



District 2 Freight Plan

NOVEMBER 2020

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Chapter 1: Vision for the Future

District 2 is located in Northern and Northwest Minnesota and consists of the following counties: Kittson, Roseau, Lake of the Woods, Marshall, Beltrami, Polk, Pennington, Red Lake, Clearwater, Norman, and Hubbard, parts of Cass, Itasca, Mahnomen (maintenance only) and Koochiching. Facts about District 2:

- No interstate highways
- 185 roadway miles in tribal areas
- 35 percent of the District's highway have substandard shoulders
- 5 US/Canada border crossings
- Non-National Highway System (NHS) routes make up 62 percent of the District's responsibility

About the District 2 Freight Plan

The District 2 Freight Plan studied the freight transportation system in Northwest Minnesota to better understand the trends, issues and needs of the area. The District Freight Plan outlined how MnDOT District 2 and public and private sector freight stakeholders should move forward in freight planning, investment and operations. Specifically, the Plan looked at how to:

- Provide an understanding of the current multimodal freight system
- Expand on existing studies and plans using current data and analysis to identify area freight priorities
- Help MnDOT understand how local industries use the system and their needs and issues Identify opportunities for public and private stakeholders to give their input
- Guide MnDOT District investments to improve the multimodal freight system including roadways, railroads, regional airports and pipelines.

The long-term objective of this plan is to identify opportunities to improve freight infrastructure for all modes that use the system in Northwest Minnesota. These future investments will increase the economic competitiveness of the region.

Relationship to Other Plans

In January 2018, MnDOT completed the Minnesota Statewide Freight System and Investment Plan (SFSP). Among the plan's key recommendations was for MnDOT to work with each region of the state to create more detailed regional plans that would identify improvements to better connect them to the Minnesota Highway Freight Program. Similarly, this plan is intended to build upon and support the 3C planning process undertaken by the Grand Forks-East Grand Forks Metropolitan Planning Organization.

The MnDOT District 2 Freight Plan outlines how the District, and its public and private sector freight stakeholders could improve freight mobility in Northwest Minnesota. Specifically, the plan will prioritize freight-related projects and develop conceptual design/cost estimates for high priority projects. The intent of the District 2 Freight Plan is to leverage, validate and expand upon existing studies and plans with the most recent and relevant data analysis. This plan will:

- Provide an up-to-date assessment of freight needs and issues specific to District 2;
- Identify a list of strategies to improve freight mobility in the District; and
- Roll up long-term planning and programming into the next Statewide Freight System Plan.

The District 2 Freight Plan also needs to integrate and align with statewide freight planning and the flow chart below depicts the steps to identify needs and ultimately recommendations advancing them to become part of the Minnesota Highway Freight Program.



Figure 1: MnDOT Freight Planning Process

Partnership with the Grand Forks - East Grand Forks Metropolitan Planning Organization

Unlike other public entities, a unique relationship exists between MnDOT and the Grand Forks - East Grand Forks Metropolitan Planning Organization (MPO) because of the MPO's federally mandated transportation planning and programming responsibilities in the East Grand Forks area. Every 5 years, the MPO develops an integrated multi-modal performance-based long-range Metropolitan Transportation Plan (MTP) that includes both long-range and short-range strategies and actions to facilitate the safe and efficient movement of people and goods. The plan considers ten planning factors (or key issues) on how transportation works within the MPO. Two of those planning factors include freight. The MTP also integrates MnDOT's State Freight System Plan.

Adopted in January 2019, the MPO's MTP outlines how transportation could be improved, including freight, in the region. The MTP prioritizes projects, many with freight targeted improvement, based upon a fiscally constrained financial plan. This MTP is updated at least every five years.

District 2 Freight Plan Development and Data Sources

The development of the District 2 freight plan leveraged past work undertaken by MnDOT and their partners, quantitative analysis and stakeholder engagement.

Leveraging Past Work

A key component of this District Freight Plan is to capture existing relevant work undertaken by MnDOT and their partners. By doing so, the plan can build upon those past efforts and analyze already identified issues at greater depth. The planning effort reviewed over 15 documents, but focused especially on the following documents. The complete list of reviewed documents is available in Appendix A.

Minnesota Statewide Freight System Plan

The 2018, Minnesota Statewide Freight System and Investment Plan describes the state's multimodal transportation system and its role in the state's economy, current and emerging industry trends, the performance of the freight transportation system, and current and future issues and needs.

Greater Minnesota Mobility Study

The Greater Minnesota Mobility Study evaluated mobility investment needs on the National Highway System throughout Greater Minnesota. Specifically, the study identified locations with the greatest mobility or reliability issues and identified low-cost spot mobility improvements to address the identified needs.

Grand Forks-East Grand Forks Metropolitan Transportation Plan

Grand Forks-East Grand Forks Metropolitan Planning Organization is the federally recognized regional transportation agency covering the cities and surrounding urban areas of Grand Forks, ND and East Grand Forks, MN. The MPO's Metropolitan Transportation Plan's existing conditions chapter shares extensive information on freight and truck routes, presented truck volumes, discussed safety issues and discussed rail lines and identified major freight businesses. The MTP identified projects that were prioritized into a fiscally constrained plan, which does not include/allow for and "reasonably available" freight program funds. However, the plan identified "illustrative" projects that benefit movement of freight.

2016 District 2 Manufacturers' Perspectives Study

MnDOT is currently conducting a series of Manufacturers' Perspective Studies focused on interviewing freight dependent businesses and building relationships through coordinated outreach. The businesses were identified using a traded-industry cluster analysis, as well as input from local economic development organizations, with a focus on identifying manufacturers and related businesses. The goal was to get firsthand feedback and understand their specific freight transportation requirements. The District 2 Manufacturers' Study collected and analyzed input to:

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

The 2016 District 2 Manufacturers' Study interviewed 68 businesses. Overall, their feedback focused on safety, expediency and cost-effectiveness, dependability, and creating accessible traffic information. The specific needs from this study will be evaluated and included in further long-term capital planning analysis for inclusion in a ranked list of freight specific needs.

Data Analysis

Evaluations of safety, mobility, and state of good repair were completed using data provided by MnDOT and other public sources. These activities are detailed in Chapter 2 and Working Paper #2: Economic and Freight System Profiles.

Stakeholder Engagement

Stakeholder engagement was critical to defining district freight needs and validating the project's data analysis. The overall project was guided by a Project Advisory Committee, and also featured stakeholder interviews, an online survey and public meeting. The public meeting was held online due to the COVID-19 pandemic.

Project Advisory Committee (PAC)

The Project Advisory Committee was formed of freight and public stakeholders designed to serve as advisors to the project team to learn about the study, review planning documents, and provide feedback on the plan

development. The group also acted as ambassadors for sharing information about the study and encouraging participation.

Stakeholder Interviews

MnDOT conducted nine stakeholder interviews to identify current freight needs and issues in this area. Figure 2 lists the interviewed organizations.



Figure 2: Interviewed Organizations

Online Survey

An online survey was distributed publicly and included similar questions as the stakeholder. The survey was advertised on MnDOT’s social media platforms.

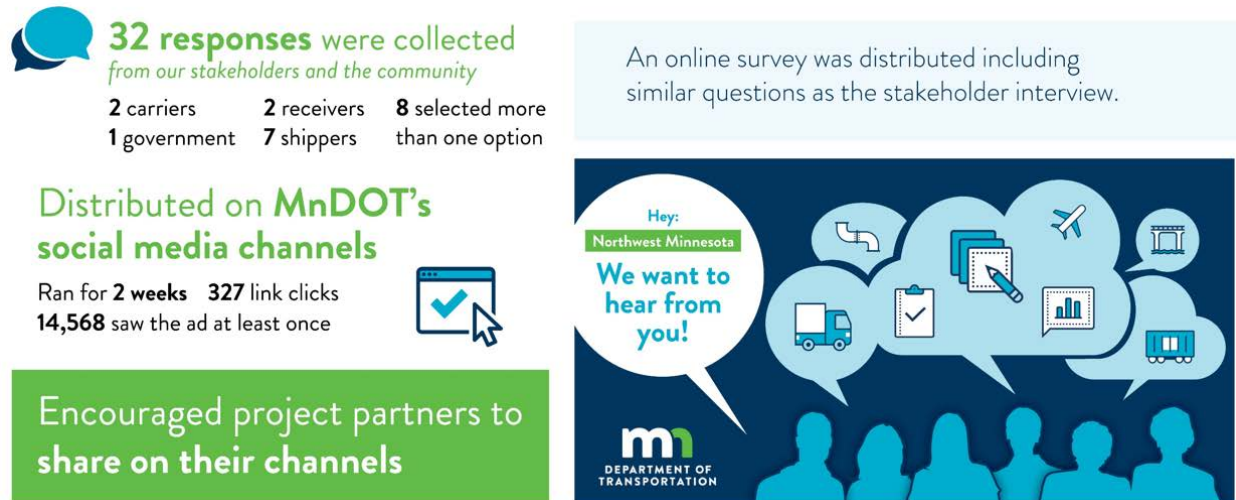


Figure 3: Online Survey Results

Additional Resources

The MnDOT District 2 Freight Plan is supported by a series of Working Papers that provide more details on District 2’s freight system, needs and priorities. The Working Papers are available on MnDOT’s District 2 Freight Plan web site, at: <http://www.dot.state.mn.us/ofrw/freight/districtfreightplan/d2.html>.

These working papers include:

- Working Paper #1: Existing Document Synthesis
- Working Paper #2: Economic and Freight System Profiles
- Working Paper #3: SWOT Analysis
- Working Paper #4: Prioritization and Preliminary Conceptual Design

Chapter 2: Existing Freight Conditions

The Importance of Freight to District 2

The District 2 Freight Plan is designed to identify and prioritize freight projects that support the economy of Northwest Minnesota. To do so, it is important to understand the region’s economy and the role freight plays in supporting it. This information provides a foundation for further discussions of freight transportation needs and issues in the District.

Minnesota’s Economy

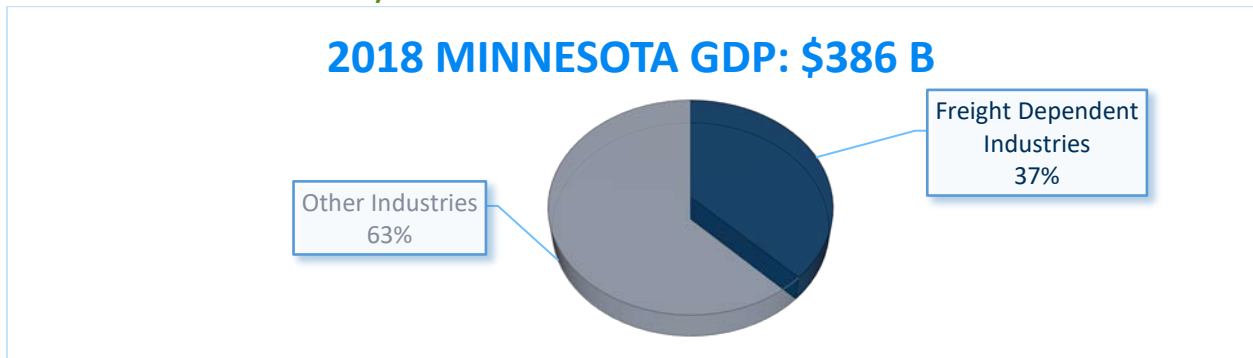


Figure 4: Minnesota Gross Domestic Product

In 2018, freight-dependent industries (defined as industries primarily focused on the manufacture or distribution of physical goods) created 37 percent of Minnesota’s Gross Domestic Product (GDP) (Figure 4). These freight-dependent industries comprise the backbone of Minnesota’s economy and also have a multiplier effect on the broader economy as a whole by supporting other industries such as local restaurants and service businesses.

District 2 Employment

Due to business confidentiality issues, county-level GDP figures are not publicly available from the U.S. Bureau of Economic Analysis (BEA). Instead, this section will focus on jobs as a measure of economic activity at the district and county levels.

Overall, the District 2 economy supports 53,444 jobs across all industries.¹ More than half (52 percent) of this employment is attributable to freight-dependent industries. Similar to Minnesota’s economy as a whole, the majority of the 28,023 freight related jobs in the district are associated with the industries of

¹ Based on analysis of Census Business Pattern data for full-time, year-round civilian employees.

manufacturing and wholesale and retail trade. Employment in these freight-dependent industries has risen substantially in recent years, growing nearly 50 percent from 2010 to 2017.

Over half of all jobs in District 2 are attributable to the freight industry.

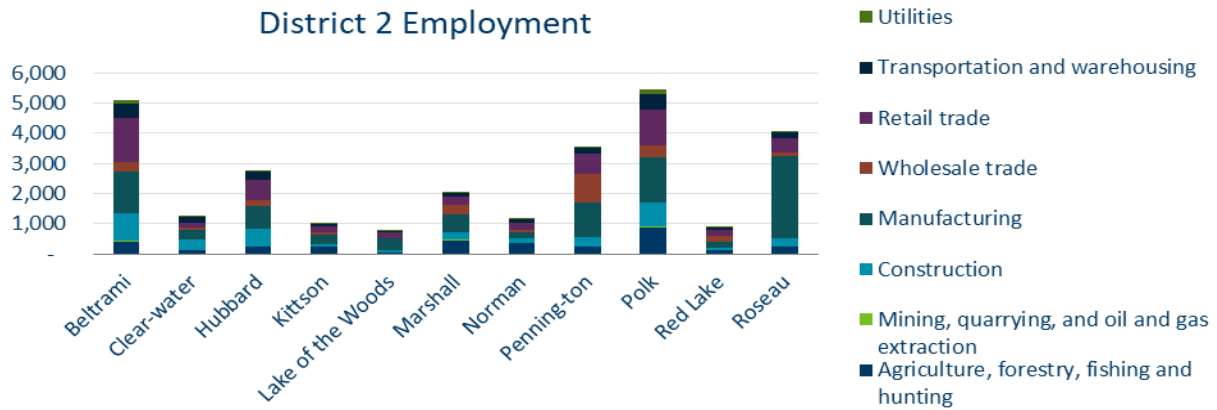


Figure 5: District 2 Employment by Freight-Dependent Industry and County, Source: US Census Business Pattern Data

The counties in District 2 with the highest levels of freight-dependent employment are Beltrami (5,087), Polk (5,461), and Roseau (4,072). These three counties account for more than half of all freight-dependent employment in the district:

- **Beltrami:** Freight-dependent jobs in this county are predominantly in the Retail Trade, Manufacturing, and Construction sectors
- **Polk:** While an overall small share of total jobs, this county has the highest employment in the Agriculture, Forestry, Fishing, and Hunting sector.
- **Roseau:** Approximately 60 percent of freight-dependent employment in this county is within the Manufacturing sector. This is a result of large manufacturers, such as Polaris, located in the area.

Freight-dependent employment density is shown in the Figure 6. The highest employment density for these jobs are clustered around Thief River Falls, Bemidji, and Warroad. There are also several areas with little to no freight-dependent employment. Of note is the large area located south of MN Highway 11 and north of Red Lake which is home to both the Beltrami State Forest and the Red Lake Wildlife Management Area.

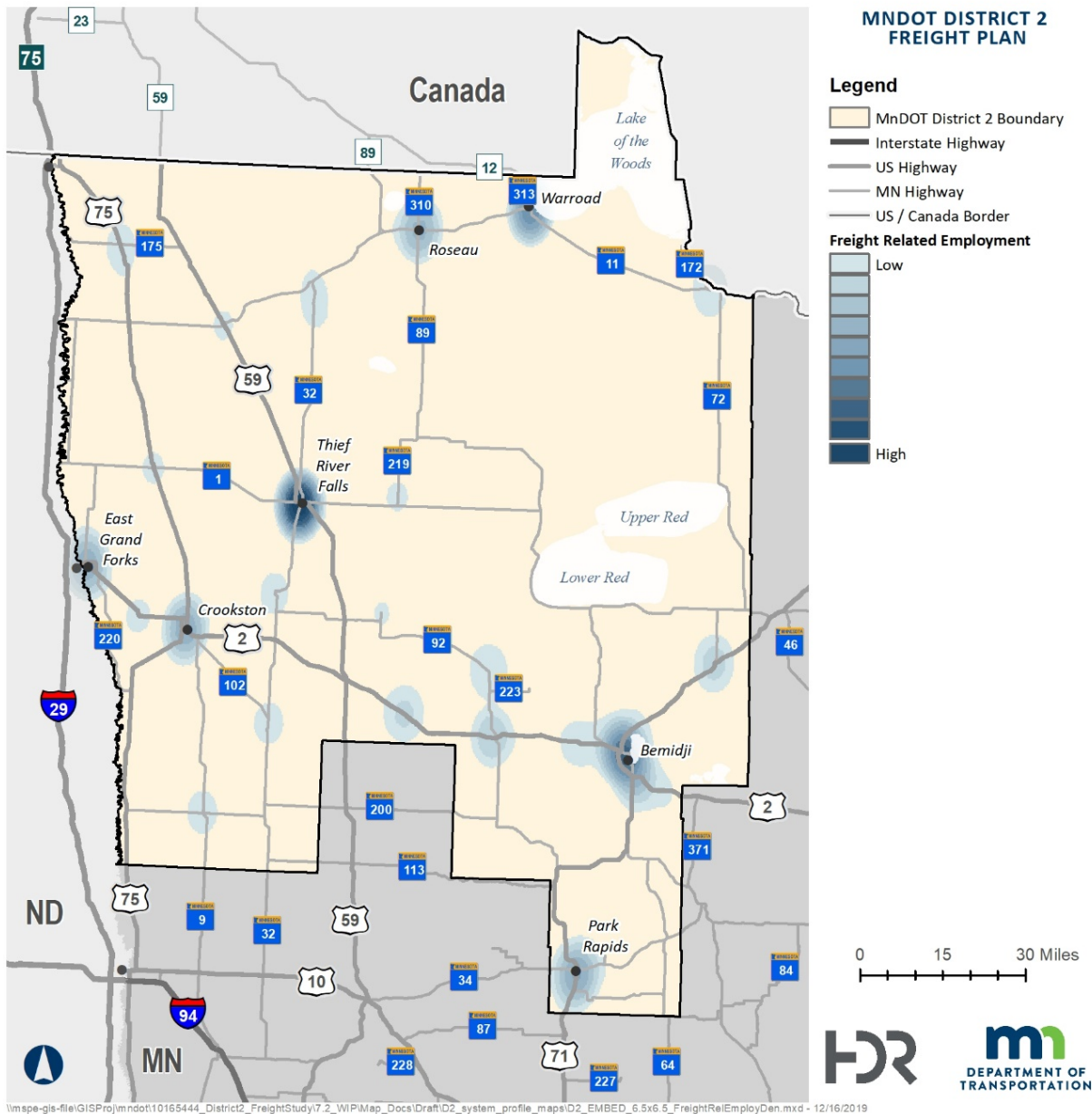


Figure 6: District 2 Freight-Related Employment Density

Economic Specialization

One method of evaluating the importance of each freight-dependent industry to District 2's economy is by measuring the degree of specialization of that industry compared to the state or nation as a whole.

For this analysis, a location quotient approach was used to calculate the ratio of each industry employment share within the district to the share of that industry throughout the state of Minnesota. A location quotient of 1.0 means that the district has exactly as much employment for that industry as would be expected based on statewide employment. A location quotient of 2.0 would indicate that the district has twice the expected level of employment for that industry. The location quotient results for year 2017 are shown in Figure 7 below. This figure also highlights the change in location quotient between 2010 and 2017. The figure

highlights the following findings regarding the specialization of freight-related industries in District 2 relative to the State of Minnesota as a whole:

- The industry with the highest level of economic specialization is **Agriculture, Forestry, Fishing, and Hunting**. Specific industries affecting this result include sugar beet farms in the Red River Valley and the forestry operations throughout the region.
- While relatively small compared to the other industry sectors, **Mining, Quarrying, and Oil and Gas Extraction** saw the highest levels of growth in terms of location quotient, increasing from a quotient value of 0.36 in 2010 to a quotient value of 1.35 in 2017.
- While the **Manufacturing** sector has the highest employment figure in District 2, its location quotient value is only slightly above the statewide average at 1.2. It also experienced the smallest growth in location quotient (excluding the Utilities sector).

Nearly all of the freight-dependent industries in District 2 have a location quotient above 1 and have experienced an increase in their location quotient between 2010 and 2017.

