CAMBRIDGE SYSTEMATICS

Minnesota Statewide Freight System Plan

Task 4.3 - Minnesota's Principal Freight Network

draft

report

prepared for

Minnesota Department of Transportation

prepared by

Cambridge Systematics, Inc.

with

SRF Consulting Group, Inc.
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May 2015

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report

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date

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1.0 Introduction

The topic of Minnesota's Principal Freight Network (PFN) was explored as part of *Task 4 – Project Development Guidance* of the Statewide Freight System Plan (Plan). The objective of Task 4 was to assess the condition and performance of Minnesota's freight transportation system and to identify the most important needs, issues and opportunities of that system. Minnesota's Principal Freight Network is critical to accomplishing this task, as the focus of Minnesota's freight system needs will be related to those segments and facilities that are most heavily used (i.e., principal facilities).

The process of identifying Minnesota's PFN employed an Ad Hoc Working Group comprised of freight and modal experts from MnDOT and other agencies who were tasked to explore and converge on designations for highway, rail, water, air, and pipeline assets. This network will move forward into the evaluation phase of this project, and also to move into broader consideration within MnDOT's related to network applications beyond this Plan.

This Tech Memo presents the impetus for designating Minnesota's PFN and how it may be used, discusses the process for designating the PFN, identifies gaps and opportunities for MnDOT to enhance this designation of the PFN, and briefly outlines next steps for implementing the PFN.

2.0 About Minnesota's Principal Freight Network

This section focuses on the purpose and process used to designate the Minnesota Principal Freight Network (PFN). This section also presents initial thoughts on how the network could be used by MnDOT and its partners in the future.

2.1 PRINCIPAL FREIGHT NETWORK DESIGNATION PURPOSES AND PROCESS

There were several motivating factors that led MnDOT to explore developing Minnesota's Principal Freight Network:

- **MAP-21 Transportation Legislation**. The Moving Ahead for Progress in the 21st Century Act (MAP-21) legislation required the U.S. DOT to designate a highway-focused Primary Freight Network (U.S. DOT PFN) consisting of up to 27,000 miles on existing Interstates and other roadways, with a possible addition of 3,000 miles in the future. One role of the U.S. DOT PFN is to help states strategically direct resources toward improving freight movement; however, the network designated in Minnesota is not a holistic representation of the State's priority system.
- **Need to knit together MnDOT "freight" networks**. MnDOT has formally and informally designated several networks that have potential overlap with what this project will define as "Minnesota's Principal Freight Network" (PFN or MnPFN). There is the Interregional Corridor designation for freight, the Twin-Trailer Network, 10-ton network, an over-dimensional freight network under development, and others. Each of these have complementary roles and should be utilized and clarified as they relate to the Minnesota PFN.
- **Need for a multimodal system**. The U.S. DOT's PFN is centered on the highway system, the traditional focus of state transportation planning and programming. However, Minnesota's freight system is multimodal and in order for supply chains to work efficiently, each component is critical. Key modal components including the highway and rail systems, intermodal hubs, and connections to ports/airports, among others should be acknowledged in the Minnesota PFN.

The process of identifying the Minnesota PFN employed an Ad Hoc Working Group comprised of multimodal experts from MnDOT and other agencies who were tasked to explore and converge on a recommended network. Keeping the purposes noted above in mind, the group met four times and reviewed and

discussed current freight system usage, industry location information, network gaps, and other data provided by the consultant team and MnDOT. Key participants in the Freight Network Ad Hoc Working Group were "implementers" within MnDOT that will be requested to follow through and act upon Plan recommendations. Members of the group are shown in the following table.

Table 2.1 Freight Network Ad Hoc Working Group Membership

Name	Affiliation	Title
John Tompkins	MnDOT Central Office	OFCVO - Freight Project Manager
Tim Spencer	MnDOT Central Office	OFCVO – Rail & Freight Director
Dave Christianson	MnDOT Central Office	OFCVO – Rail & Freight Planner
Peter Dahlberg	MnDOT Central Office	OFCVO – Rail & Freight Planner
Patrick Phenow	MnDOT Central Office	OFCVO – Ports & Waterways
Kathleen Mayell	MnDOT Central Office	OTSM – Investment Planning
Philip Schaffner	MnDOT Central Office	OTSM – Policy Planning
Bobbi Retzaff	MnDOT Central Office	OTSM – Planning Programs
Steve Voss	MnDOT District 3	District Planner
Andy McDonald	Arrowhead Regional Development Commission (ARDC)	Transportation Planner
Steve Elmer	Metro Council	Freight & Transit Planner

2.2 POTENTIAL FREIGHT NETWORK APPLICATIONS

Stated in the previous section, MnDOT was motivated to designate a network for a variety of reasons, but in large part to better understand Minnesota's key freight assets. However, in working through the designation process, there was an intertwined discussion about the numerous other potential purposes and applications of the network. If desired, the multimodal network could be used as a tool for MnDOT planning, programming, asset management, operations, maintenance, and other applications that could lead toward better integration of freight with the DOT.

The Ad Hoc working group discussed the potential applications for the PFN, as shown in Table 2.2. Some applications, such as tracking freight system activity, may be relatively easy to implement, or align with existing policies or actions. Others, such as providing different design or accessibility standards will involve significant coordination efforts, and potential changes in the way MnDOT does business, such as changes to funding allocation.

Table 2.2 Minnesota Principal Freight Network Applications

The PFN could be used to …	Highway	Rail Lines	Waterways	Freight Facilities (Rail, Water, Air)
Track freight system activity	X	X	X	X
Monitor freight system performance	X	X	X	X
Identify and prioritize system needs	X	X	X	X
Provide different design or connectivity standards	X			X
Provide different (higher) maintenance standards	X *			
Receive priority consideration during project selection and funding	X			X
Align with dedicated freight funding source	X	X		X
Consider Complete Streets principles	X			
Support existing businesses	X	X	X	X
Provide access to intermodal facilities	X	X	X	

* The Highway portion of the network is the Enhanced NHS and it may already receive priority for maintenance.

Findings related to the Ad Hoc Working Group discussion on application also included the following:

- Although applicable to each transportation mode, the first three applications - "Track freight system activity," "Monitor freight system performance," and "Identify and prioritize system needs" – have particular relevance for surface transportation, and in particular the highway mode, which is more fully under MnDOT jurisdiction and has more funding allocation than other modes.
- Connectivity, or accessibility, was determined to be an important feature of the network. For the application to "Provide different design or accessibility standards," it is suggested that the term "connectivity" should replace the previous wording of "accessibility."
- In relation to the ability of PFN status to "Provide different (higher) maintenance standards," it was determined that many facilities are outside of MnDOT's jurisdiction, so standards cannot be applied. Under this application, individual facilities outside MnDOT jurisdiction might best be labeled "Not Applicable," even if the application is linked to the mode as a whole.

- The provision to "Receive priority consideration during project selection and funding" should distinguish between improvements to facilities themselves and projects that provide access to those facilities, as each of these might have different criteria.

Related to highway network applications the Ad Hoc Working Group further discussed applications and decided to "tier" them based on the possible effort required for implementation. The three tiers include:

1. Applications using existing resources with minimal administrative coordination (near-term);
2. Applications that require moderate administrative coordination (mid-term); and
3. Applications that require additional funding and/or significantly more administrative coordination (long-term).

A description of each of these applications is provided in Table 2.3.

Table 2.3 Potential Applications for Minnesota's PFN (Highway)

Tier	Application	Description
Tier 1	Track Freight System Activity	A significant amount of data regarding the movement of freight is already being collected and monitored by MnDOT and the Federal Highway Administration (FHWA). No additional administrative coordination will be required to incorporate this data into MnDOT freight planning efforts. MnDOT currently collects average daily traffic volumes (ADT) on each NHS segment for total traffic as well as heavy commercial traffic. This data is supplemented with freight planning efforts and outreach. In addition, the FHWA currently produces data for freight tonnage, value, domestic ton-miles by state of origin and destination, and commodity type on the NHS.
	Monitor Freight System Performance	Data is currently being tracked related to traffic safety and congestion on the highway network. This data is readily available for use in the evaluations of freight system performance and can be readily tracked specific to the MFN.
	Receive Priority Consideration During Project Selection and Funding	MnDOT may use the MFN as one factor in the process for selecting and funding roadway projects. This will help to ensure that the MFN is maintained at a high standard. This application may require significant agency coordination in order to be implemented. It also may result in higher maintenance and operations standard as a result of this designation.
	Provide Access to Intermodal Facilities	The MFN should provide adequate access and connectivity to key intermodal facilities, including pipeline terminals. The NHS's intermodal connecter designation will allow MnDOT some flexibility in providing enhanced access to key intermodal facilities throughout the state. The addition of new intermodal connecters would require significant administrative coordination.
Tier 2	Identify and Prioritize System Needs	A system of MFN routes can be used as a prioritization tool when assessing systemwide needs in other highway/statewide investment plans; especially when considering other types of systems (i.e., super-load corridors, OSOW, etc.).

Tier	Application	Description
	Align with Dedicated Freight Funding Sources	Very few funding sources are dedicated solely to the improvement of freight infrastructure. However, the designation of the MFN will streamline the allocation of these funds when they do become available.
	Consider Complete Streets Principles	Freight on the MFN must coexist with many other users including passenger vehicles and non-motorized users. Consider how freight users on various types of roadways will impact and interact with people on bicycles and pedestrians. Consider the implementation of design standards that would improve safety for all users while maintaining a sufficient level of access.
	Support Existing Businesses	The MFN can be used as a promotional tool to attract and retain businesses, and focus development on freight routes. This would be used by both MnDOT and external stakeholders. These efforts could draw from the freight system activity and performances measures noted above.
Tier 3	Provide Different Design or Connectivity Standards	Many design criteria such as pavement thickness, passing lanes, and increased shoulder widths are desirable for roadways that experience high levels of freight activity. However, the implementation of these criteria can often be costly if additional right-of-way is required or if other site-specific characteristics make implementation difficult. The implementation of these standards on the MFN roadways would also be time-consuming as individual roadway segments may not be scheduled for reconstruction for many years.
	Provide Different (Higher) Maintenance Standards	The MFN could be prioritized with higher maintenance standards for snow-plowing and repairs (i.e., the MFN would be plowed before non-MFN roadways). This application would require additional study and agency coordination. This prioritization may be difficult to incorporate into existing MnDOT practices and protocols. This would also require increased levels of funding to meet the proposed higher maintenance standards.

The ultimate application of the network will be determined by MnDOT senior leadership.

The remainder of this Tech Memo presents the process to designate Minnesota's PFN, the designated network, and suggests next steps.

3.0 Highway Network Designation

This section focuses on the designation of the highway portion of the Minnesota Principal Freight Network (PFN). The highway system plays a critical role in the movement of freight throughout Minnesota. It provides connections between the many important regional trade centers within the state and to regional centers in adjacent states. In addition, it enables multimodal freight connectivity (i.e., with ports, terminals, manufactures, retail, wholesale distribution centers, etc.). Even though rail, water, and airports are used as transport modes for accomplishing a portion of the movement for many goods and raw materials, the use of the highway system is relied upon in the majority of these movements for the first and last mile.

3.1 Overview of Existing Highway Freight Networks in Minnesota

Minnesota has a number of individual highway networks that are related either directly or tangentially to the movement of freight. These networks vary with regard to their purpose and physical extent. The focus of each network falls within a spectrum between providing local access with lower levels of mobility to providing significant mobility but with very limited access. The Interstate system is an example of a network that is intended primarily for mobility with higher speeds and minimal access points. Networks intended for access are typically lower speed with a greater geographical coverage such as the county road and city roadway systems. Several networks critical to freight movement in Minnesota are:

- U.S. DOT Primary Freight Network (U.S. DOT PFN),
- Interregional Corridor Network (IRC) and Supplemental Freight Routes,
- Enhanced National Highway System (NHS),
- National Truck Network (NTN) and Minnesota Twin-Trailer Network (TTN),
- Minnesota 10-Ton Network, and
- Oversize/Overweight (OSOW) Route Network.

These networks are described below.

U.S. DOT Primary Freight Network

One provision of MAP-21 was the designation of a national primary freight network (U.S. DOT PFN) consisting of up to 27,000 miles of existing Interstate and other roadways, with a possible addition of 3,000 miles in the future. The designation of the U.S. DOT PFN was based on an inventory of national freight volumes conducted by the Federal Highway Administration (FHWA) in consultation with stakeholders, including system users, transport providers, and States.

The U.S. DOT PFN will become part of the larger National Freight Network (NFN), which includes all Interstate highways and select rural highway routes designated by states. The purpose of the U.S. DOT PFN and NFN is to assist States in strategically directing resources toward improved system performance for efficient movement of freight on the highway portion of the Nation's freight transportation system. However, the network designated in Minnesota is limited to 155 miles of roadway and is not a holistic representation of the State's priority freight system (i.e., with such a limited network it would not function to connect key points that are import to movement of freight in Minnesota).

The U.S. DOT PFN is illustrated in Figure 3.3.

Interregional Corridor Network and Supplemental Freight Routes

Minnesota's Interregional Corridor System (IRC) was designated in 1999 and was most recently reviewed and updated in 2011. This review did not make any significant changes to the previous IRC system, but did recommend the addition of supplemental freight routes to provide additional freight connectivity.

The IRC connects the largest regional trade centers in Minnesota with each other and with neighboring states and Canada, and functions as an essential transportation network moving freight and supporting state businesses. The goal of the IRC system is to maintain safe, timely, and efficient transportation services between regional centers. The combined IRC and Supplemental Freight Routes total 3,486 miles of roadway.

The IRC is illustrated in Figure 3.4.

Enhanced National Highway System

The National Highway System (NHS) was created by the National Highway System Designation Act of 1995, and consists of roadways important to the nation's economy, defense, and mobility. The NHS includes the Interstate system as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the U.S. DOT in cooperation with the states, local officials, and metropolitan planning organizations (MPOs).

The purpose of the NHS is to provide an interconnected system of principal arterial routes that serve major population centers, international border crossings, ports, airports, public transportation facilities and other intermodal

transportation facilities and other major travel destinations; meet national defense requirements; and serve interstate and interregional travel.

Under MAP-21, the NHS was expanded to include all principal arterial roadways, including those not included in previous iterations of the NHS. Within Minnesota, the NHS consists of 5,242 miles of interstate and principal arterial roadways. The NHS also included a number of intermodal connector roadways with the express purpose of linking the mainline NHS system to important intermodal facilities.

National Highway System Intermodal Connectors

National Highway System intermodal connectors are roads that provide access between major intermodal facilities and the NHS. Minnesota currently has 11 designated facilities served by intermodal connectors. The Port of Duluth and the Canadian Pacific Railway's (CP) Shoreham Rail Yard in Minneapolis are both served by intermodal connectors and are designated as freight intermodal facilities, shown in the following figures.

