CAMBRIDGE SYSTEMATICS

Minnesota Comprehensive Statewide Freight and Passenger Rail Plan

Freight Rail Supply and Demand

draft technical

memorandum

prepared for

Minnesota Department of Transportation

prepared by

Cambridge Systematics, Inc.

July 31, 2009

Part One

Freight Rail Supply

technical memorandum

Minnesota Comprehensive Statewide Freight and Passenger Rail Plan

Freight Rail Supply Technical Memorandum

prepared for

Minnesota Department of Transportation

prepared by

Cambridge Systematics, Inc.
100 CambridgePark Drive, Suite 400
Cambridge, Massachusetts 02140

July 31, 2009

Table of Contents

List of Tables

Executive Summary

The role of the rail system in providing products for Minnesota consumers, markets for Minnesota companies, and carriage of passengers has evolved greatly over recent years, a trend that will continue with the anticipated renaissance of rail services. This technical memorandum describes Minnesota's rail system, how it has evolved, who it serves today, and its ability to accommodate the current and future freight logistics needs of shippers and receivers.

In 2007, freight railroads operating in Minnesota carried nearly 3.6 million carloads and over 235 million tons of freight over 4,546 route miles.[1,2] The primary commodities originating within the State include: iron ores (43 percent); grain and other field crops (17 percent); intermodal (13 percent); food products (9 percent); and gravel, crushed stone, and sand (5 percent). The primary terminating commodities are: iron ores (33 percent); coal (21 percent); intermodal (15 percent); grain or other field crops (6 percent); and chemicals (5 percent). In addition to supporting other industries, Minnesota's freight railroads are a major employer, paying an average salary of $71,400 to over 4,300 railroad employees that lived in the State in 2007.

Minnesota is served by four Class I railroads, and 18 active shortlines and switching railroads. This technical memo profiles these 22 active freight railroads. It begins with a general overview, followed by a detailed corridor-level description of each railroad. For the four Class I carriers, Burlington Northern Santa Fe Railway (BNSF), Canadian National (CN), Canadian Pacific (CP), and Union Pacific Railroad (UP), this memo first examines the main line corridors they operate and then the lower density corridors. The main line corridors connect Minnesota with the rest of the North American rail network, while the lower density corridors offer collection/distribution services and access to key industries.

[1] Traffic, wage, and job statistics are from Railroad Service in Minnesota, Association of American Railroads, 2008.

[2] The AAR reports 4,546 miles of railroad owned in Minnesota in 2007. Our best determination, after eliminating double counting of trackage and lease agreements, is 4,631 miles.

1.0 Objective

The objective of Task 2 is to document and assess Minnesota's rail system from a physical, operational, institutional, and market standpoint, focusing on the freight rail system and how effectively it serves the needs of Minnesota shippers, receivers, and communities. This technical memorandum details the rail line infrastructure in Minnesota and has two findings sections:

1. **Freight Rail System Overview –** A summary of the railroads operating in Minnesota with a focus on railroad class and mileage.

2. **Freight Railroad Descriptions –** A detailed, corridor-level description of each railroad operating in Minnesota. It includes current condition, history, track speeds, control system, traffic base, and, where known, train volumes.

The appendices contain the following:

- **Appendix A –** Railroad Abbreviations and Names; and
- **Appendix B –** Railroad Maps.

2.0 Methodology

Information contained in this technical memorandum was obtained from various railroad and government web sites, and discussions with railroad and industry experts familiar with the Minnesota State rail network. Depending on the availability of information, the description of each line includes endpoints, level of service, important features, brief summary of its history, permitted track speeds and railcar weights, and method of train control.

3.0 Freight Rail System Infrastructure

Railroad classification is determined by the Surface Transportation Board (STB). In 2007 a Class I railroad was defined as having $359.6 million or more in operating revenues. The Class I category encompasses the largest of railroads. A Class II railroad, often referred to as a regional railroad, is a midsized railroad that operates at least 350 miles of mainline track or generates at least $40 million in annual revenues. Class III railroads, or shortlines, are the remaining non-Class I or II line-haul railroads. A switching or terminal railroad is a railroad engaged primarily in switching and/or terminal services for other railroads (i.e., they are not typically involved in line-haul moves between two geographical locations).

Tables 3.1 and 3.2 provide a summary of the 22 freight railroads in Minnesota. Table 3.1 contains a summary by railroad class, while Table 3.2 shows route miles.

Table 3.1 Minnesota Freight Railroads by Class

Name	Reporting Mark	Class I	Class II	Class III	Terminal/ Switching
Burlington Northern Santa Fe Railway	BNSF	X			
Canadian National Railway	CN	X			
Canadian Pacific Railway	CPRS	X			
Cloquet Terminal Railroad	CTRR				X
Dakota, Minnesota & Eastern Railroad (CP)	DME		X		
Iowa, Chicago & Eastern Railroad (CP)	ICE		X		
Minnesota, Dakota & Western Railway	MDW			X	
Minnesota Northern Railroad, Inc.	MNN			X	
Minnesota Commercial Railway Company	MNNR			X	
Minnesota Prairie Line	MPL			X	
Minnesota Southern Railway	MSWY			X	
Northern Lines Railway	NLR			X	
Northern Plains Railroad	NPR			X	
North Shore Mining	NSM			X	
North Shore Scenic Railway	NSSR			X	
Otter Tail Valley Railroad	OTVR			X	
Progressive Rail Inc.	PGR			X	
Red River Valley and Western Railroad Co.	RRVW			X	
St. Croix Valley Railroad Company	SCXY			X	
Twin Cities & Western Railroad Company	TCWR			X	
Union Pacific Railroad	UP	X			
LTV Steel	ZLTV			X	

Minnesota is served by four Class I railroads, Burlington Northern Santa Fe (BNSF), Canadian National (CN), Canadian Pacific (CP), and Union Pacific (UP). These railroads provide the primary connections between Minnesota's ports, farms, and industries and the rest of North America. There are two Class II, or regional, railroads operating in Minnesota, the Dakota, Minnesota & Eastern Railroad and the Iowa, Chicago & Eastern Railroad. However, through recent acquisitions they are now formally part of the CP.

The 18 active shortlines and terminal/switching railroads in the State provide both important collector/distributor services for the larger railroads and local rail service to Minnesota shippers. These railroads range from shortlines operating over 150 miles, or less, in the State, to a switching railroad that connects to line-haul railroads.

Table 3.2 provides a summary of the railroads in Minnesota based on mileage. This table includes miles operated in Minnesota (which includes owned track plus trackage rights), percent of miles operated in Minnesota to total miles operated, and the miles of road[3] owned in Minnesota. BNSF operates over the most mileage in the State, but the 1,592 in-state miles only represent 5 percent of BNSF's total system mileage. In total, there are 4,631 miles operated in the State.

Table 3.2 Summary of Railroad Miles in Minnesota

Name	Reporting Mark	Miles Operated in Minnesota	PCT of Total	Total Miles Operated
Burlington Northern Santa Fe Railway	BNSF	1,595	5%	32,166
Canadian National Railway	CN	491	2%	21,000
Canadian Pacific Railway	CPRS	720	5%	13,200
Cloquet Terminal Railroad	CTRR	11	100%	11
Dakota, Minnesota & Eastern Railroad	DME	298	27%	1,103
Iowa, Chicago & Eastern Railroad	ICE	198	14%	1,400
Minnesota, Dakota & Western Railway	MDW	3	99%	4
Minnesota Northern Railroad, Inc.	MNN	169	100%	169
Minnesota Commercial Railway Company	MNNR	52	100%	52
Minnesota Prairie Line	MPL	95	100%	95
Minnesota Southern Railway	MSWY	41	100%	41
Northern Lines Railway	NLR	22	100%	22
Northern Plains Railroad	NPR	46	9%	484
North Shore Mining	NSM	53	100%	53
North Shore Scenic Railway	NSSR	31	100%	31
Otter Tail Valley Railroad	OTVR	68	100%	68
Progressive Rail Inc.	PGR	22	14%	156
Red River Valley and Western Railroad Co.	RRVW	2	1%	517
St. Croix Valley Railroad Company	SCXY	34	100%	34

[3] "Miles of road" is a linear measure of distance that does not consider the number of tracks.

Twin Cities & Western Railroad Company	TCWR	148	100%	148
Union Pacific Railroad	UP	445	2%	26,949
LTV Steel	ZLTV	87	100%	87

Figures B.1 and B.2 in Appendix B provide detailed maps of Class I and Regional/ Shortline railroads in the State. Appendix B also contains maps of the individual freight railroad subdivision; the appropriate figure for each railroad line is referenced in the text description.

3.1 Class I Rail Lines

Burlington Northern Santa Fe Railway

The Burlington Northern Santa Fe Railway (BNSF) is one of seven Class I railroads in the U.S. The railroad has 40,000 employees and operates over 32,000 route miles primarily in the western U.S., and connecting to the Midwest and East Coast via Mississippi River Gateway connections at Chicago, St. Louis, Memphis, and New Orleans. Greater North American service is provided through many connections with Canadian and Mexican railroads.[4]

BNSF operates nearly 1,600 route miles in Minnesota, which represents 5 percent of its total system route miles. Service is provided over six major corridors. The major corridors provide the primary conduits to the North American rail network, while the low-density corridors offer collection/distribution services. Table 3.3 provides detailed information on trains a day, number of at-grade crossings, primary signal system, FRA track class, and 286K-compliancy for all BNSF subdivisions in the State.

[4] Introductory material adapted from www.bnsf.com.

Table 3.3 Summary of BNSF Subdivisions in Minnesota

Subdivision	Trains/Day	At-Grade Crossings	Primary Signal System	FRA Track Class	286K-Compliant
Appleton	6	58	TWC	3	Yes
Brainerd	9	137	TWC	4	Yes
Browns Valley	1	55	Other	2	No
Casco	12	37	CTC	4	Yes
Grand Forks	7	175	TWC	4	Yes
Hanley Falls	1	59	TWC	2	Yes
Hib Tec	1	9	TWC	2	Yes
Hinckley	14	123	TWC	4	Yes
KO	67	10	ABS	4	Yes
Lakes	7	110	CTC	4	Yes
Marshall	14	194	TWC	4	Yes
Midway	32	3	CTC	3	Yes
Monticello	2	51	TWC	2	Yes
Moorhead	7	43	ABS	4	Yes
Morris	12	165	CTC	3	Yes
Noyes	3	140	TWC	3	Yes
P-Line	1	24	TWC	2	Yes
Prosper	8	8	ABS	3	Yes
St. Croix	52	0	CTC	4	Yes
St. Paul	52	7	CTC	4	Yes
Staples	47	237	CTC	4	Yes
Watertown	3	32	TWC	3	Yes
Wayzata	15	98	CTC	3	Yes

BNSF – Appleton Subdivision

This line runs from Benson to the South Dakota State line. In Benson the line connects with the Morris Subdivision. In Appleton it connects to the Twin Cities & Western Railroad Company (TCWR) mainline. TCWR has trackage rights into South Dakota on this subdivision. See Figure B.3 in the appendix.

BNSF – Brainerd Subdivision

This line runs from Chub Lake to Staples. In Staples it connects to the Staples Subdivision while at Chub Lake it connects to the Lakes Subdivision. This line is used to access the Twin Ports area from Fargo-Moorhead. There is a yard in Staples and a minor yard and shops in Brainerd. It sees around nine trains a day. See Figure B.4 in the appendix.

BNSF – Browns Valley Subdivision

This line runs from Morris to the end of track in Beardsley. In Morris it connects to the Morris Subdivision. It sees around one train a day. See Figure B.5 in the appendix.

BNSF – Casco Subdivision

This line runs from Gunn to Brookston. It connects to the Lakes Subdivision at both locations. It also connects to the Hib Tac Subdivision in Kelly Lake. There is a minor yard at Gunn. The line sees mostly taconite traffic and approximately 12 trains a day. See Figure B.6 in the appendix.

BNSF – Grand Forks Subdivision

This line runs from Cass Lake to the North Dakota State line in East Grand Forks. At Cass Lake the line connects to the Lakes Subdivision. At Erskine it interchanges with CP and the Detroit Lakes Subdivision. At Crookston they interchange with MNN and the Noyes Subdivision branches off to Noyes. The MNN uses the Crookston to Erskine to get between their Crookston and Thief River Falls lines. The line sees everything from coal to agricultural traffic and is used to get from Grand Forks to the Twin Ports and Iron Range. See Figure B.7 in the appendix.

BNSF – Hanley Falls Subdivision

This branch line runs from Hanley Falls to Madison. It connects with the Marshall Subdivision in Hanley Falls. It sees around a train a day. See Figure B.8 in the appendix.

BNSF – Hib Tac Subdivision

This line runs from Kelly Lake to Emmert Junction where it turns into CN track. The line connects with the Casco Subdivision in Kelly Lake. The line serves the Hib Tac mine and primarily sees taconite traffic. See Figure B.9 in the appendix.

BNSF – Hinckley Subdivision

This line runs from Coon Creek in Coon Rapids, to the State line near Superior. It connects with the Staples Sub at Coon Creek. The St. Croix Valley interchanges with the BNSF in Hinckley. Besides BNSF, CP and UP use this line to access the Twin Ports. This line is the direct connection from the Twin Cities to the Twin Ports. It sees around 14 trains a day. See Figure B.10 in the appendix.

BNSF – KO Subdivision

This line runs from Dilworth to the State line at Moorhead. It connects with the Staples Subdivision in Dilworth and the Prosper Subdivision in Moorhead. There is also a yard in

Dilworth. OTVR operates between the Prosper Subdivision connection in Moorhead and the yard in Dilworth. This line also hosts Amtrak's Empire Builder. It sees around 67 trains a day. See Figure B.11 in the appendix.

BNSF – Lakes Subdivision

This line runs from Cass Lake to the State border near Chub Lake. It connects to the Grand Forks Subdivision in Cass Lake and goes to Superior on the eastern end. It also connects with the Casco Subdivision at Gunn and Brookston. It connects with the Brainerd Subdivision in Chub Lake and the Cloquet Terminal in Cloquet. This line has a mix of traffic from coal to taconite. It sees around seven trains a day. See Figure B.12 in the appendix.

BNSF – Marshall Subdivision

This line runs from Willmar to the Iowa border continuing to Sioux City. There is a small piece in South Dakota. This line connects to the Hanley Falls Subdivision in Hanley Falls. The connection to the MPLI in Hanley Falls is not currently in service. This line connects to the Wayzata and Morris Subdivisions in Willmar. There is also a sizable yard in Willmar. It sees around 14 trains a day. See Figure B.13 in the appendix.

BNSF – Midway Subdivision

This line runs from Seventh Street in St. Paul to University in Minneapolis. It connects to the Staples Subdivision at University, Wayzata Subdivision at Minneapolis Junction, MNNR at St. Anthony, UP at Westminster, and St. Paul Subdivision at Seventh Street. There is an intermodal yard at Midway. Besides BNSF, trains from CP, TCWR, UP, and MNNR also run on this line. Amtrak also runs from St. Anthony to University with the Empire Builder, and can use either the St. Paul or Midway subdivisions between the MNNR and University. It sees around 32 trains a day. See Figure B.14 in the appendix.

BNSF – Monticello Subdivision

This branch line runs from Lyndale Junction in Minneapolis to the end of the line in Monticello but is only in regular service to Albertville. The line between Albertville and Monticello is only used for special moves to the nuclear power plant in Monticello. At Lyndale Junction the line connects to the Wayzata Subdivision. From Lyndale Junction to MW Junction UP also uses this line to access its Golden Valley Industrial Lead. It sees around two trains a day. See Figure B.15 in the appendix.

BNSF – Moorhead Subdivision

This line runs from South Moorhead to Kent before crossing into North Dakota. This line connects to the KO Subdivision in Moorhead. It sees around seven trains a day. See Figure B.16 in the appendix.

BNSF – Morris Subdivision

This line runs from Willmar to East Breckenridge. It connects to the Marshall and Wayzata Subdivisions in Willmar, and there is also a sizeable yard in Willmar. It connects to the RRVW and the Moorhead Subdivision in Breckenridge (to get to the Moorhead Subdivision BNSF must run over RRVW trackage in North Dakota for a stretch). The Browns Valley Subdivision branches off at Morris while the Appleton Subdivision branches off at Benson. It sees around 12 trains a day. See Figure B.17 in the appendix.

BNSF – Noyes Subdivision

This line runs from Crookston to Noyes. In Crookston it connects with the MNN and the Grand Forks Subdivision. In Noyes it connects to the CN in Manitoba. In Warren it connects with NPR. It sees about three trains a day. See Figure B.18 in the appendix.

BNSF – P-Line Subdivision

This branch line runs from Moorhead to the end of track north of Georgetown. It connects with the Prosper Subdivision in Moorhead. See Figure B.19 in the appendix.

BNSF – Prosper Subdivision

This line runs from South Moorhead to the State line in Moorhead. It connects to the OTVR at OTV junction and the KO Subdivision in Moorhead. See Figure B.20 in the appendix.

BNSF – St. Croix Subdivision

This line runs only a couple of miles from the Mississippi river crossing to St. Croix where it connects to the St. Paul Subdivision and CP's River Subdivision. It sees around 52 trains a day. See Figure B.22 in the appendix.

BNSF – St. Paul Subdivision

This line runs from University to St. Croix. At University it connects with the Midway Subdivision and CP. At Park Junction it connects with the MNNR. At Seventh Street it connects with the Midway Subdivision; at Soo Line Junction it connects with the CP. At Division Street and Hoffman it connects with CP and UP in a large interlocking. From Hoffman to St. Croix there is a split mainline with CP's River Subdivision as one main, and the St. Paul Subdivision at the other main. It sees around 52 trains a day. See Figure B.23 in the appendix.

BNSF – Staples Subdivision

This line runs from University to Dilworth. It connects with the Midway and St. Paul Subdivisions at University as well as CP. At Coon Creek is connects with the Hinckley Subdivision. In St. Cloud, the Northern Lines Railway branches off this Subdivision. In Staples the Brainerd Subdivision connects to this subdivision. In Detroit Lakes it connects to CP and in Dilworth it connects to the KO Subdivision. There are yards at Northtown, St. Cloud, Staples, and Dilworth. Amtrak uses this route for the Empire Builder. CP and UP use the University-Coon Creek segment to get to the Hinckley Subdivision. NLR uses a short segment in St. Cloud to access different industries in town. It sees around 47 trains a day. See Figure B.21 in the appendix.

BNSF – Watertown Subdivision

This line runs from Appleton to the South Dakota State line. It connects to the Appleton Subdivision in Appleton. It sees around three trains a day. See Figure B.24 in the appendix.

BNSF – Wayzata Subdivision

This line runs from Harrison Street in Minneapolis to Willmar where it connects with the Morris and Marshall Subdivisions. At Harrison Street it connects with the Midway Subdivision, at Lyndale Junction it connects with the Monticello Subdivision and at Cedar Lake Junction it connects with the TCWR. TCWR runs from Harrison Street to Cedar Lake, and UP runs from Harrison Street to Lyndale Junction. It sees around 15 trains a day. See Figure B.25 in the appendix.

Canadian National Railroad

The Canadian National Railroad (CN) is one of seven Class I railroads in the U.S., and is actually a Canadian-based railroad. The railroad employs over 22,000 people in Canada and the U.S. and operates over 20,000 route miles in the two countries. CN is positioning itself to be the railroad of choice for north-south trade. CN operates the largest rail network in Canada and the only transcontinental network in North America. The company operates in eight Canadian provinces and 16 U.S. states. It receives 51 percent of its revenue from U.S. domestic and cross-border traffic, 26 percent from international traffic and 23 percent from Canadian domestic traffic.[5]

CN operates nearly 500 route miles in Minnesota, which represents 2 percent of its total system route miles. Service is provided over 2 major corridors that connect to the Port of Duluth and the CP's Detroit Lakes Subdivision. Table 3.4 provides detailed information

[5] Introductory material adapted from www.cn.ca.

on trains a day, number of at-grade crossings, primary signal system, FRA track class, and 286K-compliancy for all CN subdivisions in the State.

Table 3.4 Summary of CN Subdivisions in Minnesota

Subdivision	Trains/Day	At-Grade Crossings	Primary Signal System	FRA Track Class	286K-Compliant
Dresser	4	30	TWC	2	No
Iron Range	8	43	TWC	3	Yes
Keenan	4	23	TWC	3	Yes
Minneapolis	6	9	TWC	3	Yes
Minntac	14	8	CTC	3	Yes
Missabe	11	98	TWC	4	Yes
Osage	2	42	TWC	3	No
Rainy	17	87	CTC	4	Yes
Sprague	17	64	CTC	4	Yes
Superior	4	7	TWC	4	Yes
Two Harbors	6	10	TWC	2	Yes

CN – Dresser Subdivision

This line runs from Withrow to the State line. In Withrow it connects to CP's Withrow Subdivision and the Minneapolis Subdivision. There is currently no CN traffic on this line; however, CP runs ballast trains to the quarry in Dresser, Wisconsin and the Osceola and St. Croix Valley Railway runs passenger trains on this subdivision on weekends and holidays during the spring, summer, and fall months. It averages four trains a day other than in the winter when the line is embargoed due to snow and ice conditions. See Figure B.27 in the appendix.

CN – Keenan Subdivision

This line runs from Keenan to Emmert Junction where it connects to BNSF's Hib Tac Subdivision. In Keenan it connects to the Missabe Subdivision. It sees around four trains a day. See Figure B.28 in the appendix.

CN – Iron Range Subdivision

This line runs from Iron Junction to the ore docks Two Harbors. It connects with the Hinsdale Subdivision at Wyman, Wales Spur in Wales, and Two Harbors Subdivision in Waldo and Two Harbors. The Wales Spur goes to Northshore Mining. It sees around eight trains a day. See Figure B.29 in the appendix.

CN – Minneapolis Subdivision

This line runs from Withrow to the State line. It connects to the Dresser Subdivision in Withrow as well as the CP Withrow Subdivision. It sees around six trains a day. See Figure B.30 in the appendix.

CN – Minntac Subdivision

This line runs from Wolf to the Minntac plant. It connects to the Missabe Subdivision in Wolf. See Figure B.31 in the appendix.

CN – Missabe Subdivision

This line runs from Largo to the Duluth docks. The end of track is at the Duluth ore docks. At Shelton Junction it connects with the Rainy Subdivision, at Wolf the Minntac Subdivision, at Iron Junction the Iron Range Subdivision, at Keenan the Keenan Subdivision, at Carson the Superior Subdivision, and at Collingwood a spur runs to connect to BNSF. There is a major yard at Proctor and a smaller yard at Keenan. It sees around 11 trains a day. See Figure B.32 in the appendix.

CN – Osage Subdivision

This line, a part of the Cedar River Railroad – a CN subsidiary, runs from the UP connection in Glenville to the State line near Lyle. It sees around two trains a day. See Figure B.33 in the appendix.

CN – Rainy Subdivision

This line runs from Duluth Junction to Nopeming Junction. At Duluth Junction the line crosses into Ontario. At Ranier it connects to the MDW. At Shelton Junction it connects to the Missabe Subdivision and at Nopeming Junction it connects to Superior Subdivision. It sees around 17 trains a day. See Figure B.34 in the appendix.

CN – Sprague Subdivision

This line runs across northern Minnesota from the border crossing at Rainy River to the border crossing near Warroad. It sees around 17 trains a day. See Figure B.35 in the appendix.

CN – Superior Subdivision

This line runs from Carson to the Wisconsin State line. At Carson it connects to the Missabe Subdivision. At Proctor Junction it connects to Proctor Yard. At Nopeming Junction it connects to the Rainy Subdivision. The line crosses the river at Steelton. It sees around four trains a day. See Figure B.36 in the appendix.

CN – Two Harbors Subdivision

This line runs from Two Harbors connecting to the Iron Range Subdivision at Waldo and yard and ore docks in Two Harbors. See Figure B.37 in the appendix.

Canadian Pacific Railway

The Canadian Pacific Railway (CP) is one of seven Class I railroads in the U.S. The railroad has 15,000 employees, of which 80 percent are located in Canada. The railway operates over 13,200 miles, serving the principal business centers of Canada from Montreal, Quebec to Vancouver, British Columbia and the U.S. Northeast and Midwest regions.[6]

CP operates over 700 route miles in Minnesota, which represents 5 percent of its total system route miles. Service is provided over three major corridors. The major corridors provide the primary conduits to the North American rail network, while the low-density corridors offer collection/distribution services. In 2008, CP purchased the Dakota, Minnesota & Eastern Railroad (DME), including its subsidiary, Iowa, Chicago, and Eastern Railroad (ICE). Pending ongoing corporate restructuring and integration of these lines into CP, this technical memo lists them as identifiable Class II Regional railroads in the inventory and tables.

Table 3.5 provides detailed information on trains a day, number of at-grade crossings, primary signal system, FRA track class, and 286K-compliancy for all CP subdivisions in the State.

[6] Introductory material adapted from www.cpr.ca.

Table 3.5 Summary of CP Subdivisions in Minnesota

Subdivision	Trains/Day	At-Grade Crossings	Primary Signal System	FRA Track Class	286K-Compliant
Bass Lake Spur	5	8	BRT	2	Yes
Bemidji	2	37	TWC	1	No
Detroit Lakes	9	321	TWC	3	Yes
Elbow Lake	12	70	TWC	4	Yes
Hartland	4	30	Other	Unavailable	Yes
Huron	5	71	TWC	3	Yes
Jackson	2	492	TWC	3	Yes
Marquette	4	5	TWC	4	Yes
Merriam Park	12	6	CTC	4	Yes
MN&S	2	34	BRT	1	Yes
Noyes	9	79	TWC	3	Yes
Owatonna	4	111	TWC	2	Yes
Paynesville	20	105	CTC	4	Yes
River	12	70	CTC	4	Yes
St. Paul	2	12	TWC	2	Yes
Tracy	5	181	TWC	3	Yes
Waseca	4	204	TWC	2	No
Withrow	4	34	CTC	3	Yes

CP – Bass Lake Spur Subdivision

The Bass Lake Spur runs from Cedar Lake Junction in Minneapolis to Tower E-14 just west of Hopkins. It connects with BNSF at Cedar Lake and TCWR in Hopkins. CP currently does not use this subdivision; however, this is TCWR's mainline and is how it reaches the Twin Cities. It sees around four to six trains a day with mostly agricultural-based commodities. See the TCWR section for more details on what commodities it ships. See Figure B.38 in the appendix.

CP – Bemidji Subdivision

This branch line runs from Gully to Plummer where it joins the Detroit Lakes Subdivision. See Figure B.39 in the appendix.

CP – Detroit Lakes Subdivision

This line runs from Glenwood to Thief River Falls. It connects with the Paynesville and Elbow Lake Subdivisions in Glenwood and it connects with the Noyes Subdivision in Thief River Falls. In Thief River Falls is also the connection to Northern Plains and Minnesota Northern. In Plummer the Bemidji Subdivision joins this subdivision. There is a BNSF interchange in Erskine. MNN uses the line from Erskine to Thief River Falls to travel between Thief River Falls and Crookston. This line is a part of CP's connection

from Chicago to Winnipeg. There are yards in Glenwood and Thief River Falls. The line sees everything from intermodal to agricultural traffic. It sees around nine trains a day. See Figure B.40 in the appendix.

CP – Elbow Lake Subdivision

This line is a part of CP's mainline from Chicago to Portage, North Dakota and western Canada. It runs from Glenwood to the North Dakota State line. At Glenwood it connects with the Paynesville Subdivision and the Detroit Lakes Subdivision. The line sees everything from intermodal to agricultural traffic. It sees around 12 trains a day. See Figure B.41 in the appendix.

CP – Merriam Park Subdivision

This line runs from St. Paul Yard to Merriam Park. There is a spur to the Ford plant that breaks off at Fordson Junction. At St. Paul Yard it connects with the River Subdivision. At Merriam Park it connects with the MNNR. At Chestnut Street it connects with the UP Mankato Subdivision. This line goes through the interlocking plants at Hoffman Avenue with BNSF and UP. In addition to CP traffic, there is also TCWR traffic going between MNNR's A Yard, CP's St. Paul Yard and UP's Western Avenue or Belt Yards. The Empire Builder uses this line to access the Minneapolis-St. Paul station twice a day. The line sees everything from automotive to agricultural traffic. It sees around 12 trains a day. See Figure B.42 in the appendix.

CP – MN&S Spur Subdivision

This line runs from MN&S Junction in Crystal to Auto Club Junction in Bloomington. At MN&S Junction the line joins the Paynesville Subdivision. At Auto Club Junction there is an interchange with PGR's Dan Patch Line. This branch line sees a wide mix of commodities. The local train runs in both directions Monday through Friday. See Figure B.43 in the appendix.

CP – Noyes Subdivision

This line runs from the Manitoba border at Noyes to Thief River Falls. This line is part of CP's connection from Chicago to Winnipeg. In Thief River Falls it connects to the Detroit Lakes Subdivision as well as Northern Plains and Minnesota Northern. It sees around nine trains a day. See Figure B.44 in the appendix.

CP – Paynesville Subdivision

This line is a part of CP's mainline from Chicago to Portage, North Dakota, and western Canada. It runs from Glenwood to the interlocking at CP University in Minneapolis. At Glenwood it connects with the Elbow Lake Subdivision and the Detroit Lakes Subdivision. At University it connects with the BNSF's St. Paul, Midway, and Staples Subdivision. At MNS Junction it connects with the MN&S Subdivision. There is a yard in

Glenwood and Humboldt Yard and Shoreham Yard in Minneapolis. The line sees everything from intermodal to agricultural traffic. It sees around 20 trains a day. See Figure B.45 in the appendix.

CP – River Subdivision

This line is a part of CP's mainline from Chicago to Portage, North Dakota, and western Canada. It runs from St. Paul Yard to River Junction near La Crescent. At St. Paul Yard it connects with the BNSF's St. Paul Subdivision and CP's Merriam Park Subdivision. At River Junction it connects with the Tomah Subdivision and the IC&E Marquette Subdivision. There is a major yard in St. Paul (St. Paul Yard) and minor yards/terminals in Hastings, Red Wing, Wabasha, and Winona. Amtrak's Empire Builder runs along this subdivision for the entire duration. The line sees everything from intermodal to agricultural traffic. It sees around 12 trains a day. See Figure B.46 in the appendix.

CP – St. Paul Subdivision

This line runs from Cardigan Junction where it connects to the Withrow Subdivision to Soo Junction in St. Paul where it connects to BNSF. This line is a connector between the Withrow Subdivision and the St. Paul Yard and also serves local industries. See Figure B.47 in the appendix.

CP – Withrow Subdivision

This line runs from CP University to Withrow where it connects to CN's Dresser and Minneapolis Subdivisions. At CP University it connects to the Paynesville Subdivision and BNSF's St. Paul, Staples, and Midway Subdivisions. Shoreham Intermodal Yard is in Minneapolis. In New Brighton there is a MNNR yard and diamond allowing interchange between the two lines. At Cardigan Junction the CP St. Paul Subdivision branches off. The line sees a mix of traffic and is the route for CP to get ballast from Dresser, Wisconsin to the rest of its system. CN uses the line to access the cities and the MNNR (New Brighton) and BNSF (Northtown) lines. The line sees around four trains a day. See Figure B.48 in the appendix.

Dakota, Minnesota & Eastern Railroad

DME – Hartland Subdivision

This line runs from Waseca to Hartland. It connects to the Tracy and Waseca Subdivisions in Waseca and to UP in Hartland. See Figure B.49 in the appendix.

DME – Huron Subdivision

This line runs from Tracy to the South Dakota State line. This subdivision is a part of the DME mainline; its main commodities are agricultural products, construction materials,

and more. It turns into the Tracy Subdivision at Tracy, Minnesota. It sees around five trains a day. See Figure B.50 in the appendix.

DME – Jackson Subdivision

This line runs from Ramsey to Jackson. The line ends in Jackson with connections to the Owatonna Subdivision in Ramsey (near Austin). It sees around two trains a day. See Figure B.51 in the appendix.

DME – Marquette Subdivision

This line runs from the Iowa State line to La Crescent. This was the ICE mainline to the Twin Cities. In La Crescent it interchanges with the CP and continues north to St. Paul via the CP. ICE carries a variety of products with the majority being agricultural. It sees around four trains a day. See Figure B.52 in the appendix.

DME – Owatonna Subdivision

This subdivision runs from the Iowa border to Comus, just south of Northfield. From there it runs on UP to access the yard in Northfield in order to interchange with PGR, CP, and UP. For a short section it runs on the Waseca Subdivision in Owatonna. This is another north-south mainline for IC&E, with the majority of products carried being agricultural in nature. It sees around four trains a day. See Figure B.53 in the appendix.

DME – Tracy Subdivision

This subdivision runs from Waseca to Tracy. In Mankato it runs over the UP Mankato Subdivision from MP 129.6 to 142.4. This subdivision is a part of the DME mainline. Its main commodities are agricultural products and construction materials. It connects with the Huron Subdivision at Tracy and Waseca Subdivision at Waseca. It also connects with the Hartland Subdivision in Waseca. It sees around five trains a day. See Figure B.54 in the appendix.

DME – Waseca Subdivision

This Subdivision runs from Waseca to Winona. This Subdivision is a part of the DME mainline. Its main commodities are agricultural products and construction materials. It connects with the Tracy Subdivision at Waseca and CP near Winona at MC Junction. It also connects with the Hartland Subdivision in Waseca. It sees around four trains a day. See Figure B.55 in the appendix.

Union Pacific Railroad

The Union Pacific Railroad (UP) is the largest railroad in North America, operating 32,400 route miles in the western U.S. The railroad serves 23 states, linking every major West Coast and Gulf Coast port, and provides service to the east through the four major gateways of Chicago, St. Louis, Memphis, and New Orleans.[7] UP operates nearly 500 route miles in Minnesota, which represents 2 percent of its total system route miles. Service is provided over two major corridors.

Table 3.6 provides detailed information on trains a day, number of at-grade crossings, primary signal system, FRA track class, and 286K-compliancy for all UP subdivisions in the State.

Table 3.6 Summary of UP Subdivisions in Minnesota

Subdivision	Trains/Day	At-Grade Crossings	Primary Signal System	FRA Track Class	286K-Compliant
Albert Lea	11	179	CTC	4	Yes
Altoona	5	23	ABS	4	Yes
Fairmont	3	117	TWC	4	Yes
Hartland	0	29	TWC	1	No
Mankato	5	156	TWC	4	Yes
Montgomery	2	49	TWC	3	Yes
Rake	2	12	TWC	4	Yes
Winona	1	12	Other	1	Yes
Worthington	5	83	TWC	4	Yes

UP – Albert Lea Subdivision

This line runs from Hoffman in St. Paul to the Iowa State line. It connects with CP and BNSF at Hoffman. In Rosemount it connects with PGR's Eagandale line and the Roseport Industrial Lead. In Northfield it connects with CP and PGR's Jesse James and Cannon Valley lines. CP also runs on this segment from St. Paul to Northfield to access Rosemount and Northfield. In Comus it connect with CP (IC&E) as well as in Albert Lea (DM&E) and in Glenville it connect with CEDR/CN. There are yards at St. Paul and South St. Paul. It sees around 11 trains a day. See Figure B.56 in the appendix.

[7] Introductory material adapted from www.up.com.

UP – Altoona Subdivision

This line runs from Westminster to the Wisconsin State line and the Hudson bridge. The Stillwater Industrial Lead branches off at Lakeland Junction; the line connects to BNSF at Westminster. It has to run over the BSNF Midway Subdivision to access its East Minneapolis yard. It sees around five trains a day. See Figure B.57 in the appendix.

UP – Fairmont Subdivision

This line runs from Butterfield to the State line near Bricelyn. It comes off the Worthington Subdivision at Butterfield. The Rake Subdivision connects at Bricelyn; the CP (IC&E) connects at both Fairmont and Welcome. It sees around three trains a day. See Figure B.58 in the appendix.

UP – Hartland Subdivision

This line runs from Albert Lea to Hartland where it turns into the DM&E. It connects to the Albert Lea Subdivision in Albert Lea. It currently is not used in active service. See Figure B.59 in the appendix.

UP – Mankato Subdivision

This line runs from Hoffman to St. James. It connects with CP and BNSF at Hoffman, the State St. Industrial Lead at Robert Street, the Montgomery Subdivision at Merriam, and CP (DM&E) in Mankato. In St. James the line connects to the Worthington Subdivision. CP and TCWR run over the line from Chestnut Street to Hoffman and CP/DM&E run over UP for a portion of the subdivision in Mankato. There are yards at Western Avenue (St. Paul), Valley Park (Shakopee) and Mankato. It sees around five trains a day. See Figure B.60 in the appendix.

UP – Montgomery Subdivision

This line runs from Merriam to the end of track near Montgomery. It comes off of the Mankato Subdivision and has one round trip local train a day. See Figure B.61 in the appendix.

UP – Rake Subdivision

This line runs from Bricelyn to the Iowa State line, it comes off of the Fairmont Subdivision. See Figure B.62 in the appendix.

UP – Winona Subdivision

This subdivision runs in Winona and comes off the CP River Subdivision. It serves the local industry only; it has to run on CP to access this Subdivision. It sees a local train a day. See Figure B.63 in the appendix.

UP – Worthington Subdivision

This line runs from St. James to the Iowa State line. It connects to the Mankato Subdivision in St. James, the Fairmont Subdivision in Butterfield, and the Minnesota Southern in Agate. It sees around five trains a day. See Figure B.64 in the appendix.

3.2 Regional and Shortline Railroads

Cloquet Terminal

This is a switching railroad which operates four miles based out of Cloquet. Its main commodities are related to the paper mills in Cloquet, both inbound raw material and outbound finished products. It also has running rights for another 20 miles on yard and industrial track in the Cloquet area. It is owned by Sappi Fine Paper North America. Before changing its name it was the Duluth and Northeastern. CTRR interchanges with CP and BNSF. See Figure B.2 in the appendix.

Minnesota Commercial

MNNR operates 35 miles of its own track and more than 120 miles of other track in the Minneapolis-St. Paul area. Its base of operations is in St. Paul and it serve a number of the metro area suburbs as well as customers in the heart of the Metro region. The railroad started in 1987; previously, it was the Minnesota Transfer Railway which was started in 1883. It carries a wide variety of commodities from grain and steel to paper and consumer goods. It also serve various warehouses, team tracks, and transload facilities. It also hosts Amtrak and the St. Paul station on the Commercial's track. MNNR interchanges with BNSF, CP, CN, UP, and TCWR. See Figure B.2 in the appendix.

Minnesota Dakota and Western

MD&W is based out of International Falls and provides service to the paper mills of International Falls and Fort Francis, Ontario. It operates four miles of track and is owned by Boise Cascade. Besides serving the paper plants it also operates an intermodal yard in International Falls to handle container traffic in the area. It interchanges with CN on both sides of the border. See Figure B.2 in the appendix.

Minnesota Northern

MNN is made up of a number of former BN lines in northern Minnesota. Based out of Crookston, it operates branch lines out of Crookston and Thief River Falls. From Crookston it goes to Beltrami and Perley, and from Thief River Falls its run to Warroad and St. Hilaire. It operates over 230 miles of track, including trackage rights from both CP and BNSF to travel between Crookston and Thief River Falls. It own 156 of those miles.

Commodities range from grain and sugar to aggregate and fertilizer. It interchanges with both CP and BNSF. See Figure B.2 in the appendix.

Minnesota Prairie Line

MPLI is a subsidiary of Twin Cities & Western and operates 94 miles of track for the Minnesota Valley Regional Railroad Authority (MVRRA), the public owner of the railroad infrastructure. It runs between Norwood and Hanley Falls. Its main commodities are grain, ethanol, and ethanol byproducts. The line went though a number of owners after CNW abandoned it and it fell into disrepair and eventually was out of service. In 2002, service was restored to the line and MPLI began operations as the contracted carrier for MVRRA. It interchanges with TC&W in Norwood. See Figure B.2 in the appendix.

Minnesota Southern

MSWY runs from Agate to Manley on 42 miles of track owned by the regional rail authority. Previous to MSWY it was operated by Nobles Rock Railway and before that CNW. Its main commodities are corn, ethanol, and other agricultural products. It interchanges with BNSF in Manley and UP in Agate. See Figure B.2 in the appendix.

North Shore Scenic

NSSR operates between Duluth and Two Harbors during the spring, summer, and fall operating passenger trains out of the Duluth depot. The 25 miles of track is owned and maintained by the St. Louis & Lake County Regional Rail Authority. It operate over CN for a quarter mile to reach the Two Harbors depot; the remainder of their service is on the county owned track. It can interchange with CN in Two Harbors and BNSF, CP, UP, and CN in Duluth. See Figure B.2 in the appendix.

Northern Lines

NLR operates 23 miles of former BSNF track from St. Cloud to St. Joseph and Cold Spring. It is part of the Anacostia & Pacific family of shortlines. Besides operating its pair of lines, it serves a number of industries in St. Cloud proper. Its main commodity is ballast; it runs ballast trains for BNSF to the quarry in Waite Park. Besides ballast it also moves among scrap metal and building materials. It interchanges with BNSF in St. Cloud. See Figure B.2 in the appendix.

Northern Plains

NPR operates 45 of its 483 miles in Minnesota. Its former CP line runs from Thief River Falls to the State line at Oslo and to North Dakota. It ship a number of commodities from grain to aggregates and other agricultural products. It interchanges with CP in Thief River Falls and can also connect to MNN at the same location. See Figure B.2 in the appendix.

Otter Tail Valley

OTVR is a RailAmerica shortline that runs from Moorhead/Dilworth to Fergus Falls as well as a pair of branch lines. It owns a total of 71 miles of track. Its main commodities are grain and coal for the power plant in Fergus Falls. It also serve the industrial park in Moorhead. It interchanges with BNSF in Dilworth. See Figure B.2 in the appendix.

Progressive Rail

PGR operates almost 80 miles of track in the south metro area on a variety of lines. The Dan Patch line runs from Bloomington to south Minneapolis, the Eagandale line runs from Rosemount to Eagan, the Cannon Valley line runs from Northfield to Cannon Falls, the Jesse James line connects Northfield to Lakeville, and it also has a switching operation in Faribault. It moves a wide variety of commodities – everything from heavy equipment to building products, and also serve a large industrial park in Lakeville. Its lines are a mix of former UP and CP lines and it continues to interchange with both. See Figure B.2 in the appendix.

Red River Valley and Western

RRVW operates two miles of track in Minnesota, from Breckenridge to the North Dakota State line as part of its 517 miles of primarily North Dakota regional railroad operations. It moves a variety of commodities, from agricultural goods to building supplies, and has shown consistent growth in carloadings and employment over the last 23 years. It has a locomotive and car shop as well as a yard in Breckenridge and also serves a pair of grain shuttle train facilities in Breckenridge. It interchanges with BNSF in Breckenridge, and has been successful in extending its presence as an efficient grain hauler by being included as a partner in the BNSF shuttle network, with several shuttle elevators located on its lines. Although an independent company, RRVW has been associated with TC&W and MPLI through overlapping boards and corporate management teams since its inception in 1987.

