



Manufacturers' Perspectives on Minnesota's Transportation System

District 6 / *Southeastern Minnesota*



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Executive Summary

The mission of the Minnesota Department of Transportation (MnDOT) 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 using Minnesota’s roads, bridges, airports, railways, and waterways to local, state, national, and international markets. The transportation system, when aligned with shippers’ needs and priorities, plays a significant role in supporting state and regional economic vitality.

Purpose and Methodology

MnDOT collected and analyzed information on manufacturers’ perspectives in MnDOT District 6 (southeastern Minnesota) to:

- better understand their perspectives and priorities,
- build relationships to better align the transportation system in the long-term with shippers’ needs, and
- support continuous improvement at MnDOT with ongoing input from this customer segment.

The District 6 project methodology primarily consisted of interviews with manufacturers because manufacturing generally provides relatively stable, high-paying jobs, and brings revenue into the region by selling to markets beyond their immediate area. Businesses were identified using an analysis of traded regional industry clusters, with additional input from economic development professionals in southeastern Minnesota and from District 6 staff.

In addition to manufacturers, MnDOT included several other businesses from the tourism, health care, and transit industries due to their importance to the regional economy. Freight shippers were also included because they serve manufacturers and often have transportation-related needs, especially when they ship oversize, fragile, or time-sensitive loads. To the extent that MnDOT can better understand and respond to specific transportation challenges that shippers face, this can lower shippers’ costs, improve their competitiveness, and better support the regional and state economy.

Cross-disciplinary interview teams comprised of MnDOT staff and external partners conducted the interviews. Interviewers gathered input on low-cost/high-benefit transportation improvements that can be made in the near-term, with existing or limited additional resources.

Results

Of the businesses reached for this project, 115 (67 percent) agreed to be interviewed. These included:

- 95 manufacturing businesses,
- 18 shipping/distribution/transit businesses,
- One hospitality/tourism business, and
- One health care organization.

The region's strongest traded clusters represented were (number of businesses in parentheses):

- Recreational and Small Electric Goods (13).
- Food Processing and Manufacturing (13).
- Transportation and Logistics (12).
- Downstream Metal Products (11).
- Plastics (10).
- Wood Products (7).
- Production Technology and Heavy Machinery (6).

Businesses' markets included:

- 58 businesses that ship products within Minnesota,
- 79 businesses that ship nationally, and
- 53 businesses that ship internationally.

Additional information about businesses:

- Most of the 115 businesses interviewed had fewer than 50 employees.
 - 35 businesses had 100 or more employees.
- All of the businesses interviewed that ship used trucks for at least a portion of their shipping.
 - 54 businesses used more than one mode to transport goods.
- 88 businesses responded that trucks were the most critical mode for their shipping.

The District 6 Manufacturers' Perspectives study identified actionable transportation problems facing District 6 businesses. Businesses described a range of transportation concerns, including those that may be addressed by short-term, lower-cost actions, and improvements already included in MnDOT's plans for the next four years. Interviewees also addressed more complicated problems such as large-scale pavement projects that would require considerable new transportation funding. District 6 is already addressing some of the short-term, lower-cost concerns and will evaluate other feedback as staff plan for future years. Staff will analyze feedback against project criteria, such as pavement condition metrics, traffic volumes, and safety, as well as available state and federal funding.

General Findings

District 6 is located in southeastern Minnesota. Many of the district's distinct features affect its transportation structure, maintenance, and use. District 6 has the second-highest population density of the MnDOT districts, as well as a strong manufacturing presence. The eastern part of the district has hilly terrain along the Mississippi River, while the western part has flat agricultural plains prone to blizzards. The district has the second-most interstate miles in the state and is located between the Twin Cities and parts of Iowa and Wisconsin. This makes District 6 a prime location for truck traffic moving across the state and country. Truck traffic moves regionally and nationally through the district on interstates 35 and 90, both of which are trans-national routes. Many interview themes relate to the district's geographic characteristics and the resulting transportation challenges.

Infrastructure: Keeping Safe and Staying at Speed

District 6 roads stay busy with the area’s relatively condensed population, and with many manufacturers, highways, and interstates. Because of curvier roads in the east and slow-moving agricultural equipment elsewhere, District 6 businesses reported in project interviews that they strongly value passing opportunities to keep safe and stay at speed. They also value safe intersections, ones designed for easy merging into fast-moving traffic, and infrastructure and tools to help with congestion. Several businesses complimented MnDOT for incorporating safety enhancements, such as stoplights and advance warning lights, into recent road projects.

Operations and Maintenance, Communication, and Safety: Winter Weather

Snow and ice removal was the most commonly mentioned safety and employee commute issue. With many employers, District 6 has tens of thousands of employees commuting every day, truckloads of supplies coming in, and deliveries of products going out. Snowy and icy roads can hamper travel. When conditions are especially severe, MnDOT must close some roads completely. To help with these issues, businesses identified several locations in District 6 that could use improved snow and ice removal, and asked for more dynamic-text messaging signs to update drivers on weather and road conditions. A significant number of the businesses that commented on snow and ice removal complimented MnDOT on its efforts.

Policy: Truck Parking

Compared to other districts, District 6 businesses often said that trucks park in inconvenient or unsafe locations, and pointed to a need for traffic management around private truck stops. Federal rules that drivers use electronic logging devices (ELDs or e-logs), which are devices to track adherence to hours-of-service restrictions, took effect shortly after interviews were conducted, and businesses expressed concern about where trucks would park for necessary breaks when they could not find space at public or private facilities. Parking is likely a particular issue in District 6 due to the prevalence of manufacturers and the presence of interstates 35 and 90, which bring many trucks through the region.

Business and Economic Considerations: Transportation for Connected, Expanding Firms

The District 6 transportation infrastructure serves a strong base of manufacturing businesses, including many that are suppliers to or customers of other manufacturers in the area. Several of the businesses interviewed talked about the importance of these intra-district trade links, and others cited other District 6 businesses as key suppliers or customers. Most of the businesses interviewed said they planned to expand operations in the near future.

Next Steps

This section describes possible next steps for using the feedback from this interview project both for work MnDOT is already carrying out and for future plans. The points below also note ways information and analysis from this project can further advance MnDOT’s effective public engagement efforts.

MnDOT District 6

1. Incorporate business feedback into District 6’s short- and long-term planning processes and modify upcoming road projects and maintenance plans as feasible to address business issues.

MnDOT District 6 staff can:

- Continue work started in late 2017 to categorize ideas, suggestions, and requests from the District 6 business interviews, assess if action is possible and practical, and prioritize possible action items.
- Continue to review immediate, short-term action items from this Manufacturers’ Perspectives study, assign high-priority items, address them to the extent possible and practical, and track progress.
- To the extent possible, continue to embed long-term action items into the District 6 processes for the State Transportation Improvement Program (STIP), the longer-term Capital Highway Investment Plan (CHIP), and charters for future projects; and track decisions and progress going forward. District 6’s work on this began in early 2018.
- Assess opportunities to address the common infrastructure theme from the interviews of “keeping safe and staying at speed” by exploring opportunities to increase safety at intersections and interchanges, improve congestion at choke points, and add passing lanes on selected highways, especially in the eastern part of District 6.
- Maintain District 6 efforts to keep commerce moving during the winter through successful snow and ice removal and explore opportunities for improvement. Businesses suggested specific problem locations and asked for more dynamic-text, electronic signs to update drivers on weather and road conditions.
- Factor the safety comments and suggestions from businesses into the “Toward Zero Deaths” initiative. In addition to common concerns about distracted drivers, unsafe passing, and winter conditions, businesses in District 6 also noted unsafe truck parking along selected routes.
- As possible, increase truck parking at rest areas and other locations along District 6 routes in response to business concerns. Businesses expressed worry about trucks now parking at unsafe and illegal locations, the high demand for space given the truck traffic on interstates 35 and 90, and the increased need for truck breaks and parking under new federal regulations (such as the use of e-logs to track adherence to hours-of-service restrictions).
- Share suggestions and feedback from District 6 businesses with relevant authorities on topics other than District 6 state highway transportation to inform their continuous improvement practices. For example, share input on county roads with county engineers and city roads with city engineers.
- Work with District 6 manufacturers on the transportation impacts of their expansion plans, given that most of the businesses interviewed said they planned to expand operations in the near future.

2. Consider innovative ways that District 6 can build stronger relationships and partnerships with businesses, city and county engineers, economic development professionals, and other stakeholders.

MnDOT District 6 staff can:

- Communicate with businesses about progress on ideas, suggestions, and requests drawn from the business interviews.

- Convene groups around common concerns that businesses identified and develop solutions. Opportunities may include business involvement with regional transportation advisory groups.
- Consider the methods and successes for engaging District 6 businesses from the Manufacturers' Perspectives study and determine how best to build on the experience to collect input and feedback in the future from businesses, as well as other stakeholders and constituencies.
- Use contacts and relationships established with economic development organizations for the Manufacturers' Perspectives study as a base for continued interaction and cooperation.
- Explore other ways that MnDOT can better understand and more closely work with manufacturers and other relevant businesses to strengthen economic vitality in Greater Minnesota. For example, additional manufacturers could be invited to serve on Regional Transportation Advisory Committees, Area Transportation Partnerships, and other transportation planning groups.

MnDOT Central Office

3. Use feedback from District 6 businesses to make improvements to existing systems. Consider business input in future statewide planning efforts and for the development of best practices.

MnDOT Central Office staff can:

- Review weight restriction policies in neighboring states and Canada to identify potential opportunities for policy alignment. More broadly, evaluate practices regarding weight restrictions and discrepancies, including communication and messaging, to inform businesses of state and federal policy.
- Continue improving the 511 system, such as by making the website available in other languages, providing more information on construction projects, and adding more cameras.

4. Use the combined findings and suggestions from the Manufacturers' Perspectives studies in Districts 1, 2, 4, 6, and 8 to understand business needs and improve the state's transportation system. Incorporate a continuous improvement approach to the Manufacturers' Perspectives studies.

Some of the following ideas are similar to ones made in previous reports. Based on past feedback, MnDOT has created a Manufacturers' Perspectives study website (<http://www.dot.state.mn.us/ofrw/mps.html>) to highlight successes and assist in maintaining relationships with businesses. In addition, MnDOT staff are planning an interactive mapping application to more accurately capture the locations of problem areas raised in the interviews. The database resulting from this initiative will be available to district project managers, planners, and other staff on an ongoing basis.

MnDOT Central Office staff can also:

- Continue synthesizing findings from the Manufacturers' Perspectives study for communications, transportation improvements, and planning.
- Examine ways to combine findings from the Manufacturers' Perspectives studies from districts that have completed the project, and future district projects, with broader statewide findings, themes, and recommendations for use in MnDOT's Statewide Freight System Plan, its ongoing Freight Action Agenda, and other relevant plans and initiatives.

- Continue to review the completed Manufacturers’ Perspectives studies to improve their methods to meet the needs of other districts as they engage in this initiative.
- Evaluate the feasibility of developing cross-district planning forums with staff from Districts 1, 2, 4, 6, and 8 to share findings and frame broader collaborative solutions that address statewide issues.
- Strengthen communications about the Manufacturers’ Perspectives study, including a plan to communicate findings from the study to both District 6 staff and audiences external to MnDOT. Present findings in public forums, including conferences.
- Develop a process for districts that have participated in Manufacturers’ Perspectives studies to provide feedback, both internally and externally, about their progress on study findings.

District 6 Progress Update – Early Benefits

District 6 is analyzing feedback from interviews with businesses and has already acted on some near-term feedback based on this study. District 6 has done the following:

- Spoken with an interviewed business concerned about local highway access to discuss options.
- Spoken with a business about turn lane access to a new building planned for spring construction.
- Installed new signage to clarify route directions for recently completed roundabouts in Cannon Falls to make it easier for customers to reach local businesses.
- Invited interviewed carriers and manufacturers that own trucks to a meeting with MnDOT’s Office of Freight and Commercial Vehicle Operations and the Department of Public Safety in February 2018. Participants provided feedback on the agencies’ ten-year enforcement plan.
- Expanded truck parking at two safe rest areas along Interstate 90 (Hayward and Oakland Woods).
- Patched roadways in areas cited by shippers:
 - Highway 61 from Lake City to Red Wing.
 - Southbound Highway 52 from Cannon Falls to Zumbrota.
 - Interstate 90 in the Austin and Albert Lea areas.
- Worked with Olmsted County to address an increased number of crashes at the intersection of Highway 30 and County Road 8. Both MnDOT and the county have increased the size of stop signs, and MnDOT is adding a second stop sign on the left side of Highway 30 to make “dual stop signs.” MnDOT will add a “Cross Traffic Does NOT Stop” placard on stop signs, and is converting the right-hand (southbound) stop sign to one with a flashing LED. District 6 maintenance is also removing trees in the southeast quadrant of the intersection.

Introduction

Manufacturers and other freight shippers are a unique and important customer segment for the Minnesota Department of Transportation (MnDOT). This has led MnDOT to seek feedback on the state’s transportation system from these businesses—businesses that often provide high-quality jobs for their communities. The transportation system gives freight businesses access to supplies, allows workers to reach their jobs, and provides ways for goods to reach customers. A well-maintained transportation system, aligned with business needs, can increase efficiencies, lower costs, and boost productivity, contributing to a healthy state and regional economy.

Background

Since 2013, MnDOT has taken a district-by-district approach to gather manufacturers’ perspectives. Currently, MnDOT has completed 438 business interviews in five of eight MnDOT districts.¹ The project’s intent is to:

- **Meet with manufacturers and other leading industries in each region to understand their perspectives and priorities** for the transportation system, and improve MnDOT’s knowledge of industries that depend heavily on system reliability.
- **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, manufacturers, and freight transporters to sustain short-term and ongoing transportation system improvement.
- **Support statewide continuous improvement and develop recommendations** for enhancing transportation systems and practices to support freight movement.

Project Design

The District 6 Manufacturers’ Perspectives study methodology was closely modeled after methodologies used in Districts 1, 2, 4, and 8. The project in southeastern Minnesota included collaborative, cross-disciplinary interview teams and semi-structured, face-to-face interviews with businesses identified by a regional industry cluster analysis. Interview questions focused primarily on issues that could be addressed in the next few years and with existing or few additional resources. A list of businesses interviewed for this project can be found in Appendix A (page 79).

A team comprised of MnDOT staff and external partners managed and coordinated the project, analyzed data, and wrote the report. External partners also assembled the list of businesses to contact and engaged economic development organizations as partners. Interviewers included MnDOT staff from District 6, MnDOT Central

¹ The other districts are District 8 (southwestern Minnesota) in 2013-2014, District 4 (west central Minnesota) in 2014-2015, District 2 (northwestern Minnesota) in 2015-2016, and District 1 (northeastern Minnesota) in 2016-2017. See MnDOT district map at <http://www.dot.state.mn.us/information/districts.html>.

Office staff, the external project team, and members from economic development organizations (EDOs). MnDOT also invited county transportation engineers to attend interviews. All MnDOT staff, external partners, and EDOs that participated in the study are listed in Appendix B (page 81).

District 6 Background

Geographically, District 6 is the second smallest of MnDOT’s eight districts, covering 6,801 square miles in the southeast corner of Minnesota (8.5 percent of the state’s total area). However, it ranks second among districts for population density, with 74 people per square mile.² Figure 1 shows the 11 counties served by District 6. It spans from Rice County in the northwest and continues east to the Wisconsin border and south to the Iowa border.³ The district is home to Rochester, the third largest metropolitan area in the state, and the cities of Albert Lea, Faribault, Owatonna, Red Wing, and Winona. In 2015, an estimated 502,335 people (9.2 percent of the state population) lived within District 6 boundaries.⁴

Figure 1: Map of MnDOT District 6



² Data from Minnesota Area Transportation Partnership.

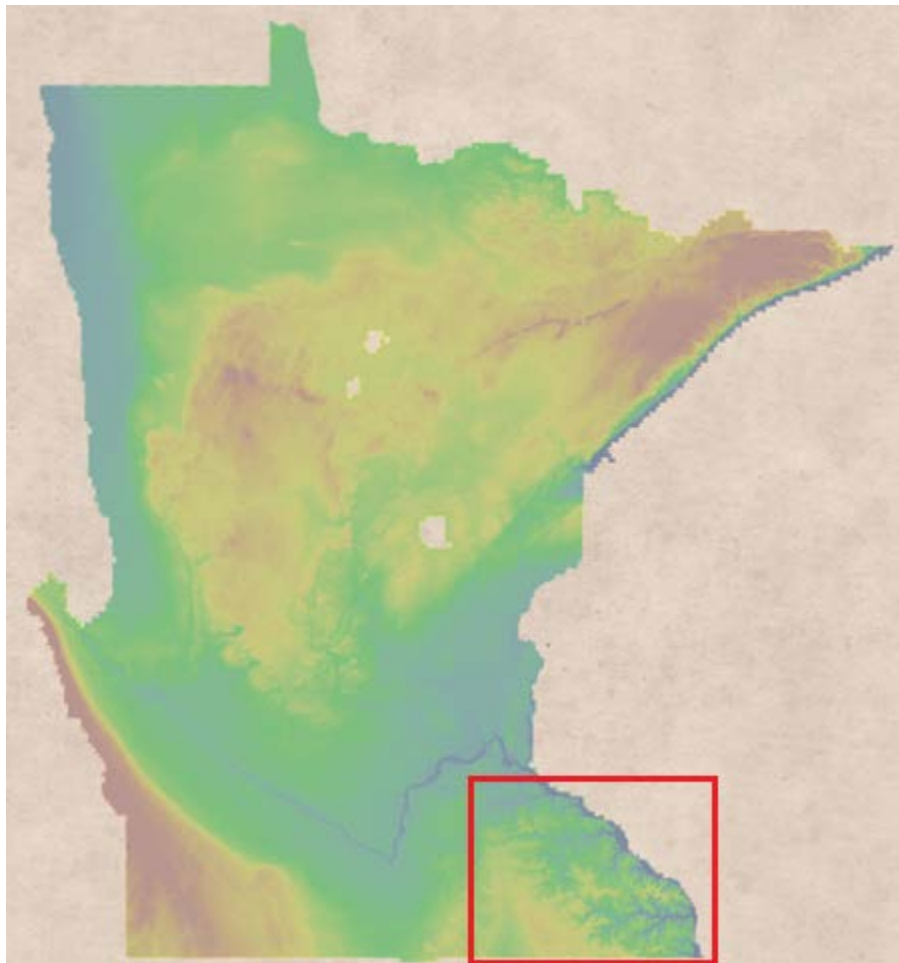
³ District 6 includes Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, and Winona counties.

⁴ Data from Minnesota Area Transportation Partnership.

District 6 contains approximately 630 manufacturers, one-third of which are in Olmsted and Winona Counties.⁵ These companies use roads to reach other parts of Minnesota, as well as Iowa, Wisconsin, and other areas around the U.S. and the world.

The district's topography presents varying transportation challenges across different counties. The district's western side is relatively flat, while its eastern counties have the Mississippi River Valley and many other river valleys, as seen in Figure 2. Roads in the eastern part of the district must follow the curves in the natural terrain, which can create a variety of challenges for maintenance and drivers. Roads in the western part face different issues. For instance, fields on the sides of highways allow winter winds to blow snow across the road, sometimes creating dangerous driving conditions. Unlike the eastern part of the district, interstates in the western part have snow gates that prevent drivers from using the road in these unsafe conditions.

Figure 2: Elevation in Minnesota⁶



⁵ Data from 2015 County Business Patterns.

⁶ Minnesota IT Services, Geospatial Information Office. Accessed January, 2018, <http://www.mngeo.state.mn.us/chouse/mapgallery.html>.

MnDOT staff in District 6 plan, design, construct, and maintain the state and federal trunk highways within the district. The team also manages the financial aid and assistance provided to local governments that qualify for state and federal transportation funding for roadways, bridges, trails, and transit systems. The district has offices in Rochester (district headquarters) and Owatonna, and operates 19 truck stations across the district.

Methodology

Interview Purpose

The primary purposes of the business interviews were to:

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

Interview Teams

All interview teams included at least two people. An economic development professional typically led the interview while a District 6 staff member documented the conversation. This combination ensured that MnDOT staff received the feedback firsthand and that MnDOT received the businesses' feedback within both economic and transportation contexts. The interview teams visited the businesses in-person and asked questions from interview guides.⁷

A cross-disciplinary group, including those listed below, conducted interviews:

- MnDOT District 6 staff, as well as Central Office staff from Operations, and the Freight and Commercial Vehicle Operations office.
- Researchers from the State and Local Policy Program (SLPP) at the University of Minnesota's Humphrey School of Public Affairs.
- City and regional economic development professionals.
- Consultants from Management Analysis and Development (MAD), a division of Minnesota Management and Budget.

The University of Minnesota's Extension Center for Community Vitality, working along with MAD, recruited economic development professionals, and MnDOT selected and invited internal staff to participate. In total, 69 interviewers participated. District 6 staff also invited county engineers to observe some interviews.⁸

⁷ See Appendix C on page 84.

⁸ In previous district studies, many businesses provided feedback not only on state roads, but also on county and local roads, prompting MnDOT to include county engineers for the interviews when possible.

Interviewer Training

In September 2017, MnDOT held three interview training sessions in Rochester and Owatonna for 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.

Business Selection Method

The University of Minnesota’s SLPP used Regional Industry Cluster Analysis to explore important segments of the District 6 economy and identify key industries and manufacturers in District 6.⁹ Clusters are geographically concentrated groups of interconnected companies, universities, and related institutions that arise out of linkages or externalities across industries and in this way contribute significantly to economic growth and development in a region. SLPP then used this cluster analysis to identify manufacturing firms for project interviews about transportation issues in the district.

The term *cluster* refers to firms within similar industries and their interactions with one another, such as segments of a supply chain. Businesses in a cluster are linked together by business-to-business sales that contribute to the production of the same or similar products or services. These networks of connected businesses often use similar technologies, employ workers with similar skill sets, and serve common markets.¹⁰ MnDOT is intent on understanding these relationships to inform 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 study focused on a wide array of industry clusters within District 6, 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 industries concentrated in a geographic region that sell to customers in other regions and nations. A local cluster is composed of industries that primarily sell within a region and are present in most (if not all) geographic areas.¹¹ Traded clusters are significant drivers of growing economies because they draw revenue *into* the regional economy and

⁹ This tool was developed by Michael Porter’s Institute for Strategy and Competitiveness at Harvard Business School.

¹⁰ Oregon Business Plan. “Industry Clusters FAQ,” Accessed February 20, 2018, <http://www.oregonbusinessplan.org/industry-clusters/industry-clusters-faq/>.

¹¹ U.S. Cluster Mapping, “Glossary of Terms.” Accessed February 20, 2018, <http://www.clustermapping.us/content/glossary-terms>.

stimulate growth, while local clusters circulate money *within* a region.¹² Researchers use a traded cluster analysis to assess the strength of particular industry clusters in a region compared to the nation as a whole.