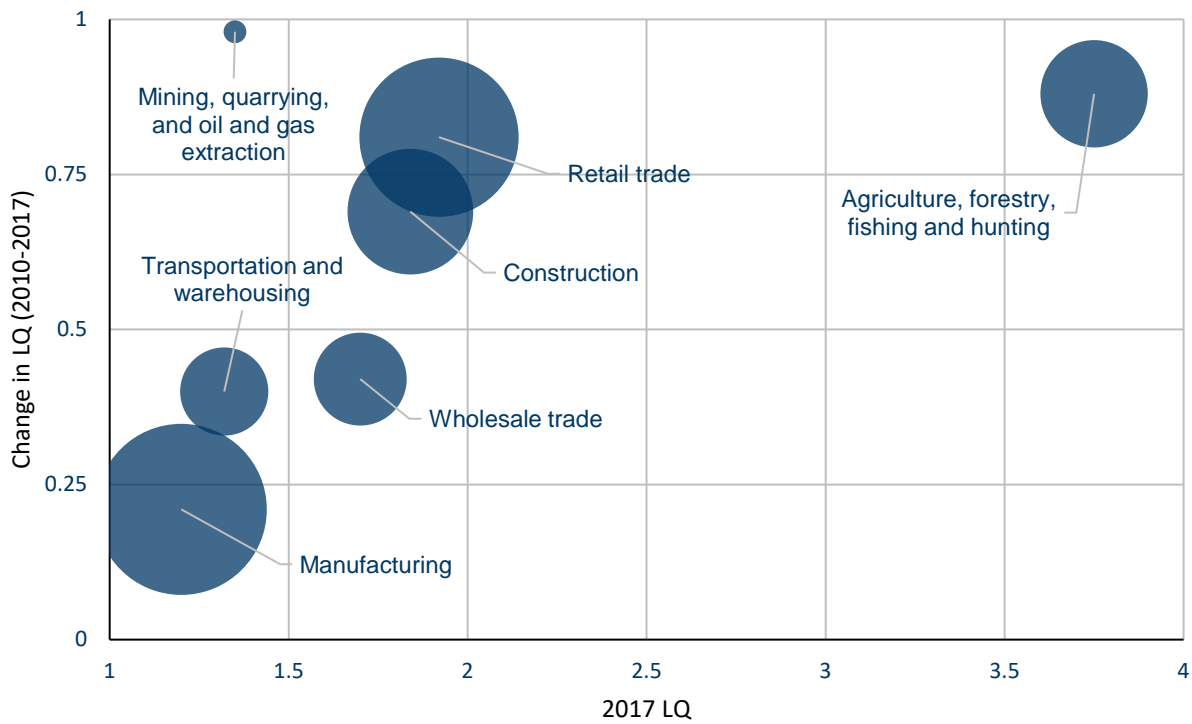


Figure 7: District 2 Industry Location Quotients

District 2's Manufacturing Impacts Beyond the District

Polaris, Textron (Arctic Cat), Team Industries, Marvin Windows and Doors, Digi-Key, and Central Boiler all trace their roots to this area. These companies have expanded well beyond District 2, with footprints in metro-areas such as Fargo-Moorhead, Grand Forks area, and the Twin Cities not only under their name but through supplier and operational partnerships. Their overall continued success in D2 can be attributed to the

networks they have developed to support the viability of their operations. This Plan is an important step to support those efforts and support this industry that plays a large role in the Minnesota economy.

District 2's Multimodal Freight System

MnDOT District 2 is served by several freight modes including highway, rail, pipeline, and aviation. A snapshot of key District 2 freight system components is summarized in Figure 8. The locations of freight infrastructure within District 2 is shown in Figure 9.

Key highways for freight access include US-2, US-75, and US-59. However, no interstates are located in the district.

Class 1 railroads in the district include BNSF, CP (SOO), and CN they, predominantly parallel the highways noted above. Class 3 railroads that operate in the district include the Minnesota Northern Railroad (NRR) and Northern Plains Railroad (NPR). Four intermodal terminals throughout the district facilitate freight movement from rail to truck.

Air cargo service in the District is provided via two regional airports in Bemidji and Thief River Falls.

Several pipelines extend through District 2 from North Dakota towards the Twin Cities carrying petroleum, crude oil, hydrocarbon gas liquid, and natural gas. A total of five border crossings facilitate goods movement between Minnesota and Canada.

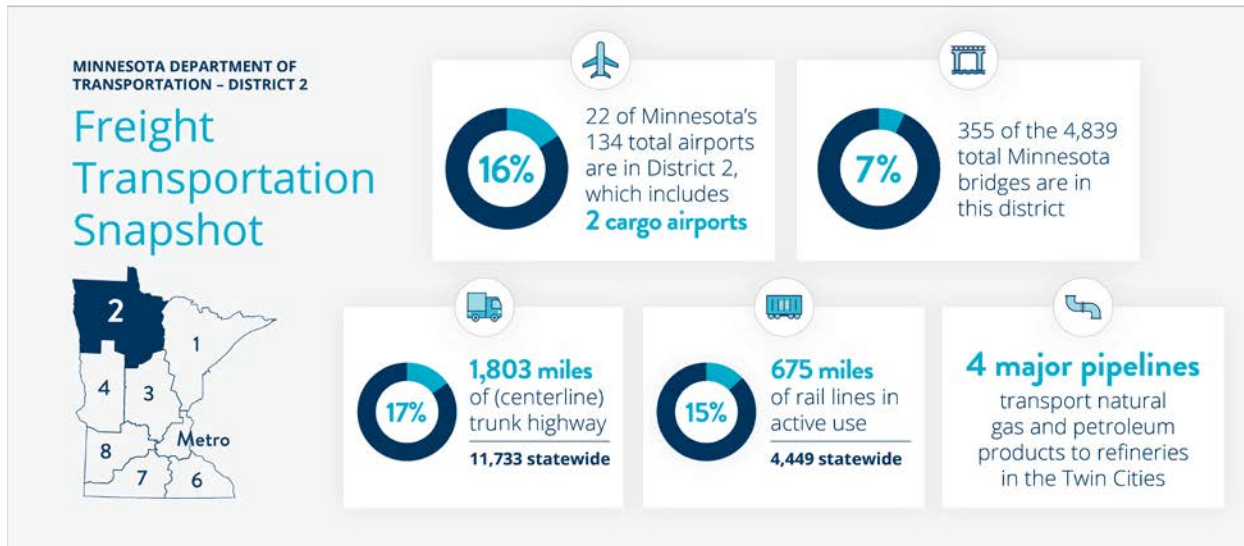


Figure 8: District 2 Multimodal Freight System Summary

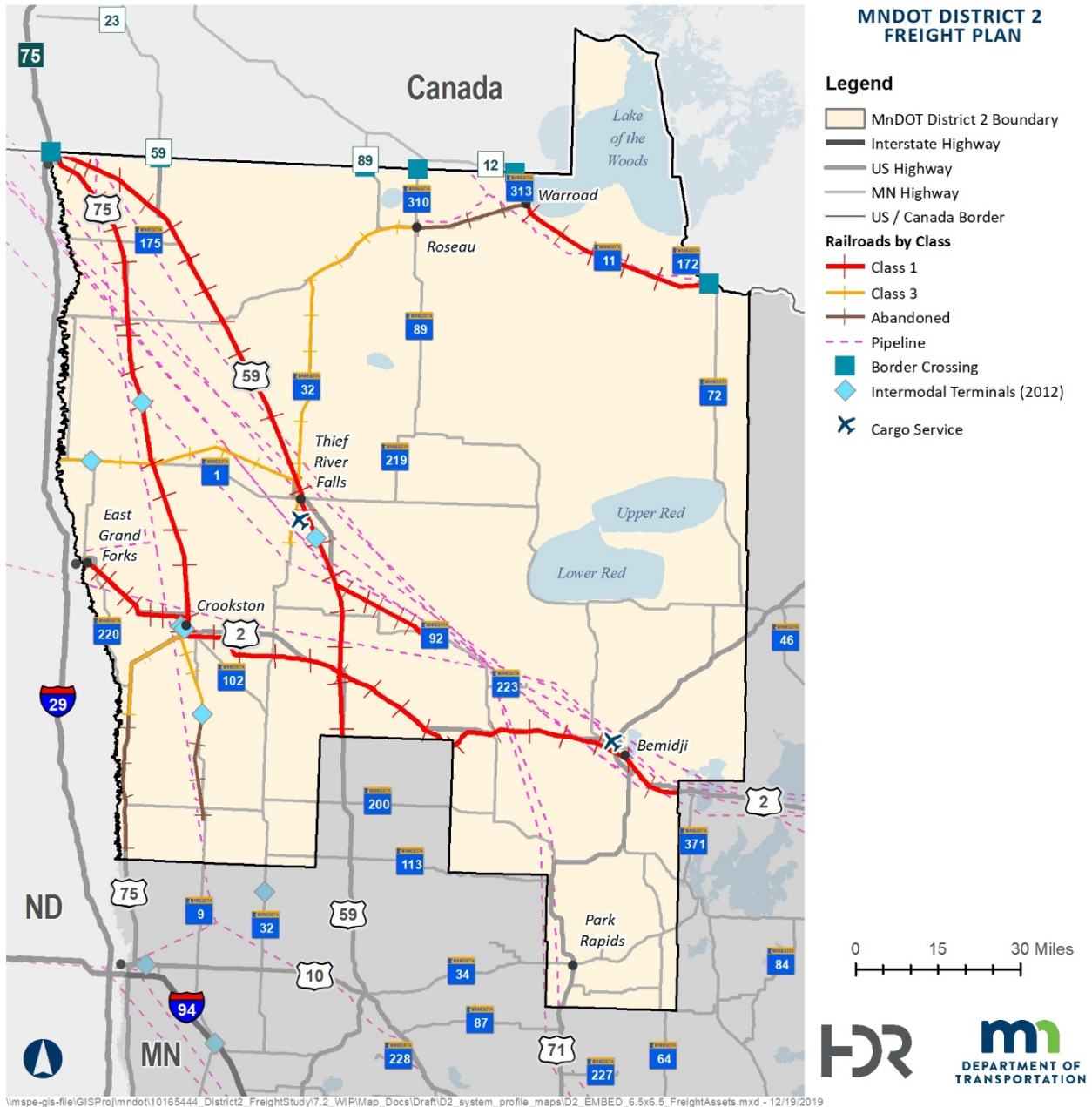


Figure 9: MndOT District 2 Freight Transportation Assets

Minnesota has several border crossings into Canada and trade with Canadian industries makes up 28 percent of the state’s total exports, 41 percent of total imports, and 36 percent of overall trade. However, the majority of this trade (94 percent by value) is conducted via ports of entry in bordering states such as North Dakota and Michigan. Five border crossings are located in District 2, including crossings in Lancaster, Pinecreek, Roseau, Warroad, and Baudette. Two additional border crossings in close proximity to District 2 are International Falls in District 1 and Pembina, located in North Dakota.

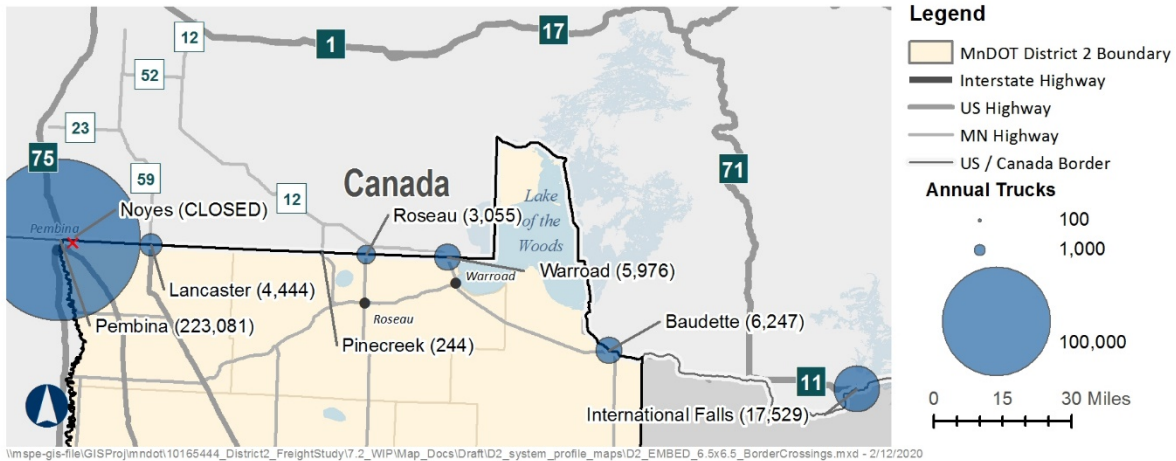


Figure 10: Canadian Border Crossings (Truck Only) in and near District 2. Source: USDOT, 2018

Truck volumes are significantly higher at the two border crossings just outside of the District 2 boundary:

- The **Pembina, ND** crossing experiences over 220,000 trucks per year.
- The **International Falls, MN** crossing is the busiest crossing in Minnesota and handles approximately 17,000 trucks per year.

Each of these two major crossings is open 24/7 and provides a more direct link between the US Interstate system and the Canadian National Highway system. In particular, the I-29 approach to the Pembina crossing functions as a regional collector for freight movements throughout much of the upper Great Plains area. The Pembina crossing is also in the process of upgrading and expanding facilities through projects such as the reconfiguration of border crossing geometry and roadway approaches to better handle commercial vehicles, improvements to commercial inspection capacity, and renovation of buildings to house additional staff.²

Border crossings are critical to freight related businesses in District 2 as Canada is one of Minnesota’s largest trading partners. Providing adequate access to Canadian markets will be critical to ensuring the economic vitality of industries located in District 2.

Freight Mode: Highway

In MndOT District 2, there are multiple US highways and state highways, but no interstates. The closest interstate is I-29, which extends along the western border of District 2 in North Dakota, and I-94, which extends along the southern border of the district through Fargo-Moorhead.

The district includes about 1,800 centerline miles and about 3,900 lane miles. District 2 experiences harsh winters and seasonal flooding in the Red River Valley, which contributes to challenges in keeping the extensive roadway system functioning and well-maintained throughout the year.

² Border Infrastructure Investment Plan, Canada – United States, December 2015.

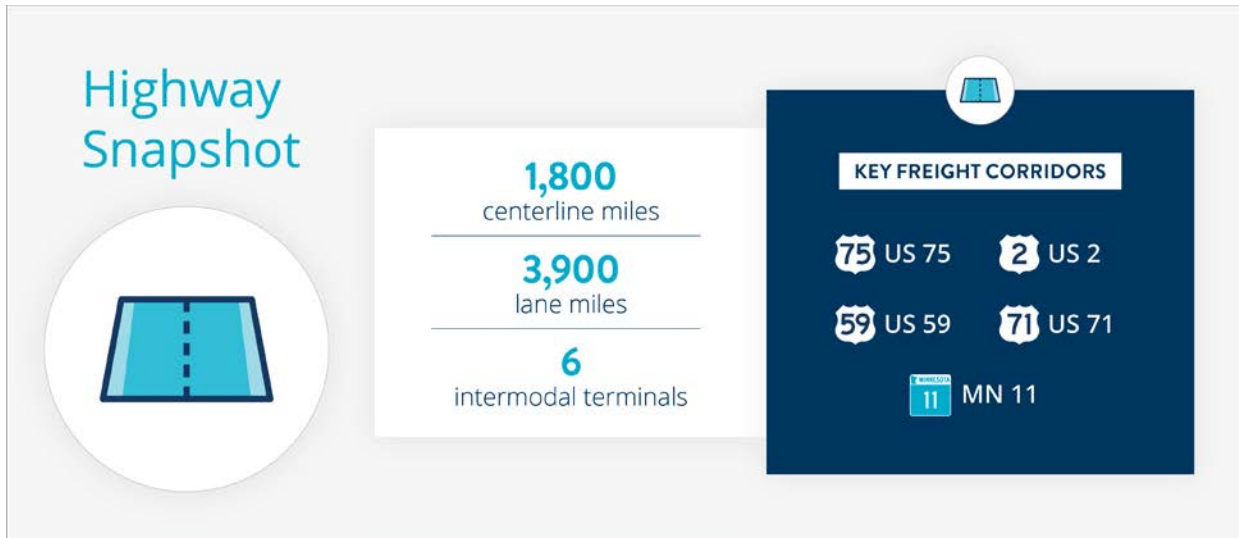


Figure 11: District 2 Highway Freight System Summary

The district also includes six intermodal terminals distributed on key highway and railroad corridors. A majority of the highway freight movement is outbound (Figure 12), which corresponds to export-heavy industries in the district that have the largest location quotient, specifically Agriculture, Forestry, Fishing and Hunting.

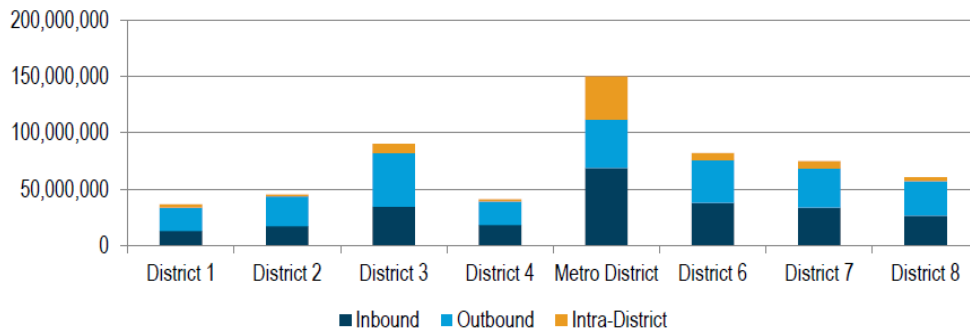


Figure 12: Truck Freight Flow by Direction, Tons, by District, 2012. Source: MnDOT “Statewide Freight System Plan” (2016).

Key Corridors

The following key highway corridors connect major population and freight employment centers within District 2 and also to other destinations including North Dakota, Canada, and statewide. Figure 13 summarizes daily traffic volumes, including Heavy Commercial vehicles along the major corridors throughout District 2.

- **US 75** starts in the Northwest corner of the state (and District) and extends north/south through Crookston, Fargo, and to other destinations in western and southwestern Minnesota. US 75 also connects to Pembina, ND, a major border crossing into Canada via I-29
- **US 59** is a similar to US 75 as a parallel north/south route through the district extending through Thief River Falls, Fergus Falls, and to other destinations in western and southwestern Minnesota
- **US 2** connects Grand Forks with Bemidji and extends east/west across the state. US 2 connects with I-29 in Grand Forks. Other nearby destinations include Duluth and northern Wisconsin

- **US 71** is a north/south route through the district extending through Park Rapids and Bemidji as well as other destinations south and north including International Falls.
- **TH 11** is an east/west route that traverses the state connecting International Falls to North Dakota and connects the cities of Warroad, Roseau, and Donaldson

Compared with the rest of the state, District 2 generally has lower Heavy Commercial vehicle volumes. The majority of the key D2 corridors have Heavy Commercial Average Annual Daily Traffic (HCAADT) volumes between 50 and 500 vehicles per day. Short segments of roadway in Bemidji, East Grand Forks, and Park Rapids have HCAADT volumes exceeding 1,000 vehicles per day.

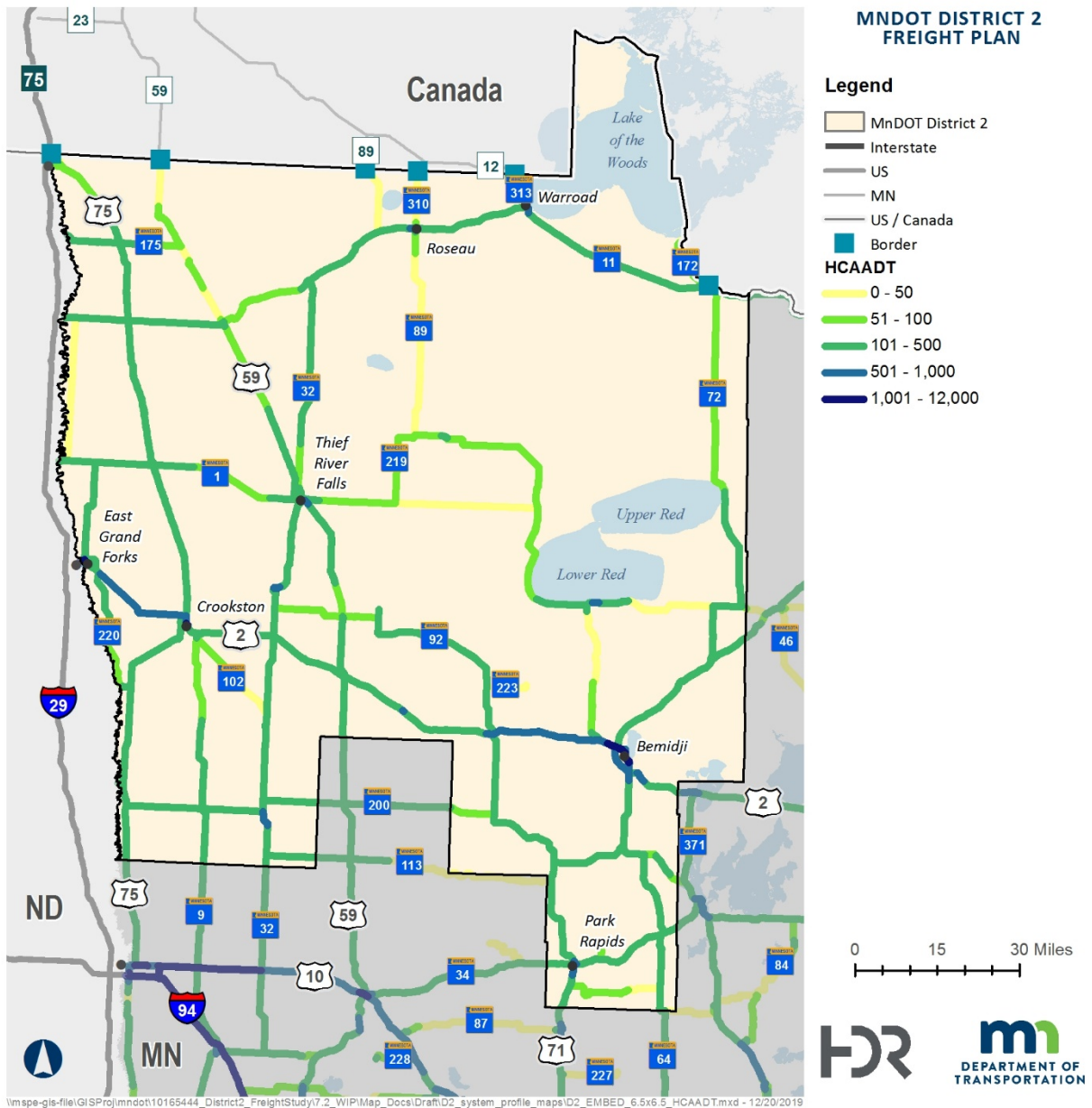


Figure 13: Heavy Commercial Average Annual Daily Traffic

Truck Origin/Destination Analysis

StreetLight Insight data was used to analyze trip origin and destination patterns for District 2. StreetLight software utilizes cell phone location-based services data for personal vehicle traffic and INRIX truck GPS navigational data for truck trips (motor vehicles 14,000 lbs. or greater). For the majority of truck freight trips for District 2 operating in the Midwest, some of the key corridors that support District 2’s freight related movement are outside of the district: I-29, I-90, I-94, and US 10.

