

Tech Memo 1: Document Synthesis

MnDOT District 3 Freight Plan

Report Version 2.0

Minnesota Department of Transportation

Prepared by:



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1. Introduction

This task is part of the 2019 MnDOT District 3 Freight Plan. Specifically, this task is to identify findings and data from prior studies regarding the key freight issues facing the region and the freight system's future needs. This document draws significantly from work the Minnesota Department of Transportation (MnDOT), research organizations, and regional and local governments have done to investigate and report on the critical freight issues in and surrounding District 3. The documents reviewed as part of this task are listed below. This report presents a synthesis of the key issues identified from these documents and common themes related to the future of freight in the region.

- Minnesota Statewide Freight and Investment Plan (2018)
- Central Minnesota Freight Study (2012)
- Minnesota State Rail Plan (2015)
- MnDOT 20-Year State Highway Investment Plan: 2018–2037 (2018)
- Transportation Planning to Support Economic Development: An Exploratory Study of Competitive Industry Clusters and Transportation in Minnesota (2015)
- St. Cloud Area Planning Organization Transportation Performance Measures Report (2018)
- Minnesota Statewide Aviation System Plan (2012)
- A Comprehensive System for Assessing Truck Parking Availability (2017)
- Region Five: Comprehensive Regional Economic Development Strategy (2016)
- Minnesota Statewide Ports and Waterways Plan (2014)
- MnDOT Weight Enforcement Investment Plan (2018)
- Central Minnesota Economic Development: 2018 Regional Profile (2018)
- Minnesota Statewide Commercial Vehicle Weight Compliance Strategic Plan (2005)

Additional studies or plans may be reviewed and incorporated in the District 3 Freight Plan based on feedback from stakeholders, including MnDOT, the Advisory Committee, and the Technical Advisory Committee.

2. District 3 Freight Overview

Currently, freight flows in District 3 are second only to the Metro District, which includes Minneapolis and Saint Paul (the Twin Cities),¹ with significant truck and rail infrastructure and traffic. I-94, a major truck corridor, runs through the southern section of the District, carrying heavy truck traffic between the Twin Cities and St. Cloud and the markets beyond, including Fargo and Chicago. Truck parking is a moderate issue along this corridor; there are 21 stations for trucks to park overnight and/or stage before reaching the Twin Cities yet some locations along I-94 frequently reach capacity. There are also 367 miles of rail line in the District.

The top three commodities by volume shipped by truck in District 3 in 2012 were cereal grains, gravel, and gasoline.² Approximately 52 percent of truck shipments by weight in the District are originating. In contrast, about 97 percent of rail shipments by weight in the District are terminating rather than originating, much of it at the largest coal-fired plant in the State which is in the District. A more detailed analysis of commodity flows in the District will be conducted as part of a later task.

Freight-related industries have a significant impact on the economy in District 3. The top freight related industries as measured by location quotient include Animal and Aquaculture and Forestry and Logging. These industries are highly concentrated in the region with a moderate number of employees. The Wood Product Manufacturing industry is both highly concentrated and has a larger number of employees.

District 3 is also second to the Metro district in population, which is a key driver of freight traffic. Between 2000 and 2017, the Central Minnesota Planning Region, which includes two of the three Regional Development Organizations (RDOs) in District 3 (it does not include Region 5), was the fastest growing region in the State with a 24 percent increase in population.³ Much of the economic activity is centered in two main areas that are activity centers in District 3: the St. Cloud metropolitan region, one of the fastest growing metro regions in the State and the Brainerd Lakes area, which is home to a significant tourist industry.

Due to both demographic and economic changes, growing and sustained industry, and an increasing trend of commuters

¹ Minnesota Statewide Freight and Investment Plan, <https://www.dot.state.mn.us/planning/freightplan/pdf/statewidefreightplanrevised2018.pdf>

² Minnesota Statewide Freight and Investment Plan, Inventory and Demand.

³ Regional Profile: Central Minnesota Planning Region. When removing the counties in the Central Minnesota Planning Region that are not in District 3 and adding population data for the remaining counties in District 3, the population growth from 2000 to 2017 is still 24 percent.

living in the District and traveling to the Twin Cities for work, the District 3 passenger and freight transportation systems are expected to experience increasing stress in coming decades. This change yields an opportunity to plan a freight system to address existing system challenges and accommodate new population and industries.

Key Freight Issues in District 3

The District 3 freight system is confronted with the following challenges, which have been summarized from the studies and reports reviewed. Addressing these key issues is essential to support future growth and vitality in the region.

- **Increased Freight Demand:** District 3, as well as the State, is experiencing continuing increases in freight demand, particularly on the road and rail system (Minnesota Statewide Freight Plan). Continuing growth leads to strained capacity, particularly along key freight corridors, and can result in impacts to performance of the network and the state of repair of the system.
- **Truck Delay and Congestion:** I-94, which runs from the Metro region northwest towards North Dakota through District 3, is the most congested corridor in the state radiating from the Metro. Truck speeds are slow (on average 49 – 54 miles per hour) which has reverberating impacts on the District 3 freight system in which trucks are the primary freight mode by tonnage and value (Central Minnesota Freight Study). Improvements are slated for this key corridor, such as improvements aimed at reducing bottlenecks along I-94 that began in the summer of 2019 between Maple Grove and Clearwater as part of the Corridors for Commerce program. Improvements include adding lanes, resurfacing, and adding safety features. Additional improvements are slated with five total I-94 projects listed in the 2019-2022 State Transportation Improvement Program (STIP).
- **Truck Parking:** Along I-94, there are challenges for trucks looking for overnight parking. Recently, testing of Truck Parking Availability Systems along the corridor have improved the ability to find parking. The MAASTO Regional Truck Parking Information Management Systems (TPIMS) is a multi-state effort to deploy real-time parking information, including on I-94 in Minnesota.⁴ In 2019, the system broadcast parking information in District 3 at two locations, in Albany and Enfield along I-94. However, there continues to be a need for investment in dynamic information and technology solutions for truck parking availability and reliability, particularly on interstates and near urban areas nationwide.
- **At-Grade Crossing Safety:** Increasing train volumes and the movement of hazardous materials contribute to safety concerns at highway-rail at-grade crossings throughout the state. Improving

⁴ MAASTO Regional Truck Parking, <http://www.maasto.net/documents/TPIMS-Summary.pdf>

grade-crossing safety is a statewide priority. There is a total of 344 at-grade crossings (as of 2010) in the region out of the total 4,000+ in the State.⁵ Sherburne County is among the top counties in the State for all crashes and for fatal crashes (Rail Grade Crossing Safety Project Selection report). In 2014, the Minnesota legislature passed safety-related bills that included \$2 million in funding from the legislature to improve grade crossing safety and reduce collisions at 15 key locations.

- **Intermodal Rail Facilities:** District 3 has limited rail facilities and does not have an intermodal (container) facility, where freight is transferred from one mode to the other. The nearest access points to container and waterway terminals are in Duluth or Minneapolis and Saint Paul. The lack of intermodal and rail facilities in the region increases truck VMT on the roadway network, impacting roadway condition and capacity.