When it comes to economic development and growth, a region's economic competitiveness depends heavily on the competitiveness of 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 form the economic base of communities in District 6, both in direct employment and in their ability to spur additional economic activity.

This project focused on manufacturers for several reasons:

- Manufacturers usually represent traded clusters, which bring dollars into the region from other states and countries.
- Manufacturing provides relatively stable and well-paying jobs, which maximize returns on state investments and support healthy communities.
- Manufacturers often have distinct needs regarding the transportation system.

Economic development researchers use calculations called *location quotients* to help assess a region's economic competitiveness. Figure 3 illustrates the largest manufacturing clusters in District 6 based on location quotients. Location quotients compare the employment in a particular District 6 industry to the employment in that industry nationally. Clusters with location quotients greater than one (the vertical axis) are more concentrated in District 6 than in the nation as a whole.¹⁵ Clusters with a change in location quotient greater than zero (the horizontal axis) are growing within the district. This study focused on manufacturing clusters with the highest location quotients and employment levels, such as the clusters for food production and manufacturing, and downstream metal products.

Figure 3 shows traded clusters by employment and specialization. The arrows in the figure are included to illustrate examples noted here in this paragraph. For example, the Vulcanized and Fired Materials cluster (with the thin blue arrow)—firms manufacturing fired materials such as clay tiles and pottery—has a location quotient of almost four. This indicates that this cluster employs, on average, almost four times as many people in District 6 than would be expected based on industry employment in the United States as a whole. As another example, the location of the Food Processing and Manufacturing bubble (with the thick green arrow) shows that this cluster experienced a small decline in employment from 1998 to 2013 relative to other parts of the country. The

¹² U.S. Cluster Mapping. "Clusters 101," Accessed February 20, 2018, <http://clustermapping.us/content/clusters-101>.

¹³ Rosenfeld, Stuart. "A Governor's Guide to Cluster-Based Economic Development." National Governors Association. 2002. <http://www.nga.org/files/live/sites/NGA/files/pdf/AM02CLUSTER.pdf>.

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 <http://www.census.gov/eos/www/naics/>.

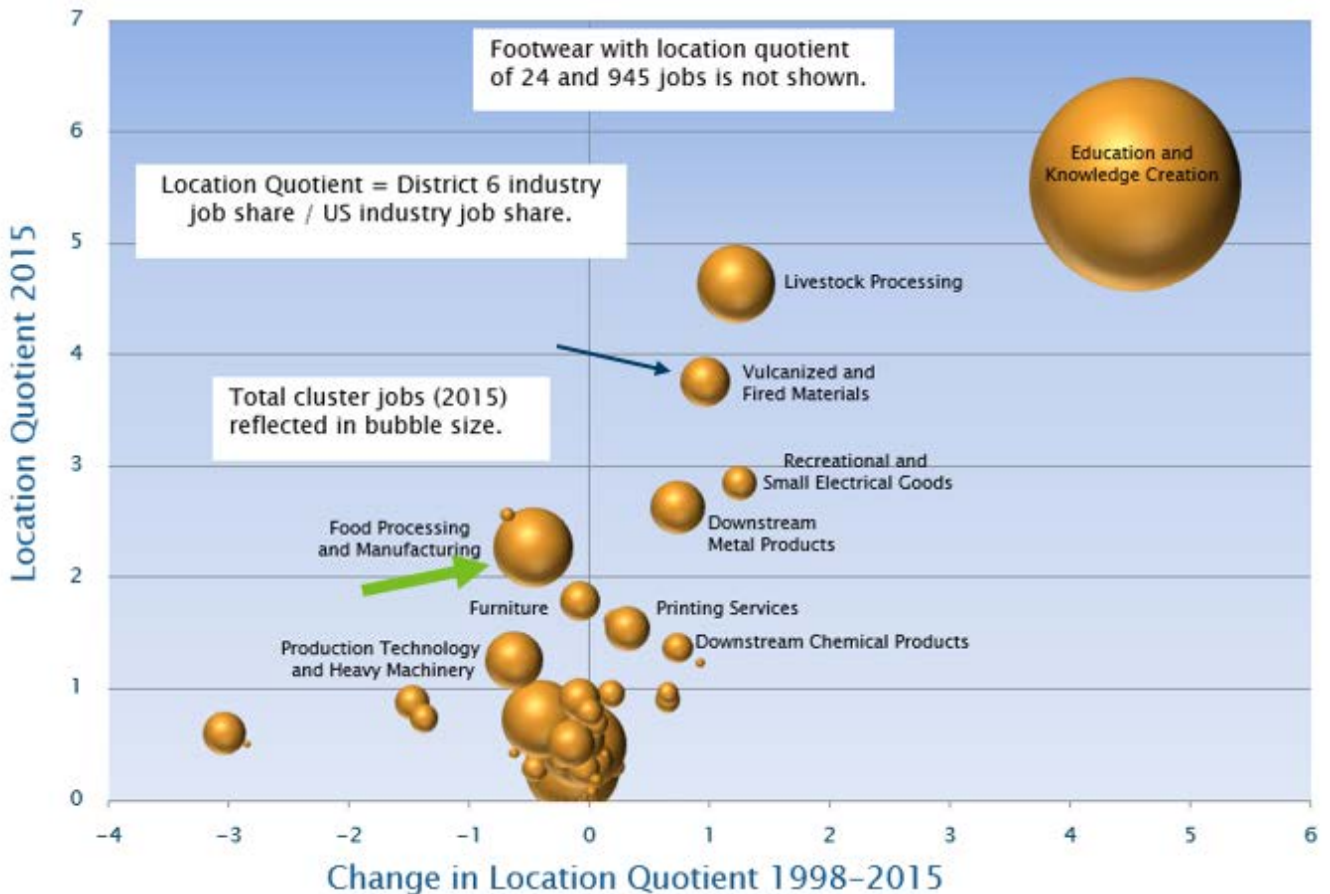
¹⁵ Appendix D on page 86 includes MnDOT District 6 location quotients for traded clusters by county. Appendix E on page 89 shows MnDOT District 6 employment by traded cluster and county.

size of the bubble indicates the number of jobs. For example, Figure 3 shows that more workers in the District 6 area are employed in Food Processing and Manufacturing than in Vulcanized and Fired Materials.

The large bubble for Education and Knowledge Creation, in the upper right of Figure 3, shows that District 6 has a disproportionately large number of jobs in this industry cluster and that the number of jobs is growing. In general, employment in this cluster—which contains educational, training, and research and development institutions—falls outside the manufacturing focus of this MnDOT project. However, a significant share of the Mayo Clinic’s employment falls within this cluster, and Mayo Clinic representatives were interviewed for the project.

Figure 3: MnDOT District 6 traded clusters by employment and specialization (location quotient), 1998–2015¹⁶

(Note: Arrows in Figure 3 are for illustrative purposes only and are referenced in the paragraph above. The thin blue arrow highlights a cluster with disproportionately high employment in District 6, and the thick green arrow highlights a cluster the experienced a small decline in employment in the district relative to the nation.)



¹⁶ Cluster map for District 6 developed by the SLPP with data from the U.S. Cluster Mapping website at <http://clustermapping.us>. Accessed February 20, 2018.

Business Recruitment

Researchers for this project (SLPP) used the Reference USA database to identify businesses that fit the District 6 Regional Industry Cluster Analysis criteria based on NAICS codes for the businesses, using a threshold of 10 or more employees.¹⁷ MnDOT District 6 staff and economic development professionals identified other key businesses based on their significant economic contribution to the region or heavy reliance on the transportation system. The businesses contacted for interviews represented a diverse group of industries from each county in District 6.

In September 2017, MnDOT mailed letters to those businesses, inviting them to participate in the study.¹⁸ MAD followed up with businesses via phone, asked them to participate in the study, and scheduled interviews. Interviews were conducted from September through April 2018.

Other Industries Interviewed

Previous studies in Districts 1, 2, 4, and 8 included perspectives from businesses outside of the manufacturing industry that were important to the district's economy. Given the past value of these interviews, MnDOT conducted some interviews with non-manufacturers for this study. These included interviews with shipping/distribution businesses, one key tourism business, one key bus company, and the Mayo Clinic, which is the largest employer in District 6. To narrow down which shipping businesses to interview, MnDOT relied on manufacturers to provide the names of their transportation companies.

Data Collection and Analysis

MnDOT and MAD developed an interview questionnaire for manufacturers based on interview guides from previous MnDOT studies and input from District 6 staff. The questionnaire allowed for semi-structured interviews, meaning that interviewers followed the questionnaire but could pursue other relevant topics as they arose. MnDOT and external partners developed separate questionnaires for tourism, health care, and shipping/distribution businesses to capture information specific to those industries.¹⁹

MAD consultants aggregated and coded interview responses, analyzed results, and developed findings. They provided actionable, location-specific business feedback to District 6 staff, who will further study the detailed feedback to identify potential system improvements. MnDOT will share relevant information with city and county engineers and other MnDOT districts.

¹⁷ The cluster categories were developed by the Harvard Business School's Institute for Strategy and Competitiveness, led by Professor Michael Porter, and are used by the Economic Development Administration (EDA). The U.S. Cluster Mapping Project is a national economic development initiative that is designed to help users find interactive, robust data and tools to understand clusters and regional business environments, improve institutions, and locate appropriate partners across the country.

¹⁸ See Appendix F on page 92.

¹⁹ See Appendix C on page 84.

Results

Response Rates

MnDOT invited 255 businesses to participate in an interview. The response rate based on the businesses reached was 67 percent.²⁰ Table 1 shows the number of businesses interviewed, the number that rejected the invitation, and the number that were not interviewed but did not reject an interview.²¹

Table 1: Recruitment results

Result	Number/percentage of businesses
Businesses contacted for interviews	256
Total businesses reached	172
Accepted invitation to interview	115
Rejected invitation to interview or accepted but did not then interview	57
Businesses that did not respond to invitation to interview	102
Acceptance rate of businesses contacted	45%
Acceptance rate of businesses reached	67%

Types of Businesses Interviewed

Most businesses interviewed (95) were manufacturers, as seen in Table 2.

²⁰ Methods for contact and response rates are consistent with previous studies. The response rate is calculated using the number of completed interviews and number of refusals (in the terminology of the American Association for Public Opinion Research, “Completed Interviews/Completed Interviews + Partial Interviews + Refusals”). This calculation excludes the 102 businesses that could not be reached or did not provide a yes or no response. For more information on this calculation, see http://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf.

²¹ “Businesses that did not respond to invitation to 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.

Table 2: Number of businesses interviewed by industry

Industry	Businesses interviewed
Manufacturing	95
Transportation and Warehousing	18
Amusement, Gambling, and Recreation	1
Health Care	1
Total	115

Industry Clusters

Of the 115 interviews conducted, 101 were with firms in 24 traded industry clusters, and 14 were with firms in six local industry clusters. Clusters differ from industry classifications, such as those listed in Table 2, because clusters include interconnected companies across discrete industries based on the interactions of the companies with one another as well as their related end products or services. Therefore, the businesses interviewed fit into the four industries listed in Table 2 but reflect 30 different clusters, as discussed below.

Industry Clusters Interviewed

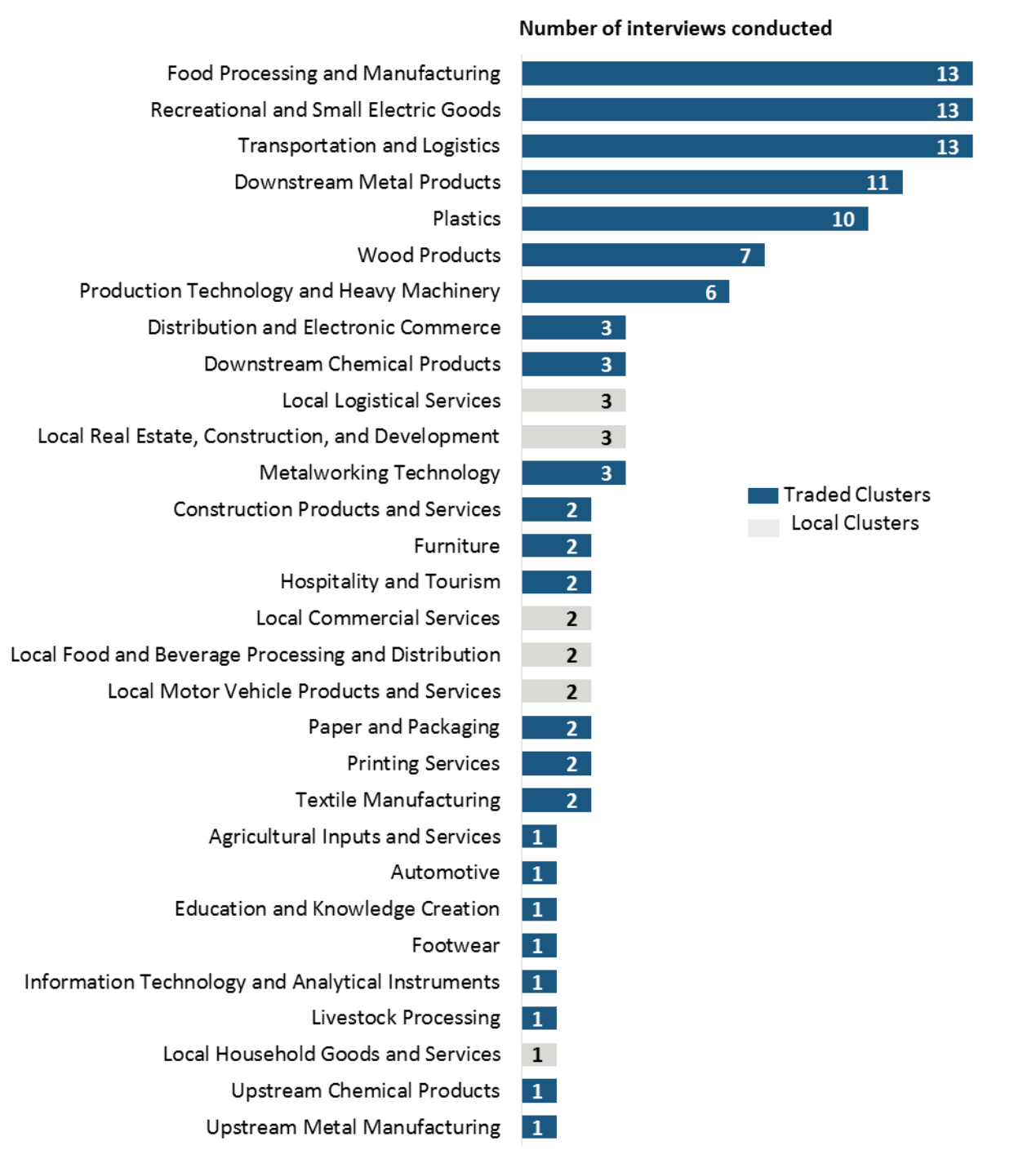
Figure 4 illustrates the traded and local clusters represented by the business interviews. District 6 clusters with the largest location quotients in 2015, and thus with a disproportionately concentrated presence in District 6 compared to the nation as a whole, were:

- Footwear (24.05).
- Education and Knowledge Creation (5.53).
- Livestock Processing (4.63).
- Vulcanized and Fired Materials (3.76).
- Recreational and Small Electric Goods (2.85).
- Downstream Metal Products (2.63).
- Music and Sound Recording (2.56).
- Electric Power Generation and Transmission (2.33).
- Food Processing and Manufacturing (2.27).

Interviews with businesses in these nine clusters accounted for 40 interviews.²²

²² See Appendix D on page 86.

Figure 4: Traded and local clusters represented in District 6 interviews



The businesses interviewed were from industry clusters that accounted for a significant number of jobs in District 6. The following 11 traded clusters each have more than 2,000 employees within the district's 11 counties. The project team conducted 46 interviews of businesses in these clusters:²³

- Education and Knowledge Creation.
- Business Services.
- Distribution and Electronic Commerce.
- Hospitality and Tourism.
- Food Processing and Manufacturing.
- Livestock Processing.
- Production Technology and Heavy Machinery.
- Downstream Metal Products.
- Vulcanized and Fired Materials.
- Insurance Services.
- Transportation and Logistics.

The three traded clusters with the greatest growth in location quotient are Educational and Knowledge Creation, Recreational and Small Electric Goods, and Livestock Processing. All three clusters were represented in the interviews, with 13 Recreational and Small Electric Goods businesses interviewed and one business interviewed in each of the other two cluster categories.

The Food Processing and Manufacturing cluster and Recreational and Small Vehicles cluster had the largest number of interviews (13 each). Of the 12 firms interviewed in the Transportation and Logistics cluster, most were carriers identified as interview targets by the District 6 manufacturers who participated in the study. There were also three carriers interviewed from the Local Logistical Services cluster. Other traded clusters covered in the interviews were Downstream Metal Products (11), Plastics (10), Wood Products (7), and Production Technology and Heavy Machinery (6).

The Mayo Clinic, the largest employer in the region, was also interviewed. While hospitals are assigned to the Local Health Services cluster because most hospitals serve their local regions, the Mayo Clinic serves not only its region in southeast Minnesota but also provides a wide range of hospital, medical, research, and health education services that are national and international in scope. A significant share of the Mayo Clinic's employment falls within the Education and Knowledge Creation cluster, which is a traded cluster.

Table 3 provides descriptions²⁴ and examples of traded clusters that were most prominent in District 6 interviews.²⁵ In addition, this report includes profiles of several companies interviewed for this project,

²³ See Appendix D on page 86 for employment information for District 6 and by county.

²⁴ Definitions of industry clusters are taken from the U.S. Cluster Mapping website, "Traded Clusters Appendix." <http://clustermapping.us/sites/default/files/files/page/Traded%20Clusters%20Appendix.pdf>.

²⁵ Clusters defined in this section are traded clusters that were represented by three or more businesses interviewed in District 6. A full list of industry clusters interviewed for the District 6 study and their descriptions can be found in Appendix G on page 94.

reflecting the range of industry clusters in this region. The profiles describe their examples of transportation system priorities as related to their unique business needs.

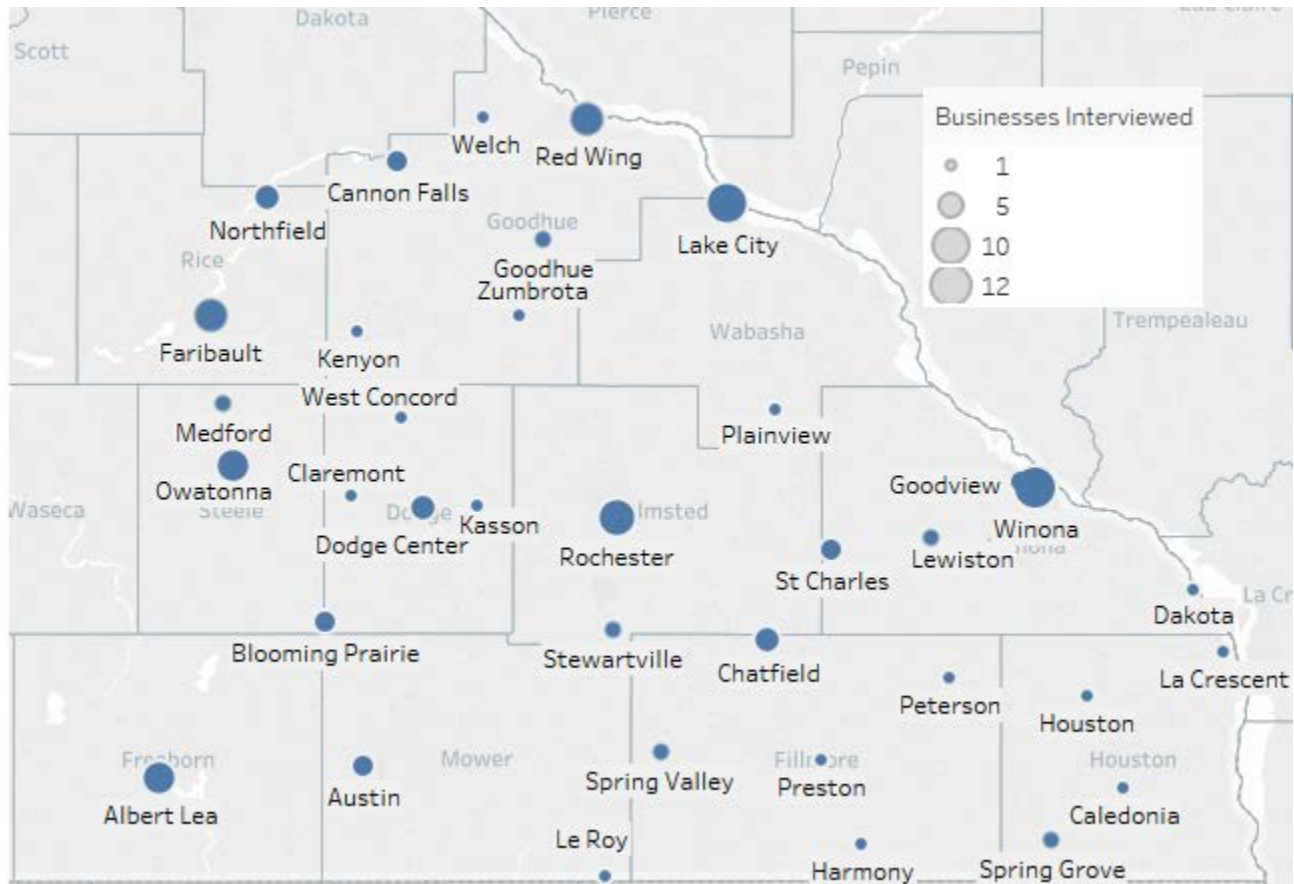
Table 3: Descriptions of the most common traded clusters represented in District 6 interviews

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.	Faribault Foods
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.	Hiatt Manufacturing
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.	Lawrence Transportation Company
Downstream Metal Products	This cluster contains establishments that manufacture metal containers, prefabricated metal structures, and end user metal products. These end user products include ammunition, kitchenware, hardware, metal bathroom fixtures, and similar metal products used in home finishing such as doors, windows, and ornamentation.	Minnesota Metals
Plastics	Establishments in this cluster manufacture plastic materials, components, and products. The plastics and foams are manufactured for packaging, pipes, floor coverings, and related plastic products. The cluster also includes the upstream manufacturing of plastic materials and resins, as well as the industrial machines used to manufacture plastics.	Acrotech
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.	Rockland Flooring
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.	Automation Services

Geographic Distribution of Businesses

Figure 5 shows the locations of all businesses interviewed in District 6. The size of each circle on the map represents the number of businesses interviewed in that city. Businesses were widely dispersed throughout the district. Cities with many interviews (large circles) are consistent with the district's cities that have many manufacturers: Albert Lea, Faribault, Lake City, Owatonna, Red Wing, Rochester, and Winona.