- District 2 Origin Truck Trips:** Figure 14 shows the destinations of trips that originated in District 2. One key finding is that 75 percent of trips starting within D2 also end in D2, highlighting the large volume of local truck traffic. Trip destinations outside of D2 extend throughout the Midwest, primarily in northern Minnesota, North Dakota, and portions of Wisconsin and South Dakota. For trips originating in District 2 and travelling to Canada, more than half end near the CP Intermodal Yard in Winnipeg. Other Canadian areas with large proportions of trips are the Emerson area (opposite Pembina/Noyes) and Morris, a city on Canadian Highway 75 between Pembina and Winnipeg.
- District 2 Destination Truck Trips:** Figure 15 shows the origins of trips that end in District 2. As noted above, 75 percent of trips ending in District 2 also begin their trip within the district. The distribution of trip origins largely matches the distribution of trip destination discussed above. Trucks originating in Canada predominantly come from areas near Winnipeg, Winkler (a city west of Morris), and Rainy River (opposite Baudette, MN).

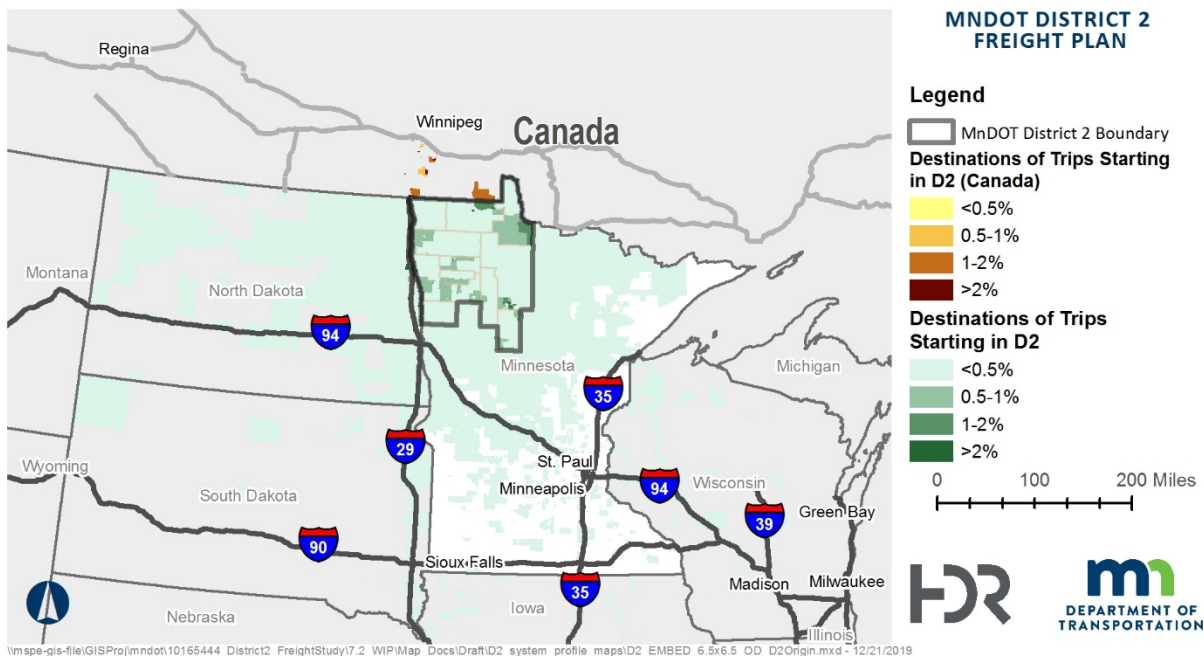


Figure 14: Destinations of Freight Trips Originating in District 2

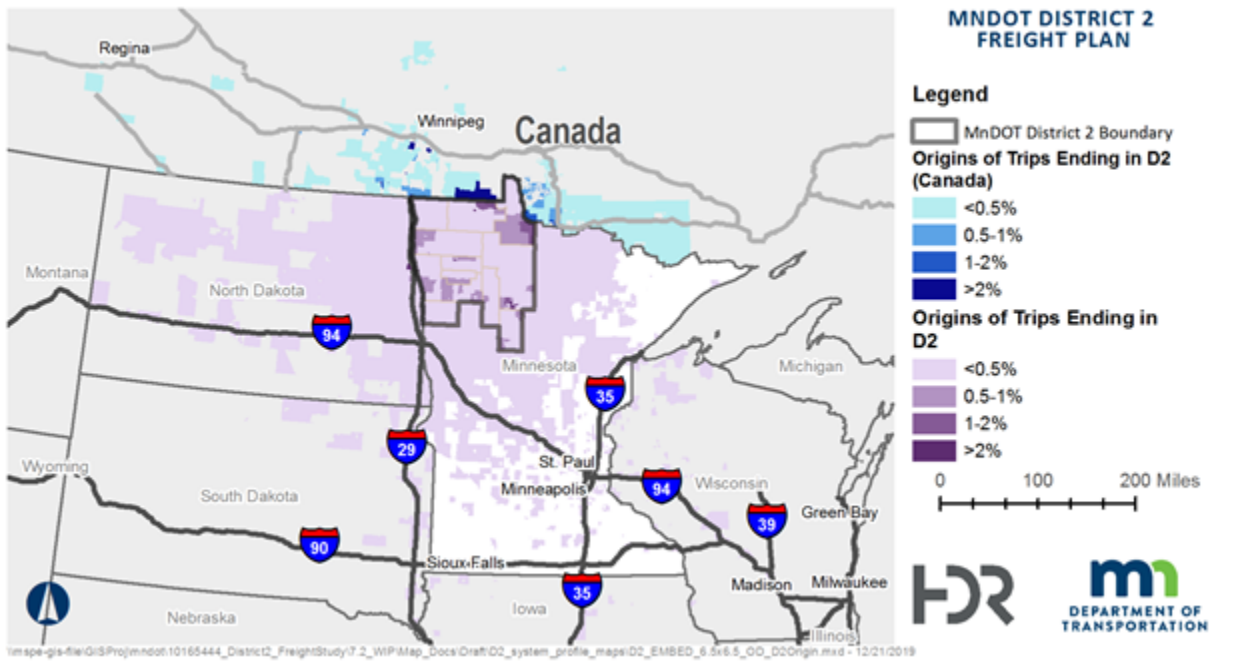


Figure 15: Origins of Freight Trips Ending in District 2

Truck Travel Time Reliability

Travel time reliability is an especially important performance measure for commercial truck trips, in some cases being more important than overall travel speeds. If a truck travels on a roadway segment that is not reliable, this often means the trucking company will have to choose between leaving “on-time” and risking a late delivery, or leaving early and potentially wasting potentially productive time while they wait for their destination location to open for business.

StreetLight Insight data was also used to assess Truck Travel Time Reliability (TTTR) along roadways throughout District 2. TTTR is a federal performance measure primarily targeted towards an assessment of conditions on the Interstate Highway System. A higher TTTR value indicates more variability in travel time, and therefore less reliability. A TTTR of 1.0 indicates a roadway segment that never varies in travel time (very reliable) while a TTTR of 2.0 indicates a roadway segment where the travel times during the slowest conditions are twice as slow as on average (less reliable).

The results of this analysis are shown in Figure 16. The analysis found that the majority of roadways throughout District 2 exhibit TTTR values between 1.0 and 2.0, indicating that travel time reliability is not a major issue on these routes. Some areas which exhibit higher TTTR values include US 75 south of Pembina, and some short segments of roads in the Bemidji area.

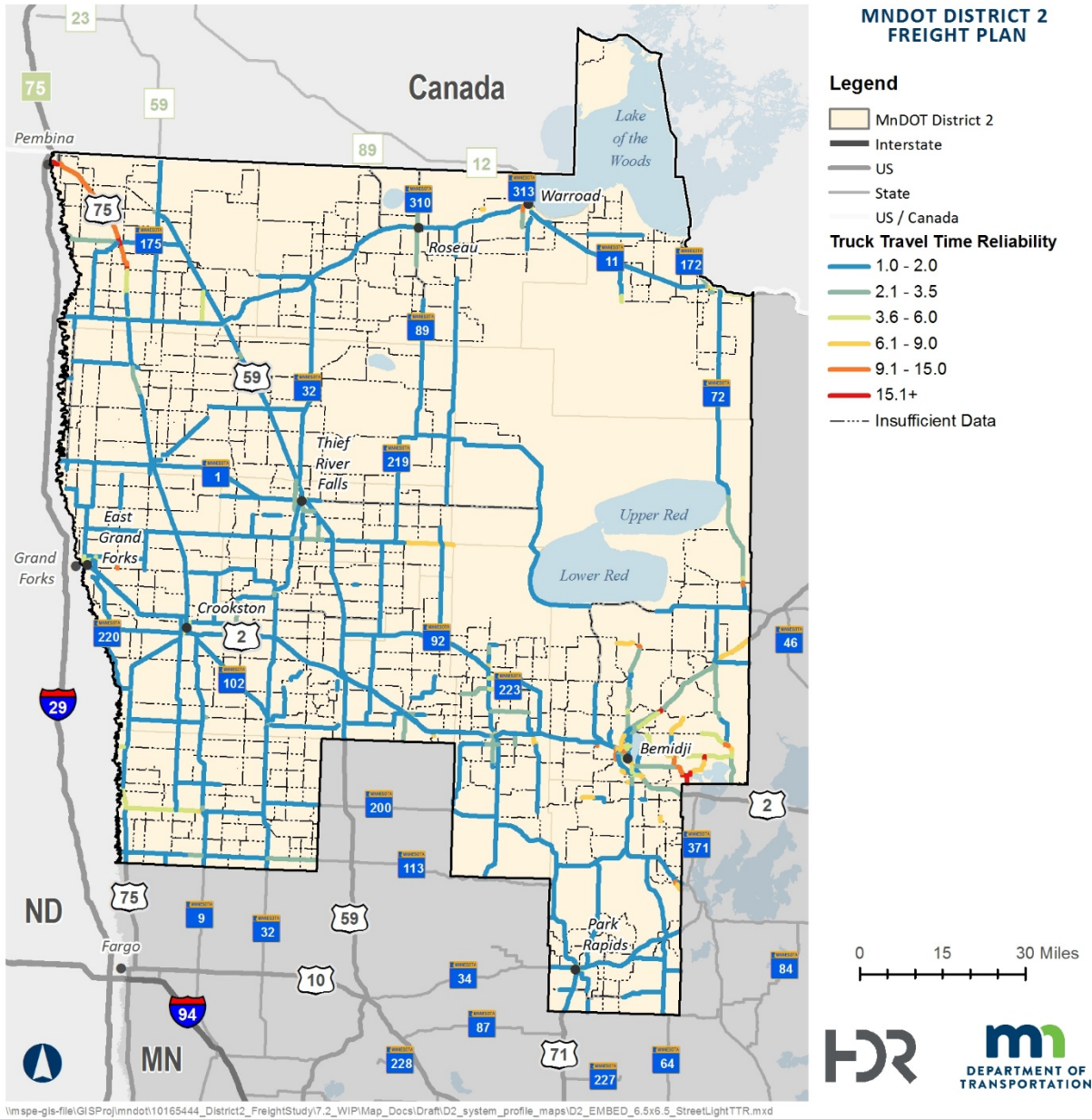


Figure 16: Truck Travel Time Reliability

Bridges and Superload Corridors

District 2 has very few roadway bridges overall, with the largest concentration in Bemidji (Figure 17). Only two bridges are considered to have a low clearance (less than 14 feet, six inches). These are both railroad bridges located on local roads in the southern portion of the District. Many of the bridges in the District have a relatively high clearance (more than 16 feet, 6 inches), making them ideal for handling oversize/overweight (OSOW) and superloads. MnDOT's designated Superload Corridors are shown on the map below. Superload corridors provide key connections across the district for oversized loads between Thief River Falls, East Grand Forks, Crookston, and Bemidji.

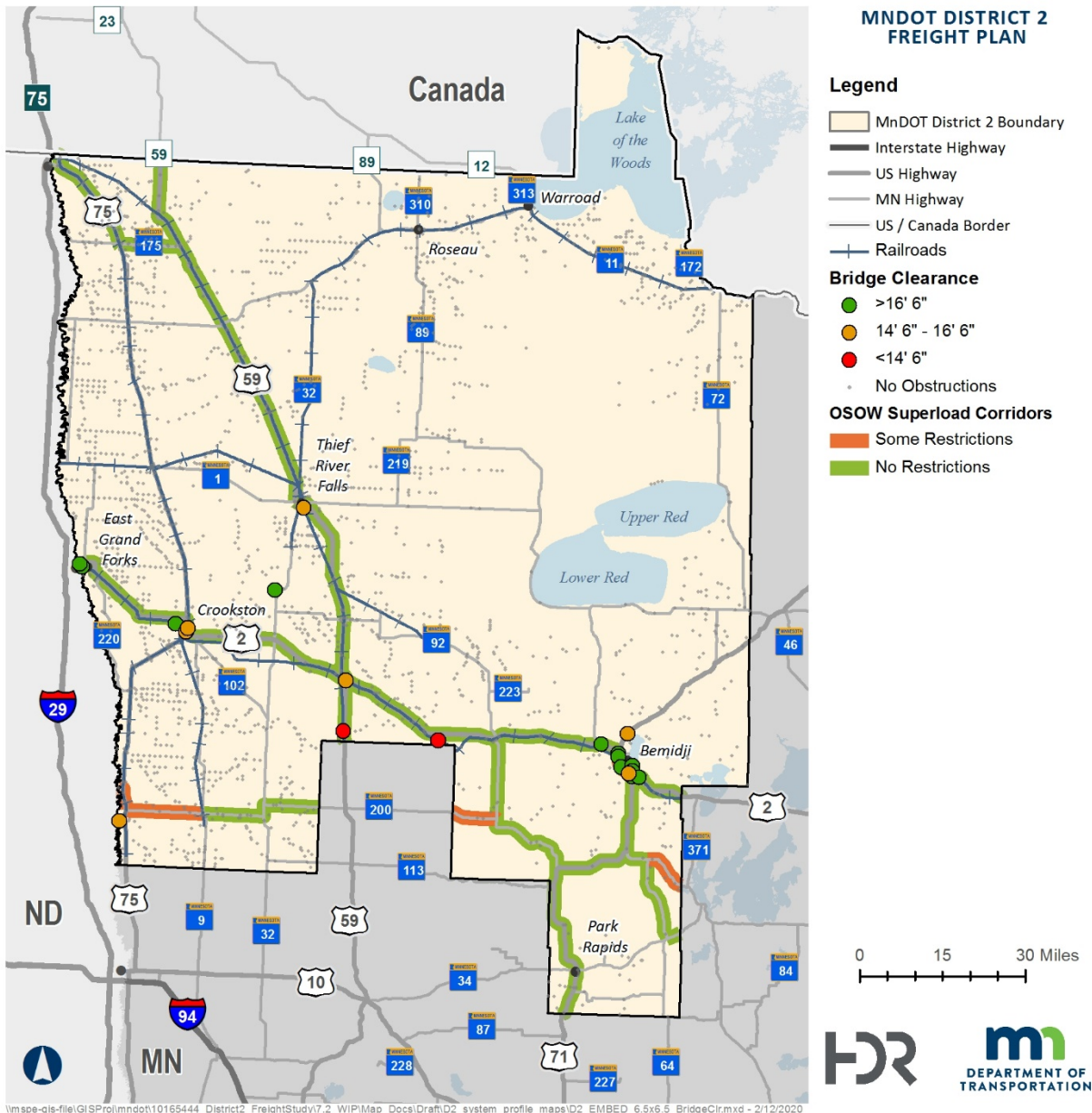


Figure 17: Bridge Clearance and OSOW/Superload corridors. Source: Mndot Superload Corridors; Mndot Bridge Office

Pavement Condition

Mndot's Asset Management group maintains annual reporting on pavement condition throughout the state. Most of the roadways are in "Good" condition, with a few in "Fair" condition including: MN TH 32, MN TH 11, MN TH 87, US 2 EB, and US 71.

Truck Parking

Mndot published the Statewide Truck Parking Study in 2019, identifying existing truck parking areas and estimated demand for truck parking. The report states that private truck stops in District 2 with provide a capacity of approximately 100 trucks. Three public rest areas are located in the district in Erskine, Park

Rapids, and Fisher, MN. The study also found that there was not significant demand for truck parking in District 2.

Highway Crash Analysis

This highway crash analysis for the freight system was based on MnDOT data from a 10-year period from 2009-2018. A freight vehicle is defined as any medium or heavy truck over 10,000 pounds. A total of 872 freight related crashes occurred over the 10-year period, representing approximately 7 percent of all crashes (number of crashes does not indicate severity).

Trucks accounted for 7 percent of all crashes in District 2

Crashes by Roadway Classification Type

Crashes occurring on the US Trunk Highway System and the State Trunk Highway system had more crashes than the County and Municipal State aid systems. This is to be expected as truck volumes are generally higher on the US and State Trunk Highway systems. Crashes are common at both intersections/interchanges and non-intersection locations on the US and State Trunk Highway systems.

Truck crashes were more frequent on U.S. Highways and Minnesota Truck Highways than county or local roads

Crashes by Manner of Collision and Severity

The most frequent type of freight crash was “unreported/other” followed by an “angle collision” type crash (Table 1). Property Damage Only (PDO) type crashes were the most common, followed by “B” and “C” type injuries, which are considered non-incapacitating or possible injury, respectively. Crashes are dispersed throughout the District, with concentrations of fatal and severe crashes near Bemidji, between Crookston and East Grand Forks, and Ada.

Manner of Collision	Fatal	“A-Injury” Incapacitating	“B-Injury” Non- incapacitating	“C-Injury” Possible Injury	Property Damage Only “PDO”	Unknown
Head-On Collision	10	6	10	8	37	-
Angle Collision	9	10	32	43	109	-
Ran-Off-the-Road	2	1	16	17	75	-
Rear-End	9	9	17	25	92	-
Sideswipe	-	2	8	10	91	1
Unreported/Other	2	12	21	19	169	-
Total	32	40	104	122	573	1

Table 1: Freight-related crashes by manner of collision and severity 2009-2018

Freight Crash Rates

Crash rates are based on crash totals over the 10-year period (2009-2018), vehicle miles traveled (VMT) data for all vehicles, as well as heavy-vehicles. MnDOT’s publicly available information only had heavy vehicle VMT data for US Truck Highways (USTH) and Minnesota Trunk Highways (MNTH), so this analysis is focused on

those two route systems. Heavy vehicle VMT data was based on the District 2 construction boundary rather than the Area Transportation Partnership boundary in order to match the boundary used to collect the crash data. It was assumed that the proportion of heavy-vehicle VMT to the all-vehicle VMT for the construction boundary for each year within the study period was the same for the ATP boundary as well.

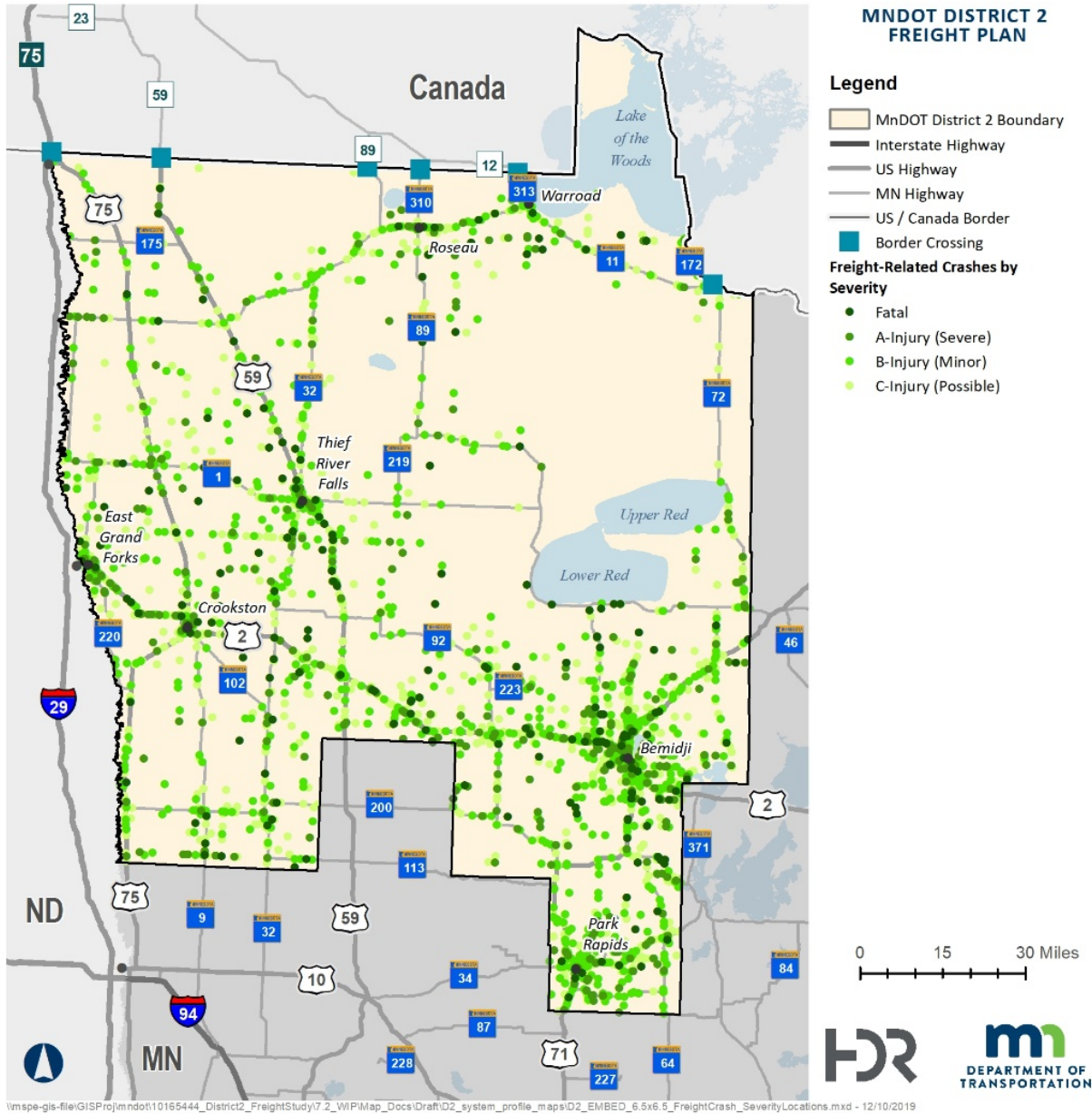


Figure 18: Freight related crashes by severity and location 2009-2018 (Does not include PDO Crashes)

Rate of Fatalities between Freight Crashes and Non-Freight Crashes

Two percent of all crashes that occurred in District 2 between 2009 and 2018 were fatal. In comparison, four percent of all freight-related crashes that occurred in District 2 between the same 10-yr time period were fatal.