⁵ District 3 Factsheet, <http://www.dot.state.mn.us/information/factsheets/d3-fact-sheet.pdf>

3. Previous Findings and Recommendations

The goods movement system in the District has unique conditions, needs, and opportunities. District 3's primary freight modes are truck and rail. The roadway and railroad systems support imports and exports in and out of the region. Without a resilient system, goods cannot move efficiently in and out of District 3, resulting in adverse economic impacts. The following section summarizes the condition, needs, and opportunities of the roadway system, the railroad system, and the economic trends related to freight in District 3 based on the results of previous plans and studies.

Freight Demand

Minnesota's multimodal freight system is experiencing growing freight demand which requires improved performance. The Minnesota Statewide Freight Plan forecasts 80 percent growth in freight tonnage by 2040. In Minnesota the mode split by weight is 63 percent truck, 25 percent rail, and five percent pipeline in 2012. These percentages are expected to remain about the same by 2040, but with increased tonnage, roadways will become more congested. In the Metro area, annual hours of truck delay are expected to follow

the national trend and increase, which likely will have reverberations along I-94 in District 3. Much of the increased tons transported and truck travel will come in the form of more long-haul rail movement and first- and last-mile deliveries.

Mainline rail capacity is also a concern. The mainline rail in the District carries among the highest volumes in the State. Two of the mainline rail lines in the District, the BNSF Staples Subdivision to Fargo and the CP line, carry 46 trains per day and 26 trains per day, respectively.⁶ In recent years, rail capacity delays have been related to the North Dakota oil boom and agricultural trends. Multiple plans point to the shift in increased oil shipments from bordering states as creating a lack of capacity which influences other industries. Some industries' products including construction materials and forest products have shifted from rail to truck modes because of limited freight rail capacity.⁷

Beyond the roadway and rail system, many goods are destined for the water and air systems. Minnesota has two commercially navigable waterways including The Mississippi River System and The Great Lakes-Saint Lawrence Seaway which

⁶ MnDOT Freight Railroad Map, Train Volumes and Speeds
<http://www.dot.state.mn.us/ofrw/maps/MNFreightRailroadMapLarge.pdf>

⁷ Transportation Planning to Support Economic Development: An Exploratory Study of Competitive Industry Clusters and Transportation in Minnesota (<https://www.dot.state.mn.us/research/TS/2015/201502.pdf>)

provide access to economic marketplaces internationally.⁸ District 3's access to the Great Lakes-Saint Lawrence Seaway is through Duluth while access to the Mississippi is through a navigation channel to the Twin Cities. The Minnesota Statewide Ports and Waterways Plan outlines key opportunities, challenges, and strategies in several areas including port infrastructure condition and capacity. To address capacity issues, strategies include upgrading aging infrastructure, identifying funding, and conducting infrastructure and needs inventories.

Roadway System

The District 3 roadway system includes 1,607 centerline miles and 423 bridges.⁹ The southern portion of the District closest to the counties bordering the Twin Cities is rapidly becoming urbanized. From 1992 to 2009, six counties in the District — Sherburne, Isanti, Crow Wing, Mille Lacs, Stearns, and Wright — had VMT growth exceeding 50 percent.¹⁰ The major corridor that allows this urbanizing population to commute to and from jobs in the Twin Cities is I-94. I-94

simultaneously carries a bulk of freight system traffic in the region.

Congestion and reliability are issues not only on I-94 but also on the District's greater roadway freight system. District 3 has three corridors on the National Highway Freight System including US 169, TH 24, and I-94.¹¹ Additional key freight corridors identified by the region include US 10, US 12, TH 23, and TH 25 (Roadway system shown in Figure 1). Although by some measures truck travel time reliability is average and congestion is moderate in the region, growth of heavy commercial traffic is predicted on I-94 and TH 10. Specifically, congestion is expected to worsen on I-94 from the Twin Cities to St. Cloud and the corridor is expected to perform below target despite improvements planned by 2030. However, there are signs of improvement: the St. Cloud AO's 2017 truck travel time reliability (calculated by dividing the ratio of the 95th percentile time by the 50th percentile time) is 1.10, a decrease of more than 15 percent from 1.30 in 2016. This is a movement in the right direction as the Federal Highway Standards consider a reliability above 1.5 unreliable.

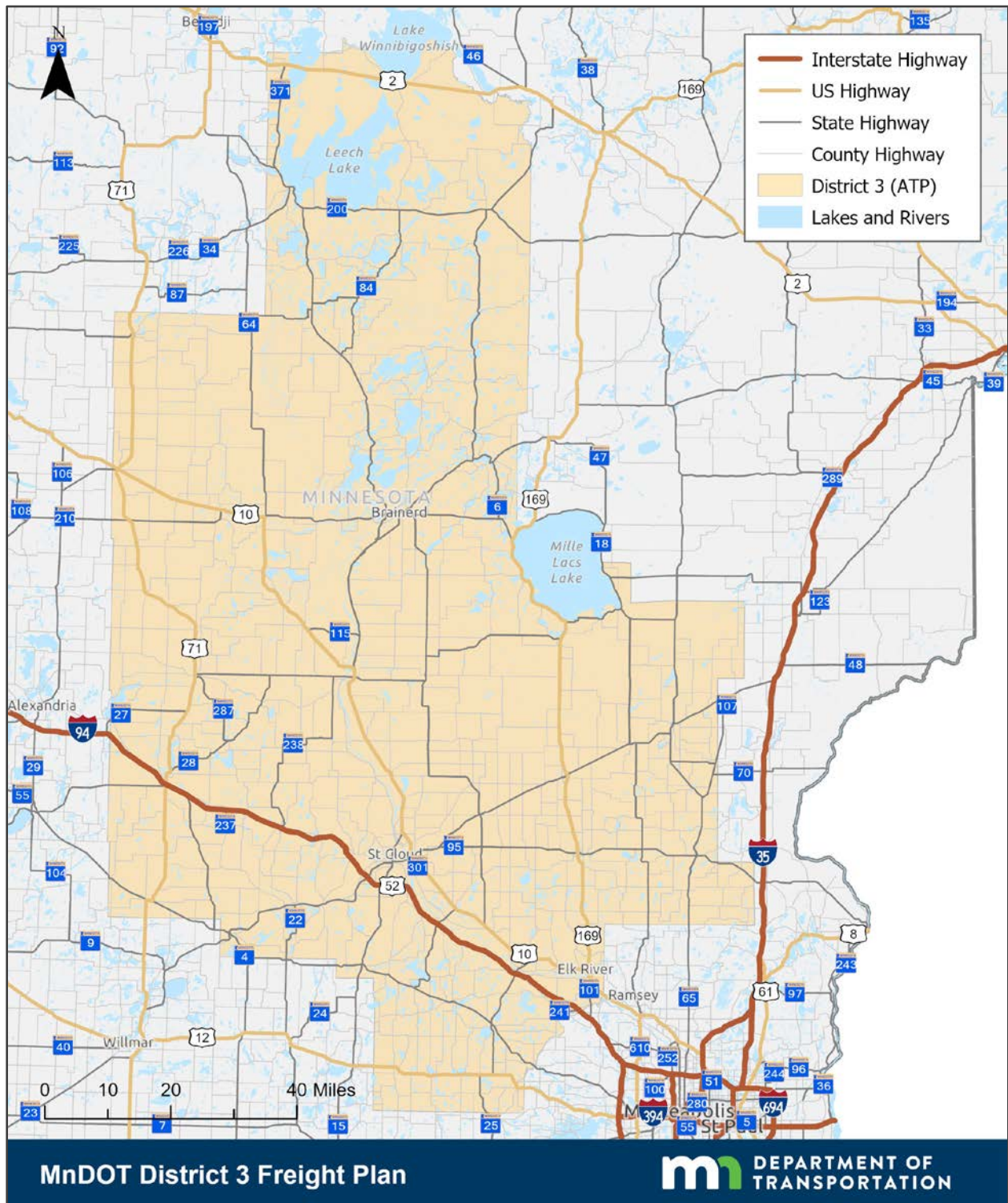
⁸ MnDOT Ports and Waterways System Plan

⁹ MnDOT District 3 Brochure, <http://www.dot.state.mn.us/d3/graphics2/MnDOTD3brochure.pdf>