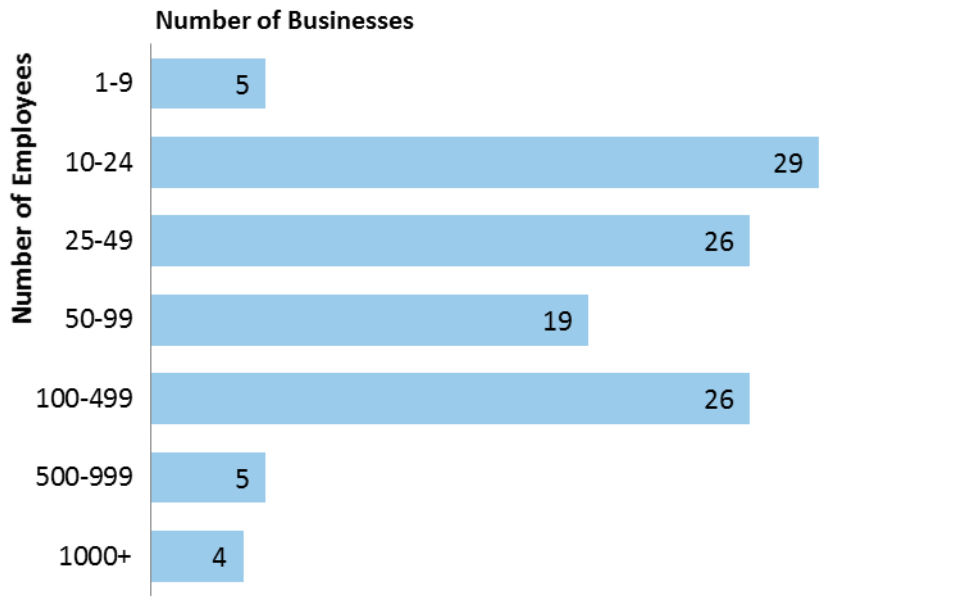
Figure 5: Locations of District 6 businesses interviewed



Number of Employees

Employment data was available for 114 of the 115 businesses interviewed. Those 114 businesses collectively employ more than 56,444 people (approximately 41,600 of them are employed by the Mayo Clinic, Minnesota's largest employer). Figure 6 shows the distribution of businesses by number of employees. Most businesses interviewed have 50 or fewer employees, but four businesses have more than 1,000 employees. Compared to other districts, District 6 has many manufacturers with more than 100 employees. Excluding the Mayo Clinic, the average number of employees was 131, while the median number of employees was 45.

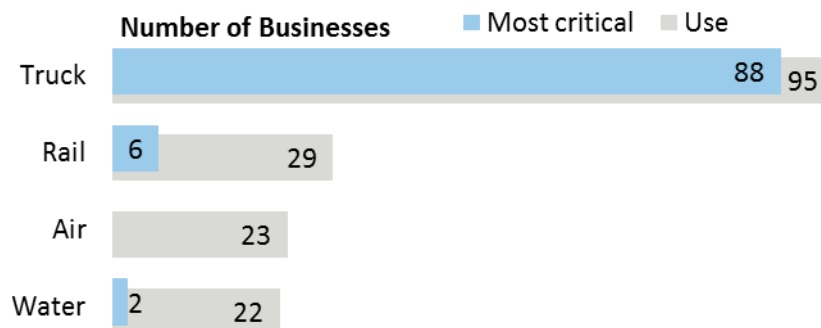
Figure 6: Number of employees at interviewed businesses



Modes of Transportation Used

All 95 manufacturers interviewed said they use trucks either to receive supplies or ship products, and 53 (56 percent) of them reported that they also use at least one other mode of transportation (rail, air, or water). Figure 7 shows the number of manufacturers that said they use each transportation mode. Eighty-eight manufacturers (93 percent) said trucks were the most critical mode of transportation to their business.

Figure 7: Modes of transportation used and most critical to manufacturers²⁶



Thirty-six of the manufacturers interviewed (38 percent) own their own truck(s) and ship at least some of their product themselves. Seven manufacturers interviewed ship all their own products, 56 manufacturers contracted

²⁶ Not every business answered every question. Some businesses use more than one mode of transportation.

with commercial carriers for all their shipping, and 29 manufacturers ship some of their own products and contract out for the rest.

Customer Markets

Manufacturers interviewed for this study produce and ship goods not only to local markets, but also throughout the U.S. and around the world. Figure 8 and Figure 9 illustrate the reach of District 6 businesses.

Figure 8: Customer markets of District 6 manufacturers

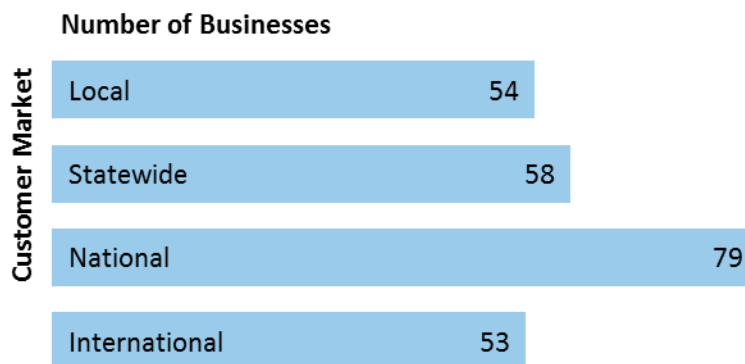
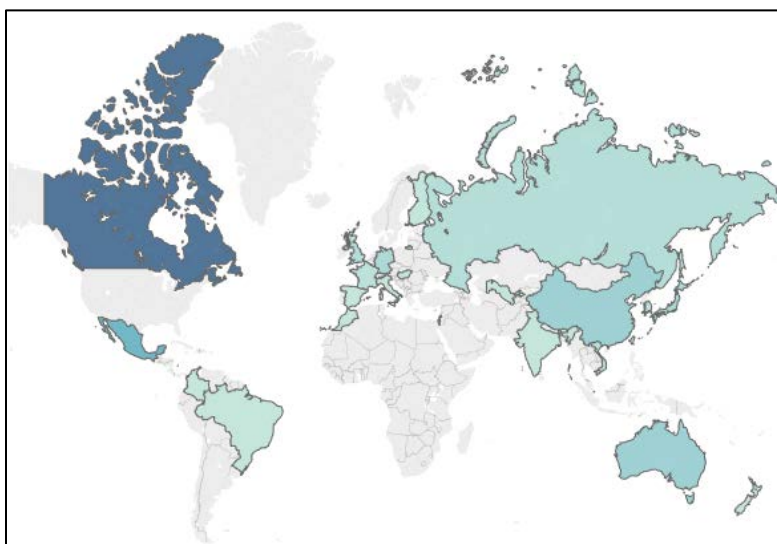


Figure 9 shows which countries purchase products from the District 6 businesses interviewed. Countries in darker blue were mentioned by businesses more often than those in lighter blue. Countries that District 6 manufacturers ship to include, but are not limited to: Australia, Brazil, Canada, China, Colombia, Finland, France, Germany, Hungary, India, Israel, Italy, Japan, Mexico, Morocco, New Zealand, Russia, Singapore, South Korea, Spain, Taiwan, United Kingdom, Uzbekistan, and Vietnam.

Figure 9: International markets reached by District 6 manufacturers



In addition, many businesses provided general responses, such as “Europe” or “South America.” Figure 9 does not include these.

Findings Overview

This section presents broad themes drawn from District 6 interviews to provide context for the more detailed findings that follow. Interviews illustrated strong connections between the district’s geographic characteristics, relatively dense population and industries, and transportation infrastructure.

Many of the characteristics that distinguish District 6 from other MnDOT districts affect its transportation structure, maintenance, and use. As discussed in the “District Background” section, District 6 has the second-highest population density of the MnDOT districts, as well as a strong manufacturing presence. The district’s eastern part has hillier terrain along the Mississippi River, while the western part has flatter agricultural plains prone to blizzards. The district has the second-most interstate miles in the state, which combined with its location between the Twin Cities and parts of Iowa and Wisconsin makes District 6 a prime location for truck traffic moving across the state and country. The mix of flat and hilly terrain, snowy climate, and the prevalence of manufacturers presents unique challenges.

Infrastructure: Keeping Safe and Staying at Speed

Passing Opportunities

District 6 roads stay busy with the area’s relatively dense population compared to other parts of the state, and the many manufacturers, highways, and interstates in the district. Combined with curvier roads in the east and slow-moving agricultural equipment elsewhere, District 6 businesses strongly value passing opportunities to keep safe and stay at speed. A lack of adequate passing opportunities leads some drivers to make risky passes or other unsafe maneuvers. One business explained that every hour lost behind a slow-moving vehicle adds to business costs.

Businesses in the eastern part of the district were most likely to mention the need for more passing opportunities, particularly along Highway 61 between Red Wing and Wabasha. This stretch is popular with tourists in the summer and fall, and the winding road can make it difficult for vehicles to pass each other safely. While some businesses in the western part of the district said they value passing opportunities, a few in Dodge County explicitly stated that they do not need more passing lanes in their area because the terrain is so flat.

Safe Intersections

With many nearby highways, interstates, and vehicles in the area, intersection safety emerged as a key concern of District 6 businesses. Businesses around the district described how difficult it can be to merge into fast-moving traffic, particularly during peak traffic hours. Vehicles and employees can be delayed and may risk

crashes trying to enter intersections. To address this, businesses often asked for intersection controls, as well as better signage to notify them of oncoming traffic and upcoming intersections.

Congestion Management

As the second most densely populated district, and an area with many manufacturers, District 6 has employees commuting at all times of day and night. Commuting traffic mixed with general traffic through District 6 can easily create congestion. In multiple areas of the district, businesses discussed how the roads can become congested during shift changes at nearby businesses. For instance, three large businesses in Red Wing are located along one stretch of road, meaning that hundreds of employees leave at similar times of the workday and attempt to enter the highway. This can create unsafe situations as drivers become frustrated. Congestion is projected to increase significantly in the Rochester area, given plans for the Destination Medical Center development and anticipated growth in jobs and freight traffic.²⁷ To accommodate congestion, businesses requested stoplights; interchanges instead of intersections; and dynamic-text, electronic signs to warn of congestion.

Operations and Maintenance, Communication, and Safety: Winter Weather

Although District 6 is not the snowiest part of the state, snow and ice removal was the most commonly mentioned safety and employee commute issue. With many manufacturers and the Mayo Clinic, the state's largest employer, District 6 has tens of thousands of employees commuting every day, truckloads of supplies coming in, and deliveries of products going out. Snowy and icy roads can hamper travel. When conditions are especially severe, MnDOT must close some roads completely.

Figure 10: Winter weather affects businesses' bottom line



²⁷ Destination Medical Center is an economic development initiative framed around expansion of the Mayo Clinic and related regional economic growth. For more on this 20-year effort, see <https://dmc.mn/what-is-dmc/>.

Businesses described how winter weather can affect production by delaying supplies and preventing employees from arriving to work. Particularly in District 6's prominent food production industry, the ability to receive fresh materials and transport out perishable products is critical, and is easily thwarted by snowy or closed roads. Similarly, the Mayo Clinic relies on time-sensitive transportation for many of its materials and equipment, testing services, and other healthcare provision.

Businesses in the district's western part more often discussed snow blowing across the roads, but even businesses in the east discussed the difficulties of doing business during winter. They described how roads in valleys stay icy because they receive little sun, and how trucks can get blown sideways by sudden winds on the tops of hills.

To help with these issues, businesses identified several locations in District 6 that could use improved snow and ice removal. They also asked for more electronic, dynamic message signs to update drivers on weather and road conditions, and said that they often use 511 to receive up-to-date information in the winter.

Policy: Truck Parking

Compared to other districts, District 6 businesses often mentioned that trucks park in inconvenient or unsafe locations, and pointed to the need for traffic management around private truck stops. Some of these comments likely stemmed from questions added to the District 6 interview guide about rest stops in southeast Minnesota, but businesses broached the subject before, during, and after those questions. Federal rules that drivers use electronic logging devices (ELDs or e-log) to track adherence to hours-of-service restrictions took effect shortly after interviews were conducted, and businesses expressed concern about where trucks would park for necessary breaks when they could not find space at public or private facilities. Although businesses across the country are undoubtedly encountering some challenges in adapting to the new federal regulations, parking is likely a particular issue in District 6 due to the prevalence of manufacturers and the presence of interstates 35 and 90, which bring many trucks through the region.

Economic Considerations: Transportation for Connected, Expanding Firms

The vast majority of the businesses interviewed—more than three-fourths—commented on the value of transportation infrastructure for their operations. They cited interstates 35 and 90 as key routes and mentioned the importance of many state trunk highways in the area. These roads bring supplies to the manufacturing firms, carry products out to customers, and allow workers to reach the facilities. Some businesses talked about costs from road conditions in the winter, congestion, and infrastructure issues that delay truck travel.

The District 6 transportation infrastructure serves a strong base of manufacturing businesses, including many that are suppliers to or customers of other manufacturers in the area. Several businesses talked about the importance of these intra-district trade links, and others cited key suppliers or customers that interviewers and other staff for this study were able to identify as District 6 businesses.

Most businesses said they planned to expand operations in the near future and said expansion would occur at or near their current locations.

Detailed Transportation Findings

The following sections explore in detail the themes that arose from the interviews regarding infrastructure, operations and maintenance, communications, policy, and other findings.²⁸

Infrastructure

Intersections and Interchanges

Intersection and Interchange Issues

Almost half of businesses provided feedback on intersections, most often detailing problems and suggesting improvements. When they discussed issues at different intersections, half of the time businesses said that poor sightlines or congestion made intersections unsafe or difficult to navigate. Several businesses described intersections where trucks lack the space needed to execute turns, while several others mentioned intersections where fast-moving and heavy traffic makes it difficult for trucks to turn.

It's very difficult to see traffic coming from the south on Bridge Avenue when you are waiting to turn on to Bridge from the westbound I-90 off ramp. If you're not expecting it, it's harder to get on the brakes and stop at that point. You can't slow down.

Many of the businesses that brought up challenging intersections and interchanges said that safety was one of their primary reasons for concern. They gave examples of fatal and non-fatal crashes at intersections and interchanges, and noted times when their employees and carriers experienced near misses. They also expressed concern about pedestrian and bicycle safety at intersections.

Businesses described trees, cars, trucks, buildings, and hills as potential obstacles to driver sightlines. When drivers do not have clear sightlines, interviewees noted, it can be difficult to gauge whether it is safe to enter intersections.

²⁸ Detailed findings follow a number of conventions, including:

- The use of quotations from interview notes to illustrate themes. When possible, these quotations are verbatim, as recorded by the interviewers. Researchers edited for spelling, grammar, and clarity only when necessary to clarify the meaning of the quote.
- Rather than specific numbers or percentages, analysts used relative proportions and terms such as “few,” “some,” “many,” and “most” to illustrate how commonly businesses provided feedback.
- The findings in this section are generalizations grouped into themes based on data collected in the interviews. District 6 received a comprehensive list of location-specific feedback.

Figure 11: Highway interchange in Dresbach



Intersections and interchanges most often cited as needing improvements include:

- Interstate 90 and Highway 52.
- Interstate 90 and Highway 63.
- Highways 43 and 61 in Winona.
- Highway 61 and Cannon River Avenue in Red Wing.

A few businesses brought up intersections that they thought had improved, including the interchange at Highway 52 and Goodhue County Road 9, and the addition of advance warning lights on Highway 61 in Winona.

The stoplight at Highway 57 and Main Street was a positive thing for the City of Kasson and the businesses along the corridor. It gives customers and employees a gap in the traffic on Highway 57 to safely enter and exit the facility.

Intersection Effects on Businesses

Interviewees explained that intersection issues can adversely affect their businesses. For example, one described how when trucks cannot easily cross an intersection, they can be late for deliveries, and “time is money.” Other businesses said their trucks would choose routes to avoid intersections they consider particularly unsafe or difficult to cross, which can add to time and business costs. Businesses also reported that they had experienced delays and damage to trucks at intersections where trucks have to make tight turns.

At the U.S. 52 and I-90 interchange, coming from the west going to southbound on Highway 52, you can’t turn to go south. There’s too much traffic—you can’t find a gap to turn into. Sometimes our trucks used to go north to the next exit and then turn around to go back south. Now they go east to County Road 7. Or they cut through Stewartville on Highway 30. This increases travel time.

Suggested Changes to Intersections

Almost one-quarter of businesses suggested changes to specific intersections, with half of them recommending new stoplights to improve safety and make intersections easier to cross. Several respondents suggested new lights on Interstate 35 in Owatonna, or on Highway 61 in Red Wing and Lake City to make it easier to enter the highway. Other intersections suggested for stoplight installation or improvements include:

- Highway 16 at the south intersection with Highway 63 in Spring Valley.
- Highway 30 and Highway 52.
- Highway 44 and Esch Drive in Caledonia.

At a few of the intersections where businesses suggested stoplights, interviewees noted that additional signage, warning lights, RCUTS,²⁹ or roundabouts might also address the issues.

At Highway 61 at 54th Avenue, a signal or RCUT would work. This would help with employees trying to leave the area at the end of the workday as well as trucks trying to make a left turn onto southbound Highway 61. It is challenging to get deliveries and workers out onto Highway 61 with the high-speed traffic and finding big enough gaps.

Several businesses requested changes to existing stoplights, typically asking MnDOT to reassess the timing of nearby stoplights. For example, they mentioned intersections in Chatfield, Stewartville, and Winona where they had experienced issues with stoplight timing. They explained that they have had to stop at multiple lights close to each other, which can disrupt the flow of traffic.

Roundabouts

One-third of businesses provided feedback on roundabouts. Most often, they offered criticism, typically discussing roundabouts that have a radius too small to allow a truck to pass through without going onto the apron.³⁰ Although aprons exist to give trucks extra turning space, trucks can tilt when driving onto the slight curb, which may displace and even damage products. Businesses also explained it can be difficult for slow-moving trucks to enter roundabouts in high-traffic situations.

Several businesses provided examples of when other drivers did not drive safely in roundabouts, particularly near trucks and in multiple-lane roundabouts. In multiple-lane roundabouts, trucks often take up multiple lanes, but other drivers may not realize this and attempt to drive alongside the truck. A few businesses stated that they avoid certain or all roundabouts because of the lack of turning space and other drivers. A few others requested more advance signage of roundabouts to allow drivers to find other routes.

²⁹ Restricted Crossing U-Turn Intersections (RCUTs), also called J-turn intersections, are a type of intersection design where drivers cannot turn left from side roads to larger roads like highways. Instead, they must turn right onto the main road and complete a U-turn further down the road. See the Federal Highway Administration for more information: <https://www.fhwa.dot.gov/publications/research/safety/09059/>.

³⁰ Aprons are curbs at the center of the roundabout that have gradual slopes to allow trucks to navigate the roundabout without striking fixed objects or other vehicles, while discouraging other motorists from crossing it and approaching the center.

Profile: Red Wing Shoe Company

Red Wing Shoe Company has been producing safety and recreational footwear for more than 100 years. The company also makes clothing and accessories, and treats leather for finished products. It employs about 1,000 people in two plants and the headquarters, creating products to ship across the globe. The company reported that 25 percent of its customers are now international.

The company's location in Red Wing allows it to serve its customers across the United States. The comprehensive transportation infrastructure in the nearby Twin Cities helps the company move supplies and products on trucks, trains, and planes. The company said trucking is particularly important because "everything in and out of Red Wing Shoe Company will spend some time on a truck."

To improve safety and efficiency, Red Wing Shoe Company would like to see four-lane highways in the area, particularly on the

narrow, curvy Highway 61. As one representative explained, traveling south to Rochester or north to the Twin Cities can be slow when trucks are stuck behind farm equipment on two-lane roads. Adding lanes would allow for improved efficiency, which would extend drivers' hours of service.

The company also recommended the addition of a stoplight at Highway 61 and Cannon River Avenue near its facility. Red Wing Shoe Company and other nearby manufacturers change shifts at similar times, which creates traffic congestion. Without a stoplight, company representatives said, it is difficult and sometimes unsafe for workers to get onto Highway 61. They mentioned that they "really, really like" the acceleration lane recently added outside their plant.

Number of employees
1,000

Cluster
Shoe Stores

Location
Red Wing, MN
Goodhue County

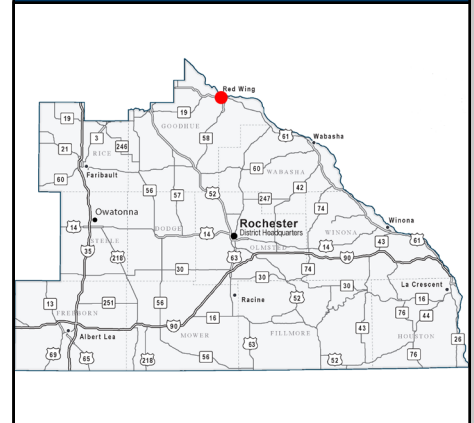


Figure 12: Roundabouts in Zumbrota



While most roundabout comments were critical, several businesses offered positive feedback. They appreciated how roundabouts can help with traffic flow, and praised the design of a few specific roundabouts, including the one at highways 14 and 42 in Eyota. A few businesses asked for new roundabouts in general or at specific locations.

Because we're over-length, they're an issue. We pick a route that avoids roundabouts. [MnDOT] says we can take them, but if we're over 53 feet, we hit signs and curbing. If we see that there's going to be a roundabout, we don't guess if we can make it; we just go around it. If it's oversized, we have to avoid the roundabouts. It could be 20 to 100 miles off of our route to go around it.

Lanes

Passing and Bypass Lanes

Almost half of businesses discussed passing or bypass lanes during their interviews. They stated that passing lanes can keep traffic flowing and improve efficiency and safety. When vehicles lack passing lanes, interviewees noted, drivers may attempt to pass in unsafe conditions and cause crashes. Businesses explained that passing lanes can reduce stress for their drivers in slower-moving vehicles because fewer vehicles will try to pass them under dangerous conditions.

A lack of passing lanes does not hinder us, but we know we hold back other vehicles in hilly terrain and long stretches of no-passing zones. We would like more passing lanes in rural areas where we get stuck behind a car going 5 mph under the limit, or behind farm equipment. Either us or someone else is causing the lane to back up; we get 1, 2, 3, 4 cars behind us. Our drivers watch backwards instead of forwards to see who will try to pass.

Businesses proposed new lanes in several areas, such as the two-lane part of Highway 14 between Dodge Center and Owatonna.³¹ Several others discussed the need for passing lanes on Highway 61 between Red Wing and Wabasha. Other locations they suggested include:

- Highway 52 between Chatfield and Rochester.
- Highway 56 north of Kenyon.
- Southbound Highway 63 south of Zumbro Falls.

Bypass lanes can also help improve traffic flow and safety, although in a different way than passing lanes, explained several interviewees. Without a bypass lane, traffic must slow down or stop for a turning vehicle. If drivers are too close or not paying attention, they may collide with the turning vehicle. Businesses described how if there is no bypass lane, many vehicles will pass the turning vehicle on the shoulder or use right-hand turn lanes as bypass lanes. Both of these maneuvers are illegal³² and can be unsafe.