Freight-related crashes were 2 times more likely to be fatal in District 2 over the past 10-year time period.

Trends over Time

Non-severe crashes appear to be on the rise from 2014 to 2018 (Figure 19). However, the frequency of severe crashes (Fatal + A-Injury) remains relatively constant over time.

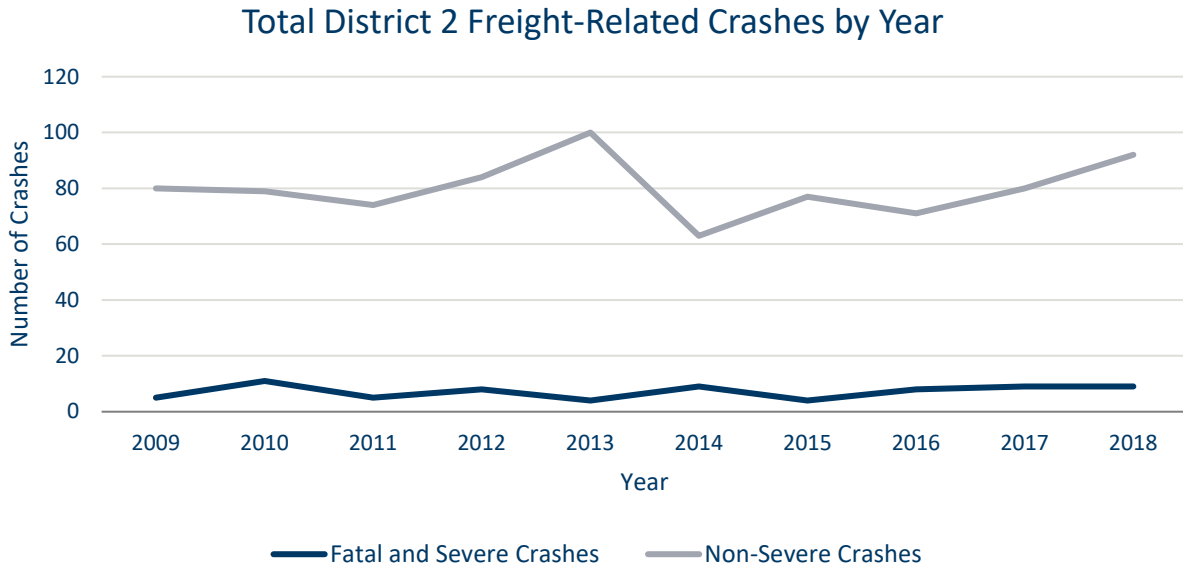


Figure 19: Freight crash trends over time 2009-2018

Roadway Surface Conditions and Lighting

Roadway surface conditions and lighting conditions appeared to have minimal effects on crashes based on data available. Approximately 63 percent of crashes were under dry conditions, and only 27 percent under snowy conditions. Over three quarters of crashes occurred during daylight hours.

Crashes during Harvest Season

Approximately 30 percent of crashes from 2009-2018 occurred during harvest season, from August to October. The month of October had the most reported crashes of all months, but combined, the harvest season has marginally higher crashes compared with other 3-month periods of the year.

Freight Mode: Railroad

Rail plays a crucial role in District 2's movement of goods coming from the Bakken in North Dakota, heading to and from destinations such as the Twin Cities and across the nation. There are three Class 1 operators in District 2: BNSF, CN and CP (SOO). Class 3 operators include MNN and NPR (Figure 21).

These lines run parallel to US highway routes US 75, US 59, and US 2. Of the 718 at-grade rail crossings, the highest volume is concentrated on the CN line in the northern portion of the district. This line accommodates up to 18 trains per day and also has the highest speeds, with trains traveling up to 60 mph through crossings.



Figure 20: District 2 Railroad Freight System Summary

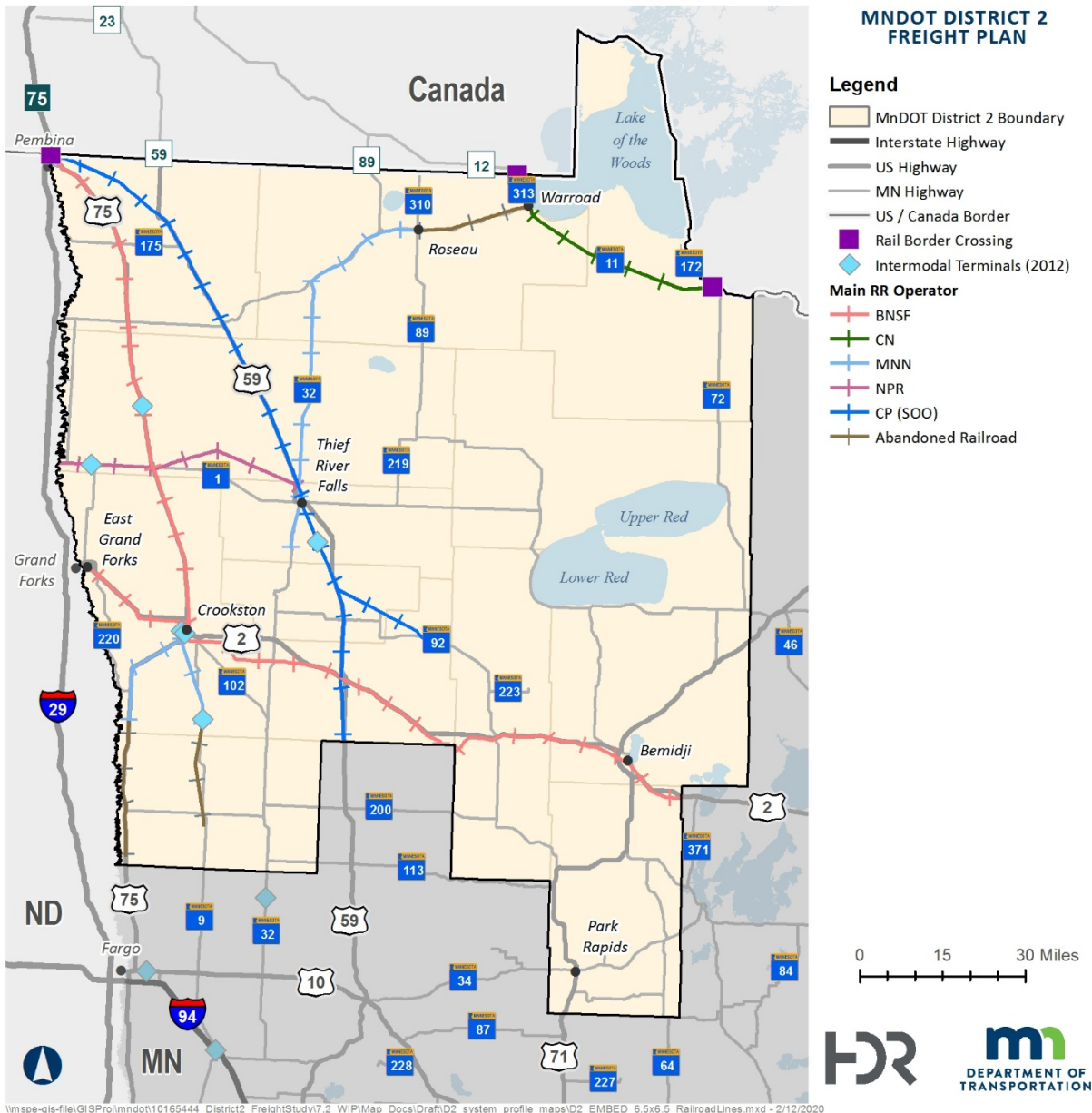


Figure 21: Railroad Lines in District 2

Intermodal

District 2 has six intermodal terminals in the district, including five grain shuttle terminals, and one pipeline terminal (Table 2). These connection points play a critical role in providing the ability to move freight efficiently and cost-effectively. In particular, the grain shuttle terminals are key components for District 2, allowing agricultural products to be shipped via rail throughout the country. These facilities and the roadways connecting to them are susceptible to large seasonal fluctuations in demand and congestion, typically peaking around the fall harvest season. Major shippers in District 2 include companies such as American Crystal Sugar Company.

Table 2: Intermodal Terminals (2012) Source: MnDOT

Name	City	Type	Commodities	Roadway	Rail
Magellan Pipeline	Crookston	Pipeline Terminal	Oil Products	US 75	BNSF
Solar Gas	Mentor	Pipeline Terminal	Oil Products	US 2	BNSF
Farmers Elevator Co. of Alvarado	Alvarado	Grain Shuttle Terminal	Wheat, barley, soybeans, sunflower seed, corn	MN 1	NPR
Markit County Grain, LLC	Argyle	Grain Shuttle Terminal	Corn, soybeans, wheat	US 75	BNSF
Northwest Grain	Hazel	Grain Shuttle Terminal	Wheat, soybeans, corn	MN 32, 3rd St E	CP
Beltrami Farmers Elevator	Beltrami	Grain Shuttle Terminal	Wheat, soybeans, corn	MN 9 (Atlantic Ave)	MNN
Mid Valley Grain Co-Op	Crookston	Grain Shuttle Terminal	Corn, soybeans, wheat	US 2, Fairfax Ave, 3rd Ave S, S Main St	BNSF

Highway-Rail At-Grade Crossing Crash Analysis

Over the 10-year period of 2009-2018, there were a total of 32 crashes as reported by the Federal Railroad Administration (FRA) at at-grade highway-rail crossings in District 2 (Figure 22). Seven of the 32 crashes occurred at private at-grade rail crossings while the remaining 25 crashes occurred at public at-grade rail crossings. Over the 10-year period, the frequency of crashes at at-grade crossings have been increasing for both private and public crossings. All crossing locations experienced only one crash during the 10-year period except for two locations:

- A private at-grade crossing located in Polk County (1 crash in 2013 and 1 in 2018)
- A public at-grade crossing located in Beltrami County (1 crash in 2013 and 1 in 2017)

Polk County experienced the highest total number of crashes, with seven over the 10-year period. Those seven crashes consisted of 5 PDOs, 1 injury and 1 fatality. Roseau County experienced the highest number of fatalities than any other county in District 2, totaling 3 fatalities. One fatality occurred in 2009, the other two fatalities occurred during the same incident (different at-grade crossing) during 2014. The majority of vehicles involved in public at-grade highway-rail crashes were passenger vehicles. There was only one incident that involved a pedestrian. Also, the majority of incidents were due to motorists not stopping at the crossing.

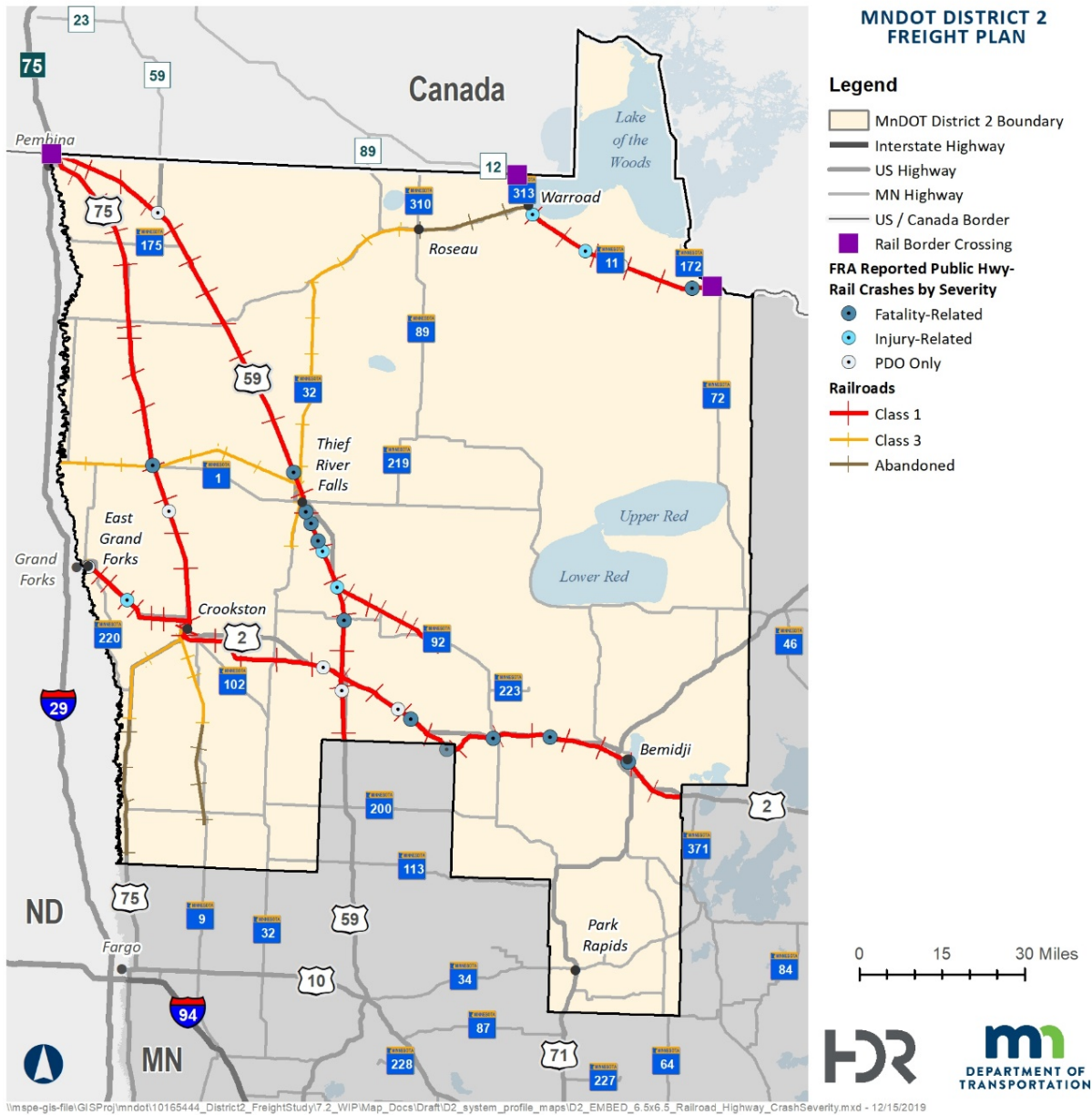


Figure 22: Highway-rail crashes by severity

Freight Mode: Water

There are no direct access points to navigable waterways in District 2. However, access to these facilities may be gained via other modes:

- Access to the **Port of Duluth-Superior** and the **Great Lakes Waterway** system can be reached by truck, predominantly via US 2. BNSF and CN railroads also have rail terminals at this port. Taconite accounts for more than two-thirds of this ports freight tonnage, followed by coal and other commodities such as grain, salt, and wind generator components.³

³ [MnDOT Commercial Waterways: https://www.dot.state.mn.us/ofrw/waterways/commercial.html](https://www.dot.state.mn.us/ofrw/waterways/commercial.html)

- Access to the barge terminals on the **Mississippi River System** can be accessed by truck, primarily via I-94 or US-10. Rail access is provided at some locations, notably the Red Rock River Terminal which provides access to the CP rail system.

While the District is landlocked from the Great Lakes and other major navigable waterways, water-based freight transportation still plays a major role in District 2’s economy. As an example, the Mississippi River system accounts for more than 50 percent of Minnesota’s agricultural exports.

Freight Mode: Aviation

District 2’s airports play a key role in allowing local industries to access regional, national and international markets via the integrator networks. Ensuring that the freight capacity of these airports can keep up with the rapidly rising demand will be an important step in maintaining economic competitiveness.

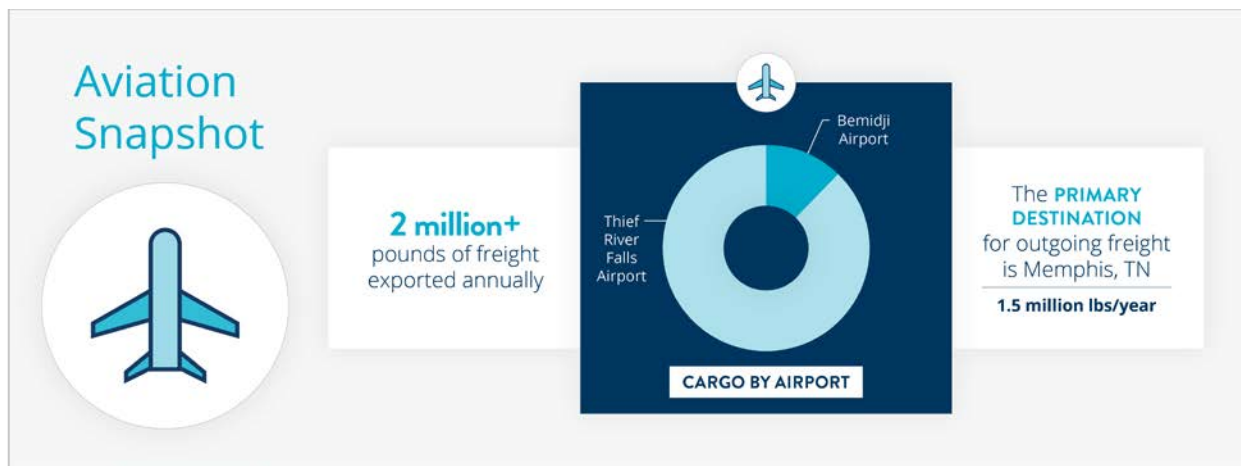


Figure 23: District 2 Aviation Freight System Summary

Freight aviation in District 2 is growing for both cargo and commercial use. Airports with cargo service are located in Thief River Falls and Bemidji. Both airports have seen substantial growth in in recent years. In the five years from 2013 to 2018, the volume of freight shipped out of the Bemidji airport grew 24 percent while the volume of freight shipped out of the Thief River Falls airport grew 305 percent.

Much of this growth is driven by local businesses such as DigiKey, an online-based electronic component distributor which uses air freight services to fulfill their e-commerce orders. The highest air freight volumes being shipped from District 2 airports are between Thief River Falls and Memphis, Tennessee with nearly 1.5 million pounds of freight shipments in 2018. The majority of this freight can likely be attributed to FedEx shipments traveling to and from the FedEx freight hub in Memphis. In recent years, air freight shipments from the District 2 airports have also increased to airports in Des Moines, Fargo, Little Rock, and Minneapolis-St. Paul. These shipments appear to be associated with small cargo aircraft feeder flights operating on behalf of UPS and FedEx to connect with regional airport hubs.



Figure 24: 2018 District 2 Air Freight. Source: HDR analysis of BTS T-100 dataset

Freight Mode: Pipelines

Four categories of pipelines extend through District 2, totaling approximately 1,259 miles. All but two of the pipelines extend in a northwesterly/ southeasterly direction (Figure 26). While MnDOT has little direct influence on the development of pipeline infrastructure, the capacity and functionality of the pipeline network is important to understand as it can have significant impacts on other modes such as rail. For example, in the past year, the number of shipments of crude-by-rail has increased sharply in response to a number of bottlenecks in the pipeline network.⁴

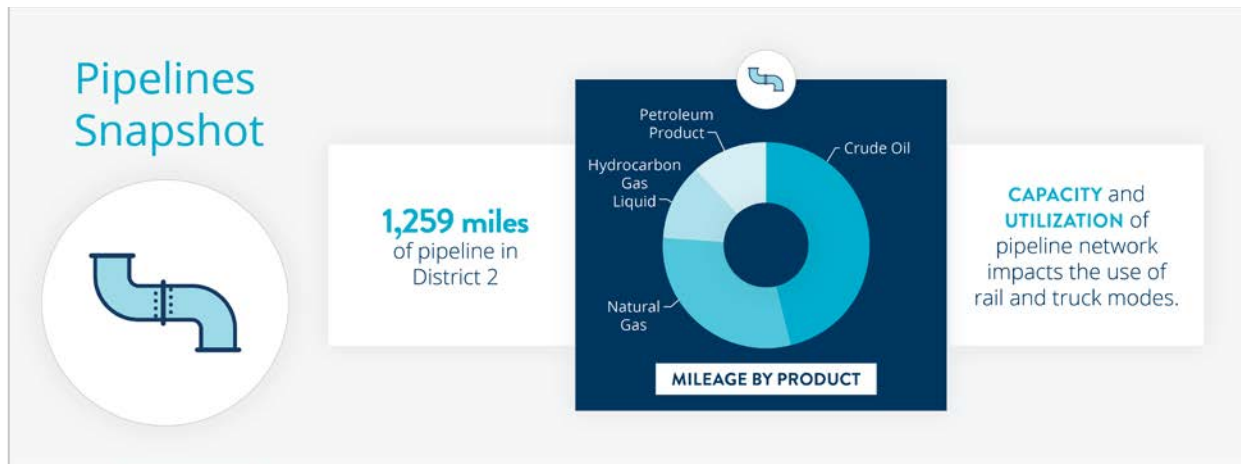


Figure 25: District 2 Pipeline Freight System Summary

According to the Energy Information Administration, about 30% of all U.S. crude oil imports enter the nation through Minnesota, largely by pipeline. One of the more notable pipelines in the District is the Enbridge Line 3 oil pipeline which transports crude oil between the Canadian oil sands and oil depots in Superior, WI. In 2018, the Minnesota Public Utilities Commission approved a plan to replace the aging pipeline with a new one that would follow a slightly altered alignment through District 2. The realigned pipeline will carry up to 760,000 barrels of crude oil per day.