¹⁰ Central Minnesota Freight Plan, <https://www.dot.state.mn.us/planning/freightplan/central/files/CentralMinnesotaFreightStudy.pdf>

¹¹ MnDOT National Highway Freight System in Minnesota, <http://www.arcgis.com/apps/webappviewer/index.html?id=b6cc09c895cc4e62944fe004ea2567f7&extent=-11010994.4952%2C5353093.7995%2C-10098642.1256%2C5860635.6673%2C102100>

Figure 1. District 3 Roadway System



In addition to congestion and increasing demand on the system, the District is experiencing pavement condition decline. As of January 2019, the Pavement Quality Index for District 3 was 3.5, which is on par with other districts.¹² When looking at the number of years until the end of the pavements design life (RSL), several roads stand out as poor, indicating there are 0-3 years until end of life (Figure 2). Some of these low RSL roads are key freight corridors including US 10, US 12, and TH 25. Maintenance and preservation of the roadway system is a State, regional, and local goal. The importance of this issue in the District is evidenced by the majority of STIP District 3 funding going to pavement condition projects. Many funded projects in the region capitalize on opportunities to maintain a good state of repair.

With increasing traffic, truck parking is increasingly an issue in the District. According to the Central Minnesota Freight Study, the I-94 West corridor had the most congested rest areas. Two locations were over capacity more than half the time. Some improvements have been made to ease capacity and truck drivers' ability to find parking locations through technology improvements. In a study of the Truck Parking Availability System (TPAS), users had positive or very positive interactions with the system indicating that the technology saved them time and allowed them to efficiently complete long trips. Thirty percent of users specifically reported an easier time complying with hours of service regulations and 60 percent reported an easier time finding truck parking.

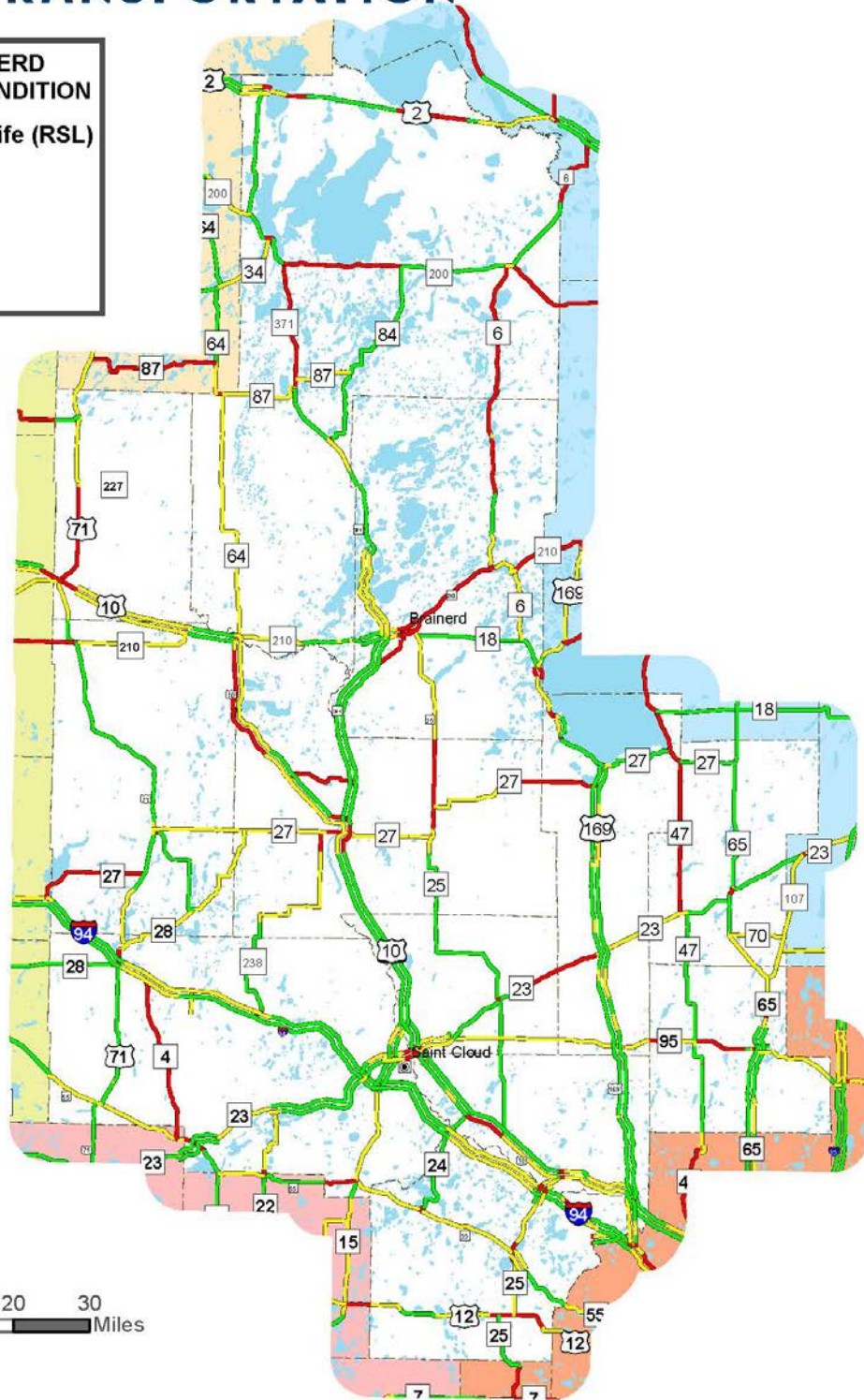
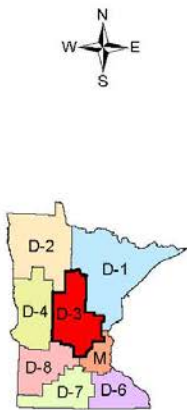
¹² MnDOT Pavement Fact Sheet, https://www.dot.state.mn.us/materials/pvmtmgmtdocs/Fact_Sheet_2018.pdf

Figure 2. District 3 Pavement Condition

mn DEPARTMENT OF TRANSPORTATION

**District 3-BRAINERD
2018 PAVEMENT CONDITION**
Remaining Service Life (RSL)
RSL_ROUG

- Poor (0 - 3 years)
- Fair (4 - 11 years)
- Good (12+ years)



Source: https://www.dot.state.mn.us/materials/maps/pvmtgmt/D3_2018_RSL.pdf

Railroad System

District 3 has 367 miles of rail, with one commuter line (NorthStar), six BNSF subdivisions, one CP subdivision, and the Northern Lines railway (NLR) operating 25 miles of track near St. Cloud (Figure 3).¹³ The 367 rail line miles are just over 8 percent of State's 4,444 rail miles. There is a total of 3,623 miles of Class I rail in the State (Figure 3). The majority of freight rail in District 3 is also Class I and owned by BNSF and Canadian Pacific (CP). BNSF and CP provide connections to North Dakota through the southern edge of the State and the Fargo/Moorhead area. To the east, a BNSF line connects to Duluth, MN with connections to Canada. One BNSF line transports the majority of coal shipments to the State's largest coal-fired power plant located in Becker, Minnesota.¹⁴ The majority of rail tonnage is moved on this line and the projected rail tonnage growth is also greatest on this line.