There should be bypass lanes on left-hand turns of major intersections. One specific one is Highway 218 at the Steele County landfill. It is just over a hill going north, and if one truck is stopped, it makes it difficult for the next one. For safety, there should never be a truck stopped in a lane of traffic at 55 mph or greater.

Several businesses requested bypass lanes outside the entrance to their facility to allow smoother and safer traffic flow. Other suggested locations for bypass lanes include:

- Highway 52 at Union St. in Chatfield.
- Eastbound Highway 56 and 770th Avenue in Le Roy.
- Southbound Highway 61 at 5th Grant Boulevard West in Wabasha.

Turn Lanes

More than one-third of businesses provided feedback on turn lanes. They explained that turn lanes increase safety by giving slowing vehicles their own space, reducing the chance that inattentive drivers may run into

³¹ This segment of Highway 14 is further discussed below under “Multiple Lane Highways.” In May 2018, after these interviews were completed, MnDOT announced Corridors of Commerce funding to expand Highway 14 from two to four lanes between Dodge Center and Owatonna.

³² Minnesota Statue 2017, section 169.18.

them. Businesses added that without turn lanes, traffic can backup behind a vehicle waiting to turn. This can increase travel time for employees and shippers, which in turn can increase business costs.

We would like [turn lanes] in Utica, Dover, and Lewiston (TH 14 left turn lane to CSAH 25). Also the Kwik Trip entrance length, off Highway 14, needs attention. The Utica intersection of multiple roads with Highway 14, as well as traffic to and from the restaurant, makes for a nasty spot that needs to be addressed. They cause delays for employees and shippers resulting in higher costs, and we have safety concerns.

A few businesses noted existing turn lanes that they appreciate, such as those on Highway 63 in Racine and on Highway 76 in Caledonia. More often, though, businesses recommended new turn lanes. Specifically, one-quarter of businesses reported at least one place where they thought new turn lanes would help with safety and traffic flow, with businesses in western counties particularly interested in new turn lanes. The locations suggested by businesses include:

- Interstate 90 and Highway 52.
- Highway 3 at multiple intersections in Faribault, including at 20th Street Northwest.
- Highways 30 and 218.
- Highway 63 at multiple intersections in Stewartville, including at Olmsted County Road 6.
- From westbound 16th Street in Rochester to northbound Highway 52.

In addition to requesting new turn lanes, several businesses discussed changes they would like to see to existing lanes. Most often, they gave examples of turn lanes that need to be longer. For example, multiple businesses said a longer turn lane is needed at Highway 43 and Highway 61 because it is too short and traffic backs up during busy times. Interview respondents also cited a few locations where they would like to have wider turn lanes, particularly for oversize products. One food production business representative said, “It’s hard on the brakes when the drivers have to slow down in such a short distance. They need to get off the brakes so they’re not heating up.”

At Dodge County Road 9 at U.S. 14, we would like a longer right turn lane or remove the at-grade intersection there in favor of a bridge and exit. This would be the shorter route for our freight to/from the east. The right turn lane is too short for our trucks, and our trucks are too long for left turns onto U.S. 14 east – can’t wait in between travel lanes of 14. We tell our freight to use the Airport Drive exit even though it’s a longer drive due to wait time and safety concerns at County Road 9.

Acceleration Lanes

One-third of businesses interviewed discussed acceleration lanes. Businesses appreciate these lanes because they allow vehicles to get up to speed before merging with traffic, which improves safety. They explained that acceleration lanes let vehicles join traffic sooner than they could if they had to wait for a gap in traffic, which can

reduce travel time and therefore costs. A few said their drivers take less direct routes to avoid intersections without acceleration lanes, and one said they had seen trucks using shoulders as acceleration lanes instead.

Several businesses gave examples of existing acceleration lanes that they like, including:

- Highway 14 westbound to Interstate 35 northbound.
- Highway 58 to Highway 52 northbound.
- Highway 61 north of Red Wing.

About one-sixth of businesses mentioned specific locations where they would like MnDOT to add acceleration lanes. Several businesses requested acceleration lanes in locations on or near hills, while a few others asked for acceleration lanes outside their facilities for exiting trucks. Other places that businesses would like to see acceleration lanes include:

- Interstate 90 and Highway 63.
- Eastbound Interstate 90 and Highway 52.
- Olmstead County Highway 104 southbound turning onto westbound Highway 14.

Would like to see northbound and southbound acceleration lanes at Highway 61 and Bundy Boulevard. Timing left or right turns from Bundy to Highway 61 gets tricky due to the traffic light at highways 43 and 61—it's hard to find gaps. Drivers really speed up after the light going south on Highway 61.

Besides adding new acceleration lanes, some businesses discussed the need for lengthening current ones. They explained that some lanes are too short to allow them to get up to speed. Several businesses brought up the need for longer acceleration lanes in general and in specific locations, including Interstate 90 to northbound Interstate 35.

Multiple-Lane Highways

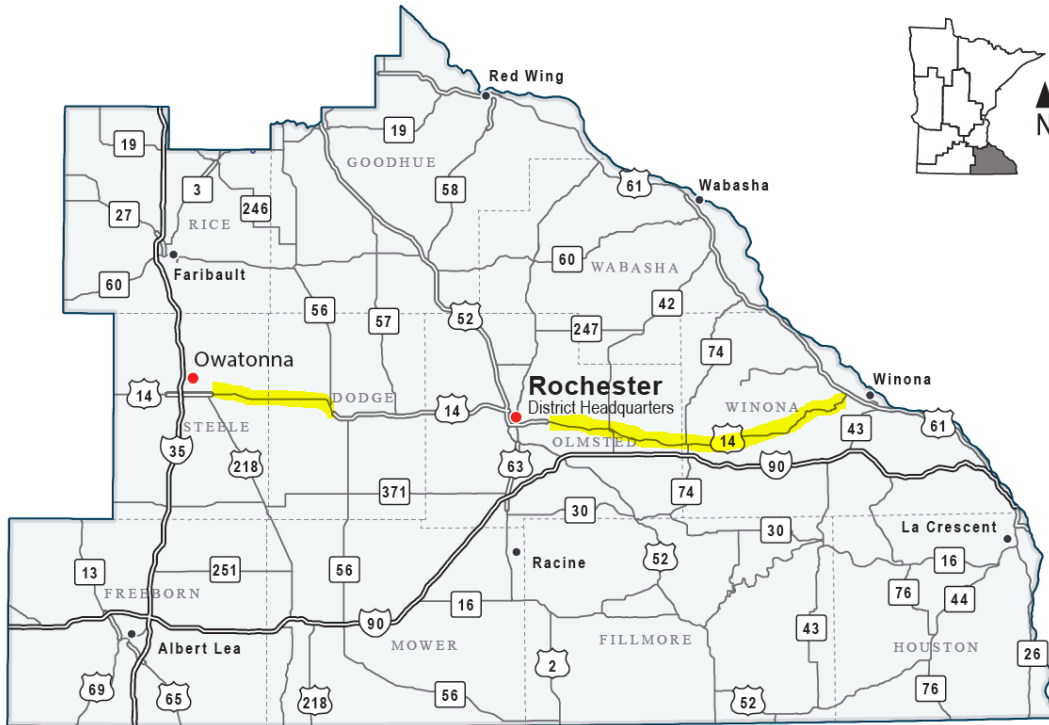
One-quarter of businesses said there is a need for additional highway lanes in different parts of District 6. Businesses explained that four-lane highways help with traffic flow and safety, allowing drivers to keep moving around slow or turning vehicles. Four-lane highways also reduce delays for employees, shipments, and deliveries. Businesses said that truck drivers prefer to have four lanes because they have more room to stop in an emergency. They also explained that without an additional lane, many vehicles pass to maintain their desired speed, sometimes under unsafe conditions.

Four lanes on Highway 61 would allow drivers to get around farm equipment during the harvest. It would add safety and efficiency. It would extend how far truck drivers can get on the road in one shift because they wouldn't be slowed down by traffic.

More than half of requests for additional lanes involved Highway 14. The road has four lanes from Dodge Center to Rochester, but some other sections are still two lanes. Figure 13 highlights which segments of Highway 14

currently have two lanes. Almost all of the comments about additional lanes on Highway 14 involved the stretch of road between Dodge Center and Owatonna, but a few businesses also discussed adding a lane to Highway 14 between Rochester and Winona.

Figure 13: Two-lane segments of Highway 14



A few businesses explained that at present they use alternative routes to avoid Highway 14 between Dodge Center and Owatonna. They consider this two-lane segment unsafe, and reported crashes and near-crashes there. Fortunately, in May 2018, MnDOT received funding to finish expanding Highway 14 to four lanes between Dodge Center and Owatonna, which will create a continuous four-lane route between I-35 and Rochester. The project will occur within the next four years.

Other highway segments cited as needing four lanes include:

- Highway 43 from Winona to Interstate 90.
- Highway 52 from Rochester to Iowa.
- Highway 60 from Faribault to Mankato.
- Highway 61 from north of Red Wing through Lake City.

Shoulders

More than one-third of the businesses interviewed provided input on shoulders, with most saying shoulders are an important safety feature for truck drivers and others. A few of the businesses commented that shoulder rumble strips make roads safer and that they are happy to see them being added to state highways.

Existing shoulders are useful for our carriers to pull over, often to check directions to our business. Roads that lack shoulders could be a safety and visibility concern for other traffic.

Wide Shoulders

More than one-quarter of the businesses provided feedback on shoulder width. They appreciated wide shoulders because they provide a place for trucks to pull over safely in emergencies, and allow drivers to avoid crashes and stalled vehicles. A few commented that wide shoulders provide a safe distance for vehicles passing bicyclists or farm equipment. A few other businesses said that wide shoulders open up the line of sight to see around corners, and provide extra space for oversize loads.

MN 60 from Faribault to Morristown needs a shoulder wide enough for trucks to pull over. We have a lot of trucks coming to/from Mankato that can't pull over on this stretch of MN 60, and this isn't safe for the drivers.

Among other locations, businesses requested wider shoulders in these areas:

- Highway 43 close to Winona and Highway 61.
- Highway 60 from Mankato to Highway 52.
- Highway 63 north and south of Rochester.

Paved Shoulders

One-sixth of the businesses provided feedback on shoulder paving, mostly supporting additional paving. Businesses explained that trucks can tip on, slide off, or sink into unpaved shoulders. One carrier described how unpaved shoulders can cause more of an issue in spring when the ground is particularly soft.

We like hard surface shoulders for wide loads because a lot of time we have to ride the shoulder to do our wide loads. Secondary routes with paved shoulders would also be nice. Shoulders are soft, not built to hold weight. We sink into gravel shoulders.

Businesses identified areas that could benefit from paved shoulders, including:

- Highway 26 from La Crescent to the Iowa border.
- Highway 30 between Blooming Prairie and Interstate 35.
- Highway 52 between Fountain and Marion.

Bridges

Overall, businesses interviewed in District 6 did not provide much positive or negative feedback on bridges. A few described challenges they have experienced with bridge clearance, while a few others said bridge capacity

Profile: PlastiCert

PlastiCert provides custom-injected molded composite parts for agriculture, aviation, sporting goods, telecommunications, and other industries. All of its customers are located within the United States, but the company occasionally ships to China.

PlastiCert cites its location in Lewiston as a strength because clients and materials can easily travel from Rochester or the Twin Cities to their facility, and its small town location saves some business costs. Company representatives also reported access to Interstate 90 and Highway 14 as benefits of the location.

The quality of nearby roads can affect PlastiCert's bottom line. For instance, officials explained that some of the county roads in the area have rough pavement. To

avoid damage to their product, shippers drive slower on these stretches, which ultimately increases costs.

One of the major transportation challenges PlastiCert faces is travelling on Highway 14. The road is subject to heavy agricultural use—resulting in a lot of slow-moving traffic—and lacks passing and bypass lanes, particularly west of Lewiston to Eyota, a nearly 20-mile stretch. Specifically, PlastiCert would like passing lanes in Dover, Lewiston, and Utica where vehicles turning left often cause backups. PlastiCert also requested a bypass lane near the mobile home park in Stockton. Highway 14 can also become congested at shift changes, and inclement weather can cause road conditions to deteriorate quickly.

Number of employees

27

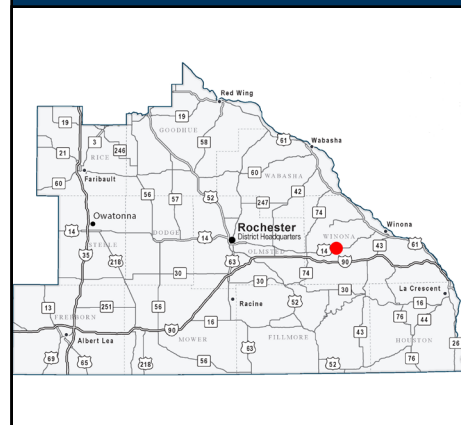
Cluster

Metalworking Technology

Location

Lewiston, MN

Winona County



has been an issue in certain locations. One Olmsted County manufacturer mentioned a railroad bridge east of Rochester that is a difficult and tight fit for its trucks.

We don't produce very heavy loads, but they are large and the height of all of the bridges throughout the United States really affects us. We have to design our equipment to fit on the specialized lower low-boy trailers and still measure at 13 feet 4 inches or less when loaded.

Businesses in cities along the Mississippi River most often discussed bridge issues. One manufacturer said that its truckers have found the new Highway 43 bridge going into Winona too steep, particularly in winter because of the curve. A few businesses said that bridge construction lengthens the time for employees and deliveries to reach their destinations. Some requested more lanes on bridges to increase overall traffic capacity.

Figure 14: Overpass bridge



Signage

More than three-quarters of the businesses gave input on signage. Most suggested ways that signage in District 6 could be improved, offering general ideas or specific locations for changes. Several praised the existing signage in southeast Minnesota.

In general, signage in Minnesota is better than in other states—every curve is properly signed, signs are very reflective and easy to see, and the placement for advance warning is better than other states.

General Signage Feedback

About one-quarter of businesses commented on signage in general, describing the types of signage they appreciate and which signage features they would broadly like to see more of. Most often, they appreciated and encouraged more use of:

- Advance notice of intersections, including signs warning of signals or stop signs ahead.
- Stop sign features, including reflectors and LED flashers on the signs themselves.
- Traffic approaching signs, also known as *rural intersection conflict warning system (RICWS)* signs.

We like LED lights around stop signs because they really stand out in low-visibility conditions; we think more would be good. By Cambridge and Sauk Centre, it's flat; and you can see these signs for 9-10 miles out. It's attention-grabbing.

Figure 15: Rural intersection conflict warning system (RICWS) sign



Specific Signage Requests

More than one-third of the businesses requested specific signage changes at different locations around District 6. Most often, they asked for more directional signage, including signs directing drivers to their facilities and improved street and highway signs. They explained that these signs can make it easier for people to find their way, and can reduce confusion and last-minute lane changes.

Other common types of specific signage requests included:

- **Truck route signage:** more and improved signage on the location of truck routes.
- **Warning signage:** more signs to warn drivers of curves, blind approaches, congested areas, and other issues.
- **Truck warning signage:** more signs to warn of trucks approaching and slow trucks.
- **Infrastructure signage:** more signs to notify drivers of upcoming acceleration lanes, exits, and other options.

One specific area of concern includes southbound Highway 52 to the southbound Highway 63 ramp. The curve is sharp and cambered in the wrong direction. There have been many truck rollovers at this location. We have tipped trucks at this location. It is the number one location [of concern] in Rochester. There should be advanced warning signs or flashers warning of a truck tipping hazard with a picture of a truck tipping over.

Businesses typically said that these sorts of signs improve safety by notifying and warning drivers of possible hazards. As one business representative put it, “Anything that can give information faster on what is happening on the roadway helps drivers anticipate conditions and delays, or inform decisions.”

Maybe a sign could be placed from St. Olaf Avenue by the bakery onto Highway 3 to let vehicles know the sightline is restricted. This is 100 percent for safety. The trucks typically come in on St. Olaf Avenue, but leave by traveling Water Street up to Highway 3.

Electronic, Dynamic Message Signs

More than half of businesses interviewed answered a question about MnDOT’s electronic, changeable message signs and the types of messages to feature. Most often, those interviewed had no additional suggestions for messages to include but did appreciate the existing signs and messages, saying they are helpful and draw more attention from drivers than permanent signs.

[The signs should say] when there are accidents ahead and identify where the accident is. This would be helpful especially before the Highway 19 exit on Northbound I-35 and the Elko Exit on Southbound I-35, because there seem to be a lot of accidents and delays in between Highway 19 and Elko.

About one-sixth of the businesses suggested more messages about weather and road conditions. They said messages could warn drivers of icy or flooded roads, as well as about winter weather conditions and strong crosswinds.

Figure 16: Electronic, dynamic message sign



Recommended topics other than weather and road conditions include:

- Warnings of crashes.
- Notification of upcoming construction projects.
- Traffic and travel time updates.
- General safety messages and reminders.
- Notification of alternate routes around crashes or congestion.

Several businesses requested additional electronic message signs, including more on interstates 35 and 90, as well as Highway 52 and 63. A few businesses in less populated areas said they did not see a need for these signs.

I really like travel time signage. I can slow down ahead of having to see brake lights when we're coming up to slower traffic. We just slow down and take our time.

Operations and Maintenance

Road Conditions

Smooth Pavement

Half of businesses discussed pavement quality, with one-quarter offering positive feedback on pavement quality and the other quarter indicating where rough pavement could be improved.

Of those who offered positive feedback, most said that generally the pavement quality in Minnesota is good, and that it has improved over time. They praised MnDOT for keeping the roads well maintained and fixing problem areas that develop. Some specific spots that businesses mentioned as having smooth pavement were:

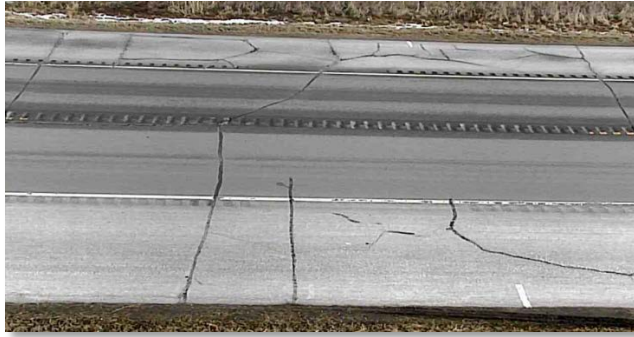
- Highways 21 and 60 near Faribault after a recent repaving project.
- Highway 61 in Red Wing since the completion of the Main Street project.
- Highways 218 after a recent repaving project.

I see the state spending money to get our roads fixed when they need to be.

Rough Pavement

Businesses described different stretches of road that have uneven pavement. They most often mentioned poor pavement quality on Highway 61, and discussed multiple segments of 61 from Red Wing to La Crosse. One specifically said that the Highway 61 shoulder south of Lake City is breaking up, and another said that the highway between Minneiska and Wabasha has developed ruts. That company further explained that the ruts let water pool on the road, which can create unsafe conditions and cause vehicles to hydroplane. A few businesses also cited gaps in the pavement along Highway 61, particularly north and south of Winona.

Figure 17: Pavement breaking apart



Besides Highway 61, businesses most often said that highways 14, 52, and 63 have rough pavement. They stated that Highway 14 near Winona has been worn down from frac sand hauling,³³ and how there are ruts in the road east of Rochester. Businesses also mentioned Highway 63 between Lake City and Rochester as an area with rough pavement, as well as Highway 52 near Preston and near Cannon Falls.

On westbound Highway 14 at the junction of C.S.A.H. 22 in Rochester to 200 feet west, the pavement in the “slow lane” is significantly bad, to the point where the drivers are advised not to travel in it if possible.

Other areas where businesses reported rough pavement include:

- Interstate 35 between 14 and the northern limits of Owatonna.
- Highway 16 adjacent to Preston.
- Highway 30 from Hayfield to Interstate 35 has many potholes and bumps.
- Highway 58 bridges on each side of Goodhue County Road 16.

MnDOT has existing plans to resurface several of the identified highways within the next two to three years. For example, one business reported that after the Zumbrota bridge project, MnDOT left a bump in the pavement on northbound Highway 52. The MnDOT interviewer explained to the business that the wedge causing the bump is temporary, and due to be fixed when the paving is completed in spring 2018.

Rough Pavement Effects on Businesses

One-fifth of businesses discussed how rough pavement can affect their business. Most often, they gave examples of how driving over bumpy roads can damage their supplies and product. For instance, one agricultural company explained that when its skim milk is shaken too much by rough pavement, the milk can foam, which is undesirable. Another business described how rough pavement can damage the fibers on material spools when they bounce around during shipping.

³³ Frac sand mining involves extracting natural gas from sand. In southeastern Minnesota and southwestern Wisconsin, this activity occurs near the Mississippi River.

Profile: Automation Services

Automation Services designs and creates control panels for a variety of products, including conveyor belts, cranes, medical devices, and wastewater plants. The company serves more than 400 customers around the United States and in 27 other countries, including Brazil, China, and Russia.

Automation Services relies on smooth pavement to make sure its products arrive safely at their destination. Control panels have complex, delicate interiors that can be rattled during truck rides over uneven roads. Although the products may appear undamaged when they arrive at the customer's location, a control panel that has had a rough journey may have performance issues when used. According to the company's representative, Highway 61 from Red Wing to Wabasha is rough, but Wabasha County has been doing a great job rebuilding roads.

The company also relies on quick transportation to provide ongoing service for its products.



For instance, Automation Services created and services the control panels at wastewater facilities in cities around southeast Minnesota. When a control panel has an issue, employees need to get to the site as soon as possible to prevent wastewater overflows. Getting the latest information on traffic, road, and construction conditions helps employees find the best route year-round.

Employee safety is paramount to Automation Services. The company requested passing lanes on Highway 61 between Lake City and Red Wing because employees report daily experiences of near-crashes when other people try to pass unsafely. Passing lanes would also help employees travel more quickly to their destinations because they could bypass tourists who slow down near Lake Pepin.

Number of employees

14

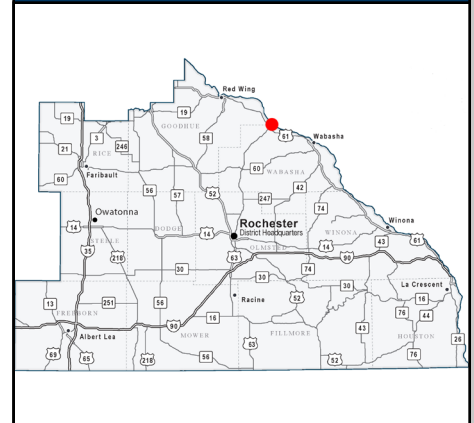
Cluster

Production Technology and Heavy Machinery

Location

Lake City, MN

Wabasha County



I took all four tires off our trailer into the shop in town because it was bouncing so much, but it wasn't the tires, it was the roads. Rough pavement damages equipment and products.