St. Croix Valley

SCXY operates 36 miles of track from Hinckley to North Branch carrying mostly grain, flour, and agricultural products. The line is a former BNSF line and the St. Croix Valley is based out of Rush City where it has a yard and office. It is owned by the same parent company that owns Minnesota Northern and Dakota Northern. It interchanges with BNSF in Hinckley. See Figure B.2 in the appendix.

Twin Cities and Western

TCWR operates over 229 miles of track with 146 of that being their own former Soo Line track. They are based out of Glencoe and run from Appleton to Hopkins with trackage rights to Milbank, South Dakota, and a variety of yards and terminals in the Minneapolis-St. Paul area. The main commodities are agricultural-based, from grain to ethanol. They

also run intermodal trains from Montevideo to Minneapolis. They interchange with BNSF in Appleton and Sisseton & Milbank in Milbank, South Dakota. In the Minneapolis-St. Paul area they interchange with BNSF, CP, UP, and MNNR. See Figure B.2 in the appendix.

3.3 Industrial Railroads

LTV Steel

This line is inactive and the mine is shut down. It runs occasional clean up trains between Hoyt Lakes and the docks at Beaver Bay. See Figure B.2 in the appendix.

Northshore Mining

This line is active and runs taconite trains from its mines near Babbitt to the docks at Silver Bay. It connects to the CN/DMIR via the Wales Spur. See Figure B.2 in the appendix.

3.4 Rail Line Conclusions

Freight railroads operating in Minnesota carried nearly 3.6 million carloads and over 235 million tons of freight over 4,546 route miles in 2007. They provided service to the ports, agricultural shippers, mining industry, and to the residents of the State by supplying consumer goods, food products, and petroleum. In addition to supporting other industries, Minnesota's freight railroads are a major employer, paying an average salary of $71,400 to over 4,300 railroad employees that lived in the State in 2007.

The four Class I railroads operating in the State, BNSF, CN, CP and UP, provide the primary connections between Minnesota and the rest of North America. The regional, shortline, and terminal/switching railroads provide local service and connections to the national rail network. The 18 active shortlines and terminal/switching railroads provide both important collector/distributor services for the Class I railroads and local regional rail services.

Appendices

Appendix A: Railroad Abbreviations and Names

AMTK	Amtrak
BNSF	Burlington Northern Santa Fe Railroad
CN	Canadian National Railroad
CP	Canadian Pacific Railroad
CTRR	Cloquet Terminal Railroad
DME	Dakota, Minnesota & Eastern Railroad
ICE	Iowa, Chicago & Eastern Railroad
MDW	Minnesota, Dakota and Western Railway
MNN	Minnesota Northern Railroad, Inc.
MNNR	Minnesota Commercial Railway Company
MPLI	Minnesota Prairie Line
MSWY	Minnesota Southern Railway
NPR	Northern Plains Railroad
NSSR	North Shore Scenic on SLLX
OTVR	Otter Tail Valley Railroad
PGR	Progressive Rail Inc.
RRVW	Red River Valley and Western
SCXY	St. Croix Valley Railroad Company
SLLX	St. Louis & Lake Counties
TCWR	Twin Cities & Western Railroad Company
UP	Union Pacific Railroad