Figure 3.1 Port of Duluth Intermodal Connector

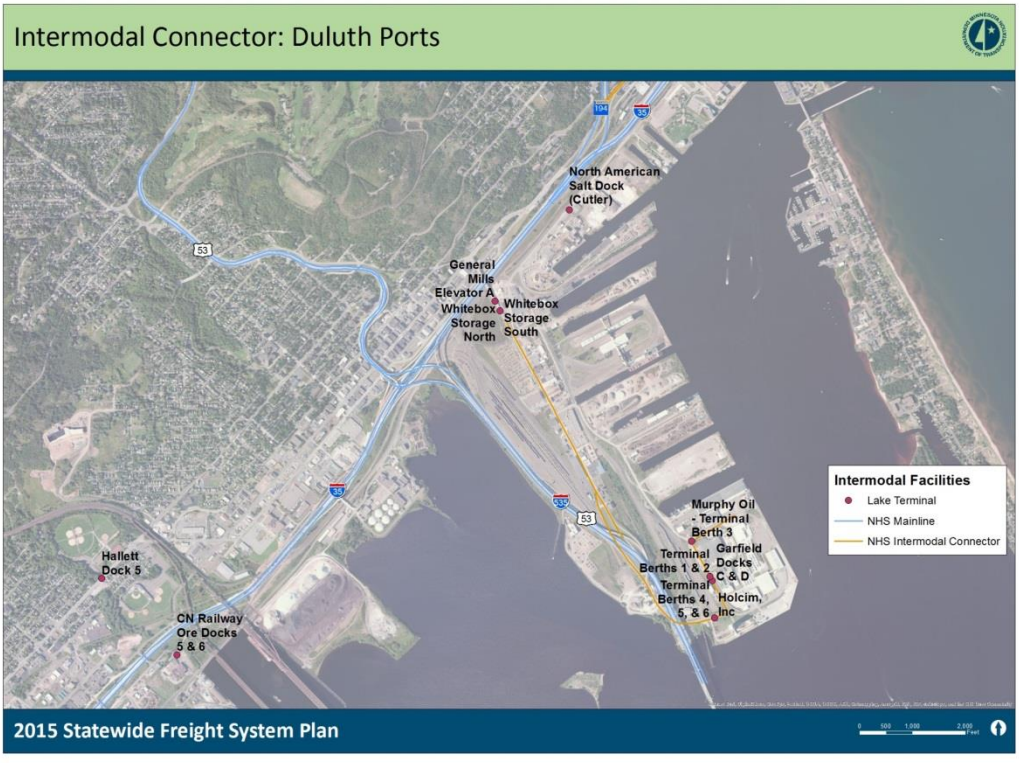
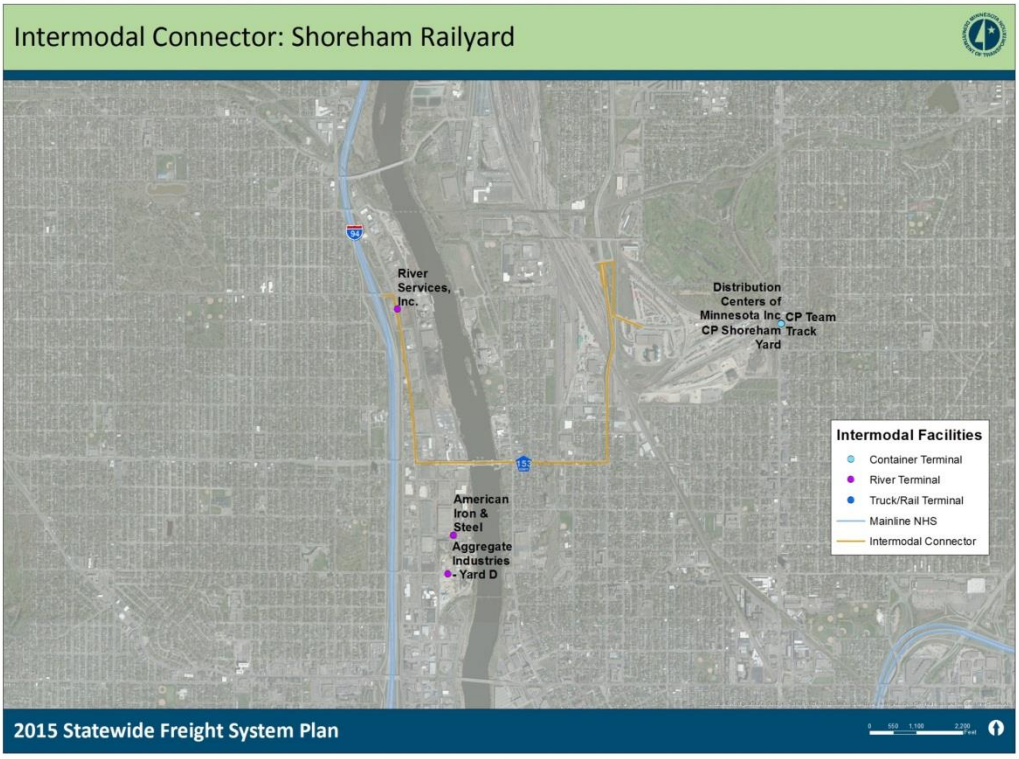


Figure 3.2 CP Shoreham Rail Yard Intermodal Connector



Nine other locations in Minnesota are designated as passenger intermodal facilities. Three of these locations are airports which serve passengers, but also provide freight service. Thus, the designated intermodal connectors do not necessarily correspond to freight routes to these facilities. These include the airports in Minneapolis-St Paul, Duluth, and Rochester.

The Enhanced NHS is illustrated in Figure 3.5.

National Truck Network and Minnesota Twin-Trailer Network

The National Truck Network was authorized by the Surface Transportation Assistance Act of 1982 and required states to allow conventional combinations (twin-trailers) on the Interstate system and other high volume roadways linking principal cities and densely developed portions of the States. The National Network has not changed significantly in the last 25 years. The purpose of the National Truck Network is to support interstate commerce by regulating the width and length of trucks on these roadways. The combined NTN and TTN networks total 6,700 miles of roadway within Minnesota.

Minnesota's Twin Trailer Network (TTN) was created to supplement the NTN. Roadways on the TTN allow for trucks with two trailers as well as trucks with single extra-long trailers.

The NTN and TTN are illustrated in Figure 3.6

Minnesota 10-Ton Network

The 10-Ton Network refers to the network of roadways in Minnesota built to a standard that can accommodate 20,000 pounds for any single axle and 10,000 pounds for any single wheel. The system will also accommodate gross vehicle weights of 80,000 pounds for any vehicle combination with five or more axles with minimum required spacing. This system includes all Interstates, U.S. Highways, and the majority of Minnesota State Trunk Highways. A number of County Trunk Highways are also built to this standard. The purpose of this network is to ensure access to freight-related destinations for heavy trucks. The 10-ton network is the largest of the freight networks included in this list with more than 20,000 miles of roadway in Minnesota.

The 10-Ton Network is illustrated in Figure 3.7

Oversize/Overweight Route Network

An oversize/overweight (OSOW) permit is required when a vehicle's overall dimensions will exceed the maximum width, height, length, or weight restrictions. MnDOT's OSOW Route Network includes roadways that are capable of handling these loads. The primary OSOW routings typically avoid areas with vertical clearance limitations (e.g., bridges). The routings also attempt to minimize exposure to high volume roadways where possible to minimize exposure to other traffic. Due to these features, there is minimal overlap between the OSOW network and the other freight networks identified in this review.

The OSOW Network is illustrated in Figure 3.8.