Several other businesses said that traveling on uneven roads can damage the tires and brakes on trucks and other equipment. Even if a bump is not big enough to cause immediate breakage, rough pavement can cause wear and tear on vehicles over time, adding to business costs when they must cover repairs at a quicker rate than normal.

Bumpy roads mean that drivers must stay below the speed limit to protect products and drive safely, causing delays, explained some businesses. A few others said that they have to use air ride trucks³⁴ to ensure their product is not damaged by the roads, which is a more expensive form of shipping.

Snow and Ice Removal

Many businesses commented on the need for quick and effective snow and ice removal to facilitate employees arriving and departing work as well as for getting freight in and out.

Because some businesses operate 24 hours per day, prompt snow removal is more important than snow removal at any particular time. Besides a prompt response, the most important time for plowing is early in the morning, to allow employees to arrive at work; some businesses have employees arriving as early as five in the morning. Another important time for snow removal is in the mid- to late afternoon when many employees begin departing work, final supply shipments come into facilities, and products are shipped out.

Figure 18: Snowplow clearing the highway



³⁴ In air ride trucks, trailers rest on a cushion of air instead of steel springs for suspension, which absorbs more shock during transit.

Almost half of businesses complimented MnDOT’s snow and ice removal, saying that snow and ice removal does not generally affect their business because roads are well maintained in winter. Businesses offered positive feedback of MnDOT’s snow removal on both major and minor routes throughout District 6.

Issues with Snow and Ice Removal

One-third of businesses mentioned issues with snow and ice removal, and discussed how removal can affect their businesses. They also suggested locations for improved removal.

Figure 19: Truck delivering road salt



Snow and Ice Removal Effects on Businesses

Bad weather can prevent employees from arriving to work on time, or arriving at all. A few businesses mentioned slowed or stalled production as an effect of insufficient or delayed snow removal. They explained that if the roads are closed or in poor condition, they may not receive their supply shipments or be able to ship out their products. For companies with limited storage capacity, missed inbound and outbound deliveries can create production challenges.

If roads aren't cleared sufficiently, we may have to cancel routes and deliveries, which makes customers unhappy.

Several businesses expressed concerns with the use of chemicals and brines for melting snow and ice. They explained that the use of salt and chlorides or other solutions on the road can cause equipment to corrode. Overall, the businesses understood the need for chemicals to keep roads clear in winter. At the same time, they wanted MnDOT to be careful not to overuse salt and chemicals, and to look at trying different, less corrosive mixes.

The use of magnesium chloride is really causing harm to trucks and trailers. It's causing rust and corrosion, especially on aluminum and steel joints.

Locations Suggested for Improved Snow and Ice Removal

Some businesses identified locations that they felt require additional snow removal or are prone to blowing snow, drifting snow, or ice buildup—especially on hills. Examples of these locations include:

- Highway 14: snow drifts, icy conditions.
- Highway 63 from Zumbro Falls to Stewartville: snow drifts, icy hills.
- Interstate 35 from Owatonna to Albert Lea: snow drifts, blowing snow, black ice.
- Interstate 90: snow drifts, blowing snow.

Communications

511

MnDOT provides 511 as a public service “to help travelers access information about road conditions, traffic incidents, commercial vehicle restrictions, and weather information via the phone or the Web, 24 hours a day, seven days a week.”³⁵ Most businesses interviewed said they were aware of 511, even if they did not use it, while one-quarter said they were not aware of it. There was no difference in awareness of 511 between manufacturers that handle their own shipping and those that contract it out. Compared to many of the previously studied districts, more businesses in District 6 were already familiar with 511.

Businesses that use 511 most often said they rely on the service more in the winter than in other seasons. They also use it to check road conditions, crashes, and construction projects. Several businesses said that their staff check 511 daily, while a similar number said they rarely use the application.

Those businesses that provided feedback on 511 mostly praised the system, explaining that it is easy to use and more stable than in the past. Several businesses that use 511 suggested how MnDOT could improve the service, including:

- Make the site available in other languages.
- Provide more detailed construction information, including length and width restrictions, and the estimated completion dates of projects.
- Add more cameras showing road conditions.
- Publicize 511 more.

³⁵ Minnesota Department of Transportation. “About 511,” Accessed January, 2018, <https://hb.511mn.org/About.html>.

Figure 20: 511 road incident screenshot #1 (road condition overview)

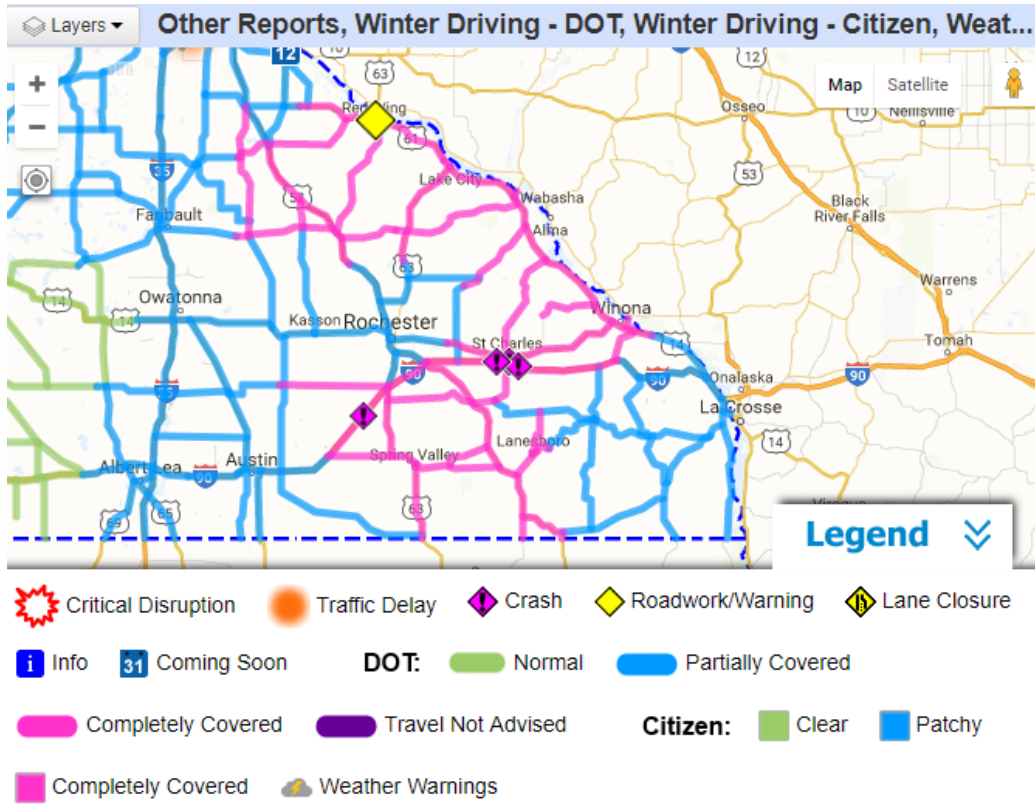
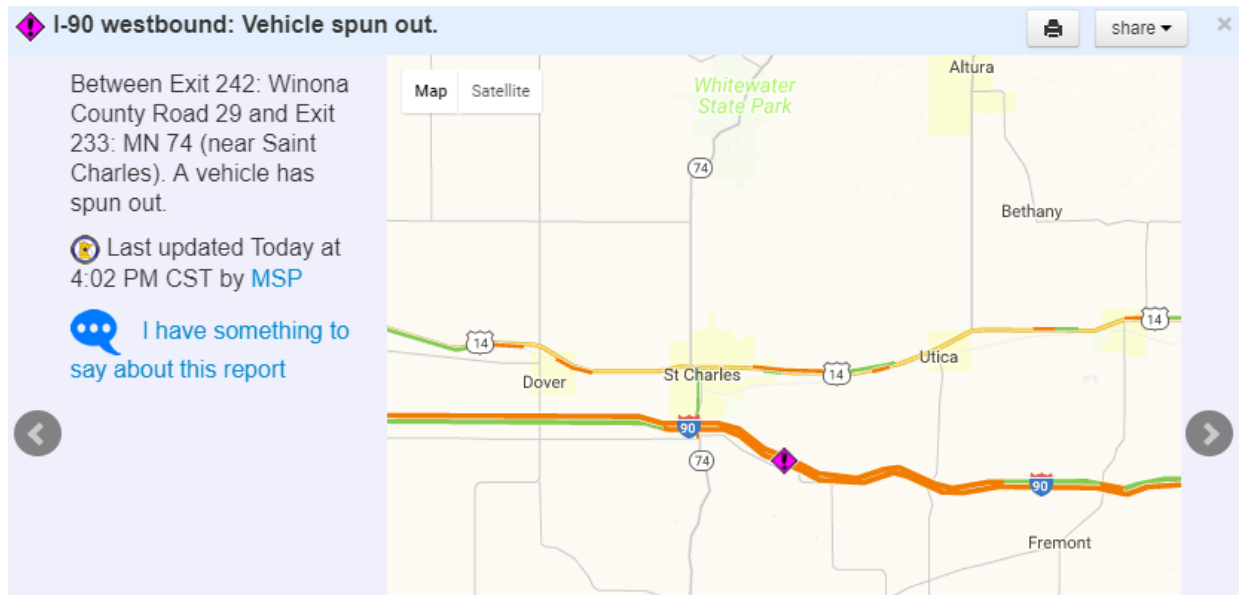


Figure 21: 511 road incident screenshot #2 (pop-out from screenshot #1 in describing road condition)



I thought it would be good for MnDOT to add MapQuest type functionality with prompts for start/end trip locations, weight, height inputs, shorter distance options, route logging to compare results of fastest routes.

About half of the businesses interviewed responded to a question about whether they had viewed the photos or videos of road conditions on 511, either from still cameras or snowplow cameras. Of those respondents, half said that they had viewed the videos or photos. Businesses offered very positive feedback on the cameras, saying the pictures and videos are accurate and helpful. They explained that they use the footage and pictures to make travel decisions, especially in winter, and said it is a good feature to help employees and drivers stay safe. Some of their ideas for making the camera system better include:

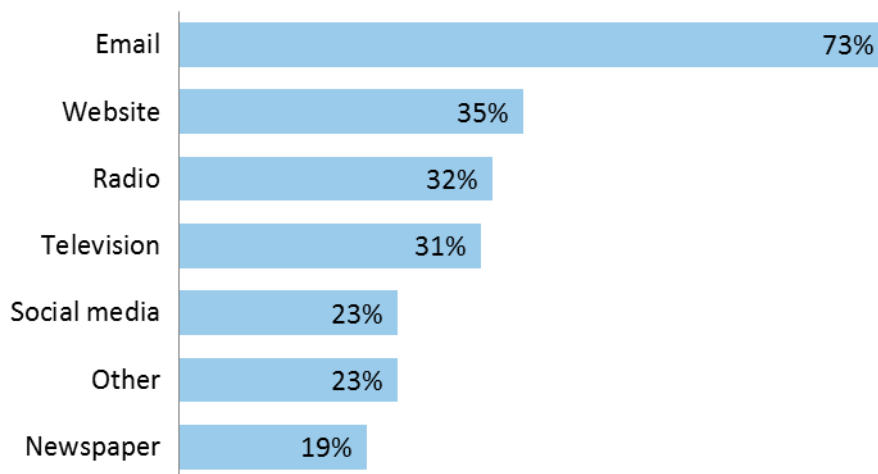
- Make clearer which cardinal direction the camera is facing.
- Add more cameras in the Dexter and St. Charles areas.
- Offer more frequent updates to still photos.

Preferred Communication Methods

More than three-quarters of businesses answered a question about the best methods for MnDOT to communicate with them about construction projects and road conditions. Figure 22 shows that 73 percent of respondents identified email as the best method, making it by far the most popular response. Website, radio, and television were the next most common responses. “Other” communication methods most mentioned were 511, roadside signs, texts, in-person visits, and phone calls.

Figure 22: Businesses’ preferred communication methods

In general, what are the best methods for MnDOT to communicate with your business about construction projects and road conditions? (n=93)



Road Construction Communication

More than half of the businesses said they felt well informed by MnDOT communications during road construction season. Manufacturers that ship their own products more often reported that they felt informed than manufacturers that contract out their shipping.

Although most respondents gave general positive feedback, several mentioned that they appreciate signs put up along roadsides that warn travelers of upcoming construction projects in that area. A few others said that MnDOT communications had improved over time.

Figure 23: Construction workers rebuild the highway in Red Wing



About one-fifth of respondents answered that they do not feel well informed about construction projects. Several of them learned about 511 during the interview and said it would be a useful tool for them in the future. Specific issues they noted include:

- It is difficult to find information about recommended detours and their length.
- MnDOT does not give enough notice of upcoming projects.

Suggestions for Improvement

More than one-quarter of businesses offered suggestions on how MnDOT could improve road construction communication. While a few respondents said they heard from MnDOT about upcoming projects, they felt that information sometimes comes too early, meaning businesses forget the information until the project starts. They all appreciated the early notice but would like more information closer to the start date as well.

Other suggestions from businesses include:

- Inform a larger radius of affected businesses when communicating about local projects.
- Use electronic signs to show weekly update information on construction projects in the area.

Profile: Mrs. Gerry's Kitchen

Mrs. Gerry's Kitchen has been producing potato salads, mashed potatoes, coleslaws, pasta salads, and other dishes for more than four decades. The company uses ingredients from around the country to create 120 different food products that it sells to grocery stores and food distribution companies. Mrs. Gerry's ships to customers within a 500-mile radius, but has been broadening its reach in recent years across the United States.

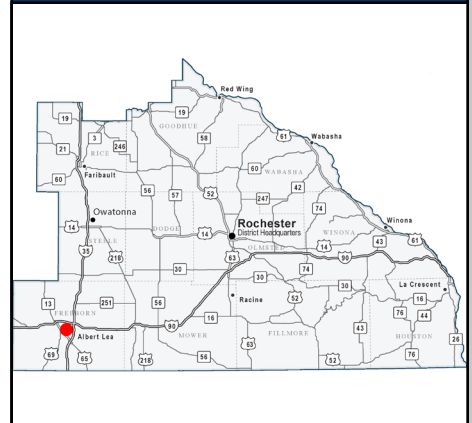
With perishable food at stake, Mrs. Gerry's needs its trucks and carriers to get goods to market as quickly as possible to maximize a product's time on the shelf before it expires. The company's facility turns over its inventory every three days, which means Mrs. Gerry's must receive supplies on time and get products out the door to make room for the next batch.

Bad weather can negatively affect production. In the winter, snow and ice storms can make it difficult for employees to get to the facility. Those same storms can cause MnDOT to close Interstate 90 because it is unsafe to drive. In those instances, the company may not receive its multiple daily shipments of potatoes from Idaho on time. The company can process 10,000 pounds of potatoes per hour, but without enough supplies and workers, the company must temporarily shut down production lines. They must then fully sanitize the line before they can resume production, adding costs to production and delaying shipments to customers.

Number of employees
200

Cluster
Food Processing and Manufacturing

Location
Albert Lea, MN
Freeborn County



- Notify chambers of commerce so they can inform members.
- Visit businesses to explain the impacts of upcoming projects.

MnDOT should do updates as construction progresses. I have seen something saying that the road is closed or down to one lane and when I get to it, there is only work on the shoulder or in the ditch and not affecting the road.

Policy

Weight Restrictions

About one-third of businesses, including nearly all the carriers interviewed, commented on weight restrictions. Of the manufacturers that commented on weight restrictions, half shipped at least some of their product themselves, while the other half contracted out all their shipping.

Some businesses said they are very careful, sometimes even altering their trucks or loads, to ensure they meet weight limits. One business representative said, “We typically load our trucks to 80,000 pounds. In the winter we have to load them lighter because of the weight of snow and ice accumulation.” A few businesses requested clear signage and communication about weight restrictions, especially during construction, so drivers have enough notice to re-route.

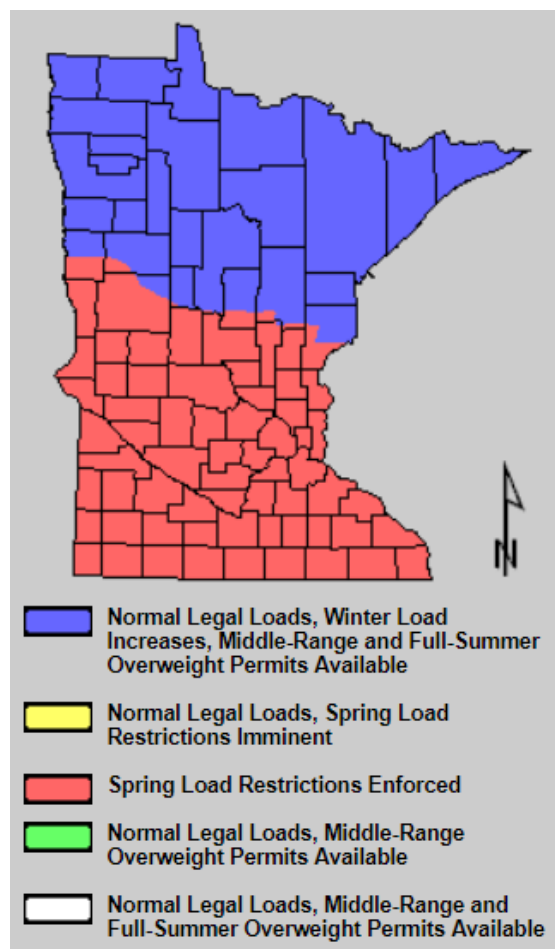
Businesses noted that allowing trucks to haul more material would reduce shipping costs and relieve pressure on the current truck driver shortage. They proposed that Minnesota allow increased weights on trucks that use additional axles. One business also suggested using “super-B” trailers, which are sets of two trailers with eight axles. Such trailers are used in Canada.

Several businesses said they would like the ability to increase loads on Minnesota roads. Some cited the border states, such as Iowa, North Dakota, South Dakota, and Wisconsin, which allow trucks to haul heavier loads. As one business stated, one truck load in Wisconsin is one and one-quarter truck loads in Minnesota, which means they need five trucks in Minnesota to haul the same amount of material that four trucks in Wisconsin can haul. Another business mentioned that it sometimes has to make up to 20 percent fewer deliveries with one truckload, depending on the product, because weight restrictions reduce the amount of product the trucks can carry.

A few businesses also cited challenges with interstate travel. One business said suppliers from California need to obtain permits for Minnesota but do not need state-specific permits to travel through other states. Another said their trucks often have to stop at the Minnesota border to wait until they are authorized to travel into the next state. These businesses expressed a preference for more consistent weight limits among states.

A few businesses said they support Minnesota’s weight limits.

Figure 24: MnDOT seasonal load status as of March 16, 2018



Spring Weight Restrictions

Many of the businesses that talked about weight restrictions commented specifically on spring weight restrictions, which restrict heavy trucks from operating on some roads during the spring thaw when pavement is in a weakened state. The restrictions affect paved roads that do not meet the 10-ton spring load design standard.

Nearly half of these comments were about spring restrictions on county and local roads. Businesses said it becomes more difficult to ship products to smaller cities and towns when spring restrictions are in effect. Some of the businesses that use agricultural products said farmers are forced to bring in more, lighter loads when they haul in the spring. Other businesses said their preferred routes are no longer accessible or that they experience additional hauling challenges because their business is located on a local road.

A few other businesses said spring restrictions affect them, but not a lot. One business inquired about allowing exceptions when a carrier has a “compelling need to move heavy freight,” even if MnDOT were to charge a higher fee for such exceptions.

A few businesses also mentioned that hauling their product would be easier if more state highways were converted to year-round 10-ton roads. Specifically, they cited highways 19, 21, 42, and 56. Businesses would prefer the ability to use Highway 21 year-round because it allows them to avoid Twin Cities traffic.

Oversize Loads

Several businesses mentioned that they haul oversize loads. A few said oversize restrictions have minimal impact on their business, although the restrictions take some additional planning. A few also said that re-routing around construction on interstates 35 and 90 can add miles and cost to a shipment. Another business mentioned that it has to work around summer weekend and holiday travel restrictions for oversize loads and noted that some states are changing similar rules.

Figure 25: Large loads face unique challenges



Permitting Process

The permitting process was a concern for some businesses. About half said they have no problems getting permits and that the permitting system has improved in recent years, while a few others requested more coordination between the state and counties. One business described an incident where a discrepancy between state and county permits left them not knowing whether they could use a particular route.

A few businesses said they have had difficulty with overweight permits. One business said MnDOT's permitting system does not operate as smoothly as it does in other states, but added that permitting staff were helpful. A few businesses also mentioned that waiting for permits has caused shipment delays.

Carrier Policies

Inspections and Weigh Stations

Several businesses offered feedback on vehicle inspections and weigh stations, such as:

- Vehicles, particularly fifth-wheel trailers, are inspected too frequently.

Profile: Truss Specialists

Truss Specialists has been creating wood roof and floor trusses for retail lumberyards that serve residential, commercial, and agricultural construction since 1982. Its customers are local and typically located within 150 miles of the company. The company reported that its La Crescent location is a strength because it is near large cities and Interstate 90, yet overhead costs are low compared to bigger cities.

As an oversize product, trusses face unique transportation challenges. For instance, the company has a difficult time fitting its products through roundabouts, and sometimes the products hang into bike lanes. Truss Specialist drivers benefit greatly from wide and paved shoulders to help them with their oversize loads. The company recommended that MnDOT pave the shoulders on

Highway 26 between La Crescent and the Iowa border.

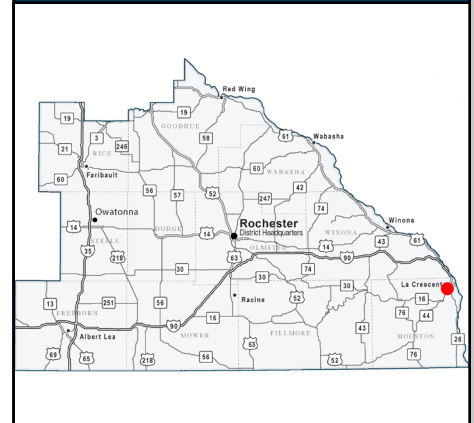
Oversize products require permits from different levels of government, and sometimes the state, counties, and townships are not coordinated in their permitting. This can make it difficult to find an efficient route to delivery sites.

Finding a path can be even more difficult during construction season because of bridge restrictions. During the Dresbach bridge construction on Interstate 90, for example, Truss Specialists' drivers had to travel to Prairie du Chien to cross the river and circle back to La Crosse, Wisconsin. This turned a typically short drive into a more than two-hour trip. However, the company praised the MnDOT project manager for keeping them informed on the project.

Number of employees
80

Cluster
Wood products

Location
La Crescent, MN
Houston County



- Products coming into the state are treated differently than products leaving the state.
- There has been inconsistent enforcement of rules, which shows a need for inspector education on driver and company rules and responsibilities.
- Weigh stations are not open often enough and do not have enough room for parking.

One business reported that working with commercial vehicle inspectors has been great.