Appendix B: Railroad Maps

Figure B.1 Minnesota Class I Railroad Map

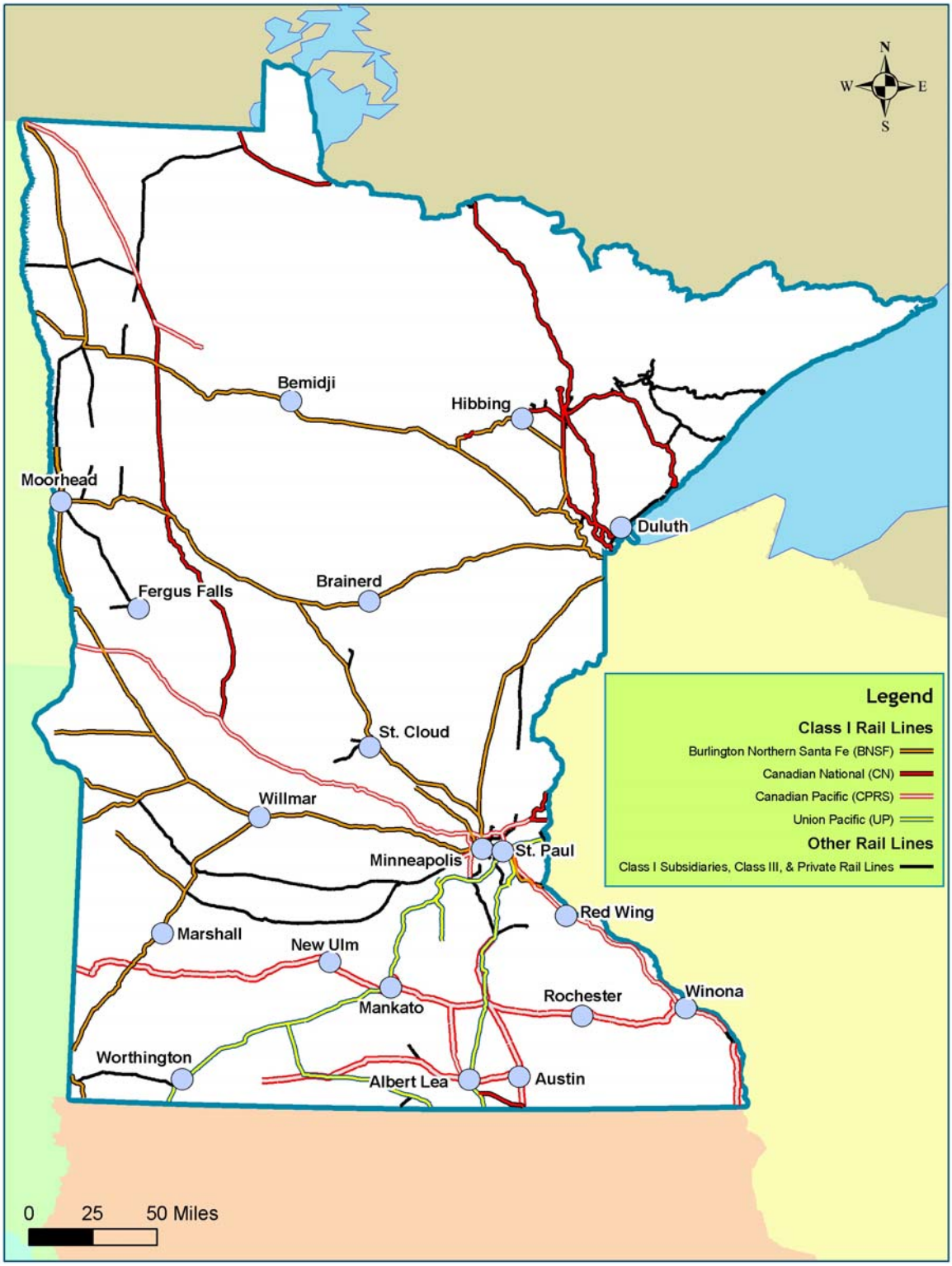


Figure B.2 Minnesota Regional and Shortline Railroad Map

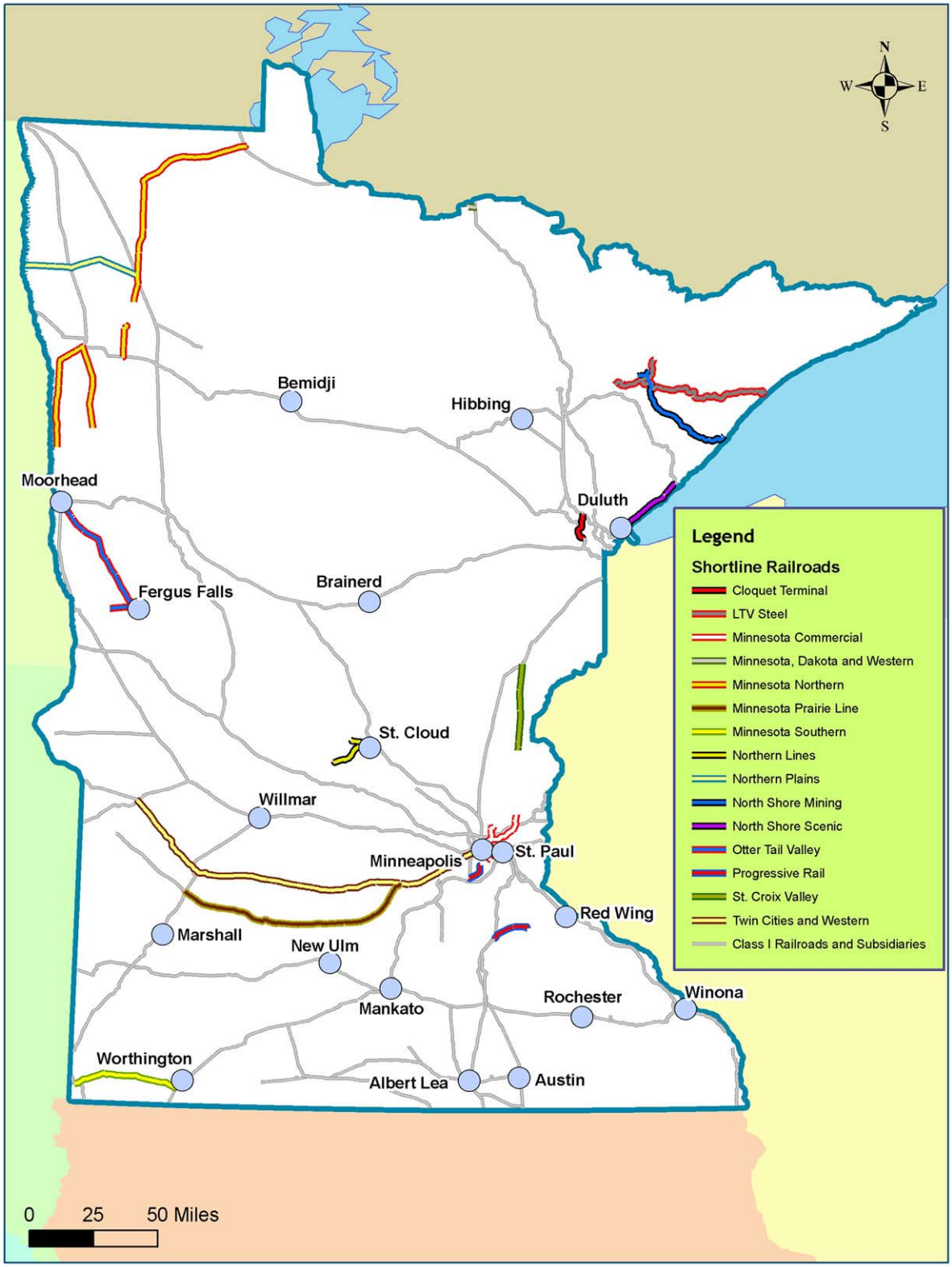


Figure B.3 BNSF Appleton Subdivision

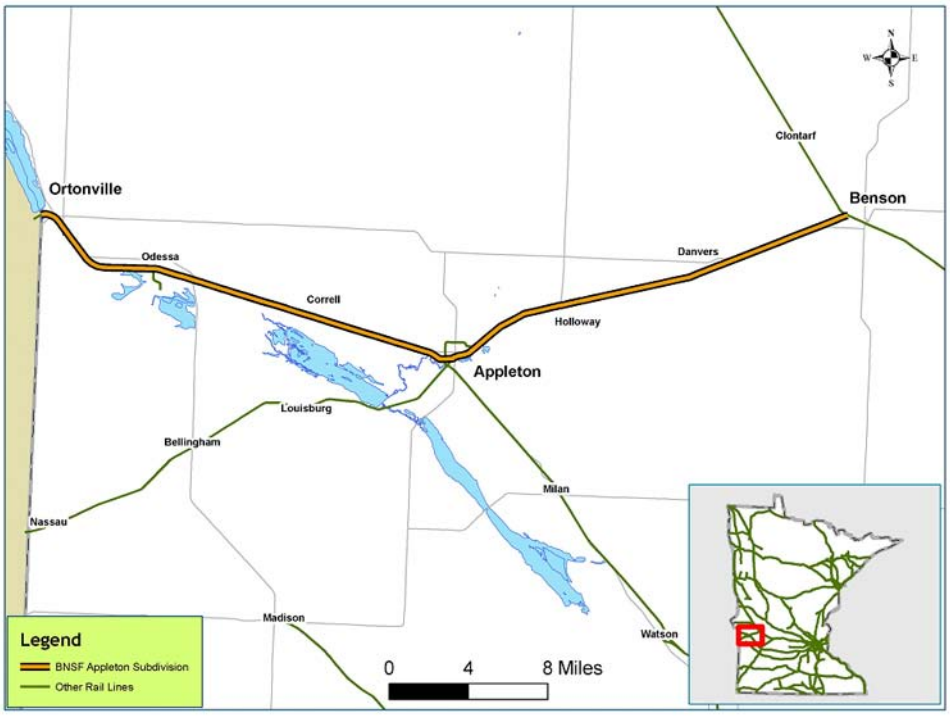


Figure B.4 BNSF Brainerd Subdivision

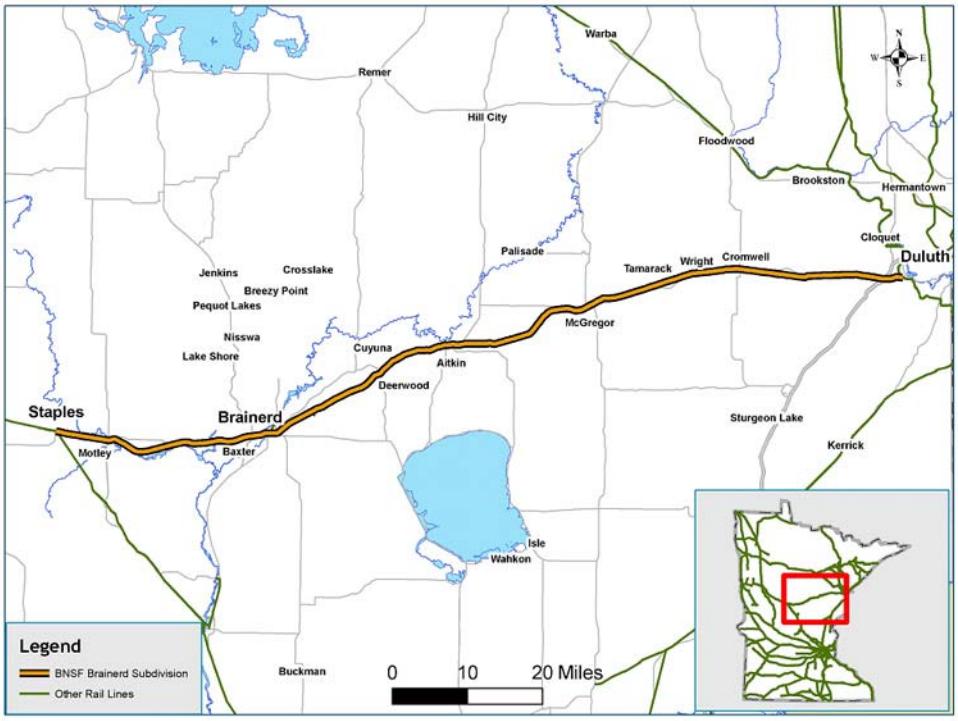


Figure B.5 BNSF Browns Valley Subdivision

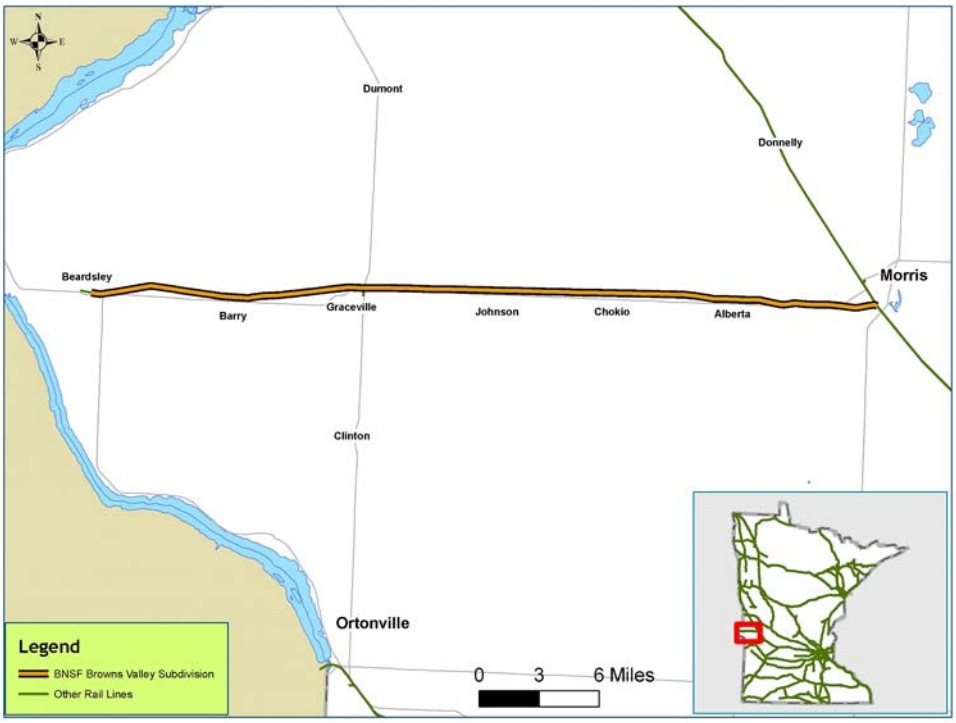


Figure B.6 BNSF Casco Subdivision

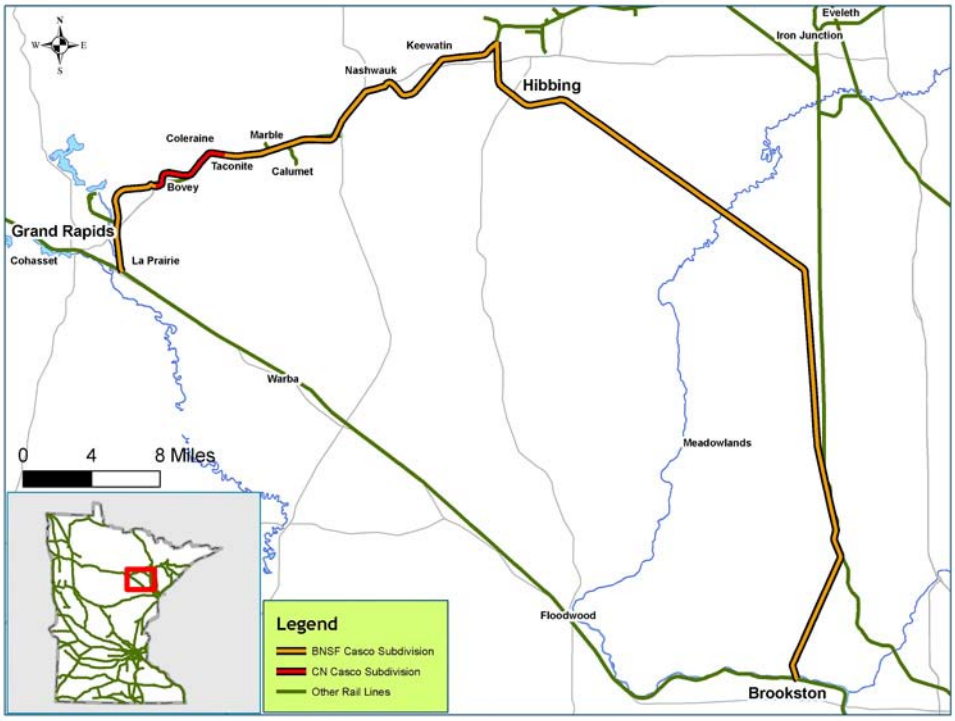


Figure B.7 BNSF Grand Forks Subdivision

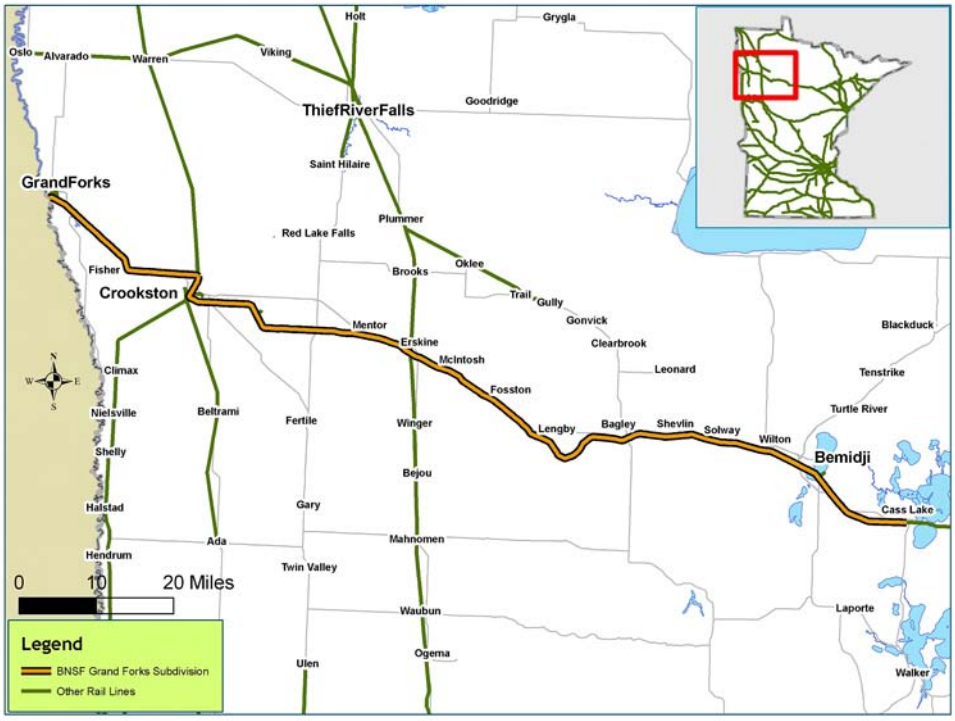


Figure B.8 BNSF Hanley Falls Subdivision

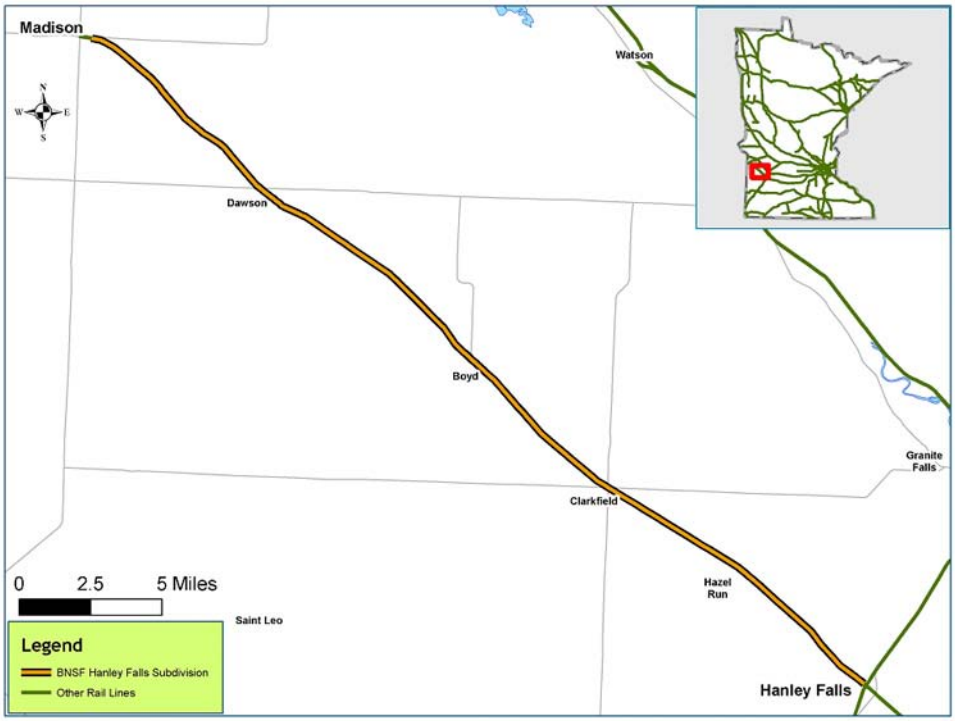


Figure B.9 BNSF Hib Tac Subdivision

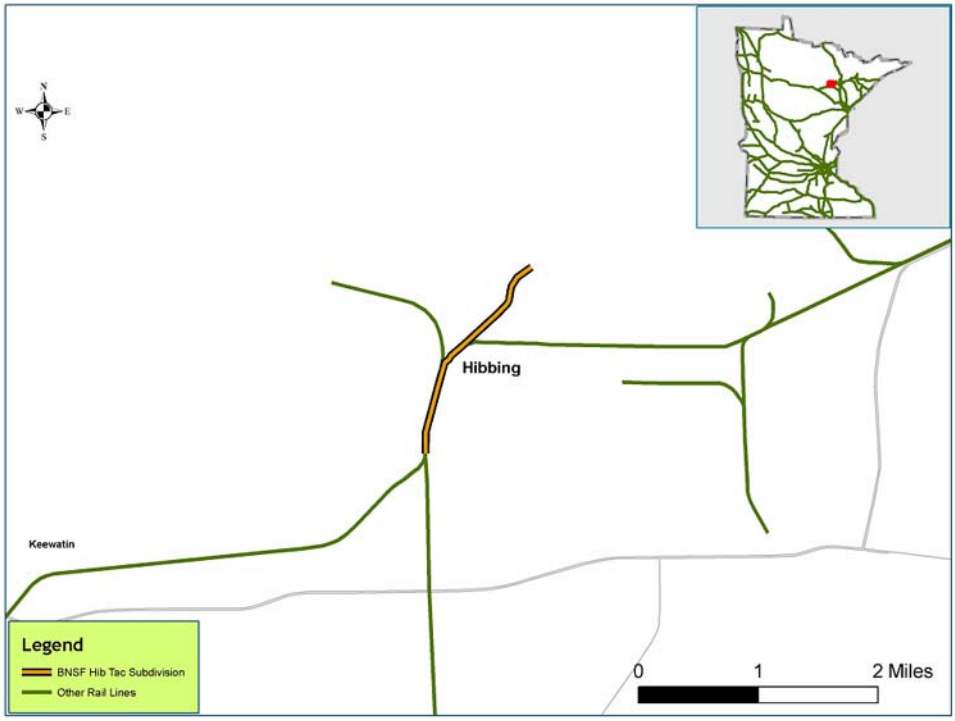


Figure B.10 BNSF Hinckley Subdivision

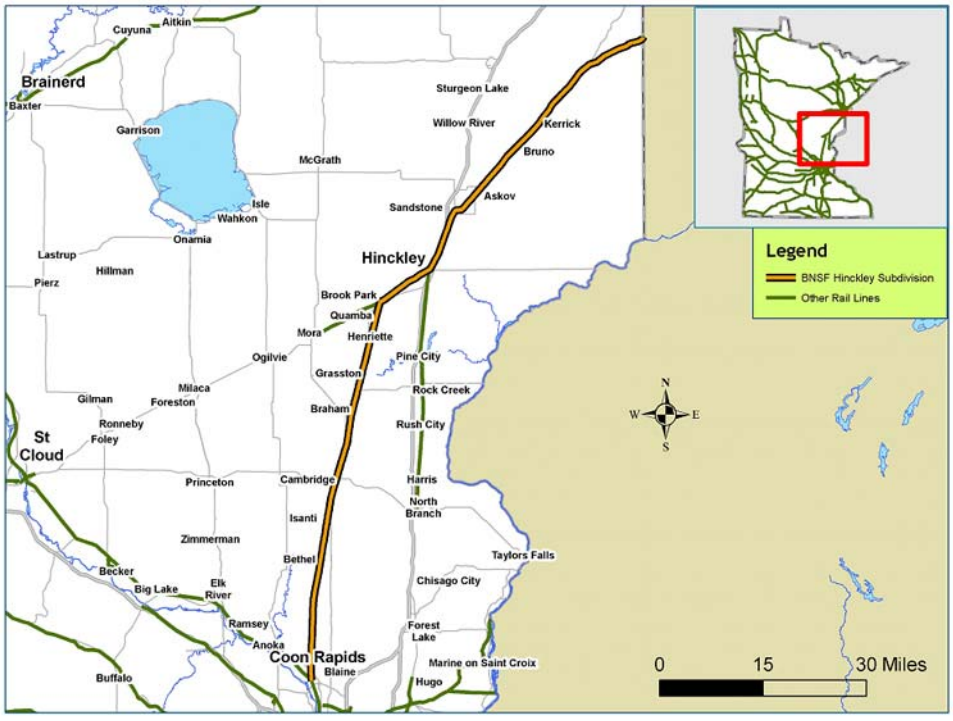


Figure B.11 BNSF KO Subdivision

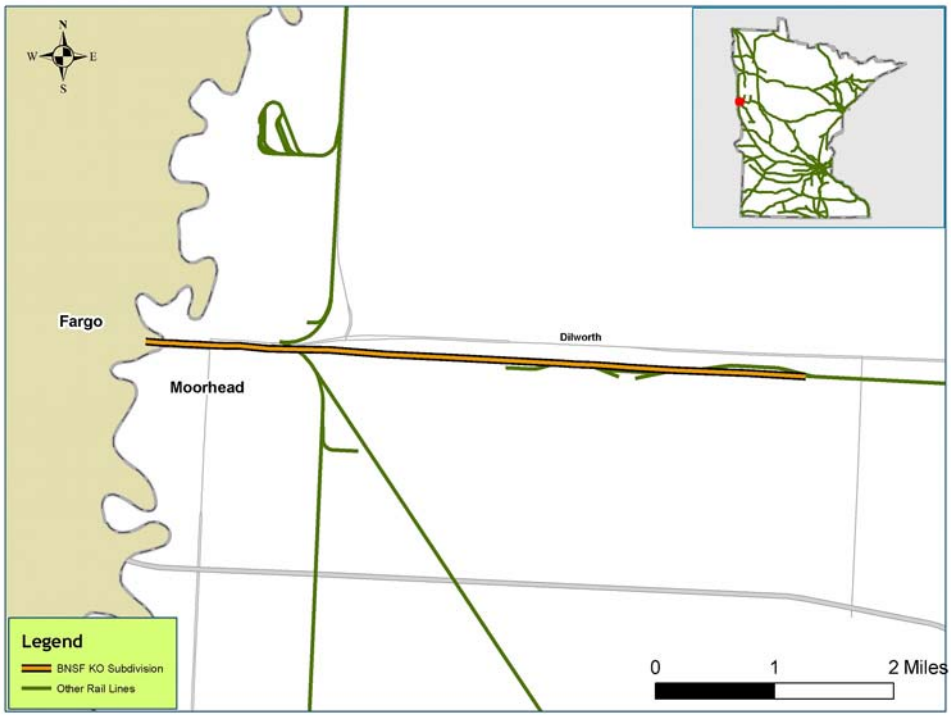


Figure B.12 BNSF Lakes Subdivision

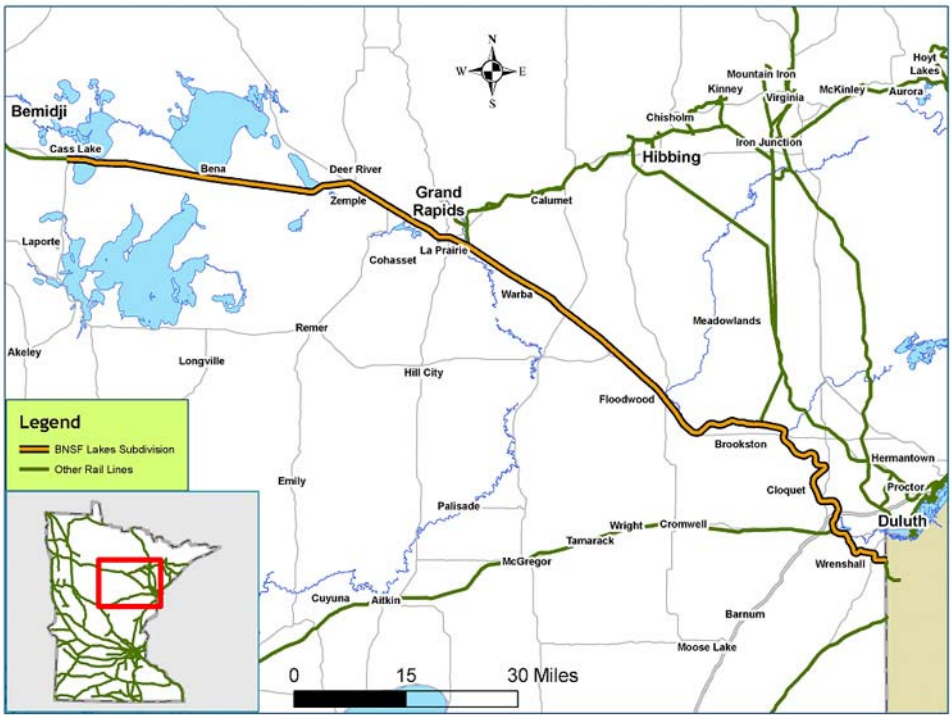


Figure B.13 BNSF Marshall Subdivision

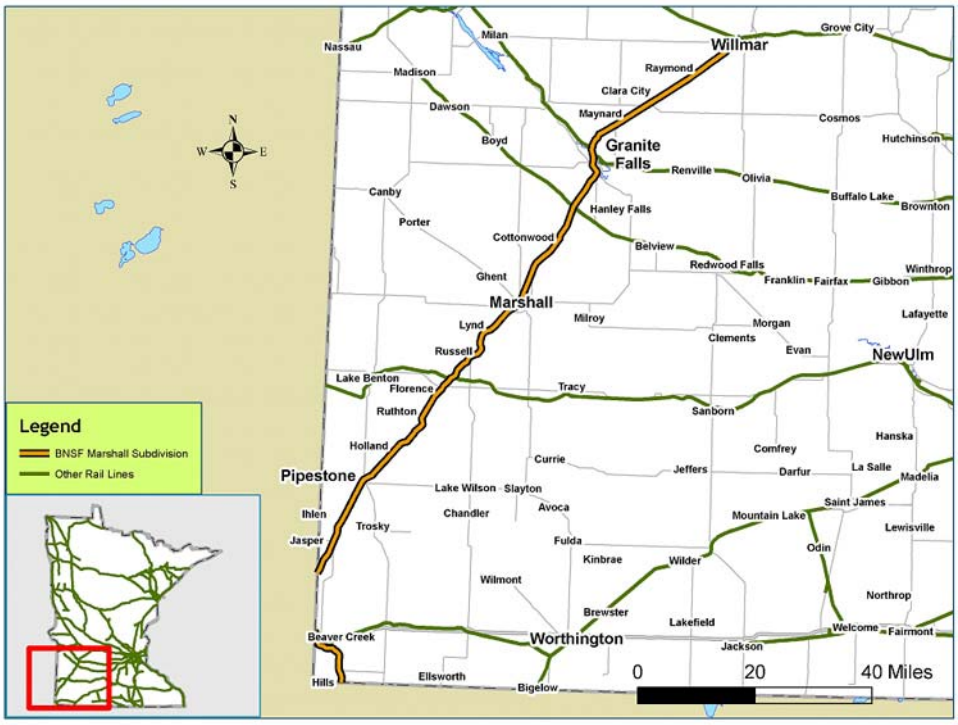


Figure B.14 BNSF Midway Subdivision

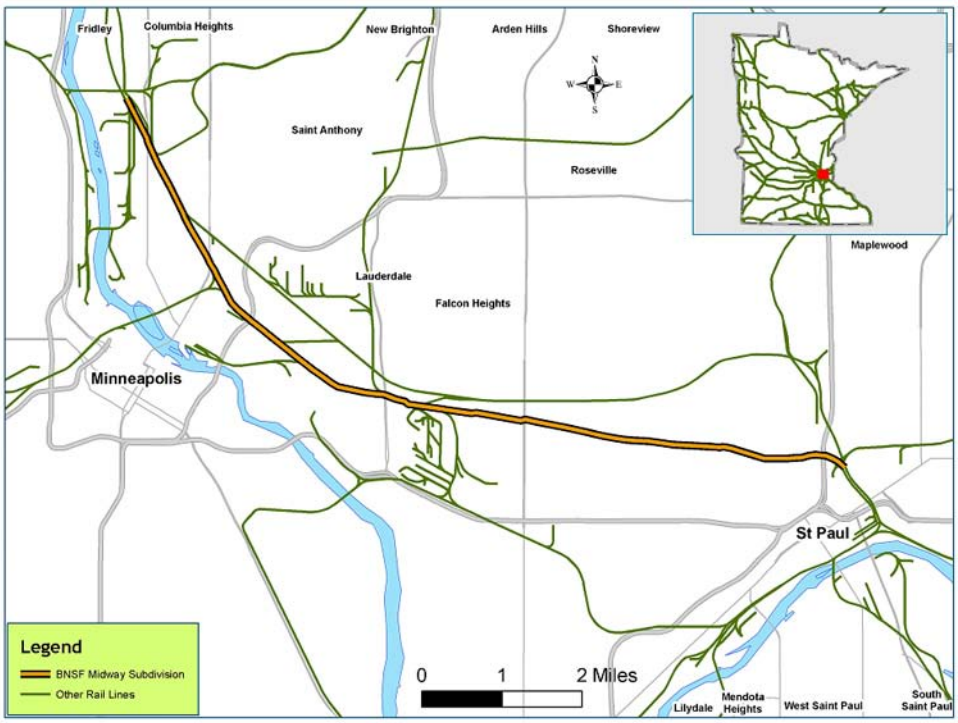


Figure B.15 BNSF Monticello Subdivision

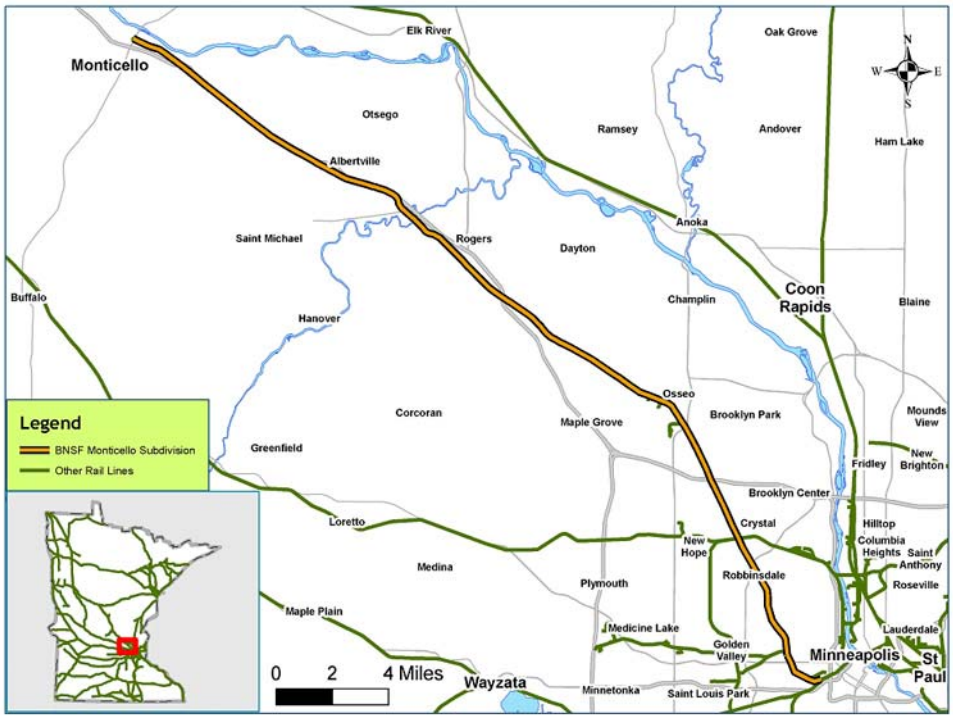


Figure B.16 BNSF Moorhead Subdivision

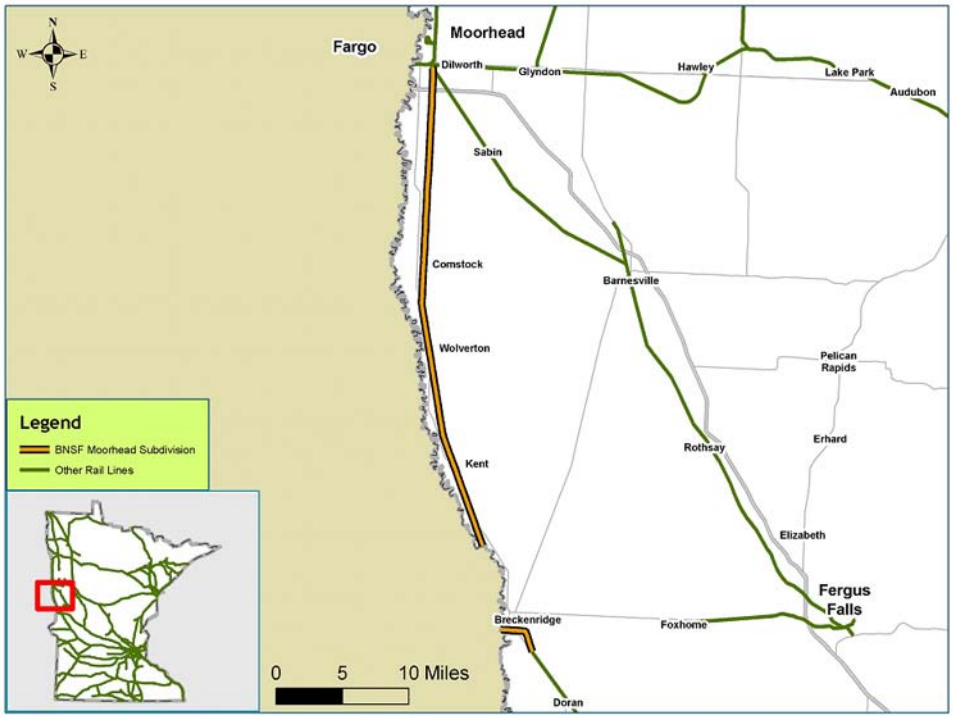


Figure B.17 BNSF Morris Subdivision

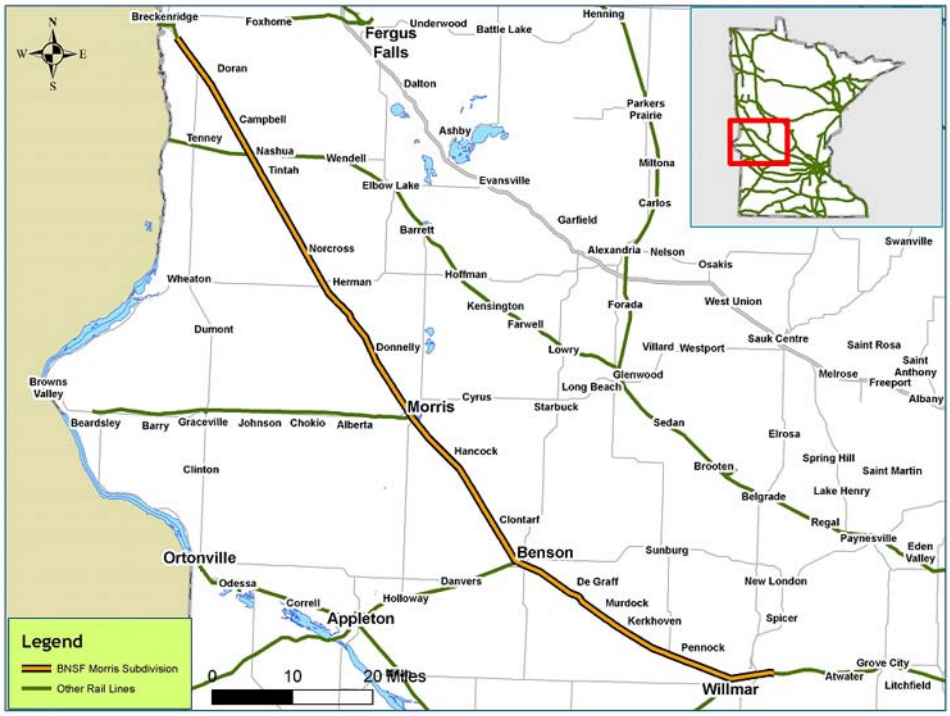


Figure B.18 BNSF Noyes Subdivision

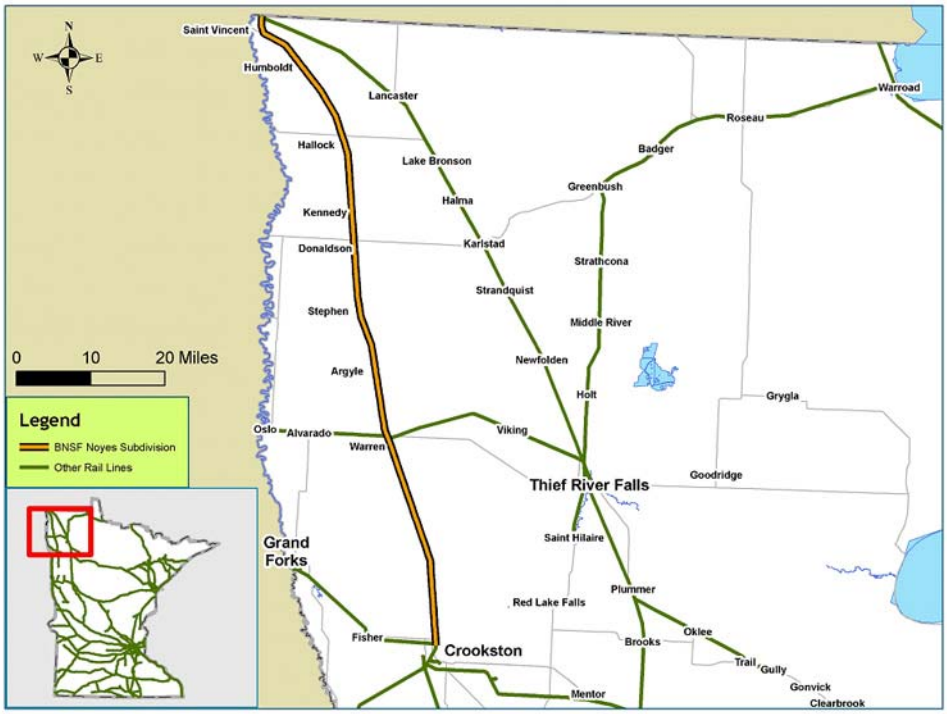


Figure B.19 BNSF P-Line Subdivision

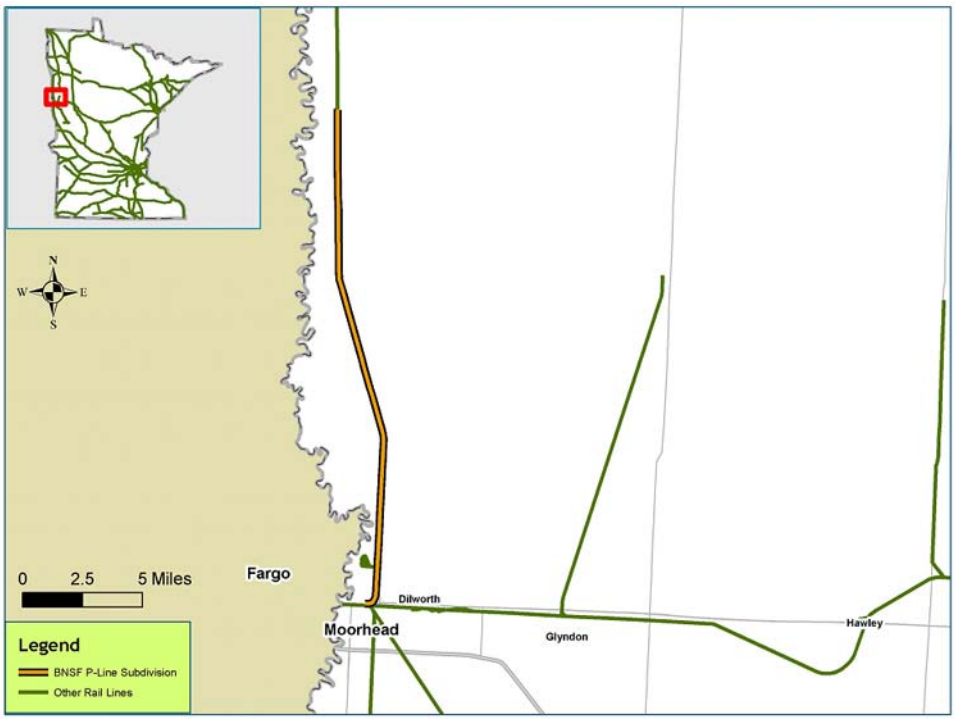


Figure B.20 BNSF Prosper Subdivision

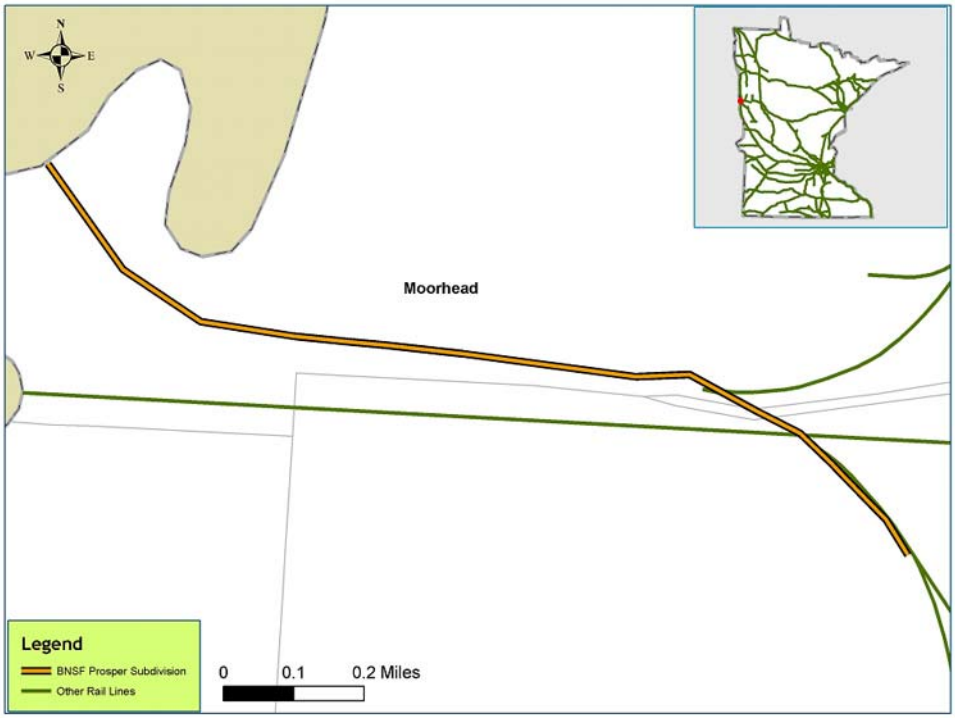


Figure B.21 BNSF Staples Subdivision

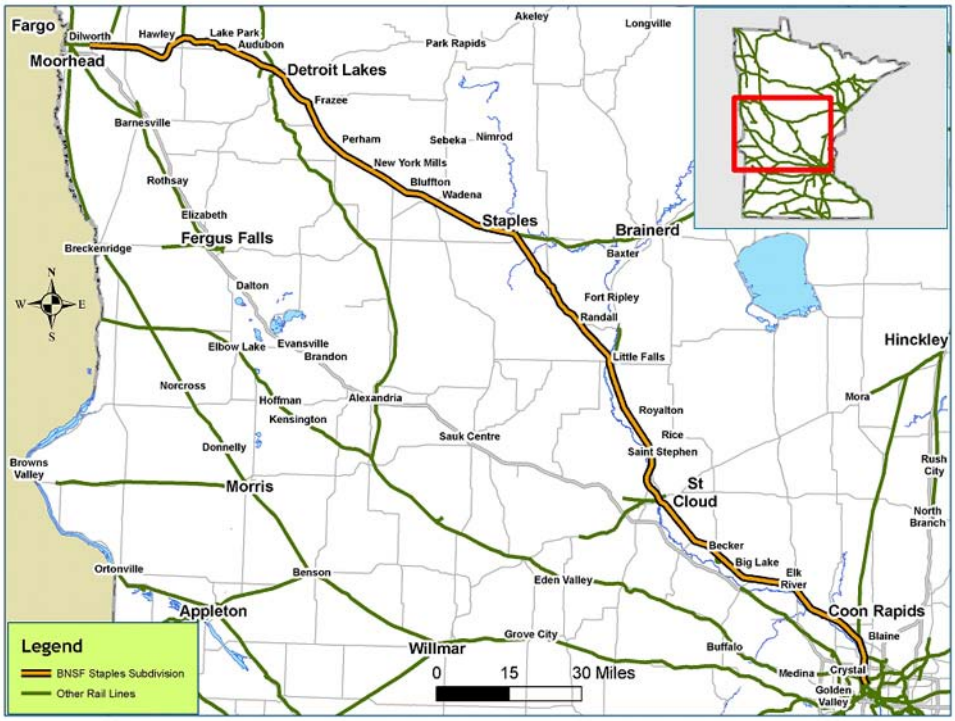


Figure B.22 BNSF St. Croix Subdivision

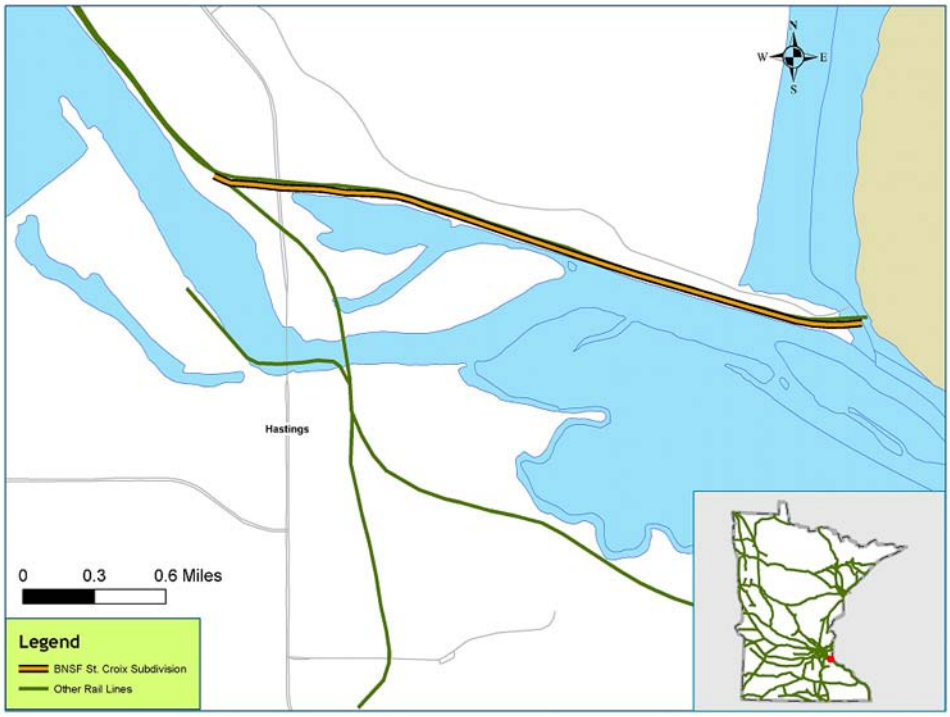


Figure B.23 BNSF St. Paul Subdivision

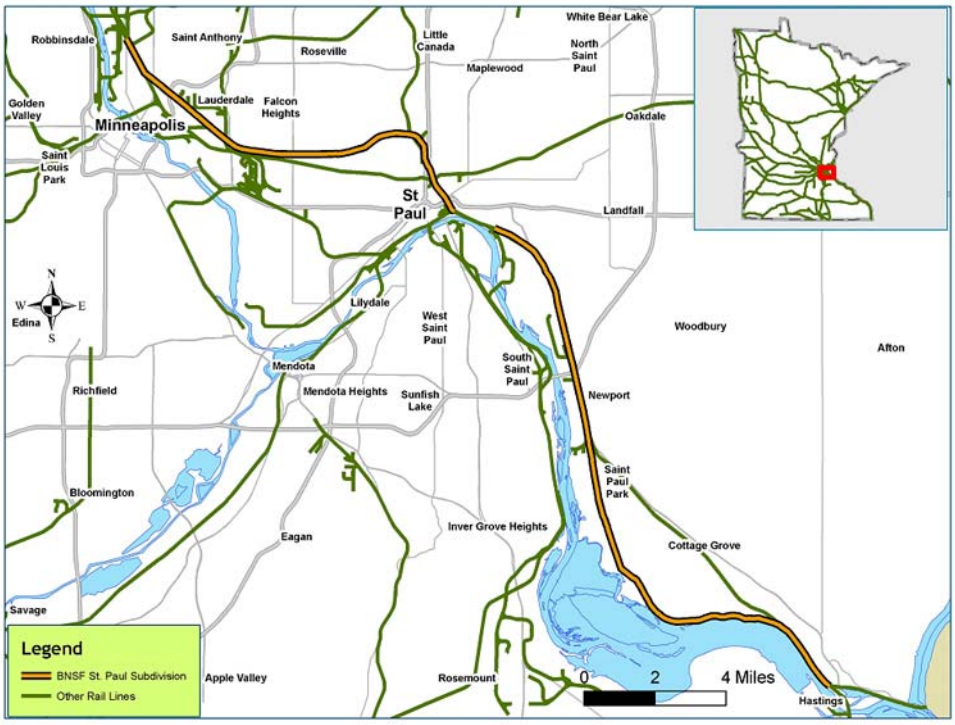


Figure B.24 BNSF Watertown Subdivision

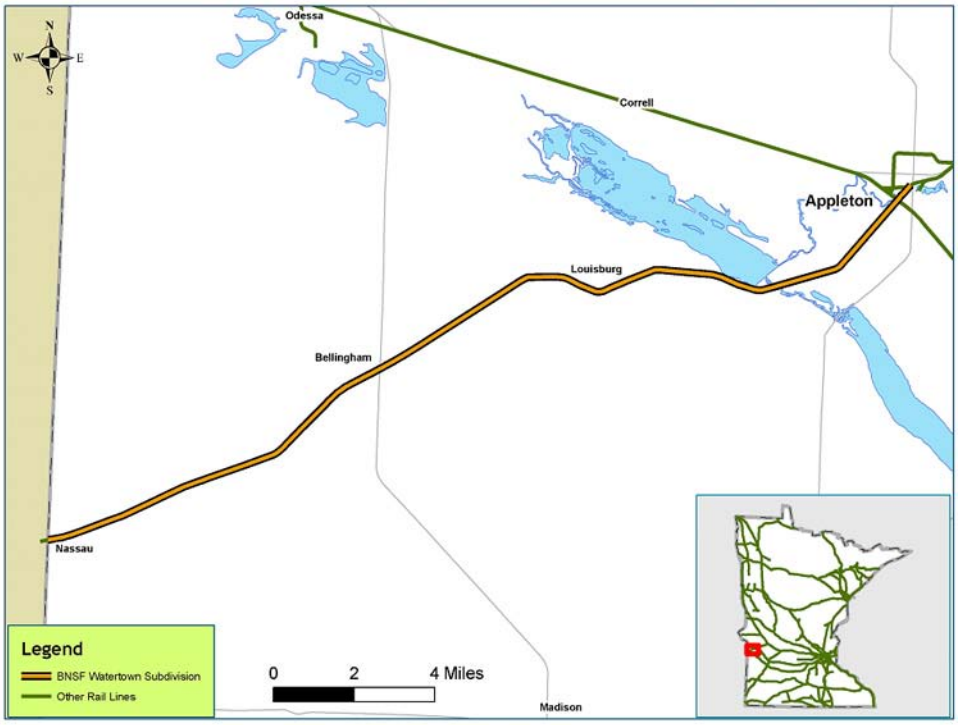


Figure B.25 BNSF Wayzata Subdivision

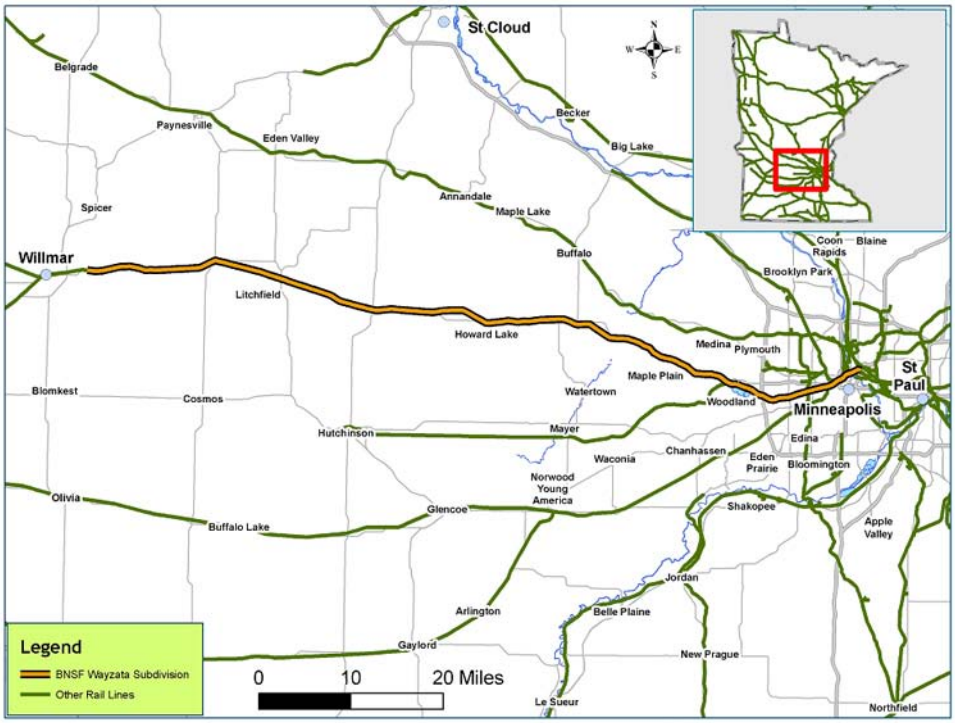


Figure B.26 CN Casco Subdivision

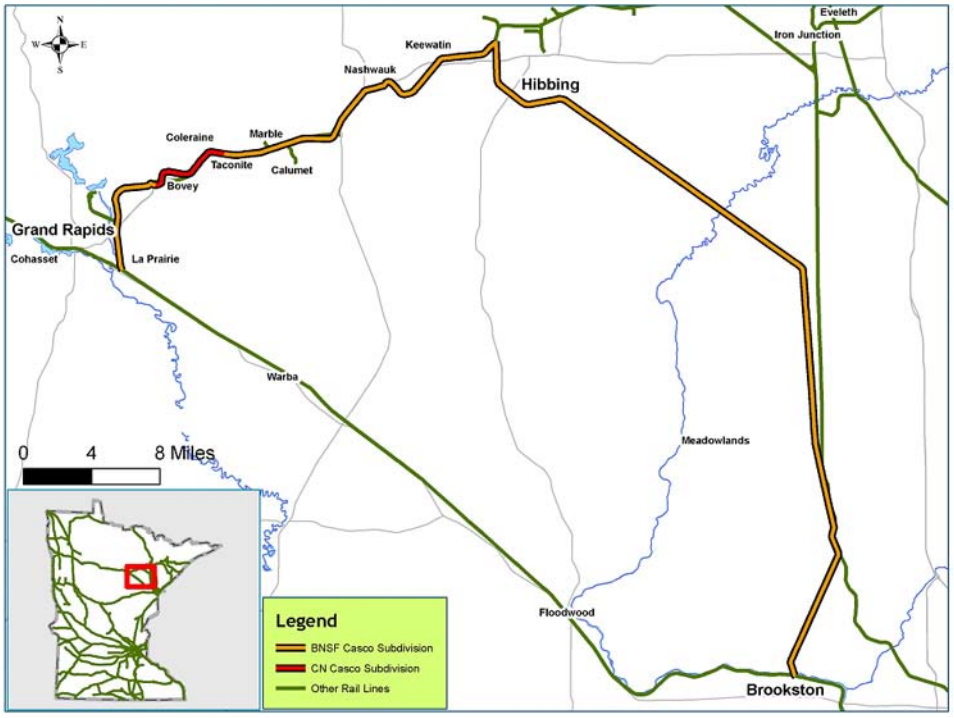


Figure B.27 CN Dresser Subdivision

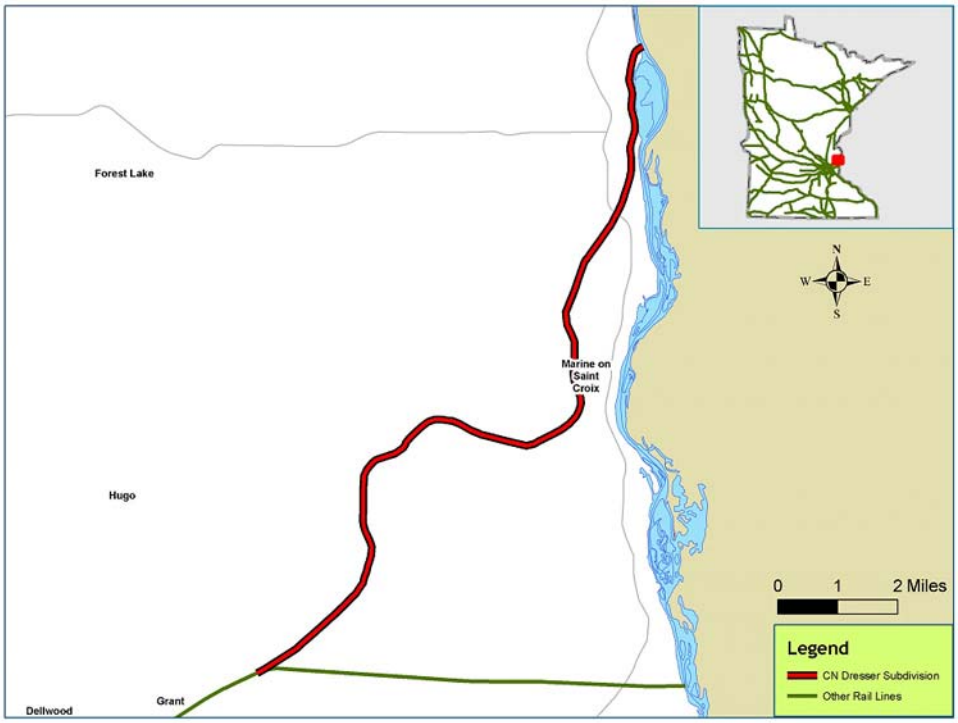


Figure B.28 CN Keenan Subdivision

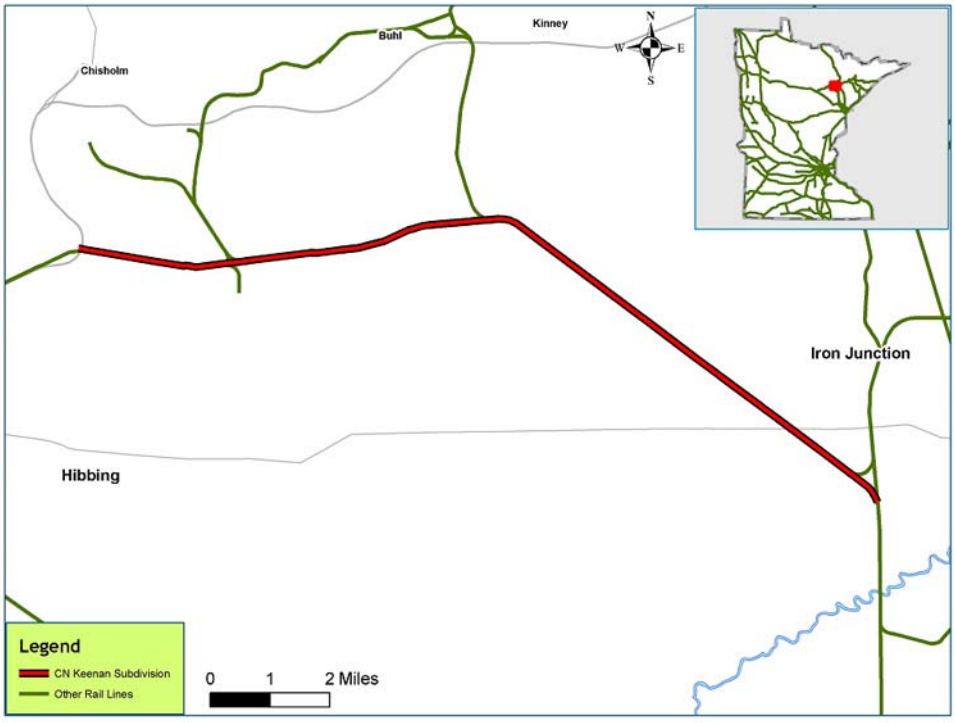


Figure B.29 CN Iron Range Subdivision

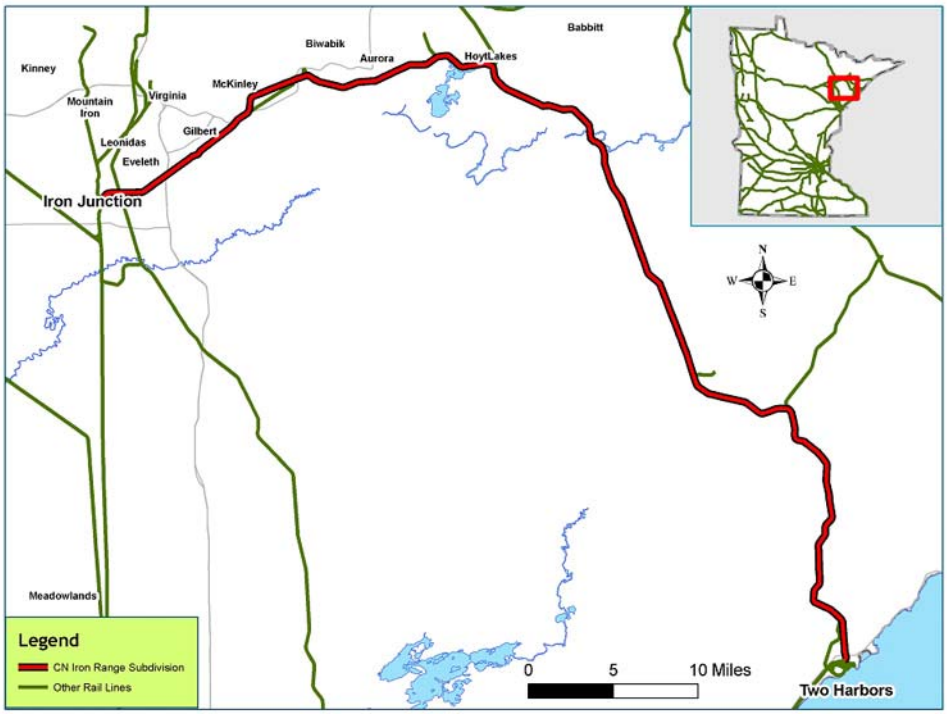


Figure B.30 CN Minneapolis Subdivision

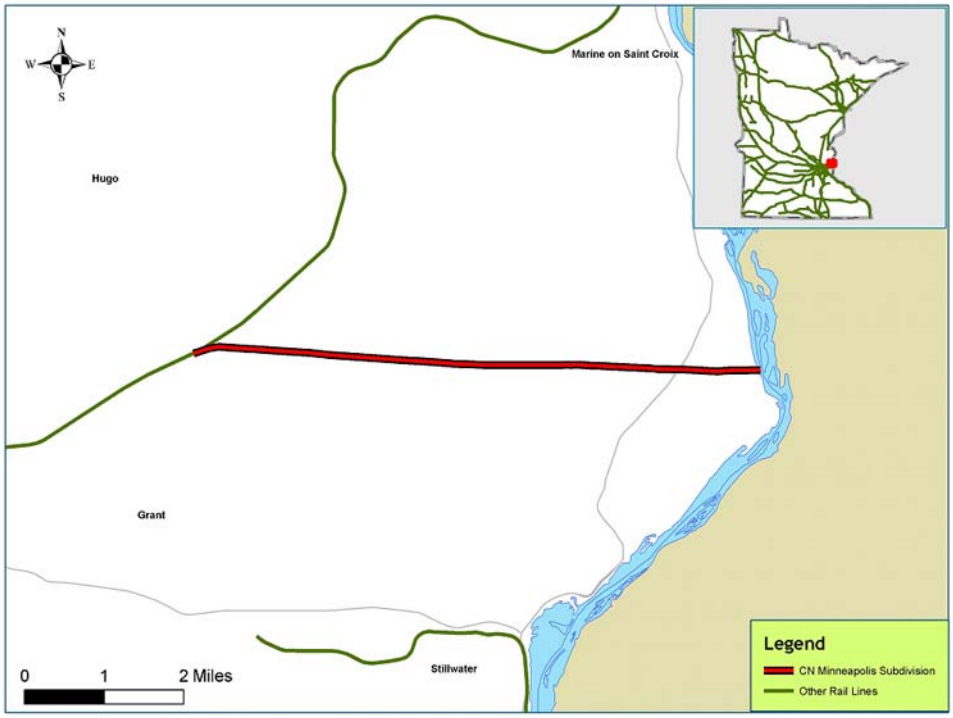


Figure B.31 CN Minntac Subdivision

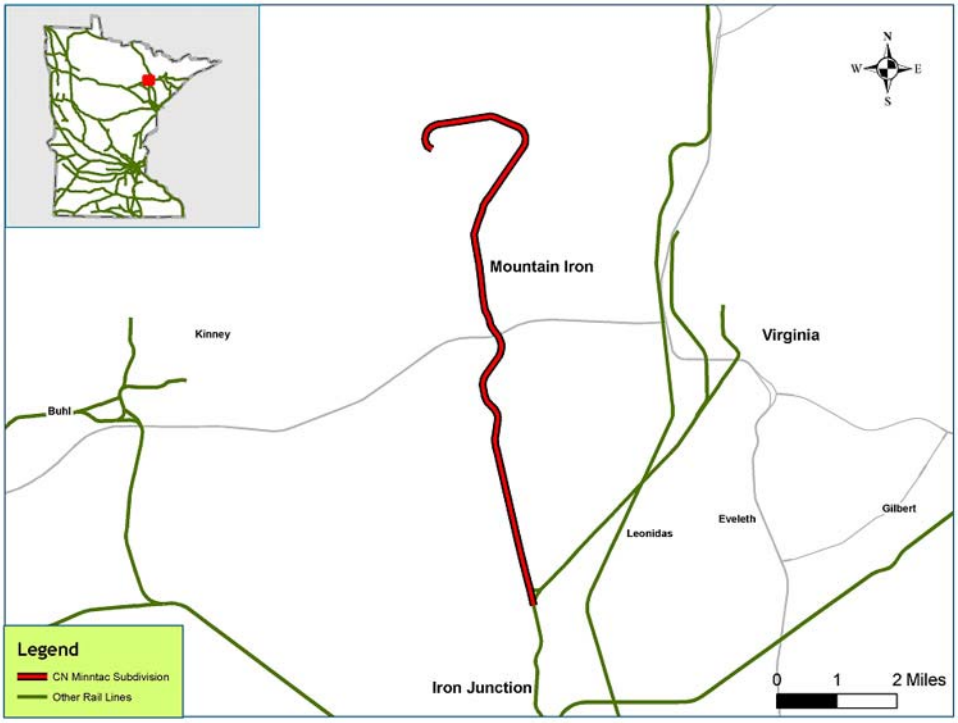


Figure B.32 CN Missabe Subdivision

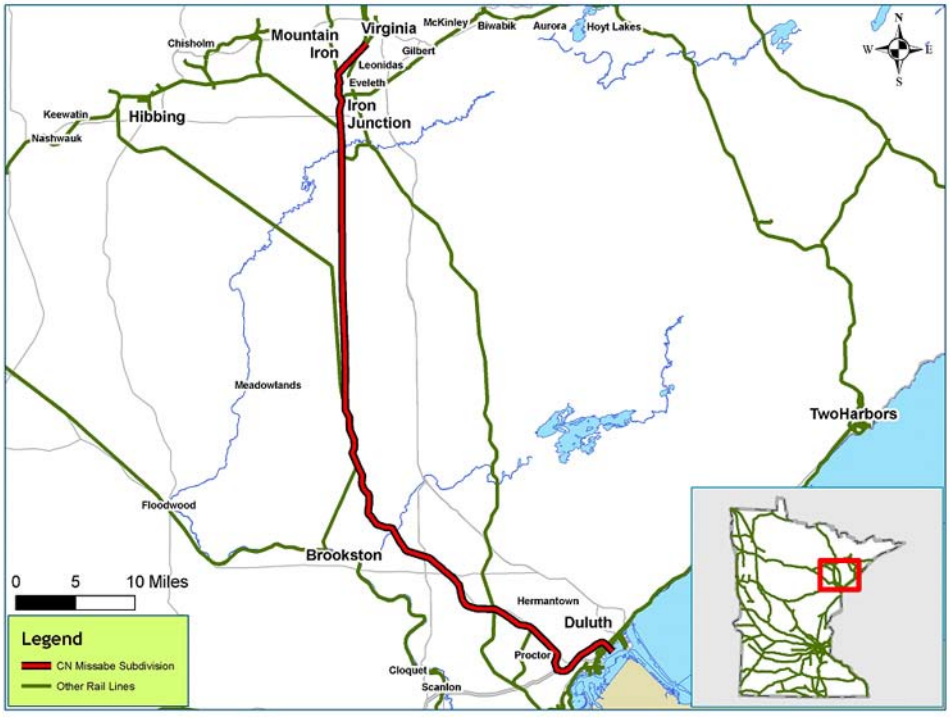


Figure B.33 CN Osage Subdivision

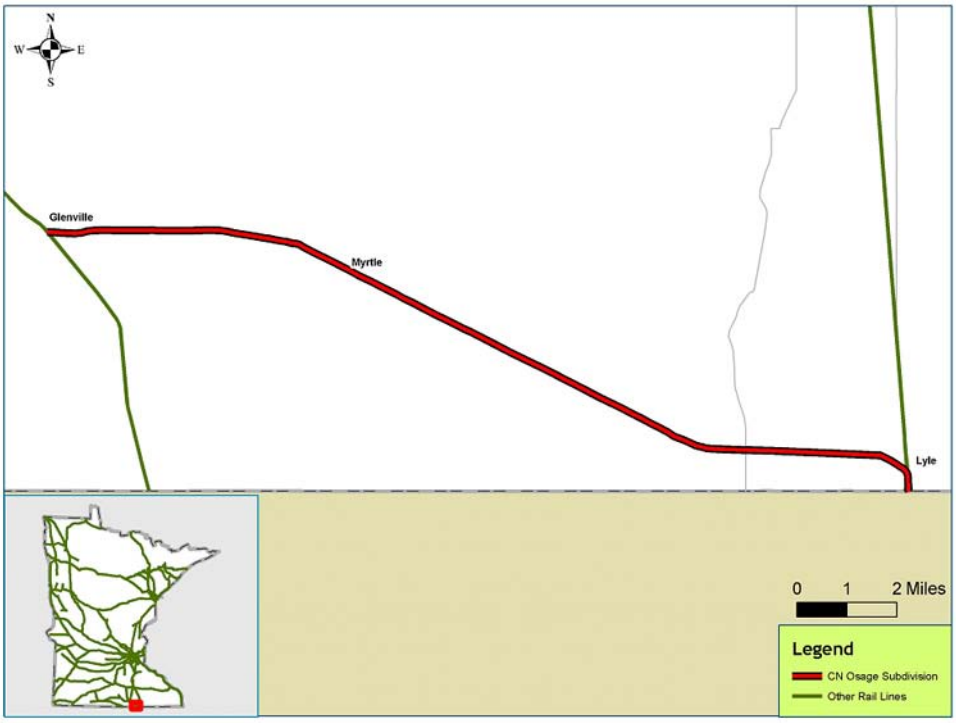


Figure B.34 CN Rainy Subdivision

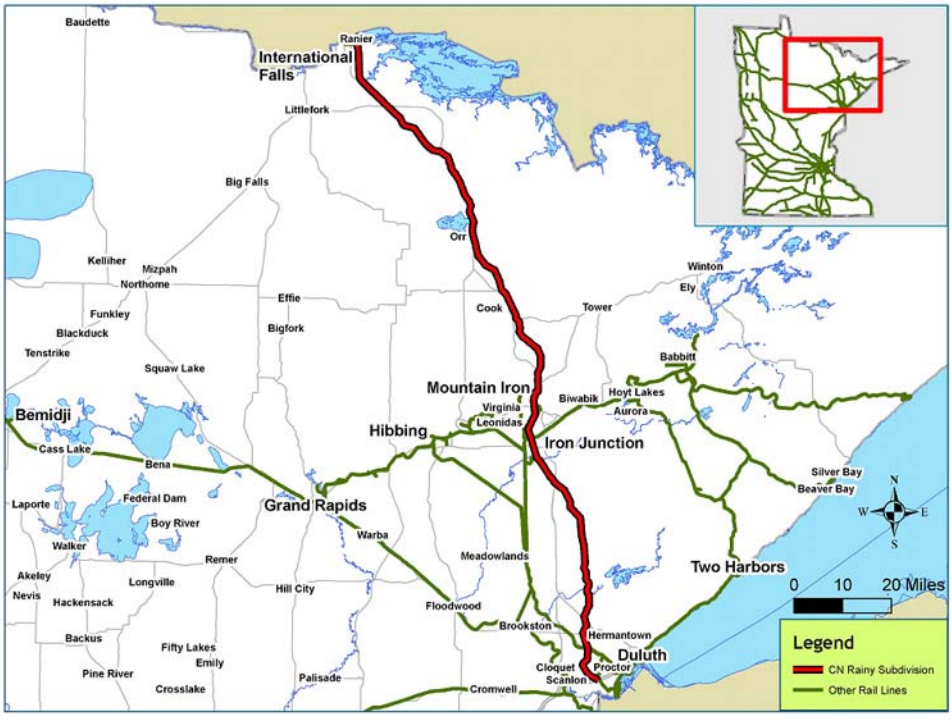


Figure B.35 CN Sprague Subdivision

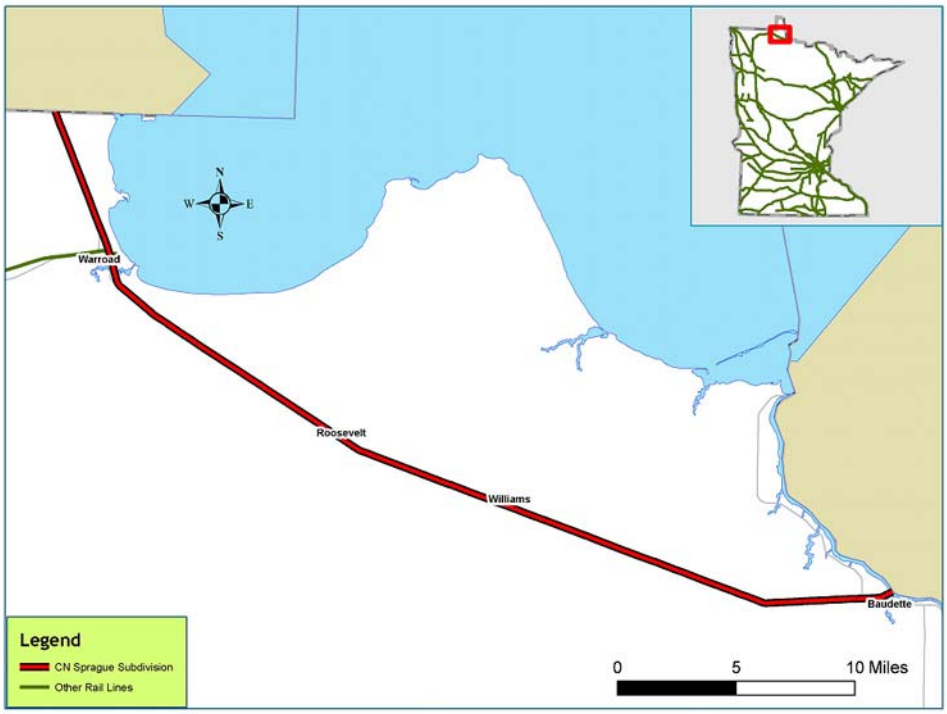


Figure B.36 CN Superior Subdivision

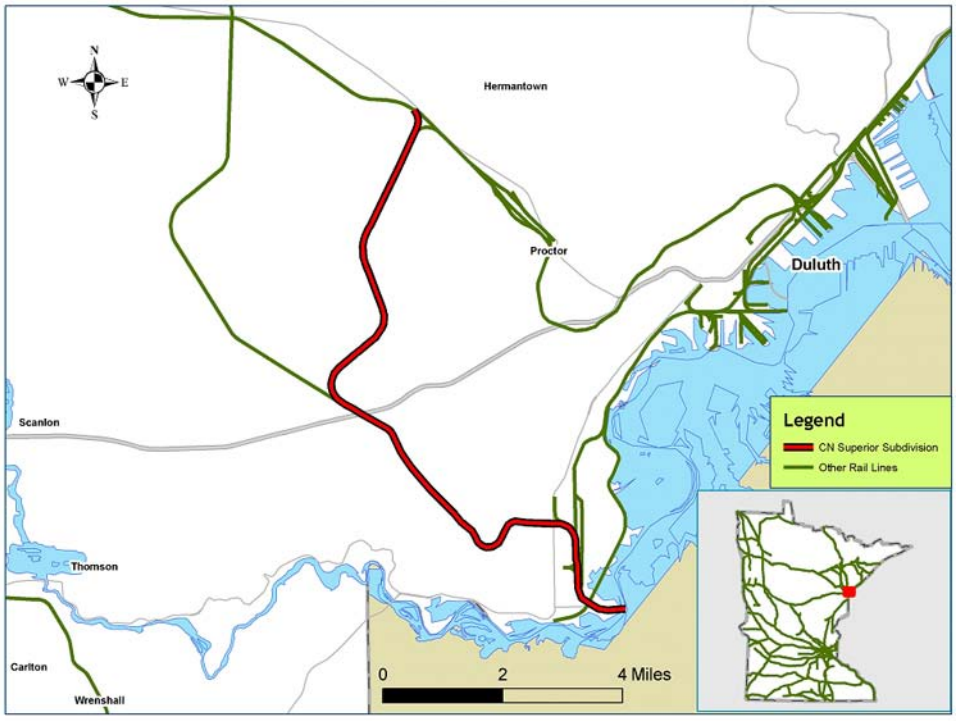


Figure B.37 CN Two Harbors Subdivision

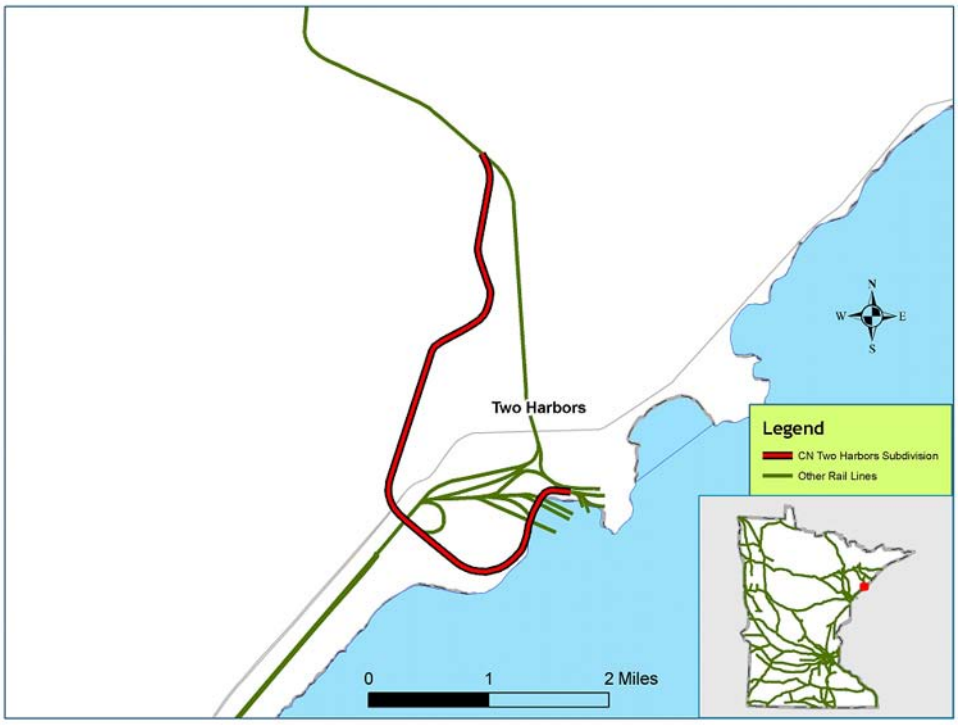


Figure B.38 CP Bass Lake Spur Subdivision

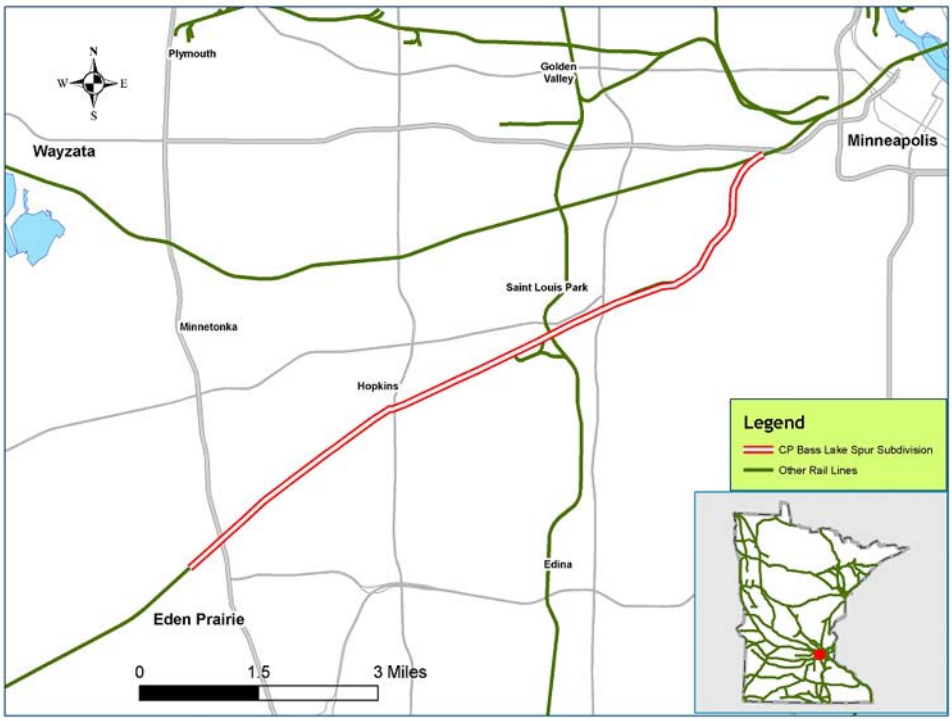


Figure B.39 CP Bemidji Subdivision

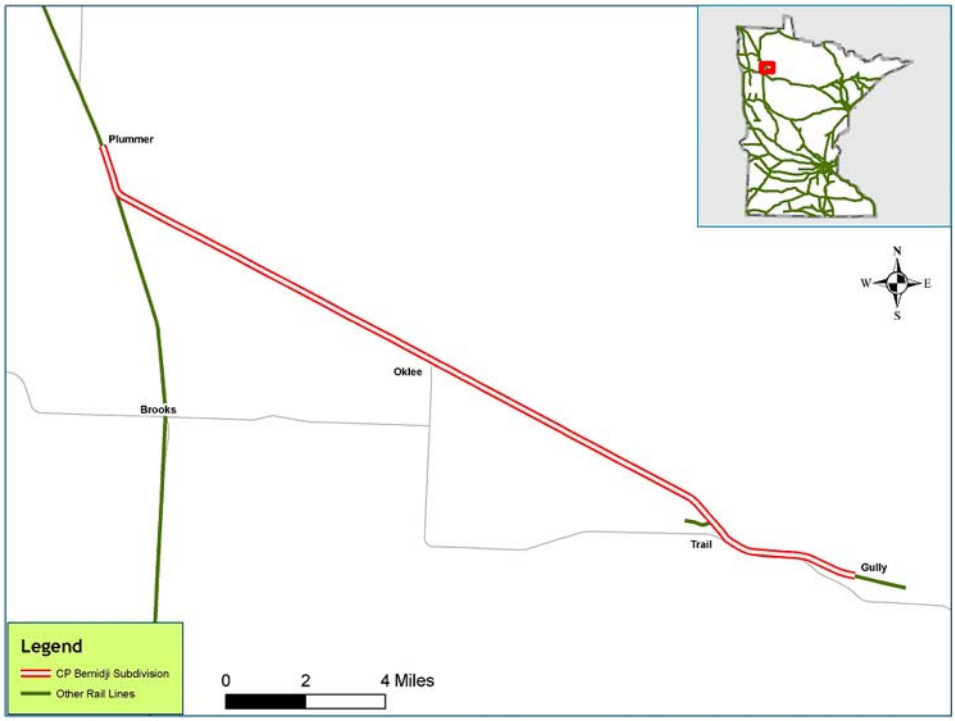


Figure B.40 CP Detroit Lakes Subdivision

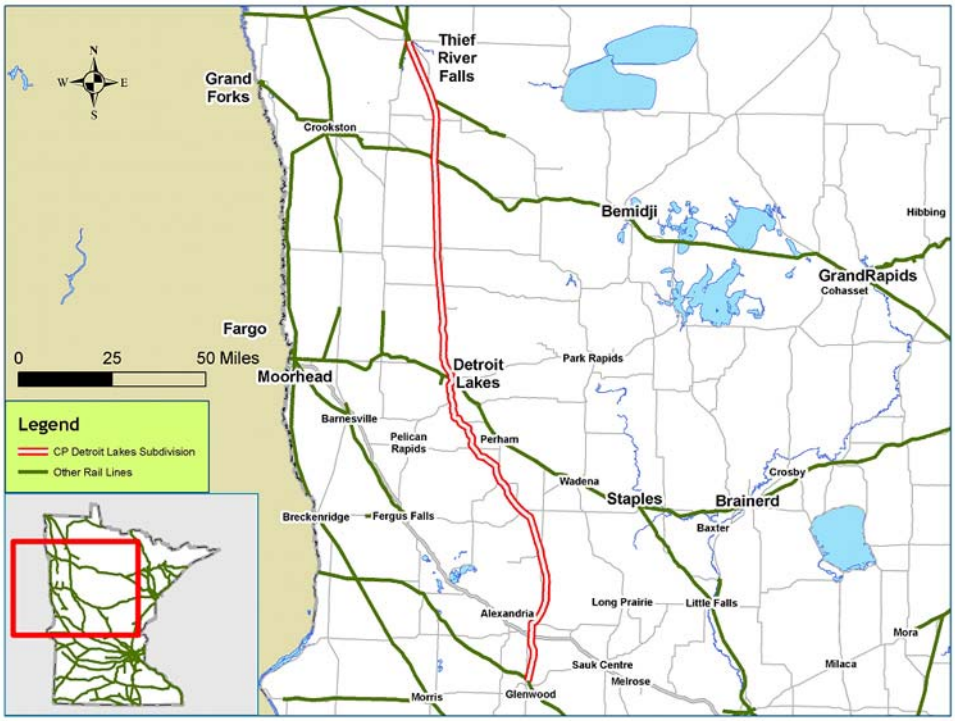


Figure B.41 CP Elbow Lake Subdivision

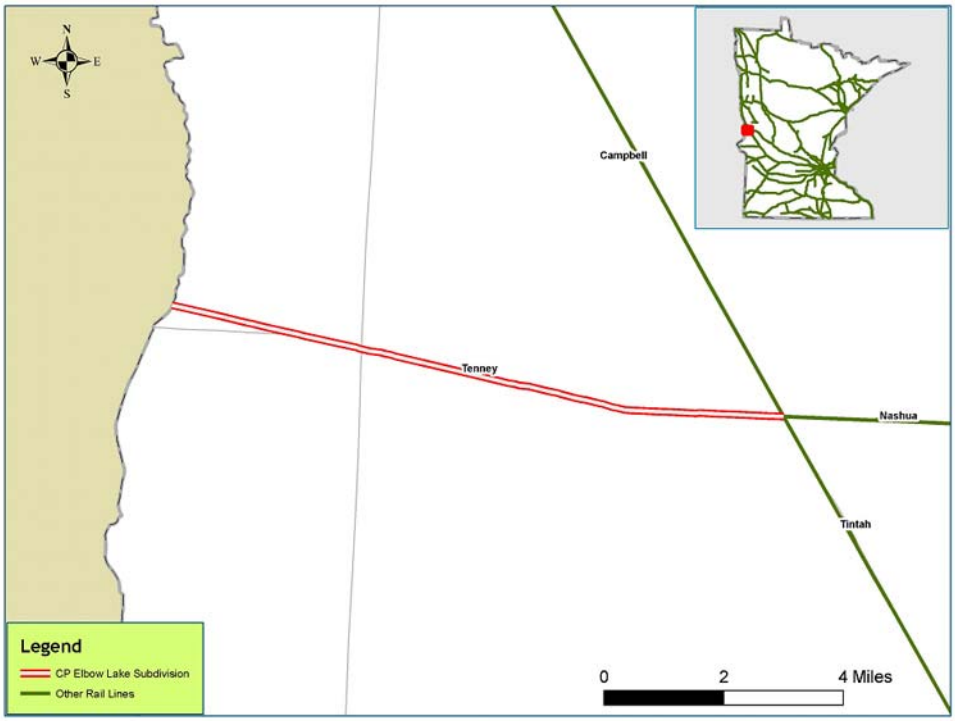


Figure B.42 CP Merriam Park Subdivision

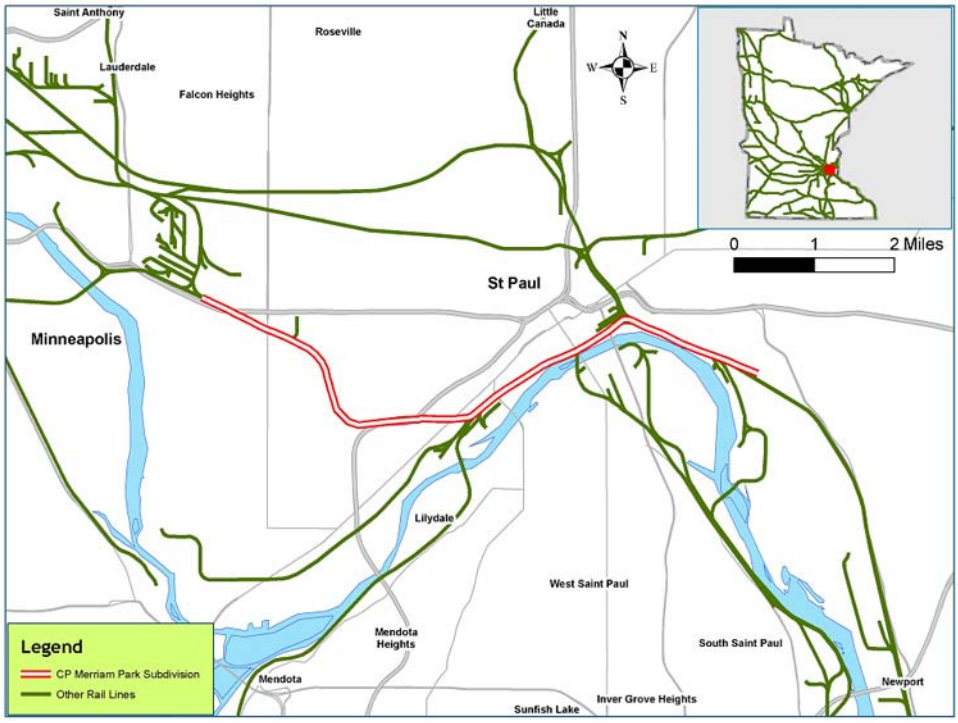


Figure B.43 CP MN&S Spur Subdivision

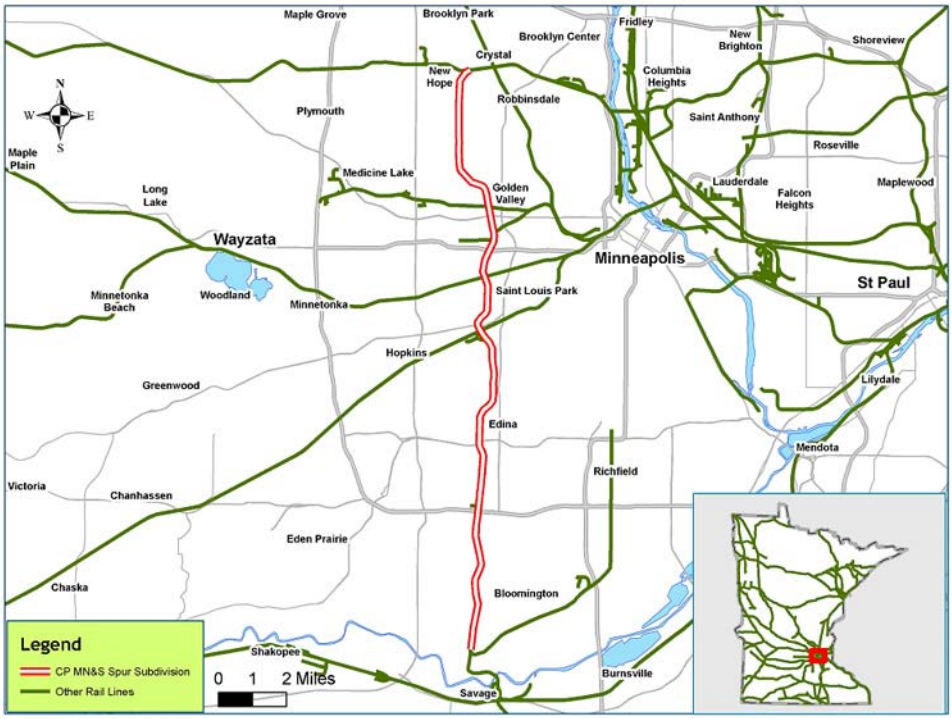


Figure B.44 CP Noyes Subdivision

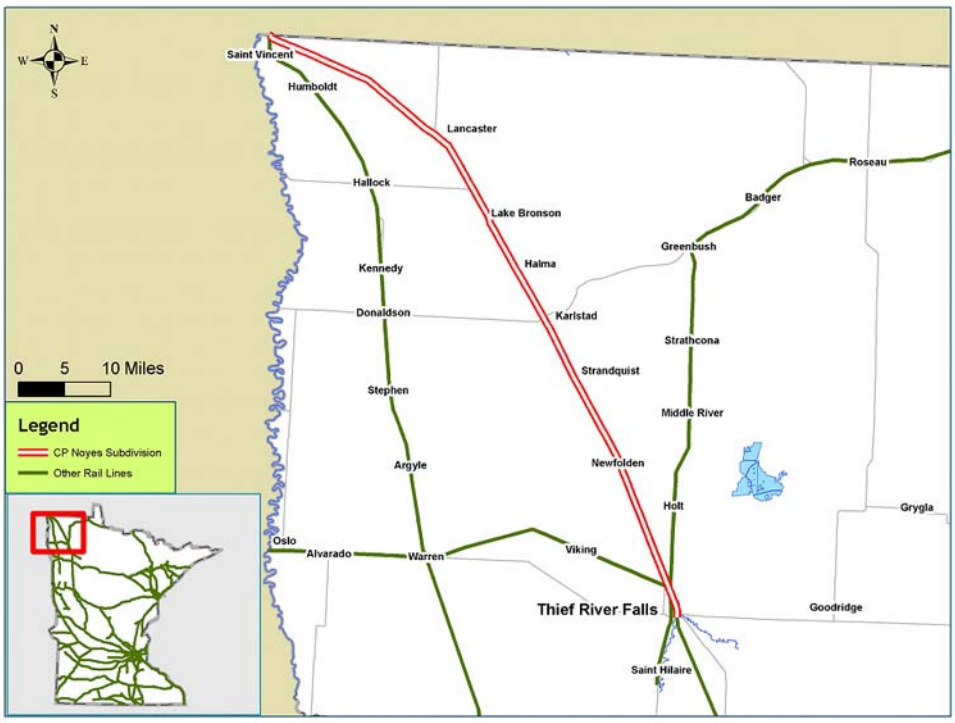


Figure B.45 CP Paynesville Subdivision

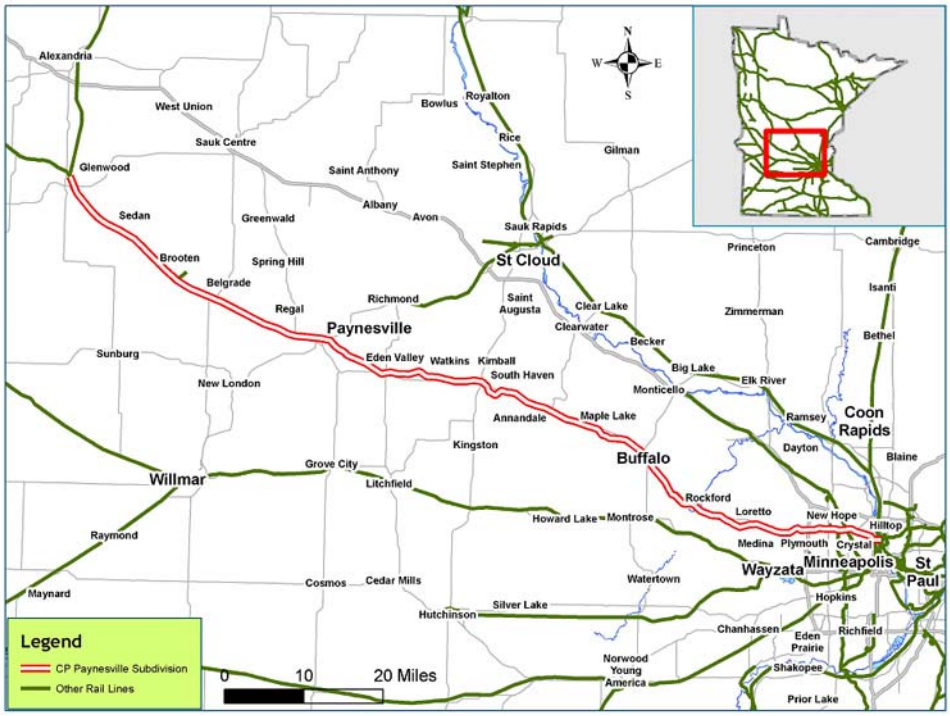


Figure B.46 CP River Subdivision

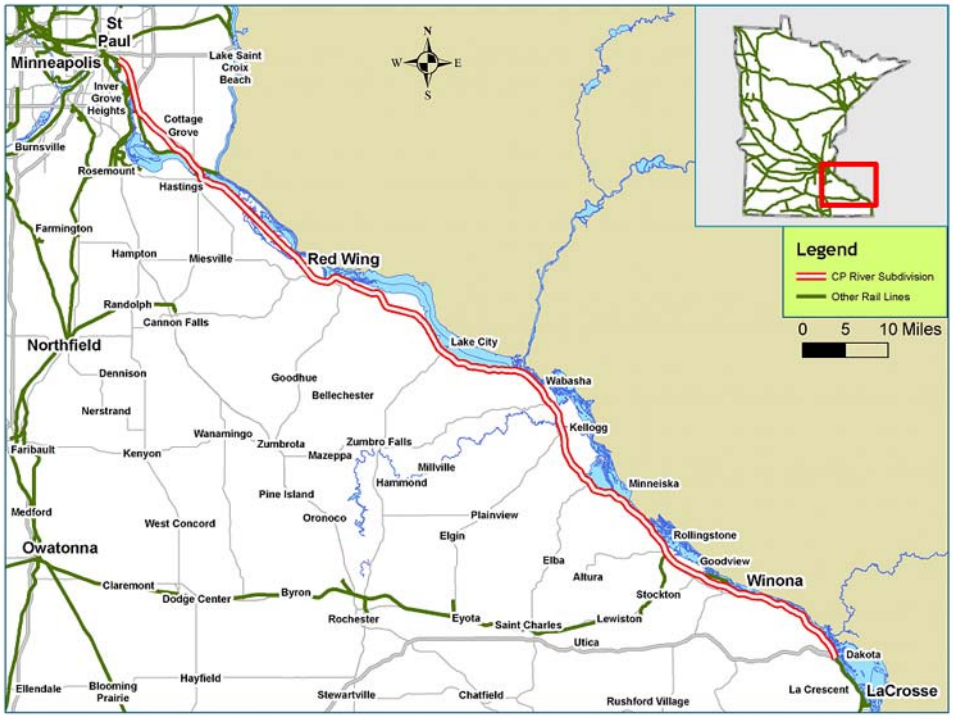


Figure B.47 CP St. Paul Subdivision

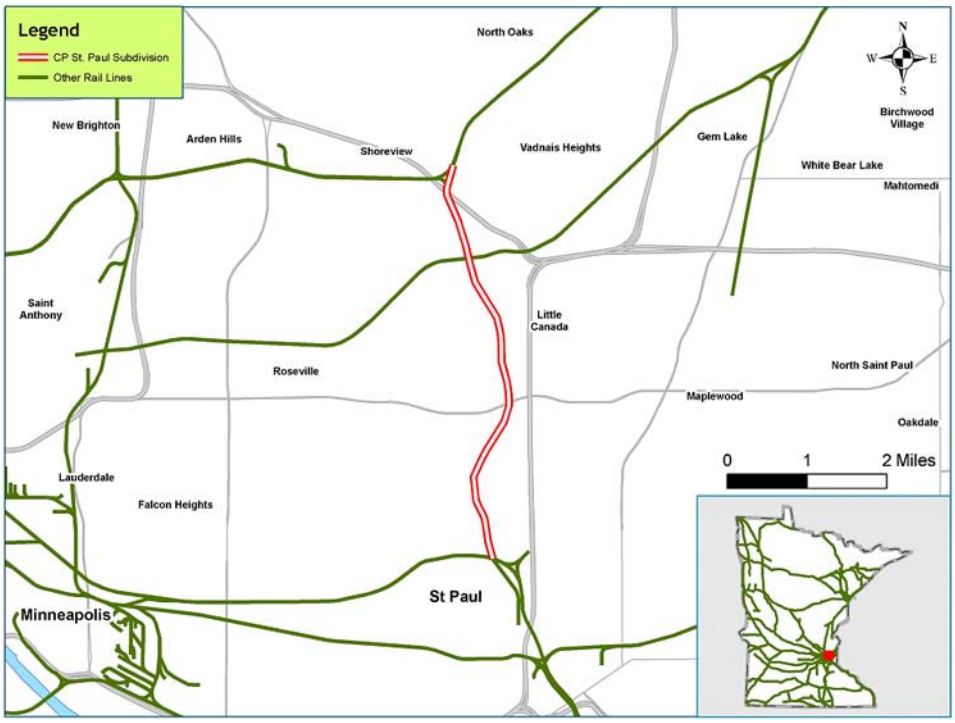


Figure B.48 CP Withrow Subdivision

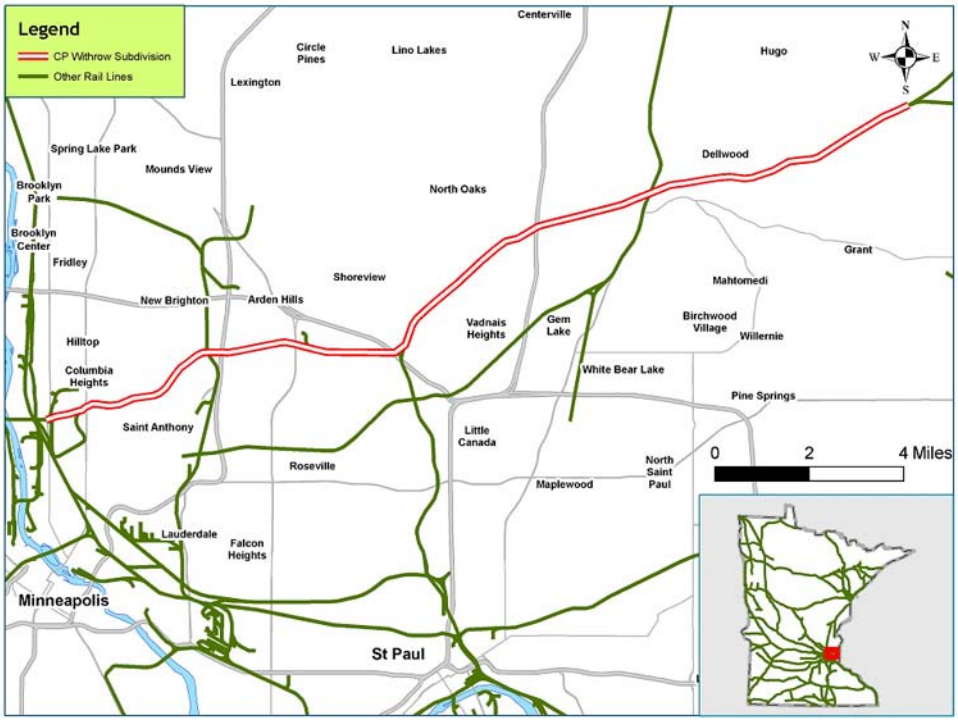


Figure B.49 DME Hartland Subdivision

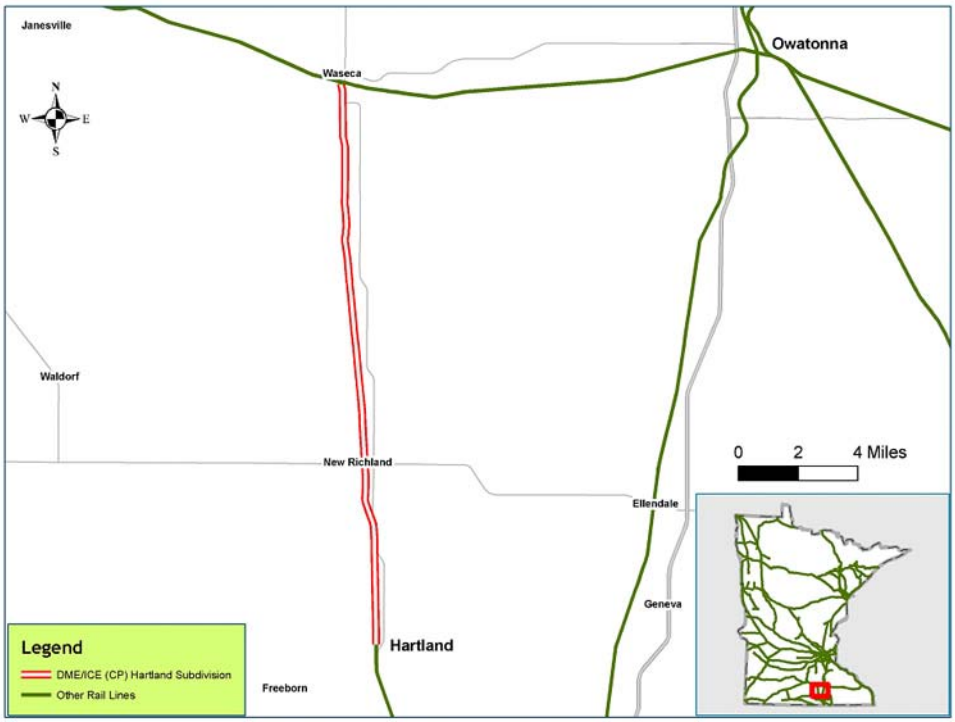


Figure B.50 DME Huron Subdivision

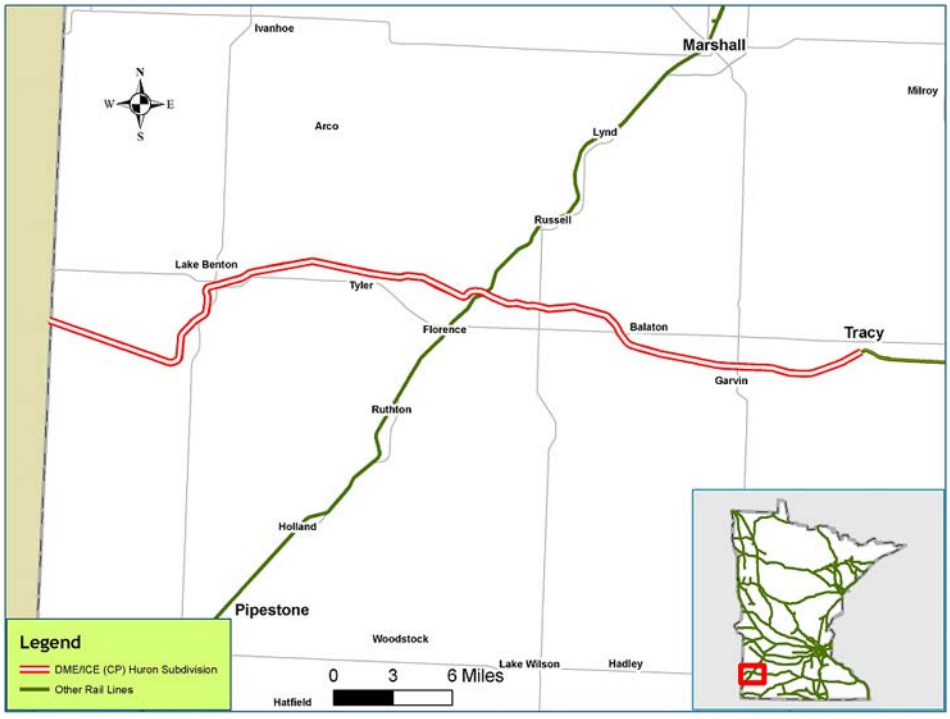


Figure B.51 DME Jackson Subdivision

Figure B.52 DME Marquette Subdivision

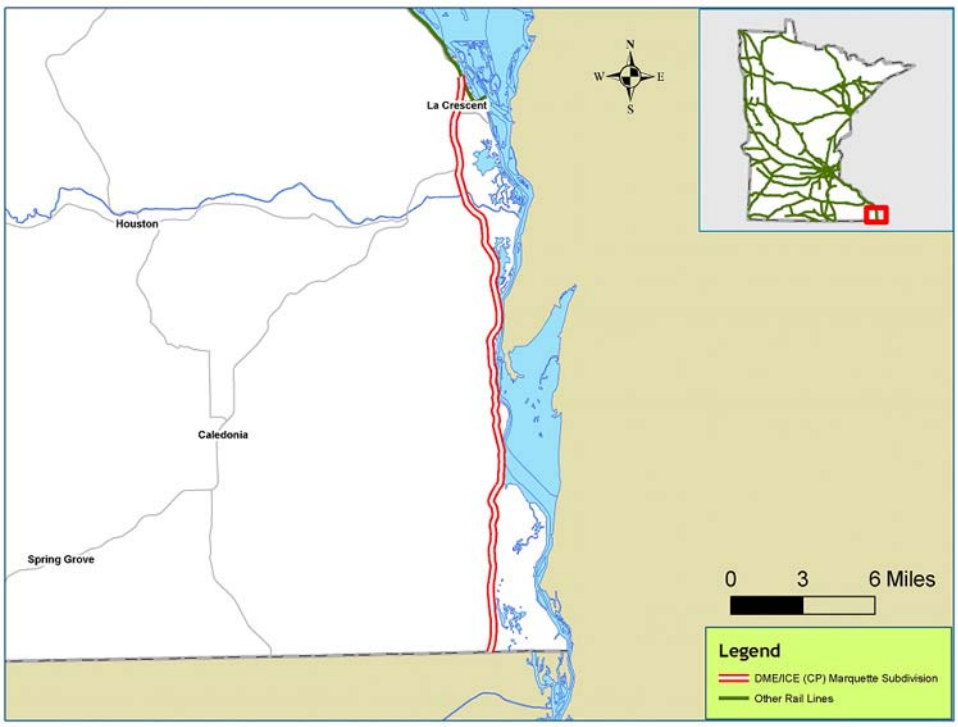


Figure B.53 DME Owatonna Subdivision

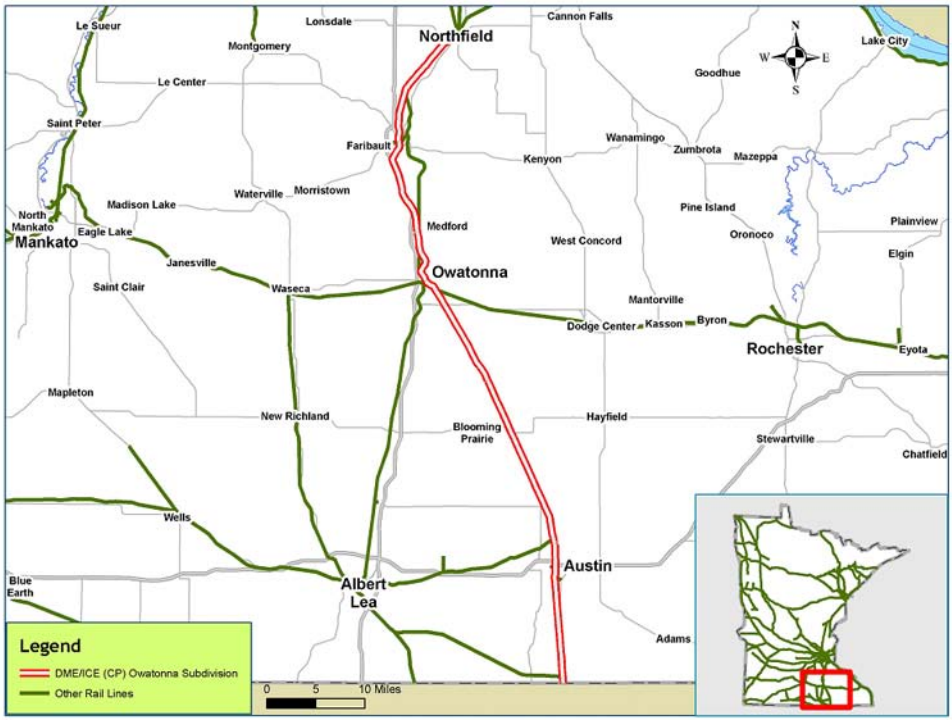


Figure B.54 DME Tracy Subdivision

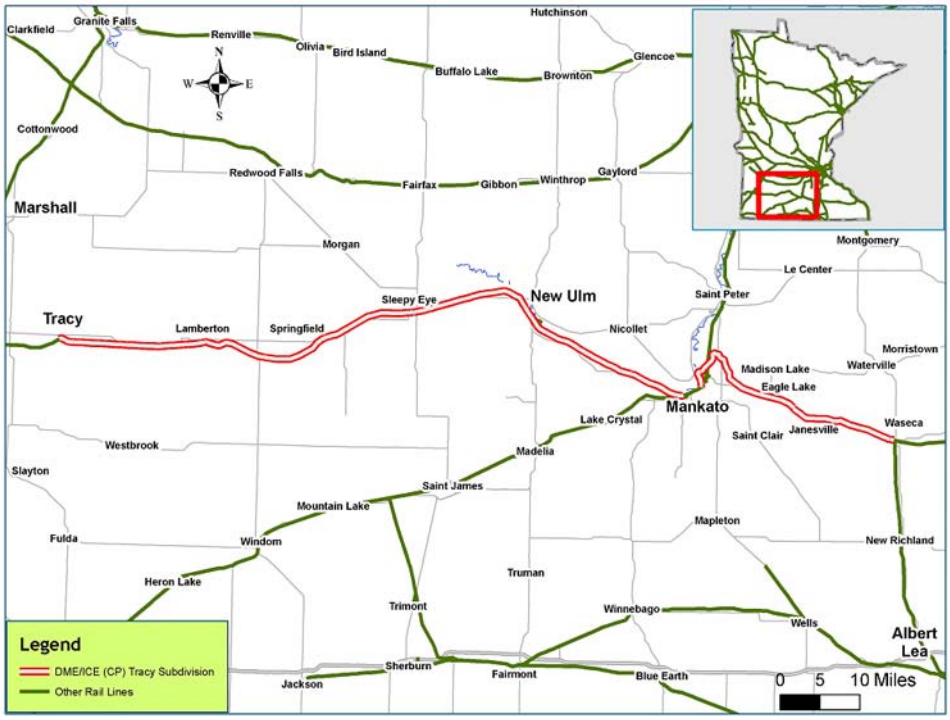


Figure B.55 DME Waseca Subdivision

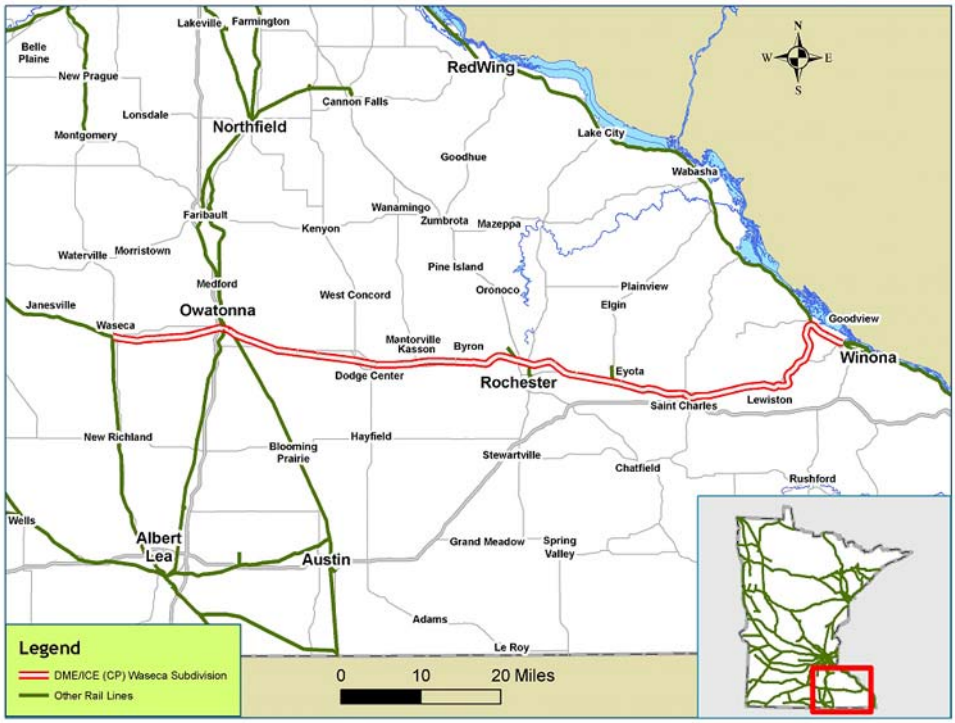


Figure B.56 UP Albert Lea Subdivision

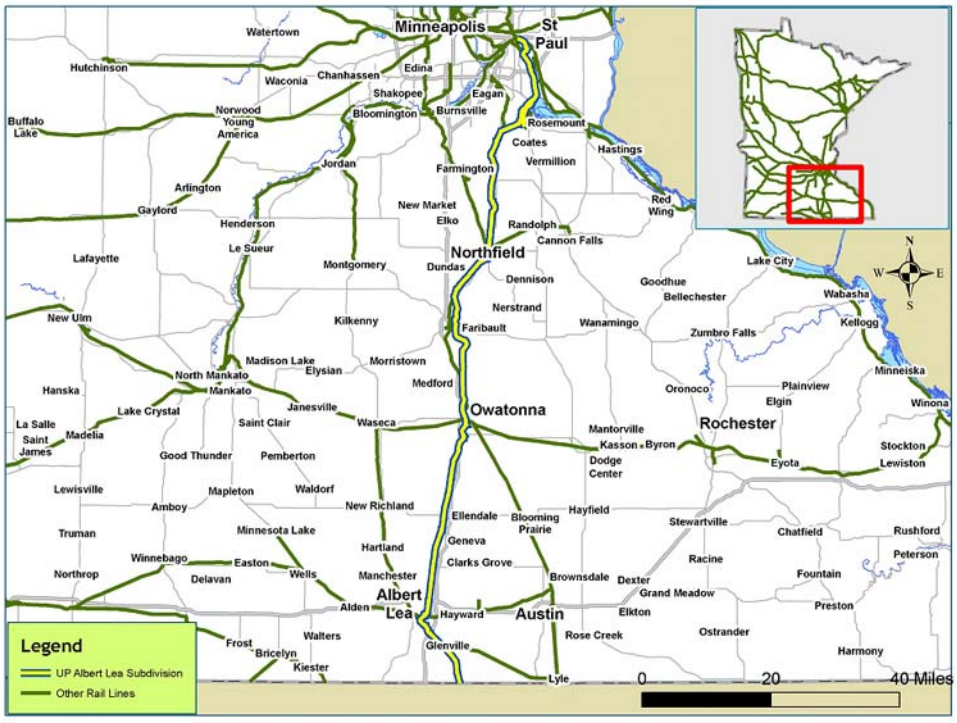


Figure B.57 UP Altoona Subdivision

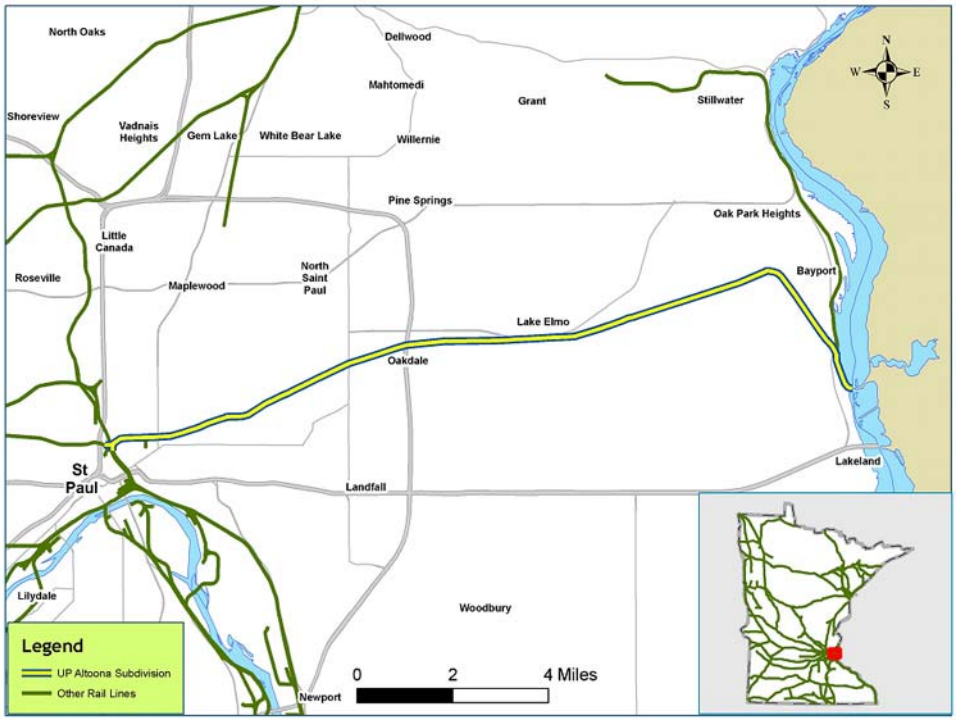


Figure B.58 UP Fairmont Subdivision

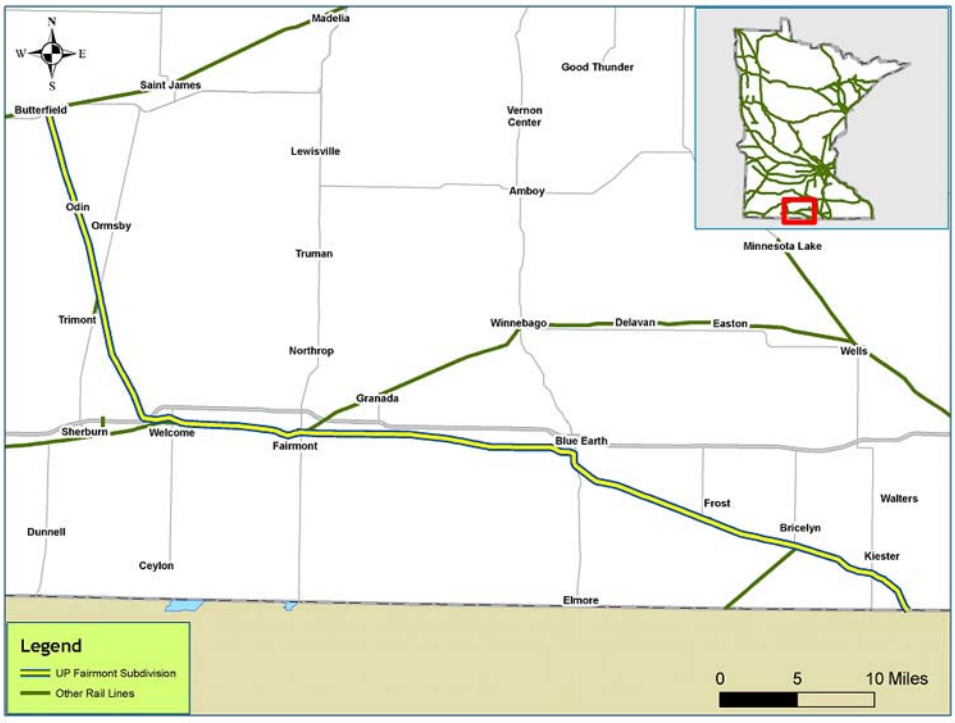


Figure B.59 UP Hartland Subdivision

Figure B.60 UP Mankato Subdivision

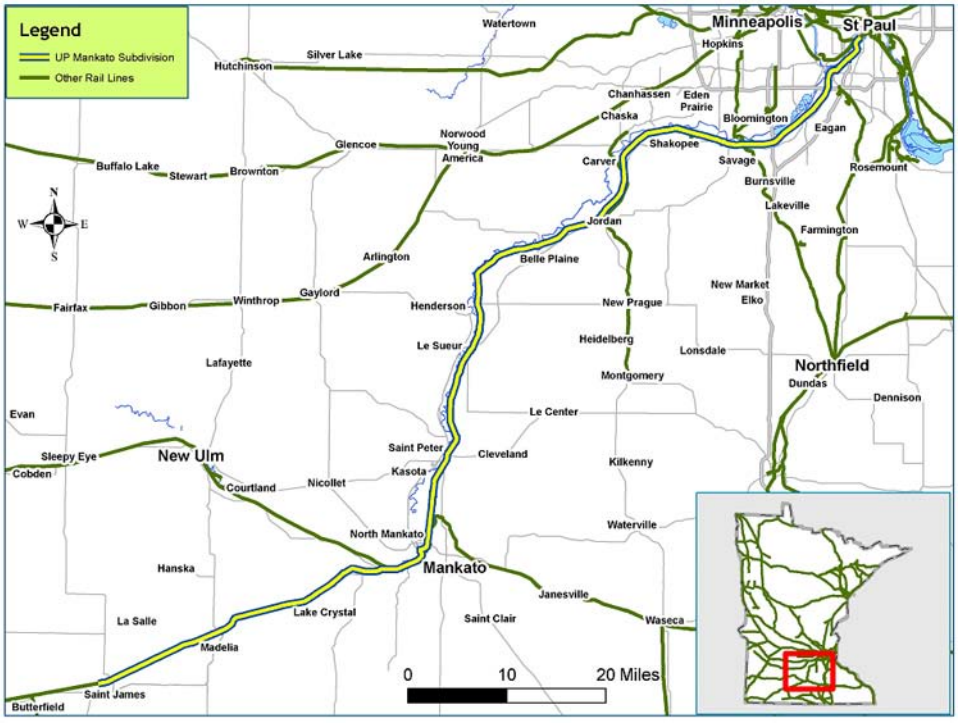


Figure B.61 UP Montgomery Subdivision

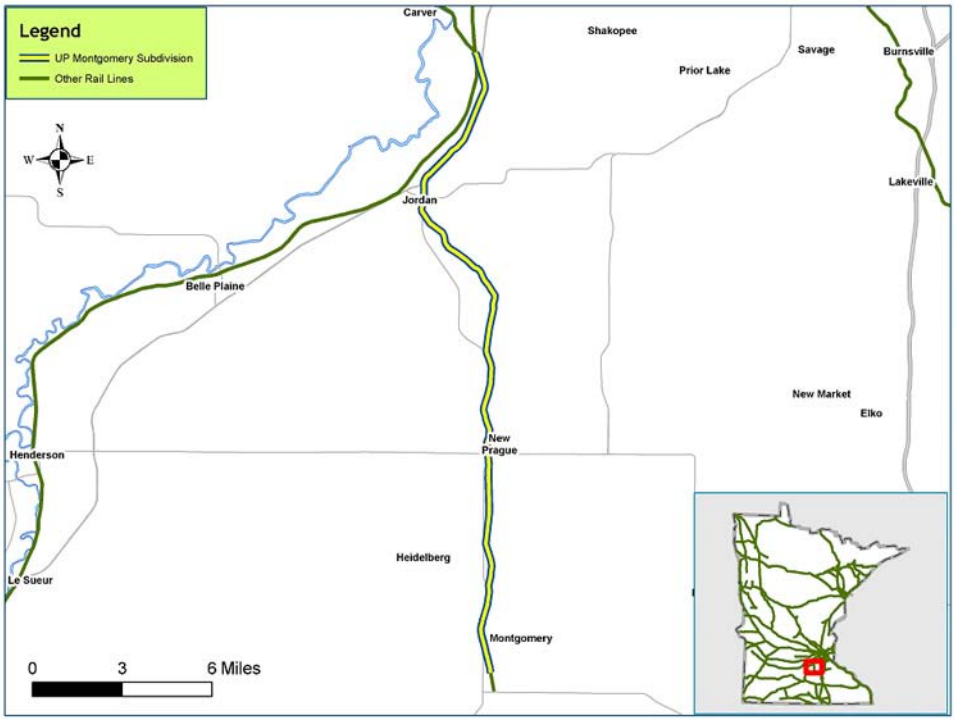


Figure B.62 UP Rake Subdivision

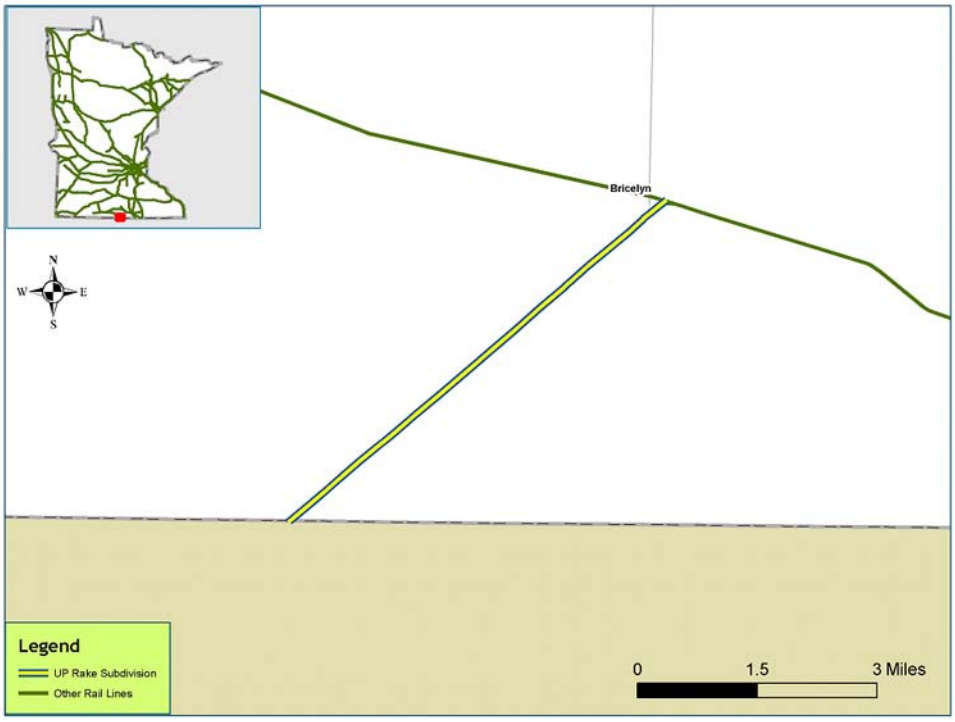


Figure B.63 UP Winona Subdivision

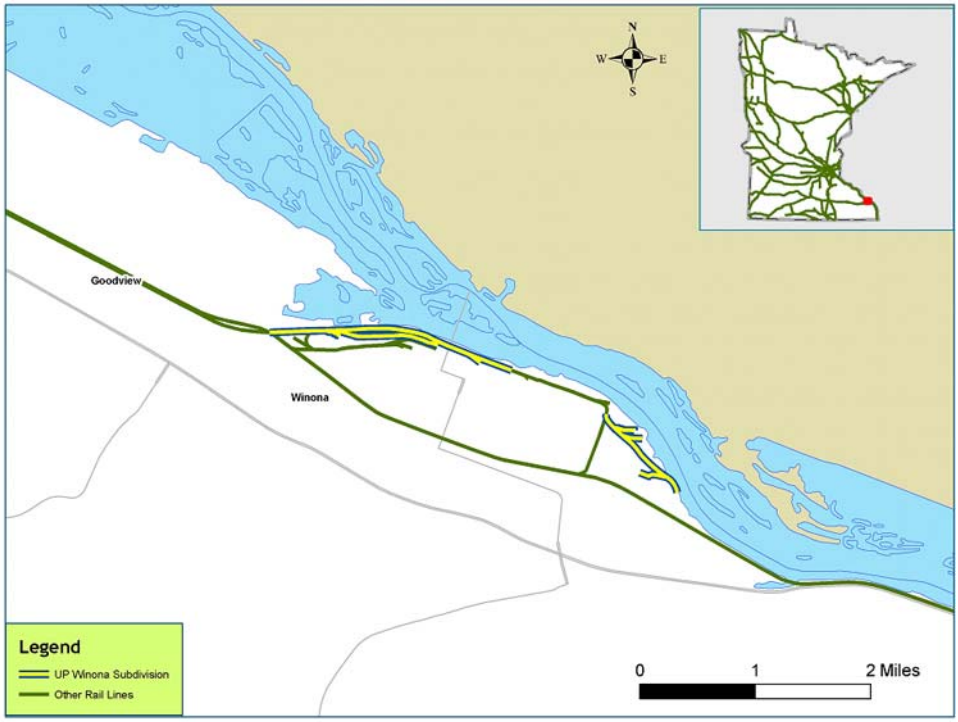
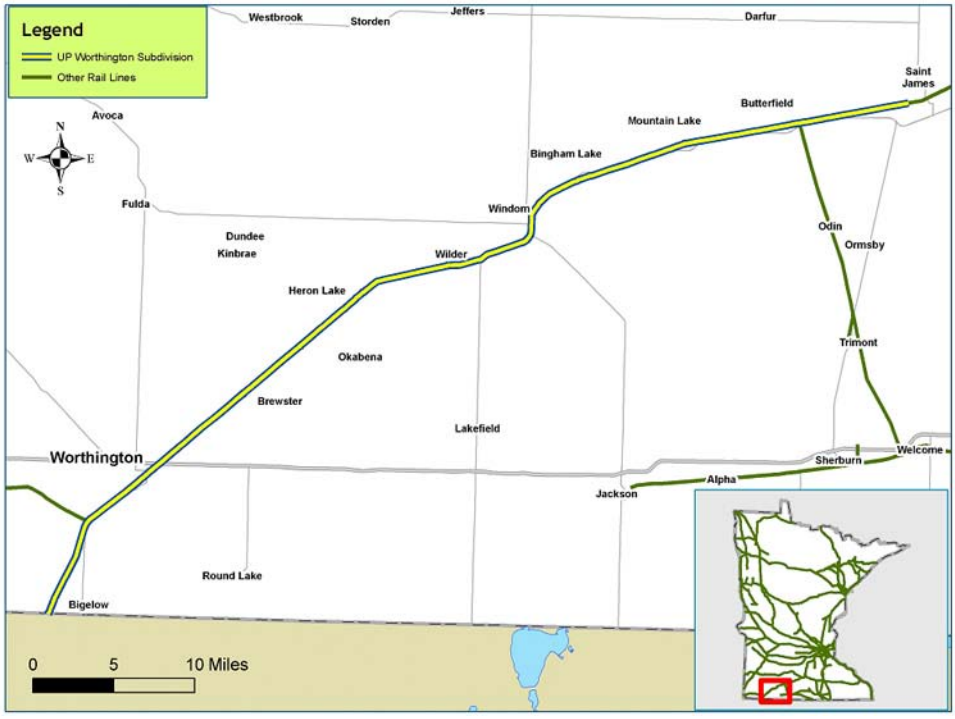


Figure B.64 UP Worthington Subdivision



Part Two

Freight Rail Demand

technical memorandum

Minnesota Comprehensive Statewide Freight and Passenger Rail Plan

Freight Rail Demand Technical Memorandum

prepared for

Minnesota Department of Transportation

prepared by

Cambridge Systematics, Inc.
100 CambridgePark Drive, Suite 400
Cambridge, Massachusetts 02140

July 31, 2009

Table of Contents

List of Tables

List of Figures

Executive Summary

In recent years, Minnesota's economic growth has generally outpaced other Midwestern states, due to its globally competitive and diverse sectors that range from medical services to retail, finance, tourism, manufacturing, as well as natural resource extraction. Much of the economic growth has been centered on the Twin Cities metropolitan area, which was ranked 14th in the nation in 2006. However, many of the State's smaller metropolitan areas have contributed to the State's vitality as well. This includes Rochester, of which the former is of course for its famous medical center, and other centers such as Mankato and Fargo-Moorhead. Beyond these diverse urban economies, the State is an innovative leader in agriculture and metallic minerals. For example, Minnesota has continued to sustain its long-standing dominance in producing iron ores for U.S. markets, but also as an increasingly important participant in international markets.

Minnesota's economic success has in no small part relied on an effective multimodal freight system that encompasses all of the major modes from highway to rail, water, and air. Rail lines stretching across the State provide high-quality connections to the west, south and east, as well as Canada. Access to transport by water includes not only the Mississippi River System but also the Great Lakes, which have played a critical role in developing and sustaining northern Minnesota's economy. The vitality of the transportation system is important not just to the extractive industries, but also to support the continued growth of service industries that are expected to fuel much of the State's future growth. Future development of freight volumes will be primarily influenced by overall population and employment growth, changes in national and global logistics patterns, and the evolution of the State's industries.