Figure 3.3 U.S. DOT Primary Freight Network

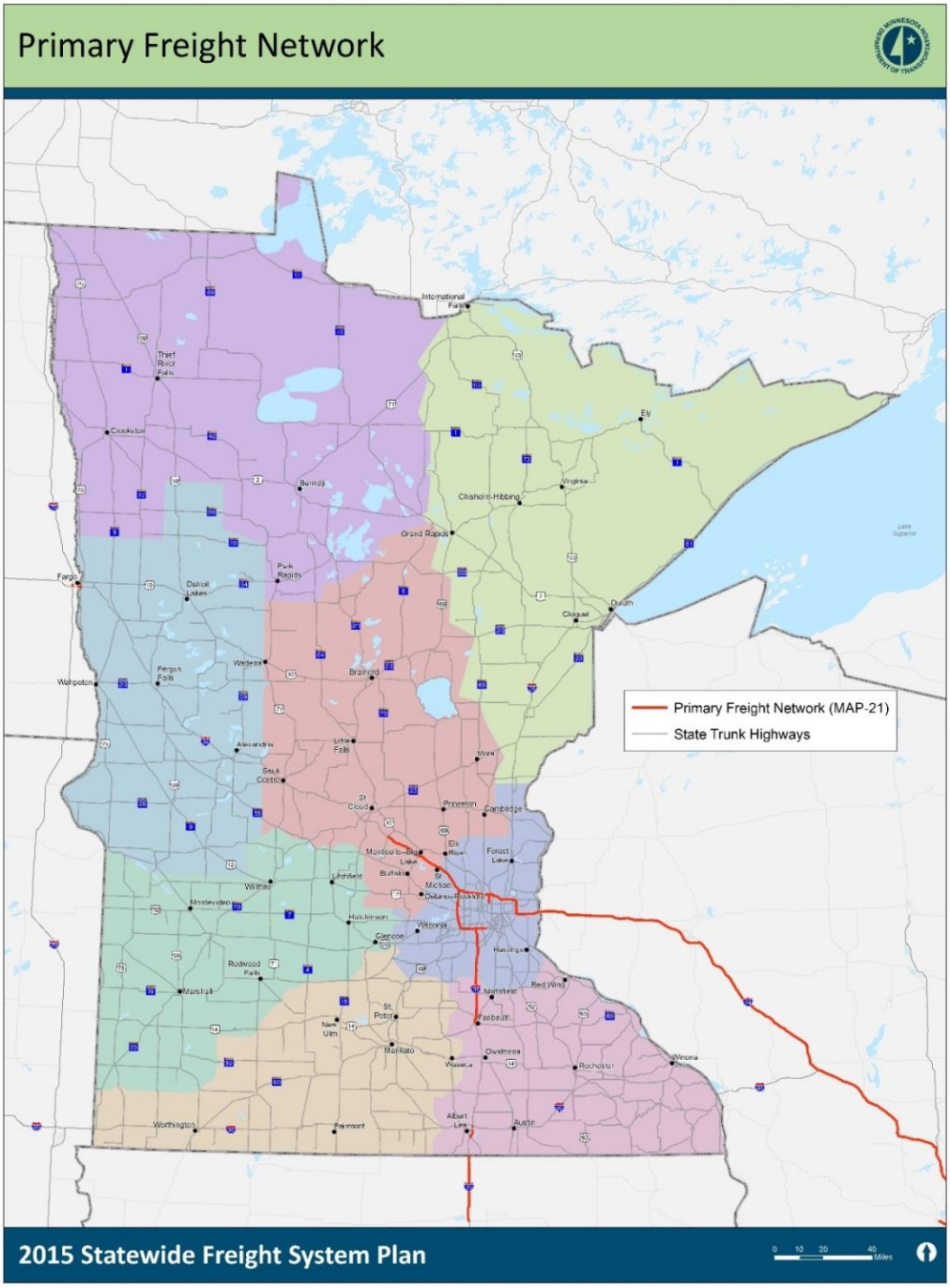


Figure 3.4 Interregional Corridor Network and Supplemental Freight Routes

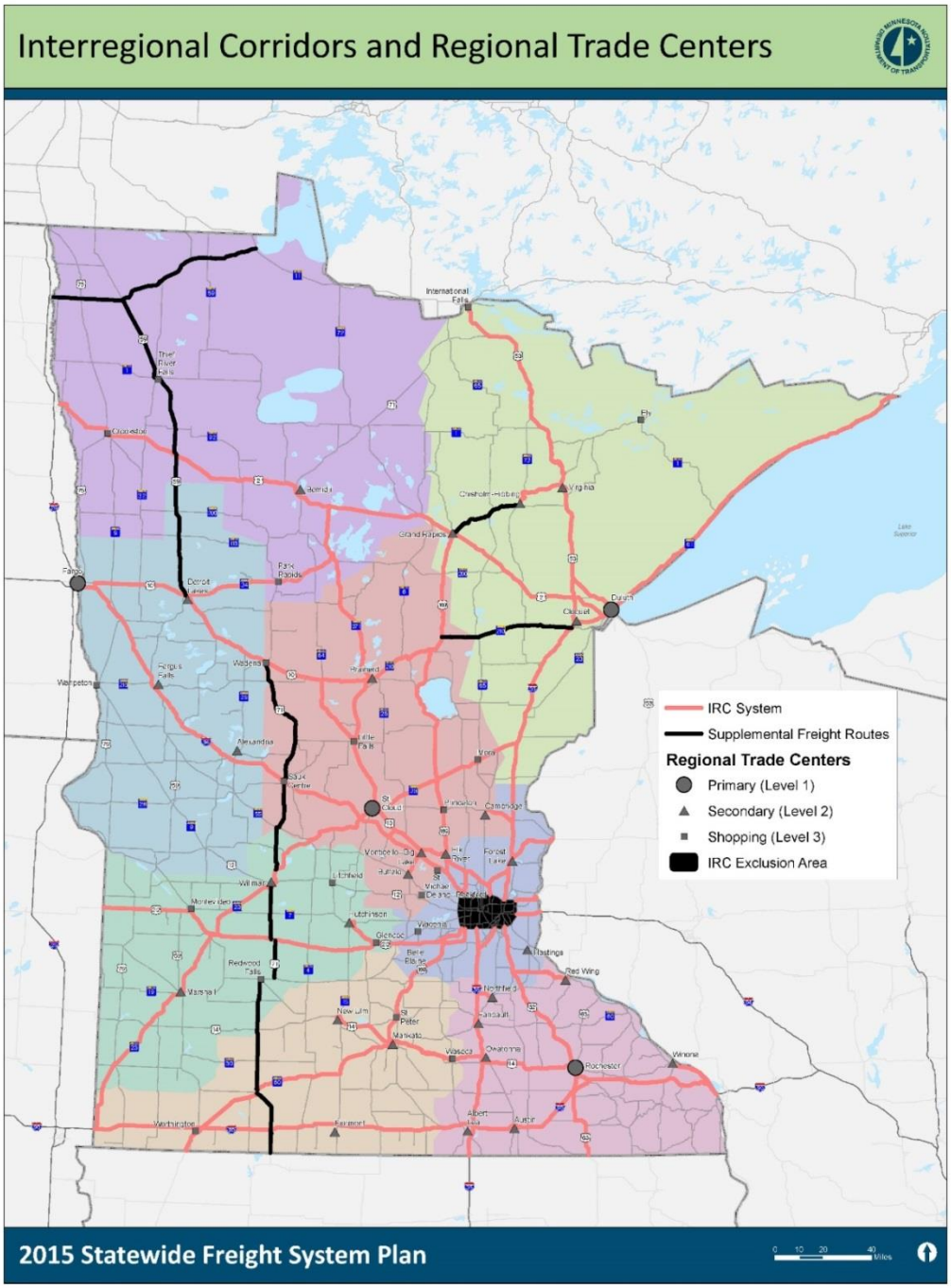


Figure 3.5 Enhanced National Highway System

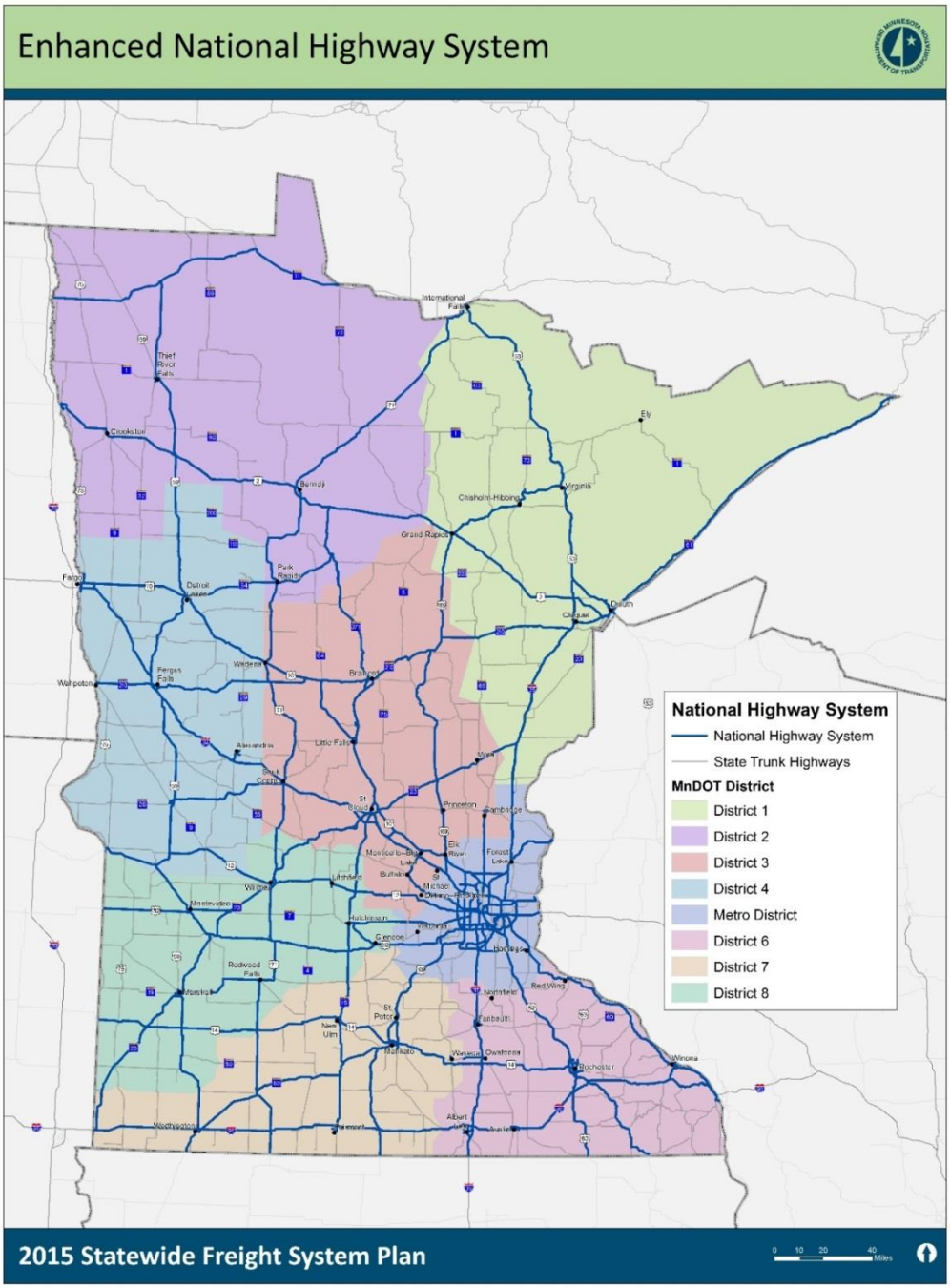


Figure 3.6 National Truck Network and Minnesota Twin-Trailer Network

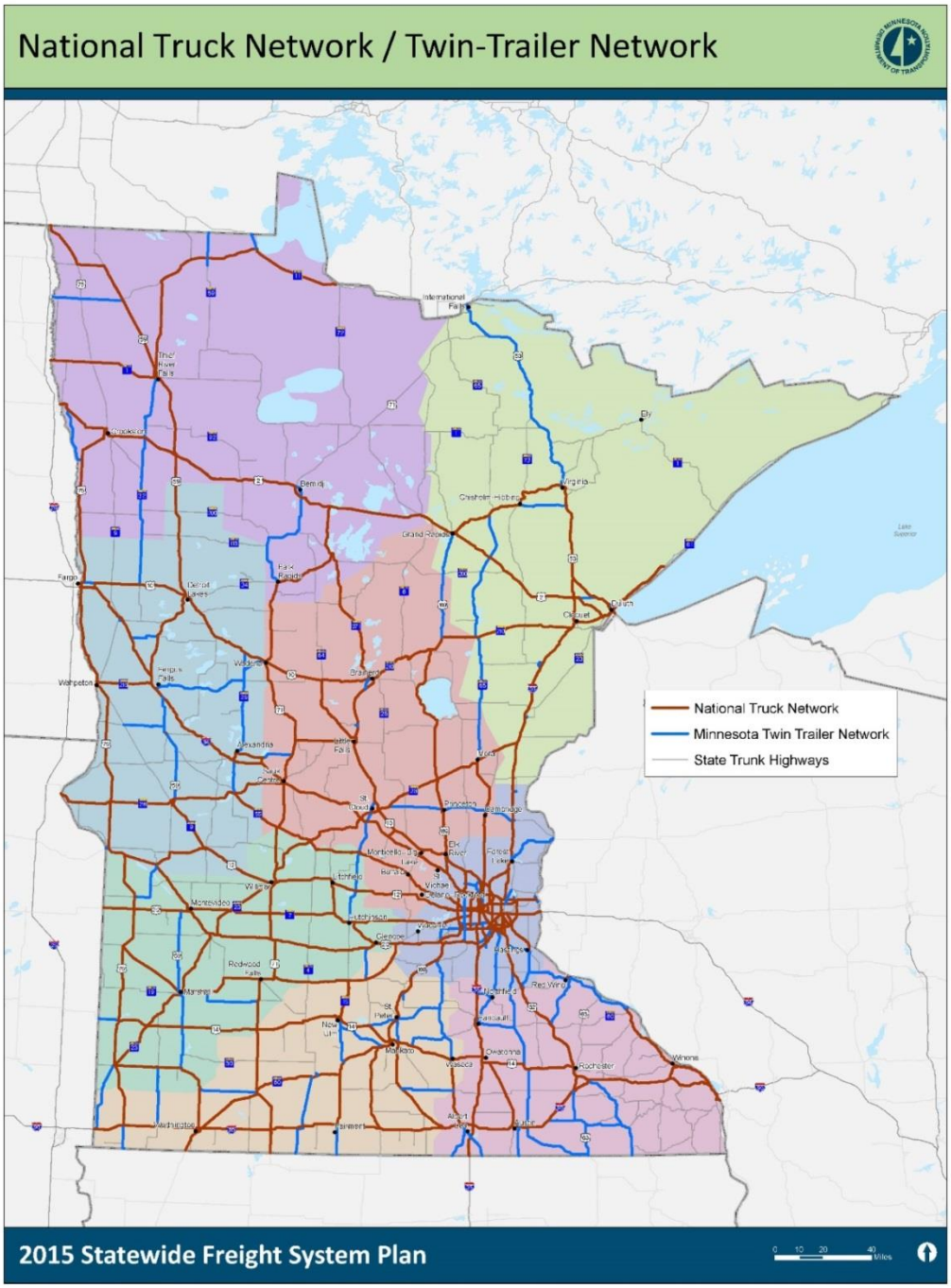


Figure 3.7 Minnesota 10-Ton Network

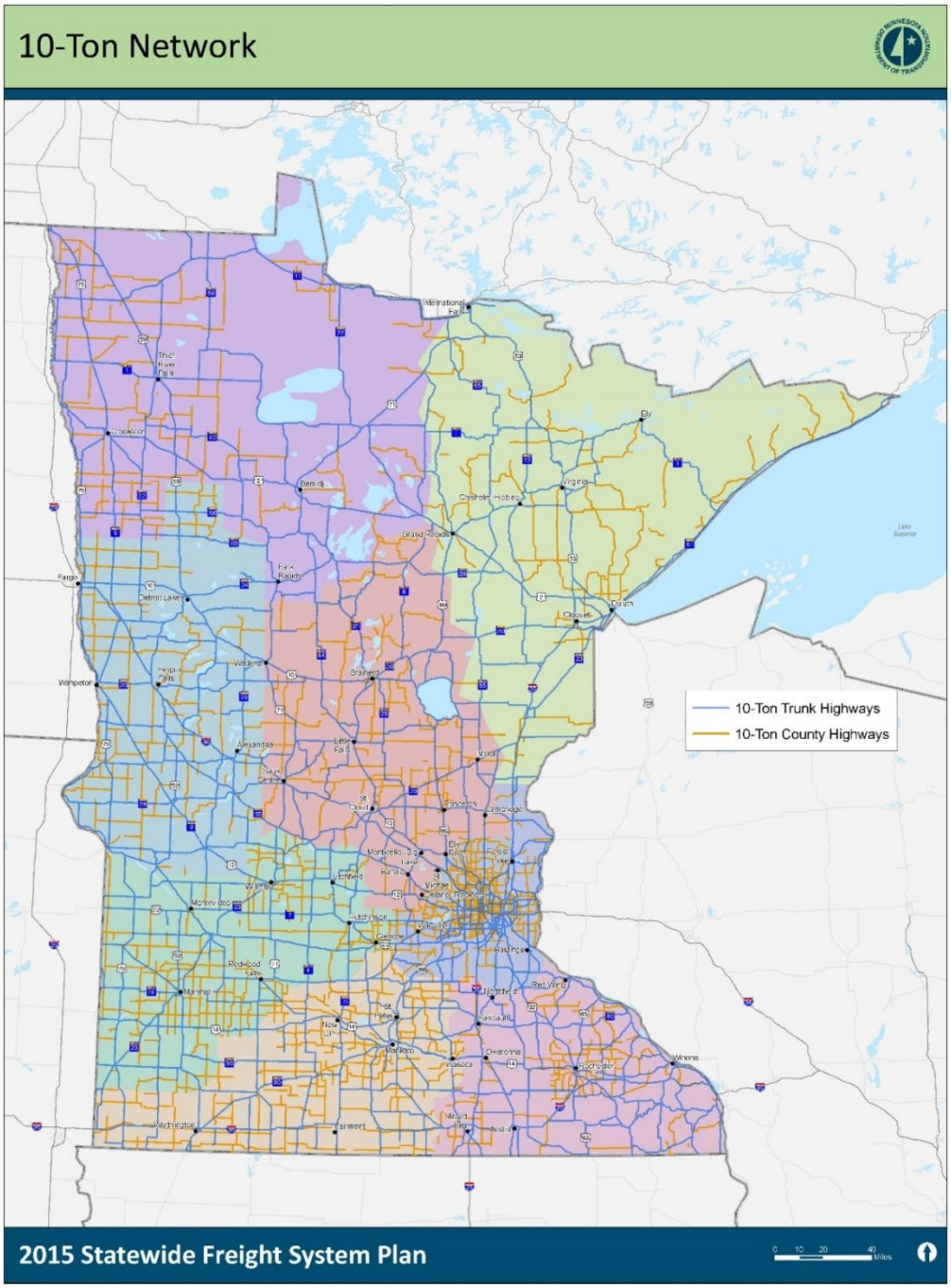
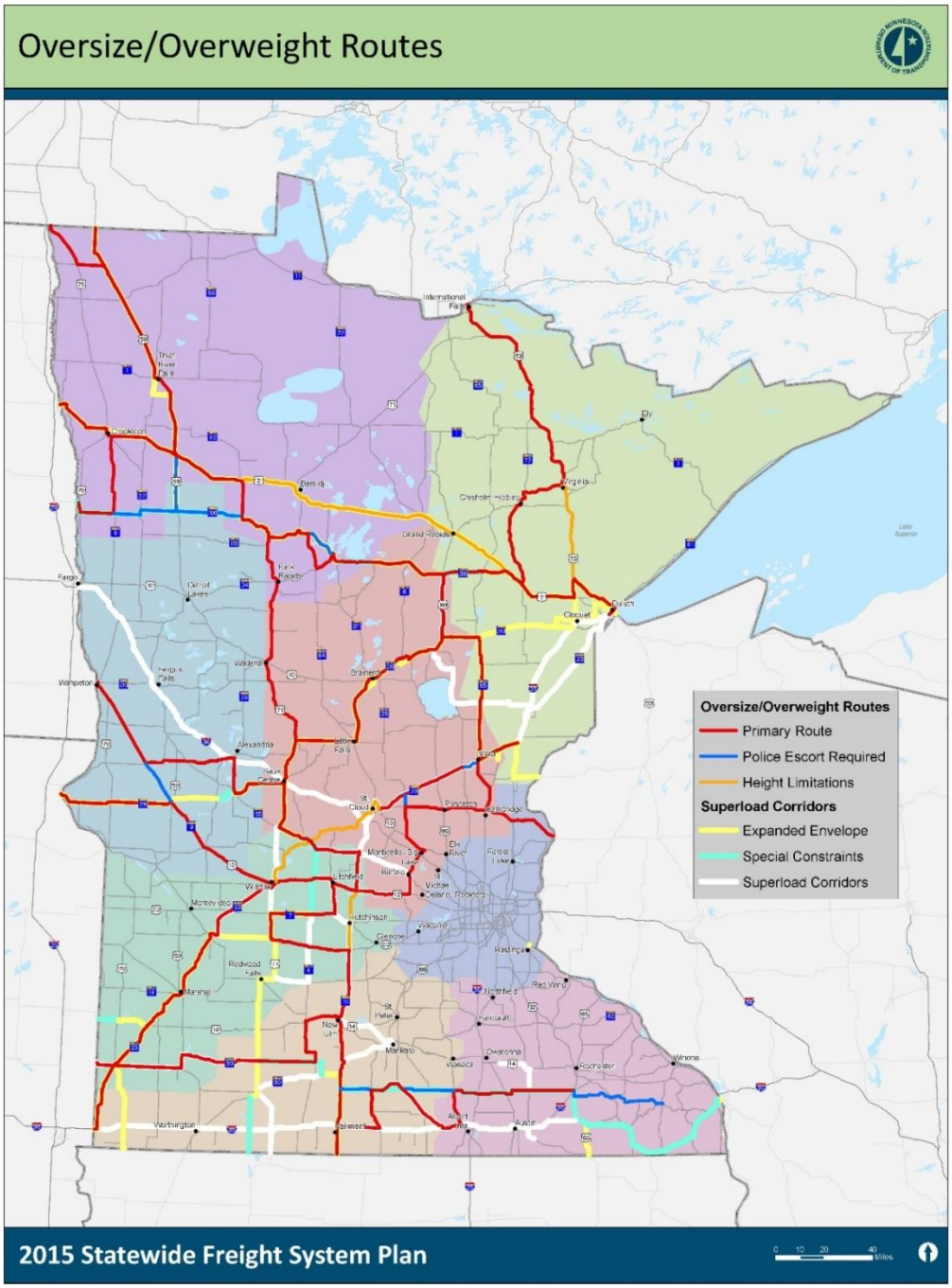


Figure 3.8 Oversize/Overweight Routes



Comparison of Minnesota's Highway Freight Networks

Each of the networks described above varies with regard to extent, purpose, and jurisdictional authority. At 155 miles within Minnesota, the U.S. DOT PFN represents the smallest freight network. This network consists solely of Interstate system segments and does not represent a truly contiguous network, but rather individual segments meeting a heavy commercial traffic volume threshold established by the U.S. DOT. In contrast, at more than 20,000 miles throughout the state, the Minnesota 10-Ton Network represents the largest freight network. The 10-Ton network consists of multiple roadway jurisdictions, including Interstates, state highways, as well as county and local roads. A comparison summary of each network is provided in Table 3.1.

Table 3.1 Highway Freight Networks in Minnesota - Comparison

Highway Freight Network	Centerline Miles	Purpose of Network and Authority Responsible for Oversight
Primary Freight Network (U.S. DOT PFN)	155	Federally designated based on heavy commercial traffic volumes to assist states with strategic allocation of resources.
Interregional Corridor Network and Supplemental Freight Routes (IRC)	3,486	Designated by MnDOT to connect the largest regional trade centers in Minnesota and adjacent states
National Highway System (NHS)	5,242	Federally designated with the purpose of focusing Federal investment to roads serving major freight and transportation facilities
National Truck Network & Minnesota Twin-Trailer Network (NTN/TTN)	6,700	Designated by FWHA (NTN) and MnDOT (TTN) with the purpose of supporting commerce by regulating allowable truck size
Minnesota 10-Ton Network	20,000+	The network includes Federal, state, county, and Local roads and is intended to provide connections to freight generators and intermodal facilities
Oversize/Overweight Route Network (OSOW)	2,000+	Specialty network intended to guide the movement of oversize and overweight goods to roadways with low traffic and limited clearance restrictions.