Driver Restrictions

Several businesses commented on new driver restrictions, saying electronic logging devices (see next section), rules about hours of service, and other new policies have limited their ability to hire drivers. In addition to existing regulations, new regulations—like the need to have a current Department of Transportation health card—are restricting drivers who are both qualified and interested in entering or staying in the field. These regulations cause concern among businesses that they will not have enough trucks and drivers available to haul freight.

Electronic Logging Devices

The most recent change to regulations is the federal requirement that each driver use an electronic logging device (ELD or e-log). ELDs synchronize with the vehicle’s engine and record driving time automatically and are required as part of federal legislation to improve safety in the trucking industry.³⁶

Without prompting, several interviewees—including about half of the carriers interviewed—offered feedback on ELDs. Most businesses said they were concerned that ELDs would put additional strain on truck stops and rest areas. One business mentioned that it would cause more trucks to park on shoulders. A few other businesses said ELDs would worsen the current driver shortage, hurt small businesses, create additional delays, and reduce the number of deliveries made. As one business representative stated, “We anticipate that when this become a requirement that you will see trucks increasing speeds and parking on roadway shoulders due to the Electronic Log Book.”

One business said it likes ELDs because it already uses them, and the requirement that other companies use ELDs too will put the business on even standing with its competitors.

General Laws, Rules, and Policies

Businesses also provided comments on general laws, rules, and policies. Most comments related to speed, with suggestions for both increased and decreased speeds. For increases, the requests from businesses include:

- Increase the limit on the interstates to at least 75 miles per hour.
- Increase the limit on Highway 61 near Reads Landing to 55 miles per hour.
- Increase the limit on Highway 56 (no location or speed specified).

³⁶ See the Federal Motor Carrier Safety Administration for more information: <https://www.fmcsa.dot.gov/hours-service/elds/electronic-logging-devices>.

- Increase the limit on Highway 14 where it is two lanes.

For decreases, requests include:

- Reduce the limit on Highway 61 near Golf Line Drive in Red Wing to 45 miles per hour to allow for truck access.
- Reduce the limit on Highway 61 southbound on the north side of Lake City.
- Reduce the limit on Highway 56 in Le Roy because current speeds are unsafe for pedestrians.

Other requests include:

- When performing inspections, have trucks pull completely off Highway 218.
- Incentivize municipalities to create industrial parks near interstates, which can handle increases in truck traffic better than local roads.
- Do not create truck speeds that are different from the rest of traffic because they disrupt traffic flow and create safety hazards.

A few businesses also said they would be in favor of raising the gas tax if it funded additional road improvements and repairs.

Safety

When asked about their safety concerns, respondents cited a variety of perceived hazards. The most commonly expressed concerns include:

- Unsafe intersections (see page 32 for more information on intersections).
- Distracted driving.
- Unsafe passing (see page 36 for more information on passing and bypass lanes).
- Winter driving (see page 49 for more information on snow and ice removal).
- General unsafe driving.
- Speeding.
- Trucks parking in unsafe and illegal locations.
- Improperly licensed or trained drivers.

Distracted Driving

One-sixth of businesses expressed concern about distracted drivers, typically citing the use of cellphones as the main problem. Businesses gave examples of times when drivers who were using their phones swerved and drove at inconsistent speeds. One business also said that construction projects can contribute to distracted driving.

General Unsafe Driving

Several businesses discussed unsafe driving in general, particularly around trucks. Businesses explained that other drivers do not always give trucks the extra space they need for slowing down or turning. A few of the businesses described unsafe behaviors from truck drivers, such as going too fast on cloverleaf exits or icy roads.

What our drivers do, what other drivers do around our trucks, and the perception of safety all affect our bottom line due to insurance. Trucks need more insurance coverage than autos, plus we have a bigger target on our heads for lawsuits after collisions, and our premiums are higher still because of it. Also, as a smaller trucking company, we can't self-insure our drivers, so sometimes drivers are rejected for insurance due to lack of experience or an unfortunate accident. Therefore, other drivers not providing space on the road for trucks, not letting us do wide right turns, driving while distracted, or just cutting us off affects the safety of our drivers and our viability to remain profitable.

Other Findings

Safe Rest Areas

Safe places to stop are critical for truck drivers going long distances. Besides resting, businesses explained that truck drivers use rest stops to stage deliveries and conduct safety checks, such as adjusting straps on their cargo.

One-quarter of businesses interviewed said they have found sufficient parking at rest stops in southeast Minnesota, while another quarter said they have not. When asked which areas have had insufficient parking, several businesses reported this as an issue across the area, and sometimes even beyond the region. Specific rest areas mentioned as having insufficient parking were:

- Interstate 90 westbound by Rochester.
- Interstate 90 eastbound between Austin and Stewartville, at High Forest.
- Interstate 35 in both directions from Faribault.
- Interstate 35 northbound south of Highway 19 at mile marker 68.
- Highway 14 between Owatonna and Kasson.
- Around Owatonna.

Some businesses praised Minnesota's rest stops for being clean and having bathrooms, lighting, and places to walk. Other businesses saw room for improvement. They largely requested more rest areas (including on Highway 52 and Highway 14 near Dodge Center), more parking at existing rest areas, and improved signage showing parking availability. When rest area parking is not available, businesses reported, trucks might end up parked on shoulders, ramps, other roads, or at private truck stops.

Profile: Mayo Clinic and Mayo Medical Labs, FedEx Express, and Rochester International Airport: Supporting patient healthcare, regionally, nationally, and globally

Precision instruments and biopharmaceuticals are the highest value commodity, per ton, in Minnesota. A recently completed study, “Berry Boxes on the Move— Mapping Airports’ Role in Minnesota’s Global Medical Supply Chain,” found that in 2015, medical devices accounted for almost \$34 billion in traded goods. Much of this high-value freight flies through Rochester International Airport (RST); “...over 11,000 tons of goods flew through RST in 2015.”³⁷

A priority segment of RST’s freight is bound for Mayo Clinic, Mayo Medical Labs (MML), and related facilities. FedEx Express (air cargo) is Mayo Clinic’s/MML’s (and related facilities’) primary air freight carrier, moving 18-20 million pounds of freight annually. The freight transported daily to Mayo takes up one-third to half of the hold of a FedEx 757. This freight includes tens of thousands of patient samples from around the world that require the high-quality and specialized testing that MML provides. Other critical freight includes pharmaceuticals, surgical equipment, and other medical equipment and supplies.

FedEx transports this medical freight to Mayo Clinic six days per week, with two flights on Tuesday. FedEx Ground transports the shipments from the airport to Mayo’s facilities in Rochester.

The biological patient samples bound for MML are particularly

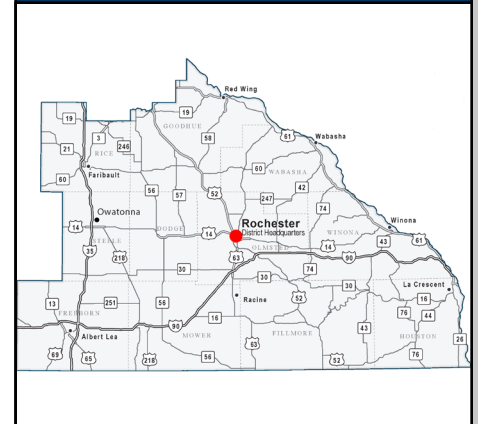
³⁷ Travis Fried, “Berry Boxes on the Move – Mapping Airports’ Role in Minnesota’s Global Medical Supply Chain,” Transportation Policy and Economic Competitiveness, 2018, abstract.

time-sensitive. These samples are shipped in “berry boxes,” which are color-coded as such and loaded to move immediately off of the airplane onto FedEx Ground trucks, to be delivered to Mayo Medical Labs within 40 minutes of landing. Berry boxes contain biological samples for testing, diagnosis, and subsequent medical decision making by physicians and patients; timeliness and proper handling are essential in often life-or-death situations for patients.

Each package contains a sensor that records temperature and movement because many pieces of fragile, precision medical equipment cannot tip. Temperature-sensitive biological samples, material, and pharmaceuticals are packed in dry ice. If there are delays in getting materials to Mayo, FedEx needs to send the flight to its main hub in Memphis, Tenn., so that the company can re-ice sensitive materials within required specifications. Ruined samples can result in stressful and possibly life-threatening delays for patients.

Location

Rochester, MN
Olmsted County



Much of Mayo’s other air cargo is time-sensitive and critical to patient care, as well: pharmaceuticals, surgical equipment, and other supplies are delivered as part of Mayo Clinic’s “just-in-time” supply chain, with little flexibility.



Profile: Mayo Clinic and Mayo Medical Labs, FedEx Express, and Rochester International Airport: Supporting patient healthcare, regionally, nationally, and globally

FedEx Express at the Rochester International Airport (RST) has grown as Mayo has grown over the past 20 years. Starting with ground transportation and small feeder aircraft in the region, FedEx expanded to 727s and to the current 757 at RST almost 10 years ago. FedEx Express and Mayo have visited each other's facilities to understand each other's operations.

FedEx Express also transports medical freight for a government contractor in the Upper Midwest that provides the U.S. military with medical equipment, medication, and other supplies. There is not another airport besides RST close enough to this contractor that can handle a large jet landing. FedEx Express has additional major regional customers and "bulks out" the 757 on every flight, in- and out-bound.

RST officials have noted that one of the challenges FedEx Express faces in ensuring timely transport of their customers' sensitive and critical freight is landing in adverse weather conditions at RST. If the plane cannot land at RST, the plane goes to Minneapolis-Saint Paul International Airport (MSP) where it waits until the weather clears. The flight crew can run out of the hours the FAA allots them to fly within a certain time period.

There are contingency plans; FedEx trucks can drive approximately 90 miles to MSP to pick up the berry boxes and drive them down to Mayo Medical Labs.

But depending on the weather, increasing roadway congestion, and other factors, these delays can be catastrophic for patients, and costly and inconvenient for Mayo and its staff.

Even when samples are transported within their viable time period, diversion to MSP is financially costly for both FedEx and Mayo Clinic. According to the recent study about berry boxes and based on 2012 data, "Roughly, four to 12 percent of all flights in-bound to RST are diverted to MSP because of fog. This amounts to \$633,000 of additional costs for shippers each year."³⁸

For Mayo/MML, when samples are delayed for testing, the lab can lose a full shift of processing time, creating staff scheduling challenges, and often resulting in significant costs for the overtime work needed to allow lab staff to "catch up."

Data on diversions to MSP, compiled by MML and RST, from 2010 to 2012, showed that in 2010, there were 19 diversions; in 2011, there were eight; and in 2012, there were seven. MML calculated that approximately 25,000 tests were delayed in 2011 and 2012 due to diversions.^{39 40}

Industry representatives interviewed expressed the need for funding to upgrade RST's navigation system to Category II (CAT II), which would "cut the altitudes that planes can land in by half" in low-visibility conditions. With a CAT II system, planes would not have to be diverted to MSP in fog or other

³⁸ Fried, "Berry Boxes on the Move."

³⁹ Mayo Medical Laboratories, "Impact of Weather-Related Diversions RST to MSP/STP," 2013.

⁴⁰ Additional cost breakdowns for both MML and FedEx are detailed in "Benefit Cost Analysis Data for Runway 31 CAT-II Operations: Rochester International Airport," a report prepared by Mead & Hunt, 2013.

low-visibility conditions, thus ensuring timely delivery of essential samples and materials.

According to interviews for this project, enhancing RST's landing capability also would help meet the projected growth of Destination Medical Center and related regional health care industry growth. With a CAT II navigation system, and additional runway infrastructure upgrades at RST, FedEx could expand their equipment to include a 767 to meet the expected larger regional demand.

Transportation researchers found that "supply chain resiliency— rather than capacity—represents the most pressing issue for medical manufacturers and healthcare providers."⁴¹ The Rochester International Airport executive director views resiliency in this case as a safety issue, as well. "It's a safety net for Minnesota as a whole, not turning planes around."

As research from the University of Minnesota's Transportation Policy and Economic Competitiveness concludes, "...RST is no mere regional partner to the global economy, but a lifeline for Mayo Clinic's global patient care network."⁴²

⁴¹ Fried, "Berry Boxes on the Move."

⁴² Ibid.

As described in the “Carrier Policies” section on page 58, new federal requirements mandate that each truck use an electronic logging device (ELD or e-log) to record driving time automatically. Most of the businesses that discussed e-logs noted that this will increase the need for truck parking at rest stops and other locations.

Figure 26: Straight River Rest Area



There is not enough truck parking available for truck drivers. Most rest areas are full at night year-round or during snow storms. Most truck stops are full as well. There is a new federal law requiring electronic truck logs. This will make adequate parking and planning ahead even more important.

Congestion

Almost two-thirds of businesses discussed congested areas in District 6. By far the most commonly mentioned road was Highway 61. One-sixth of businesses interviewed discussed congestion there, typically between Red Wing and Wabasha. Part of the congestion stems from the road’s location along the river valley, which attracts tourists in the summer and fall. One business said its drivers no longer use Highway 61 when there are “leaf lookers.”

There are also lake gawkers along 61 that go 30 instead of 55, so you get 20 to 30 cars backed up between Lake City and Wabasha.

Development plans in and around Rochester for the Destination Medical Center (DMC), anchored by the Mayo Clinic, are expected to significantly increase freight and commuter traffic in the area and worsen congestion. Interviewees noted that Rochester has already been experiencing queues on ramps, through lanes, and interchanges into Rochester during rush hour. They explained that there are already freight delivery problems in downtown because of the growth in employees, patients, and related movement of people. As businesses add more jobs, they will need to recruit employees from further away. Unless alternatives for transportation—such

as regional bus services, carpooling, and other options—are more fully developed, the expansion could potentially add significantly more vehicles into existing congestion.

Compared to other districts, District 6 businesses often mentioned congestion due to shift changes at manufacturing facilities. Unlike some other districts, District 6 has many manufacturers that are often clustered together within cities, sometimes along the same road. One-sixth of businesses discussed congestion around shift changes, including in Blooming Prairie, Chatfield, Dodge Center, Faribault, Lake City, Owatonna, and Red Wing. Hundreds of employees at large manufacturers in those cities can leave at similar times when their shifts end, creating a sudden flood of cars on the road, long delays, and unsafe conditions. One business said it had even changed its shift times to avoid overlapping with the times at neighboring businesses.

Figure 27: Congestion during a snow event



With District 6’s large agricultural industry, several businesses also mentioned congestion during planting and harvesting season. A few businesses cited road construction as a cause of congestion, while a few others discussed congestion that occurs near truck stops.

The SuperAmerica at Minnesota 21 and 30th Street Northwest adds to the congestion—it acts as a mini truck stop. Both trucks and commuters can be delayed in this area.

Businesses reported that congestion can create a range of problems. They expressed safety concerns and gave examples of crashes and near-crashes. They said congestion can also create delays for both incoming supplies and outgoing products. These delays can add to business costs and create unhappy customers when products do not arrive on time. Businesses recommended access control, passing lanes, warning lights, and signage to help reduce congestion.

It's time lost for our trucks, which means profits lost. It's a safety hazard when impatient drivers cut off our trucks. Stop and go traffic is very bad for the fuel consumption of our trucks—and they consume a lot of fuel. Delays make it harder for our drivers to finish work on time. Our top costs are wages, fuel, and insurance—congestion adds to all of those.

Employee Transportation

About half of businesses discussed transportation and transit challenges for their employees. Most of these businesses noted that the majority of their employees live nearby and that winter weather is the primary disruption to employee commutes. Bridge construction in Red Wing and Winona also caused delays for employees coming from Wisconsin, noted some businesses. A few also mentioned that trains through Winona can cause backups and delays for employees.

Any transportation issues are generally in the winter with road closures. We operate 24 hours per day, so we keep cots and sleeping bags on hand for staff if needed. We need a minimum of five staff to run the plant. When interstates 35 or 90 close down, it really impedes our work.

Several businesses also mentioned the need to strengthen the transit system to improve employee commuting. They indicated that some employees traveled from surrounding towns and cities and did not have public transportation options. Several businesses described the changing workforce and the need to improve public transportation for employees in cities farther away. Even in cities with access to transit, businesses said bus schedules often do not align with their business hours to meet their employees' needs.

Businesses specifically mentioned the need for improved public transportation between Red Wing, Rochester, St. Charles, Winona, and nearby cities. One business also requested more park-and-ride options for those employees carpooling, specifically in locations such as highways 16 and 63, and on Interstate 90 between La Crescent and Rochester.

There is a lack of transit options from Rochester to places like St. Charles. Having a better public transit option could encourage more people to work for companies like this one in St. Charles and other similar communities.

Driver and Carrier Shortages

Some businesses mentioned that there has been a shortage of truck drivers available to transport products. Several attributed it to increasing laws and regulations that have made it difficult for carriers to recruit and retain drivers, while a few cited the lack of workers in their area as a reason for the shortage. A few businesses that rely on agriculture discussed how it is particularly difficult to find enough drivers during the autumn, when they are busiest.

We are having trouble getting trucks to bring supplies from the West Coast. We need 10 semi loads each week, and in the last weeks we've been shorted loads because they can't find drivers and trucks. They began missing loads.

Several businesses reported issues with finding sufficient carriers to take their products. They mentioned driver and truck restrictions and their rural location as possible causes for the issue. A few noted that they were in areas of the state where FedEx and UPS do not offer next-day delivery, which has been a problem for them. In contrast, a few businesses in larger cities said they have had no issue finding carriers.

Bigger companies have full truck loads. We have six pallets—it's tough to make the dollars work. For the most part, we are LTL [less than truckload]. It's hard to find non-contracted carriers for partial and extra loads. Drivers are quitting because of laws and regulations. We're serviced first with our carriers; but when we need something out of the ordinary, it's hard to find those trucks. It's getting harder and costing more.

Transportation Modes beyond Truck

Half of businesses interviewed use at least one form of transportation besides trucks. These businesses use rail lines, the Mississippi River, and local airports to receive supplies and transport their products.

Rail

One-fifth of the businesses provided feedback about rail. Several said railroad crossings cause delays for their trucks and employees, which can prevent drivers from completing deliveries on time and can make their employees arrive late to work. These businesses were mostly located in Winona, and to a lesser extent Lake City.

Other modes of transportation do meet our needs. There are some capacity constraints on rail, with many different industries competing with each other for rail space—oil, agriculture, et cetera. The development of oil in North Dakota and the harvest in agriculture leads to a battle for capacity on rail.

Several other businesses reported that rail transportation is critical to their business, and said they would like to ship more by rail. One rail car can take multiple trucks off the road, they said, but shipping by rail can also take longer than shipping by truck. They noted the challenge of variable pricing, strict schedules, and low capacity, especially during oil booms and the fall agricultural season.

Profile: McNeilus Truck and Manufacturing

McNeilus Truck and Manufacturing, an Oshkosh Corporation company, is an industry-leading manufacturer of refuse truck bodies and concrete mixers, supported by a comprehensive, factory direct sales and service network equipped with replacement parts. In the Dodge Center facility, it manufactures products that are distributed globally, requiring over 1,500 shipments weekly from its workforce of more than 1,000.

From the transportation perspective, the company is concerned with the shortage of qualified truck drivers. Approximately one-quarter of its freight is driveaway, where drivers are dropped in Dodge Center and drive the finished trucks away. Traveling to Dodge Center using transit can be difficult for driveaway drivers or customers. Some take taxis or other services

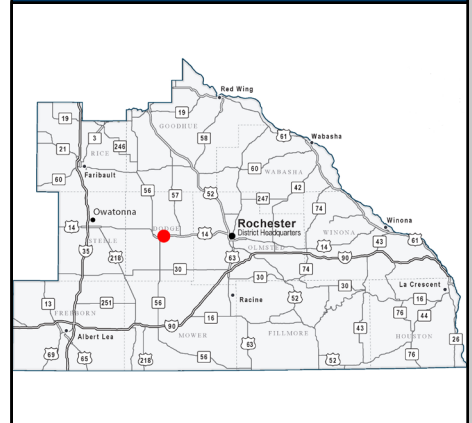
from airports, or use shuttles or buses from Rochester. Sometimes, McNeilus picks customers up at the airport. The company's logistics department was disappointed when talks about a potential passenger rail line between Minneapolis and Rochester fell through. McNeilus felt such a rail line would have made it easier for customers and drivers to arrive and would have helped keep costs down.

Rough pavement also creates a unique challenge for McNeilus. Drivers often use highways, and typically garbage truck driver seats—specifically cab-overs—do not adequately absorb the shock from hitting bumps at highway speeds. The company reported that Interstate 90 from Austin and Rochester is still rough despite recent repaving efforts.

Number of employees
1,000+

Cluster
Production Technology and Heavy Machinery

Location
Dodge Center, MN
Dodge County



Air and Water

A few businesses gave feedback on air and water transportation. Those that discussed air transportation said that being relatively close to Minneapolis–Saint Paul International Airport allows them to make next-day deliveries. However, they also indicated that air transportation is more expensive than other options. The businesses that discussed water transportation said they were satisfied with their experiences but noted that water transportation is much slower than other methods.

Figure 28: Red Wing Port



Business and Economic Development Considerations

Transportation infrastructure and maintenance have a significant impact on business costs, the success of firms in the market, and the economic vitality of regions. As noted earlier, manufacturing businesses depend upon roads and other transportation modes to bring workers and supplies to their facilities and move products to customers. Beyond manufacturing, the broader range of businesses in any region also needs reliable transportation for workers, customers, and supplies. “Transportation is vital for all businesses, including our own,” said one manufacturer’s representative.