With a total volume of 630 million tons and a value of slightly over $1 trillion annually, Minnesota hosted nine percent by value and five percent by tonnage of all intercity freight transported in the U.S. in 2007. As in most regions, highways handled the majority of goods in Minnesota, with modal share for all inbound, outbound, local and through intercity shipments amounting to 81 percent of value and 49 percent of tonnage. However, at 19 percent for value and 38 percent for tonnage, the State enjoys more rail traffic and less truck traffic compared to the U.S. in general, where market share by value was only 4 percent. Shipments by water represented 6 percent of total tonnage, versus 4 percent nationally. The relatively higher portion of freight traffic carried by rail in Minnesota is caused by the mix of industries and a geographic location that plays to the railroad's strengths of handling large volumes over long distances, and is most clearly evident in that approximately 50 percent of all rail traffic neither originated nor terminated in the State. Indicative of the railroad's markets, less than 1.5 percent of all rail traffic by value and traveled wholly within Minnesota in 2007. However, there are some notably heavy flows of rail traffic, particularly between the iron range and the ports of Duluth/Superior.

A forecast by IHS-Global Insight anticipates that rail tonnage is expected to grow modestly at perhaps 25 percent or less through 2030, driven by flattening demand of Minnesota's most rail dependent industries, as well as the cessation of growth in the handling of coal from Wyoming and Montana's Powder River Basin. Consistent with other markets, substantial growth is expected to come from intermodal traffic. Representing 35 percent of all units in 2007 but only 7 percent of tonnage, intermodal volume is expected to increase by 97 percent to 2.55 million units in 2030. Throughout this time, only 28 percent of this traffic will either originate or terminate within Minnesota, with the majority consisting of through traffic between the West Coast and the east.

An increasing part of Minnesota's rail traffic has been cross-border trade with Canada, which accounted for 18 percent of rail traffic tonnage in 2007. This growth is expected to be robust, with the value of Canadian cross-border traffic expected to increase by 61 percent from $187.5 to $301.7 billion.

1.0 Objective

An essential understanding of the economy and the current and anticipated goods traffic is fundamental to identifying the future needs for rail transportation in Minnesota. Thus, this Technical Memorandum leads off by describing the composition of the economic sectors that make-up each of the State's metropolitan areas. This is followed by an overview of the Minnesota's most freight intensive industries, their logistics requirements and a reflection onto current and projected demands for freight transportation through 2030. While the focus is on rail, a perspective on truck, air and water traffic is necessary as well.

This *Freight Rail Demand* Technical Memorandum builds on the *Freight Rail Supply* Technical Memorandum (Technical Memorandum 2A) that details the rail line infrastructure that provided 1) a summary of the railroads operating in Minnesota with a focus on railroad class and mileage and 2) a detailed, corridor-level description of each railroad operating in Minnesota, includes current condition, history, track speeds, control system, traffic base, and, where known, train volumes.

2.0 Methodology

The findings and conclusions reported in this Technical Memorandum were developed in the following steps.

A review of Minnesota's regional economies and its most important industries comprises Section 3.0. A capsule snapshot is provided for each of the key industries, summarizing its contribution to the economy, current and future prospects, and logistics practices. Woods and Poole forecasts were used here, and other information was drawn from a variety of sources, including government and trade association data.

For the analysis of Minnesota's freight traffic in Section 4.0, the primary sources of data were IHS-Global Insight's 2007 TRANSEARCH INSIGHT database, and the Surface Transportation Board's 2007 Rail Waybill Sample. The former provided a picture of traffic flows for all primary modes – rail, highway, water, and air, for domestic and NAFTA traffic. Geographic resolution varied from county-level within Minnesota to BEA-level beyond the State. The Waybill Sample provides a more detailed picture of rail traffic, including more specific geography, traffic characteristics and routing information. In general, traffic was characterized by volume (tons and value), commodity, and top trading partner. Future traffic was developed using the TRANSEARCH INSIGHT database traffic projections for 2030. This forecast depicts the demand for goods movement between regions, and is not a general economic projection. It takes into account industry, regional, national and international economic trends to estimate commodity-level trade flows.

3.0 Minnesota's Economy

Minnesota's ability to compete goes beyond being industrious and having a strong work ethic, but also demands an efficient rail system that can deliver products reliably and on time. With its leading position as part of the Midwest's agricultural and manufacturing belts, the efficiency of Minnesota's freight rail system also is fundamental to overall U.S. competitiveness. The growth of rail freight volumes in Minnesota will be influenced by the interplay of a variety of factors that will have a bearing on transportation demand. These factors include overall population and employment growth, changes in national and global logistics patterns, and the evolution of the State's industry structure. Industries, ranging from agriculture to iron ore mining have specific freight needs, and their growth will affect rail freight demand. On the supply side (i.e., the provision of freight transportation infrastructure and quality freight services), the strength of Minnesota's rail network and its ability to carry freight efficiently will affect, positively or negatively, the overall competitiveness of the State's industries and its economy.

The relationship between rail freight activity and the Minnesota economy is strong and multifaceted. For example, industries rely heavily on the efficient movement of goods, both for the outbound shipments of their products to reach worldwide markets, as well as for inbound shipments of intermediate goods required for production. In addition to rail's importance to Minnesota's industries, efficient multimodal freight transportation systems can help to minimize the cost of consumer goods to Minnesota's residents. Transportation infrastructure improvements that reduce costs by either 1) lowering travel times or by 2) increasing the reliability of on-time shipments translate directly into benefits for the Minnesota economy.