3.2 DESIGNATION OF MINNESOTA'S PRINCIPAL FREIGHT NETWORK (HIGHWAY)

The designation of the Minnesota's PFN was guided by the Freight Network Ad Hoc Working Group, as previously described. Additional input was received from other public and private stakeholders through multiple presentations to the Minnesota Freight Advisory Committee (MFAC).

The Working Group determined that the designation of the highway portion of Minnesota's PFN should be based on an existing network rather than the creation of a new network. It was determined that given the large number of existing highway freight networks, this approach would be more easily integrated into MnDOT's planning and managerial processes compared to the creation of a new network. Additional feedback from the working group stressed the importance that Minnesota's PFN provide connections to freight facilities and access points.

Early in the review process, three of the six existing networks were eliminated from consideration based on the factors summarized below:

- **U.S. DOT Primary Freight Network:** At only 155 miles of roadway within Minnesota, the U.S. DOT PFN was determined to provide inadequate coverage in the state to be considered for designation as Minnesota's PFN.
- **Minnesota 10-Ton Network:** With three times more roadway miles than the next largest highway freight network, the 10-Ton system is by far the most extensive network reviewed. However, it was determined that the inclusive nature of this network does not meet the goal of focusing resources on key freight infrastructure. The 10-Ton Network also includes many roadways outside of MnDOT's control such as county roads. This jurisdictional issue could limit the potential applications of Minnesota's PFN.
- **Oversize/Overweight Route Network:** While this is an important component of Minnesota's freight system, the Working Group determined that the OSOW network functions more as a "specialty" network and is not representative of the Minnesota freight system as a whole.

Freight Network Overlap

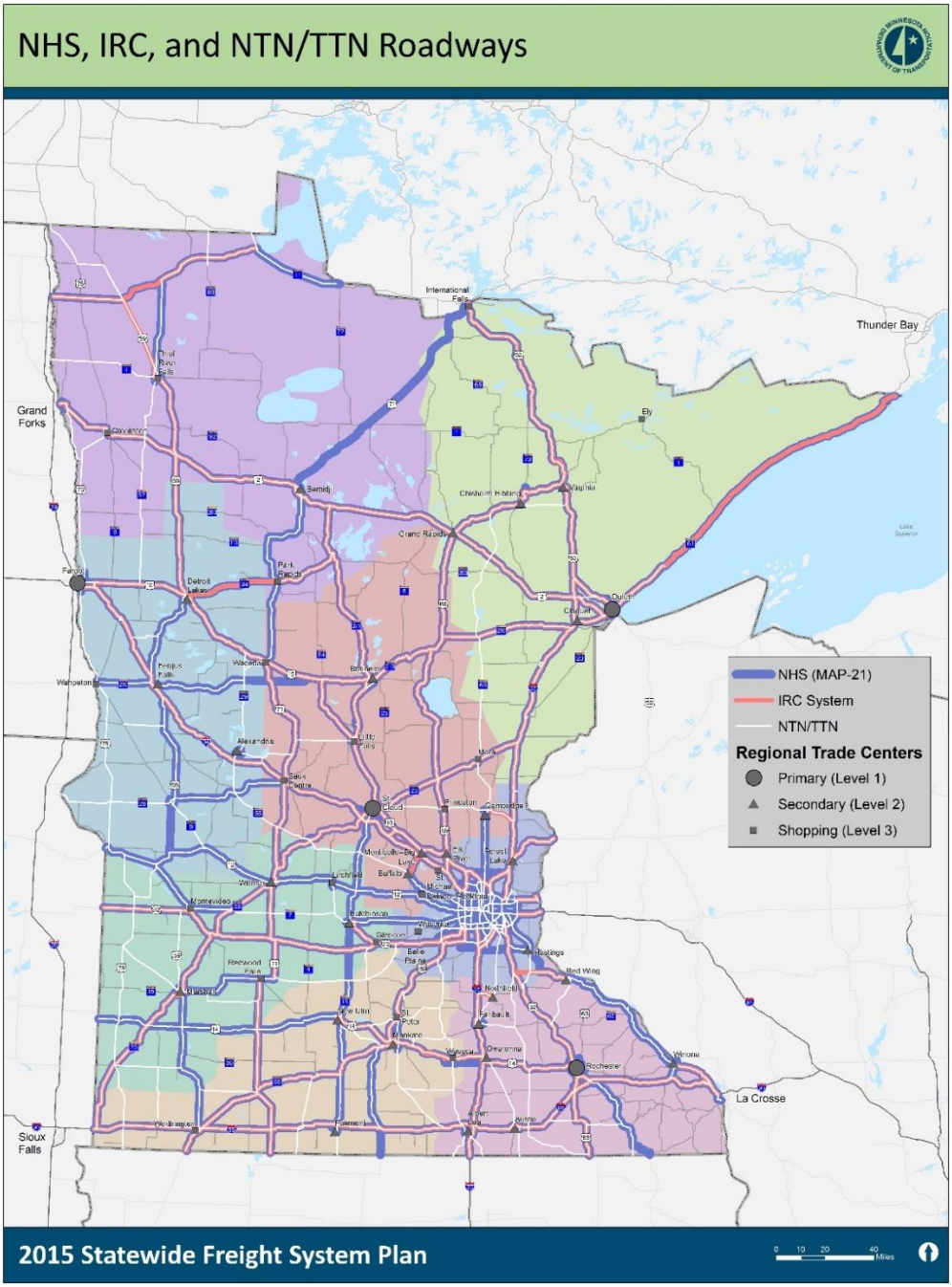
There is a large degree of overlap between the remaining three highway freight networks: the Interregional Corridors and Supplemental Freight Routes (IRC), the National Highway System (NHS), and the National Truck Network/Minnesota Twin-Trailer Network (NTN/TTN). The extents of each network are shown in Figure 3.9.

Minnesota's trunk highway system totals nearly 12,000 miles of roadway. Of this, 60 percent is included on one or more of these freight networks. Additionally, 25 percent of the trunk highway system is included on all three networks. The three networks range in size with the IRC at 3,486 miles, the NHS at 5,242 miles, and

the NTN/TTN at 6,700 miles. It was found that the two larger networks incorporate the majority of the smaller networks within their extents. For example, 98 percent of the IRC network is also included in the NHS network. Likewise, 91 percent of the NHS network is also included in the NTN/TTN network.

While there is much overlap between the three networks, there are also key difference that influence the designation of Minnesota's PFN. For example, by definition the IRC network does not include any roadways within the core metropolitan area of Minneapolis-St Paul (defined as within the I-494/696 ring roads). The NTN/TTN network is also nearly twice as large as the IRC in terms of mileage. These differences are reviewed in greater detail in the following sections to assess their potential impact to the designation of Minnesota's PFN.

Figure 3.9 Map of Overlapping Highway Networks



Proximity to Freight-Related Businesses

For each of the three networks, a proximity analysis was conducted to assess their level of connectivity to freight-related business throughout Minnesota. Data for Minnesota businesses was collected through InfoUSA and included all businesses with 20 employees or more. The dataset was further refined to evaluate only freight-related businesses (determined using two-digit NAICS industry codes). Businesses in the following industries were included in the analysis:

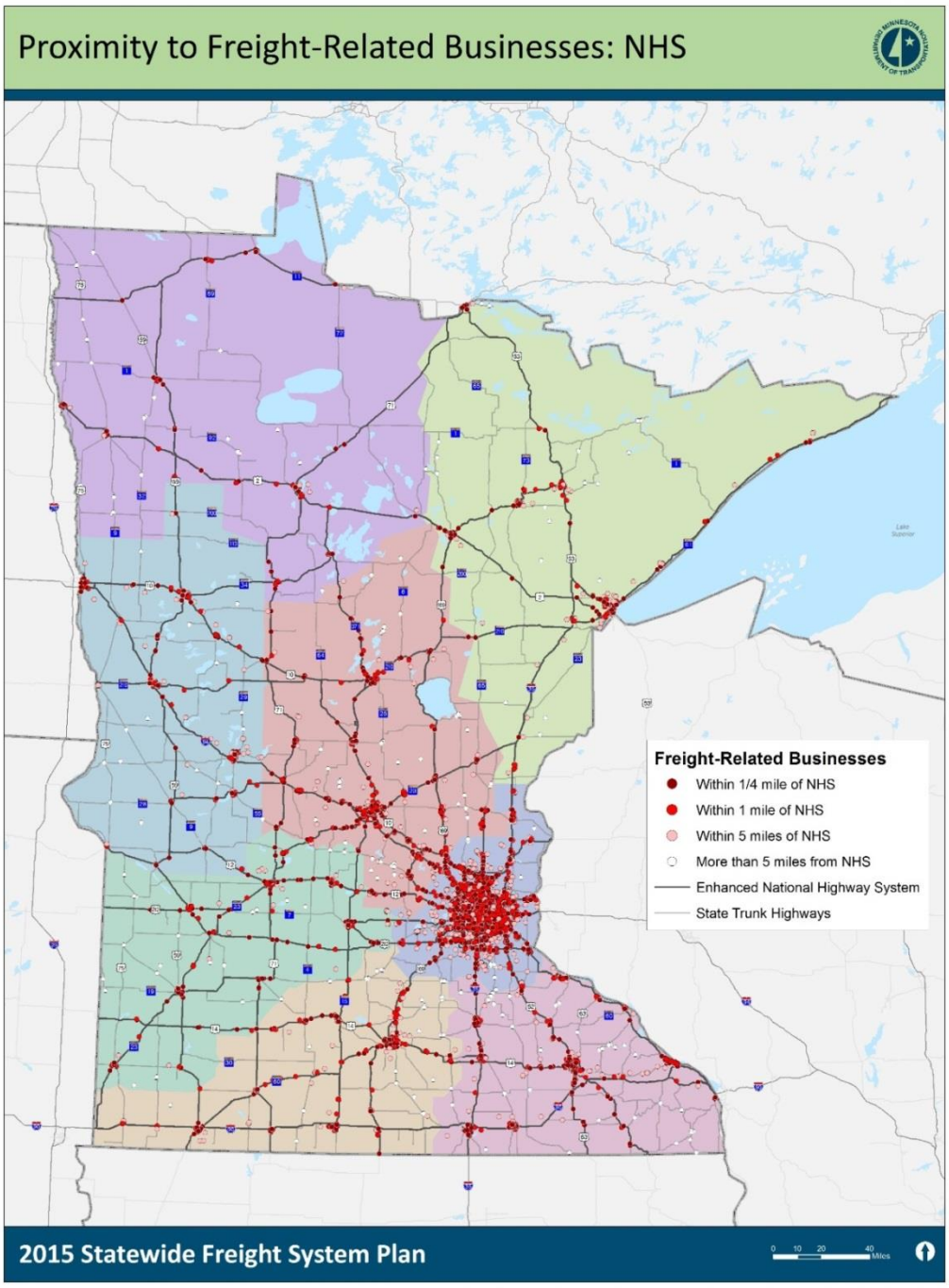
- Agriculture, Forestry, Fishing, and Hunting
- Mining
- Utilities
- Construction
- Manufacturing
- Wholesale Trade
- Retail Trade
- Transportation and Warehousing

The analysis calculated the total number and the overall percent of freight-related businesses statewide located within one-quarter mile, one mile, and five miles of each network. An example of this analysis for the NHS network is shown in Table 3.2. The results of the analysis are summarized in Figure 3.10.

Table 3.2 Proximity to Freight-Related Businesses

Highway Freight Network	0.25-Mile Buffer		1-Mile Buffer		5-Mile Buffer	
	Count	Percent	Count	Percent	Count	Percent
Interregional Corridors and Supplemental Freight Routes (IRC)	1,479	21%	2,996	43%	5,365	78%
National Highway System (NHS)	3,472	50%	5,767	84%	6,605	96%
National Truck Network and Minnesota Twin-Trailer Network (NTN/TTN)	3,629	53%	5,921	86%	6,740	98%

Figure 3.10 Proximity Analysis: Freight-Related Businesses



Since the IRC network is not located within the Minneapolis-St Paul metropolitan area, it is at a disadvantage when it comes to the total number of businesses within each buffer. The metropolitan area has the highest concentration of freight-related businesses in the state. The impact of this is most noticeable in the quarter-mile buffer analysis.

While both the NHS and NTN/TTN networks capture more than half of the businesses in the state within this distance, the IRC network captures only 21 percent. The percent of businesses located within a one-mile buffer of the IRC is still only 43 percent compared to 84 and 86 percent for the NHS and NTN/TTN networks respectively. The difference is less pronounced with the five-mile buffer analysis, most likely because at this distance, a large segment of the metropolitan area is included in the buffer. Even so, at five miles, the NHS and NTN/TTN networks achieve nearly full coverage while the IRC nets only 78 percent of businesses.

A similar analysis was conducted using the percent of statewide sales volume for freight-related businesses located within each of the three buffer distances. The results of this analysis are summarized in Table 3.3. The results for this analysis are nearly identical to those in the previous analysis with the difference generally in the range of one to five percentage points.

Table 3.3 Proximity to Freight-Related Sales Revenue

Highway Freight Network	0.25-Mile Buffer		1-Mile Buffer		5-Mile Buffer	
	$Billions	Percent	$Billions	Percent	$Billions	Percent
Interregional Corridors and Supplemental Freight Routes (IRC)	$55.9	19%	$114.0	40%	$224.9	78%
National Highway System (NHS)	$15.8	52%	$250.2	87%	$279.6	97%
National Truck Network and Minnesota Twin-Trailer Network (NTN/TTN)	$159.8	56%	$260.1	90%	$284.9	99%

One purpose of this analysis was to assess the extent to which the proximity to each of the networks correlates to an increase in sales revenue. Such a correlation could potentially show that locating close to these key freight networks is an important consideration for businesses. The results show that for the NHS and the NTN/TTN networks this correlation appears to hold true; however, the effects are minor. For both of these networks the difference between sales revenue and businesses captured is two to three percentage points at the one quarter-mile distance and three to four percentage points at the one mile distance. At the five mile distance there is only a difference of one percent for both networks.

However, the inverse of this correlation appears to be the case for the IRC network. At the one quarter-mile and one mile distances, the percent of sales revenue captured is actually two and three percentage points lower than the percent of businesses captured respectively. This result is likely impacted by the lack of IRC designated roadways within the core metropolitan area. The average sales revenue for businesses located in the metropolitan area is higher than the average for the state as a whole. Due to this factor, the IRC is not able to capture sales revenue to the same extent as the NHS and NTN/TTN networks.

A third analysis was conducted using the data for freight-related businesses to assess the density of businesses and sales revenue along each network. The purpose of this analysis was to assess the extent to which each network aligns with freight businesses in the state. A high density of businesses and sales revenue would indicate that the network is located predominantly in areas with the highest concentration of freight-related businesses. Table 3.4 summarizes the calculation of the average number of businesses within one mile per mile of each network.

Table 3.4 Freight-Related Businesses and Sales Revenue per Mile

Highway Freight Network	Miles	Freight-Related Businesses per Mile (1-Mile Buffer)	Freight-Related Sales Revenue per Mile ($Millions; 1-Mile Buffer)
Interregional Corridors and Supplemental Freight Routes (IRC)	3,486	0.9	$32.7
National Highway System (NHS)	5,242	1.1	$47.7
National Truck Network and Minnesota Twin-Trailer Network (NTN/TTN)	6,700	0.9	$38.8

For all three networks the average number of businesses per mile of roadway is very similar at between 0.9 and 1.1. The differences are more pronounced when reviewing the average sales revenue per mile of roadway. The NHS achieves the highest rate at $47.7 million per mile compared to $38.8 million per mile for the NTN/TTN and $32.7 million per mile for the IRC.