One critical challenge for rail statewide and in the District is capacity. A study of the granite industry found that rail capacity can create delays and economic losses for District 3.¹⁵ Many delays are due to the oil boom in North Dakota, which drove up demand for rail between 2014 and 2017. Record harvests in the Midwest around this time period also increased demand on the rail freight network. A compounding

factor is the lack of intermodal facilities in the region, which could improve efficiency and speed of goods movement transferred in the region. The closest access to intermodal container service is in Minneapolis and Saint Paul at the CP Shoreham Yard and BNSF Railway Midway Yard. Waterway terminals are in Duluth and the Twin Cities.

Another need on the rail system in the State is improved safety at grade crossings. The Central Minnesota Freight Plan identifies six at-grade rail crossings that result in truck traffic delays. One of these locations along US 10 has a high exposure value, indicating potential safety concerns.¹⁶ High exposure values mean the crossing has a higher volume of train/vehicle traffic. The state rail plan identifies many of the freight corridors running through District 3 as key corridors for crossing safety improvements. The three corridors identified in the Plan (referencing the Grade Crossing Safety Report) are a focus due to high volumes of Bakken crude oil unit trains pass through District 3. Four strategies, including closing at-grade crossings, upgrading passive warnings to active signals, using safety treatments to improve active protection, and creating grade separations are identified for these corridors.

¹³ MnDOT District 3 Brochure, <http://www.dot.state.mn.us/d3/graphics2/MnDOTD3brochure.pdf>

¹⁴ Central Minnesota Freight Study The Central Minnesota Freight Plan, <https://www.dot.state.mn.us/planning/freightplan/central/files/CentralMinnesotaFreightStudy.pdf>

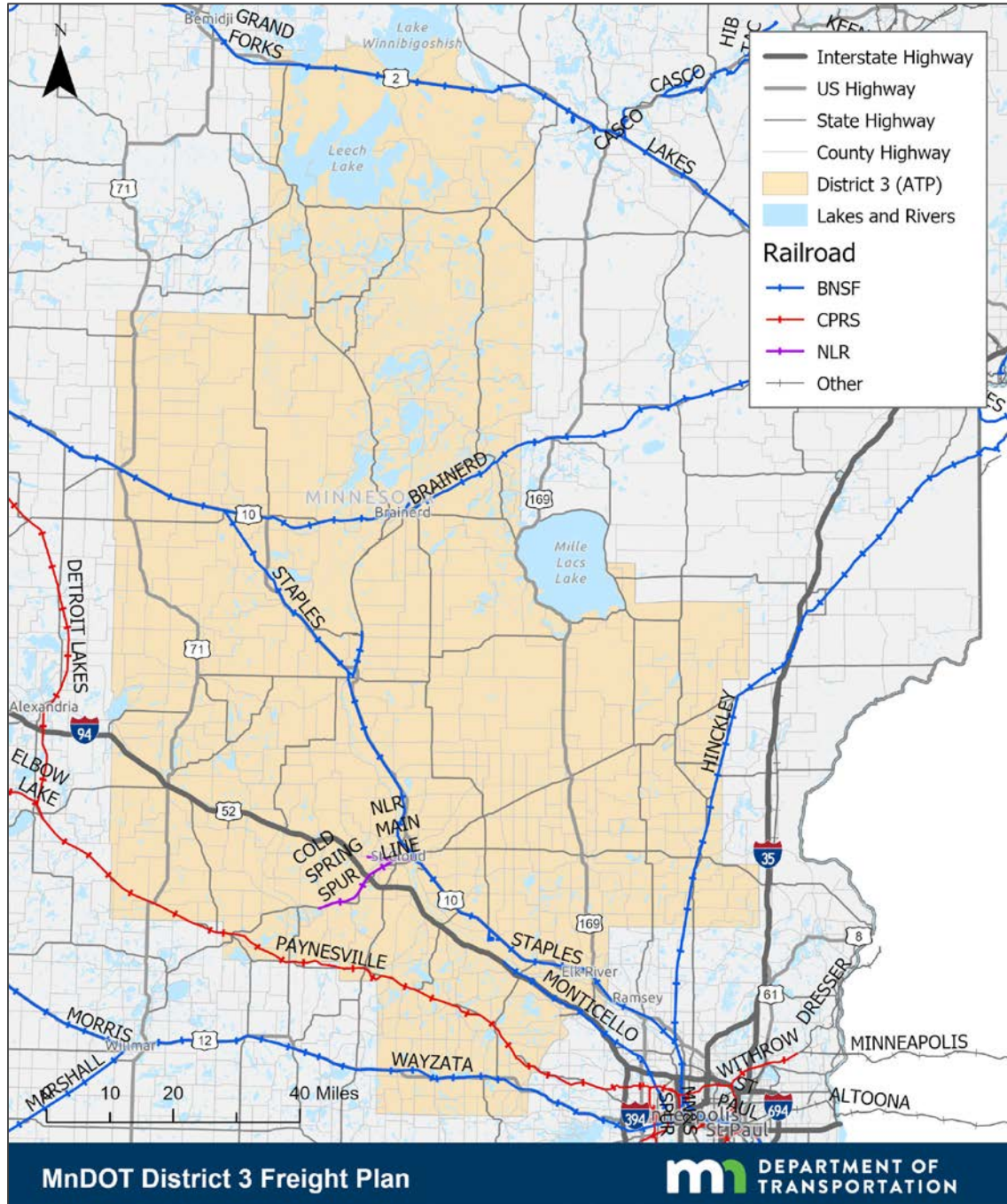
¹⁵ Transportation Planning to Support Economic Development: An Exploratory Study of Competitive Industry Clusters and Transportation in Minnesota (<https://www.dot.state.mn.us/research/TS/2015/201502.pdf>)

¹⁶ Rail Grade Crossing Safety Project Selection, <https://www.dot.state.mn.us/research/TS/2016/201625.pdf>

There are opportunities statewide to move more tons by long-haul rail. The Minnesota Statewide Freight Plan identifies long-haul rail movement as the form that much of increased tons transported will take. Among other strategies for the next 20 years, the State

Rail Plan identifies opportunities to upgrade mainline track to 25mph, implement state-of-the-art traffic control, expand intermodal service, and leverage the rail network for economic development.

Figure 3. District 3 Railroads



Economy

There are several key economic sectors in the District. The largest employing industry in Central Minnesota is healthcare, which is primarily a service sector and not heavily dependent on freight. The second largest industry in Central Minnesota is manufacturing, an industry that relies on efficient freight transportation. The metro area surrounding St. Cloud is a central location for both manufacturing and service industries.