This section reviews the industry factors that drive the demand for rail freight in Minnesota. It begins with a brief discussion of the economic structure of Minnesota and its larger metropolitan areas. It then proceeds to a more detailed analysis of the principal industries that depend on Minnesota's freight rail services and transportation network to ship and to receive goods.

3.1 Changing Economic Structure

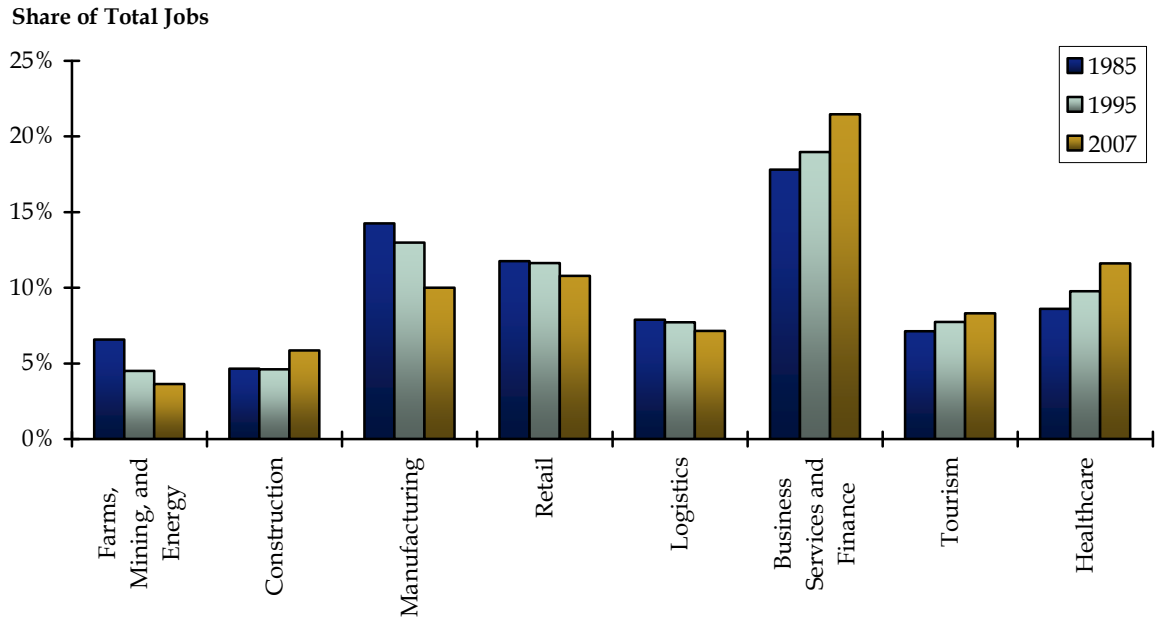
The growth of rail freight volumes in Minnesota will be influenced by the interplay of a variety of factors that will have a bearing on transportation demand. These factors include changes in national and global logistics patterns, overall population and economic growth, and the evolution of the State's economic structure. Industries, ranging from agriculture and retail to manufacturing and mining have specific transportation needs,

and their growth will affect rail freight demand in Minnesota. Rail represents a crucial component of Minnesota's transportation system; its ability to carry freight efficiently will affect, positively or negatively, the overall competitiveness of the State's economy.

A defining characteristic of the Minnesota economy is the relative growth of its business services, finance, and healthcare sectors. Minnesota's strengths in these advanced services industries have contributed to the overall economic dynamism of the State and have helped set the State apart from other Midwestern states. In 2007, business services and finance accounted for 22 percent of Minnesota's jobs, up from 19 percent in 1995. During the same period healthcare increased its share of Minnesota jobs from 10 percent to 12 percent. Figure 3.1 illustrates the contribution of each major sector to total jobs in Minnesota and the prominence of the State's business services and finance, and healthcare sectors can be easily seen.

Figure 3.1 Minnesota Economic Structure

1985 to 2007



Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

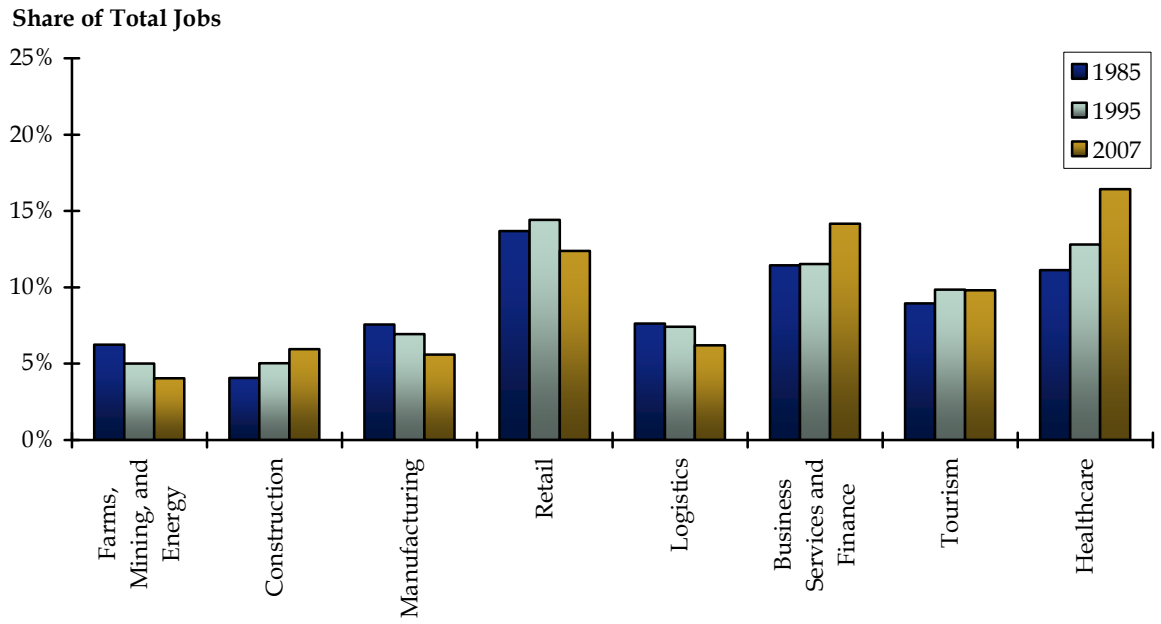
These services-oriented industries tend to move smaller, more time-sensitive goods, shipments that are typically handled by trucking and air. Similar to the United States economy, Minnesota's is becoming less reliant on farms, mining, and manufacturing for jobs. However, these industries are becoming more productive, requiring less labor, and Minnesota will continue to play a key strategic role within the U.S. economy supplying food, iron ore, and a range of manufactured goods. All of these industries rely on rail to receive inputs and to ship products to domestic markets or to U.S. and Canadian gateways for shipment overseas.

The remainder of this section highlights recent and historical economic activity for each of Minnesota's Metropolitan Statistical areas.

Duluth

Similar to the Minnesota economy, Duluth's growth has been focused on business services and finance, and healthcare. As the hub for a large region that also is a popular vacation destination, Duluth has relatively large retail and tourism sectors. The traditional industries of the Duluth area, iron ore mining and logistics (including the Port of Duluth), are declining in terms of relative jobs numbers, as shown in Figure 3.2. However, a resurgence of iron mining as well as the introduction of steel making in northeastern Minnesota underscore that the Duluth region's legacy industries will continue to make important contributions to the area's economy in the future.

Figure 3.2 Duluth MSA Economic Structure
1985 to 2007



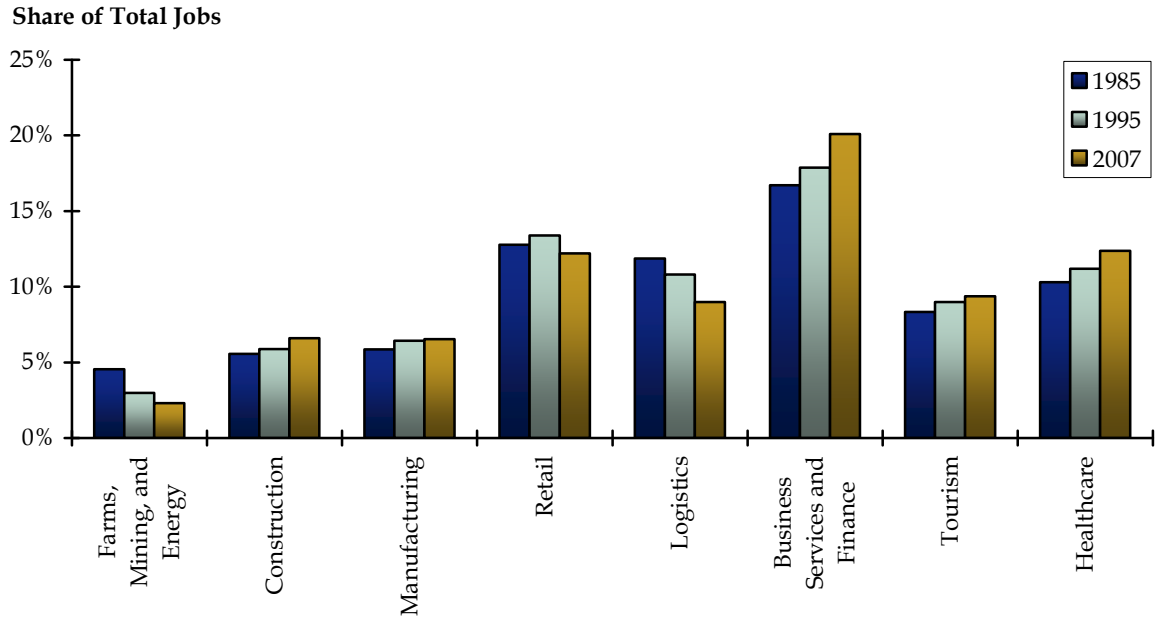
Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

Fargo-Moorehead

The Fargo-Moorehead area has an extremely resilient economy that has not experienced the job losses occurring in most other metropolitan areas around the country. Fargo-Moorehead continues to experience growth in business services and finance, and as shown in Figure 3.3, unlike other areas, the manufacturing sector is showing some

growth. Like Duluth, Fargo-Moorehead, also is a regional center serving a vast area. This contributes to a relatively large retail sector. The logistics industry, though declining in relative size, remains a major contributor to the Fargo-Moorehead economy. Fargo-Moorehead is the center for grain transport (much of it by rail) and grain storage for the Red River Valley.

Figure 3.3 Fargo-Moorehead MSA Economic Structure
1985 to 2007

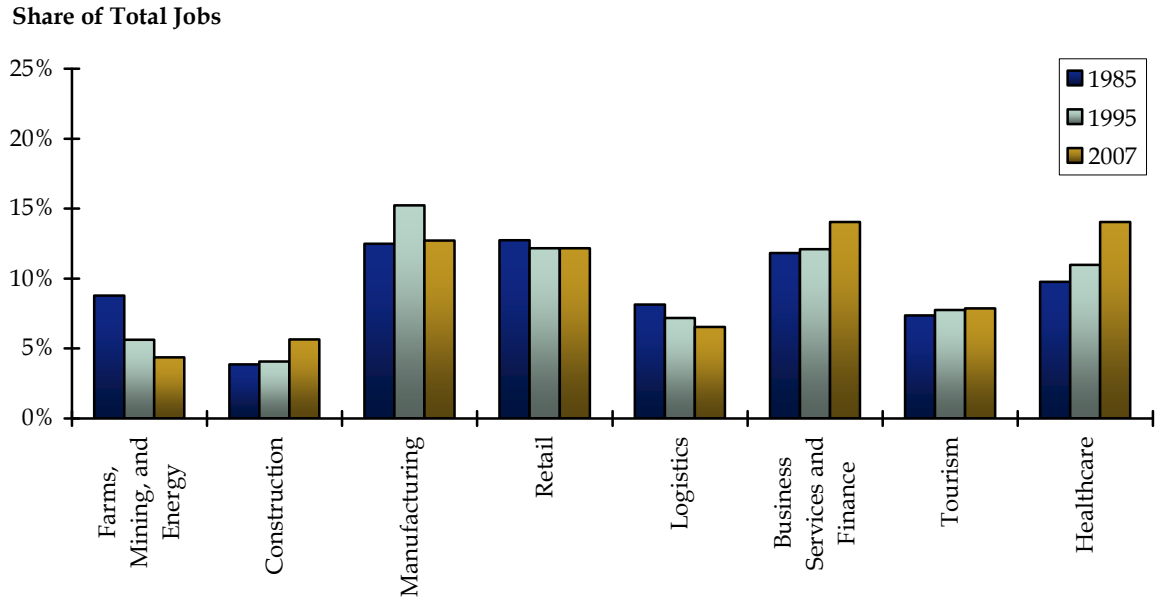


Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

Mankato

Like the overall state economy, Mankato's 2007 jobs growth focused on business services, finance, and healthcare, shown in Figure 3.4. As a regional center, Mankato also possesses a relatively large retail sector. At the heart of south-central Minnesota's corn and soybean growing areas, Mankato continues to have a large farming sector, though its contribution to jobs in the economy is declining. Mankato has a much larger manufacturing sector than Minnesota, accounting for 13 percent of jobs compared to 10 percent in the State. Manufacturing is more dependent on freight transportation than most other industry sectors and counts on the reliability and connectivity provided by the rail and road networks to produce and deliver products. Food processing, feed preparation, and farm machinery are important contributors to Mankato's manufacturing strength.

Figure 3.4 Mankato MSA Economic Structure
1985 to 2007

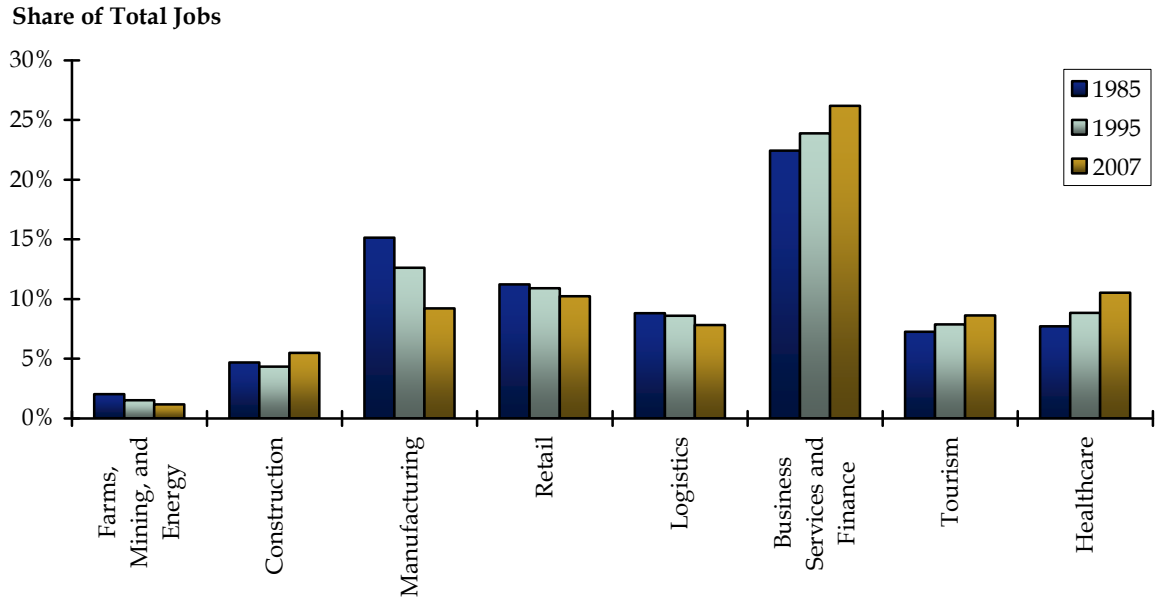


Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

Minneapolis-St. Paul

Comprising two-thirds of the Minnesota economy, the Minneapolis-St. Paul area's economic structure is similar to the State's, with recent job gains dominated by business services, finance, and healthcare. Minneapolis-St. Paul also is the transportation and retail hub for the North Central United States – roles that the metropolitan area will likely maintain into the future. The region's diverse economy and historically strong population and economic growth has helped sustain demand for new commercial, residential, and government buildings, as well as expanded infrastructure, as shown in Figure 3.5. Although construction has slowed significantly due to the current drop-off in home building, Minneapolis-St. Paul, as a locus for much of the State's (and North Central U.S.) long-term population growth, will support a more robust construction sector in future years. Construction depends on the reliability of the rail and roadway systems to ensure on-time deliveries of building materials.

Figure 3.5 Minneapolis-St. Paul MSA Economic Structure
1985 to 2007

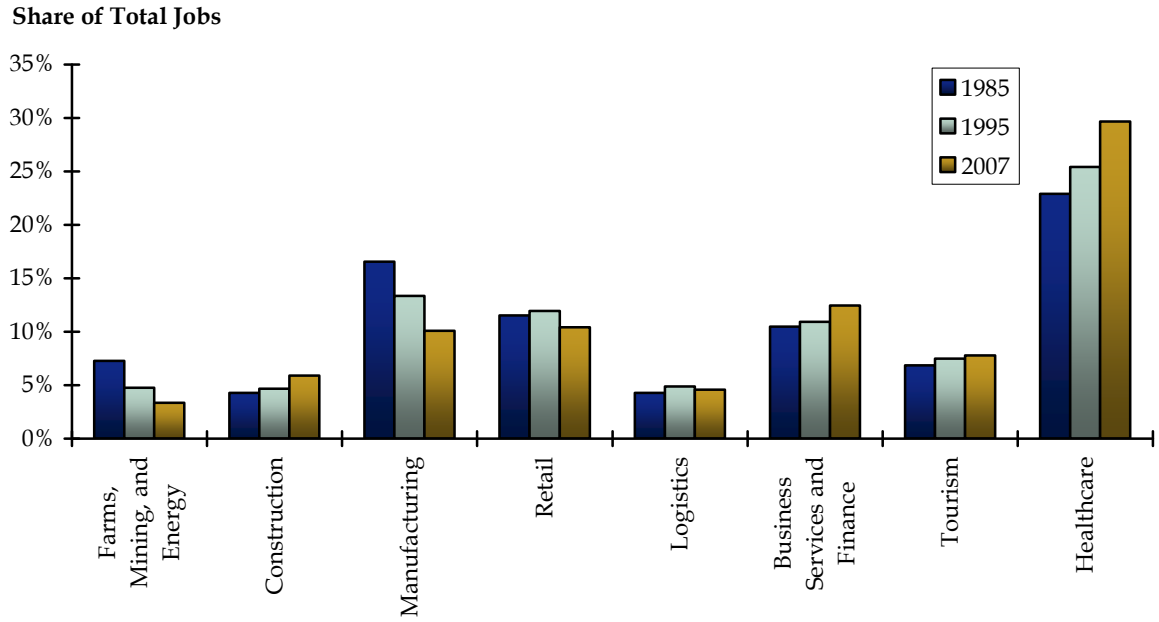


Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

Rochester

Due to the presence of the Mayo Clinic, the University of Minnesota-Rochester, the Hormel Institute, and numerous other institutions, Rochester is a center of medicine, technology, and biosciences. Given these unparalleled strengths, Figure 3.6 clearly illustrates that healthcare is the pillar of the Rochester economy. Healthcare continues to generate jobs and now accounts for 30 percent the Rochester area's jobs. By comparison, healthcare accounts for 12 percent of the State's jobs base. Rochester's relative competitiveness in healthcare and life science industries is expected to sustain long-term economic growth for the area.