⁴ [Wall Street Journal: Oil Trains Make Comeback as Pipeline Bottlenecks Worse: https://www.wsj.com/articles/oil-trains-make-comeback-as-pipeline-bottlenecks-worsen-11548930600](https://www.wsj.com/articles/oil-trains-make-comeback-as-pipeline-bottlenecks-worsen-11548930600)

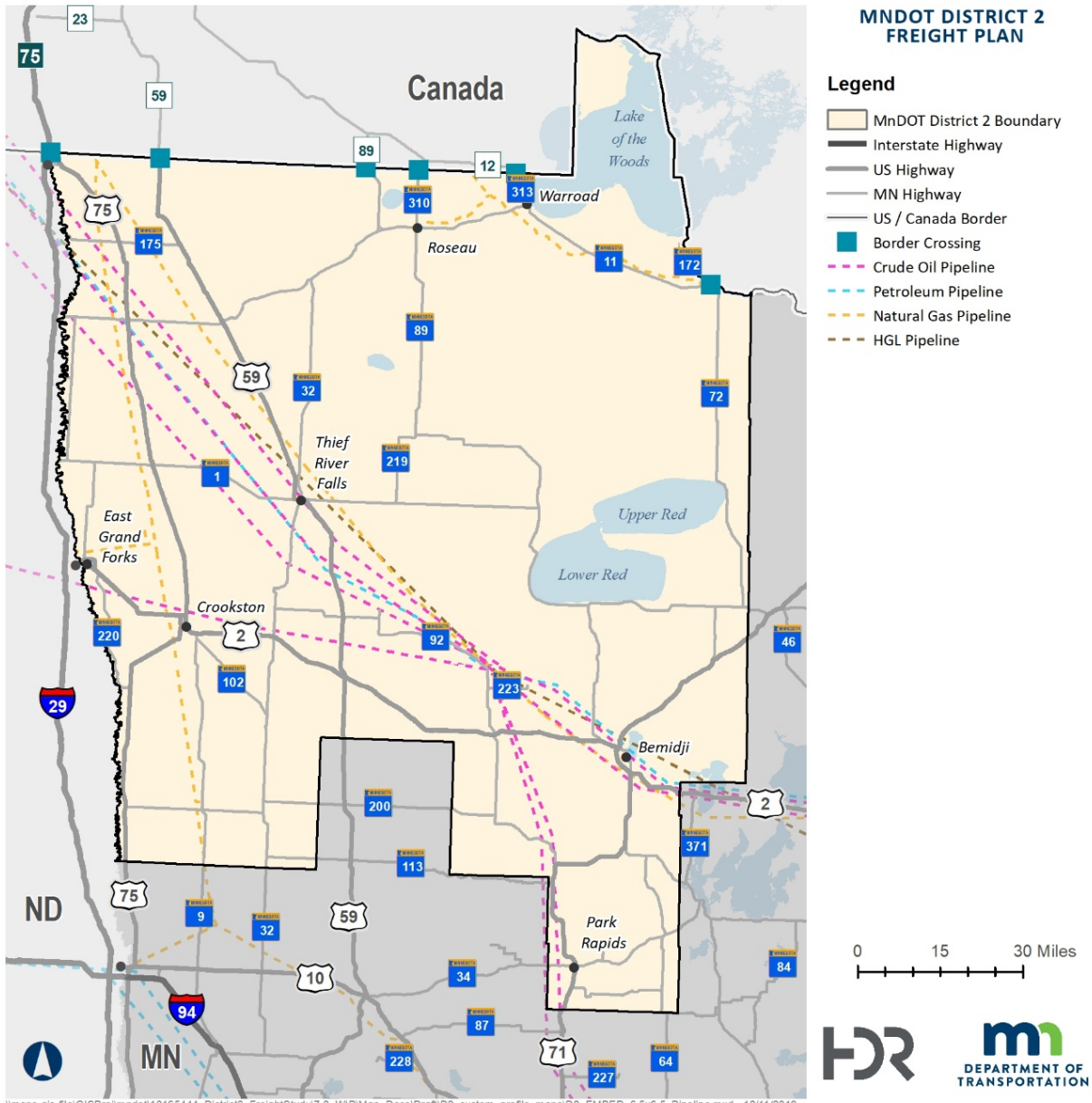


Figure 26: Pipelines in District 2

Chapter 3: Key Needs, Issues and Challenges

District 2 Freight System Needs and Issues

The identification of freight needs in District 2 relies on a variety of sources including the work completed and summarized in Working Papers 1 through 3, interviews with freight businesses throughout the District, and coordination with the Project Advisory Committee (PAC). The intended purpose of this approach is to combine a quantitative data-driven methodology with more qualitative methods to develop a comprehensive list of freight needs and issues within the District.

- **Data-Identified Needs:** Freight needs in this category were determined through a detailed analysis of data collected and summarized *in* Working Paper #1: Existing Document Synthesis and Working Paper #2: Economic and Freight System Profiles. This included an assessment of crash data, truck GPS data, and freight infrastructure condition data from MnDOT.
- **Stakeholder-Identified Needs:** Freight needs in this category were determined through coordination with the PAC, interviews with select freight shippers and carriers operating in District 2, and the results of previous plans and studies, particularly the findings of the *District 2 Manufacturers' Perspectives Study* completed by MnDOT in 2016.

Freight Need Categories

To better understand the scope of freight needs within the context of District 2's other transportation infrastructure, the list of freight needs identified through this exercise was categorized into three distinct categories:

- **Safety:** Needs in this category were determined primarily based on crash history over the past five years for highway-related crashes and the past 10 years for crashes at highway-rail grade crossings. Needs were also identified using risk factor analysis developed by MnDOT in previous studies.
- **Mobility:** This category relates to the ability of freight carriers to move freight throughout the district and includes factors such as travel time reliability, bridge weight limits, and low bridge vertical clearance issues.
- **Condition:** Maintaining freight infrastructure at an adequate condition level is critical to ensuring the long-term viability and trust in the freight transportation system. This category includes freight needs based on MnDOT's bridge condition and pavement quality data.

A full list of the needs identified through this analysis is available in Working Paper 4.

Data-Identified Needs

The first step in identifying freight needs was the application of a series of freight-related metrics and performance measures based on the safety, mobility, and condition categories discussed above. This needs identification and scoring methodology was developed by MnDOT staff for the purpose of standardizing the approach used in each district freight plan. The methodology identifies thresholds for the identification of freight-related needs through measures such as crash history, infrastructure condition below a specific level, and low travel time reliability scores as measured during the system profile analysis.

As much as possible, these thresholds should remain consistent between district freight plans. However, some thresholds have been adjusted to reflect the unique conditions of District 2. For example, the measure of truck travel time reliability will show much lower levels of congestion in District 2 compared to more urban districts such as District 3 or Metro District. For this metric, a lower threshold is used to identify congestion issues proportionate to the congestion levels typically experienced in District 2.

Maps for the Data Related Needs detailed below are available in Working Paper 4.

Safety

Safety issues pose a risk to both human life and property. Crashes involving the movement of freight are often more likely to result in severe injury and death due to the size of the vehicles involved. Freight crashes also impact the economy by disrupting supply chain operations and delaying the delivery of goods. This section identifies freight safety need by reviewing highway truck crash frequency at intersections and roadway segments as well as safety issues at highway-rail grade crossings.

Truck Crash History

This analysis used a 10-year crash history including years 2009 through 2018. A total of 872 freight-related crashes occurred within District 2 during the time period. Separate analyses were conducted for intersection-related crashes and roadway segment-related crashes.

A total of 420 crashes were identified as intersection related. These occurred at 346 intersections. Only 115 intersections experienced more than one freight-related crash over the 10-year analysis period. The intersection with the highest number of freight-related crashes is the intersection of US 2 and Central Avenue in East Grand Forks where nine freight-related crashes occurred over this time period. For this analysis, a threshold of three crashes over the analysis period (or an average of approximately one freight-related crash every 3-4 years) was selected for the identification of freight safety needs. Using this threshold identified 18 intersections which account for 15 percent of all freight-related intersection crashes in the District.

A total of 452 crashes were identified as segment related. These occurred on 2,849 distinct roadway segments throughout the district. Only 80 segments experienced more than one crash over the 10-year analysis period. For this analysis, two thresholds were used to identify freight safety needs: 1) At least two crashes on the segment and 2) A minimum density of one crash per roadway mile. This resulted in the identification of 19 roadway segments located primarily in Bemidji, Crookston, East Grand Forks and Roseau. Additional information about these issues can be found in Working Paper 4.

Highway-Rail Grade Crossing Risk Rating and Crash History

This analysis builds on the results of MnDOT's *Rail Grade Crossing Safety Project Selection* study completed in 2016. This study included a systematic assessment of risk factors associated with increased crash rates at highway-rail grade crossings. A result of the study was the calculation of risk ratings (measured on a scale of 0 to 9) for each active and passive public grade crossing in Minnesota. For this analysis, public rail grade crossings were identified as a freight safety need if they scored higher than a rating of 7. This threshold identifies 10 crossings with a rating of 8. The majority of these crossings are located on the CP (SOO) rail line. No crossings in District 2 have a rating of 9. As a supplement to this analysis, grade crossings which experienced more than one crash in the five-year crash history were also identified as freight system safety needs. Two crossings located on the BNSF rail line met this criteria.

Mobility

Multiple factors influence the ability of freight carriers to transport goods across the roadway system. The three factors included in this analysis are Truck Travel Time Reliability, a measure of the variability in traffic congestion, and bridge vertical clearance and bridge weight limit. These bridge limitations may affect the efficiency of truck routing if the ideal route is blocked by a low bridge or a low weight limit.

Truck Travel Time Reliability

The Truck Travel Time Reliability Index (TTRI) is a federal performance measure calculated as the ratio of the 95th percentile travel time to the 50th percentile travel time. It essentially measures the difference between average travel time and the travel time at heavily congested times. Reliability is important for carriers since it allows them to schedule deliveries efficiently. If the travel time on a roadway is unreliable, this could result in carriers delivering late or building in additional travel time, potentially leading to routing inefficiencies. The calculation of TTRI in District 2 is documented in Working Paper #2. For the identification of freight reliability needs, three thresholds were used:

1. **Trip Sample Counts > 100:** The TTRI analysis was conducted using the StreetLight Insight platform. This tool uses truck GPS data to calculate transportation metrics. Roadway segments were excluded if they had fewer than 100 sample trip counts.
2. **TTRI > 8:** The TTRI measure ranged from 1.03 to a high of 25. Setting a TTRI threshold 8 limits the selection to the top 10 percent of D2 roadway segments.
3. **Segment Length > 1 Mile:** Short, isolated roadway segments with high TTRI measures could be the result of noise in the data or an artifact of data processing methods. Even if the is accurate, very short segments will have limited impact on overall truck route reliability. Therefore, the selection was limited to contiguous roadways extending more than 1 mile.

Using these criteria identifies portions of TH 75 near the North Dakota border, and portions of TH 71 and Highways 8, 11, and 27 near Bemidji.

Bridge Vertical Clearance

In some cases, the presence of low bridge vertical clearances requires trucking carriers to travel a more circuitous and inefficient route. In District 2, only two bridges are categorized as having low clearance (vertical clearance less than 14 feet, 6 inches). Each of these impediments is a railroad bridge on the BNSF mainline located in the southern portion of the District. One bridge is located on 440th Street SE in Winger and the other is located on 400th Ave SE in Lengby. Neither of these bridges is located on a heavy truck route and in each location, there are alternative routes within a reasonable distance.

Bridge Weight Limit

Similar to bridge vertical clearance issues, bridges with low weight limits have the potential to impact the efficiency of truck routing. For this analysis, bridges in District 2 were identified as being a freight need if they have a posted weight limit of 15 tons or less. Within District 2, there are 11 bridges that meet this criteria.

Infrastructure Condition

Insufficient maintenance of freight infrastructure can have substantial impacts to the movement of freight. Deteriorating bridges and roadways pose a safety risk to all transportation system users and also have the

potential to damage goods. Roads and bridges may also deteriorate to the point that weight limits are put in place further impacting freight movement.

Bridge Condition Rating

MnDOT bridges are routinely inspected to identify issues that require immediate or long-term repair. Each bridge is measured on a condition scale of 0-10 for three categories: Deck, Superstructure, and Substructure. For this analysis, any bridge with a condition rating of 4 or less was identified as a freight need. The description of the conditions warranting a rating of 4 are summarized below for each category.

- **Deck:** Deck has advanced deterioration (replacement or overlay should be planned).
- **Superstructure:** Superstructure has advanced deterioration. Members significantly bent or misaligned. Connection failure may be imminent. Bearings severely restricted.
- **Substructure:** Substructure has advanced deterioration - repairs may be necessary to maintain stability. There may be extensive scour, erosion, or undermining. There may be significant settlement, movement, misalignment, or loss of bearing area.

Pavement Quality

MnDOT routinely monitors pavement quality and condition on interstate highways and state roads in Minnesota. The Pavement Quality Index (PQI) is a measure of overall pavement quality measured on a rating scale between 0.0 and 4.5. As discussed in Working Paper #2, roadways in D2 are primarily rated as Good with a small portion of roadways falling into the Fair category. No roads in District 2 are categorized as being in Poor condition. Pavement quality is also an issue that has not come up frequently during stakeholder outreach during interviews with District 2 businesses and interaction with the Advisory Committee. Due to these findings, pavement quality has not been used as a measure for identifying freight needs.

While pavement quality on MnDOT-maintained roads was not identified as an issue at this time, many stakeholders noted concerns about overall pavement quality on county and local roads in District 2.

Stakeholder-Identified Needs

The identification of needs through stakeholder outreach is intended to both supplement and compliment the data-identified needs discussed in the previous section. While the data-driven needs identification provides a quantitative and objective approach, there are many potential freight issues that would not come to light through a data-driven approach alone such as problematic intersection geometry, the need for roadway expansion, or potential safety concerns that have not yet resulted in crashes

This section includes the results needs identification exercises through reviews of previous plans and studies, a series of stakeholder interviews, an online stakeholder survey, and feedback from the Project Advisory Committee.

Previous Plans and Studies

One of the primary sources of information on freight needs comes from the District 2 Manufacturers' Perspectives Study, completed in 2016. The study involved interviews with 68 manufacturing businesses within the district with the goals of better understanding business needs and priorities, building relationships between MnDOT and the private sector, and supporting continuous improvement at MnDOT with input from this customer segment.

One focus of the interviews was to identify needs and issues experienced by the manufacturers' to better understand how MnDOT can help improve the freight transportation system. Feedback included policy issues such as concern about truck size and weight consistency between Minnesota and neighboring states and operational issues such as needing to have snow plowing completed earlier in the morning to ensure smooth and safe morning deliveries. For this study, feedback related to requests for upgraded or modified infrastructure were collected and categorized.

A total of 21 issues and needs were collected from the Manufacturers' Perspectives Study. The locations of these needs are shown in Figure 27. Each issue has been designated a unique issue ID. Additionally, each issue was broadly categorized as related to safety, condition, or mobility.

- **Safety:** 7 issues were related to safety. These included issues such as requests for bypass lanes at key intersections or business accesses, installation or modification of traffic signals, and roadway sections with narrow lanes and steep shoulders.
- **Condition:** 5 issues were related to infrastructure condition. These included issues such as rough pavement and bumps or dips that could potentially cause damage to vehicles and loaded goods.
- **Mobility:** 9 issues were related to freight mobility. These included issues requests for roadway widening, installation of passing lanes or requests to upgrade two-lane roadways sections to four-lane.

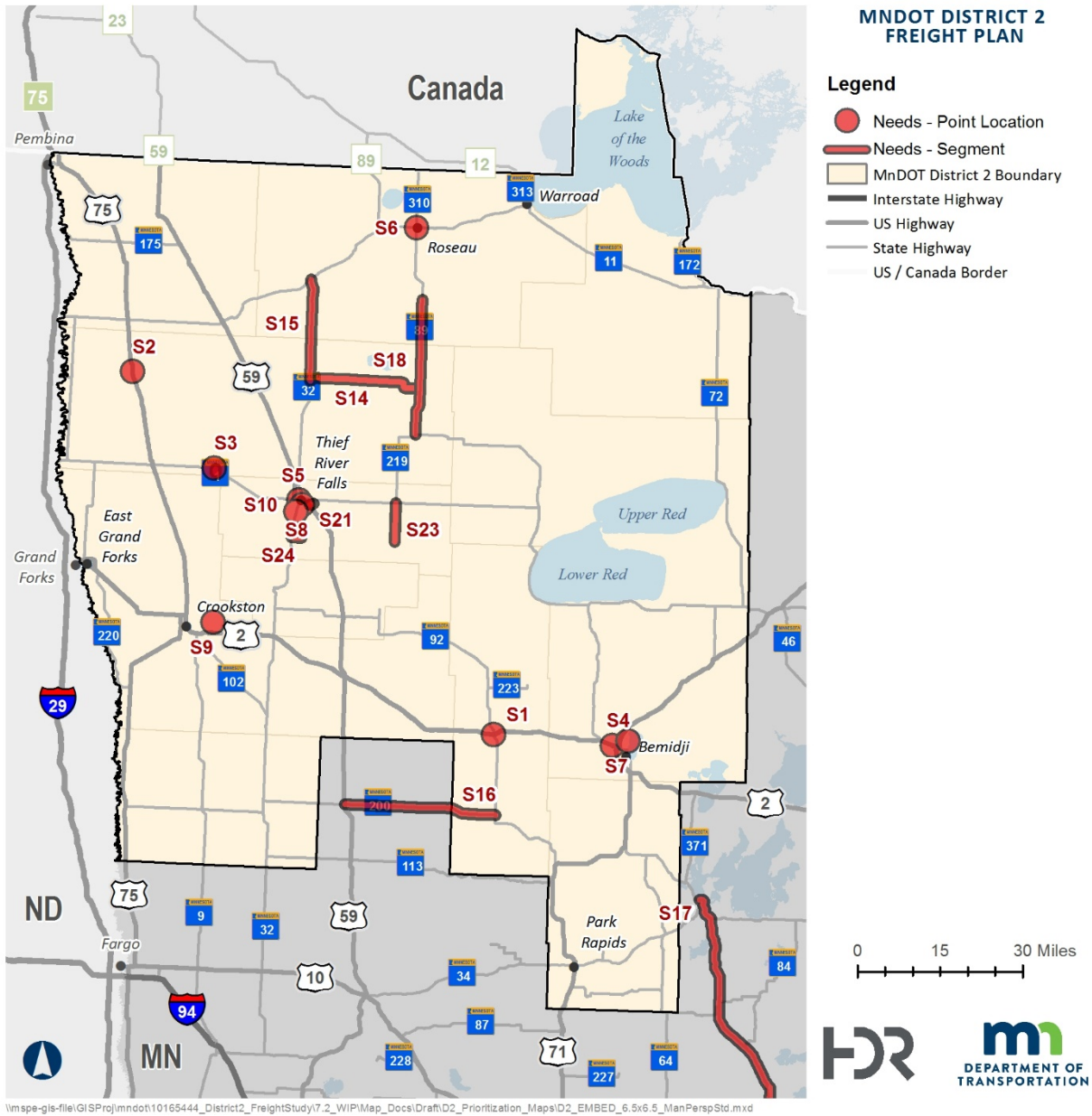


Figure 27: Manufacturers' Perspectives Study Identified Needs

Stakeholder Interviews and Online Survey

A series of stakeholder interviews were conducted as part of this study to identify current freight needs and issues related to freight movement through District 2. For each interviewee, questions were asked regarding the type of industry they represent and how their business uses and relies on the freight system in the District. Questions focused on economic factors of the business such as the types of goods they ship, the types of vehicles they use, and the locations of their most heavily used shipping routes. Questions also focused on the identification of freight system issues that most impact their business, including policy-related issues such as truck size and weight restrictions as well as infrastructure issues such as pavement conditions or truck route restrictions.

In addition to these interviews, a supplementary online survey was distributed including a similar series of questions. 32 responses were collected from the online survey. The locations of the needs identified during stakeholder interviews and the online survey are shown in Figure 28. Each issue has been designated a unique issue ID.

A common finding during multiple interviews and survey responses was the desire for a four lane north/south connection, such as TH 59 to be upgraded to a 3 or 4 lane road from the Canadian border to Detroit Lakes. Multiple respondents noted potential safety issues and travel time issues related to slower moving passenger vehicles on this corridor. Other issues identified during the interviews was the desire for a runway extension at the Thief River Falls airport and the desire for an upgraded maintenance facility at the Bemidji airport.