In addition to manufacturing, transportation and warehousing jobs are also on the rise. In Central Minnesota, there was a 15 percent increase in transportation and warehousing jobs from 2012 to 2017. By 2017, the transportation and warehousing sectors had nearly 10,000 jobs. Additionally, truck drivers are one of

the identified jobs in high demand in the region. There is growth in goods movement related jobs and more opportunity for economic opportunity from the goods movement industry in the form of job growth.

Major freight commodities in the region include nonmetallic minerals, farm products, food products, cut stone, and paper products. Table 2 shows the top freight-related industries, measured by location quotient,¹⁷ in District 3 in 2013. The primary employment is in the wood products industry with several employers comprising the core of the freight related industries. The top commodities in the District by total truck tonnage are cereal grains, gravel, and gasoline, with gravel comprising the largest percent of truck tonnage originating in the district of any commodity.

Table 1. Top Freight-Related District 3 Industries by Average Location Quotient

Industry	NAICS Code	Mean Location Quotient	Major District Employer	Employer Location	Employment
Animal production and aquaculture	112	7.07	Wilmar Poultry	Foley	37
Forestry and logging	113	5.06	Sylva Corp	Princeton	30
Wood product manufacturing	321	4.12	Woodcraft Industries	Foreston	200

Source: Minnesota Statewide Freight System Plan (Bureau of Labor Statistics Location Quotient Data, 2013)

¹⁷ Location quotient quantified the concentration of an industry relative to the rest of the state or nation.

Freight is also critical for supporting two industry clusters identified by University of Minnesota researchers. An industry cluster for granite is in the St. Cloud area with a location quotient that is more than 10 times the national average. Cold Spring Granite, one of the granite companies, receives 26 truckloads of granite per week, mostly via I-94. Transportation challenges for the industry include increased scrutiny of rail shipments post 9-11 and rail capacity delays in North Dakota related to the oil boom. The tourism industry has a cluster located in Grandview, Minnesota, with good access from Highway 371 and few freight related issues. However, the tourism industry in this area requires shipments of materials to support the tourism facilities that are occupied year-round.

The Region 5 Economic Development District, which includes the five counties in District 3 that are not part of the Central Minnesota Planning Region, developed a five-year Comprehensive Regional Economic Development Strategy (CREDS) for the region that identifies economic development opportunities and needs. The 2016 CREDS identified key transportation issues including the quality of roads and access to broadband. The broadband need is not necessarily transportation specific but may have freight transportation implications in the future as new technologies such as connected vehicles rely on broadband infrastructure.

To address these challenges, CREDS recommends a number of broad goals. To address broadband access, the goal is for 100 percent of businesses and households to have access to broadband. The air and

rail goal is to maintain freight and passenger rail and airport infrastructure and keep all infrastructure operational by 2025. Additionally, the plan calls for general investments in freight infrastructure that lead to economic improvements. The specific investments are not mentioned in the Plan.

Regional Freight Goals and Investments

Goals from the Minnesota Plans

The District 3 freight goals and objectives should be responsive to State goals and regional priorities. To that end, key goals and objectives from previous plans that should inform this process are summarized here. Goals for this plan will be outlined out a later stage.

The State's goals from the Minnesota Statewide Freight and Investment Plan include:

- Support Minnesota's Economy
- Improve Minnesota's Mobility
- Preserve Minnesota's Infrastructure
- Safeguard Minnesotans
- Protect Minnesota's Environment and Communities

Additionally, the plan's resulting Action Agenda aims to improve efficiency, safety and reliability of the freight system.

More centrally focused, the District 3 Capital Highway Investment Plan (CHIP) has five major investment areas that guide ten years of transportation investment through 2028:

- System Stewardship: Asset management including pavement and bridge preservation
- Transportation Safety: Focused on preventing fatal and serious crash types
- Critical Connections: ADA and bicycle system improvements
- Healthy Communities: Local partnerships
- Project Delivery: Allocate funds for overruns and supplemental agreements

Many of these investment areas overlap with MnDOT Goals and the State freight goals, particularly in the areas of safety, mobility, and preservation of the State's infrastructure. Notably, project delivery and the allocation of funds is specified as a major investment area in the CHIP and not explicitly stated in the State goals. The State goal focuses on supporting the economy more broadly.

The Area Organization's (AO) five goals reflect the importance of a strong economy and efficient management of funds related to project delivery. These five critical goals frame the AO's performance measure report:

- Maintain and enhance transportation system safety;
- Increase system accessibility, mobility, and connectivity;
- Efficiently manage operations and cost-effectively preserve the system;
- Support metropolitan vitality and economic development; and

- Promote energy and environmental conservation.

Freight Investment Decision Process

Investments in the freight system should be led by the goals and objectives identified above. At the state level, investments are identified as part of the Family of Plans, including MnSHIP, and the Statewide Freight and Investment Plan. At the local level, the 2018 3-year District 3 Capital Highway Investment Program has no funding specifically tied to freight identified for the ten-year plan period however many of the projects identified in the program align with state goals.

For State highway funds allocated in the MnSHIP to support the above goals, investment areas include System Stewardship (condition of infrastructure), Transportation Safety (injuries and fatalities), Critical Connections (mobility and connections to other modes), and Healthy Communities (land use and transportation connections). District 3 in the 2015-18 Minnesota State Transportation Improvement Program (STIP) is allocated just under \$2 million, more than four of the eight districts. The majority of the allocated roadway funding is for pavement condition projects, followed by bridge condition projects. All roadway freight projects in the STIP must be on the NHS and fall into one of the MnSHIP freight related categories:

- Pavement condition
- Bridge condition
- Roadside infrastructure
- Interregional corridor mobility

- Twin cities mobility
- Regional community improvement program
- Traveler safety

The investment portion of the Minnesota Statewide Freight and Investment Plan identifies freight projects and project evaluation criteria using the MnSHIP as a model. The MnSHIP model was used in combination with guidance from stakeholders to finalize the criteria, which includes:

- Highway Project Categories:
 - Safety (NHS)
 - Freight Congestion/Freight Efficiency Improvement (NHS)
 - First/last mile connections (non-NHS)
- Other Categories:
 - Planning, data collection
 - Intermodal port and rail

The majority of the freight investment detailed in MnSHIP is allocated towards projects that are classified as either 'Freight Congestion/ Efficiency Improvement' or 'Safety'. Of the 36 project applications received, two projects in District 3 were selected, both in Sherburne County:

- **Sherburne County CR 45 at 125th Street/9th Avenue Circle Intersection Improvement (FY 2019):** Involves reconstruction and safety improvements between TH 24 and US 10 on CSAH 8. The project aims to improve freight safety and mobility with design features including

improving existing shoulders, adding right-turn lanes and bypass lanes at all intersections, improving signage and road striping, and replacing pavement. The project connects to a State Rural Freight Corridor. The total project cost is projected to be \$1.15 million.

- **Sherburne County CSAH 8 Reconstruction (FY2019):** Also connecting to a Rural Freight Corridor, the CSAH 8 reconstruction involves reconstruction of a four-way intersection. The project is adjacent to Trunk Highway 169 which is the most heavily used non-interstate highway freight corridor in Sherburne County. The total project cost is projected to be \$6.08 million.