Figure 3.6 Rochester MSA Economic Structure
1985 to 2007

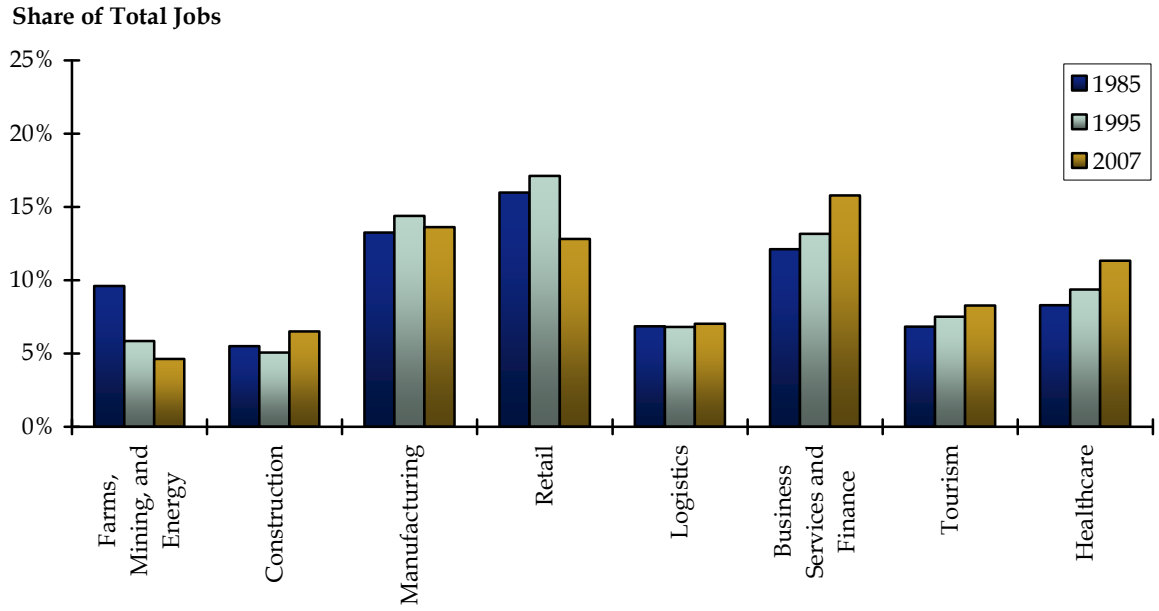


Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

St. Cloud

The St. Cloud area is on the western fringe of the expanding greater Minneapolis-St. Paul Region. Population and economic growth, long term, will sustain growth in the St. Cloud area's already sizeable construction industry. Beyond construction, St. Cloud's recent jobs growth has been fueled by business services, finance, and healthcare, as shown in Figure 3.7. As a regional center, St. Cloud also has a relatively large retail sector. At the heart of Minnesota's dairy industry, St. Cloud continues to have a large farming sector, though its contribution to jobs in the economy is declining. St. Cloud has a much larger manufacturing sector than Minnesota, accounting for 14 percent of jobs compared to 10 percent in the State. Manufacturing is more dependent on freight transportation than most other industry sectors and counts on the reliability and connectivity provided by the rail and road networks to produce and deliver products. Food processing, optics, and appliances are important contributors to St. Cloud's manufacturing strength.

Figure 3.7 St. Cloud MSA Economic Structure
1985 to 2007



Sources: Woods & Poole based on Bureau of Economic Analysis historic data.

3.2 Outlook for Minnesota Freight-Intensive Industries

Within Minnesota, there are a number of industries that are: 1) key players in the State economy due to their size, growth opportunities, and strategic importance; and 2) highly dependent on the efficient movement of transportation and rail freight to keep supply chains flowing, manage costs, and remain productive in very competitive national and global markets. In this section, the economic importance and trends of the industries that produce (and ship) or receive large volumes of rail freight shipments, both in terms of tonnage and value, are analyzed. These are the shippers that depend on Minnesota's freight transportation network and services to transport their goods in the global marketplace, to stock their shelves with the latest products for Minnesota residents and visitors, and to haul construction materials to keep pace with infrastructure, commercial, and residential building projects.

Within the Minnesota economy, eight specific industries were selected as being especially sensitive to the performance of the State's rail freight transportation system and/or strategically significant to the State's future competitiveness. These industries include Manufacturing, Life Sciences, Agriculture and Food (Soybeans, Corn, and Ethanol), Energy (Coal Consumption), Construction (Sand and Gravel, Taconite Tailings), Paper and Wood Products, Iron Ore and Steel, and Distribution. In addition, at the conclusion of

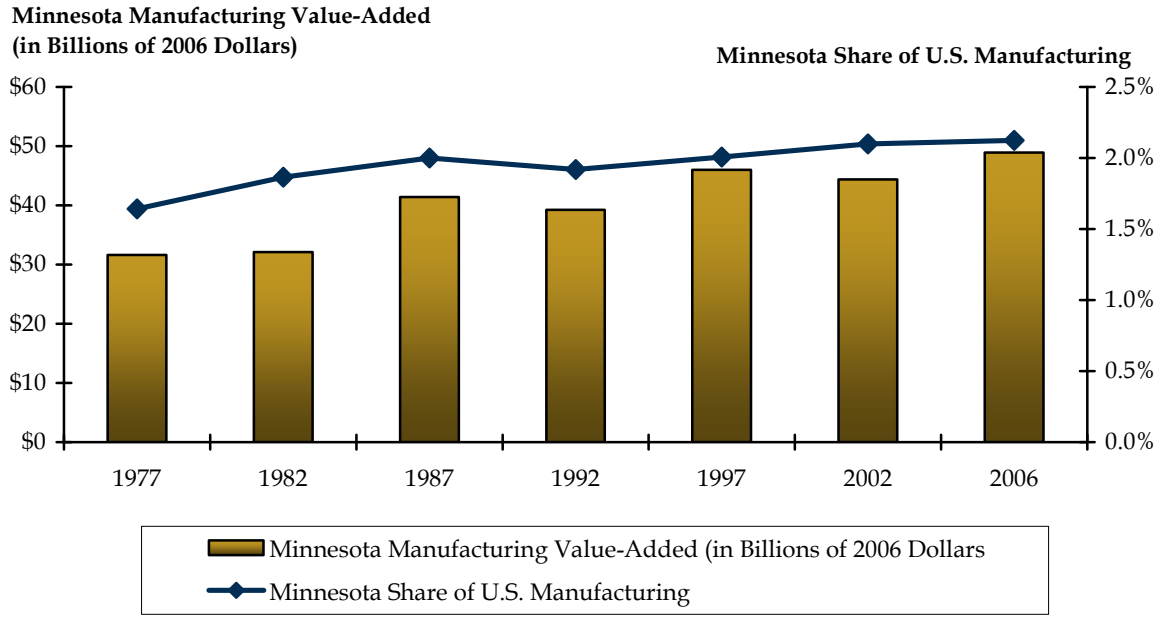
this section transshipping at the Ports of Duluth/Superior also is discussed, given its importance to Minnesota as an outlet for bulk products destined for markets along the Great Lakes and overseas.

Manufacturing Industry

Manufacturing has been an important contributor to the Minnesota economy for decades, transforming from the milling of grains and the manufacture of machinery to today's production of high-value medical equipment and energy-efficient building products. Minnesota's manufacturing sector, today, employs approximately 360,000 people, accounting for 10 percent of all the State's jobs. Manufacturing also accounts for 10 percent of U.S. jobs. As Minnesota plans for the future of its rail freight transportation network, it needs to consider the substantial contribution of manufacturing to the state economy, a fact that can be obscured by years of declining jobs in the industry. While employment in the Minnesota manufacturing sector has been dropping (similar to almost all other states), the value of goods manufactured in Minnesota has been rising (Figure 3.8). Minnesota manufacturers have invested heavily in automation and sophisticated process technologies, reducing their need for labor while maintaining and increasing output. The drop in manufacturing employment also reflects the internal restructuring of manufacturing firms. To lower costs and maintain competitiveness, manufacturers have been outsourcing functions, such as human resources, payroll, maintenance, engineering, and logistics services. This has shifted employment from manufacturing to other sectors, notably to the service sector, which has seen continuing increases in employment. While the number of manufacturing jobs in Minnesota have decreased over the past few decades, the value of goods produced by the State's manufacturers posted a 25 percent increase (in inflation-adjusted dollars) between 1992 and 2006, giving Minnesota a slowly rising share of total U.S. manufacturing production.[8]

[8] Bureau of Economic Analysis, manufacturing GDP growth adjusted for inflation.

Figure 3.8 Minnesota Manufacturing Value Added
1977 to 2006

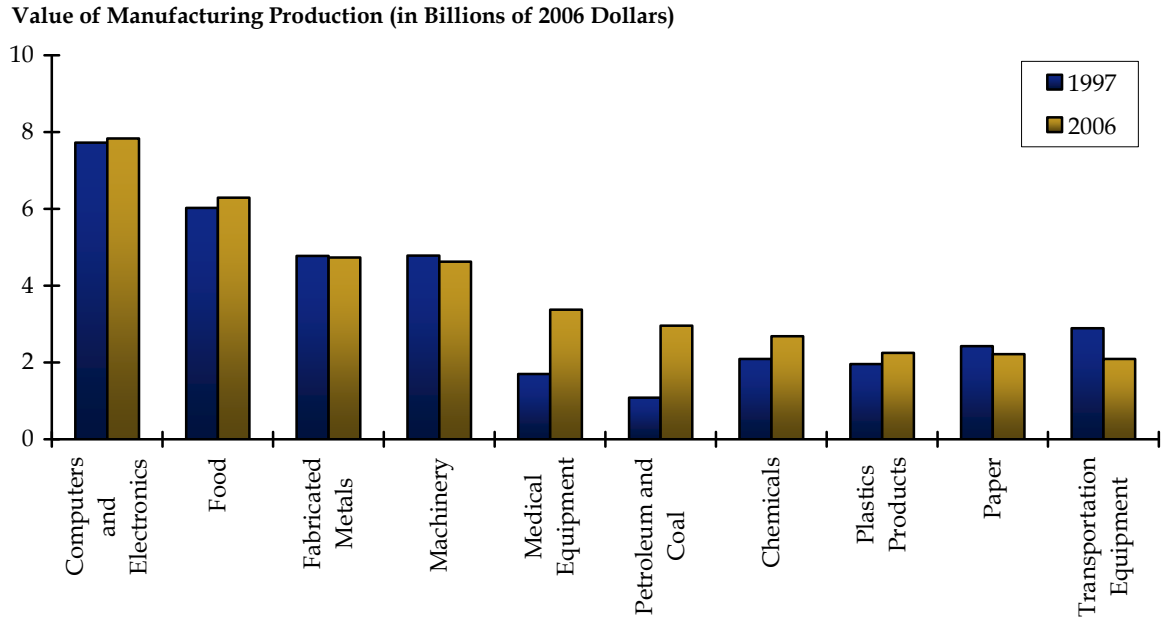


Source: U.S. Census Bureau, Census of Manufactures and Annual Survey of Manufactures.

Looking at Minnesota's manufacturing performance over the last decade, the State's improvements are varied by industry. In real terms, manufacturing output increased in each of the State's two largest manufacturing industries (Figure 3.9) – computers and electronics; and food – between 1997 and 2006. Output also surged within the quickly emerging medical equipment industry, doubling from $1.7 billion in 1997 to $3.4 billion in 2006.

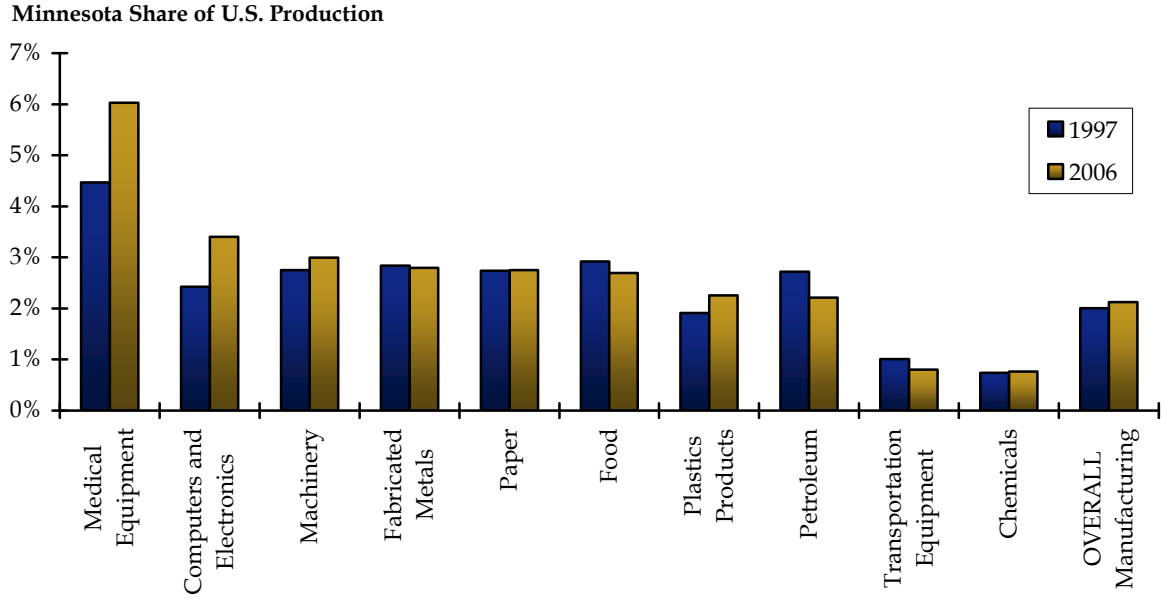
Minnesota's recent increases in U.S. manufacturing share have been led by the medical equipment and computers and electronics industries (Figure 3.10). Between 1997 and 2006, the State's share of the nation's medical equipment production increased from 4.5 percent to 6.0 percent while its share of computers and electronics output rose from 2.4 percent to 3.4 percent. This trend underscores Minnesota's role as a national leader in innovation and cultivating technologically advanced industries.

Figure 3.9 Value of Minnesota Manufacturing Production by Industry
1997 to 2006 (In 2006 Dollars)



Source: U.S. Census Bureau, Census of Manufactures and Annual Survey of Manufactures.

Figure 3.10 Minnesota's Share of U.S. Production by Manufacturing Industry
1997 to 2006



Source: U.S. Census Bureau, Census of Manufactures and Annual Survey of Manufactures.

While there is no doubt that Minnesota has been affected by competition from other countries, the State's manufacturing sector has continued to play an important role in the state economy. However, Minnesota's manufacturers must strive to stay in front of competitors from lower-cost countries, which will impart continued pressure on manufactured goods pricing. Success will be dictated by the degree to which Minnesota's manufacturers are able to rapidly adopt new technology, improve quality, and sustain aggressive cost-control efforts.

Transportation is a key contributor to manufacturer competitiveness and these trends have several implications for Minnesota's rail freight transportation system. First is the need to maintain flexible and reliable transportation services that efficiently connect Minnesota manufacturers with customers and suppliers.

Rail also is crucial to Minnesota manufacturers, especially for shipping heavy goods (e.g., structural steel, machinery, building materials) and chemicals. While Minnesota's rail links to the West Coast and western Canada are considered excellent, rail moves to the East Coast are problematic as trains must go through Chicago, the most heavily congested rail bottleneck in North America. This adds to manufacturers' costs, potentially reducing the efficiencies and cost advantages of using rail. Improving the flow of rail traffic through the Chicago region (as is envisioned in the CREATE initiative) and perhaps developing alternative routes to the East Coast would add to the efficiency of Minnesota's manufacturers by lowering costs and helping them reach gateways and markets more effectively.

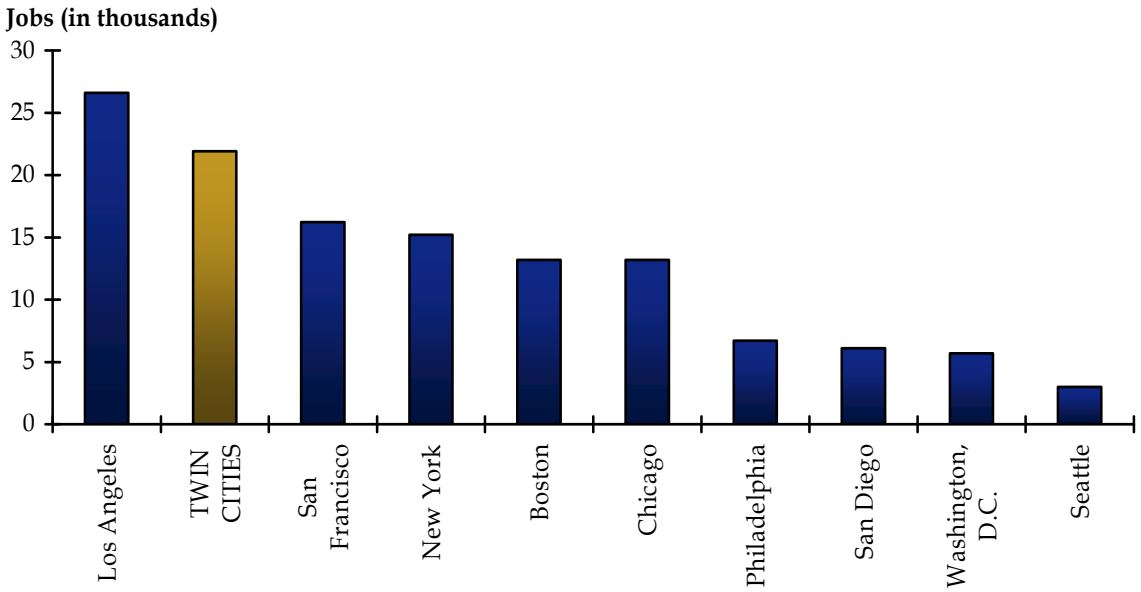
Life Sciences

Beginning with the multispecialty group practice pioneered by the Mayo Clinic in Rochester and opened in 1914, Minnesota has developed a strong legacy in healthcare services and medical technology. Healthcare is one of the fastest growing sectors of the State's economy, both in terms of job gains and contribution to gross state product. Since 1997, healthcare services, has accounted for over one-quarter of Minnesota's jobs growth. Today, the Mayo Clinic in Rochester is a medical destination for patients from all parts of the United States and around the world. The clinic employs over 30,000 people in Rochester and has an economic contribution of over $4 billion per year, accounting for 1.3 percent of the Minnesota economy. As the nation becomes older, the healthcare industry is forecast to continue its expansion. At this point, it is uncertain how potential changes in Federal healthcare policy may affect employment in the industry.

With a strong healthcare services sector providing a strong base, Minnesota's life sciences industry (includes medical devices, pharmaceuticals, biotechnology, and clinical research) also is one of the largest in the United States. A recent study by the Milken Institute analyzing the life sciences clusters around the country, highly ranked Minneapolis-St. Paul among the nation's metropolitan areas in the strength of its life sciences industry, as shown in Figure 3.11. The Twin Cities are particularly strong in the medical devices industry, ranking second to metropolitan Los Angeles in total jobs within the industry.

Medical devices are a technology-intensive industry and include X-ray apparatus, surgical supplies, dental equipment, opthalmic goods, and electro-medical equipment.

Figure 3.11 Medical Device Employment by Metropolitan Area
2007



Source: Bureau of Labor Statistics, U.S. Census Bureau, Harris InfoSource, Milken Institute.

The high-value, low-weight goods produced and consumed by the life sciences industry require fast and reliable transportation services, generally relying on trucks and air freight to ship projects and receive inputs from an increasingly global supply chain. For example, high-value-added components for Boston Scientific medical equipment are manufactured in Maple Grove and shipped by air to Ireland for final assembly. Longer-term, life sciences are expected to be a growth industry nationwide and Minnesota is in a good position to capitalize on this growth.

Agriculture and Food

Agriculture and food are two interrelated industries. "Agriculture" represents the growing of crops (e.g., soybeans, corn, wheat) and the raising of livestock, while "food" represents the manufacture of the items commonly found on grocery store shelves (e.g., milk, cheese, bread, meat, soda, beer, etc.) other than fresh produce. Both agriculture and food use rail, roadways, and waterways for inputs (fertilizer, feed, oils, flour, etc.) and to transport harvested commodities and finished goods to more distant markets.

Agriculture. Minnesota's agriculture industry is the 6th largest in the country, producing crops and livestock valued at $11.0 billion in 2006 (Table 3.1). While the State ranks first in the country in turkeys and third in hogs, Minnesota's agriculture industry, based on value, is led by crop production (e.g., corn, soybeans, sugar beets, and wheat).

Table 3.1 Market Value of Total Agricultural Production

Top 10 States, 2006

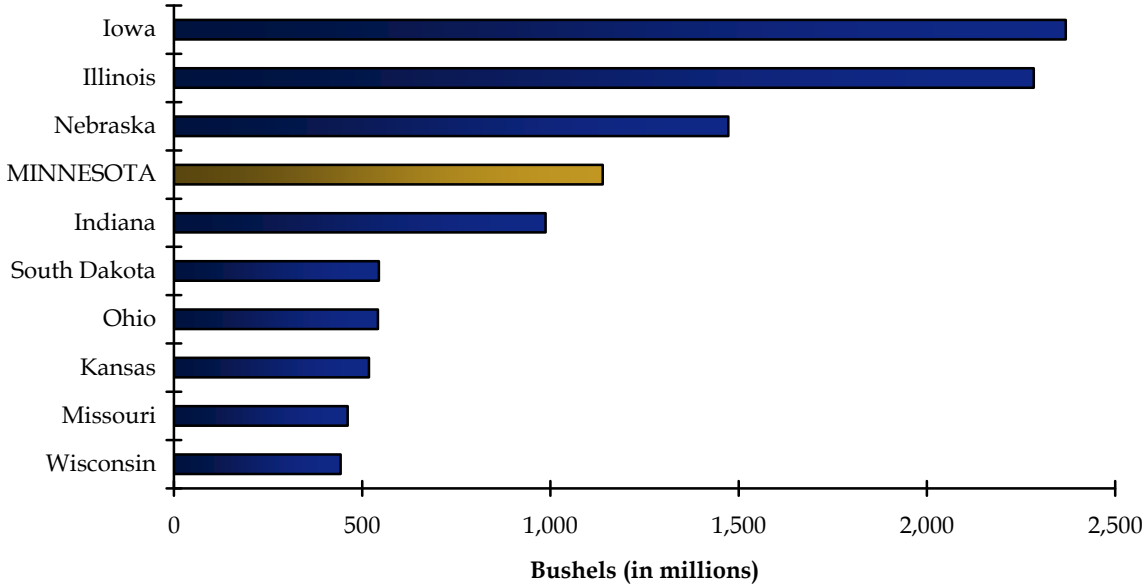
	Value (In Billions of Dollars)	Share of United States
California	34.1	12.4%
Texas	19.1	6.9%
Iowa	16.4	6.0%
Nebraska	13.2	4.8%
Kansas	11.1	4.0%
Minnesota	**11.0**	**4.0%**
North Carolina	10.2	3.7%
Illinois	10.2	3.7%
Wisconsin	8.1	2.9%
Florida	7.7	2.8%
United States	275.7	

Source: U.S. Department of Agriculture.

Minnesota, joined by Iowa, Illinois, Nebraska, and Indiana, is one of the nation's top-tier growers of corn (Figure 3.12), with nearly 1.2 billion bushels grown in 2007. Historically, there has been an upward trend in Minnesota corn production for about a decade and the State generally accounts for about 10 to 11 percent of the nation's corn harvest (Figure 3.13).

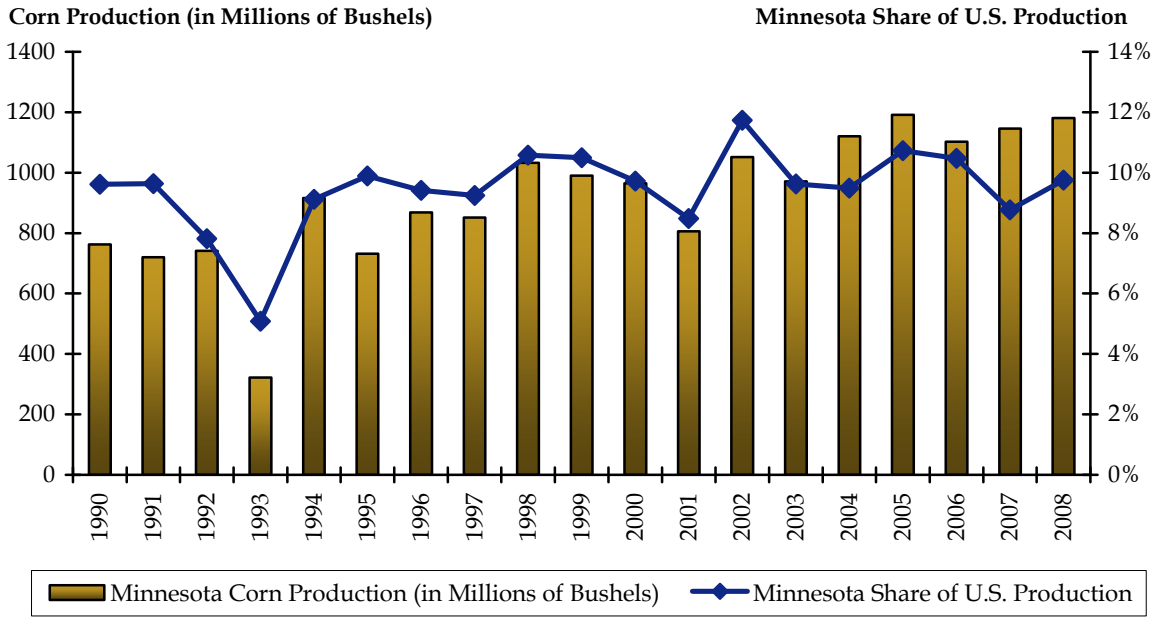
With the expanding use of ethanol, which uses corn as its primary feedstock, and increasing worldwide demand for corn as an animal feed, Minnesota's corn production reached a record in 2005 with the 2008 crop just a fraction smaller. In August 2008, there were 19 ethanol plants operating in Minnesota (see Figure 3.14 map) with an annual capacity of 850 million gallons per year. There are an additional three plants under construction, which, when (or if) completed, will increase the State's ethanol production capacity by about one-third once they become operational. Similar to many other Midwestern states, Minnesota has seen a marked increase in ethanol production capacity in a short amount of time (Figure 3.15). In early 2009, Minnesota's ethanol plants had the fifth highest production capacity in the United States.

Figure 3.12 Top Corn Producing States



Source: U.S. Department of Agriculture, 2007.

Figure 3.13 Minnesota Corn Production

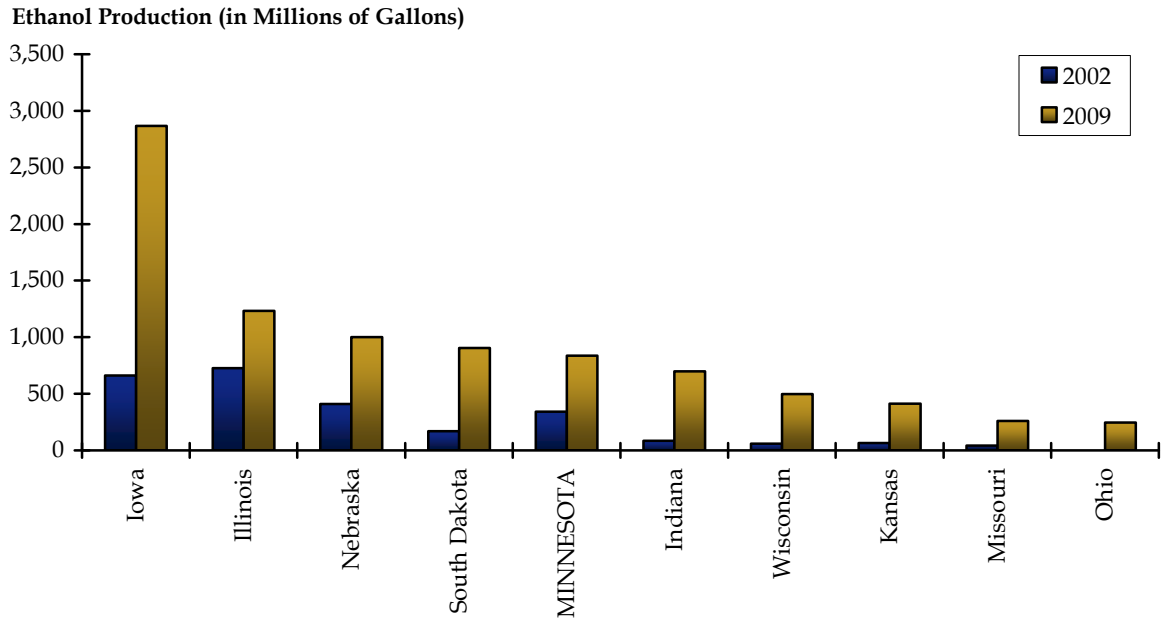


Source: U.S. Department of Agriculture, 2007.

Future growth of the ethanol industry may be constrained by fewer cars on the road that are capable of running on fuels that are more than 10 percent ethanol. Today only three percent of cars are designed flex-fuel vehicles able to run on gasoline with high ethanol content and there is concern about the potential for mechanical problems in nonflex-fuel vehicles if ethanol levels in common gasoline is increased to 12.5 or 15 percent. A change in allowable ethanol content or the increased availability of flex-fuel vehicles could result in a very large increase in ethanol demand.

Figure 3.14 Ethanol Production Capacity – Leading States

2002 to 2009

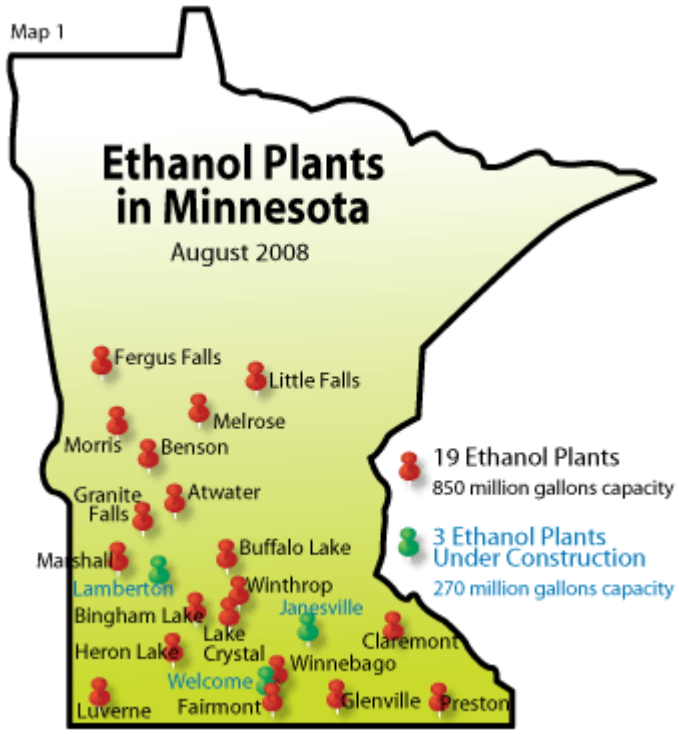


Source: Renewable Fuels Association

Although ethanol production is concentrated in the Midwest, its consumption is led by California, Texas, and the Northeast. Most of this traffic is handled by rail in tank cars, as the material is not suitable for transport by the existing pipeline network. With these plants located near their crop sources in rural areas, short lines are often the beneficiaries of this new traffic. It has contributed substantially to the success of some short lines in Minnesota and throughout the Midwest. However, eventually volumes may be sufficient to develop a dedicated pipeline network for ethanol, which would result in the diversion of this traffic away from rail.

These demand factors (animal feed and ethanol production) will influence Minnesota's corn harvest in coming years. Corn is grown abundantly throughout southern and western Minnesota, with the largest harvests found in Renville, Martin, Faribault, Redwood, and Mower Counties.

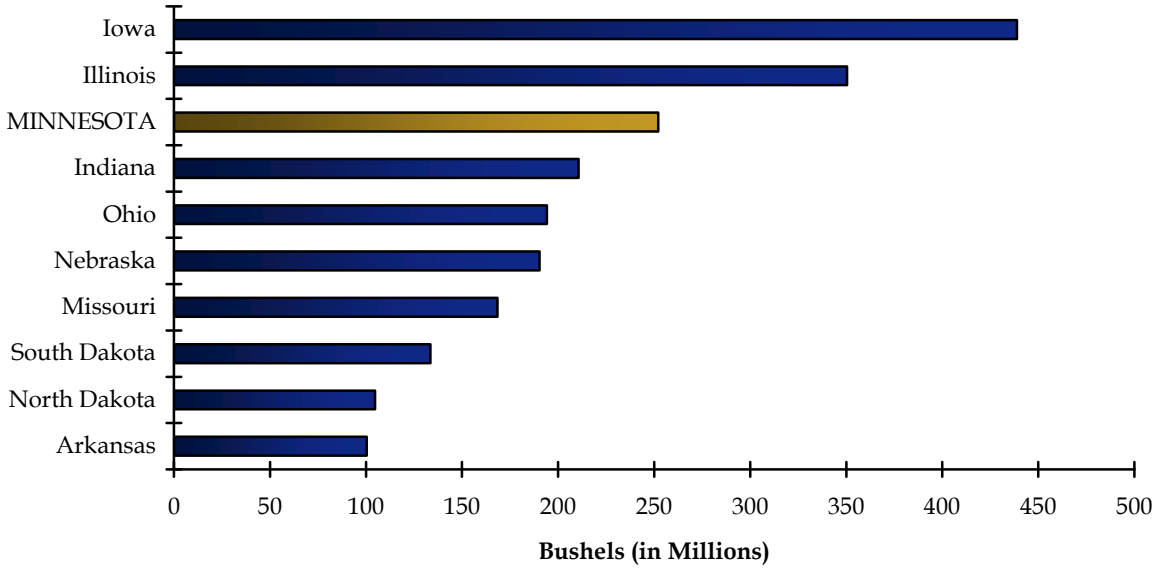
Figure 3.15 Ethanol Production Facilities



Source: Minnesota Department of Agriculture.

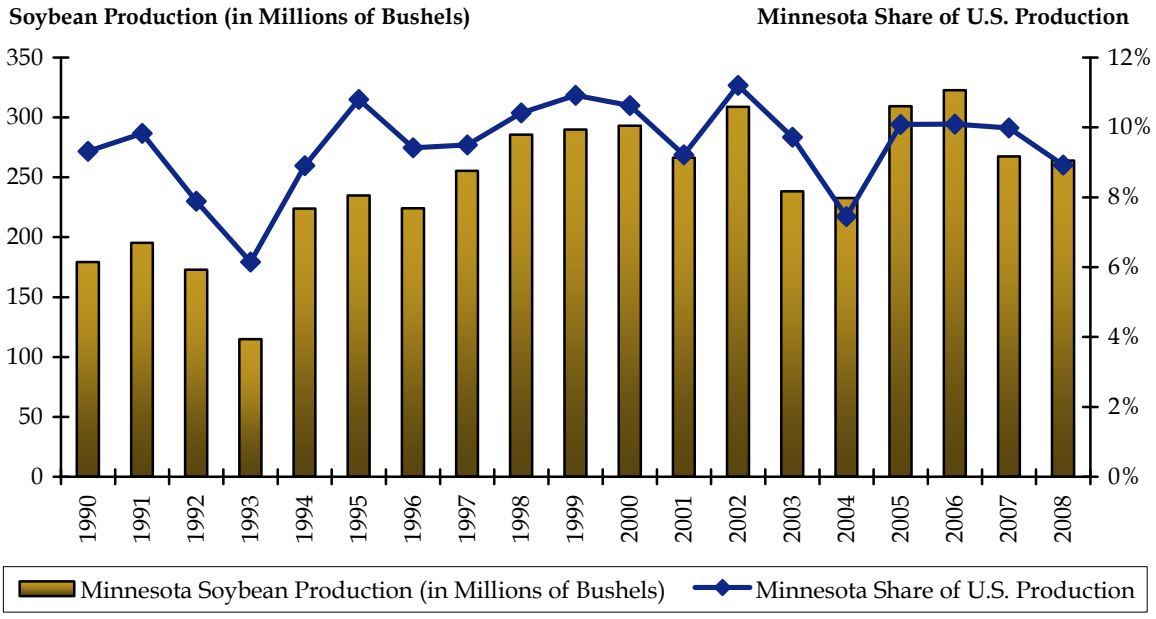
After corn, the other leading crop grown in Minnesota is soybeans. Minnesota ranked as the third largest grower of soybeans in the United States in 2007, following Iowa and Illinois (Figure 3.16). Minnesota's soybean harvest, however, fell to 250 million bushels in 2008 after exceeding 300 million bushels in 2006, a record high. Minnesota's soybean harvest has remained fairly steady for about a decade and generally fluctuates between 250 million to about 300 million bushels per year. Minnesota's share of total U.S. soybean production is typically around 10 percent (Figure 3.17), roughly similar to the State's share of the nation's corn harvest. Long term, demand for Minnesota's soybeans will be stimulated by factors similar to those that are driving up production for corn – renewable fuels (soybean biodiesel) and worldwide demand for both corn and soybeans to be used as feeds or processed into food products.

Figure 3.16 Top Soybean Producing States



Source: U.S. Department of Agriculture, 2007.

Figure 3.17 Minnesota Soybean Production



Source: U.S. Department of Agriculture, 2007.

Close to the heart of the nation's agricultural belt, Minnesota will remain an attractive location for developing plant-based energy in coming years. The adoption of these fuels to meet the country's energy needs will be a strong influence on soybean and corn cultivation in Minnesota (and other Midwestern states) in the future. The amount of biodiesel sold in Minnesota is expected to rise as the State has recently introduced a requirement that all diesel fuel contain at least five percent biodiesel, which is mostly derived from soybeans. By 2015, the requirement will increase to 20 percent. These mandates will support biodiesel producers, mostly located in the southern part of the State. However, soybeans may lose favor to other oils, canola and corn, that can be refined into biodiesel at a lower cost.

Soybeans are intensively grown in the same parts of Minnesota as corn, with the largest concentrations of acreage and production located in the southern and western parts of the State and stretching north into the Red River Valley. The top soybean producing counties are Redwood, Polk, Faribault, Nobles, and Martin.

Food Products. The value of Minnesota's food products output reached $6.4 billion in 2006, ranking Minnesota 15th among the states (Table 3.2), and increasing by 31 percent between 1997 and 2006, a rate of increase somewhat below the national average. Food production is an important part of the Minnesota economy, and within the food industry, Minnesota is a national leader in the production of cheese (rank #5) and milk (#6).

Table 3.2 Top Food Processing States, 2006

Value of Food Output, in Billions of Dollars

State	1997	2006	Percent Change
California	16.6	24.9	50.0%
Texas	9.6	14.1	46.9%
Pennsylvania	9.1	13.8	51.6%
Illinois	12.3	12.9	4.9%
Ohio	8.9	10.3	15.7%
Georgia	6.3	10.2	61.9%
Iowa	7.0	9.5	35.7%
North Carolina	4.5	8.7	93.3%
Wisconsin	6.5	8.7	33.8%
Tennessee	4.2	7.4	76.2%
New York	6.0	7.1	18.3%
Arkansas	3.7	7.0	89.2%

Table 3.2 Top Food Processing States, 2006 (continued)
Value of Food Output, in Billions of Dollars

State	1997	2006	Percent Change
Virginia	4.1	6.6	61.0%
Indiana	4.6	6.4	39.1%
Minnesota	**4.8**	**6.3**	**31.3%**
United States	163.7	233.7	42.8%

Source: U.S. Census Bureau, Census of Manufactures, and Annual Survey of Manufactures.

Rail freight plays a crucial role in Minnesota's food and agriculture industries. The agriculture industry ships goods that are heavy, bulky, and relatively low value per ton, and these products often must be shipped long distances to reach domestic and global markets. This means that transportation costs are a significant portion of the price of delivered shipments and products. For this reason, agricultural shippers stress the importance of lower-cost and reliable rail and barge transportation to maintain their competitiveness. The expansion of Midwestern ethanol production and the nationwide distribution network also has increased the demand for longer-haul rail transportation to transport feedstock and refined fuels from Minnesota to other parts of the country. Higher-cost truck transportation also is crucial for transporting key inputs (fertilizers, seeds, feed, etc.) to farms and to bring harvests to loading facilities, processing plants, and other markets.

Minnesota and the Midwest has been the breadbasket to the world for decades, exporting huge volumes of grain to countries with inadequate tillable land or inefficient agricultural sectors. The value of Minnesota agricultural exports has grown substantially in recent years, having reached $3.6 billion in 2007, which places it at the 7th highest in the nation. Soybeans and feed grains (e.g., corn) dominate the State's agricultural exports. Rail freight access to the country's international gateways, including the Port of Duluth-Superior, as well as ports along the Atlantic, Pacific, and Gulf coasts are crucial to the competitiveness of the State's agricultural exports.

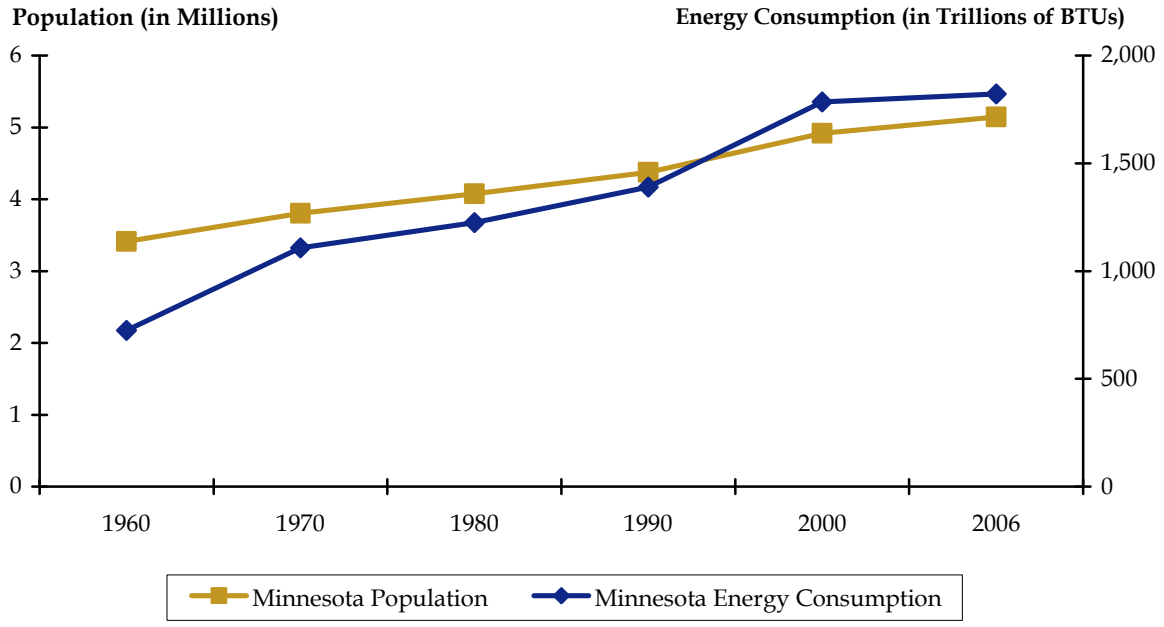
Rail is important for shipping grains for export, but the agricultural sector now finds itself competing with the retail industry and coal/electric power industries for space on the rail network. Smaller shippers are finding it hard to get specialized rail cars such as bulk hopper cars and to get reliable and timely service for small lot shipments. Without adequate rail service, agricultural shippers must shift to trucks, increasing their transportation costs and potentially making them less competitive with major agricultural producers in Argentina, Australia, and Brazil. The price and availability of transportation could influence what types of crops are grown, which could favor growers in parts of the State that have better and more accessible rail service over locations that do not.