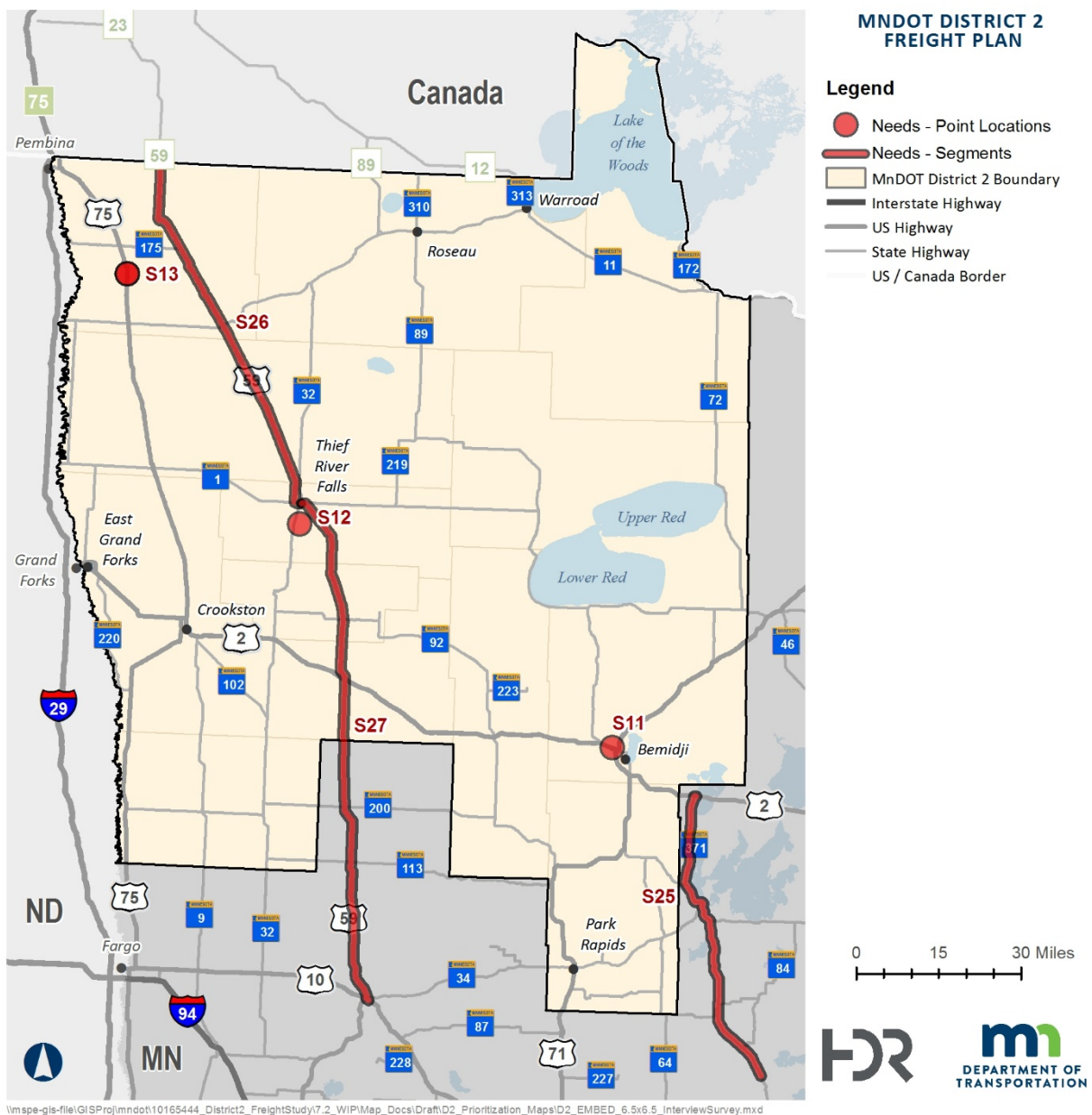


Figure 28: Stakeholder Interview and Online Survey Identified Needs

Summary of Identified Project Needs

The following map and table summarize the freight needs identified through the process outlined in above and with greater detail in Working Paper 4. Each location has been assigned an identification number: IDs starting with “D” indicate that they were identified through data-driven analysis. IDs starting with “S” indicate that they were identified through stakeholder engagement.

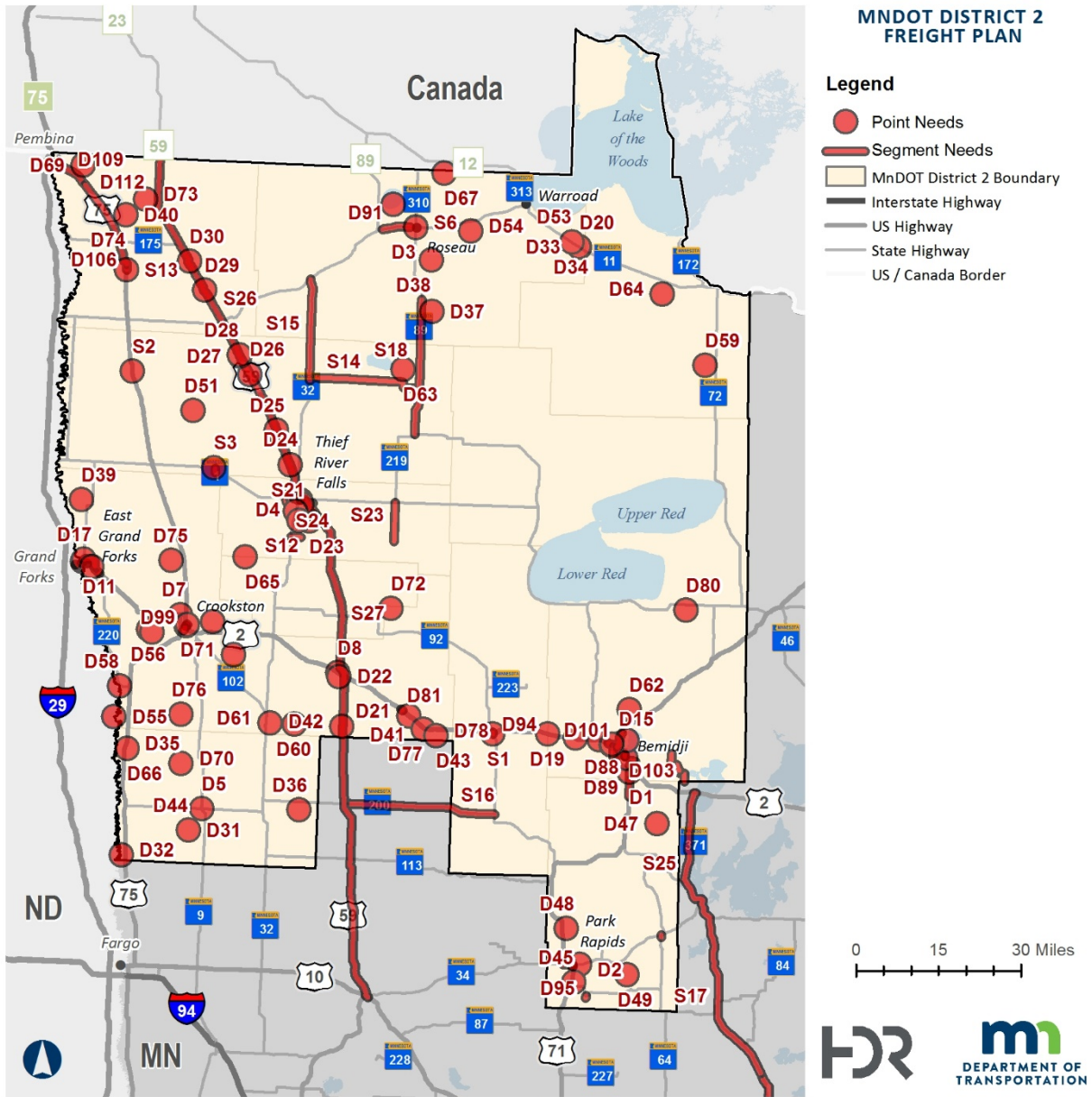


Figure 29: Freight Needs

Future Challenges

While this plan identified specific freight needs and improvements, the analysis and outreach effort also captured much larger long-term challenges that must be addressed to enhance freight mobility in District 2. While some of these issues are not in MnDOT's direct control, they pose impediments to economic development in the region. Specifically:

IMPORTANCE OF AIR CARGO: The airports at Bemidji and Thief River Falls handle more air cargo than any other airports in Minnesota with the exception of MSP. The high-quality air cargo service provided at these airports allows District 2 business to access national and international markets. There are several air cargo related projects at the two airports that must be addressed to keep high-quality advanced manufacturing activities in the District.

MANUFACTURING IS CRITICAL TO THE ECONOMY: Manufacturing and freight-related businesses make up a larger share of District 2 employment than they do within the State as a whole. Industries such as agricultural and forestry products are uniquely important to the local economy.

LIMITED CANADIAN BORDER CROSSING OPTIONS: Many of the border crossings between District 2 and Canada have limited operating hours, forcing many carriers to detour to crossings outside the District such as Pembina and International Falls. This indirect routing increases travel time and shipping costs for District 2 businesses.

DESIRE FOR MULTI-LANE HIGHWAYS: District 2 has no Interstate highways and has only limited segments of multi-lane highway. As noted by many respondents in the District 2 Manufacturers' Perspectives Study, expansion of some roadways to multi-lane configuration would increase safety and the efficient movement of goods.

DOWNTOWN STUDIES: District 2 freight stakeholders identified a need to better integrate freight into the downtown areas across the district. Specifically, that these areas needed further study that was beyond the scope of the District 2 Freight Plan.

SWOT Analysis

Based on the results of the quantitative economic and freight system profile analysis and stakeholder feedback, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was conducted to frame the development of the project’s prioritization efforts. The table below summarizes internal (Strengths and Weaknesses) and external (Opportunities or Threats) issues that should be considered when planning for District 2’s economic future. A thorough SWOT analysis is detailed in Working Paper #3

Table 3: District 2 Freight SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong, diverse economy • Export market • Outbound air cargo • Many multimodal connectivity points • GF/EGF Bi-State Cooperation • Air cargo service at two airports (including parcel service from UPS and FedEx) • Overall Trunk Highway pavement quality • Trunk Highway 10-ton roads • Winter weather response on the Trunk Highway system • Relatively low fatal CMV crash frequency • Strong local communities • Freight-related industries support the local economy • Large segments of designated wilderness and State Forest areas 	<ul style="list-style-type: none"> • High reliance on freight from Twin Cities • Less than truckload carrier availability • Lack of four-lane highways on key corridors • Limited north/south roadway connectivity • Additional Red River crossings • Short line rail state of good repair • Air cargo ramp maintenance • Weight restricted county facilities • Winter weather response on county facilities • Winter response at airports • Deicing availability at Bemidji airport • Left turn related crashes during harvest • Narrow roads with limited shoulders • Crash rate highest in western half of District 2 • Increased rail grade crossing incidents / incident rate • Downtown truck movements can impact nearby residents and businesses
Opportunities	Threats
<ul style="list-style-type: none"> • Improved future passenger aircraft service • Outbound cargo levels support larger aircraft which presents opportunities for new high-tech investment in the area because of inbound availability and workforce • Multi-state Oversized/Overweight Harmonization (including Canada) • Investment in longer runways and larger hangers at Thief River Falls and Bemidji airports. • Directional signage and dynamic messaging systems • Grade crossing closure/consolidation • Safety improvements that benefit freight (passing lanes, acceleration/deceleration lanes, etc.) • Partnerships with local delivery companies to address delivery issues • Address first/last mile issues • Future “main street” redesign projects could integrate freight 	<ul style="list-style-type: none"> • U.S. Customs and Border Protection border crossing hours of operation and equipment placement decisions • Global Trends • Consolidation by larger firms not in the region make it harder to expand locally • Limited funding opportunities for expanded facilities to support air cargo growth • Limited funding opportunities for multimodal projects • Potential impacts of increased train volumes, particularly transportation of hazardous materials such as Bakken crude oil • Increased e-commerce related deliveries • More trucks from manufacturing and agriculture. • Trucks crossing through communities to reach air cargo facilities • Increased movement of hazardous materials

Chapter 4: Project Funding and Prioritization

Funding Sources for Freight Improvements

Minnesota State Highway Investment Plan

Previous transportation plans – nationally and in Minnesota – have identified an overall funding shortfall that constrains the ability of State DOTs to respond adequately to ongoing maintenance, operations and capacity needs. In Minnesota, this gap is documented in the Minnesota State Highway Investment Plan (MnSHIP).

The 2018 MnSHIP estimated an \$18 billion funding gap through 2037.

District 2 Capital Highway Investment Plan

More locally, the 2018 District 2 Capital Highway Investment Plan (CHIP) details how the District plans to invest over \$500 million in highway infrastructure improvements over the next decade. The CHIP is updated annually and feeds into the larger Minnesota State Highway Investment Plan (MnSHIP). Investment decisions are based on the following overall strategies. Figure 30 highlights four overall objectives and specific areas of focus while Figure 31 represents how future programming plans align with those strategies and the relative investments dedicated to them.

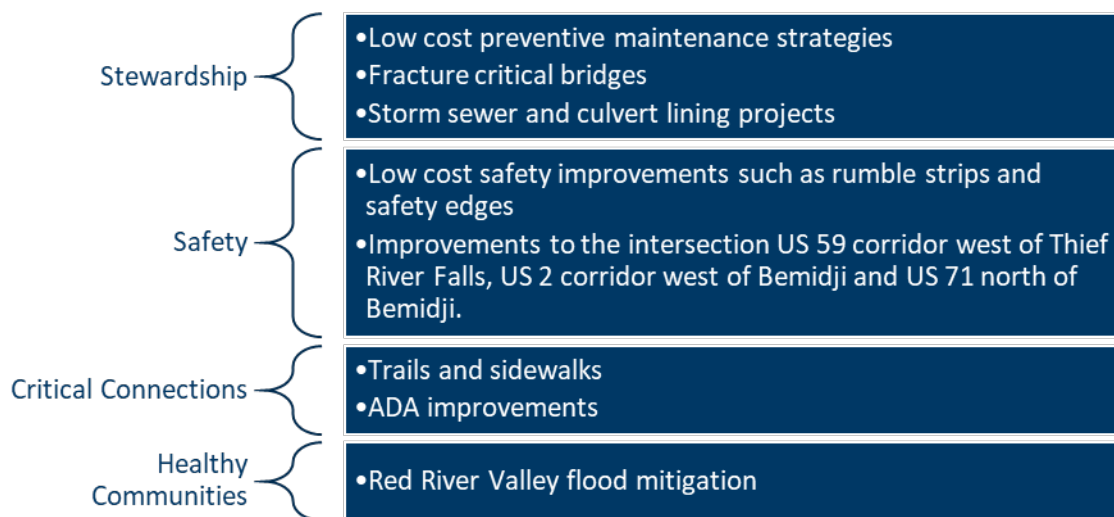
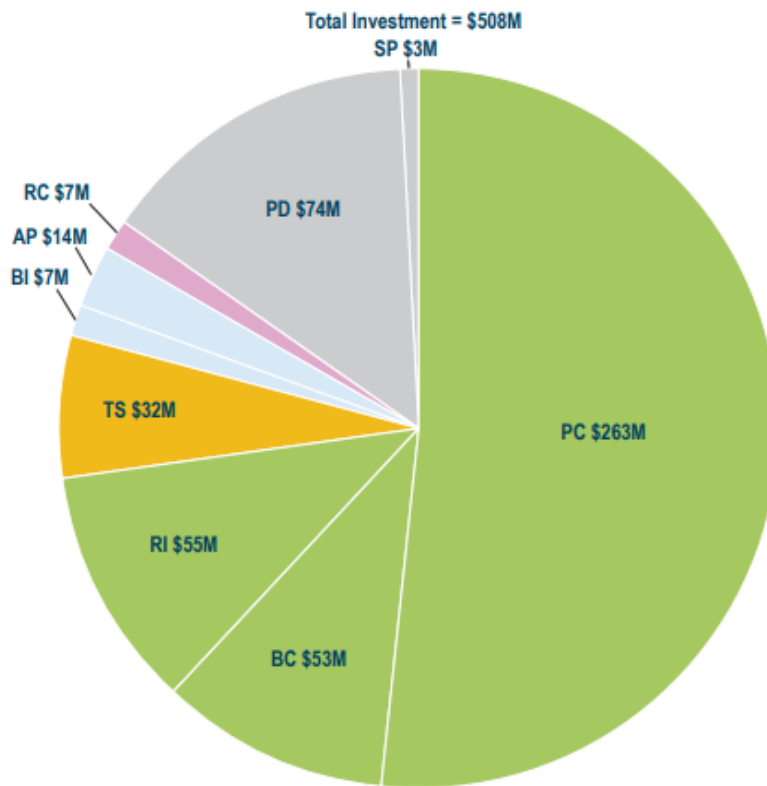


Figure 30 District 2 CHIP Investment Strategies and Highlighted Initiatives



Note: No investment for Jurisdictional Transfer, Facilities, Freight or Greater MN Mobility

System Stewardship	Critical Connections	
PC	TC	TS
BC	GM	RC
RI	FR	PD
JT	BI	SP
FA	AP	

Figure 2-3: District 2 10-Year CHIP, Total Investment Per Year (millions of dollars)

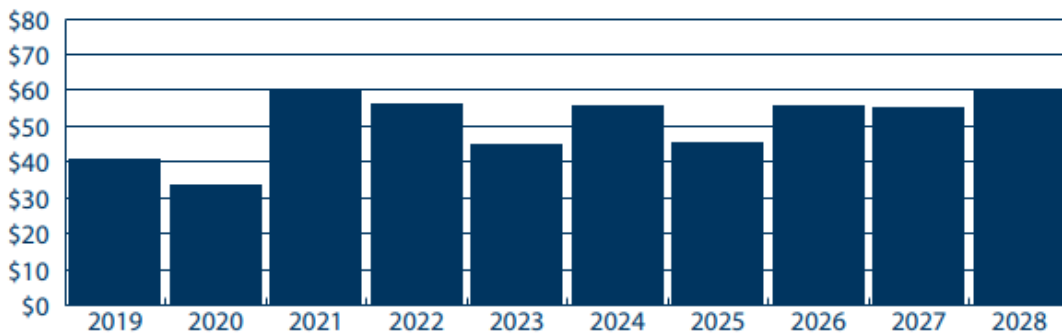


Figure 31: District 2 CHIP Investment Plan Summary

Freight Specific Funding

The Fixing America's Surface Transportation (FAST) Act created a dedicated freight formula program, the National Highway Freight Program. While the program establishes basic eligibility criteria and some funding limitations, it allows each state to allocate the funding as they see fit.

In 2017, MnDOT established the Minnesota Highway Freight Program (MHFP) as a competitive grant program to award the federal freight allocation. The process was updated in 2020. There are currently two major MHFP categories: Roadway Projects and Intermodal Projects. Within the Roadway Projects category there are three subcategories: Safety Projects, Freight Mobility Improvements and First/Last Mile Connections.

Table 4 summarizes the maximum number of points for each criteria under each category. The + sign indicates extra points can be awarded for the category or measure. Projects cannot exceed 1,000 points or the maximum points for any category.

Table 4: 2020 Minnesota Highway Freight Program Selection Criteria

Criteria	Main Measure	Category: Safety	Category: Freight Mobility	Category: First/Last Mile
Truck Volume	Heavy Commercial Annual Average Daily Traffic (HCAADT)	250	250	250
Safety	Crash rate reduction	350	100	100
Mobility	Truck Travel Time Reliability	100	350	150
Facility Access	Number of Trucks Entering and Exiting Project Area	+25	+25	200
Cost-Effectiveness	Divide amount of points awarded above by amount of requested funds	150	150	150
Project Readiness	Various measures	150	150	150

Approach to Freight Project Selection and Prioritization

The first step in the freight project selection and prioritization effort was to compare the identified needs against the planned and programmed transportation infrastructure projects to be completed over the next few years to identify any gaps or areas of need that are not currently being addressed. This approach reviewed programmed improvements for MnDOT's State Transportation Improvement Program/Grand Forks - East Grand Forks MPO Metropolitan Transportation Plan, MnDOT's Capital Highway Investment Plan, and County Capital Improvement Plans. Figure 32 overlays the locations of all identified freight needs with the locations of programmed transportation improvements.

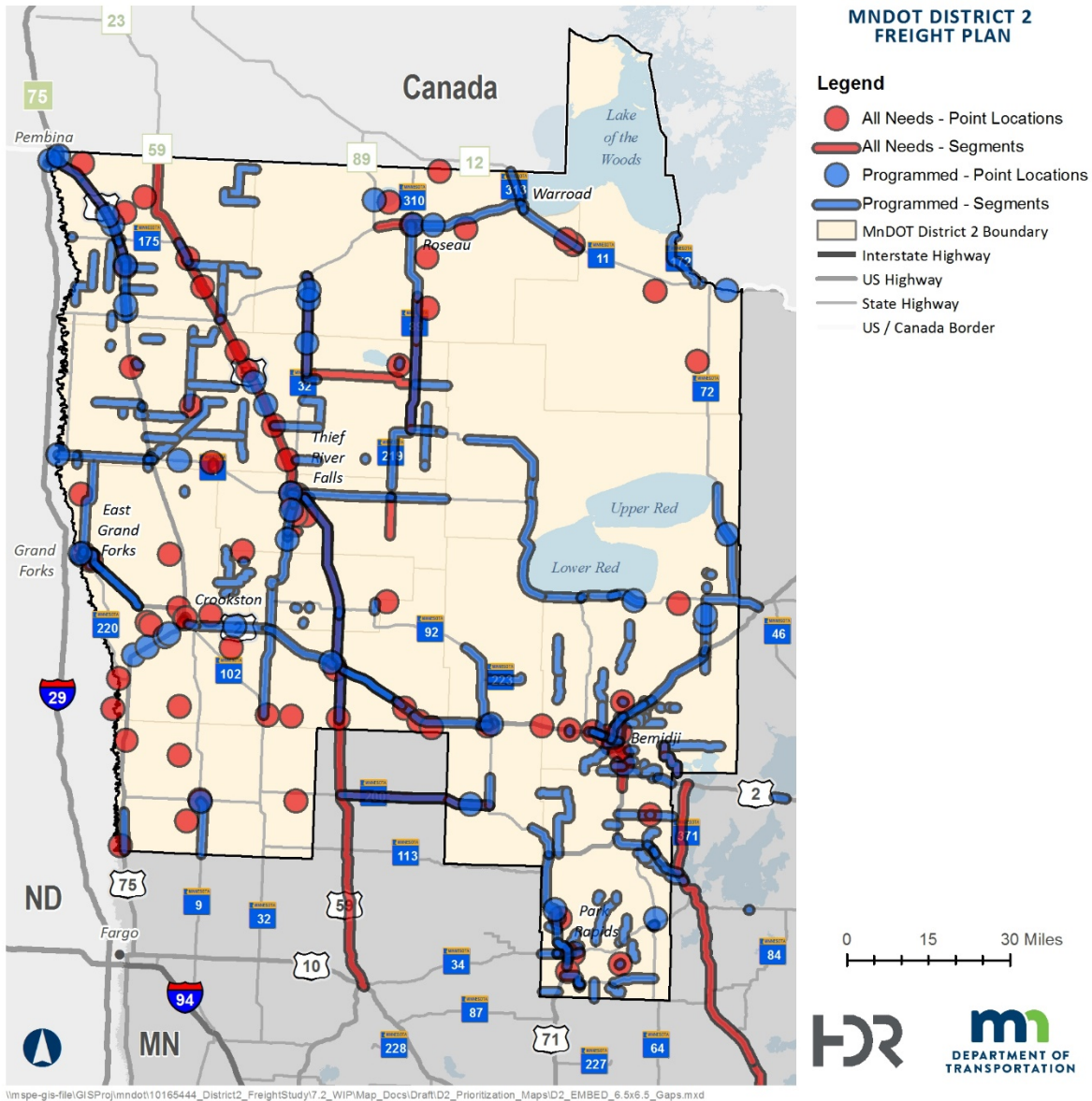


Figure 32: Needs vs. Programmed Projects

Many of the locations of need have programmed projects scheduled to occur in the area of identified need. Notable examples include US 75 south of Pembina, MN 200 between Mahnommen and Zerkel, and many portions of US 2. However, there are also many areas of need which are not currently being addressed, including multiple locations with poor bridge conditions and many parts of US 59 from the Canadian border to Thief River Falls.