Key Freight Issues in Nearby States

The key freight issues in District 3 are not isolated from surrounding regions. Many other state districts and bordering states experience capacity related challenges,

congestion and slow truck speeds, truck parking over capacity, and a number of safety challenges. Nearby states’ approaches to solving these challenges, as identified in their State Freight Plans, are documented and synthesized in Table 3.

Table 2. Neighboring States’ Approaches to Freight Transportation Issues

STATE	Increased freight demand	Congestion/ Slow Speeds	Truck Parking	At-Grade Crossing Safety	Rail Facilities
Wisconsin	<ul style="list-style-type: none"> - Use a performance-based approach to identify state trunk highway system preservation needs, including development of a bridge asset management system - Refine and expand a state-of-the-art process for prioritizing needs and identifying cost-effective state trunk highway construction alternatives 	<ul style="list-style-type: none"> - Support communications along state highway corridors of freight significance to ensure drivers can remain informed of changing conditions 	<ul style="list-style-type: none"> - Redesign truck parking lots so vehicles don't take up more than one spot, adding capacity - Communicate information in real time to drivers 	<ul style="list-style-type: none"> - Deploy technology such as positive train control, electronically controlled pneumatic brakes, and distributed power. - Improve emergency response with ITS systems and cross agency collaboration - Seek to understand platooning and autonomous/ connected technology that is expected to improve highway safety. 	<ul style="list-style-type: none"> - WisDOT plays a role in facilitating intermodal strategy - Preserve rail corridors, including rights-of-way, for freight service - Evaluate what corridors should stay in service to preserve strategic connections - Acquire rail lines into public ownership, when appropriate, to preserve essential railroad service
Nebraska	<ul style="list-style-type: none"> - Use key Freight Corridors and Critical Freight Corridors to identify and prioritize projects that support freight mobility 	<ul style="list-style-type: none"> - Identify and mitigate bottlenecks that create significant congestion 	<ul style="list-style-type: none"> - Deploy new technologies to allow a driver to identify (and reserve) a truck parking spot ahead of time 	<ul style="list-style-type: none"> - Implement safety measures (warning lights, gates) or separate road-rail crossings. 	<ul style="list-style-type: none"> - Establish cross agency and business connections

<p>Iowa</p>	<ul style="list-style-type: none"> - Right-size the system with cost effective solutions to address anticipated issues 	<ul style="list-style-type: none"> - Provide real-time information on system conditions to support the movement of freight - Use new technologies (such as social media) to communicate project information 	<ul style="list-style-type: none"> - Provide real-time information 		<ul style="list-style-type: none"> - Explore new rail intermodal facilities to enable lower cost rail services for Iowa businesses
<p>South Dakota</p>	<ul style="list-style-type: none"> - Participate in multistate freight planning 	<ul style="list-style-type: none"> - Improve data at critical freight links through use of ITS infrastructure 	<ul style="list-style-type: none"> - Monitor future truck parking needs at rest areas - Use asset management to maintain rest area security cameras and lighting 		

Sources: Wisconsin Freight Plan, Low-Cost Strategies to Increase Truck Parking in Wisconsin , Wisconsin Rail Plan, Nebraska Freight Plan, Iowa Freight Strategies, South Dakota Freight Plan

Appendix: Summary of Previous Plans and Studies Reviewed

Table 3. Previous Plans and Studies Reviewed

Plan	Year	Website
Minnesota Statewide Freight and Investment Plan	2018	https://www.dot.state.mn.us/planning/freightplan/pdf/statewidefreightplanrevised2018.pdf
Central Minnesota Freight Study	2012	https://www.dot.state.mn.us/planning/freightplan/central/files/CentralMinnesotaFreightStudy.pdf
Minnesota State Rail Plan	2015	https://www.dot.state.mn.us/planning/railplan/2015report/DraftMNStateRailPlan.pdf
MnDOT 20-Year State Highway Investment Plan: 2018–2037	2018	http://minnesotago.org/application/files/4815/5076/5789/MnSHIP_Final_Jan2017_With_Appendices_and_Update.pdf
Transportation Planning to Support Economic Development: An Exploratory Study of Competitive Industry Clusters and Transportation in Minnesota	2015	https://www.dot.state.mn.us/research/TS/2015/201502.pdf
St. Cloud Area Planning Organization Transportation Performance Measures Report	2018	http://www.stcloudapo.org/uploads/1/2/8/7/12874227/final_tpm_report_nov2018.pdf
Minnesota Statewide Aviation System Plan	2012	https://www.dot.state.mn.us/aero/planning/sasp2012.html
A Comprehensive System for Assessing Truck Parking Availability	2017	https://www.dot.state.mn.us/ofrw/PDF/assessing-truck-parking.pdf
Region Five: Comprehensive Regional Economic Development Strategy	2016	https://docs.wixstatic.com/ugd/f30eae_72cef56393a74b62a5bdd2b765fad154.pdf
Minnesota Statewide Ports and Waterways Plan	2014	http://dot.state.mn.us/ofrw/PDF/portswaterwaysplan.pdf
MnDOT Weight Enforcement Investment Plan	2018	https://www.dot.state.mn.us/ofrw/mfac/pdf/mfacjune2018-weight-safety-enforcement-plan.pdf
Central Minnesota Economic Development: 2018 Regional Profile	2018	https://mn.gov/deed/assets/rp_central_090418_tcm1045-133244.pdf
Minnesota Statewide Commercial Vehicle Weight Compliance Strategic Plan	2005	https://www.dot.state.mn.us/ofrw/PDF/cvePlan051004_1.pdf

Minnesota Statewide Freight and Investment Plan

Overall Summary

The Minnesota Statewide Freight and Investment Plan, released in 2018, identifies the key issues related to freight movement in the state and the goals and strategies needed to address them. Minnesota's freight system and its role in the national and global market are described to provide context to the importance of the state freight challenges. The Plan results in a Minnesota Freight Action Agenda and investment decisions. The Action Agenda aims to improve efficiency, safety and reliability of the freight system.

Key Findings

Minnesota's multimodal freight system is experiencing growing freight demand which requires improved performance. Much of the increased tons transported and truck travel will come in the form of more long-haul rail movement and first- and last-mile deliveries. Safety is a mixed picture as incidents overall have generally improved over the last decade, but recent upticks are noted. Highway and railroad crossing incidents increased recently as well. Truck delay is increasing across the system, costing all system users and impacting the economic well-being of the state. This is more concentrated in the Twin Cities area. Strategies to improve performance include public-private partnerships, greater integration of freight considerations agency wide, and maximizing economic growth through the freight system.

The investment portion of the Plan identified freight projects and project evaluation criteria. The majority of the investment direction is towards projects that are classified as Freight Congestion/ Efficiency Improvement and Safety. Of the 36 project applications received, two projects in District 3 were selected.

District 3 Findings

The Minnesota Statewide Freight System Plan has sparse details for each district. Rather, it provides a 'big-picture' view of the state's freight system condition, issues, and needs. State goals reflect district goals and vice versa. The State's goals include:

- Support Minnesota's Economy
- Improve Minnesota's Mobility
- Preserve Minnesota's Infrastructure
- Safeguard Minnesotans
- Protect Minnesota's Environment and Communities

Specific to District 3, there are several findings on system performance and funding. District 3's truck freight flows are reported relative to other districts. Their outbound flows exceed their inbound flows, and total truck freight flows are second only to the Metro District. Related to funding, District 3 in the 2015-18 Minnesota STIP was allocated just under \$2

million, more than four of the eight districts. The majority of the allocated funding is for pavement condition projects, followed by bridge condition projects.