Energy

Electricity costs are a key business climate consideration that affects the site location decisions of prospective companies and also influences the willingness of local companies to expand. Businesses expect a reliable flow of competitively priced electricity (not only do blackouts or brownouts bring work to a halt, but they also can destroy production runs in some industries such as plastics products). Efforts to lower the costs of electricity, including the costs of transporting feedstocks (e.g., coal) to utilities, have a positive impact on Minnesota businesses and residents, alike. Due to the intensive use of coal to generate electricity and the commensurately high coal volumes hauled on Minnesota railways, the link between rail freight and energy production is clear.

Minnesota's total energy consumption (includes fuels used for all uses) in recent decades has grown proportionately with the State's population (Figure 3.18). If this relationship holds into the future, Minnesota's energy supplies will need to grow to meet the State's projected increases in population. To satisfy its energy needs, Minnesota will either need to add generating capacity within the State or import more electricity from other states. Eventually, barring efforts to gain efficiencies and diversify energy sources towards a greater use of renewables, Minnesota's fossil fuel power facilities will need to increase generation capacity by either expanding or building new plants.

Figure 3.18 Energy Consumption and Population Growth in Minnesota
1960 to 2006



Sources: U.S. Department of Energy and U.S. Census Bureau.

The transport of fuels (i.e., coal and petroleum) by rail is one of the leading inputs in the energy industry. Rail currently is the dominant mode of transportation to bring coal into Minnesota, and coal is the top commodity brought into Minnesota. In 2007, coal accounted for 53 percent (22 million tons) of all goods transported by rail with a Minnesota destination. Because of its weight and the volumes required to sustain electricity production at power plants, rail and barge are the preferred modes for transporting coal. Thus, rail is a principal cost factor in electricity production that affects the overall price of energy.

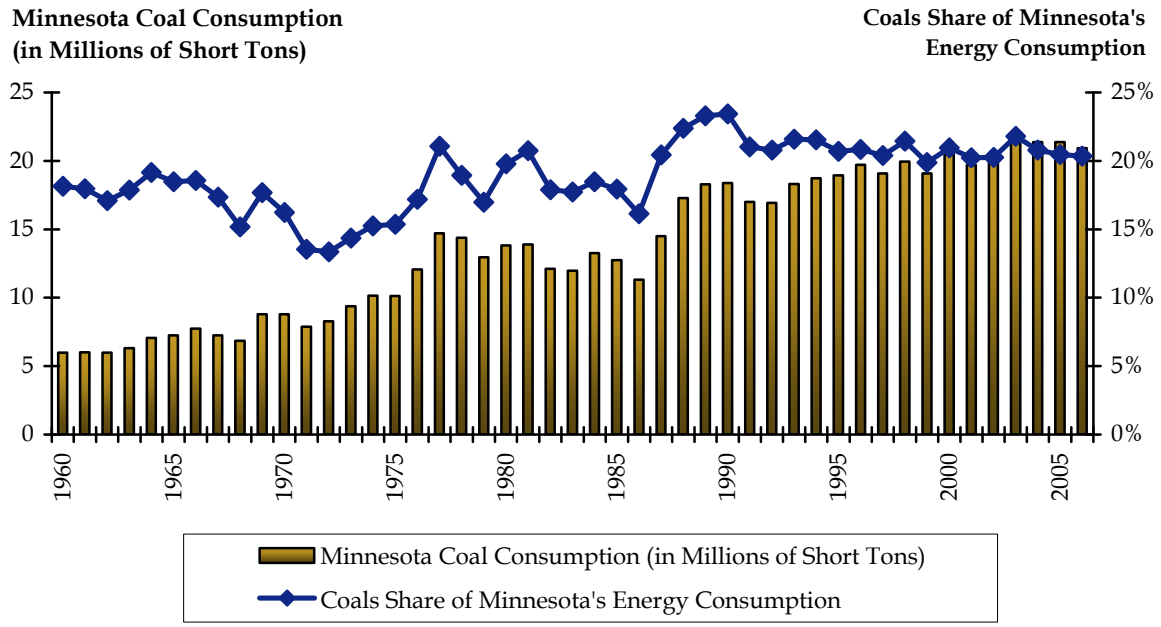
Coal supplies in the United States are plentiful and coal-fired power plants offer lower electricity rates than plants using oil or natural gas. Limitations on the development of nuclear and hydroelectric power plants, both low-cost sources of electricity, combined with new technologies that allow coal to be burned more cleanly, have made coal a popular fuel choice for expanding electricity production. Should oil prices rise again as they did in 2008, the appeal of coal is likely to increase. However, major recent discoveries of natural gas in the United States as well as rising concerns about greenhouse gas emissions may well result in either stable or lower demand for coal in future years. If greenhouse gas regulation is introduced in the United States, the price of electricity from coal is likely to rise, and thus make it a less attractive feedstock for electricity generation. Reflective of these trends, coal plants are disappearing or becoming a smaller factor in some utilities long-range plans. For example, Xcel Energy abandoned plans to build a 550 megawatt coal plant near Rosemount in 2007. Close to Taconite in the Mesabi Range, a 600 megawatt coal gasification plant currently is being reviewed but has not yet been approved.

In Minnesota, the annual consumption of coal has increased from six million tons in 1960 to 21 million tons in 2006, very close to the 22 million record set in 2003. In 1960, coal accounted for 18 percent of the energy consumed in Minnesota, but declined to 13 percent in the mid-1970s. Since the 1980s, coal, again, has become a more important source of energy in Minnesota. According to 2006 figures, it now accounts for 20 percent (Figures 3.19 and 3.20), and is essential for fueling Minnesota's 13 coal-fired power plants. In 2007, Minnesota was the 22nd largest consumer of coal in the country.[9]

[9] National Mining Association, http://www.nma.org/pdf/c_use_state.pdf.

Figure 3.19 Minnesota Coal Consumption

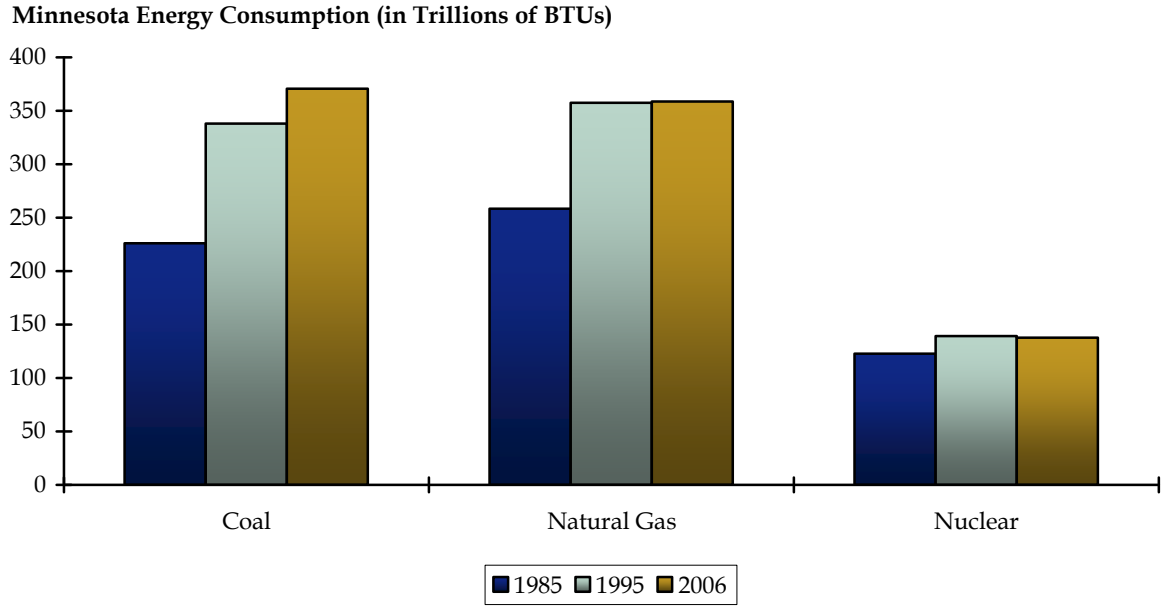
1960 to 2006



Source: Energy Information Administration.

Figure 3.20 Minnesota Energy Consumption by Source

1985 to 2006



Source: Energy Information Administration.

Irrespective of greenhouse gas emissions, pending regulations that mandate cleaner emissions will require all coal-burning plants to implement scrubbing, which is likely to affect the current heavy dependence on low sulfur Powder River Basin (PRB) coal. Once PRB coal requires scrubbing, sources of coal that are located more closely will become more attractive, since the cost of transportation far exceeds that of the coal itself. The primary alternative sources for coal in Minnesota are Southern Illinois and Indiana, as well as the lignite deposits in North Dakota. With many of southern Minnesota's older utility plants built for Illinois basin coal, resuming its use would an obvious choice, once scrubbing technology has been implemented. Should such a shift in the origins of Minnesota's coal occur, rail linkages towards Chicago could increase in importance. Furthermore, the Mississippi River System offers a competitive modal option that could further reduce delivery costs for some of these plants.

Ultimately, the decisions made in the next decade concerning how to meet Minnesota's energy needs will have a bearing on the utilization of the State's rail network. If clean-burning natural gas and renewable energies become the preferred option, the use of rail to transport coal is likely to go into gradual decline as older power plants become obsolete. The decisions made by Minnesota's energy providers to address the State's future electricity requirements need to be monitored by policy-makers as they will have an effect on how the State's freight transportation system is used.

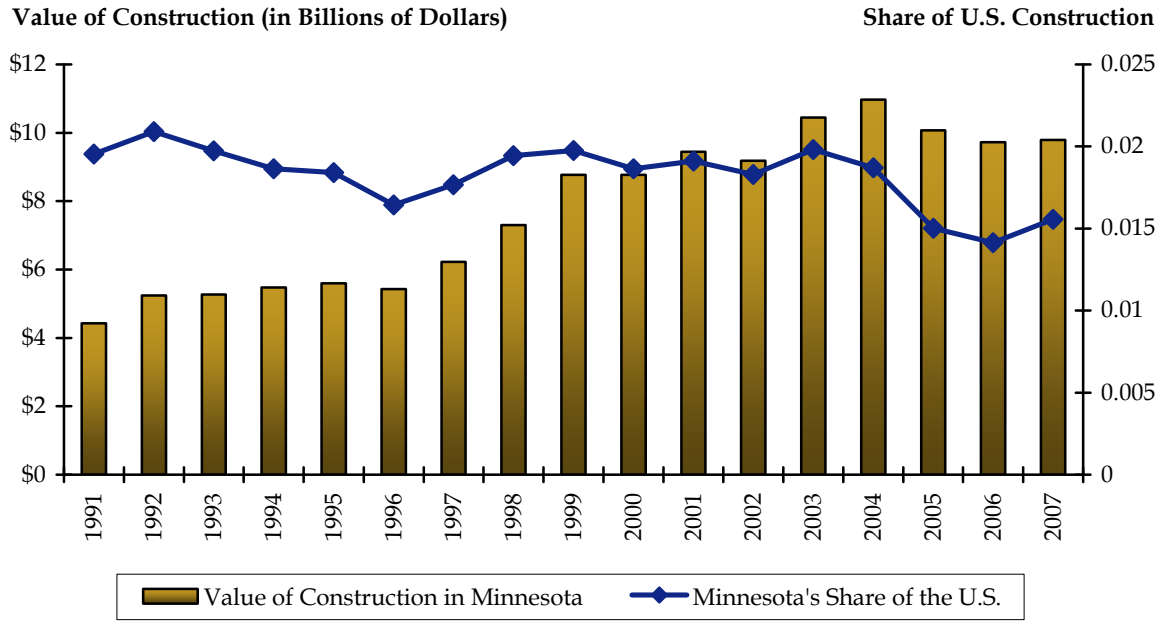
Construction

Economic expansion and population growth together form the two main drivers for growth in the Minnesota construction industry. Similar to the rest of the nation, Minnesota in mid-2009 has the population growth but is waiting for a rebound in economic activity. The resurrection of economic growth will stimulate new investment in commercial structures such as office buildings, industrial facilities, warehouses, laboratories, etc., while Minnesota's growing population will continue to translate into demand for housing, retail centers, schools, and other public infrastructure. Due to its North Central location, Minnesota also benefits directly from overall U.S. growth that further encourages the construction of warehousing, distribution, and transportation facilities within the State to serve national markets.

Until 2005, Minnesota's construction industry boomed. The total value of construction contracts in Minnesota was $9.8 billion in 2007, down from a record $11.0 billion reached in 2004. The 2008 and 2009 figures, once available, will undoubtedly show further decline. Minnesota generally accounts for between 1.5 percent and 2.0 percent of total U.S. construction (Figure 3.21). Minnesota's share has declined somewhat since 2003 as Sunbelt states such as Florida received an inordinate amount of construction work, mostly for housing. The construction industry is a primary end user of a range of supplies, including lumber, aggregate, and structural steel – all commodities carried by rail due to their bulk, cost, weight, and transport distance. The timeliness of freight deliveries is crucial to the construction industry, making transportation reliability a primary concern. Although construction is sensitive to economic cycles, including the economic uncertainties being experienced presently, the overall future growth trend for construction

in Minnesota is likely to remain positive as the State's population and economy resume a long-term trend towards moderate growth.

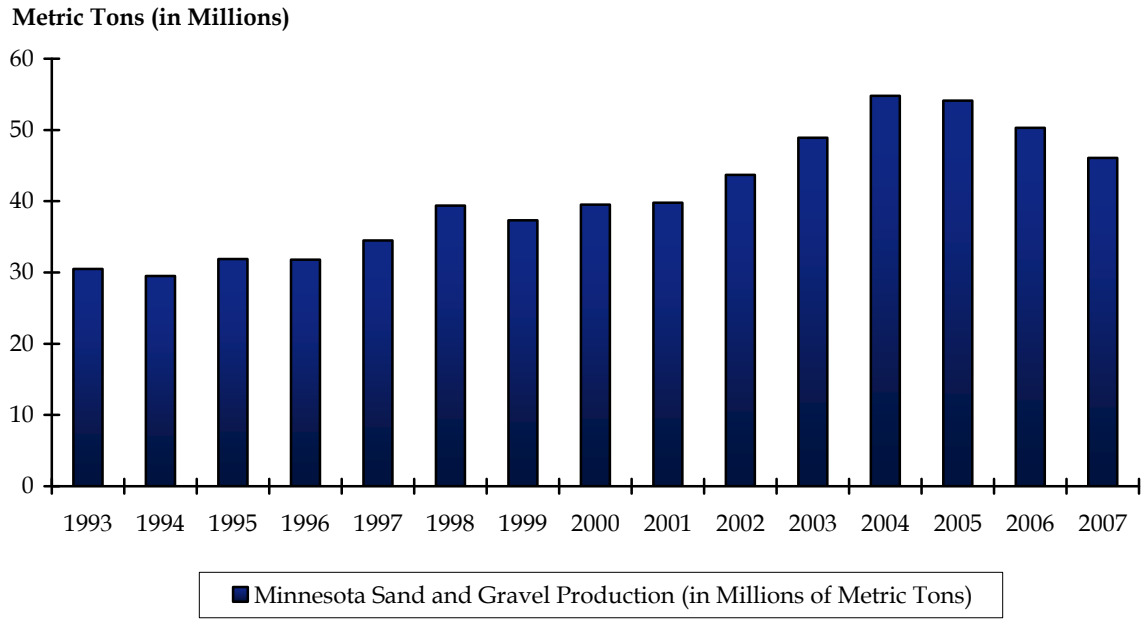
Figure 3.21 Value of Construction in Minnesota



Source: McGraw-Hill Construction (copyright) as presented in Statistical Abstract of the United States.

Sand and Gravel. Sand and gravel is one of the leading commodities carried by rail as well as a key input into almost all construction projects, particularly for making concrete and pavement. Minnesota quarries about 40 to 50 million tons of sand and gravel per year, accounting for about four percent of the U.S. total (Figure 3.22) and making it the country's fifth largest producer. Glaciers left sand and gravel deposits throughout the State and there are sand and gravel mining operations in nearly every county in Minnesota. Shipments of Minnesota aggregate are transported by rail, truck, and barge. As economic conditions improve and the construction industry rebounds, the demand for Minnesota sand and gravel will increase.

Figure 3.22 Minnesota Sand and Gravel Production



Source: U.S. Geological Survey.

Taconite Tailings. Minnesota's Mesabi Range iron mines have long produced taconite pellets that are shipped outside the State to manufacture steel. The leftover rock from the mining process, "taconite tailings," has been stockpiled for decades and, until recently, has largely been left unused. Plentiful and harder than most aggregates, taconite tailings have been found to be an outstanding pavement material. Already used by MnDOT on a number of northeastern Minnesota road projects, interest is growing to use taconite tailings elsewhere in the State and in other parts of the country.

Low-cost transportation and workable distribution logistics will be key for expanded use of taconite tailings in markets beyond northeastern Minnesota. The extensive rail network that services the Iron Range is well positioned to transport taconite tailings (in addition to taconite pellets) to the Port of Duluth. From Duluth, barges already are transporting the tailings to Chicago.

Although taconite tailings are cost-efficient to transport to Duluth and to Lower Great Lakes markets like Chicago, breaking into the Twin Cities market and beyond will require some effort. Primary movement would be by rail which has significant cost advantages over truck for moving heavy, inexpensive, high-volume goods like taconite tailings and aggregate. This would necessitate the establishment of volume traffic, minimal switching, an unloading facility in or near the Twin Cities, and economically competitive rates from the railroads.

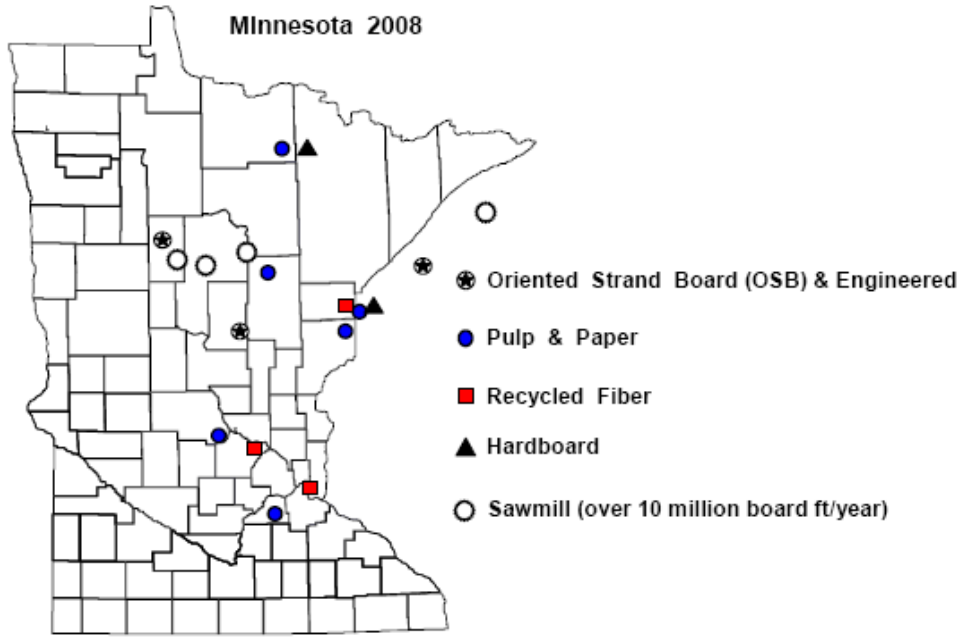
Long-term, taconite tailings are likely to gain increased favor in road building. Local sources of quality aggregate suitable for road building, such as those available nearby the Twin Cities, will confront growing problems satisfying demand in the future. Existing

environmental regulations also make it difficult to open new aggregate quarries, making northeastern Minnesota's reserves of taconite tailings an important alternative source for future road building materials.

Paper and Wood Products

Minnesota's paper and wood products industry includes logging, sawmills, paper mills, and wood products (e.g., windows, cabinets, pallets, crating, etc.). The State's timber, lumber, and paper industries are economic legacies of the State and still form an important pillar of the Minnesota economy. In 2007, these industries accounted for 38,000 jobs in the State, with total production valued at $6.6 billion (Figure 3.23). In 2006, Minnesota accounted for over three percent of the nation's wood products production and paper output. Among the states, Minnesota's wood products shipments, valued at $1.6 billion in 2006, are the 11th highest in the country. Within the industry, Minnesota has specific strengths, including window and door components (#2 producer). The State also ranks 16th in paper production, with output valued at $2.2 billion in 2006.

Figure 3.23 Minnesota Paper and Lumber Products Facilities



Source: Minnesota Department of Natural Resources.

While lumber, wood, and paper remain important contributors to the Minnesota economy, the timber harvest and the total value of paper and wood products production is not expanding, largely due to declines in the construction industry that began in 2006.

Since 1997, Minnesota's timber production has averaged about 3.6 million cords per year according to the Minnesota Department of Natural Resources, but fell in 2006 to 3.2 million cords. The State's timber industry is located predominantly in the north central and northeastern parts of the State.

Confronting the headwinds of the recession and slumping construction, the overall outlook for the lumber, wood, and paper industry in Minnesota is mixed. Paper and wood products market demand is primarily based on population, so longer-term demand is expected to recover as population growth continues to increase, both in the State and throughout the country. Competition from surplus Canadian pulp also can dampen the U.S. market at times.

Regulation also plays a role in the paper industry, in particular. Because there are many chemicals (e.g., ammonia) required to break down pulp fiber, there are numerous regulatory requirements around the usage, disposal, and storage of chemicals related to the paper industry. These regulations will continue to become more stringent and will contribute to limiting the creation of new mills. Instead, existing mills in Minnesota (and elsewhere in the United States) are likely to be upgraded and modernized. The regulations in the long-term, should contribute to keeping the industry stable in Minnesota. Currently, a major expansion at a SAPPI paper plant in Cloquet (Carlton County) is undergoing environmental review. SAPPI is a major user of rail.

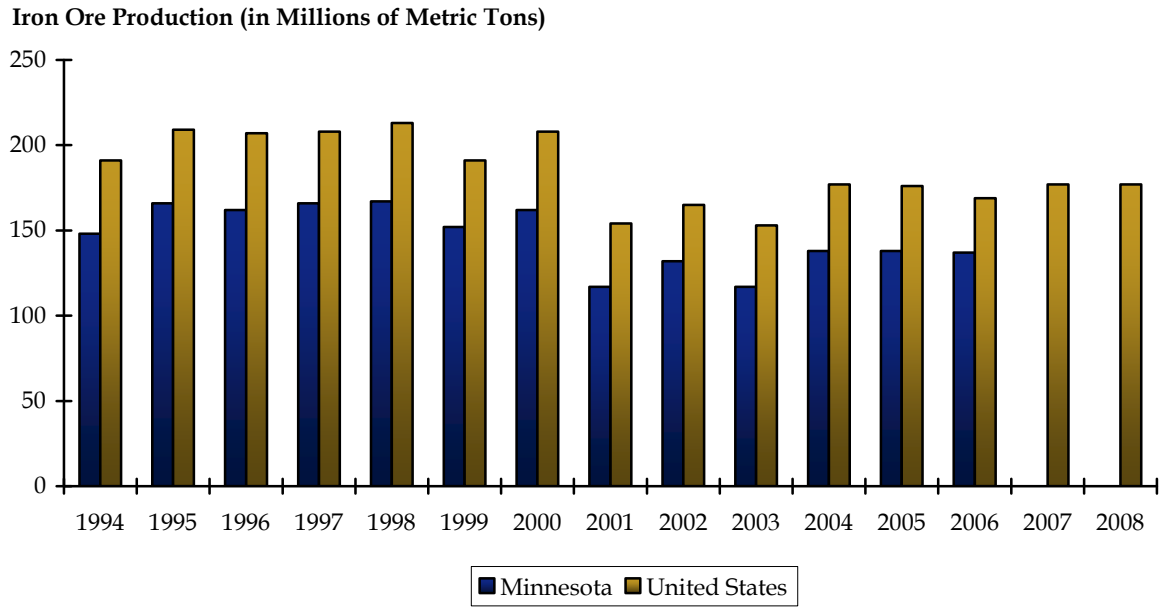
Rail is a key mode for shipping lumber and wood products to and from Minnesota. In particular, rail is crucial for bringing construction lumber into the State. Although Minnesota harvests a significant amount of timber on an annual basis, the State imports far more timber from other states to meet demand than it exports to other states. According to the United States Forest Service, Minnesota imported 10 times more timber than it exported in 2006, primarily from Canada. Due to the relative bulkiness and heavy weights of lumber, rail is the most cost effective mode for transporting lumber and wood products, especially for long-distance trips. The use of rail helps to manage shipping costs and thus contribute to the competitiveness of these industries in Minnesota.

Iron Ore and Steel

Minnesota's Iron Range represents 80 percent of United States iron ore production and has been benefiting from increased worldwide demand, mostly emanating from China. China's production of pig iron (made from iron ore), has increased almost eight-fold from 60 million tons in 1990 to 470 million tons in 2008. As Chinese iron production has mushroomed, it has increased iron ore imports from Brazil and Australia. Brazilian ore, until the phenomenal growth of the Chinese market, had been a chief competitor with Minnesota iron ore for the steel makers located in inland U.S. markets. As the prices for iron ore have increased largely due to Chinese demand, the economics of supplying imported iron ore to inland U.S. markets has changed. This shift is favoring Minnesota iron ore producers and inland steel producers are transitioning from consuming imported ore to domestic producers. Iron Range ore has become much more price competitive compared to the landed cost of imported ore, including ocean and inland transportation.

After years of slow decline, Minnesota iron ore production started to increased since hitting a low in 2000 (Figure 3.24).

Figure 3.24 Minnesota Iron Ore Production



Source: U.S. Geological Survey. Data for 2007 and 2008 available for U.S. only.

Even during the current recession which is having an impact on steel demand and prices, major investments in Minnesota's Iron Range are continuing to move forward, indicating favorable long-term prospects for iron mining, iron processing, and steel production in northern Minnesota. Projects include reclaiming iron from old mine refuse ("tailings"), a technologically advanced U.S.-Japanese joint venture iron nugget plant, and a 50 percent increase in the iron nugget capacity of a U.S. Steel facility. By far the largest planned expansion of the iron industry in Northeast Minnesota is being made by an Indian company, Essar Steel. Site work already is underway for the $2 to $3 billion facility near Nashwauk to expand mining operations and build a steel plant. Interest in Minnesota's iron and copper is expected to pick-up further once the economy improves. Such development would stimulate demand for truck, rail, and water freight transportation.

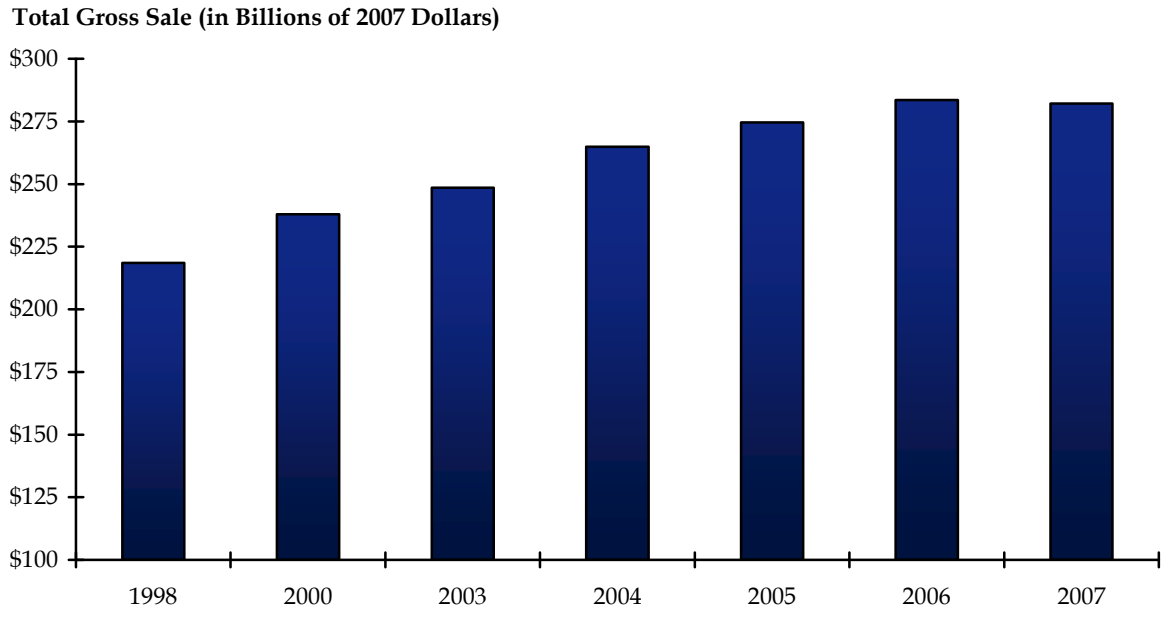
Distribution, Warehousing and Retail

The retail industry comprises establishments that sell merchandise. Retailing is the final step in the distribution process, a process that includes manufacturing, wholesale trade, and transportation – all leading to the sale of merchandise, either through a store (e.g., "brick and mortar" retailer) or a nonstore retailer (e.g., catalog, Internet sales) to the general public.

Retail is the third largest industry sector in Minnesota after services and healthcare, when measured in terms of employment. Gross sales in Minnesota have reached $282 billion in 2007, a very slight decline compared to 2006. Measured in terms of GSP, retail comprises 6.0 percent of the total Minnesota economy, but accounts for about 11 percent of the State's jobs.

Growth in retail trade responds to the expansion of the economy, income, and population. Minnesota's long-term trend in these three indices suggests that retail sales in the State are likely to continue growing at a moderate pace in the future. Between 1998 and 2007, the value of total retail sales in Minnesota increased, in real terms, from $219 billion to $282 billion (Figure 3.25). This trend is expected to be maintained in the coming years as economic growth resumes.

Figure 3.25 Retail Sales in Minnesota
1998 to 2007 (In 2007 Dollars)



Source: Minnesota Department of Revenue, "Minnesota Total Gross Sales"; data not available for all years.

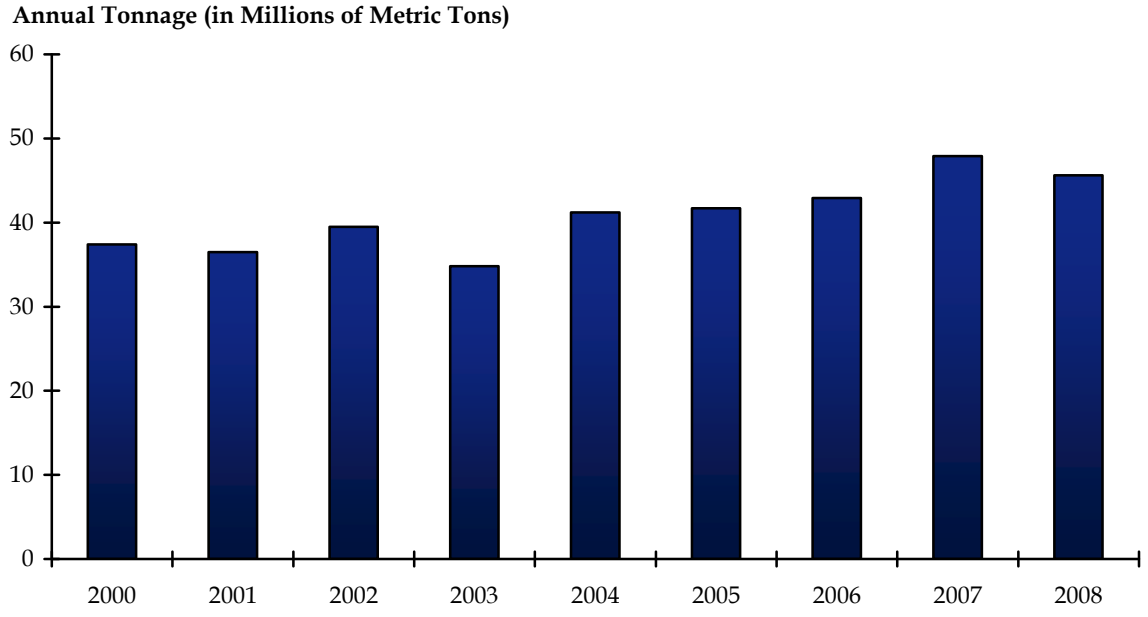
The retail industry in Minnesota, like the nation's, is characterized by the variety of products it delivers to millions of consumers. These products are brought to market through sophisticated logistics channels that put demands on Minnesota's intermodal transportation system, including rail. Today, retail merchandise is often imported through high-volume container port facilities through West and East Coast ports, and is then transported by rail and truck to regional distribution facilities, with several located in Minnesota, primarily along the I-94 Corridor. From these distribution facilities, the merchandise reaches retail shelves by truck.

Today, retailers strive to reduce fixed inventory as part of their cost-saving efforts. This operational strategy to minimize stock levels and optimize labor places tremendous pressure on the freight transportation system to carry inventory responsively and predictably. The reliability of deliveries to Minnesota retailers depends on rail and roadways to function as planned.

Transshipments

At the extreme western end of Lake Superior, the Port of Duluth is the busiest on the Great Lakes, handling over 40 million tons of cargo per year. Historically, the port's highest volume commodity has been iron ore (taconite), mined in the nearby Mesabi Range, and shipped to steel facilities located throughout the Great Lakes/St. Lawrence Seaway region. Beyond locally sourced taconite, the port ships other bulk products, including stone, coal (arriving on unit trains from Wyoming's Powder River Basin), and grain from the Upper Midwest and Great Plains of the United States and Canada. The total tonnage of goods handled by the Port of Duluth has increased since 2000 (Figure 3.26) after remaining fairly steady since the mid-1960s. Volume growth has been led, in almost equal part by coal and iron ore. In recent years, coal has surpassed iron ore, by a slight margin, as the port's top commodity. The increases in coal and iron ore have more than offset declines in grain tonnages at the port.

Figure 3.26 Port of Duluth-Superior Cargo Tonnage
2000 to 2008 (In Millions of Metric Tons)



Source: Duluth Seaway Port Authority.

Consistent with its role as a major port, and intermodal transfer point, and retail center, Duluth handles significant volumes of rail and truck traffic. Stronger world demand for iron, led by growth in the Chinese market, has stimulated a recent increase in mining and steel investments in the Mesabi Range as discussed previously. Once these projects come on-line, port volumes are likely to remain at high levels or increase. Mesabi Range iron ore reaches the Port of Duluth by rail or truck and is transshipped to boats bound for steel plants along the Great Lakes (e.g., Burns Harbor, Indiana). Rail also is used to carry iron ore to inland steel plants in other parts of the country (e.g., Utah and Alabama). Unit trains bring Wyoming coal (Powder River Basin) into the port where it is stockpiled and transloaded onto ships for distribution throughout the Midwest and exported overseas. As discussed earlier in the report, Powder River Basin coal production may son hit a peak. For this reason, coal volumes at the Port of Duluth are likely to remain at high levels in coming decades but may not increase markedly.

4.0 Minnesota's Freight Traffic

4.1 National and Modal Comparison

In 2007, over 630 million tons of freight was moved in Minnesota. As shown in Figure 4.1, this is a relatively small fraction of the United States' total freight volume[10] – approximately five percent. And, as shown in Figure 4.2 Minnesota has a somewhat larger share of U.S. freight when measured by value. With a total value of slightly over $1 trillion annually, nine percent of U.S. freight by value,[11] passes through Minnesota.

The share of tonnage carried by each mode is significantly different in Minnesota than in the United States overall. Railroads in Minnesota have a share of freight tonnage in the State that is over twice as large as the portion of freight moving by rail in the country as a whole. Water transportation in Minnesota also carries a higher portion of freight than it does in the U.S. overall; this is likely due to the large amount of iron ore leaving the state via the Great Lakes.

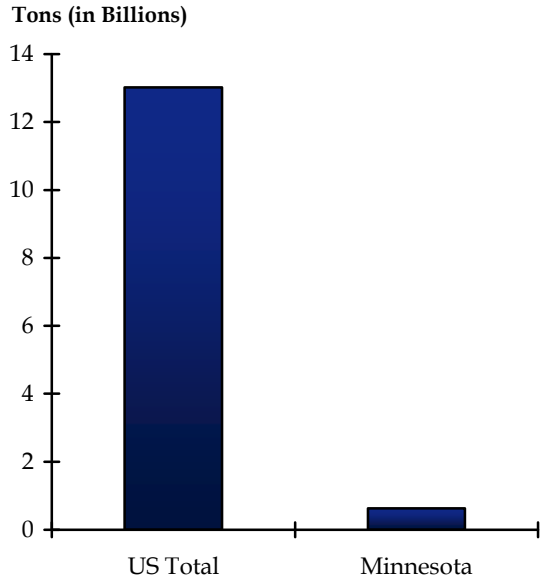
As is typical in most regions of the U.S., trucks have the largest share of Minnesota's freight movement by both weight and value. Measured by weight, nearly 50 percent of all freight in the State (311 million tons) is moved by truck (Figure 4.4). At 241 million tons, rail has a 38 percent share of Minnesota's freight by tonnage handled, while water and "other" have 6 and 7 percent shares respectively.[12] Air cargo in Minnesota totaled only 480,000 tons in 2007, less than a 0.1 percent share.

[10] 2007 Commodity Flow Survey, US Bureau of Transportation Statistics.

[11] Ibid.

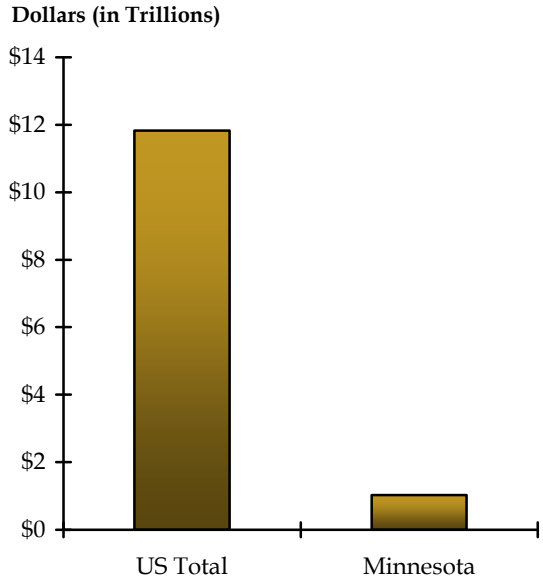
[12] Cross-border shipments may be classified as "other" in customs documents when the mode of transport is not clearly identified or not specified at all. This traffic consists primarily of crude petroleum, natural gas and other pipeline products. For domestic shipments, TRANSEARCH excludes pipeline traffic.

Figure 4.1 U.S. and Minnesota Freight by Tonnage
2007



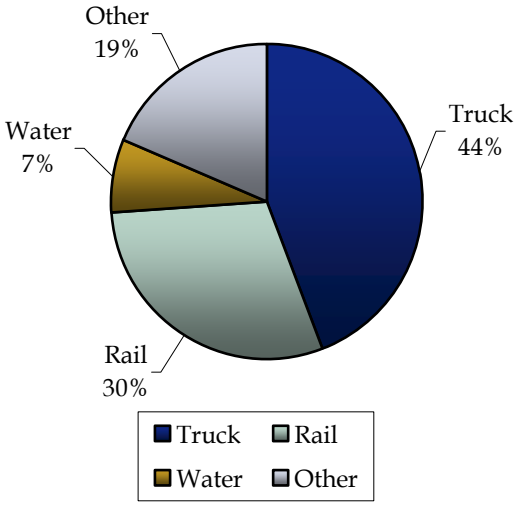
Source: 2007 Commodity Flow Survey, U.S. Bureau of Transportation Statistics.

Figure 4.2 U.S. and Minnesota Freight by Value
2007



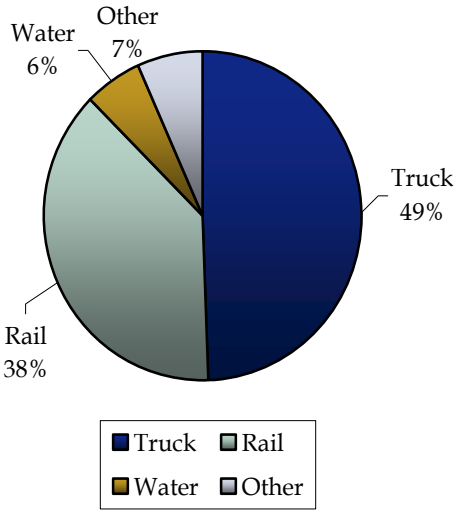
Source: 2007 Commodity Flow Survey, U.S. Bureau of Transportation Statistics.

Figure 4.3 U.S. Freight Tonnage by Mode
2007



Source: Bureau of Transportation Statistics, Freight Activity in the United States, 2009.

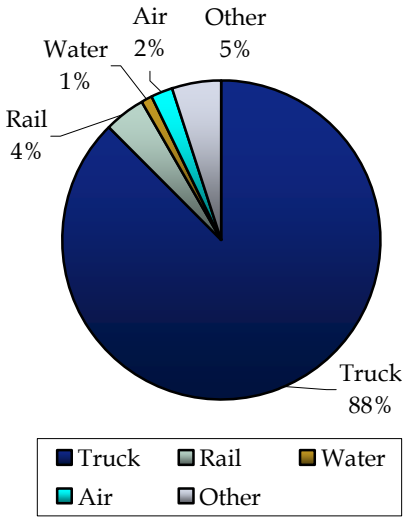
Figure 4.4 Minnesota Freight Tonnage by Mode
2007



Source: TRANSEARCH.