As with previous analyses, the result for the IRC is likely affected by the lack of roadways within the metropolitan area. If this same analysis were limited to areas outside of the metropolitan area, it is anticipated that the results for businesses and sales revenue per mile for the IRC network would be closer to results for the NHS and NTN/TTN networks.

Proximity to Intermodal Facilities

The Working Group—in addition to stressing the importance of connections to freight-related businesses—also emphasized the importance of connections to intermodal freight facilities. These facilities include truck/rail terminals, container terminals, pipeline terminals, air cargo terminals, grain shuttle terminals, lake terminals, and river terminals. A total of 179 intermodal facilities are located in Minnesota.

Similar to the freight-related business proximity analysis, the number of intermodal facilities within one quarter mile, one mile, and five miles of each network was tabulated. The results of this analysis are summarized in Table 3.5. The results of this analysis are similar to the previous proximity analyses with both the NHS and NTN/TTN networks capture a much higher number of intermodal facilities. At all three buffer distances, these two networks are within one percentage point of each other. Within one quarter mile, both networks capture approximately 40 percent of Minnesota's intermodal facilities. Within one mile, this number jumps to approximately 80 percent. And within five miles this number again rises to approximately 93 percent.

Table 3.5 Proximity to Intermodal Connectors

Highway Freight Network	0.25-Mile Buffer		1-Mile Buffer		5-Mile Buffer	
	Facilities	Percent	Facilities	Percent	Facilities	Percent
Interregional Corridors and Supplemental Freight Routes (IRC)	34	19%	62	35%	139	78%
National Highway System (NHS)	71	40%	144	80%	166	93%
National Truck Network and Minnesota Twin-Trailer Network (NTN/TTN)	73	41%	142	79%	168	94%

Given the degree of overlap between the NHS, the IRC, and the NTN/TTN, each network has the potential to be a viable candidate for designation as Minnesota's PFN. However, the NHS network stands out for a number of reasons.

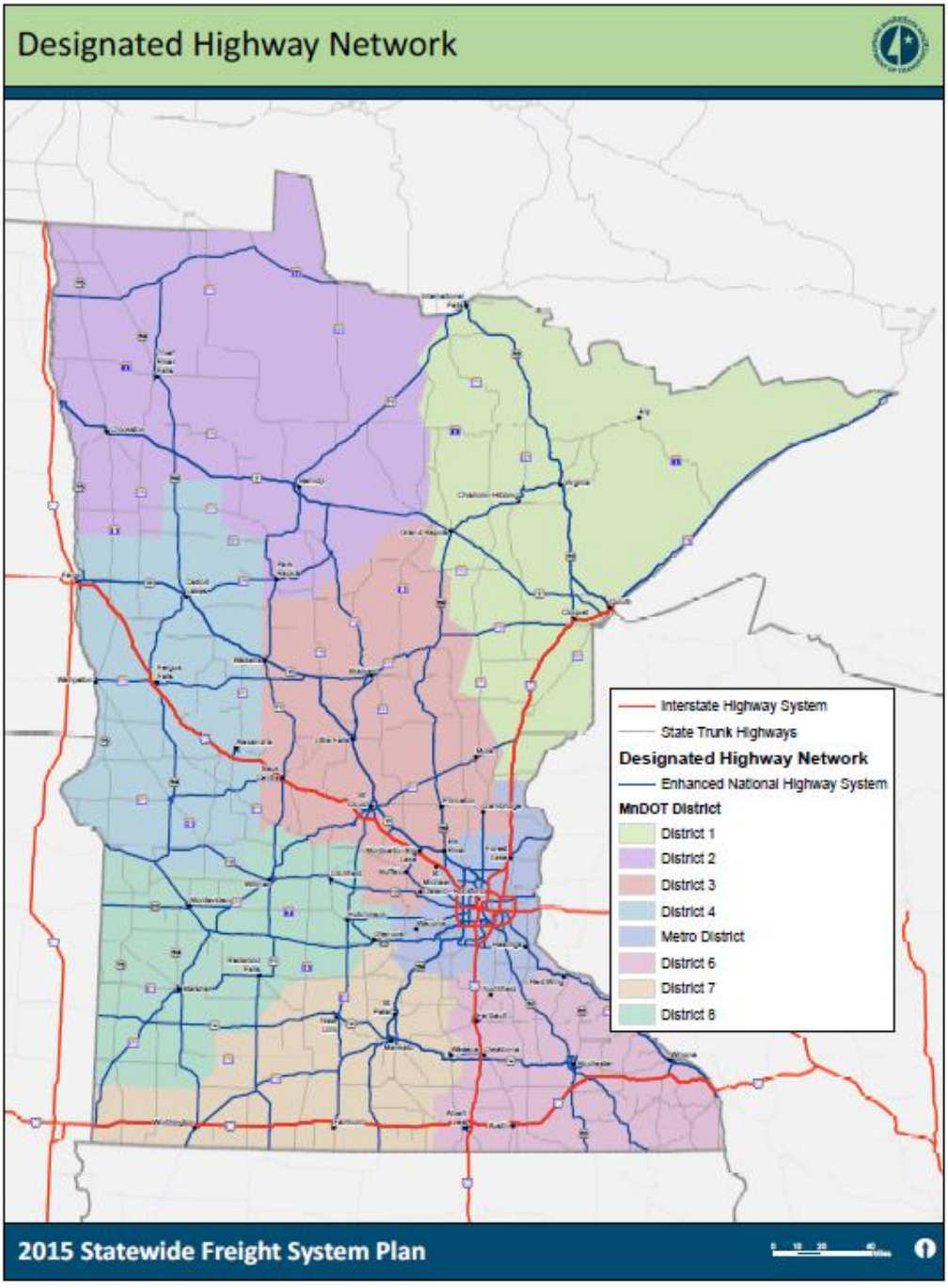
The NHS provides key connections to a large number of freight-related businesses and intermodal facilities. While the results of the proximity analyses are similar between the NHS and the NTN/TTN, the NHS accomplishes these results with a network that is 20 percent smaller than the NTN/TTN. As demonstrated in the analysis of the business and sales volume density the, NHS provides service to the highest concentrations of freight business activity.

The NHS also has the advantage of having a designated intermodal connector component built into the network. These designated roadways on the NHS

provide direct connections between major intermodal facilities and the mainline NHS network. Minnesota currently has a total of eleven intermodal connectors. Two of these are freight-only facilities and three are airports which are designated as passenger intermodal facilities, but also provide freight service. The remainder of the intermodal connectors serve passenger-only facilities. The intermodal connector component provides additional opportunities for further connecting Minnesota's PFN to other major intermodal facilities.

Given these advantages, the consensus of the Working Group was to recommend the National Highway System as the highway portion of Minnesota's Principal Freight Network (PFN), as shown in Figure 3.11.

Figure 3.11 Minnesota PFN Designated Highway Corridors



4.0 Non-Highway Network Designation

This section focuses on the designation of the non-highway portions of the Minnesota Principal Freight Network (PFN). As previously noted, efforts to designate a freight network at the national level (i.e., the U.S. DOT's PFN) have been centered on the highway system. While this is the traditional focus of state transportation planning and programming, freight movements require multiple modes and seamless connectivity between them to enable the efficient conveyance of goods. As such, MnDOT desires key modal components including the highway and rail systems, intermodal hubs, and connections to ports/airports, among others be acknowledged in the Minnesota PFN.

4.1 Linking Highway and Non-Highway Modes

The highway system and other modal systems are linked via first- and last-mile connectors. Nationally, many of these connections are made via NHS intermodal connectors which are designated to connect highways with multimodal access points that are critical for passenger and freight travel. The process for designation NHS intermodal connectors is done at the National level; candidate connectors are submitted by states and approved by FHWA. Candidates are selected using a process of primary and secondary criteria established by FHWA, and detailed in Appendix A.

The FHWA primary criteria for designating intermodal connectors are a quantitative evaluation of traffic at the facility and connector route. The Port of Duluth and Minneapolis-St. Paul airport are two facilities meeting primary criteria designation related to freight volumes in Minnesota. Secondary criteria for designating intermodal connectors allow a state to use state-specific methodologies to designate "Major Facilities" for either freight or passenger travel which become candidates for intermodal connectors to the NHS. Intermodal connectors at the Rochester and Duluth Airports are designated through this process. As noted in Section 3.1, Minnesota currently has 11 designated intermodal connectors, two of which serve freight facilities at the Port of Duluth, CP's Shoreham Rail Yard. Intermodal connectors also serve passenger facilities at the Minneapolis-St Paul, Duluth, and Rochester Airports.[1]

[1] The airports are designated as "Major Facilities" for passenger service, but also serve freight traffic.

As an established process is in place to designate intermodal connectors, this criteria was used as an input in identifying facilities/nodes that should be designated as part of Minnesota's PFN. The primary and secondary criteria for the NHS intermodal connector designation were used as screening criteria to determine which non-highway facilities/nodes should be included on Minnesota's PFN. Several facilities meet these criteria (i.e., generate volumes) and currently do not have designated intermodal connectors linking to them.

Additionally, two state-specific criteria for the MPFN were used to screen non-highway facilities. These criteria are:

- **Regional Significance:** This criteria relates to whether or not a facility is regionally significant in terms of freight volumes, commodities, or markets served.
- **Future Growth:** This criteria relates to whether or not a facility has potential for high future growth that may translate to future needs.

Further detail about how these criteria were applied to rail, port, and airport facilities/nodes is included in each of the modal sections below. Additionally, a category of "emerging" facilities was considered. Although not formally designated as part of the Minnesota's PFN, "emerging" facilities are those that generate (or may in the future provide) significant freight activity, and should be re-evaluated in the future for designation on the PFN.

4.2 FREIGHT RAIL SYSTEM

Minnesota's rail network has historically played a major role in supporting freight movements for key commodity groups and industries, particularly for the state's agricultural producers and shippers. In addition, the state's rail network supports regional and national goods movement between major shipping centers in Chicago and points west, including Pacific Northwest Ports. For statewide freight planning purposes, the goal of designating Minnesota's PFN rail facilities was two-fold:

- to identify key rail ***corridors*** in the state, and
- to identify important ***facilities/nodes*** that connect to rail corridors and/or the designated Minnesota PFN highway corridors.

The rail system in Minnesota consists of 5,760 miles operated by 19 carriers (including trackage rights). About 80% of this trackage is operated by Class I railroads; the remainder is provided by shortlines and switching railroads that

provide integral connections in key areas of the state,[2] shown in Figures 4.1 and 4.2.

Rail system tonnage is projected to grow 83% by 2040, while units are projected to more than double in the same time period. To accommodate this growth the system will rely on physical and operational capacity from all classes of rail operators in the foreseeable future. A comparison of tonnage and units between class I's and short lines is shown in **Error! Reference source not found.**.

Table 4.1 Rail Freight Volumes by Railroad Class (2012-2040, in Thousands)

Railroad Class	Tons 2012	Tons 2040	Units 2012	Units 2040
Class I	251,349	460,613	3,898	8,106
Short Line	2,867	5,051	24	38
Total Tons	280,025	465,664	3,922	8,144

Source: 2015 MnDOT State Rail Plan, based on STB 2012 Confidential Carload Waybill Sample and FHWA FAF 3.5 forecast for 2040, process by Cambridge Systematics

[2] Class I Railroad: A railroad with 2012 operating revenues of at least $452.7 million. Regional Railroad: A non-Class I line-haul railroad that has annual revenues of at least $40 million, or that operates at least 350 miles of road and revenues of at least $20 million. Railroads operating are as of December 31, 2012.

Figure 4.1 Minnesota Class I Railroads

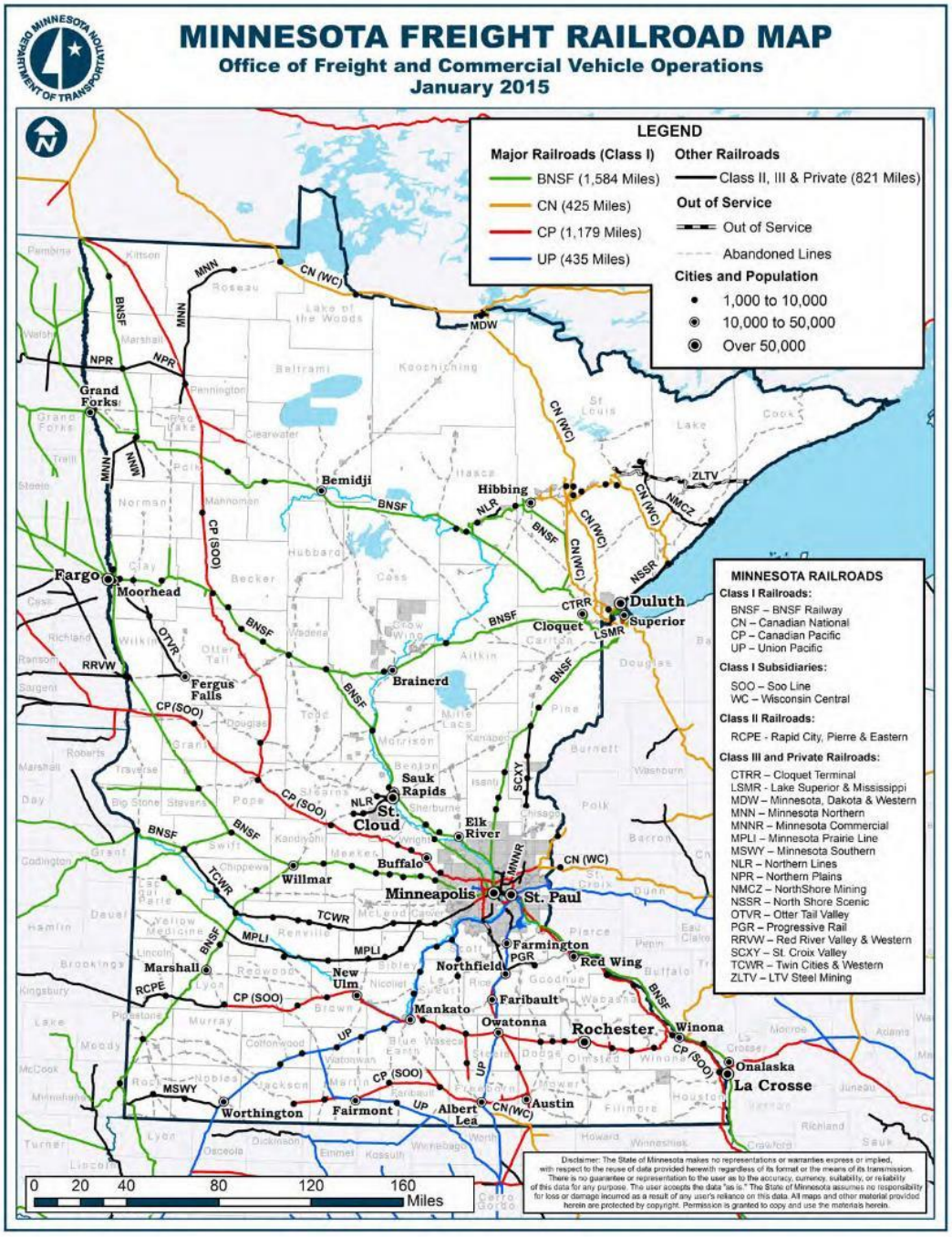
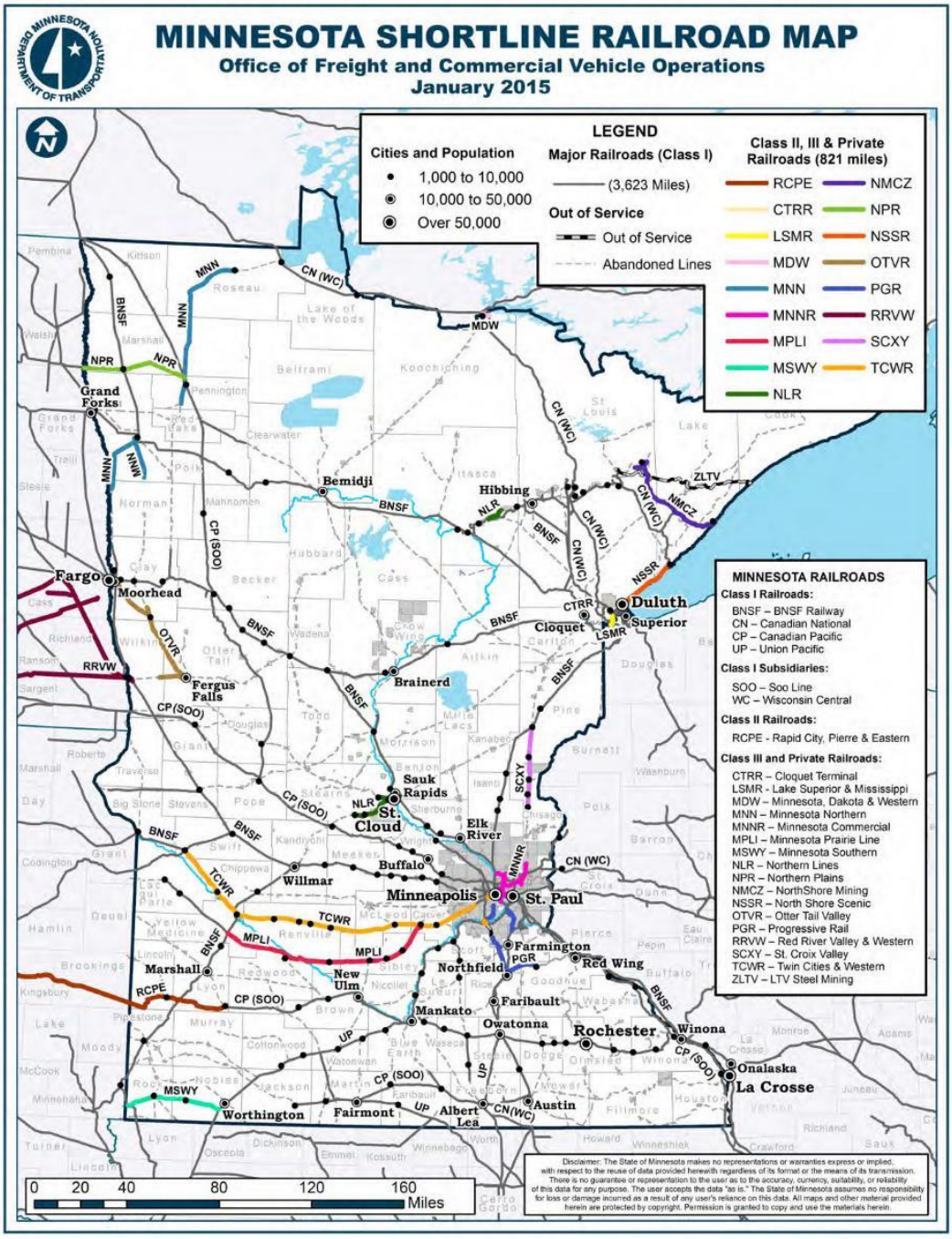