Central Minnesota Freight Study

Overall Summary

Developed in 2012, The Central Minnesota Freight Plan outlines the freight infrastructure, demands, and identified projects to meet future changes in District 3. The primary freight modes in the district are truck, rail, air, and pipeline. The region is an integral part of the state freight networks in part because it has the largest population outside the Twin Cities region and expects the largest population growth in the state. The regional freight goals are fairly broad including identifying industry- and region-specific trends, planning for freight movement in the region, and strengthening freight considerations in planning and investment processes and decision-making.

Key Findings

The freight system in central Minnesota faces critical challenges across the major freight transportation modes. I-94 is the major highway carrying truck traffic in District 3. The Central Minnesota Primary Freight System is comprised of one major Interstate: I-94, three US highways: US 10, US 12, US 169, one State highway: TH 23 and two state connectors: route TH 24 connects I-94 to TH 10 and TH 25 connects I-94 to TH 55. Along I-94 towards North Dakota from the Twin Cities improvements are planned to ease congestion. This corridor is the most congested corridor radiating from the Metro area. Trucks are the primary freight mode in the region as measured by tonnage and value, yet truck speeds are slow and there are challenges with overnight parking for trucks along the I-94 corridor. In 2010, I-94 from the Twin Cities to St. Cloud average speed was between 49 and 54 miles per hour while St. Cloud to Twin Cities average speed was between 49 and 54 miles per hour. Rail challenges are related to facilities. There are limited intermodal and rail access facilities. A major rail destination is the power plant in Becker along the BNSF line which receives coal shipments daily. Air goods movement is challenged with retaining passenger and cargo facilities. Of four airports in the district, Brainerd Lakes Regional Airport is the only one that provides primary scheduled air cargo activity. Many of the specific key findings related to freight movements and tonnage are more than 10 years old with limited implications on recent trends.

Minnesota State Rail Plan

Overall Summary

The State Rail Plan Update draft from 2015 was developed by the Minnesota Department of Transportation's Office of Freight and Commercial Vehicle Operations (OFCVO) and the Passenger Rail Office. This document directs future freight and passenger rail investment in the state. The Plan includes an assessment of existing infrastructure and commodities, system performance, and an Action Plan with a four- and 20-year vision for the state's rail system.

Key Findings

The State Rail Plan Update identified a handful of key issues in the realm of rail capacity, safety, and funding. Many short line railroads are in need of upgrades while mainline capacity is also a challenge. Rail safety related to new hazardous material being moved by rail is an area of concern requiring increased state resources. Shipment of these materials also heightens concerns over safety at at-grade crossings. At-grade crossings alone are a concern due to the risks of collisions with vehicles, bicyclists, and pedestrians. Funding for all the projects to address these issues and others is scarce, with increased competition from multimodal projects. The long- and short-term plans to address the major rail challenges involve planning to address these challenges such as safety at at-grade crossings, improving capacity, planning to mitigate critical bottlenecks, and implementing positive train control.

District 3 Findings

The State Rail Plan Update has few District 3 specific findings. Related to crossing safety improvements, the three corridors identified as a focus due to high volumes of Bakken crude oil unit trains pass through District 3. Four strategies including closing at-grade crossings, upgrading passive warnings to active signals, using safety treatments to improve active protection, and creating grade separations are identified for these corridors. One additional notable discussion of rail within the District is the extension of rail between the Twin Cities and St. Cloud.

MnDOT 20-Year State Highway Investment Plan: 2018–2037

Overall Summary

The Minnesota State Highway Investment Plan (MnSHIP) reports on capital project investment with a 20-year horizon through 2037. The Plan is updated every four years to reflect a renewed vision for the State. Investments are concentrated in five areas including System Stewardship, Transportation Safety, Critical Connections, Healthy Communities, and Other.

Key Findings

The State highway system is composed of more than 12,000 miles which is 8 percent of the total miles in the State. It carries most of the freight movement in the State as well as the majority of the vehicle miles traveled. Challenges facing the system include aging infrastructure, annual average shortfall of \$900 million, and significant pavement decline. The State's goals are reflected in the investment areas including System Stewardship (condition of infrastructure), Transportation Safety (injuries and fatalities), Critical Connections (mobility and connections to other modes), and Healthy Communities (land use and transportation connections).

District 3 Findings

The MnSHIP does not include District 3 specific findings beyond identifying the State highway system and showing the NHS and non-NHS routes.

Transportation Planning to Support Economic Development: An Exploratory Study of Competitive Industry Clusters and Transportation in Minnesota

Overall Summary

This report describes a research study to look at geographically clustered industries in Minnesota and the role that transportation plays in these competitive industries. The study focuses on 12 industries that are geographically distributed across the State. Industry locations are identified by high location quotients.

Key Findings

The study resulted in a few key findings, some of which are industry specific, but many of which have broad transportation implications for the State. One cross cutting theme is delay in shipments, some due to globalization of the supply chains and some due more locally to weather, congestion on State roads, and construction. Some industries such as construction materials and forest products have shifted from rail to truck modes due to a shortage of freight rail capacity. One reason for the lack of capacity described is increased oil shipments from bordering states. Poor condition of infrastructure, such as roads, is another concern for Minnesota industries because of the potential for damage while transporting sensitive products.

District 3 Findings

Two of these twelve industries clusters are located in District 3. A hospitality and tourism cluster is located in Grandview, Minnesota, with good access from Highway 371 and few freight related issues. Granite is a major industry cluster for the St. Cloud region with a location quotient that is more than 10 times the national average. Cold Spring Granite, one of the granite companies, receives 26 truckloads of granite per week, mostly via I-94. Transportation challenges with the industry include increased scrutiny of rail shipments post 9-11 and rail capacity related delays in North Dakota related to the oil boom.

St. Cloud Area Planning Organization Transportation Performance Measures Report

Overall Summary

A summary of the St. Cloud Area Planning Organization (APO) performance measures to reach their transportation goals. Delivered in 2017, the report outlines four goals including (1) maintain and enhance transportation system safety; (2) Increase System accessibility, mobility, and connectivity; (3) Efficiently Manage Operations and Cost-Effectively Preserve the System; (4) Support Metropolitan Vitality and Economic Development and (5) Promote Energy and Environmental Conservation. Each goal has a number of performance metrics that are tracked with 2017 data and multi-year trend results.

Key Findings

The key performance measure related to freight is truck travel time reliability. The 2017 truck travel time reliability (Calculated by dividing the ratio of the 95th percentile time by the normal time (50th percentile) is 1.10, a decrease of more than 15 percent from 1.30 in 2016. By Federal Highway Standards, a reliability above 1.5 is unreliable. St. Cloud AO's truck reliability is in the normal range of truck reliability.

Minnesota Statewide Aviation System Plan

Overall Summary

The Minnesota State Aviation Plan (SASP) describes the current aviation system's performance and challenges, and future directions for the state. The interactive report includes projects and costs and an airport report card. This plan is currently being updated by the Minnesota Department of Transportation Office of Aeronautics.