Prioritization Process

In order to identify and prioritize projects that will have the greatest impact on the District 2 freight system, this analysis used a project scoring approach using a variety of scoring measures. These included scores related to truck volume, truck percentage, crash history, grade crossing safety, travel time reliability, and bridge conditions. Each scoring category assigns a range of values between 0 and 5 based the individual

measures which have been tailored to match the relative scale of freight conditions in District 2. Additional information about the prioritization process and specific criteria are available in Working Paper #4.

While the needs were prioritized using a data-driven process, District 2 and key stakeholders decided what projects to progress to the next phase of the project – preliminary conceptual design. The Pure Ranking of the evaluated needs is available in Appendix C.

Chapter 5: Recommended Actions

Recommendations

Chapter 3 identified key freight system needs, issues and challenges. The chapter evaluated District 2's strengths and opportunities to improve the economic competitiveness of the area. To support MnDOT's continued investment in the District's freight network, the Plan has identified recommendations organized into:

- **Projects** to physically improve the District's freight system.
- **Policies** to improve the governance and efficiency of the District's freight system.
- **Programs** to improve freight mobility in the area.
- **Partnerships** to collaboratively address system and operational challenges.

Projects

Chapter 4 identified over 120 unfunded freight needs (see Figure 32). The complete list of identified gaps is available in Appendix C. Generally, the gaps fell into three categories: safety, mobility, and conditions. These categories also correspond with the MHFP project categories.

Safety

A total of 57 locations were identified as having a freight safety need. Just over half (56 percent) of these locations were identified based on the analysis of MnDOT crash data involving trucks. The second largest number of safety-related needs (19 percent) were identified using MnDOT's grade crossing risk rating measure. The remaining needs were identified through a combination of FRA accident/incident data, a review of previous plans and studies, and through stakeholder interviews. Four programmed projects overlap the locations of these needs. All four projects are described as pavement reconstruction or mill and overlay projects. The extent to which these projects will address safety concerns is unknown. Therefore, these needs are categorized as potential gaps. The remaining needs not covered by a programmed project are also categorized as gaps.

Mobility

A total of 37 locations were identified as having a freight mobility need. Just over one third (35 percent) of these locations were identified based on a review of MnDOT Bridge Inventory data, identifying bridges with posted weight limits less than 15 tons. The remaining needs were identified through a combination of the review of previous plans and studies, the analysis of truck travel time reliability, stakeholder interviews and the online survey. Six programmed projects overlap the locations of these needs. As with the safety needs, all six projects are described as general roadway reconstruction work. The extent that these project will address freight mobility issues is unclear. These needs are also categorized as potential gaps, while the remaining needs are categorized as gaps.

Condition

A total of 28 locations were identified as having a freight condition need. All but four of these locations were identified using MnDOT Bridge Inventory data to find bridges with one or more rating less than 5. The remaining issues were identified through the review of previous plans and studies and stakeholder consultation. These were predominantly related poor roadway conditions. Five programmed projects will replace or repair bridges identified through the needs analysis. One programmed pavement reconstruction

project will address roadway condition issues. The remaining needs not covered by a programmed projects are categorized as gaps.

Project Feasibility and Conceptual Analysis

From this prioritized list, the 40 top ranked locations were then reviewed to assess whether they should be considered for conceptual analysis and preliminary cost estimation. Working with the Project Management Team, each issue was reviewed to determine if the issue had already been addressed and whether the issue fell within MnDOT jurisdiction. A total of 10 issues were selected from this list. In addition to these 10, the Project Management Team identified an additional five locations that have known freight issues or which have programmed construction that would benefit from additional review through the lens of freight analysis. These additional locations are identified in the table below using an “A” before the issue number.

The table below summarizes the issue locations selected for additional analysis and provides additional notes relevant to each issue. The full conceptual analysis and layouts are provided in Appendix C.

Table 5: Issues Selected for Conceptual Design and Analysis

Issue ID	Roadway	Issue	Conceptual Design	Review Notes
D3/S6	3rd St NW	Intersection with high crash density	The MN 11/MN 89 intersection was reconstructed in 2015. In 2019, Roseau completed a MN 89 corridor study that included multiple alternatives. Review alternatives for additional freight considerations.	MnDOT has planned funding in FY 2027 for a project on MN 89 in Roseau.
D17	Central Ave	Intersection with high crash density	In 2019, the Grand Forks/East Grand Forks MPO completed a MN 220 corridor study with multiple alternatives. Review alternatives for additional freight considerations.	MnDOT does not currently have an intersection revision project in its 10-year CHIP, but will continue to work with the MPO and other stakeholders to develop improvements.
S1	Main Ave	Trucks have difficulty with signal/turn onto city street	The US 2/MN 92 intersection was reconstructed in 2018. Due to right of way constraints, trucks have challenges turning at the intersection. Analyze the area for a potential truck route.	MnDOT will continue to monitor the situation and work with public and private stakeholders to resolve concerns.
D5	E Main St	Intersection with high crash density	Review the types of crashes at this two way stop intersection to determine potential alternatives.	MnDOT reconstructed this section of MN 9 in 2013 and replaced the antiquated flashing stop sign with a flashing LED stop signs at the MN 200 intersection. MnDOT will continue to monitor the situation and work with stakeholders to address concerns.
D11	Demers Ave	Intersection with high crash density	Trucks have challenges turning at this urban intersection. The signal system is planned for replacement in FY 2024. Review for potential intersection alternatives to improve freight.	MnDOT has a signal replacement project planned in FY 2024 and a sidewalk improvement project is planned in FY 2021. MnDOT will work with the MPO and City on improvements that incorporate the Downtown Transportation Study.
S3	220th St NW	Turn Lane from 220th ST from TH 1 WB	Review for turn lane warrants. Segment not included in 10 year plan, but could be included in future MnDOT/County scoping efforts if warranted.	MnDOT does not have a project identified in this section of MN 1 in its 10-year CHIP. MnDOT will continue to monitor the situation and work with stakeholders to address concerns.

Issue ID	Roadway	Issue	Conceptual Design	Review Notes
S2	USTH 75	Bypass lane requested due to high truck traffic	There are multiple access points in this 1/4 mile section. Review previous plan or study data to determine potential alternatives.	MnDOT does not have a project identified in this section of US 75 in its 10-year CHIP. MnDOT will continue to monitor the situation and work with stakeholders to address concerns.
D7	USTH 2	Intersection with high crash density	Review the larger area between bypass junction and the US 75 junction for freight challenges.	MnDOT has a US 2 resurfacing project in this vicinity planned in 2030 of its 10-year CHIP. MnDOT will continue to monitor the situation and work with stakeholders to address concerns.
D15	Anne St NW	Intersection with high crash density	The intersection is planned for reconstruction in FY 2022. Alternatives include a roundabout at the US 71/Anne St. intersection. Review current alternatives for additional freight considerations.	MnDOT has a US 71 project from the MN 197 intersection to approximately Town Hall Road in 2022. Safety improvement alternatives include freight considerations in the design.
A1	MN 87 to RP 47	Curves/Shoulders	Curves just east of Hubbard have been noted as a freight challenge. Analyze the area for potential improvement.	MnDOT has a MN 87 project east of Hubbard planned in 2024 in its 10-year CHIP. Improvement alternatives will include freight improvement considerations in the design.
A2	MN 11 to RP 75	Curves	MnDOT has a planned construction project in adjacent to the Roseau Airport in FY 2025. Review alternatives for additional freight considerations.	MnDOT has a MN 11 project east of Roseau planned in 2025 in its 10-year CHIP. Improvement alternatives include realigning the curves adjacent to the airport and will consider other freight improvement considerations in the design.
A3	US 71 to RP 264	Truck Route Access	Intersection has been noted as a freight challenge. Analyze the area for potential improvement.	MnDOT has a US 71 project north of Park Rapids planned in 2029 in its 10-year CHIP. This location is approximately 200 ft. west of the US 71 junction at Hubbard CR 48/28. MnDOT will continue to monitor the situation and work with Hubbard County on potential solutions to resolve concerns.
A4	US 59 to RP 356	Shoulder Width	Wider shoulders have been noted as a need in this area. Analyze widen shoulder for freight benefit.	MnDOT has a US 59 project from Brooks to Thief River Falls planned in 2023 in its 10-year CHIP. Improvement alternatives will include freight improvement considerations in the design.
A5	MN 371 to RP 91	Truck Bypass Suggested	Truck movement through Walker has been noted as a freight challenge. Analyze the area for potential freight improvement.	MnDOT has a MN 371 project and a MN 34 project in Walker planned in 2027 and 2026 respectfully. MnDOT will work with stakeholders to discuss improvements and develop alternatives related to the planned state highway work.

Policies, Programs, and Partnerships

The 2018 Statewide Freight System and Investment Plan (SFSP) identified five specific goals designed to guide MnDOT’s efforts to support freight mobility.

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

To ensure the District 2 Freight Plan’s recommended policies, programs and partnerships align with the current SFSP, the recommendations were structured by SFSP goal. The recommendations address issues identified by the SWOT analysis and stakeholders, and are focused on initiatives MnDOT and/or their partners could undertake to improve freight mobility.

SFSP Goal 1: Support Minnesota’s Economy

The ability of businesses and industries in Minnesota to compete in the marketplace relies in part on an efficient freight transportation system that effectively moves goods and raw materials. The freight system that these businesses depend on is multimodal, transports products not only within Minnesota but also throughout the U.S., and provides connections to trading partners throughout the world. Minnesota’s freight system needs to respond and adjust to changing state, U.S., and world economic conditions.

Table 6: Policies, Programs and Partnerships to Support Minnesota’s Economy

Type	Description
Policies	<ul style="list-style-type: none"> • Use sustained/long-term investments to improve timeliness of travel to the Twin Cities
Programs	<ul style="list-style-type: none"> • Advocate for programs to fund air cargo improvements that support rural economies • Continue work to maintain relationships from the Manufacturers’ Perspective Study and the District Freight Plan efforts
Partnerships	<ul style="list-style-type: none"> • The State of Minnesota could work with U.S. Customs and Border Protection to address the implications of focused freight crossings into Canada via Pembina, ND, creating a circuitous truck route to the Winnipeg market. This could include remote border crossings. • Continued partnership between the Grand Forks - East Grand Forks MPO and MnDOT to address urban freight challenges • Build upon success of Manufacturers Study.

SFSP Goal 2: Improve Minnesota’s Mobility

Freight system mobility can be described in several ways. Delay, slow travel speeds, and congestion are ways to measure mobility, and each translates into a freight transportation system that may have limited maneuverability, be unreliable, have chokepoints, and not provide a competitive advantage to industry. A freight system that has limited mobility may be unattractive for industries, especially where “just-in-time” delivery is critical. Minnesota’s freight system needs to offer access for all freight users and reliable service with minimal chokepoints.

Table 7: Policies, Programs and Partnerships to Improve Minnesota’s Mobility

Type	Description
Policies	<ul style="list-style-type: none"> • Initial planning efforts to identify additional north/south cross-district routes • Work with the Grand Forks - East Grand Forks MPO and NDDOT to address urban freight challenges address Grand Fork rail crossing delays that extend into Minnesota
Programs	<ul style="list-style-type: none"> • Develop “three lane” corridors in heavy agricultural areas and key interregional corridors • Long term investment/development of new Red River crossings (in coordination with MPO) • Work with the Grand Forks - East Grand Forks MPO to continue development of key freight projects in their area like the US 2 and MN 220 corridors.
Partnerships	<ul style="list-style-type: none"> • Partner with the private sector and local airports to pursue funding for larger hangers and extended runways • Work with the railroads to ensure connectivity to multimodal connectivity points • Multi-state Oversized/Overweight Harmonization (including Canada) • Assistance to county governments with freight planning • Work/Partner with the Grand Forks - East Grand Forks MPO to address freight planning needs in their area.

SFSP Goal 3: Preserve Minnesota’s Infrastructure

In 2012, one billion tons of freight moved over Minnesota’s transportation system, and by 2040 that volume is expected to rise to 1.8 billion tons – an increase of 80 percent overall. In 2012, trucks carried 63 percent of all freight tonnage, while rail (carload and intermodal) carried about 25 percent. This growth in freight transportation will stress Minnesota’s transportation infrastructure. Strategic improvements in multimodal freight system infrastructure to ensure critical segments and connections are both available and in a state of good repair are essential for Minnesota to meet expected demand.

Table 8: Programs, Policies and Partnerships to Preserve Minnesota’s Infrastructure

Type	Description
Policies	<ul style="list-style-type: none">• Improved signage – both directional and dynamic messaging signs
Programs	<ul style="list-style-type: none">• Short line railroad tax credit aimed to incentivize maintenance and rehabilitation on rail used for agricultural rail shuttles• Program to help counties address weight restricted key agricultural corridors.
Partnerships	<ul style="list-style-type: none">• Work with the airports to advocate for air cargo project funding at state legislature

SFSP Goal 4: Safeguard Minnesotans

Safety is a high priority for both public and private organizations involved in freight transportation. In Minnesota, a multifaceted approach to enhance safety has resulted in a historic trend of decreasing fatalities for both passenger and commercial vehicles. However, there are increased safety concerns in some Minnesota communities due to increased transport of hazardous materials, in particular crude oil from the Bakken region of North Dakota transported by rail. Minnesota needs to enhance freight system safety and ensure plans are in place to protect areas where freight activity and the public interface.

Table 9: Policies, Programs and Partnerships to Safeguard Minnesotans

Type	Description
Policies	<ul style="list-style-type: none">• Improved signage near past crash locations, left hand turn lanes, bypass lanes, or two-way left turn lanes (three lane roads) which may help eliminate these risks during harvest
Programs	<ul style="list-style-type: none">• Create a shoulder widening program for key freight corridors
Partnerships	<ul style="list-style-type: none">• Partner with counties to increase response times to winter weather on local roads• Identify funding opportunities to improve airport weather response

SFSP Goal 5: Protect Minnesota’s Environment and Communities

Minnesota’s residents and businesses rely on freight transportation to support their economies; however, freight facilities and services sometimes negatively impact communities and the environment. Some of these impacts relate to air quality and noise, the presence of trucks in neighborhoods, and land use conflicts. Freight may affect Minnesota’s traditionally underrepresented communities, such as racial and ethnic minorities, households without vehicles, and persons who are low-income. It is necessary to plan, design, develop, and preserve the freight system in a way that respects and complements the natural, cultural, and social context and is consistent with the principles of context sensitive solutions.

Table 10: Policies, Programs and Partnerships to Protect Minnesota’s Environment and Communities

Type	Description
Policies	<ul style="list-style-type: none"> • Develop programs that minimize the environmental impacts of freight, specifically: pollution, greenhouse gas emissions, stormwater impacts and wildlife habitat loss • Apply context sensitive, truck design guidelines on roads with significant volumes or deliveries • Analyze the impact of freight on environmental justice populations
Programs	<ul style="list-style-type: none"> • Last mile connectivity to air cargo facilities • Future “main street” redesign projects that integrate freight
Partnerships	<ul style="list-style-type: none"> • Working with private sector partners and local agencies, study and address urban delivery issues in downtowns. • Partnerships with local delivery companies to address curb space/parking issues • Work with partners to integrate freight into state, district, MPO and county safety planning efforts.

Appendix A: Previous Plans

A key component of this District Freight Plan is to capture existing relevant work undertaken by MnDOT and their partners. By doing so, the plan can build upon those past efforts and analyze already identified issues at greater depth.

The review of previous plans undertaken for this District Freight Plan identified several relevant past efforts, with the five most relevant documents summarized below. This chapter explores and synthesizes key takeaways from these documents. A complete review of all these documents is available in Working Paper 1.

Table 11: Relevant Documents Reviewed

Geographical Focus	Document Titles
National/Statewide	Statewide Freight System & Investment Plan
National/Statewide	State Rail Plan
National/Statewide	Statewide Truck Parking Study
National/Statewide	Minnesota TS&W Project
National/Statewide	Minnesota State Highway Investment Plan
National/Statewide	Freight Rail Economic Development Study
National/Statewide	Rail Grade Crossing Safety Project Selection
National/Statewide	FHWA Cross-Border Scenario Planning Report
Regional	Develop Minnesota 2016
Regional	Greater Minnesota Mobility Study Final Report & Scoring Sheets
Regional	Great Northern Corridor (x6)
Regional	Western Minnesota Regional Freight Study
Regional	Northern Minnesota / Northwestern Wisconsin Regional Freight Plan
District	D2 - Manufacturers' Perspectives on Minnesota's Transportation System
District	D2 Capital Highway Investment Plan
District	Grand Forks - East Grand Forks MPO 2045 LRTP & 2019 TIP
District	Headwaters Region 2016 Comprehensive Economic Development Strategy
District	Headwaters Region 2016 Comprehensive Economic Development Strategy
District	Northwest MN 2016 Comprehensive Economic Development Strategy
District	Local Community Improvement Plans

Appendix B: Project Advisory Committee

Table 12: Project Advisory Committee List

Name	Organization
David Paulson	Artic Cat
Billy Bushelle	Bagley Livestock Exchange
Bruce Hasbargen	Beltrami County
Kristine Bommersbach	Bemidji Chamber of Commerce
Gary Bergstrom	Bergstrom Wood Products Inc
Lydia Bjorge	BNSF Railroad
Ron Kiesow	CHS Oil Seed Processing
Greg Lyngen	CHS Prairie Lakes
Mark Borseth	City of Thief River Falls
Jim Krierger	CP Railroad
Dan Bernhardson	Crystal Sugar
Chris Lauer	Digi-Key
DeAnna Alby	Digi-Key
Mark Schmitke	Digi-Key
Peter Tollefson	Eickhof Columbaria
Ron Kobes	Erskine Attachments
Jairo (hi-row) Viafara	Grand Forks - East Grand Forks MPO
Earl Haugen	Grand Forks - East Grand Forks MPO
Dave Hengel	Greater Bemidji
Bryan McCoy	HRDC
Emily Tribby	HRDC
Ronald Dvorak	Lake Superior Warehousing
Daniel Johnson	Lamb Weston RDO
Steve Larson	Log Homes Minnesota Inc
Lon Aune	Marshall County
Dan Lykken	Marvin Windows and Doors
Mike Scheef	Marvin Windows and Doors
Jamie Reese	Mattracks (Litefoot Division)
Karla Holm	Minnesota Dehydrated Veg Inc
Jason Bierwerth	Minnesota Northern Railroad
Michael Bachmeier	Northern Plains Railroad & Northern Plains Rail Services
Sean Ranum	NWRDC
Troy Schroeder	NWRDC
Arnie Paradis	Paradis Trucking
Jesse Barthel	Polaris
Pete Aube	Potlatch
David Dahl	TEAM Industries
Hal Halliday	US 2 Manufacturer's Association

Appendix C: Pure Project Ranks

Table 13: Identified Freight Needs

Issue ID	Source	Roadway	Category	Details
D1	MnDOT 10-Year Crash Data	Washington Ave SW	Safety	Intersection with high crash density
D2	MnDOT 10-Year Crash Data	MNTH 34	Safety	Intersection with high crash density
D3	MnDOT 10-Year Crash Data	3rd St NW	Safety	Intersection with high crash density
D4	MnDOT 10-Year Crash Data	MNTH 32	Safety	Intersection with high crash density
D5	MnDOT 10-Year Crash Data	E Main St	Safety	Intersection with high crash density
D6	MnDOT 10-Year Crash Data	USTH 2	Safety	Intersection with high crash density
D7	MnDOT 10-Year Crash Data	USTH 2	Safety	Intersection with high crash density
D8	MnDOT 10-Year Crash Data	Vance Ave	Safety	Intersection with high crash density
D9	MnDOT 10-Year Crash Data	MNTH 1	Safety	Intersection with high crash density
D10	MnDOT 10-Year Crash Data	Main Ave	Safety	Intersection with high crash density
D11	MnDOT 10-Year Crash Data	Demers Ave	Safety	Intersection with high crash density
D12	MnDOT 10-Year Crash Data	Robert St	Safety	Intersection with high crash density
D13	MnDOT 10-Year Crash Data	USTH 2	Safety	Intersection with high crash density
D14	MnDOT 10-Year Crash Data	W 6th St	Safety	Intersection with high crash density
D15	MnDOT 10-Year Crash Data	Anne St NW	Safety	Intersection with high crash density
D16	MnDOT 10-Year Crash Data	Demers Ave	Safety	Intersection with high crash density
D17	MnDOT 10-Year Crash Data	Central Ave	Safety	Intersection with high crash density
D18	FRA Accident/Incident Data	USTH 2B	Safety	Multiple grade crossing crashes in past 5 years
D19	FRA Accident/Incident Data	Clearline Rd NW	Safety	Multiple grade crossing crashes in past 5 years
D20	MnDOT Rail Grade Crossing Safety Project Selection	690th Ave	Safety	Risk Rating > 7
D21	MnDOT Rail Grade Crossing Safety Project Selection	350th Ave SE	Safety	Risk Rating > 7
D22	MnDOT Rail Grade Crossing Safety Project Selection	350th St SE	Safety	Risk Rating > 7
D23	MnDOT Rail Grade Crossing Safety Project Selection	130th St NE	Safety	Risk Rating > 7
D24	MnDOT Rail Grade Crossing Safety Project Selection	230th St NE	Safety	Risk Rating > 7
D25	MnDOT Rail Grade Crossing Safety Project Selection	290th St NW	Safety	Risk Rating > 7
D26	MnDOT Rail Grade Crossing Safety Project Selection	390th St NW	Safety	Risk Rating > 7
D27	MnDOT Rail Grade Crossing Safety Project Selection	Lincoln St	Safety	Risk Rating > 7
D28	MnDOT Rail Grade Crossing Safety Project Selection	Marshall St	Safety	Risk Rating > 7
D29	MnDOT Rail Grade Crossing Safety Project Selection	Cleveland Ave	Safety	Risk Rating > 7
D30	MnDOT Rail Grade Crossing Safety Project Selection	Hill St	Safety	Risk Rating > 7
D31	MnDOT Bridge Inventory Data	160th Ave	Mobility	Posted weight limit <= 15 tons
D32	MnDOT Bridge Inventory Data	CR-106	Mobility	Posted weight limit <= 15 tons
D33	MnDOT Bridge Inventory Data	T-26	Mobility	Posted weight limit <= 15 tons
D34	MnDOT Bridge Inventory Data	T-26	Mobility	Posted weight limit <= 15 tons
D36	MnDOT Bridge Inventory Data	205th Ave	Mobility	Posted weight limit <= 15 tons
D37	MnDOT Bridge Inventory Data	160th St	Mobility	Posted weight limit <= 15 tons
D38	MnDOT Bridge Inventory Data	420th Ave	Mobility	Posted weight limit <= 15 tons
D39	MnDOT Bridge Inventory Data	460th Ave NW	Mobility	Posted weight limit <= 15 tons