Transportation Infrastructure and Access

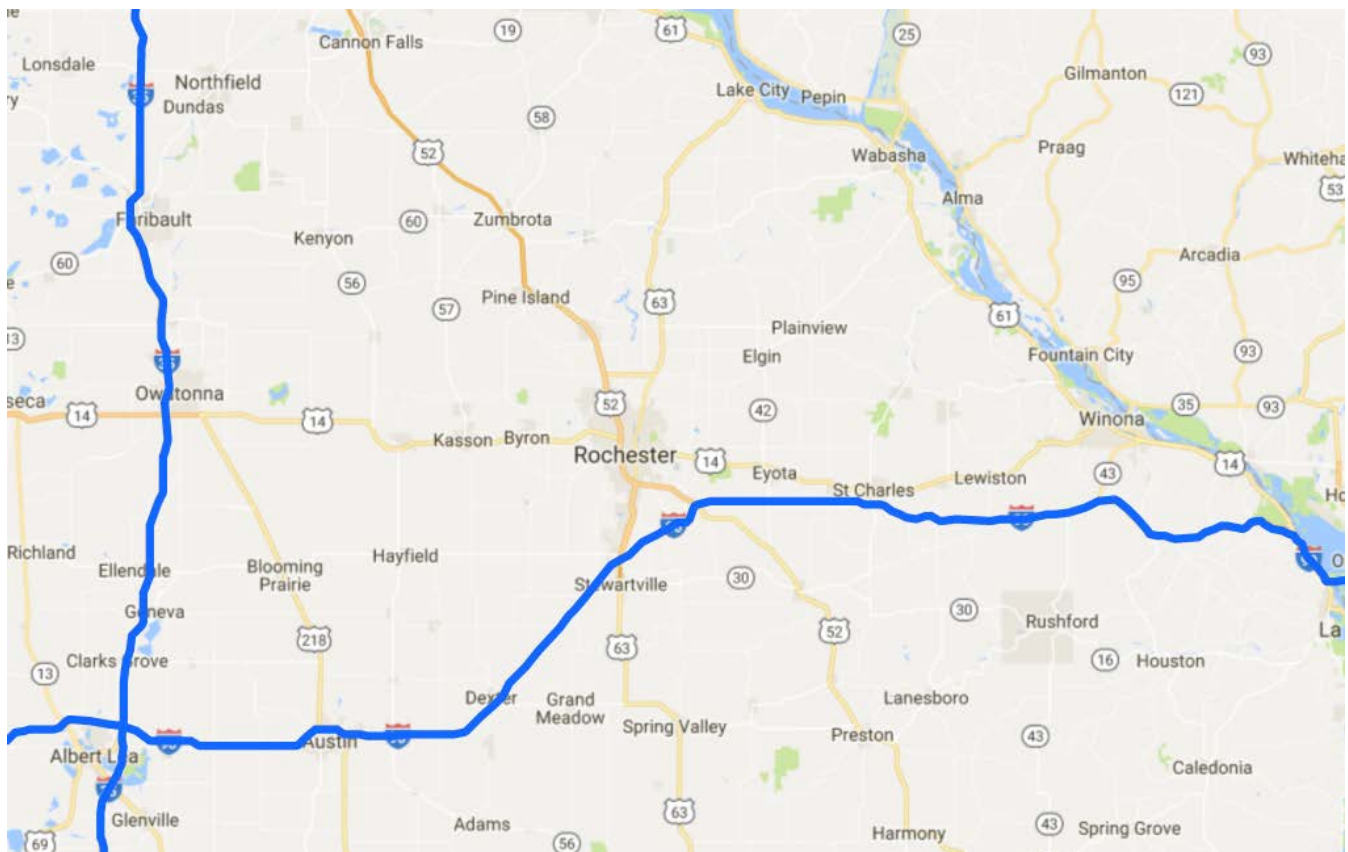
The overwhelming majority of those interviewed in District 6 emphasized the importance of transportation, with officials and staff at more than three-fourths of the businesses citing transportation infrastructure and access to it as a positive and important business factor. “I cannot do business without the road system working,” said one

manufacturer’s representative. Another commented, “Transportation’s importance can’t be understated. If you have it, a truck brought it.”

Transportation is very important to us. It is how we get materials and employees to our facility and how we ship goods out to our clients.

Almost three-fourths of businesses identified District 6 highways as a strength for meeting business needs or a positive factor that stands out for the area. Nearly half of the businesses mentioned proximity to Interstate 90 as a positive factor, and one-third mentioned Interstate 35 as important. “Direct access to I-90 is a good thing so workers and materials can come in and products can go out to the clients,” said one manufacturer. When they talked about business and economic development considerations, businesses also reported state highways as important access routes, frequently citing highways 14, 52, and 61, and also commenting on highways 16, 19, 30, 42, 44, 56, 63, 65, 69, 76, 218, and 247.

Figure 29: District 6 businesses cited Interstate 35 and Interstate 90 as key transportation routes



Cheap, reliable transportation is a huge part of a successful business. The location of Owatonna is excellent. It is very nice to have I-35, Highway 14, and I-90 right here.

When discussing access to transportation infrastructure, several businesses commented on the importance of rail transportation. Several others cited access to Minneapolis-St. Paul International Airport, which is outside District 6 but close enough for some businesses that use air transport.

Impacts of Transportation on Business Costs

Poor road conditions and inadequate transportation infrastructure increase business costs. As noted in previous sections of this report, some of the businesses commented specifically on their costs from road maintenance issues, infrastructure capacity, and road conditions. Several mentioned winter weather road conditions that sometimes add costs. Others noted transportation-related costs from congestion, construction projects, and shortcomings in the roadway infrastructure. A few firms said transportation regulations add to their costs.

Everything we sell is time. Time and people equal profit. If I lose someone, profit dives. If someone is in an accident or gets hung up, I really lose.

Among the businesses that talked about transportation-related business costs, more expressed concerns about winter road conditions than any other single factor, making this maintenance issue an important one. Snow and ice on roads in winter can delay shipments of supplies and products and also delay production if employees have trouble getting to work. “Weather is really the only issue that affects us as we can only store two days of product on site. If the product cannot be moved, the plant must shut down,” said one manufacturer’s representative. Another manufacturer talked about the importance of safe travel for workers and the impact of winter conditions on their commutes into work. Weather delays for workers and shipments result in higher costs. (For more on snow and ice removal effects on businesses, see page 49.)

Figure 30: District 6 businesses cited snow and ice conditions as sometimes adding to their costs



Some District 6 businesses talked about business costs that stem from infrastructure shortcomings. Some cited the impacts of rough pavement, noting damaged supplies and products as well as harm to freight vehicles. (For more on rough pavement effects on businesses, see page 46.) A number of businesses said they incur costs from increased travel times when roads in some of the district’s larger cities and on routes into the Twin Cities experience more traffic than they can handle and congestion results. A carrier in the district reported that congestion adds to wage and fuel costs. Another trucking firm, located within one of the district’s larger cities, said congestion on local streets may force a relocation to a less congested area at some point in the future. (For more on congestion, see page 65.) In contrast, a number of other District 6 businesses located outside of the District’s larger cities said a lack of congestion on the roadways in and around them is a plus for them.

Several District 6 businesses noted costs from infrastructure issues and called for improvements to make truck travel faster and easier. For example, one manufacturer suggested a stoplight or roundabout at the intersection of highways 30 and 52 to reduce travel delays. Another manufacturer called for passing lanes on Highway 14 between Eyota and Lewiston to reduce shipping delays and costs.

A few of the District 6 businesses said construction delays have significantly increased travel times and slowed deliveries. A few other District 6 businesses cited added delays and costs from transportation regulations, including spring load restrictions, commercial vehicle inspections, and federal requirements that truck drivers submit to a physical exam at least every two years.

Access for Workers

In a time of tight labor markets, some of the interviewees noted how important commuter routes and options are to their businesses. “In terms of transportation, from our standpoint, it’s about getting employees here,” said one manufacturer’s representative. A few called for better transit service—a challenge in smaller cities and rural areas. (For more on employee transportation, see page 67.)

Having no public transportation limits workforce, but it’s also a challenge to get to the facility [located outside of town] for public transportation.

Beyond Transportation: Other Location Considerations

While transportation infrastructure matters to most businesses and consequently to economic development, it ranks as one of many factors that influence location decisions and contribute to business success. When asked about the strengths of their current locations in the context of transportation needs, some businesses commented on factors beyond transportation as well. Most frequently, respondents cited proximity to customers or suppliers as a strength. Interviewers heard from manufacturers about these intra-district trade links, even though this was not a formal part of the interviews or a research topic for this project.

Profile: Rochester City Lines

Rochester City Lines has been providing bus transportation in southeast Minnesota since 1966 through commuter, charter, and specialty bus services. The commuter division serves 55 communities, bringing approximately 1,500 people into the city of Rochester each day. Rochester City Lines' charter division works with many organizations within Rochester on a daily basis, including the Rochester Area Chamber of Commerce, local public schools, local colleges and universities, and the Mayo Clinic. Specialty services include backup bus service for airlines or trains, as well as shuttles to local communities to serve labor force needs. This unique combination of services has resulted in Rochester City Lines transporting almost 600,000 passengers each year.

Park and rides are a key component to Rochester City Lines' daily commuter service. Helping to reduce traffic and buildup during congested parts of the day, park and rides that are easily accessible, well lit, and offer plenty of parking to encourage individuals to use these locations. In their MnDOT interview, Rochester City Lines noted many opportunities for additional park and rides in the region, particularly from the Twin Cities to Rochester. Suggested improvements range from small updates, such as more lighting and

additional snowplows, to potential locations for new park and rides.

From plowing park and ride locations to salting and sanding highways, Rochester City Lines recognizes the impact of snow and ice on their routes during winter months. Storms or poor weather can increase the number of passengers for each commuter route by up to ten percent. Though commuter routes center around major highways, which are generally well plowed in the winter, there are specific highway stretches where crosswinds cause concern. The problem is exacerbated because there are few snow fences in the area. Rochester City Lines suggested that more of these fences could be quite valuable in snowy, windy conditions. With an emphasis on safe and dependable transportation, Rochester City Lines believes that a prepared and prompt response to the area's climate is critical to ensure local commuter and charter travelers make it to their destinations safely and promptly.



Number of employees

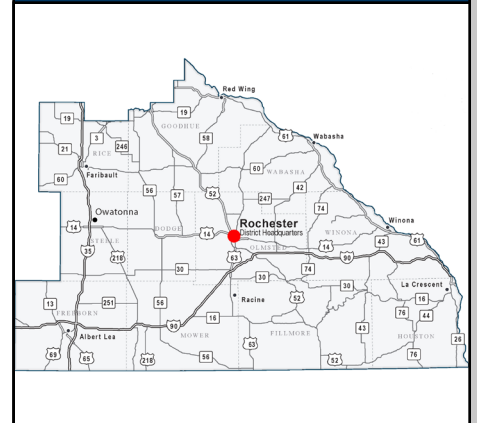
164

Cluster

Local Logistical Services

Location

Rochester, MN
Olmsted County



By way of example, a couple of manufacturers said they use hardwood timber from the area to produce their products, while several of the food manufacturers interviewed noted their proximity to farm operations in the district as an important, cost-saving supply link. One District 6 firm’s representative said, “Our biggest strength is our proximity to our top customer and supplier—both being McNeilus [Steel].” These comments from the businesses illustrate the importance of connections among District 6 manufacturers and industry clusters in the region. (For more on industry clusters, see page 17.)

A few manufacturers said their District 6 locations worked well because the district is centrally located for customers well beyond the immediate area and outside Minnesota and Wisconsin.

We’re situated in the middle of the country. Nothing takes longer than 3-4 days to get anywhere in the country.

While some businesses said their rural setting is an advantage for their operations, another business commented that its proximity to the Twin Cities area is an important success factor. One business said its location works well because the area has an adequate supply of skilled trades people who learned their craft at a nearby community college or on nearby farms. However, other businesses said a lack of available labor has been a hindrance.

A few businesses said their District 6 locations are favorable because they have room to expand operations. Business expansion in general was a notable theme, with more than half of firms saying they would expand in the near future. Almost all the businesses with expansion plans indicated they would expand at their current location. In a few cases, the businesses said that location factors and constraints may mean expansion at new sites, possibly including places outside District 6.

Next Steps

Comments, ideas, and suggestions from the business interviews carried out for this District 6 project confirm many of MnDOT’s current priorities and approaches for the district and provide useful input to inform and enhance both existing efforts and initiatives in the future. This section describes possible next steps for using the feedback from this interview project both for work MnDOT is already carrying out and for future plans. The points below also note ways information and analysis from this project can further advance MnDOT’s effective public engagement efforts.

MnDOT District 6

1. Incorporate business feedback into District 6’s short- and long-term planning processes and modify upcoming road projects and maintenance plans as feasible to address business issues.

MnDOT District 6 staff can:

- Continue work started in late 2017 to categorize ideas, suggestions, and requests from the District 6 business interviews, assess if action is possible and practical, and prioritize possible action items.
- Continue to review immediate, short-term action items from this Manufacturers' Perspectives study, assign high-priority items, address them to the extent possible and practical, and track progress.
- To the extent possible, continue to embed long-term action items into the District 6 processes for the State Transportation Improvement Program (STIP), the longer-term Capital Highway Investment Plan (CHIP), and charters for future projects; and track decisions and progress going forward. District 6's work on this began in early 2018.
- Assess opportunities to address the common infrastructure theme from the interviews of "keeping safe and staying at speed" by exploring opportunities to increase safety at intersections and interchanges, improve congestion at choke points, and add passing lanes on selected highways, especially in the eastern part of District 6.
- Maintain District 6 efforts to keep commerce moving during the winter through successful snow and ice removal and explore opportunities for improvement. Businesses suggested specific problem locations and asked for more dynamic-text, electronic signs to update drivers on weather and road conditions.
- Factor the safety comments and suggestions from businesses into the "Toward Zero Deaths" initiative. In addition to common concerns about distracted drivers, unsafe passing, and winter conditions, businesses in District 6 also noted unsafe truck parking along selected routes.
- As possible, increase truck parking at rest areas and other locations along District 6 routes in response to business concerns. Businesses expressed worry about trucks now parking at unsafe and illegal locations, the high demand for space given the truck traffic on interstates 35 and 90, and the increased need for truck breaks and parking under new federal regulations (such as the use of e-logs to track adherence to hours-of-service restrictions).
- Share suggestions and feedback from District 6 businesses with relevant authorities on topics other than District 6 state highway transportation to inform their continuous improvement practices. For example, share input on county roads with county engineers and city roads with city engineers.
- Work with District 6 manufacturers on the transportation impacts of their expansion plans, given that most of the businesses interviewed said they planned to expand operations in the near future.

2. Consider innovative ways that District 6 can build stronger relationships and partnerships with businesses, city and county engineers, economic development professionals, and other stakeholders.

MnDOT District 6 staff can:

- Communicate with businesses about progress on ideas, suggestions, and requests drawn from the business interviews.
- Convene groups around common concerns that businesses identified and develop solutions. Opportunities may include business involvement with regional transportation advisory groups.
- Consider the methods and successes for engaging District 6 businesses from the Manufacturers' Perspectives study and determine how best to build on the experience to collect input and feedback in the future from businesses, as well as other stakeholders and constituencies.

- Use contacts and relationships established with economic development organizations for the Manufacturers’ Perspectives study as a base for continued interaction and cooperation.
- Explore other ways that MnDOT can better understand and more closely work with manufacturers and other relevant businesses to strengthen economic vitality in Greater Minnesota. For example, additional manufacturers could be invited to serve on Regional Transportation Advisory Committees, Area Transportation Partnerships, and other transportation planning groups.

MnDOT Central Office

3. Use feedback from District 6 businesses to make improvements to existing systems. Consider business input in future statewide planning efforts and for the development of best practices.

MnDOT Central Office staff can:

- Review weight restriction policies in neighboring states and Canada to identify potential opportunities for policy alignment. More broadly, evaluate practices regarding weight restrictions and discrepancies, including communication and messaging, to inform businesses of state and federal policy.
- Continue improving the 511 system, such as by making the website available in other languages, providing more information on construction projects, and adding more cameras.

4. Use the combined findings and suggestions from the Manufacturers’ Perspectives studies in Districts 1, 2, 4, 6, and 8 to understand business needs and improve the state’s transportation system. Incorporate a continuous improvement approach to the Manufacturers’ Perspectives studies.

Some of the following ideas are similar to ones made in previous reports. Based on past feedback, MnDOT has created a Manufacturers’ Perspectives study website (<http://www.dot.state.mn.us/ofrw/mps.html>) to highlight successes and assist in maintaining relationships with businesses. In addition, MnDOT staff are planning an interactive mapping application to more accurately capture the locations of problem areas raised in the interviews. The database resulting from this initiative will be available to district project managers, planners, and other staff on an ongoing basis.

MnDOT Central Office staff can also:

- Continue synthesizing findings from the Manufacturers’ Perspectives study for communications, transportation improvements, and planning.
- Examine ways to combine findings from the Manufacturers’ Perspectives studies from districts that have completed the project, and future district projects, with broader statewide findings, themes, and recommendations for use in MnDOT’s Statewide Freight System Plan, its ongoing Freight Action Agenda, and other relevant plans and initiatives.
- Continue to review the completed Manufacturers’ Perspectives studies to improve their methods to meet the needs of other districts as they engage in this initiative.
- Evaluate the feasibility of developing cross-district planning forums with staff from Districts 1, 2, 4, 6, and 8 to share findings and frame broader collaborative solutions that address statewide issues.

- Strengthen communications about the Manufacturers’ Perspectives study, including a plan to communicate findings from the study to both District 6 staff and audiences external to MnDOT. Present findings in public forums, including conferences.
- Develop a process for districts that have participated in Manufacturers’ Perspectives studies to provide feedback, both internally and externally, about their progress on study findings.

District 6 Progress Update – Early Benefits

District 6 is analyzing feedback from interviews with businesses and has already acted on some near-term feedback based on this study. District 6 has done the following:

- Spoken with an interviewed business concerned about local highway access to discuss options.
- Spoken with a business about turn lane access to a new building planned for spring construction.
- Installed new signage to clarify route directions for recently completed roundabouts in Cannon Falls to make it easier for customers to reach local businesses.
- Invited interviewed carriers and manufacturers that own trucks to a meeting with MnDOT’s Office of Freight and Commercial Vehicle Operations and the Department of Public Safety in February 2018. Participants provided feedback on the agencies’ ten-year enforcement plan.
- Expanded truck parking at two safe rest areas along Interstate 90 (Hayward and Oakland Woods).
- Patched roadways in areas cited by shippers:
 - Highway 61 from Lake City to Red Wing.
 - Southbound Highway 52 from Cannon Falls to Zumbrota.
 - Interstate 90 in the Austin and Albert Lea areas.
- Worked with Olmsted County to address an increased number of crashes at the intersection of Highway 30 and County Road 8. Both MnDOT and the county have increased the size of stop signs, and MnDOT is adding a second stop sign on the left side of Highway 30 to make “dual stop signs.” MnDOT will add a “Cross Traffic Does NOT Stop” placard on stop signs, and is converting the right-hand (southbound) stop sign to one with a flashing LED. District 6 maintenance is also removing trees in the southeast quadrant of the intersection.

Appendix A: List of Businesses Interviewed

Acrotech	Chatfield Trucking	Hearth and Home Technologies
Advanced Coil Technology	Church Offset Printing Inc.	Hiatt Manufacturing
Ag Partners Co-Op	Clean Plus	Images on Metal
Al-Corn Clean Fuel	Concast	Innovative Food Processors
Alive LLC	Concepts and Design	International Ingredients
All-American Cooperative	Custom Building Components	Interstate Molding and Manufacturing
Amesbury + Truth Hardware Products	Daikin Applied	J and B Pallet
Anova	DCM Tech Corp	Kappers Fabricating
Ardent Mills	Engineering Lab Designs	Keith Carlson Trucking
Arkema	Envirolastech	Knitcraft
Automation Services	Excel Manufacturing	LaX Fabricating
Avalon Express	Express-A-Button	Lakeside Foods
Badger Equipment	EZ Fabricating	Lawrence Transportation
Banks Outdoors	Faribault Foods	MALT Europ North America Inc.
Bellisio Foods	Faribault Woolen Mill	Mayo Clinic
Best Way Promotions	Faribo Manufacturing	McDonough Truckline
BIC Graphic	Fastenal	McFarland Truck Lines
Biesanz Stone	Food Service Specialties	McLane
Bilken Industrial Fabricators	Foodliner	McNeilus Steel
Bioplastic Solutions	Foremost Farms USA	McNeilus Trucking
Bosch Corporation Automotive Service Solutions	Freerksen Trucking	Metal Services of Blooming Prairie
Cardinal Glass Industries	Gemini Inc.	Metal Transformations
	Genova Minnesota	
	Geotek Inc.	

Midwest Manufacturing	Red Wing Shoes Company	Technigraph
Midwest Specialized	Riedell Shoes	Top Shop Of Rochester
Minnesota Metals	Rivercity Manufacturing and Machining	TraLo
Mrs Gerry's Kitchen	Riverstar	Treasure Island Casino
National Chemicals	Rochester City Lines	Truss Specialists
Nigon Woodworks	Rockland Flooring	Tuohy Furniture
Nuss Truck and Equipment	Root River Hardwood	United Packaging
Pepin Heights Orchards	Seneca Foods	USG Interiors
Pepin Manufacturing	Solvay	Vogelsberg Trucking
Plasticert	Spring Grove Soda Pop	Watlow Electric
POET Biorefining	Staggemeyer Stave	Wild Wings
Poly Pak Plastics	Steve Yaggy Specialized Transportation	Win Craft
Pro Advantage	Strongwell	Wintech Electronics
Pro-Pet	Taylor Truck Line	WS Packaging Group
Randy's		Wylie Wilson Trucking
RDM of Minnesota		Zumbro River Brand

Appendix B: List of Project Team and Interviewers

Minnesota Department of Transportation

MnDOT Project Team

- Ronda Allis, Planning Director, MnDOT District 6
- Fausto Cabral, Assistant District Engineer State Aid, MnDOT District 6
- Mike Dougherty, Public Affairs Coordinator, MnDOT District 6
- Steve Kirsch, Assistant District Engineer for Program Support, MnDOT District 6
- Donna Koren, Market Research Director, MnDOT Operations Division
- Anne Meyer, Public Affairs Coordinator, MnDOT District 6
- Mark Panek, Assistant District Engineer West Operations , MnDOT District 6
- Tracy Schnell, Senior Planner, MnDOT District 6
- Mark Schoenfelder, Assistant District Engineer for Program Delivery, MnDOT District 6
- Todd Stevens, Assistant District Engineer East Operations, MnDOT District 6
- Kurt Wayne, Planner, MnDOT District 6
- Jeff Vlaminc, District Engineer, MnDOT District 6

Additional MnDOT Interviewers

- Richard Augustin, Project Management Engineer, MnDOT District 6
- Aaron Breyfogle, Project Management Engineer, MnDOT District 6
- Julie Carr, Planning Program Coordinator, MnDOT Aeronautics
- Ted Coulianos, Oversize/Overweight Permits Supervisor, Office of Freight and Commercial Vehicle Operations
- Maceo Douangdy, Transportation Operations Supervisor (Rochester), MnDOT District 6
- Patty Eckdahl, Administrative Manager, MnDOT District 6
- Andrew Fischbach, Maintenance Subarea Supervisor (Red Wing/Cannon Falls/Zumbrota), MnDOT District 6
- Chad Hanson, Project Management Engineer, MnDOT District 6
- Ron Heim, Maintenance Subarea Supervisor (Owatonna/Faribault/Northfield), MnDOT District 6
- Neil Hjelmeland, Maintenance Subarea Supervisor (Winona/Wabasha/St. Charles), MnDOT District 6
- Rob Holschbach, Permit Technician, Office of Freight and Commercial Vehicle Operations
- Cameron Ihrke, Maintenance Subarea Supervisor (Albert Lea), MnDOT District 6
- Keith Kallin, District Land Surveyor, MnDOT District 6
- Jai Kalsy, Project Management Lead Engineer, MnDOT District 6
- Mike Kempinger, District Design Engineer, MnDOT District 6
- Joel Kroening, Maintenance Subarea Supervisor (Dresbach/LaCrescent/Caledonia/Rushford), MnDOT District 6
- Jordan Kurth, Land Surveyor, MnDOT District 6
- Kyle Lake, Project Management Engineer Lead, MnDOT District 6
- Robert Langanki, Rochester Maintenance Subarea Supervisor, MnDOT District 6
- Heather Lukes, Project Management Engineer, MnDOT District 6

- Adam Miller, Transportations Operations Supervisor (Owatonna), MnDOT District 6
- Don Nosbisch, West Maintenance Superintendent, MnDOT District 6
- Gabe Perkins, District Training and Development Coordinator, MnDOT District 6
- Jim Roberts, West District Construction Engineer, MnDOT District 6
- Tory Thompson, Construction Project Engineer (Owatonna), MnDOT District 6
- Tony Wagner, Project Management Administrative Engineer, MnDOT District 6
- Adam Wellner, Assistant District Traffic Engineer, MnDOT District 6
- Brian Wolfgram, Maintenance Subarea Supervisor (Stewartville/Spring Valley/Preston), MnDOT District 6
- Paul Zager, Project Management Engineer, MnDOT District 6
- Tim Zierden, East Maintenance Superintendent, MnDOT District 6

Economic Development Partners

- Kim Ann, Economic Development Coordinator, City of Faribault
- Lisa Babington, Director, Lake City Economic Development Authority
- Nate Carlson, Economic Development Coordinator, City of Northfield
- Brian Carlson, Project Development, Widseth Smith Nolting
- Shari Chorney, Business Development Manager, Red Wing Port Authority
- John Eckerman, Business Development Manager, Boldt
- Cathy Enerson, Community and Business Development Specialist, Community and Economic Development Associates
- John Garry, President and CEO, Development Corporation of Austin
- Chris Giesen, Vice President Government Relations, Community and Economic Development Associates
- Jennifer Hawkins, Extension Educator, Community Economics, University of Minnesota Extension
- Joe Jacobson, Administrator, Rochester City Lines/Richfield Bus Company
- Muhammad Khan, Senior Transportation Planner, Rochester-Olmsted Council of Governments
- Dan King, Community Development Director, City of Zumbrota
- Greg Kruschke, Community Development Manager, City of Owatonna
- Deanna Kuennen, Community and Economic Development Director, City of Faribault
- Donna Mack, Community and Business Development Specialist, Community and Economic Development Associates
- Lucy McMartin, Director of Community Development, City of Winona
- Brad Meier, President/CEO, Owatonna Area Chamber of Commerce and Tourism
- Ryan Nolander, Executive Director, Albert Lea Economic Development Agency
- Natalie Siderius, Southeast Regional Business Development Manager, Minnesota Department of Employment and Economic Development
- Mark Vahlsing, City Administrator, City of Kenyon
- Jim Vrchota, Vice President and Commercial Banker, Merchants Bank
- Myron White, Development Coordinator, City of Winona Port Authority

Project Partners

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

- Lee Munnich, Senior Fellow
- Matt Schmit, Adjunct Faculty Member

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

- Kristina Krull, Management Consultant
- Matt Kane, Management Consultant
- Kris Van Amber, Management Consultant

Observers

Five county engineers participated in District 6 interviews as observers (not lead interviewers) and talked with the businesses about local transportation concerns.