Figure 4.2 Minnesota Shortline Railroads



Designation of Minnesota's Principal Freight Network (Rail)

Rail Corridors

Numerous rail related criteria and scenarios were discussed throughout working group discussions, including tonnage, commodities carried, rail that provides direct service to industries, and others. There were stakeholders in favor of designating the entire system and others interested in designating a subset of the rail system. Ultimately the group consensus was that the rail portion of the PFN should be a subset of the Class I railroad network in the state, with two key factors driving designation:

- A segment that carries ten or more trains per day, and
- A route that is long-distance and provides interstate or interregional connectivity.

The designated rail portion of the PFN is shown in Figure 4.3. The network includes all major corridors for Class I operators in the state and represents key connections between Minnesota and major points to the north, south, east, and west.

Rail Facilities/Nodes

Each of Minnesota's key rail facilities was evaluated using the NHS intermodal connector primary and secondary criteria, and the Minnesota PFN criteria for regional significance or future growth. To minimize confusion, for the purposes of this designation, the term 'intermodal' is broadly defined, and refers to facilities that generate freight across multiple modes, rather than the traditional rail definition of intermodal, which refers to facilities that transfer containerized freight across modes.

As shown in Table 4.2, all seven rail facilities meet the NHS intermodal connector primary criteria for trucks/day or TEUs/year. In addition all facilities also meet the NHS intermodal connector secondary criteria. Figure 4.3 shows a map of rail facilities designated as part of as part of Minnesota's PFN.

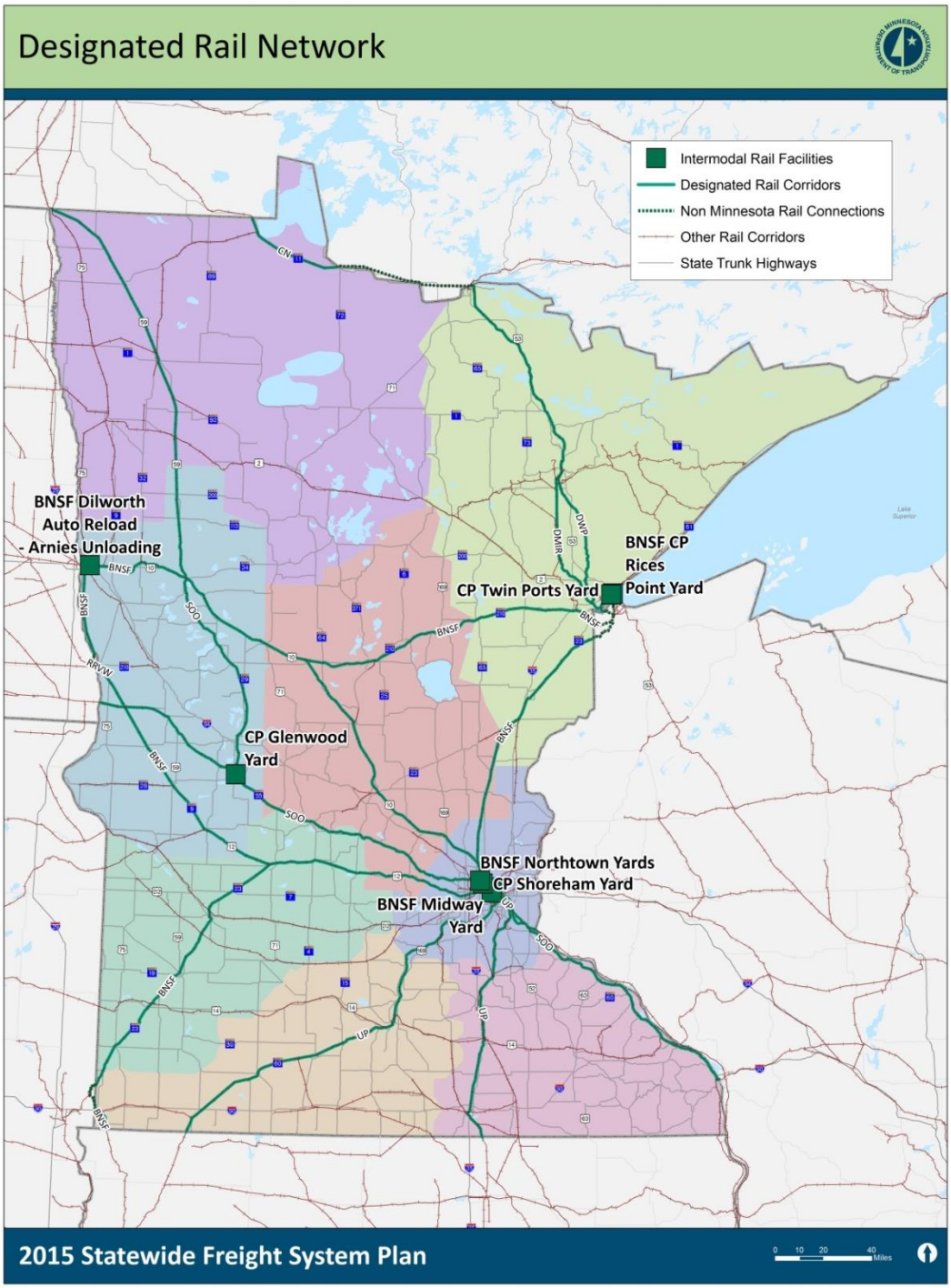
Table 4.2 Summary of Designation Criteria for Minnesota's Rail Facilities

Rail Facilities	NHS - Primary Criteria	NHS - Secondary Criteria
	100 Trucks/Day or 50,000 TEUs/Year	**Identified under the secondary criteria but may lower traffic levels. Direct connection or proximity (2 to 3 miles) to an NHS route?**
Dilworth (BNSF)	HCAADT on adjacent highways is 830 (US10)-1150(MN336)[1]	US10 and MN336 are both NHS Routes
Glenwood Yard (CP)	HCAADT on adjacent roadway is 445 (MN28)	Bulk transload facility is on north end of yard
Midway Yard (BNSF)	HCAADT on access roads not available. Midway handles container traffic	According to FHWA's Interactive Map, MN280 is an intermodal connector
Northtown Yards (BNSF)	According to FHWA's Interactive Map, University Ave is an intermodal connector	Adjacent to Shoreham Yard
Rice's Point Yard (BNSF/CP)	According to FHWA's Interactive Map, Port Terminal Drive is an intermodal connector	I35, I535, and US53 are all on the NHS System
Shoreham Yard (CP)	According to FHWA's Interactive Map, University Ave is an intermodal connector	
Twin Ports Yard (CP)	HCAADT on Oneota St not available. On I35, HCAADT is 1,950	I35 and US2 are NHS Routes

FHWA Interactive NHS Mapping Tool: http://hepgis.fhwa.dot.gov/hepgismaps11/#
[1] 2012 count data, http://www.dot.state.mn.us/traffic/data/

Meets NHS Intermodal Connector Primary Criteria
Meets NHS Intermodal Connector Secondary Criteria
Meets MnPFN Criteria #1 or #2

Figure 4.3 Minnesota PFN Designated Rail Corridors and Facilities



4.3 WATERWAY SYSTEM

Minnesota has one of the more unique positions in the country for waterway movements as it is located on both the Mississippi River and the Great Lakes (i.e., Lake Superior). The Mississippi River provides access to river ports to the south as well as the Gulf of Mexico via New Orleans. The Great Lakes-St. Lawrence Seaway provides access to other ports along the Great Lakes through to the Atlantic Ocean. Due to this, Minnesota has numerous public ports in operation: four along the Mississippi River and four along Lake Superior. The goal of designating Minnesota's PFN waterway facilities was two-fold:

- to identify key waterway ***corridors*** in the state, and
- to identify important ***facilities/nodes*** that connect to waterway corridors and/or the designated Minnesota PFN highway corridors.

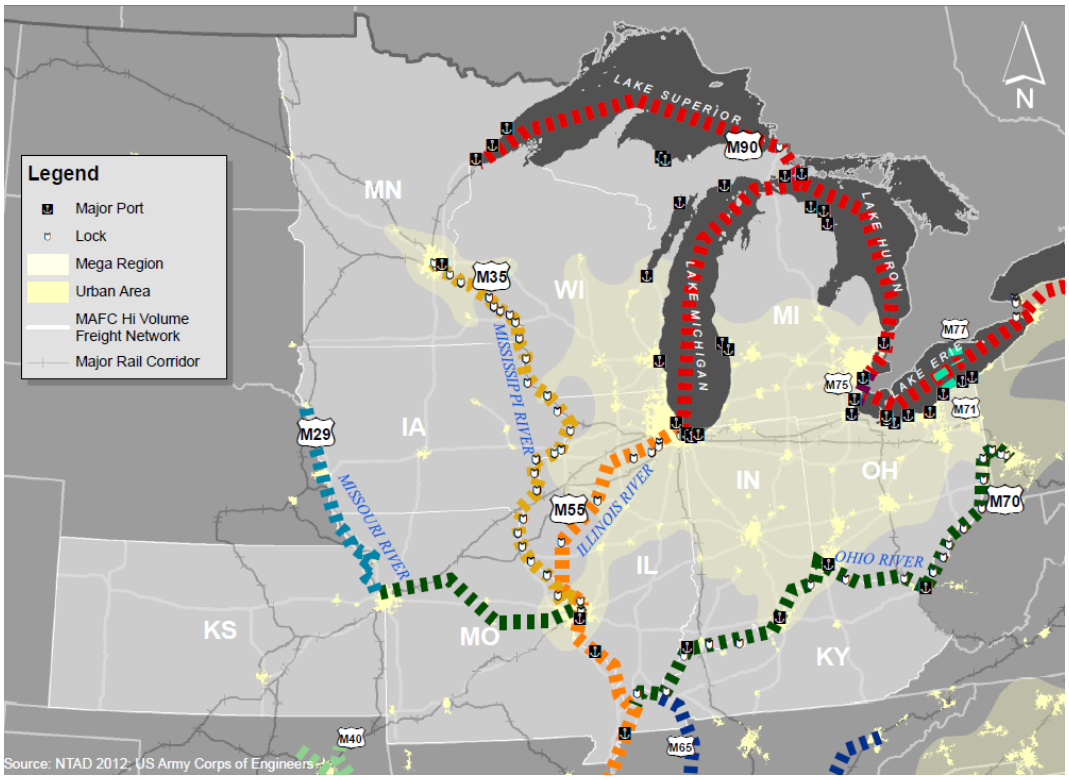
Designation of Minnesota's Principal Freight Network (Waterway)

Waterway Corridors

There are two primary waterway corridors in Minnesota, both of which are part of the U.S. DOT Maritime Administration's Marine Highway Program, shown in Figure 4.4. The Mississippi River System connects Minnesota's river ports to national and international destinations through the Gulf of Mexico. The Upper Mississippi from Minneapolis along the border of Minnesota and to the connection with the Illinois River is designated as the M-35 corridor. The other body of water, Lake Superior, carries all tonnage to and from the Port of Duluth and Minnesota's other 3 lake ports. This is designated as the M-90 corridor.

Both the Lake Superior M-90 corridor and the Mississippi River M-35 corridor (between Lock 1 in Minneapolis and the southern border of the state) are designated as part of Minnesota's PFN. Additionally, the portion of the Minnesota River that connects the Port of Savage to the Mississippi River is designated as part of the PFN, to ensure a contiguous route is provided from the Port of Savage to the Gulf. Figure 4.5 shows a map of waterway corridors designated as part of Minnesota's PFN.

Figure 4.4 USDOT MARAD's Marine Highway Designations in States belonging to the Mid-America Freight Coalition



Source: Mid-America Freight Coalition

Waterway Facilities/Nodes

Each of Minnesota's ports was evaluated using the NHS intermodal connector primary and secondary criteria, and the Minnesota PFN criteria for regional significance or future growth. As shown in Table 4.3, all eight ports met the criteria for designation as part of the MPFN. The Port of Duluth/Superior meets the NHS intermodal connector primary criteria for tons moved by highway.[3] No facilities meet the secondary criteria. All eight ports meet the regional significance criteria, while Two Harbors and Silver Bay also meet the future growth criteria. Figure 4.5 shows a map of water ports designated as part of as part of Minnesota's PFN.