Issue ID	Source	Roadway	Category	Details
D40	MnDOT Bridge Inventory Data	310th St	Mobility	Posted weight limit <= 15 tons
D41	MnDOT Bridge Inventory Data	440th St SE	Mobility	Posted weight limit <= 15 tons
D42	MnDOT Bridge Inventory Data	440th St SE	Mobility	Bridge clearance < 14.5'
D43	MnDOT Bridge Inventory Data	400th Ave SE	Mobility	Bridge clearance < 14.5'
D45	MnDOT Bridge Inventory Data	149th Ave	Condition	One or more bridge ratings < 5
D46	MnDOT Bridge Inventory Data		Condition	One or more bridge ratings < 5
D47	MnDOT Bridge Inventory Data	CSAH 16	Condition	One or more bridge ratings < 5
D48	MnDOT Bridge Inventory Data	CSAH 40	Condition	One or more bridge ratings < 5
D49	MnDOT Bridge Inventory Data	CSAH 13	Condition	One or more bridge ratings < 5
D50	MnDOT Bridge Inventory Data		Condition	One or more bridge ratings < 5
D51	MnDOT Bridge Inventory Data	320th St NW	Condition	One or more bridge ratings < 5
D54	MnDOT Bridge Inventory Data	CSAH 13	Condition	One or more bridge ratings < 5
D55	MnDOT Bridge Inventory Data	440th St SW	Condition	One or more bridge ratings < 5
D56	MnDOT Bridge Inventory Data	Kt Rd SW	Condition	One or more bridge ratings < 5
D57	MnDOT Bridge Inventory Data	320th Ave SW	Condition	One or more bridge ratings < 5
D58	MnDOT Bridge Inventory Data	385th St SW	Condition	One or more bridge ratings < 5
D59	MnDOT Bridge Inventory Data	Wild Rice Rd SW	Condition	One or more bridge ratings < 5
D60	MnDOT Bridge Inventory Data	440th St SE	Condition	One or more bridge ratings < 5
D61	MnDOT Bridge Inventory Data	440th St SW	Condition	One or more bridge ratings < 5
D62	MnDOT Bridge Inventory Data	Island View Dr NW	Condition	One or more bridge ratings < 5
D63	MnDOT Bridge Inventory Data	310th Ave NE	Condition	One or more bridge ratings < 5
D64	MnDOT Bridge Inventory Data	School Forest Rd SW	Condition	One or more bridge ratings < 5
D65	MnDOT Bridge Inventory Data	140th St SW	Condition	One or more bridge ratings < 5
D67	MnDOT Bridge Inventory Data		Condition	One or more bridge ratings < 5
D68	MnDOT Bridge Inventory Data	350th Ave	Condition	One or more bridge ratings < 5
D69	MnDOT Bridge Inventory Data	160th Ave	Condition	One or more bridge ratings < 5
D70	MnDOT Bridge Inventory Data	220th St	Condition	One or more bridge ratings < 5
D71	MnDOT Bridge Inventory Data	T-244	Condition	One or more bridge ratings < 5
D72	MnDOT Bridge Inventory Data	310th Ave SE	Condition	One or more bridge ratings < 5
D73	MnDOT Bridge Inventory Data		Condition	One or more bridge ratings < 5
D75	MnDOT Bridge Inventory Data	290th Ave SW	Condition	One or more bridge ratings < 5
D76	MnDOT Bridge Inventory Data	265th Ave SW	Condition	One or more bridge ratings < 5
D80	MnDOT Bridge Inventory Data		Condition	One or more bridge ratings < 5
D81	MnDOT 10-Year Crash Data	W 1st St	Safety	Segment with high crash density
D82	MnDOT 10-Year Crash Data	USTH 2	Safety	Segment with high crash density
D83	MnDOT 10-Year Crash Data	Demers Ave	Safety	Segment with high crash density
D84	MnDOT 10-Year Crash Data	USTH 2	Safety	Segment with high crash density
D85	MnDOT 10-Year Crash Data	N Broadway	Safety	Segment with high crash density
D86	MnDOT 10-Year Crash Data	Gateway Dr NW	Safety	Segment with high crash density
D87	MnDOT 10-Year Crash Data	USTH 2	Safety	Segment with high crash density
D88	MnDOT 10-Year Crash Data	Washington Ave SW	Safety	Segment with high crash density
D89	MnDOT 10-Year Crash Data	USTH 71	Safety	Segment with high crash density

Issue ID	Source	Roadway	Category	Details
D90	MnDOT 10-Year Crash Data	USTH 2	Safety	Segment with high crash density
D91	MnDOT 10-Year Crash Data	MNTH 11	Safety	Segment with high crash density
D92	MnDOT 10-Year Crash Data	Marie Ave	Safety	Segment with high crash density
D93	MnDOT 10-Year Crash Data	1st St W	Safety	Segment with high crash density
D94	MnDOT 10-Year Crash Data	Main Ave	Safety	Segment with high crash density
D95	MnDOT 10-Year Crash Data	MNTH 87	Safety	Segment with high crash density
D96	MnDOT 10-Year Crash Data		Safety	Segment with high crash density
D97	MnDOT 10-Year Crash Data	Washington Ave SW	Safety	Segment with high crash density
D98	MnDOT 10-Year Crash Data		Safety	Segment with high crash density
D99	MnDOT 10-Year Crash Data		Safety	Segment with high crash density
D100	StreetLight Data Analysis		Mobility	Segment with TTRI > 8
D101	StreetLight Data Analysis	USTH 71	Mobility	Segment with TTRI > 8
D102	StreetLight Data Analysis		Mobility	Segment with TTRI > 8
D104	StreetLight Data Analysis		Mobility	Segment with TTRI > 8
D105	StreetLight Data Analysis		Mobility	Segment with TTRI > 8
D106	StreetLight Data Analysis	USTH 75	Mobility	Segment with TTRI > 8
D107	StreetLight Data Analysis	S Atlantic Ave	Mobility	Segment with TTRI > 8
D108	StreetLight Data Analysis	N Atlantic Ave	Mobility	Segment with TTRI > 8
D109	StreetLight Data Analysis	USTH 75	Mobility	Segment with TTRI > 8
D110	StreetLight Data Analysis	USTH 75	Mobility	Segment with TTRI > 8
D111	StreetLight Data Analysis	MNTH 171	Mobility	Segment with TTRI > 8
D112	StreetLight Data Analysis	USTH 75	Mobility	Segment with TTRI > 8
D35, D66	MnDOT Bridge Inventory Data	120th St	Mobility	Posted weight limit <= 15 tons, One or more bridge ratings < 5
S1	Previous Plans/Studies	Main Ave	Mobility	Trucks have difficulty with signal, turn onto city streets to avoid movmeent (NB to EB and WB to SB movements)
S2	Previous Plans/Studies	USTH 75	Mobility	Bypass lane requested due to heavy truck traffic.
S3	Previous Plans/Studies	220th St NW	Mobility	Turn lane requested onto 220th St from TH 1 WB.
S4	Previous Plans/Studies	USTH 2	Safety	Unsafe signal, reports of WB trucks not seeing signal in time to stop and running light.
S5	Previous Plans/Studies	3rd St W	Safety	Bypass lane requested on US 1. Many vehicle pass on shoulder to pass left-turning vehicles.
S6	Previous Plans/Studies	Center St W	Safety	Signalized intersection requested to improve safety.
S7	Previous Plans/Studies	Bemidji Ave N	Safety	Request for bypass lane at business entrance.
S8	Previous Plans/Studies	Pennington Ave S	Safety	Small radius of roundabout causes some issues for truck movements, particularly in icy winter conditions.
S9	Previous Plans/Studies	260th St SW	Mobility	Bypass lane requested.
S10	Previous Plans/Studies	MNTH 32	Safety	Unsafe access/intersection due to slow vehicles pulling onto TH 32.
S11	Stakeholder Interviews	Bemidji Airport	Condition	Request for new airport maintenance facility.
S12	Stakeholder Interviews	TRF Airport	Mobility	Request for runway extention to allow for larger aiplanes.
S13	Stakeholder Interviews	210th St	Safety	Request for designated turn lane.
S14	Previous Plans/Studies	MNTH 89	Mobility	Request for 10-ton road to allow deliveries in the spring
S15	Previous Plans/Studies	MNTH 32	Condition	Rough road conditions due to frost heaving damage goods.
S16	Previous Plans/Studies	MNTH 200	Condition	Many bumps and dips in roadway and generally rough surface can damage goods. Also some rough/bumpy bridges.
S17	Previous Plans/Studies	MNTH 371	Mobility	Passing lanes desired to avoid conflicts with passenger vehicles.
S18	Previous Plans/Studies	MNTH 89	Safety	Sections with narrow road and steep shoulders. Two rollovers and 2 deaths in recent years.
S19	Previous Plans/Studies		Mobility	Lack of shoulder prevent some carriers from using this road.

Issue ID	Source	Roadway	Category	Details
S20	Previous Plans/Studies		Condition	Request for gravel road to be paved to improve truck/business access.
S23	Previous Plans/Studies		Condition	Roadway poor condition. Also requested to be upgraded to 10-ton road.
S24	Previous Plans/Studies	Broadway Ave	Mobility	Request for roadway widening.
S25	Online Survey	MNTH 371	Mobility	Request for upgrade to 4-lane road.
S26	Stakeholder Interviews	USTH 59	Mobility	Request for upgrade to 4-lane road.
S27	Stakeholder Interviews	USTH 59	Mobility	Request for bypass or passing lanes to address conflicts with passenger vehicles.

The following table provides the final scoring output for each identified issue based on the scoring criteria described in Section 4. The projects have been sorted according to the final adjusted total score after accounting for whether the issue was stakeholder-identified or data-identified. Individual ranks are also provided for each scoring criteria. In all cases, ranking tie-breaks are determined according to proportion of truck traffic at each issue where data is available.

Table 14: Issue Scoring and Prioritization

Issue ID	Truck Volume		Safety		Mobility		Condition		Total		Adjusted Total	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
D12	100%	1	100%	1	NA	NA	NA	NA	100%	1	100%	1
D14	90%	2	100%	2	NA	NA	NA	NA	93%	2	93%	2
D17	80%	3	100%	7	40%	59	NA	NA	75%	3	75%	3
D3	60%	9	100%	6	60%	44	NA	NA	70%	4	70%	4
S1	50%	14	20%	51	80%	22	NA	NA	50%	21	67%	5
D68	NA	NA	0%	95	100%	17	100%	3	67%	5	67%	6
S11	NA	NA	0%	95	NA	NA	NA	NA	0%	137	67%	6
S8	NA	NA	0%	95	NA	NA	NA	NA	0%	137	67%	6
S12	NA	NA	0%	95	NA	NA	NA	NA	0%	137	67%	6
S6	60%	7	0%	63	40%	57	NA	NA	40%	40	60%	10
D5	50%	13	100%	3	40%	58	NA	NA	60%	6	60%	11
D6	70%	4	100%	5	0%	90	NA	NA	60%	7	60%	12
S4	70%	5	20%	54	0%	92	NA	NA	40%	41	60%	13
D11	40%	24	100%	12	NA	NA	NA	NA	60%	8	60%	14
S14	NA	NA	0%	64	100%	1	NA	NA	33%	65	60%	15
D40	NA	NA	0%	95	80%	33	100%	3	60%	11	60%	16
D33	NA	NA	0%	95	80%	33	100%	3	60%	11	60%	16
S3	60%	6	20%	50	0%	87	NA	NA	35%	60	57%	18
S2	50%	10	0%	60	40%	55	NA	NA	35%	61	57%	19
S13	50%	11	0%	61	40%	56	NA	NA	35%	62	57%	20
S5	40%	21	20%	53	40%	60	NA	NA	35%	63	57%	21
D7	60%	8	100%	4	0%	89	NA	NA	55%	13	55%	22
D9	40%	21	100%	9	40%	60	NA	NA	55%	14	55%	23
D10	40%	23	100%	10	40%	62	NA	NA	55%	15	55%	24
S9	NA	NA	20%	57	0%	97	NA	NA	10%	117	55%	25
S7	NA	NA	0%	95	20%	79	NA	NA	10%	117	55%	25
D16	30%	27	100%	14	NA	NA	NA	NA	53%	16	53%	27
D100	NA	NA	30%	48	100%	1	NA	NA	53%	17	53%	28
D97	NA	NA	50%	18	60%	45	NA	NA	53%	17	53%	28
D80	NA	NA	0%	95	100%	17	60%	10	53%	19	53%	30
D90	50%	16	50%	18	60%	45	NA	NA	52%	20	52%	31
D4	40%	19	100%	8	20%	72	NA	NA	50%	22	50%	32
D15	30%	26	100%	13	40%	63	NA	NA	50%	23	50%	33
D98	NA	NA	50%	18	NA	NA	NA	NA	50%	24	50%	34

Issue ID	Truck Volume		Safety		Mobility		Condition		Total		Adjusted Total	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
D96	NA	NA	50%	18	NA	NA	NA	NA	50%	24	50%	34
D99	NA	NA	50%	18	NA	NA	NA	NA	50%	24	50%	34
D85	50%	16	50%	18	NA	NA	NA	NA	50%	24	50%	34
S20	NA	NA	0%	64	NA	NA	NA	NA	0%	133	50%	34
D23	NA	NA	50%	37	NA	NA	NA	NA	50%	28	50%	39
D45	NA	NA	0%	95	NA	NA	100%	3	50%	28	50%	39
D69	NA	NA	0%	95	NA	NA	100%	3	50%	28	50%	39
D73	NA	NA	0%	95	NA	NA	100%	3	50%	28	50%	39
D71	NA	NA	0%	95	NA	NA	100%	3	50%	28	50%	39
D13	NA	NA	100%	16	0%	97	NA	NA	50%	28	50%	39
S26	10%	45	20%	55	80%	23	NA	NA	28%	85	49%	45
D1	50%	15	100%	11	20%	73	NA	NA	48%	34	48%	46
D86	30%	29	50%	18	80%	23	NA	NA	48%	35	48%	47
D87	40%	25	50%	18	60%	45	NA	NA	48%	35	48%	47
S10	40%	19	20%	52	0%	91	NA	NA	24%	102	46%	49
D8	40%	18	70%	17	0%	88	NA	NA	44%	37	44%	50
D89	20%	32	50%	18	80%	23	NA	NA	44%	38	44%	51
D88	30%	29	50%	18	50%	54	NA	NA	43%	39	43%	52
D2	30%	28	100%	15	0%	93	NA	NA	40%	42	40%	53
D91	20%	32	50%	18	60%	45	NA	NA	40%	43	40%	54
S24	20%	32	0%	64	40%	64	NA	NA	16%	113	40%	54
S25	20%	32	0%	64	NA	NA	NA	NA	10%	115	40%	54
S17	20%	32	0%	64	NA	NA	NA	NA	10%	115	40%	54
S23	NA	NA	0%	64	0%	94	NA	NA	0%	133	40%	54
D46	NA	NA	0%	95	60%	49	60%	10	40%	46	40%	59
D76	NA	NA	0%	95	60%	49	60%	10	40%	46	40%	59
D67	NA	NA	0%	95	100%	17	20%	19	40%	46	40%	59
D21	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
D22	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
D26	NA	NA	50%	37	20%	79	NA	NA	40%	46	40%	59
D43	NA	NA	0%	95	100%	17	20%	19	40%	46	40%	59
D20	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
D29	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
D30	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
D27	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
D28	NA	NA	40%	39	NA	NA	NA	NA	40%	46	40%	59
S27	20%	32	20%	55	10%	86	NA	NA	17%	112	38%	71
S15	10%	45	0%	64	40%	64	NA	NA	12%	114	37%	72
S19	10%	45	0%	64	NA	NA	NA	NA	5%	132	37%	73
D94	0%	56	50%	18	80%	23	NA	NA	36%	58	36%	74
D84	20%	32	50%	18	40%	64	NA	NA	36%	58	36%	74

Issue ID	Truck Volume		Safety		Mobility		Condition		Total		Adjusted Total	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
D81	20%	32	50%	18	NA	NA	NA	NA	35%	64	35%	76
S18	10%	45	0%	64	20%	74	NA	NA	8%	127	34%	77
D104	NA	NA	0%	64	100%	1	NA	NA	33%	65	33%	78
D102	NA	NA	0%	64	100%	1	NA	NA	33%	65	33%	78
D105	NA	NA	0%	64	100%	1	NA	NA	33%	65	33%	78
D95	NA	NA	50%	18	0%	94	NA	NA	33%	65	33%	78
D35, D66	NA	NA	0%	95	80%	33	20%	19	33%	75	33%	82
D31	NA	NA	0%	95	80%	33	20%	19	33%	75	33%	82
D24	NA	NA	40%	39	20%	79	NA	NA	33%	75	33%	82
D25	NA	NA	40%	39	20%	79	NA	NA	33%	75	33%	82
D41	NA	NA	0%	95	80%	33	20%	19	33%	75	33%	82
D42	NA	NA	0%	95	100%	17	0%	43	33%	75	33%	82
D34	NA	NA	0%	95	80%	33	20%	19	33%	75	33%	82
D93	20%	32	50%	18	20%	74	NA	NA	32%	82	32%	89
D83	30%	29	50%	18	0%	94	NA	NA	32%	82	32%	89
D82	20%	32	50%	18	20%	74	NA	NA	32%	82	32%	89
D92	10%	45	50%	18	20%	74	NA	NA	28%	85	28%	92
D107	20%	32	0%	64	100%	1	NA	NA	28%	85	28%	92
D101	20%	32	0%	64	100%	1	NA	NA	28%	85	28%	92
D110	20%	32	0%	64	100%	1	NA	NA	28%	85	28%	92
D109	10%	45	10%	59	100%	1	NA	NA	28%	85	28%	92
D37	NA	NA	0%	95	80%	33	0%	43	27%	91	27%	97
D36	NA	NA	0%	95	80%	33	0%	43	27%	91	27%	97
D72	NA	NA	0%	95	60%	49	20%	19	27%	91	27%	97
D38	NA	NA	0%	95	80%	33	0%	43	27%	91	27%	97
D39	NA	NA	0%	95	80%	33	0%	43	27%	91	27%	97
D32	NA	NA	0%	95	80%	33	0%	43	27%	91	27%	97
D54	NA	NA	0%	95	60%	49	20%	19	27%	91	27%	97
D59	NA	NA	0%	95	60%	49	20%	19	27%	91	27%	97
D50	50%	12	0%	62	NA	NA	0%	42	25%	99	25%	105
D60	NA	NA	0%	95	40%	67	20%	19	25%	100	25%	106
D61	NA	NA	0%	95	40%	67	20%	19	25%	100	25%	106
D111	10%	45	0%	64	100%	1	NA	NA	24%	103	24%	108
D108	10%	45	0%	64	100%	1	NA	NA	24%	103	24%	108
D106	10%	45	0%	64	100%	1	NA	NA	24%	103	24%	108
D112	10%	45	0%	64	100%	1	NA	NA	24%	103	24%	108
D57	NA	NA	0%	95	40%	67	20%	19	20%	107	20%	112
D19	NA	NA	30%	49	0%	97	NA	NA	20%	107	20%	112
D18	NA	NA	20%	57	20%	79	NA	NA	20%	107	20%	112
D65	NA	NA	0%	95	NA	NA	20%	19	10%	117	10%	115
D70	NA	NA	0%	95	NA	NA	20%	19	10%	117	10%	115

Issue ID	Truck Volume		Safety		Mobility		Condition		Total		Adjusted Total	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
D75	NA	NA	0%	95	NA	NA	20%	19	10%	117	10%	115
D51	NA	NA	0%	95	NA	NA	20%	19	10%	117	10%	115
D64	NA	NA	0%	95	NA	NA	20%	19	10%	117	10%	115
D58	NA	NA	0%	95	20%	79	0%	43	7%	129	7%	120
D55	NA	NA	0%	95	20%	79	0%	43	7%	129	7%	120
D56	NA	NA	0%	95	0%	97	20%	19	7%	129	7%	120