Appendix C: Interview Guides

Interview Guide for MnDOT District 6 Manufacturers

For the MnDOT Manufacturers' Perspectives Study in Southeast Minnesota, interviewers will ask the following questions to understand manufacturers' businesses, transportation needs, and transportation challenges. Interviewers may ask additional questions and follow-up questions as appropriate.

- Do you have any general thoughts to share about the importance of transportation to your business operations here in Minnesota?
- Please tell us about your business: number of employees, primary products, primary suppliers and their transportation modes, and primary customers and their general locations.
- Are there transportation issues associated with your employees getting to and from work?
- What modes of transportation do you use to transport your products and which are most critical?
- What are the strengths of your current location for meeting your business's transportation needs?
- What are your business's transportation challenges or concerns?
- What changes could MnDOT make to highway features that would help you better move your freight or people? (For example, intersections, passing/turn lanes, shoulder width, pavement quality, rest areas.)
- Which routes are most important to be cleared of snow and ice; when and why?
- Is there any regular traffic congestion in this area and, if so, how does this affect your business?
- Where would additional or different signage be helpful?
- How do size or weight restrictions affect your business? What feedback do you have on the restrictions and the permitting processes?
- What safety concerns do you have regarding transportation?
- How well informed do you feel by MnDOT during construction season, and what could we change to better inform you?
- Does your business have any expansions planned in the near future?
- What else 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.

Interview Guide for MnDOT District 6 Carriers

For the MnDOT Manufacturers' Perspectives Study in Southeast Minnesota, interviewers will ask the following questions to understand carriers' businesses, transportation needs, and transportation challenges. Interviewers may ask additional questions and follow-up questions as appropriate.

- Do you have any general thoughts to share about the importance of transportation to your business operations here in Minnesota?
- Please tell us about your business: number of employees, services provided, products handled, primary customers and their general locations.
- Are there transportation issues associated with your employees getting to and from work?
- What are the strengths of your current location for meeting your business's needs?
- What are your business's transportation challenges or concerns?
- What changes could MnDOT make to highway features that would help you better move freight or people? (For example, intersections, passing/turn lanes, shoulder width, pavement quality.)
- Which routes are most important to be cleared of snow and ice; when and why?
- Is there any regular traffic congestion in this area and, if so, how does this affect your business?
- Where would additional or different signage be helpful?
- How do size or weight restrictions affect your business? What feedback do you have on the restrictions and the permitting processes?
- What safety concerns do you have regarding transportation?
- How well informed do you feel by MnDOT during construction season, and what could we change to better inform you?
- Does your business have any expansions planned in the near future?
- What else 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.

Appendix D: Location Quotients for District 6 Traded Clusters, 2015⁴³

Traded Cluster	District 6	Dodge	Fillmore	Freeborn	Goodhue	Houston	Mower	Olmsted	Rice	Steele	Wabasha	Winona
Footwear	23.76	11.23	-	-	252.53	-	-	-	-	3.09	-	-
Education and Knowledge Creation	5.46	-	-	0.10	0.20	0.21	0.08	10.78	4.85	0.09	0.06	2.23
Livestock Processing	4.57	0.35	1.44	20.46	0.60	-	47.61	0.32	6.16	0.10	-	0.16
Vulcanized and Fired Materials	3.72	-	-	-	1.04	-	-	0.04	6.22	34.35	-	1.90
Recreational and Small Electric Goods	2.82	2.29	1.55	0.71	2.50	15.24	0.41	0.26	-	23.56	7.31	0.89
Downstream Metal Products	2.60	0.42	1.71	0.26	8.47	4.79	0.90	0.15	3.51	11.47	3.13	2.41
Music and Sound Recording	2.53	-	-	-	-	-	-	0.31	-	-	-	23.64
Electric Power Generation and Transmission	2.30	1.18	1.60	-	23.16	-	1.81	-	-	-	-	-
Food Processing and Manufacturing	2.25	0.34	4.16	7.10	2.43	2.28	1.64	1.09	5.60	1.71	7.39	2.31
Furniture	1.77	0.52	18.15	5.73	5.67	-	1.12	1.21	0.49	0.62	0.56	0.23
Agricultural Inputs and Services	1.59	15.86	4.79	3.30	1.71	-	2.58	0.37	1.20	2.90	6.01	0.78
Printing Services	1.52	2.21	1.00	0.46	6.81	-	0.79	0.54	0.45	2.67	0.39	2.50

⁴³ 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 location quotient exceeding 1.00 can indicate that an industry cluster employs more people than similar industries in other parts of the country. Businesses in this cluster that products or services outside of the region and are referred to as a traded cluster. On this table, location quotients of 1.3 or higher are shaded in blue to indicate the most competitive clusters for the region and each county.

Traded Cluster	District 6	Dodge	Fillmore	Freeborn	Goodhue	Houston	Mower	Olmsted	Rice	Steele	Wabasha	Winona
Downstream Chemical Products	1.36	-	-	-	0.17	-	-	0.22	0.16	0.20	-	11.98
Production Technology and Heavy Machinery	1.24	1.05	1.43	1.10	0.77	-	0.50	0.76	2.90	1.90	7.01	1.22
Jewelry and Precious Metals	1.21	-	-	-	-	-	-	0.35	1.53	11.17	-	-
Upstream Chemical Products	0.95	6.98	8.13	3.74	4.24	-	-	-	-	1.64	-	-
Lighting and Electrical Equipment	0.94	-	-	-	-	-	0.21	0.03	-	1.15	-	8.08
Plastics	0.90	4.93	6.01	2.05	1.50	-	0.09	0.23	0.69	1.39	1.88	1.54
Medical Devices	0.89	-	0.94	-	1.01	-	-	1.54	-	-	0.74	0.92
Metalworking Technology	0.87	-	3.38	4.22	2.63	-	0.89	0.41	0.32	0.20	0.38	1.26
Automotive	0.79	13.85	0.25	-	0.31	4.22	0.07	0.02	0.04	0.05	3.44	3.02
Wood Products	0.78	-	8.64	2.54	2.32	12.11	1.05	0.01	-	0.27	4.17	0.11
Upstream Metal Manufacturing	0.73	0.43	0.58	0.27	1.83	4.91	-	0.26	-	-	-	3.57
Hospitality and Tourism	0.72	0.11	0.86	0.63	3.01	0.89	0.49	0.55	0.24	0.44	1.09	0.44
Paper and Packaging	0.68	-	0.67	5.73	-	-	3.10	0.15	0.11	-	-	1.92
Environmental Services	0.60	-	2.72	-	3.90	-	0.72	0.13	0.45	-	-	0.44
Information Technology and Analytical Instruments	0.60	-	1.33	-	0.48	0.31	-	0.32	0.79	0.27	3.04	2.21
Insurance Services	0.55	0.11	0.30	0.21	0.03	0.38	0.08	0.13	0.08	5.40	0.12	0.10
Textile Manufacturing	0.53	-	-	3.45	-	-	0.66	-	-	-	-	3.56
Transportation and Logistics	0.50	1.26	0.66	0.66	0.31	4.02	1.62	0.16	0.69	0.44	2.62	0.30
Leather and Related Products	0.49	-	-	3.44	-	10.49	1.97	-	-	-	-	1.22
Distribution and Electronic Commerce	0.49	2.47	1.35	0.90	0.55	1.80	0.19	0.10	1.05	0.45	0.89	0.96
Nonmetal Mining	0.42	2.06	-	1.29	0.50	-	-	0.11	0.47	0.57	2.20	0.91

Traded Cluster	District 6	Dodge	Fillmore	Freeborn	Goodhue	Houston	Mower	Olmsted	Rice	Steele	Wabasha	Winona
Apparel	0.40	-	-	-	0.68	-	-	-	0.63	0.76	1.48	1.85
Forestry	0.40	-	3.49	1.60	0.62	4.88	-	0.13	0.58	-	2.73	-
Financial Services	0.34	0.27	0.37	1.67	0.18	0.35	0.40	0.36	0.37	0.17	0.19	0.12
Performing Arts	0.33	0.98	2.00	0.61	0.24	1.87	0.35	0.15	0.55	0.27	1.04	0.22
Communications Equipment and Services	0.30	-	-	-	0.61	-	-	0.14	0.09	0.12	-	1.62
Marketing, Design, and Publishing	0.29	0.26	0.53	0.41	0.13	0.50	0.09	0.17	0.28	0.75	0.28	0.67
Business Services	0.28	0.07	0.23	0.17	0.20	0.28	0.67	0.25	0.24	0.40	0.19	0.41
Construction Products and Services	0.28	0.63	0.28	0.34	1.34	-	0.35	0.14	0.19	0.17	-	0.14
Biopharmaceuticals	0.19	4.31	-	-	-	-	-	-	0.97	-	-	-
Water Transportation	0.18	-	-	-	-	-	-	-	-	-	-	1.75
Oil and Gas Production and Transportation	0.07	1.44	-	0.30	-	-	-	0.04	0.05	0.07	-	-
Video Production and Distribution	0.03	-	-	-	-	1.26	-	-	-	0.18	-	-
Aerospace Vehicles and Defense	0.01	-	-	0.21	-	-	-	-	-	-	-	-

Appendix E: Number of Employees by Traded Cluster⁴⁴

Traded Cluster	District 6	Dodge	Fillmore	Freeborn	Goodhue	Houston	Mower	Olmsted	Rice	Steele	Wabasha	Winona
Education and Knowledge Creation	43,807	-	-	30	150	20	40	37,837	3,850	60	10	1,810
Business Services	8,742	50	115	190	554	102	1,292	3,302	740	1,007	120	1,270
Distribution and Electronic Commerce	7,243	815	327	477	751	311	179	616	1,526	542	275	1,424
Hospitality and Tourism	5,888	20	115	183	2,255	85	250	1,953	192	289	187	359
Food Processing and Manufacturing	5,870	20	179	665	585	70	269	1,251	1,450	365	406	610
Livestock Processing	5,770	10	30	925	70	-	3,760	175	770	10	-	20
Production Technology and Heavy Machinery	3,145	60	60	100	180	-	80	850	730	395	375	315
Downstream Metal Products	2,764	10	30	10	830	60	60	70	370	995	70	259
Vulcanized and Fired Materials	2,325	-	-	-	60	-	-	10	385	1,750	-	120
Insurance Services	2,193	10	20	30	12	18	20	233	30	1,770	10	40
Transportation and Logistics	2,160	122	47	102	122	205	441	299	296	155	239	132
Automotive	1,915	750	10	-	70	120	10	20	10	10	175	740
Printing Services	1,844	60	20	20	760	-	60	289	54	264	10	307
Financial Services	1,690	30	30	295	81	20	122	780	182	70	20	60
Information Technology and Analytical Instruments	1,633	-	60	-	120	10	-	381	215	60	175	612
Plastics	1,595	195	175	130	245	-	10	175	120	200	70	275
Furniture	1,509	10	255	175	445	-	60	450	41	43	10	20

⁴⁴ Institute for Strategy and Competitiveness, Harvard Business School. "U.S. Cluster Mapping," Accessed February 20, 2018, <http://clustermapping.us>.

Traded Cluster	District 6	Dodge	Fillmore	Freeborn	Goodhue	Houston	Mower	Olmsted	Rice	Steele	Wabasha	Winona
Recreational and Small Electric Goods	1,100	20	10	10	90	70	10	45	-	750	60	35
Metalworking Technology	1,089	-	70	190	305	-	70	224	40	20	10	160
Marketing, Design, and Publishing	994	20	30	50	42	20	20	258	95	209	20	230
Footwear	945	10	-	-	925	-	-	-	-	10	-	-
Electric Power Generation and Transmission	873	10	10	-	810	-	43	-	-	-	-	-
Downstream Chemical Products	850	-	-	-	10	-	-	60	10	10	-	760
Upstream Metal Manufacturing	760	10	10	10	175	60	-	120	-	-	-	375
Wood Products	710	-	130	83	195	130	60	2	-	20	80	10
Lighting and Electrical Equipment	700	-	-	-	-	-	10	10	-	70	-	610
Paper and Packaging	615	-	10	185	-	-	175	60	10	-	-	175
Construction Products and Services	608	30	10	26	265	-	47	130	40	30	-	30
Medical Devices	575	-	10	-	60	-	-	435	-	-	10	60
Upstream Chemical Products	425	70	60	60	175	-	-	-	-	60	-	-
Agricultural Inputs and Services	404	90	20	30	40	-	41	41	30	60	32	20
Communications Equipment and Services	320	-	-	-	60	-	-	65	10	10	-	175
Performing Arts	301	20	30	20	20	20	20	61	50	20	20	20
Textile Manufacturing	255	-	-	60	-	-	20	-	-	-	-	175
Music and Sound Recording	185	-	-	-	-	-	-	10	-	-	-	175
Water Transportation	140	-	-	-	-	-	-	-	-	-	-	140
Environmental Services	133	-	10	-	80	-	10	13	10	-	-	10

Traded Cluster	District 6	Dodge	Fillmore	Freeborn	Goodhue	Houston	Mower	Olmsted	Rice	Steele	Wabasha	Winona
Apparel	130	-	-	-	20	-	-	-	20	20	10	60
Oil and Gas Production and Transportation	130	60	-	20	-	-	-	30	10	10	-	-
Biopharmaceuticals	120	60	-	-	-	-	-	-	60	-	-	-
Nonmetal Mining	90	10	-	10	10	-	-	10	10	10	10	20
Jewelry and Precious Metals	80	-	-	-	-	-	-	10	10	60	-	-
Forestry	70	-	10	10	10	10	-	10	10	-	10	-
Leather and Related Products	40	-	-	10	-	10	10	-	-	-	-	10
Video Production and Distribution	20	-	-	-	-	10	-	-	-	10	-	-
Aerospace Vehicles and Defense	10	-	-	10	-	-	-	-	-	-	-	-
Total Traded Clusters	112,765	2,572	1,893	4,116	10,582	1,351	7,189	50,285	11,376	9,364	2,414	11,623
Percent of Total Traded Clusters	100%	2%	2%	4%	9%	1%	6%	45%	10%	8%	2%	10%

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Table prepared by State and Local Policy Program, Humphrey School of Public Affairs, University of Minnesota.

Appendix F: Business Invitation Letter

District 6 Rochester
2900 48th St. NW
Rochester, MN 55901
jeff.vlaminck@state.mn.us
507-286-7501

August 28, 2017

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

Dear <Name>,

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

We plan to schedule interviews from September through mid-November. Project consultants from Management Analysis and 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 at a time when you're available. For your convenience, I have enclosed a draft of the interview guide.

Our interview with you and other manufacturers and shippers in the region will be useful 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 want to ensure that we work hard to understand what they are.

A secondary goal of this effort is to increase familiarity between MnDOT District 6 staff and area businesses and open lines of communication. Our district serves all or portions of 11 counties across southeast 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. When possible, our project team also will include staff from local economic development organizations to further develop connections amongst our organizations.

MnDOT has completed four studies using this interview model: in southwest Minnesota in 2013, west-central Minnesota in 2014, northwest Minnesota in 2015, and northeast Minnesota in 2016. Conversations with manufacturers revealed specific challenges and requests regarding infrastructure and maintenance. The districts were able to address some problems, while other input has helped inform planned infrastructure changes and maintenance. Additionally, manufacturers' input led to improvements in the districts' planning and

communication processes. We expect that we'll 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 1 Manufacturers' Perspectives Report: <http://bit.ly/MnDOTD1MPreport>

District 2 Manufacturers' Perspectives Report: <http://bit.ly/MnDOTD2MPreport>

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

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

On behalf of MnDOT, we look forward to working with you to support your business and strengthen economic vitality in southeast 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,

Jeffrey L. Vlaminc, P.E.
Transportation District Engineer
MnDOT District 6

Enclosure

Appendix G: Descriptions of Clusters Interviewed

Below is a complete list of all clusters interviewed with descriptions of each cluster and an example of a business interviewed in District 6.

Table 4: Definitions and examples of traded industry clusters in District 6⁴⁵

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.	Ag Partners Co-Op
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.	Technigraph Corp.
Construction Products and Services	The establishments in this cluster supply construction materials, components, products, and services. Construction materials and components include those made of sand, stone, gravel, asphalt, cement, concrete, and other earthen substances. Construction products include pipes and heat exchangers. Construction services include the construction of pipelines for water, sewers, oil and gas, power, and communication, as well as building services for homes and industrial buildings.	Biesanz Stone
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.	Fastenal
Downstream Chemical Products	Establishments in this cluster manufacture complex chemical products for end users. These products include adhesives, beauty products, soaps, cleaners, film processing chemicals, dyes, paints, explosives, and lubricating oils.	Arkema

⁴⁵ U.S. Cluster Mapping, “Local Clusters Appendix.” Accessed February 20, 2018, <http://clustermapping.us/sites/default/files/files/page/Traded%20Clusters%20Appendix.pdf>.

Cluster	Definition	Business example
Downstream Metal Products	This cluster contains establishments that manufacture metal containers, prefabricated metal structures, and end user metal products. These end user products include ammunition, kitchenware, hardware, metal bathroom fixtures, and similar metal products used in home finishing such as doors, windows, and ornamentation.	Minnesota Metals
Education and Knowledge Creation	This cluster contains all educational and training institutions, as well as related supporting establishments. It also includes research and development institutions in biotechnology, physical sciences, engineering, life sciences, and social sciences.	The Mayo Clinic
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.	Faribault Foods
Footwear	Establishments in this cluster are those that manufacture men’s and women’s shoes, boots, slippers, and other footwear. This cluster also contains the upstream leather used in making footwear.	Red Wing Shoe Company
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 textiles.	Tuohy Furniture Corp
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 other accommodations, transportation, and services related to recreational travel such as reservation services and tour operators.	Treasure Island Casino
Information Technology and Analytical Instruments	This cluster consists of information technology and analytical products such as computers, software, audiovisual equipment, laboratory instruments, and medical apparatus. The cluster also includes the standard and precision electronics used by these products (for example, circuit boards and semiconductor devices).	Engineering Lab Designs
Livestock Processing	This cluster contains establishments engaged in processing meat from livestock and livestock wholesaling.	Randy’s

Cluster	Definition	Business example
Metalworking Technology	The establishments in this cluster manufacture machine tools and process metal for use in metalworking. The cluster also contains the downstream manufacture of metal fasteners and hand tools.	DCM Tech Corp.
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.	Envirolastech
Plastics	Establishments in this cluster manufacture plastic materials, components, and products. The plastics and foams are manufactured for packaging, pipes, floor coverings, and related plastic products. The cluster also includes the upstream manufacturing of plastic materials and resins, as well as the industrial machines used to manufacture plastics.	Acrotech
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.	WS Packaging Group
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.	Automation Services
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.	Hiatt Manufacturing
Textile Manufacturing	This cluster contains textile mills that primarily produce and finish fabrics for clothing, carpets, upholstery, and similar uses. The textiles include yarn, thread, fibers, hosiery, knits, and other specialty fabrics.	Faribault Woolen Mill
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.	Lawrence Transportation Company

Cluster	Definition	Business example
Upstream Chemical Products	This cluster consists of firms that manufacture basic organic and inorganic chemicals and gases. The chemicals are usually separate elements that could be used as inputs for more complex downstream chemical products.	POET Biorefining
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.	McNeilus Steel
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.	Rockland Flooring

Table 5: Definitions and Examples of Local Industry Clusters in District 6⁴⁶

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.	BIC Graphic
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.	McLane
Local Health Services	Firms in this cluster include local health care establishments and services such as hospitals, medical laboratories, home and residential care, and funeral services and crematories. This cluster also includes pharmacies and optical goods retail stores.	The Mayo Clinic

⁴⁶ U.S. Cluster Mapping, “Local Clusters Appendix.” Accessed February 20, 2018, <http://clustermapping.us/sites/default/files/files/page/Local%20Clusters%20Appendix.pdf>.

Cluster	Definition	Example
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.	Hearth and Home Technologies
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.	McDonough Truckline
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.	Nuss Truck and Equipment
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 contain firms that support land development, concrete manufacturing, highway and street construction, as well as building equipment distribution.	Concepts and Design

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