Key Findings

The SASP is a 20-year plan. The estimated capital costs that are needed in the next 20 years far exceeds the amount of funding that is expected to be available by more than double.

District 3 Findings

St. Cloud and Brainerd have airports identified as key airports in the SASP. Key airports are in larger centers and have more regular air freight and airline service. The St. Cloud airport lost commercial airline service in 2009 but is working to restore service. Brainerd Lake Regional Airport provides commercial service.

A Comprehensive System for Assessing Truck Parking Availability

Overall Summary

This research study describes the testing and development of a Truck Parking Availability System (TPAS) along I-94 in Minnesota. A multi-camera approach was used at three parking

facilities within 100 miles west of Minneapolis- Saint Paul. The facilities in operation were for a duration of between 1.3 and 2.7 years.

Key Findings

Users had positive or very positive interactions with TPAS, indicating that the technology saved them time, allowing them to efficiently complete long trips. Thirty percent of users specifically reported an easier time complying with HOS regulations and 60 percent reported an easier time finding truck parking.

District 3 Findings

I-94, the corridor at the center of this study, is the major interstate through District 3. Beyond general findings for truck parking along the corridor, District 3 findings are absent from the study.

Region Five: Comprehensive Regional Economic Development Strategy

Overall Summary

The Economic Development District of the five-county central Minnesota area developed a five-year Comprehensive Regional Economic Development Strategy (CREDS) for the region. The 2016 CREDS describes the region, past and current economic development data, trends, and the goals and strategies for the future.

Key Findings

Key transportation issues identified in CREDS include lack of transit on the weekends, the quality of roads, and access to broadband. Related to these challenges, the CRED lays out regional goals and strategies. To address broadband access, the goal is for 100 percent of businesses and households to have access to broadband. The air and rail goal involves making freight and passenger rail and airport infrastructure maintained and operational by 2025. Additionally, the Plan calls for investment in two small scale freight infrastructure enhancements that lead to economic improvements by 2025.

Minnesota Statewide Ports and Waterways Plan

Overall Summary

The Minnesota Statewide Ports and Waterways Plan was developed for 2013 – 2033 by the Minnesota Department of Transportation Office of Freight and Commercial Vehicle Operations. The Plan is the first Minnesota Statewide Ports and Waterways Plan. The goals of the plan are based on the Minnesota GO Vision. The Plan promotes:

- “Continued enhancement of the ports and waterways system’s role in providing the global, national, statewide, regional, and local transportation connections essential for Minnesotans’ prosperity and quality of life, and taking advantage of technological, logistical, and infrastructural advancements;

- Improved and maintained ports and waterway connections, in order to maximize return-on-investment for freight shipping, especially in an era of constrained resources;
- Better integrated planning within MDOT and greater coordination with transportation partners.”

Key Findings

The Plan outlines key opportunities, challenges, and strategies in the areas of (1) port infrastructure condition and capacity, (2) marine system operations, (3) economic competitiveness, (4) planning integration and (5) communication and coordination. Related to port infrastructure, aging infrastructure, shipping channel maintenance, and lock and dam maintenance are key issues. On the operations front, there are opportunities related to the Minnesota Ports Association’s review and expansion and technology, and challenges around environmental concerns, such as mitigating invasive species. Economic competitiveness opportunities include logistical improvements, containerization, and expanding new markets. Key planning issues include land use compatibility, intermodal links, and integrating marine system planning within MnDOT. In the area of communication, outreach and education activities including task forces and federal programs can communicate the maritime sector’s contributions.

District 3 Findings

No navigable waterways are located in District 3 and the Statewide Ports and Waterways Plan has no specific District 3 findings.

MnDOT Weight Enforcement Investment Plan

Overall Summary

The 2018 MnDOT Weight Enforcement Investment Plan (WEIP) is a product of the Minnesota Department of Public Safety (DPS) and MnDOT. MnDOT owns and maintains weigh station and weigh in motion infrastructure, while the state patrol has a state jurisdiction over safety, vehicle size and weight enforcement. The goal of the Plan is to protect public investment in highway infrastructure, such as pavement, by enforcing laws about vehicle size and weight and ensuring public safety. The 10-year capital and design investment analysis identified an approximately \$96 million funding gap.

Key Findings

The WEIP identifies eight categories of need for future weight enforcement facility investments. These include (1) investment in existing facilities (2) inspection buildings (3) coordination of enforcement pull-off areas (4) improved weigh-in-motion use, (5) portable scale replacement plan, (6) increased Minnesota State Patrol staffing, (7) Education and outreach, and (8) additional weight enforcement facilities.

District 3 Findings

The WEIP is a statewide plan with few district specific details. On the investment front, there are two additional weight enforcement facilities recommended within the District, one on the border, and one existing border facility recommended for increased investment. One of the recommended facilities on the Hennepin County and District 3 border was identified in meetings with the District 3 and Metro districts. Site 3.3 located on MN 28 between Sauk Centre and Little Falls was the top District 3 rated because of a need for a pull-off site to enforce trucks carrying aggregate.

Central Minnesota Economic Development: 2018 Regional Profile

Overall Summary

The 2018 central Minnesota Regional Profile summarizes demographic, labor force, income/wage, and economic trends in the region.

Key Findings

Central Minnesota has a population of just over 700K (13 percent of the state) and recently experienced huge population growth, the biggest of any region, over the period from 2000 to 2017. Minnesota is expected to have a nearly 4 percent gain population from 2020 to 2040.

Central Minnesota has a lower educational attainment than the rest of the state. They also have a consistently higher unemployment rate than the state, with unemployment as high as 9 percent in 2009. Many workers in the region travel to the twin Cities for work. Many people who live in the region, do not work in the region. Location quotient data for Central Minnesota has a higher concentration than the State in production, education, training and library, farming, construction and extraction, installation and maintenance, healthcare support, and transportation and material moving. Truck drivers are one of the identified jobs in high demand. The second largest industry in Central Minnesota is manufacturing. Transportation and warehousing had nearly 10,000 jobs as of 2017, with a 6 percent increase from 2012.

Minnesota Statewide Commercial Vehicle Weight Compliance Strategic Plan

Overall Summary

The Commercial Vehicle Weight Compliance Strategic Plan (2005) aims to help the State protect their infrastructure and improve safety through better compliance with truck weight regulations. The Plan clarifies roles and expectations for inter-agency coordination, identifies optimal weight enforcement practices and strategies for maximizing economic benefits, and establishes direction for improving weight compliance strategies.

Key Findings

The Plan identified a number of needs, issues and conditions to improve the Weight Compliance Program. A few key findings include:

- Overweight vehicles cause demand in the range of \$30 million per year.
- Weight compliance is not significantly measured but is a problem. Weigh in motion scales (WIMs) are used for highway planning purposes. The weight compliance data has additional uses related to weight enforcement.
- Staffing is a major problem at all levels including for Electrical System Staff installation, inspectors, and state troopers

A number of recommendations address these challenges such as virtual WIM integration across the state, expansion of WIM scales, new forms of enforcement, and new staff processes and training.

District 3 Findings

There are no District 3 specific findings. Minnesota has seven weigh stations (in 2005) and none are located in District 3.