[3] In order to meet the NHS intermodal connector primary criteria, it is necessary to be able to determine the amount of goods moving to and from the facility on the highway system. Although several other Port facilities exceed the 500,000 tons per year threshold, the percentage of movements on the highway system versus via rail connector were unable to be determined.

Table 4.3 Summary of Designation Criteria for Minnesota's Water Ports

Water Port Facilities	NHS - Primary Criteria		MnPFN Criteria	
	>50,000 TEUs or > 500,000 tons per year **by highway*** or 100 trucks per day (each direction)	> 250,000 passengers per year or 1,000 passengers per day.	Criteria 1: Regional significance (Volumes, commodities, etc.)	Criteria 2: High level of projected growth or anticipated needs
Duluth / Superior	36,000,000		Taconite and other products	Yes
Two Harbors	16,500,000		Primarily Taconite	Yes
Silver Bay	6,000,000		Primarily Taconite	Regional iron ore projected to increase 20% to 24 million tons in 2014
Taconite Harbor	657,700		Primarily Coal	
St. Paul	5,500,000		Large shipper of non-grain agricultural products. Largest state river port	
Savage	2,000,000		Primarily grain; also serves as hub for rail/highway connections	
Winona	1,700,000		Primarily grain; also serves as hub for rail/highway connections	
Red Wing	<1,000,000		Primarily grain	
Total	**68,357,700**			

*note: port volumes reported are total tons, including both rail and highway

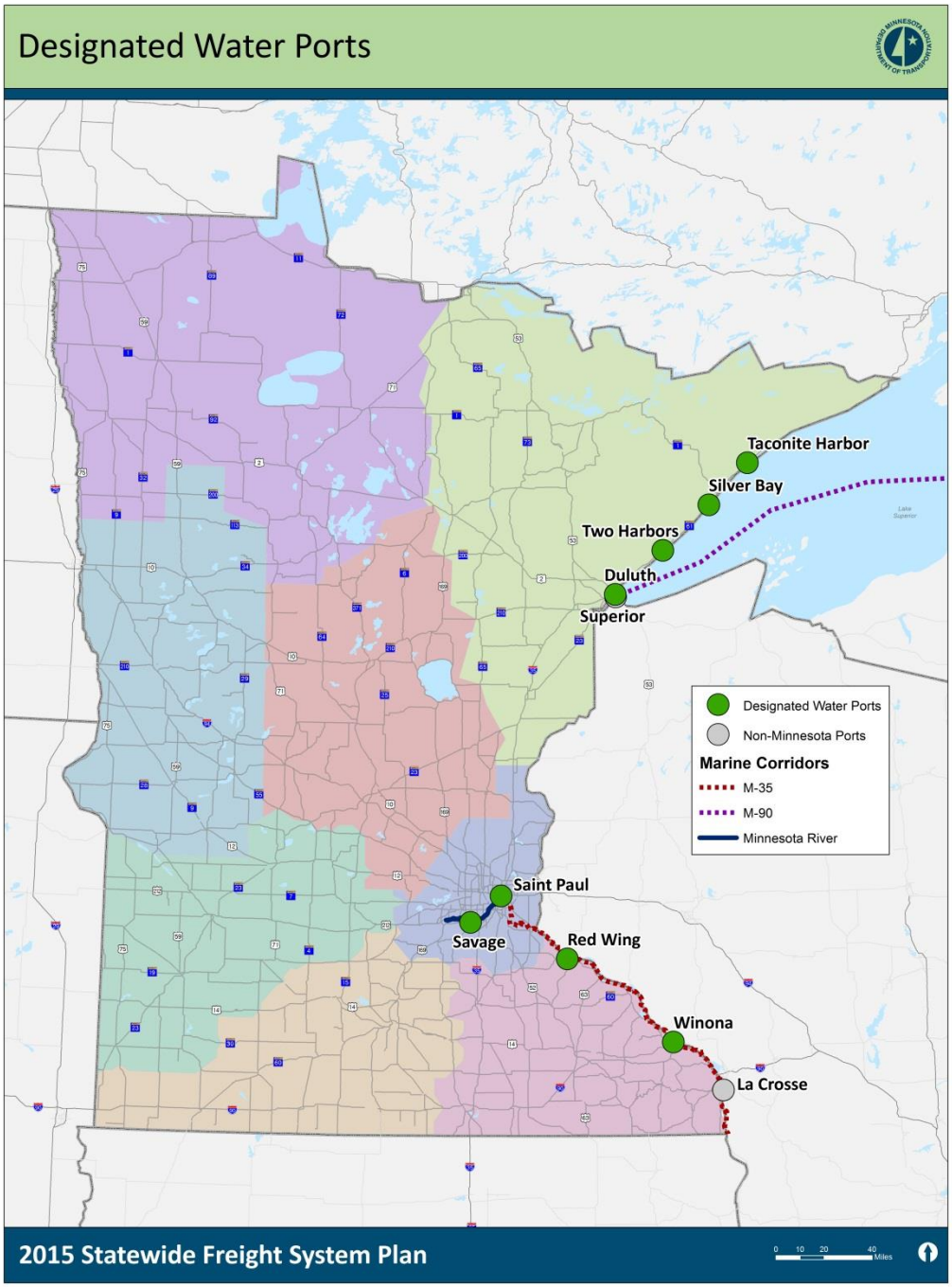
Source: Minnesota Freight Plan, Task 2.3

Meets NHS Intermodal Connector Primary Criteria

Meets NHS Intermodal Connector Secondary Criteria

Meets MnPFN Criteria #1 or #2

Figure 4.5 Minnesota PFN Designated Waterways and Water Ports



4.4 AVIATION SYSTEM

Minnesota is home to 97 airports listed in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS). This list is updated every two years to identify existing and proposed airports that are considered significant to national air transportation. Of these, eight are primary airports and include:

- Bemidji Regional Airport (BJI)
- Brainerd Lakes Regional Airport (BRD)
- Duluth International Airport (DLH)
- Falls International Airport (INL)
- Minneapolis–St. Paul International Airport (MSP)
- Range Regional Airport (HIB)
- Rochester International Airport (RST)
- Thief River Falls Regional Airport (TVF)

Identification in this manner allows airports to receive Federal grants under the Airport Improvement Program (AIP). These eight are considered primary airports due to the volume of passenger boardings (at least 10,000 per year). Most would not meet the criteria for primary airport status based on the air cargo threshold of total annual landed weight by cargo aircraft (at least 100 million pounds). A ninth airport, St. Cloud, served passenger traffic until 2013. A number of these airports also serve freight traffic.

For statewide freight planning purposes, the goal of designating Minnesota's PFN aviation system is to identify important ***facilities/nodes*** that generate significant activity or are critical to local industry.

Designation of Minnesota's Principal Freight Network (Airports)

Each of these airports was evaluated using the NHS intermodal connector primary and secondary criteria, and the Minnesota PFN criteria for regional significance or future growth. As shown in Table4.4, five airports met the criteria for designation as part of Minnesota's PFN. The Minneapolis–St. Paul Airport meets the NHS intermodal connector primary criteria for passenger traffic. Rochester and Duluth airports were designated as "major facilities" (for passenger traffic) in MnDOT transportation plans, and thus meet the secondary criteria. Each of these three airports were also determined to be significant for freight traffic.

To evaluate the Minnesota PFN criteria for the remainder of the airports, statistics for air cargo (freight and mail) were sourced through the Bureau of Transportation Statistics. (Data on air cargo volumes or value has previously not been collected by MnDOT.) Both Bemidji and Thief River Falls had more than

400,000 lbs. of freight or mail transported by air in 2014 and were screened in using the regional significance criteria because of these volumes of traffic. Both aforementioned airports are also experiencing significant annual growth; 11 percent between 2013 and 2014, supporting inclusion through the second Minnesota PFN criteria of high growth.

Although the criteria for the Minnesota PFN are based on volume of shipments, it is important to realize that air cargo shipments are different than other types of freight. Even Minneapolis-St. Paul, which has the most air cargo, by volume, serves a relatively small amount of tonnage when compared to other modes. Nevertheless, air cargo is vitally important to the state's economy, as it is primarily high value, time sensitive goods, such as mail, packages, medical supplies, or last-minute manufacturing requirements. Thus, airports can serve as significant economic engines while serving a relatively small volume of freight. Furthermore, these shipments may be made in small planes that are not subject to the same limitations regarding runway size or regional population than are hubs for passenger service. It is not uncommon for UPS air shipments, for example, to be contracted to carriers using planes suitable for use at airports with runways less than 4,000 feet in length.

For designation as part of the Minnesota PFN, only airports with reportable air cargo shipments were considered. At this time supporting data on airports with smaller volumes of freight or mail traffic is unavailable. In the future MnDOT may pursue a greater understanding of the movement of air freight in the state. As data is available, it is recommended that these airports that serve air freight but do not yet reach the threshold criteria for designation on the PFN be designated as "emerging" freight facilities for future consideration.

Figure 4.6 shows a map of airports designated as part of Minnesota's PFN.

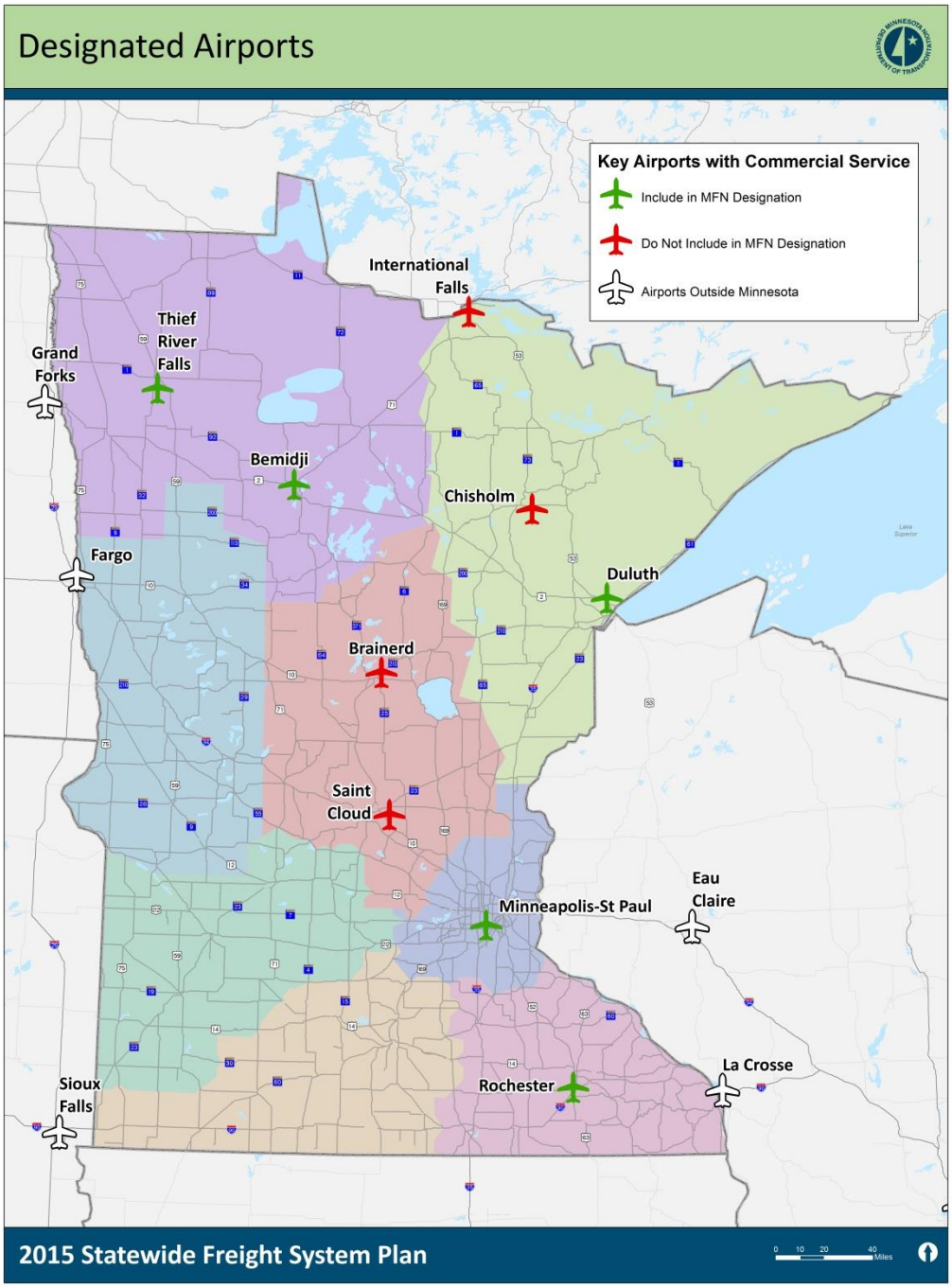
Table 4.4 Summary of Designation Criteria for Minnesota's Airports

Airport Facilities	NHS - Primary Criteria		NHS - Secondary Criteria				MnPFN Criteria	
	Passengers—more than 250,000 annual enplanements.	Cargo—100 trucks per day (each direction) or 100,000 tons per year by highway mode.	20 percent or more of passenger or freight volumes by mode within Minnesota	Identified in Minnesota and metropolitan transportation plans as a major facility	Significant investment in an intermodal terminal	Connecting routes targeted by for investment	Criteria 1: Regional significance	Criteria 2: High level of projected growth or anticipated needs
		Freight/Mail (lbs., 2014)					Freight/Mail (lbs., 2014)	Freight/Mail Growth (2013 - 2014)
Minneapolis-St Paul International	16,280,835	732,663,072	98%	Yes			407,000,000	0%
Duluth International	155,496	N/A	1%	Yes			2,113,000	2%
Rochester International	109,870	N/A	1%	Yes			21,000,000	20%
Bemidji Regional	22,819	N/A	0%	No			807,000	11%
St. Cloud Regional	15,842	N/A	0%	No			2,350	-98%
Falls International-Einarson Field	15,796	N/A	0%	No			-	N/A
Brainerd Lakes Regional	15,654	N/A	0%	No			-	-100%
Range Regional	11,669	N/A	0%	No			-	-100%
Thief River Falls Regional	2,079	N/A	0%	No	Investment in a 19,800 Sq. Ft. freight facility in 2013		483,000	11%
Total	**16,630,060**							

Source: FAA, CY2013 statistics, http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

Meets NHS Intermodal Connector Primary Criteria
Meets NHS Intermodal Connector Secondary Criteria
Meets MnPFN Criteria #1 or #2

Figure 4.6 Minnesota PFN Designated Airports



4.5 PIPELINE FACILITIES

Pipelines serve an important role in Minnesota's multimodal freight system. Whether carrying petroleum products, natural gas, propane or other liquids and gasses, commodities that travel via pipeline do not take up space on Minnesota's roads or rails. Pipelines help share the goods movement burden; if pipelines were not in Minnesota to convey these commodities, there would be an increase in the number of trucks and trains on the transportation system

For statewide freight planning purposes, the goal of designating Minnesota's PFN pipeline facilities was to identify important ***facilities/nodes*** that generate significant activity. Related to pipelines, both refineries and refined product transload facilities were considered.

The primary pipeline system in Minnesota is the Minnesota Pipe Line (MPL) system. This pipeline receives crude oil from other pipelines systems (e.g., the Enbridge Pipeline System that carries crude from Alberta, Canada) at a terminal in Clearwater County. The Minnesota Pipe Line system has four lines running from Clearbrook to the Twin Cities and can transport about 465,000 barrels of crude oil per day.[4] In the Twin Cities, the pipeline connects to refineries. These two refineries are crucial to Minnesota; they produce much of the transportation fuels used in the state and throughout the Upper Midwest and are designated as part of Minnesota's PFN. They are:

- Pine Bend Refinery in Rosemount, and
- St. Paul Park Refinery in St. Paul Park.

