The districts were able to address some problems shortly after their projects concluded, and other input is informing planned infrastructure changes and maintenance. Additionally, manufacturers' input led to improvements in both districts' planning and communication processes. We expect that we'll be able to have similar successes, as we learn about your specific transportation priorities and challenges.

If you would like to view these reports, please visit the addresses below:

District 8 Manufacturers' Perspectives Report: bit.ly/MnDOTD8MPreport

District 4 Manufacturers' Perspectives Report: bit.ly/MnDOTD4MPreport

MnDOT has been involved in a number of recent projects that asked for feedback from northwest-area businesses, such as the assessment of the Highway 11 corridor and an economic development study involving industry cluster analysis. We greatly appreciate the amount of participation in these projects. I assure you that these efforts are complementary, not duplicative. I hope that you will participate in the Manufacturers' Perspectives project, even if your business has been interviewed for other projects.

We will schedule interviews for September and October. Project consultants from Management Analysis & Development (State of Minnesota) will contact you during that time to schedule your interview. Interviews generally take about an hour, and the interview team can come to your location when it's suitable for you. For your convenience, I have enclosed a draft of the interview guide.

On behalf of MnDOT, we look forward to working with you to support your business and strengthen economic vitality in northwest Minnesota, and Minnesota as a whole. If you have any questions about the project, please contact our project manager, Donna Koren, MnDOT's Market Research Director (651-366-4840 or donna.koren@state.mn.us).

Sincerely,

Craig Collison, P.E.
Transportation District Engineer
MnDOT District 2

Enclosures

Appendix G: Interview Guides

Manufacturers

INTERVIEW GUIDE OVERVIEW
FOR MnDOT DISTRICT 2 MANUFACTURERS

1. Introductions.

2. Approximately how many people are employed at this location?

3. Please describe your company's primary products.

4. Please provide a brief overview of your primary **suppliers**.

5. Please provide a brief overview of your primary **customers.**

6. If your company is using air, rail or other non-truck modes with suppliers or customers, are these modes meeting your needs?

7. Do you transport your products in-house, or contract with private commercial transportation service providers?

8. What are the **strengths** of your current location for meeting your firm's transportation needs? What works well regarding transportation?

9. What are your transportation **challenges** or concerns in receiving supplies/inputs and shipping your products/services?

10. Does your business have any expansions plans in the near future? If yes, do you think the expansion may require transportation changes?

11. What else, if anything, would you like MnDOT to be aware of?

Thanks again for your time. If you have any follow up questions or thoughts, please share them with our project manager, Donna Koren, MnDOT's Market Research Director at (651) 366-4840 or donna.koren@state.mn.us. (Interviewers may also offer their own contact info, if they wish.)

Shippers

INTERVIEW GUIDE OVERVIEW
FOR MnDOT DISTRICT 2 SHIPPERS

1. Introductions all around (name, title, organization).

2. Please describe the types of services you provide in northwest Minnesota.

3. About how many manufacturers does your company serve in District 2?

4. How many of your drivers and office staff support hauling in northwest Minnesota?

5. Please provide a brief overview of your primary customers in MnDOT's District 2 (northwest Minnesota). Which routes do you use to get in, out and around District 2?

6. What are the **strengths** of northwest Minnesota, in terms of enabling your company to meet your customer's shipping requirements?

7. What are your transportation **challenges** or concerns in this part of the state?

8. Does your business have any expansions plans in the District in the near future? Do you think the expansion may require transportation changes?

9. What else, if anything, would you like MnDOT to be aware of?

Thanks again for your time. If you have any follow up questions or thoughts, please share them with our project manager, Donna Koren, MnDOT's Market Research Director at (651) 366-4840 or donna.koren@state.mn.us. (Interviewers may also offer their own contact info, if they wish.)

Report prepared by: Management Analysis & Development

Management Analysis & Development is Minnesota government's in-house fee-for-service management consulting group. We are in our 31st year of helping public managers increase their organization's effectiveness and efficiency. We provide quality management consultation services to local, regional, state, and federal government agencies and public institutions.

Copies of this report

For more information or copies of this report, contact MnDOT:
Donna Koren, Project Manager, MnDOT Market Research Director, Operations Division,
(651) 366-4840, donna.koren@state.mn.us or

TJ Melcher, Public Affairs Coordinator, MnDOT District 2, (218) 755-6552, TJ.Melcher@state.mn.us

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Better Pavement Management for Better Road Maintenance

Minnesota's *Better Patching for Better Roads*

When we do the right road and bridge pavement maintenance – *in the right way, in the right place and at the right time* – only then are we right on the money. This means we have taken every measure to proactively protect, maintain and preserve the roads we have. In doing so, we maximize our taxpayers' investments into better, longer-lasting roads for smoother, safer and more efficient travel.

That is why the *Better Patching for Better Roads* initiative, which began in Minnesota just a few years ago, has gained momentum. It has become an officially recognized, ongoing effort to better maintain the integrity – and maximize the longevity – of all of our state roads.

In 2013, funding was extended beyond traditional capital roadway expenditures when MnDOT adopted the *Better Patching for Better Roads* approach to pavement maintenance at the district level, or regional, level. The agency allocated $4 million specifically to finance roadway preservation through targeted preventive and routine patching maintenance designed to achieve more lasting performance. These funds were used for materials, labor, buying or renting equipment, or contract work in all eight MnDOT districts.

Subsequently, as a means to maximize its level of investment toward pavement products, services and life cycles, MnDOT pressed forward with *Better Patching for Better Roads* as the agency's preferred approach to road maintenance. In 2014, the Minnesota State Legislature took action on the need for ongoing investment in pavement maintenance specific to potholes. Recognizing the heavy toll the winter of 2013-2014 had taken on state roadways, legislators granted an additional $10 million as part of a supplemental budget. These additional funds were invested by MnDOT districts using the *Better Patching for Better Roads* approach where ever possible.

The *Better Patching for Better Roads* approach has gained widespread support in Minnesota due to highway maintenance needs and the demonstrable performance outcomes resulting from dedicated funding.

Going forward: According to 2014 State Performance Measures, 501 miles of state Minnesota state highways are classified as in "poor" condition. Without additional investment dedicated to pavement construction, that number will increase to 987 miles by 2018. It is now more important than ever to continue investing in new pavement construction as well as maintaining our existing roads with the ***Better Patching for Better Roads*** approach.

For More Information

Visit: mndot.gov or contact:

Sue Lodahl, Assistant State Maintenance Engineer/MnDOT, (651) 366-3549 Sue.Lodahl@state.mn.us

MINNESOTA DEPARTMENT OF TRANSPORTATION

Minnesota Department of Transportation

395 John Ireland Boulevard
Saint Paul, MN 55155-1899
Telephone (651) 296-3000
Toll-free 1-800-357-3774

www.dot.state.mn.us