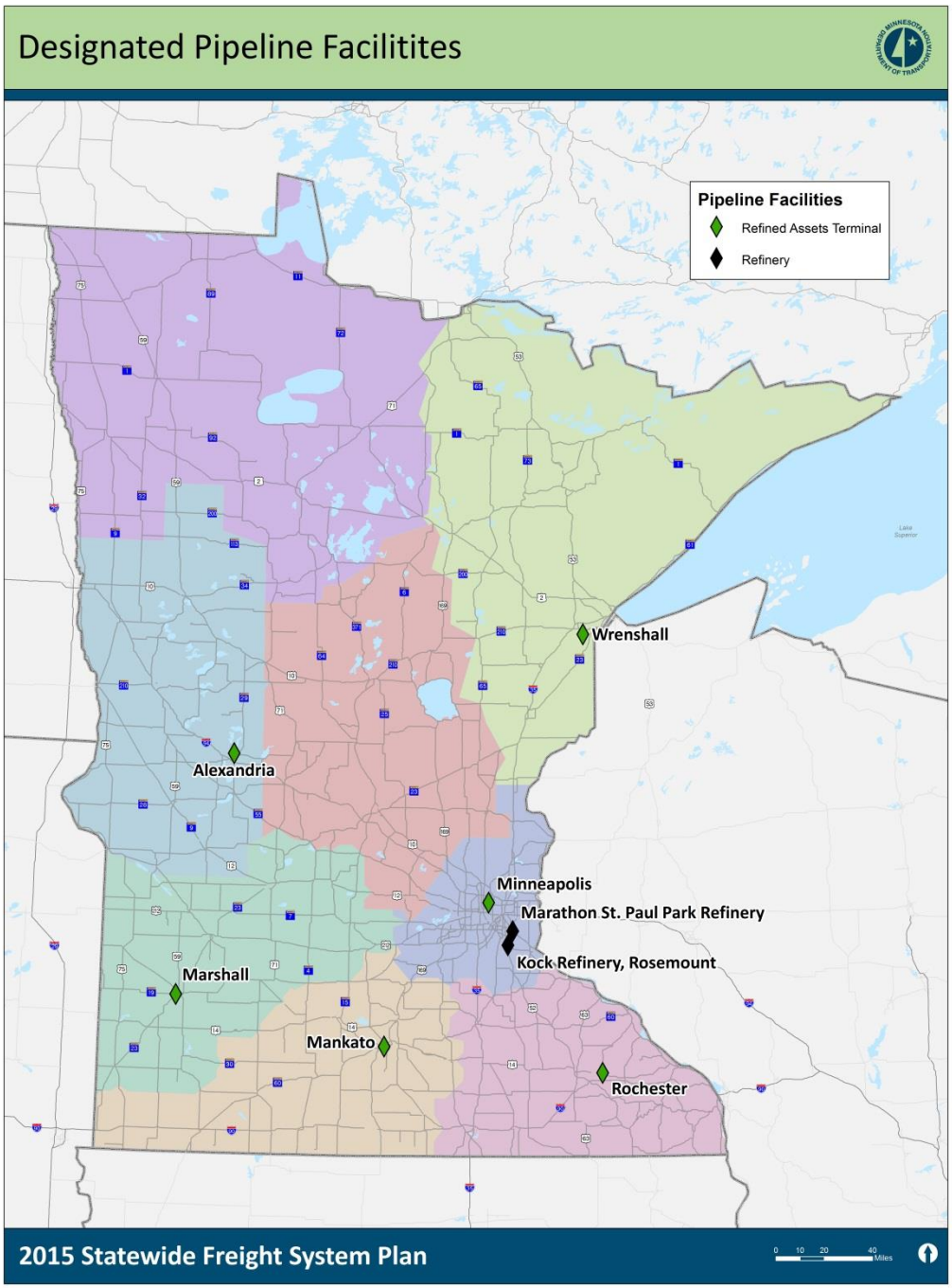
Once crude is refined, pipelines transport product to transload facilities where fuel can be distributed via truck to consumers throughout Minnesota and the U.S. There are six refined petroleum product transload facilities that have been designated as part of Minnesota's PFN. They are located in:

- Alexandria,
- Marshall,
- Mankato,
- Minneapolis,
- Rochester, and
- Wrenshall.

Figure 4.7 shows a map of refineries and key refined products terminals designated as part of Minnesota's PFN.

[4] Minnesota Pipe Line, http://www.minnesotapipeline.com/

Figure 4.7 Minnesota PFN Designated Pipeline Facilities



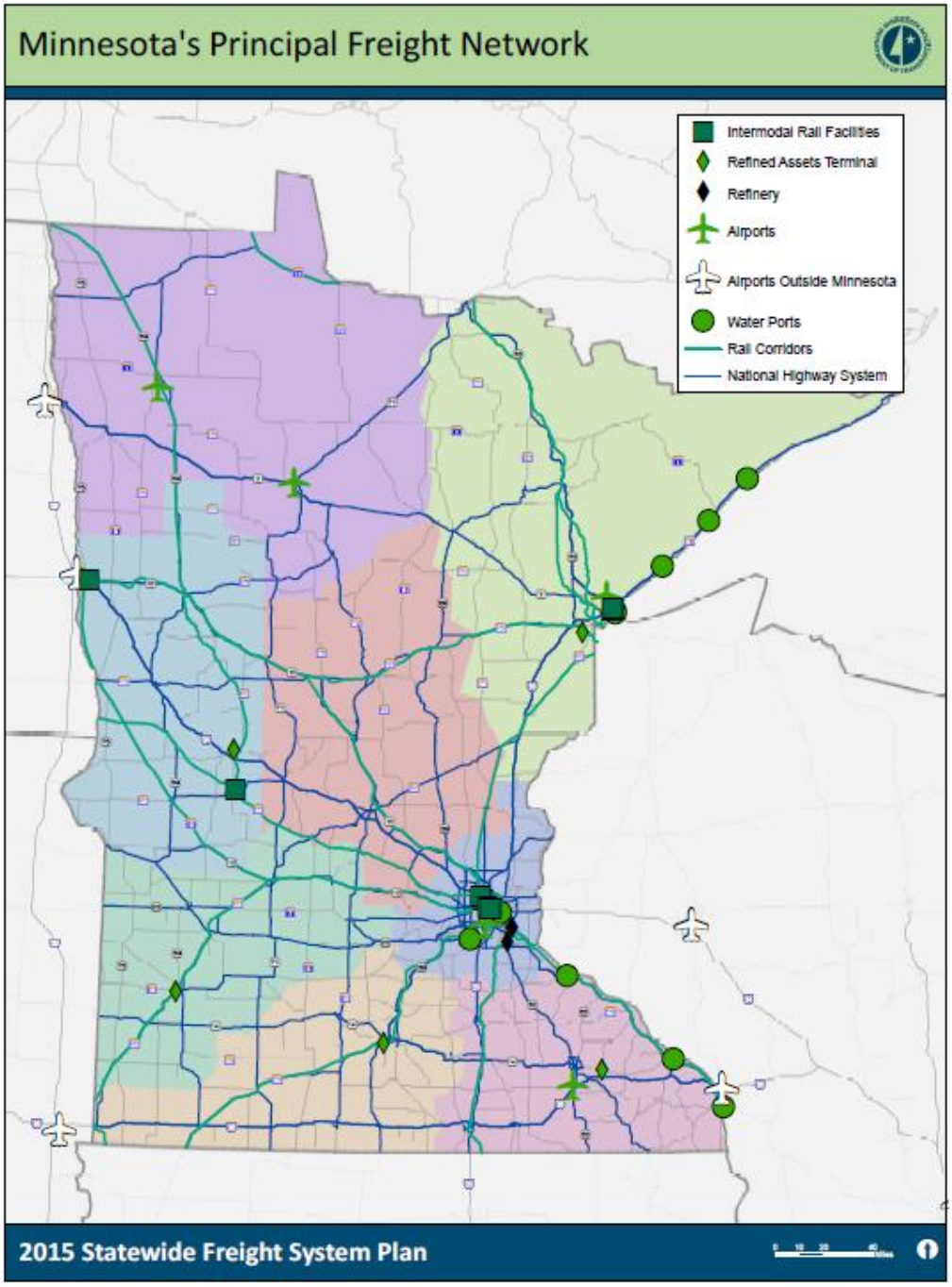
5.0 Minnesota's Principal Freight Network

This Tech Memo described the process used to designate Minnesota's Principal Freight Network. In total the network includes:

- Highway System – over 5,200 miles,
- Rail Corridors – 2,081 miles,
- Rail Facilities – 7 terminals,
- Waterway Corridors – 1 Great Lakes corridor and 2 Inland Waterway corridors,
- Waterway Ports - 4 Great Lakes ports and 4 Inland Waterway ports,
- Airports – 7 airports, and
- Pipeline Facilities - 2 refineries and 6 refined asset terminals.

This multifaceted network highlights the principal components of each modal system and the points of multimodal/intermodal connectivity. This network links to industry needs and provides access throughout Minnesota, the Upper Midwest, Nationally, and to key International import/export ports. The complete designation is shown in Figure 5.1.

Figure 5.1 Designated Minnesota Principal Freight Network



6.0 Next Steps

The process of identifying and designating the principal components of Minnesota's freight system proved to be both challenging and enlightening for the Ad Hoc Working Group. While MnDOT was motivated to designate a network for a variety of reasons, described earlier, it was done in large part to better identify/understand Minnesota's key freight assets. In working through the designation process, intertwined was discussion about the numerous other potential purposes and applications the network could serve for MnDOT. The Ad Hoc Working Group recommended Minnesota's Principal Freight Network, but a key next step to operationalize the tool within MnDOT is for senior leadership to determine how the designation will be used and maintained. As previously described, several potential applications are viable for Minnesota's PFN; some will be relatively easy to implement and others will require significant administrative coordination and funding. The potential applications are shown in Table 6.1. This list will move forward into the discussions of the Organization and Policy Ad Hoc Working Group being convened as part of Plan development, to ultimately determine how the network will be applied.

Table 6.1 Minnesota Principal Freight Network Applications

The PFN could be used to …	Highway	Rail Lines	Waterways	Freight Facilities (Rail, Water, Air)
Track freight system activity	X	X	X	X
Monitor freight system performance	X	X	X	X
Identify and prioritize system needs	X	X	X	X
Provide different design or connectivity standards	X			X
Provide different (higher) maintenance standards	X *			
Receive priority consideration during project selection and funding	X			X
Align with dedicated freight funding source	X	X		X
Consider Complete Streets principles	X			
Support existing businesses	X	X	X	X
Provide access to intermodal facilities	X	X	X	

* The Highway portion of the network is the Enhanced NHS and it may already receive priority for maintenance.

As shown in the table, suggested applications vary by mode and type (i.e., corridor versus facility), reflecting the public-/private-sector nature of the freight system. This table reflects how the network could be integrated within/used by MnDOT; the ability of MnDOT to influence applications that relate to systems operated by others (e.g., railroads) may be limited. However, the place MnDOT can provide benefits, and help ensure the multimodal freight system has seamless connections between modes, is by being proactive related to non-highway facility connections to the highway portion of the PFN.

The process of designating principal rail, port, airport and pipeline facilities highlighted that there are numerous significant freight generators in the state where the modal systems need to be connected. Review of Minnesota's designated NHS intermodal connectors highlighted that the majority of these freight facilities identified meet FHWA's primary or secondary criteria for NHS intermodal connector designation, but are not formally designated (or are only designated for passenger travel). As a next step, part of Organization and Policy Ad Hoc Working Group discussions, MnDOT leadership should decide whether or not to pursue designation of these new intermodal connector routes.

A next step of this Plan is to use Minnesota's PFN to assess the condition and performance of Minnesota's freight system.

A. Guidelines for Establishing Intermodal Connectors

FHWA Guidance Criteria for Evaluating Requests for Modifications to the National Highway System (Appendix D to Subpart A of Part 470) *as of January 21, 2015*

… The following guidance criteria should be used by the States to develop proposed modifications to the NHS.

1. Proposed additions to the NHS should be included in either an adopted State or metropolitan transportation plan or program.
2. Proposed additions should connect at each end with other routes on the NHS or serve a major traffic generator.
3. Proposals should be developed in consultation with local and regional officials.
4. Proposals to add routes to the NHS should include information on the type of traffic served (*i.e.*, percent of trucks, average trip length, local, commuter, interregional, interstate) by the route, the population centers or major traffic generators served by the route, and how this service compares with existing NHS routes.
5. Proposals should include information on existing and anticipated needs and any planned improvements to the route.
6. Proposals should include information concerning the possible effects of adding or deleting a route to or from the NHS might have on other existing NHS routes that are in close proximity.
7. Proposals to add routes to the NHS should include an assessment of whether modifications (adjustments or deletions) to existing NHS routes, which provide similar service, may be appropriate.
8. Proposed modifications that might affect adjoining States should be developed in cooperation with those States.
9. **Proposed modifications consisting of connections to major intermodal facilities should be developed using the criteria set forth below.** These criteria were used for identifying initial NHS connections to major intermodal terminals. The primary criteria are based on annual passenger volumes, annual freight volumes, or daily vehicular traffic on one or more principal routes that serve the intermodal facility. The secondary criteria include factors which underscore the importance of an intermodal facility within a specific State.

Primary Criteria

Airports

- Passengers—scheduled commercial service with more than 250,000 annual enplanements.
- Cargo—100 trucks per day in each direction on the principal connecting route, or 100,000 tons per year arriving or departing by highway mode.

Ports

- Terminals that handle more than 50,000 TEUs (a volumetric measure of containerized cargo which stands for twenty-foot equivalent units) per year, or other units measured that would convert to more than 100 trucks per day in each direction. (Trucks are defined as large single-unit trucks or combination vehicles handling freight.)
- Bulk commodity terminals that handle more than 500,000 tons per year by highway or 100 trucks per day in each direction on the principal connecting route. (If no individual terminal handles this amount of freight, but a cluster of terminals in close proximity to each other does, then the cluster of terminals could be considered in meeting the criteria. In such cases, the connecting route might terminate at a point where the traffic to several terminals begins to separate.)
- Passengers—terminals that handle more than 250,000 passengers per year or 1,000 passengers per day for at least 90 days during the year.

Truck/Rail

- 50,000 TEUs per year, or 100 trucks per day, in each direction on the principal connecting route, or other units measured that would convert to more than 100 trucks per day in each direction. (Trucks are defined as large single-unit trucks or combination vehicles carrying freight.)

Pipelines

- 100 trucks per day in each direction on the principal connecting route.

Secondary Criteria

Any of the following criteria could be used to justify an NHS connection to an intermodal terminal where there is a significant highway interface:

- Intermodal terminals that handle more than 20 percent of passenger or freight volumes by mode within a State;
- Intermodal terminals identified either in the Intermodal Management System or the State and metropolitan transportation plans as a major facility;
- Significant investment in, or expansion of, an intermodal terminal; or
- Connecting routes targeted by the State, MPO, or others for investment to address an existing, or anticipated, deficiency as a result of increased traffic.

Proximate Connections

Intermodal terminals, identified under the secondary criteria noted above, may not have sufficient highway traffic volumes to justify an NHS connection to the terminal. States and MPOs should fully consider whether a direct connection should be identified for such terminals, or whether being in the proximity (2 to 3 miles) of an NHS route is sufficient.