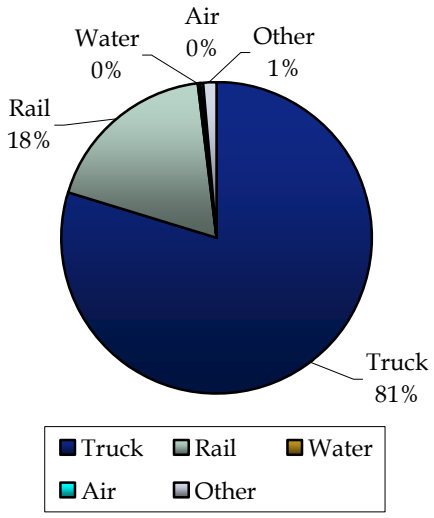
Truck freight in Minnesota is significantly more dominant when measured by value than when measured by weight. As shown in Figure 4.6, truck freight in the State was valued at over $817 billion, a nearly 80 percent share of Minnesota's total freight value. Rail accounts for 18 percent of the total value of freight moving in the State, a much smaller share than when measured by tonnage, due to the low value of rail freight relative to that moved by truck. The remaining 2 percent of Minnesota's freight value is split between air, water, and "other" modes.

Figure 4.5 U.S. Freight Modes by Value
2007



Source: Bureau of Transportation Statistics, Freight Activity in the United States, 2009.

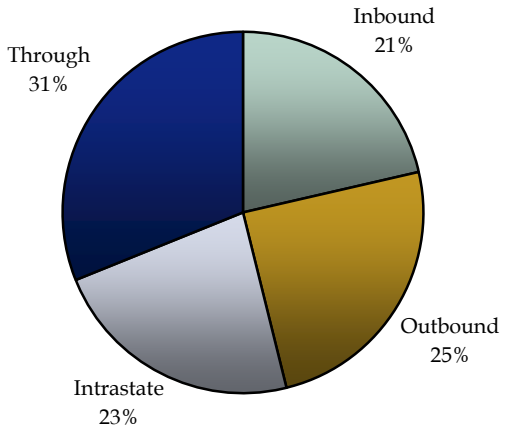
Figure 4.6 Minnesota Freight Modes by Value
2007



Source: TRANSEARCH.

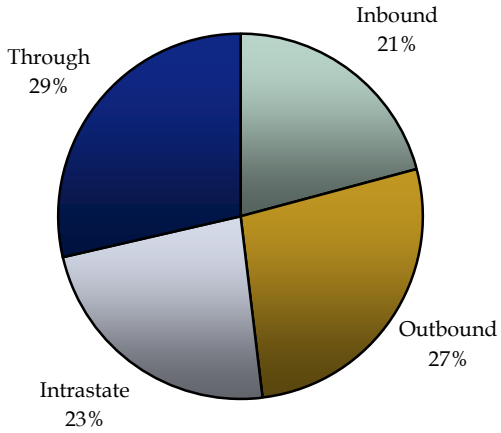
Figures 4.7 and 4.8 show freight movements (all modes) by tonnage for each movement type in 2007 and 2030 respectively. The relative shares of inbound, outbound, through, and intrastate freight are expected to remain remarkably stable over the next 20 years with only a slight decrease in through freight and a slight increase in outbound freight.

Figure 4.7 Minnesota Freight Movement Types by Tonnage
2007



Source: TRANSEARCH.

Figure 4.8 Minnesota Freight Movement Types by Tonnage
2030

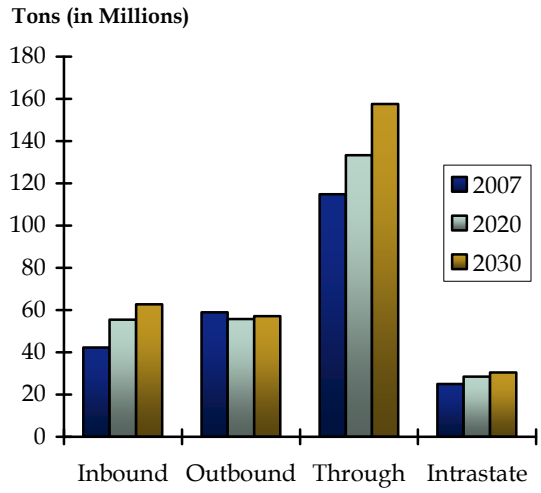


Source: TRANSEARCH.

4.2 Current and Projected Rail Traffic

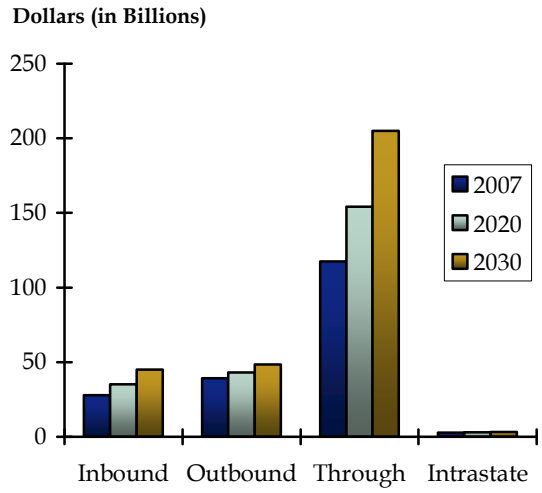
In 2007, Minnesota's freight railroads moved over 240 million tons of freight and by 2030 it is expected that these railroads will carry more than 300 million tons annually, an increase of 25 percent. Figures 4.9 and 4.10 detail inbound, outbound, intrastate, and through movements by tonnage and value. Clearly, through movements are dominant, with a greater tonnage than inbound and outbound movements combined, and are expected to grow by over 40 million tons over the next two decades. Intrastate movements are significantly smaller than other movement types but are still expected to be substantial, representing over 20 million tons annually. Inbound, outbound, and through movements exhibit a similar pattern measured by value as when measured by weight, with through movements totaling somewhat more than the combined value of inbound and outbound movements and exhibiting a higher growth rate. Intrastate movements amounted to only $2.7 billion in 2007, less than 1.5 percent of the total value of goods moving by rail in the State, an indication that commodities moving by rail between points within the State tend to be relatively heavy, low-value goods.

Figure 4.9 Rail Movement Types by Tonnage
2007 to 2030



Source: TRANSEARCH.

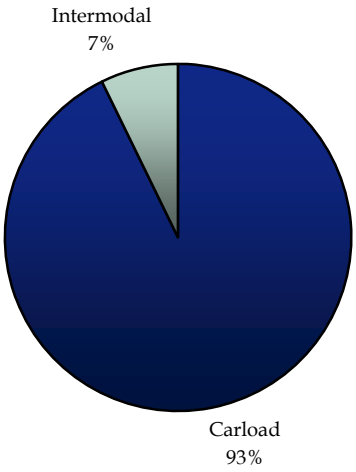
Figure 4.10 Rail Movement Types by Value
2007 to 2030



Source: TRANSEARCH.

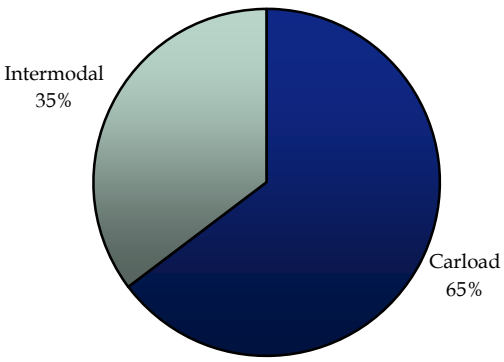
Breaking this data down to examine carload and intermodal traffic, when measured by tonnage, carload rail freight is overwhelmingly dominant in Minnesota, with a 93 percent share (Figure 4.11). When measured by number of rail units, Minnesota's intermodal freight is much more significant than when measured by tonnage. As shown in Figure 4.12, intermodal units have a 35 percent share of all rail units moving in the State. The disparity between the share of intermodal units and intermodal tonnage is due to the fact that intermodal shipments tend to be higher value lower weight items such as consumer goods, while carload shipments tend to be heavy lower value goods such as coal, metallic ore, and grain.

Figure 4.11 Minnesota Carload/ Intermodal Rail Freight by Tonnage
2007



Source: TRANSEARCH.

Figure 4.12 Minnesota Carload/ Intermodal Rail Freight by Number of Units
2007



Source: TRANSEARCH.

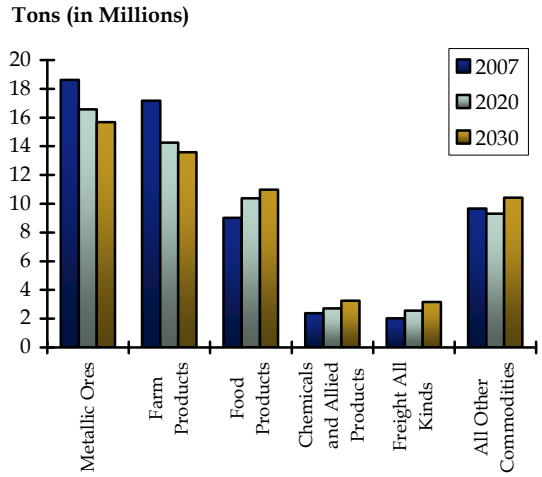
Rail Traffic by Commodity

Outbound Commodities. The top five outbound commodities by tonnage account for over 80 percent of the total 59 million outbound tons, with the leading outbound commodity as metallic ores having nearly 19 million tons and 32 percent of the outbound share (Figure 4.13). The second highest outbound commodity is farm products with over 17 million tons and 29 percent of the outbound share. These two commodities alone account for over 60 percent of all outbound commodities. The remaining top outbound commodities include food products (15 percent), chemicals and allied products (4 percent), and miscellaneous mixed shipments (3 percent). Over the next two decades, as shipments of metallic ores and farm products are predicted to decline, shipments of food, chemicals, and intermodal freight are expected to grow.

The top five outbound commodities by value include three of the top commodities by weight (Figure 4.14). Miscellaneous mixed shipments, which form the bulk of traffic carried by trailers and containers, are projected to be the highest value group in 2030, climbing from a 2007 share of 23 percent to 28 percent of the total value of outbound rail shipments. Food products, the highest value commodity group in 2007 with a value of over $10 billion, are expected to grow to over $12.5 billion in 2030, representing approximately 26 percent of Minnesota's rail exports by value. Outbound rail shipments of chemical products also are expected to increase by nearly $2 billion annually, from a 2007 level of $4.6 billion (11.7 percent) to over $6.5 billion (13.5 percent) in 2030.

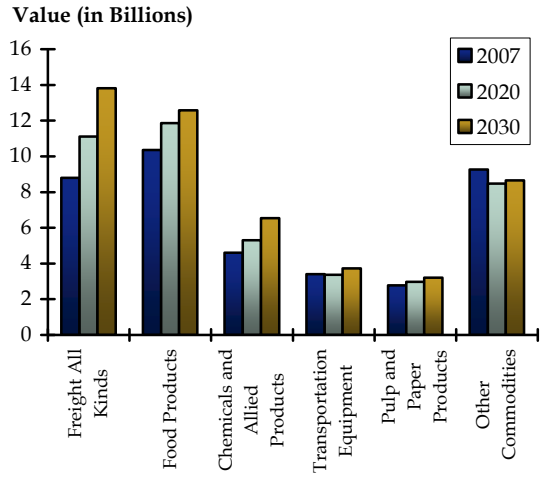
Shipments of transportation equipment and pulp and paper products also are expected to increase somewhat during this period.

Figure 4.13 Top Outbound Rail Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.14 Top Five Outbound Rail Commodities by Value
2007 to 2030



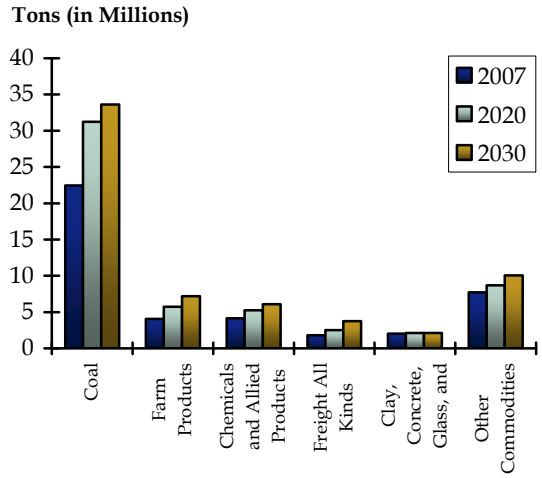
Source: TRANSEARCH.

Inbound Commodities. The top five inbound commodities account for over 80 percent of all inbound tons. The leading inbound commodity is coal with over 22 million tons and 53 percent of the inbound share (Figure 4.15).[13] The next two highest inbound commodities, farm and chemical products, each accounted for just over 4 million tons in 2007 and are expected to grow to 7.1 and 6.0 million tons respectively by 2030. Representing about 20 percent of total inbound tonnage in 2007, these two commodities are predicted to comprise a slightly larger share in 2030. The remaining top five inbound commodities include clay, concrete, glass and stone (5 percent) and miscellaneous mixed shipments (4 percent). Mixed shipments are expected to more than double to 3.8 million tons (6 percent) by 2030, while inbound shipments of clay, concrete, glass and stone are predicted to remain relatively flat, declining to 3 percent over this period.

[13] The TRANSEARCH forecast indicates continued substantial growth in coal volumes of 50% through 2030, an outcome that most energy experts find unlikely to occur, even absent a strong regulatory regime controlling greenhouse gas emissions. Given the importance of coal to Minnesota's railroads and ports, including the potential build-out of the Dakota, Minnesota, and Eastern Railroad (DM&E) into the Powder River Basin, having a clear understanding of the future of this traffic is a critical element of the rail planning effort. We are seeking clarification from IHS-GI and will adjust this section once updated information has been received.

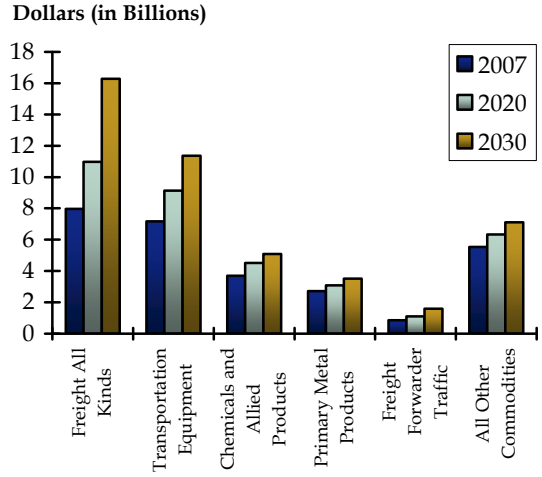
Mixed freight (freight of all kinds), i.e., intermodal traffic, is the largest inbound commodity in terms of value at nearly $8 billion in 2007, representing 29 percent of all inbound rail freight (Figure 4.16). By 2030 these shipments are expected to double in value to over $16 billion annually, 36 percent of all inbound rail freight. Inbound shipments of transportation equipment also are expected to increase substantially by 2030, growing from an annual value of $7.2 billion to $11.4 billion in 2030. Chemical and primary metal products are both expected to grow substantially but decline in terms of their share of total inbound value.

Figure 4.15 Top Inbound Rail Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.16 Top Inbound Rail Commodities by Value
2007 to 2030



Source: TRANSEARCH.

Intrastate Commodities. Approximately 10 percent of Minnesota rail freight tonnage is attributed to intrastate movements and the top five intrastate commodities by tonnage account for 98 percent of the total intrastate tons. Figure 4.17 depicts the share of these top five intrastate commodities. The overwhelming majority of this intrastate traffic is comprised of metallic ores (21 million tons), which make up over 85 percent of all intrastate rail freight. Nonmetallic minerals are a distant second with only 1.5 million tons, 6 percent of all intrastate rail freight. These two commodities together account for 91 percent of all intrastate rail freight. The remaining top five intrastate commodities include farm products (4 percent), along with chemicals and food products, each of which make up 2 percent of total intrastate rail freight tonnage.

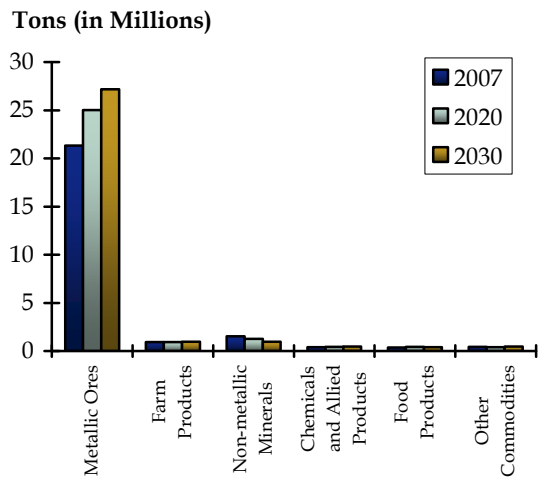
In 2030 metallic ores are expected to make up over 27 million tons (89 percent) of intrastate rail freight. Intrastate shipments of farm products are expected to increase slightly to 950,000 tons (3.1 percent). The proportion of intrastate rail freight generated by

chemicals, food products, and all other commodities is not expected to change significantly over the next 20 years although their total tonnages are expected to grow slightly.

The IHS-GI forecast indicates substantial shrinkage by 33 percent to 950,000 tons in the shipment of nonmetallic minerals over the next two decades. The forecast runs counter to our discussions with stakeholders, who indicated that extraction of nonmetallic minerals is expected to increase substantially. The degree to which this traffic will be hauled by rail versus other modes will depend on the markets served.

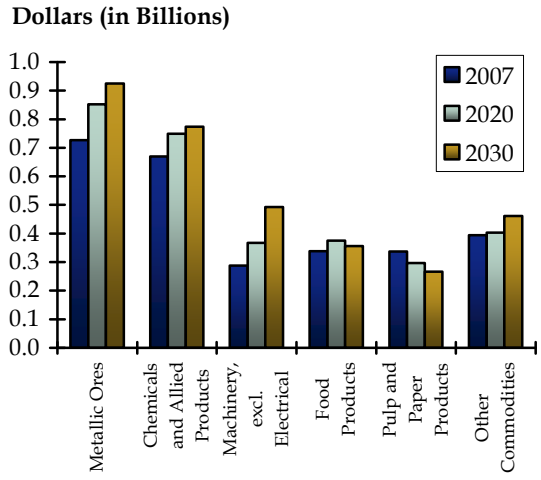
Valued at over $725 million in 2007, metallic ores represent the largest share of Minnesota's intrastate rail freight (26 percent) and these shipments are expected to increase to nearly $925 million by 2030, a 28 percent share (Figure 4.18). Intrastate rail shipments of chemical products are expected to grow by nearly $100 million between 2007 and 2030, to nearly $775 million, maintaining an approximately 24 percent share of intrastate rail freight by value. Intrastate shipments of nonelectrical machinery are predicted to exhibit the greatest growth over the next two decades, climbing from $288 (11 percent) to $493 million (15 percent).

Figure 4.17 Top Five Rail Intrastate Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.18 Top Five Rail Intrastate Commodities by Value
2007 to 2030



Source: TRANSEARCH.

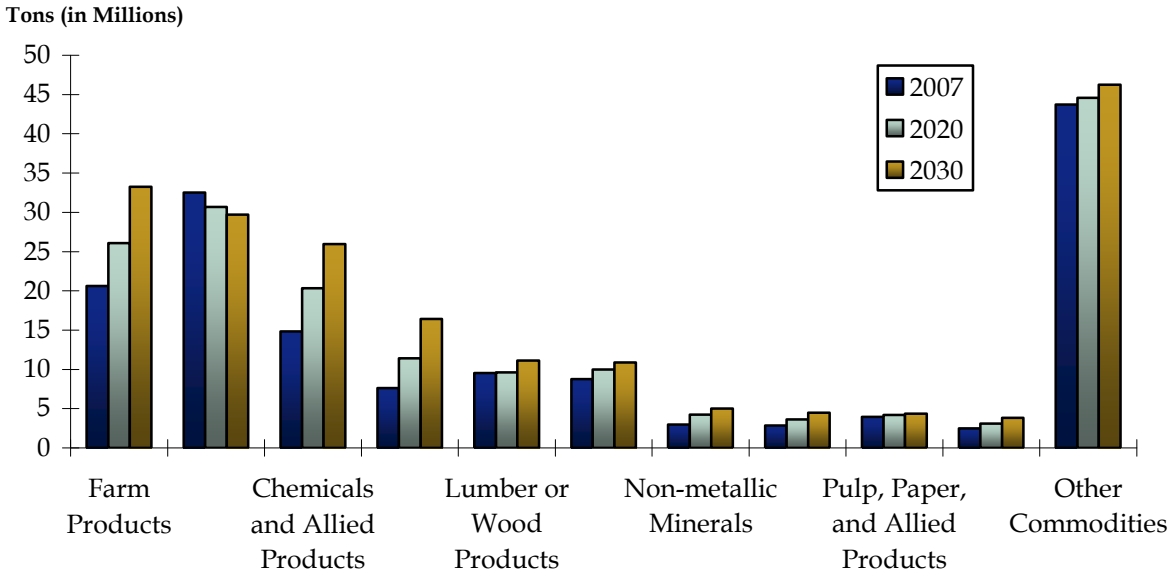
Through Commodities. At nearly 115 million tons, through rail freight comprised 48 percent of rail movements in the State of Minnesota in 2007. Through rail freight tends to be significantly more diverse than other rail movements with the top 10 commodities by tonnage, comprising only 71 percent of the total. Of these top commodities, only three surpassed 10 million tons in 2007. Coal was the most dominant commodity, with a 22 percent share of through rail freight by tonnage and is expected to remain strong through

2030 although its share of total through rail freight is expected to decline somewhat, to 16 percent. Farm products, the second largest through-rail commodity, had a 14 percent share (21 million tons) in 2007 and are projected to be the largest through freight commodity in 2030, with a 17 percent share (33 million tons). At 15 million tons in 2007 (a 10 percent share), chemicals and allied products were Minnesota's third largest through rail commodity by tonnage and is expected to exhibit strong growth over the next 20 years – climbing to 26 million tons (a 14 percent share) by 2030. Shipments of mixed freight (freight all kinds), which tend to be higher value goods moving in intermodal containers, are expected to more than double during this period as well climbing from an annual total of 7.6 million tons in 2007 to over 16.4 million tons in 2030. Through shipments of both lumber and wood products and food products are predicted to grow modestly to roughly 11 million tons annually by 2030. All of the remaining top through commodities by tonnage are expected to grow over the coming years but to remain below 5 million tons annually in 2030. Through rail shipments of all other commodities also is expected to grow modestly in the coming years from a 2007 level of 44 million tons to 46 million tons by 2030.

Measured by value, through rail shipments appear less diverse. Mixed freight (freight all kinds) shipments, which tend to be high-value goods moving in intermodal containers, were the top commodity in 2007, with a value of $33.2 billion, and is expected to grow dramatically to $71.7 billion by 2030. Shipments of chemicals and allied products, the second largest through rail commodity by value, totaled approximately $24.3 billion in 2007 and are expected to reach $40.7 billion annually by 2030. Through rail shipments of transportation equipment also are expected to rise sharply over the next 20 years, from a 2007 value of $18.1 billion to $30.0 billion in 2030. While through rail shipments of food products are expected to climb from $8.4 to $13.4 billion between 2007 and 2030, none of the remaining top through rail commodities by value are expected to reach annual values above $10 billion during this period. Shipments of all other through rail commodities are expected to grow from $8.2 to $11.1 billion over this period.

Figure 4.19 Top 10 Rail Through Commodities by Tonnage

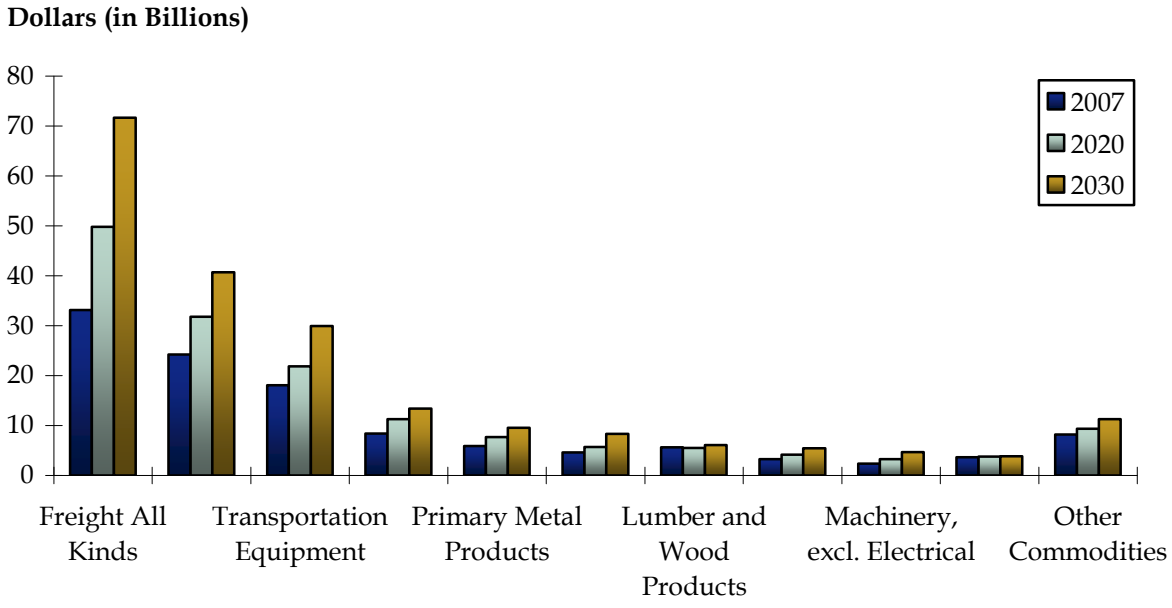
2007 to 2030



Source: TRANSEARCH.

Figure 4.20 Top 10 Rail Through Commodities by Value

2007 to 2030

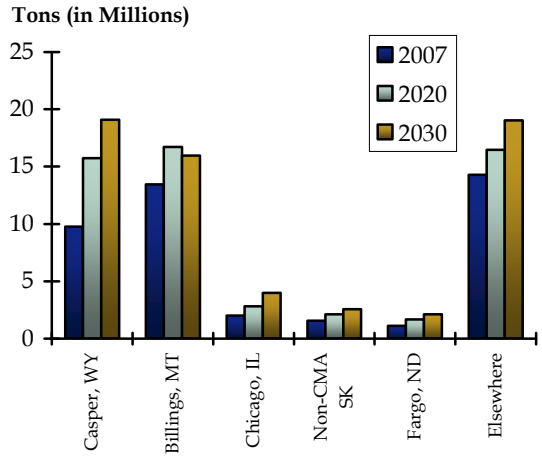


Source: TRANSEARCH.

Top Trade Partners

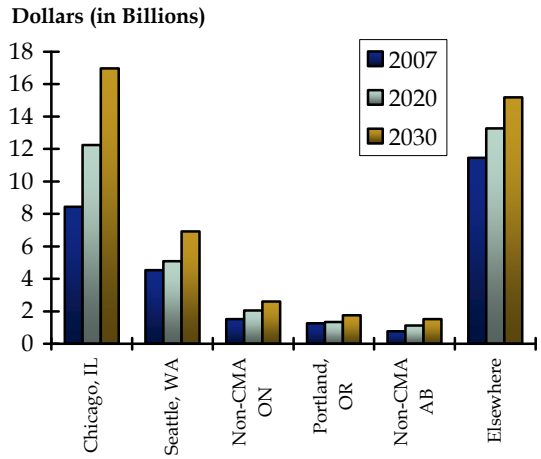
Inbound Trade Partners. Figures 4.21 and 4.22 depict the top origin regions (by weight and value respectively) for rail freight being shipped to destinations in Minnesota from out of state in 2007. With coal being the dominant inbound commodity by tonnage, the Billings, MT and Casper, WY BEA's were the top origins, together accounting for over 23 million tons in 2007, and more than all other regions combined. The remaining top five origin regions for rail freight into Minnesota are Chicago, nonmetropolitan Saskatchewan, and Fargo, ND, all of which are expected to increase their freight shipments to Minnesota by 2030.

Figure 4.21 Top Origins of Minnesota Rail Freight by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.22 Top Origins of Minnesota Rail Freight by Value
2007 to 2030



Source: TRANSEARCH.

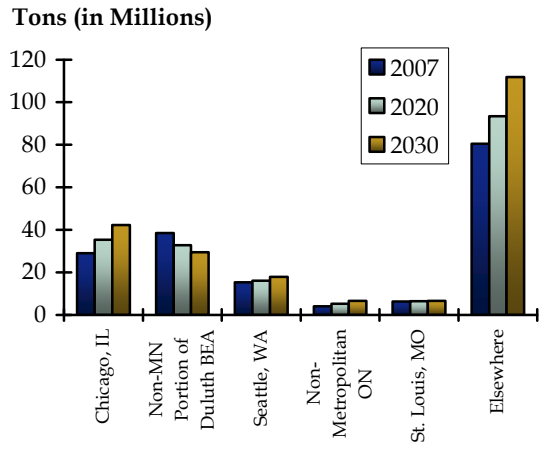
Chicago is Minnesota's only trade partner that is a top origin for inbound freight both in terms of weight and value. In 2007, shipments from Chicago to Minnesota were valued at over $8 billion and are expected to reach nearly $17 billion per year by 2030, making it the largest origin region for rail freight into the State for the next 20 years. With rail shipments to Minnesota valued at over $4.5 billion in 2007 and predicted to rise to $6.9 billion in 2030, Seattle is expected to remain as the second largest origin of rail freight to Minnesota.

For Seattle, the volume growth is associated with the Puget Sound ports, which provide the most direct link between Minnesota and Asia. The traffic volumes shown for Chicago, which serves as the nation's primary gateway between the eastern and western halves of the U.S., reflect a broad geographic reach for intermodal traffic. The catchment area consists of a large swath of the Midwest that can be reached within one day's drive. For

example, an intermodal shipment originating in Indianapolis destined for Minneapolis will typically be drayed to a Chicago-area terminal for westward shipment by rail. Adding to the volumes shown, for service between city pairs in the east and west where direct rail intermodal service is not available, shipments must change terminals in Chicago. This sorting process takes place over the region's roads and will appear as two distinct moves, one destined for Chicago, the other from Chicago to the final destination.

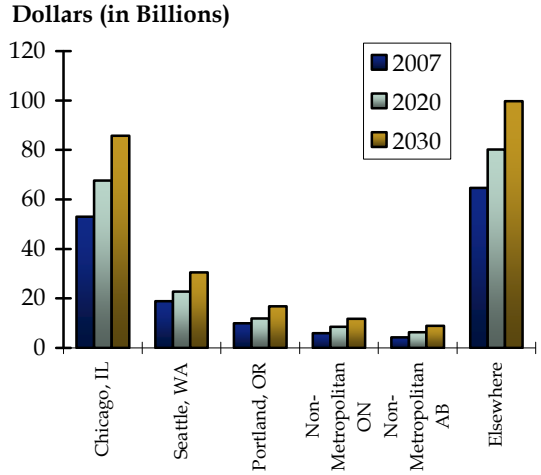
Outbound Trade Partners. Figures 4.23 and 4.24 show the top out of state destinations for Minnesota rail freight (by weight and value respectively). At nearly 38.5 million tons, the non-Minnesota portion of the Duluth, MN BEA region was by far the largest out of state destination for Minnesota rail freight. This is likely due to iron ore from Minnesota mines being shipped through the Port of Superior, Wisconsin. The Chicago area was the next largest rail freight destination for Minnesota goods by tonnage, a market that is expected to become the top destination for Minnesota rail freight by 2030. At nearly 15.5 million tons in 2007, Seattle was the third largest destination by tonnage for rail freight from Minnesota. By 2030, shipments to Seattle are expected to increase modestly, to nearly 18 million tons. Nonmetropolitan Ontario and St. Louis, MO are the other top destinations predicted to be top destinations for Minnesota rail freight in 2030. These five destinations received 54 percent of outbound Minnesota rail freight in 2007 and while the total freight received by these destinations is expected to increase by nearly 10 million tons, their share of Minnesota's outbound rail freight is expected to decrease to below 50 percent by 2030.

Figure 4.23 Top Destinations of Minnesota Rail Freight by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.24 Top Destinations of Minnesota Rail Freight by Value
2007 to 2030



Source: TRANSEARCH.

Three of the top outbound destinations by tonnage also are top destinations by value. At over $53 billion in 2007, the Chicago region received well over twice the rail freight, in

terms of value, as any other destination. By 2030, freight to Chicago is predicted to grow significantly, to over $87 billion annually. Receiving nearly $20 billion in Minnesota rail freight, Seattle was the second largest destination in 2007 and is predicted to remain in this position over the coming years, receiving over $30 billion in rail freight from Minnesota in 2030. Portland, Oregon and the nonmetropolitan areas of Ontario and Alberta are the other top destinations for outbound Minnesota rail freight. Portland, Oregon received nearly $10 billion in freight in 2007, which is expected to climb to more than $16.5 billion by 2030. Both Seattle and Portland serve as primary gateways to Asia, and the anticipated growth in volumes thus reflect expanding trade across the Pacific. Rail freight to nonmetropolitan Ontario and Alberta, which received $8.5 and $6.3 billion in 2007 respectively, also is expected to grow substantially over the next two decades.

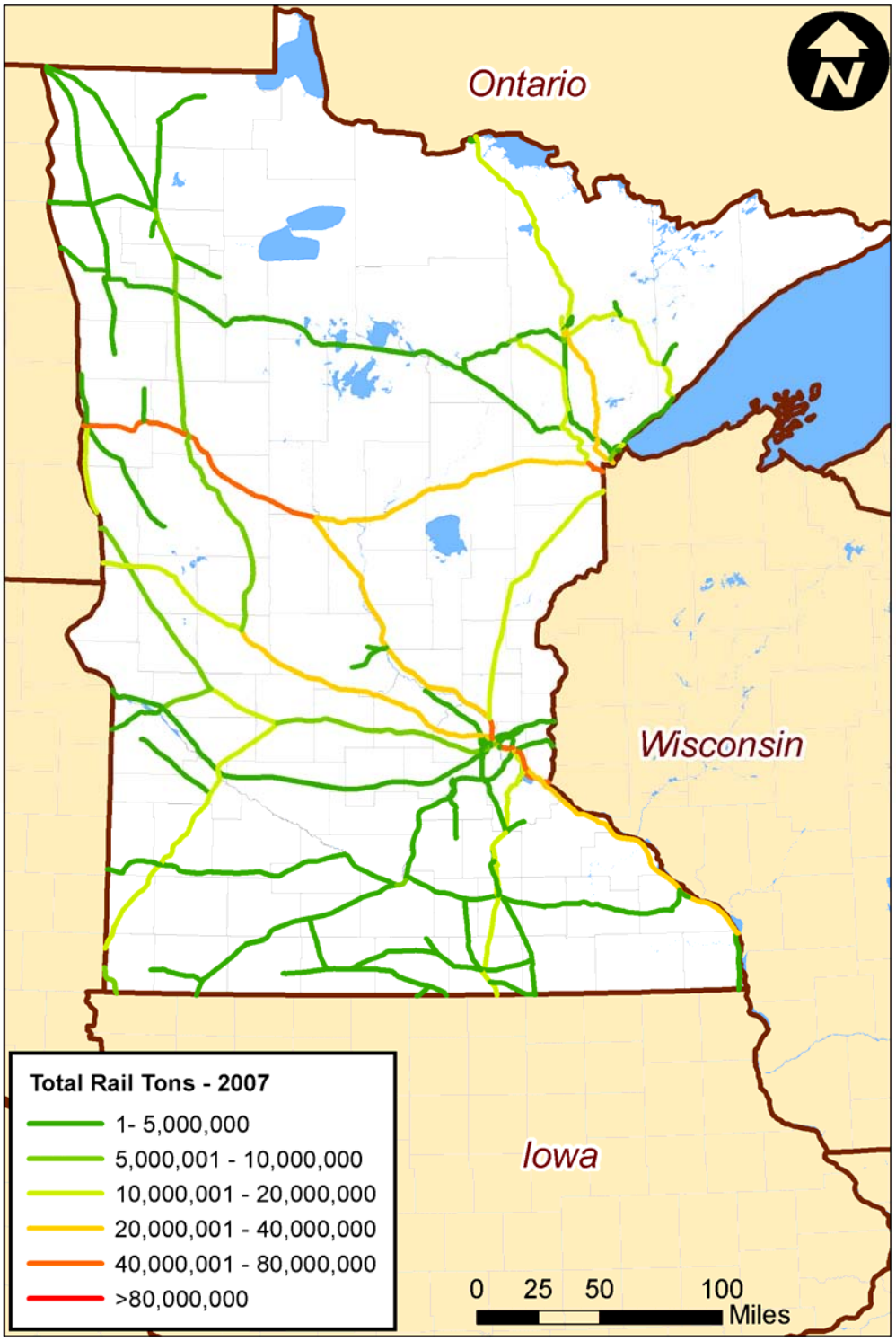
Minnesota Rail Traffic Patterns

Figures 4.25 and 4.26 display the volume of freight moving on Minnesota's railroads in 2007 and predicted freight volumes in 2030. The most significant changes are on the BNSF mainline that runs northwest between Minneapolis and Fargo, ND, the Canadian Pacific main connecting Minneapolis to North Dakota, and on Canadian National's former Duluth, Winnipeg and Pacific route running south from International Falls through Duluth. Both of the CP and CN lines form parts of through routes between Chicago and the Canadian west, with access to the natural resources and Pacific port cities of Vancouver and Prince George, BC.

Annual volume on the BNSF mainline between Fargo, ND and Minneapolis, currently the highest-volume line in Minnesota, is expected to increase between 12 and 17 million tons – with some segments near the North Dakota state line expected to carry over 72 million tons in 2030. The Canadian Pacific main line between North Dakota and Minneapolis is expected to carry volumes 14 to 18 million tons greater in 2030 than in 2007. Volumes on the Canadian National line between Duluth and International Falls are expected to increase by roughly 10 million tons annually by 2030. The highest volume segment in 2030 is located in the Minneapolis area and is expected to carry nearly 100 million tons annually, up from less than 70 million tons in 2007.

The only rail line exhibiting a marked reduction in volumes over the coming years is a short segment of BNSF railroad running east to west at the Wisconsin state line, just south of Lake Superior. Volumes on this segment are expected to decline by approximately 10 million tons annually over the next 20 years. This reduction may be the result of declining iron ore production in the region.

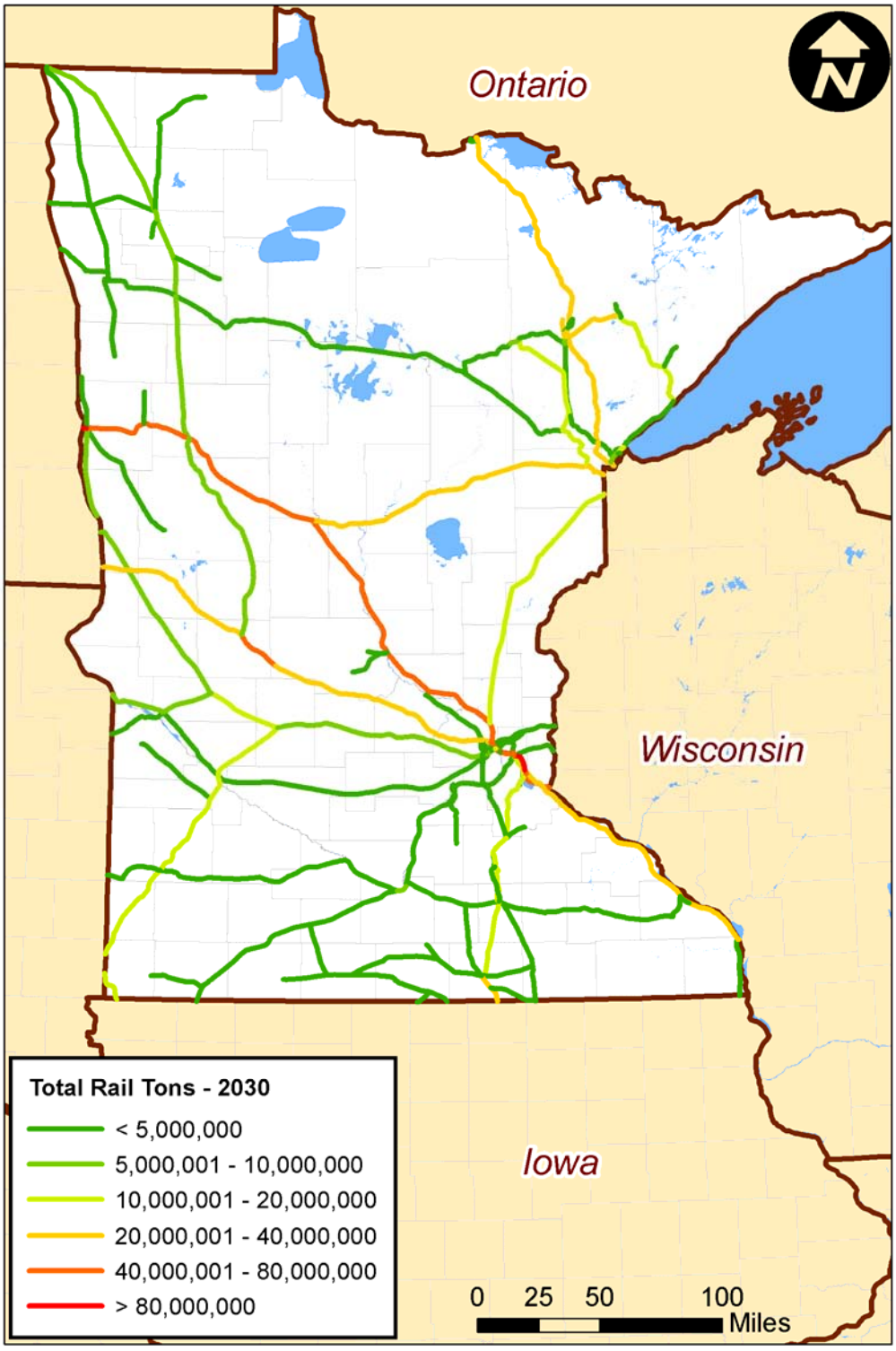
Figure 4.25 Freight Volume on Minnesota Railroads (Tons)
2007



Source: TRANSEARCH.

Figure 4.26 Freight Volume on Minnesota Railroads (Tons)

2030



Source: TRANSEARCH.

Rail Traffic by Minnesota County

Figures 4.27 and 4.28 depict the 2007 geographic distribution of the originating and terminating tonnage by each Minnesota county. As shown in Figure 4.29, St. Louis County leads all others with the most originating tonnage (greater than 36 million tons). Itasca and Washington Counties, with the second and third greatest originating tonnage, shipped 6.6 and 4 million tons respectively. The massive rail freight volumes generated in St. Louis and Itasca Counties are due to the iron mining industry in the region. Minnesota's Mesabi Iron Range is largely within these counties and the largest open pit iron mine in the world, the Hull-Rust-Mahoning Open Pit Iron Mine, is located in St. Louis County.

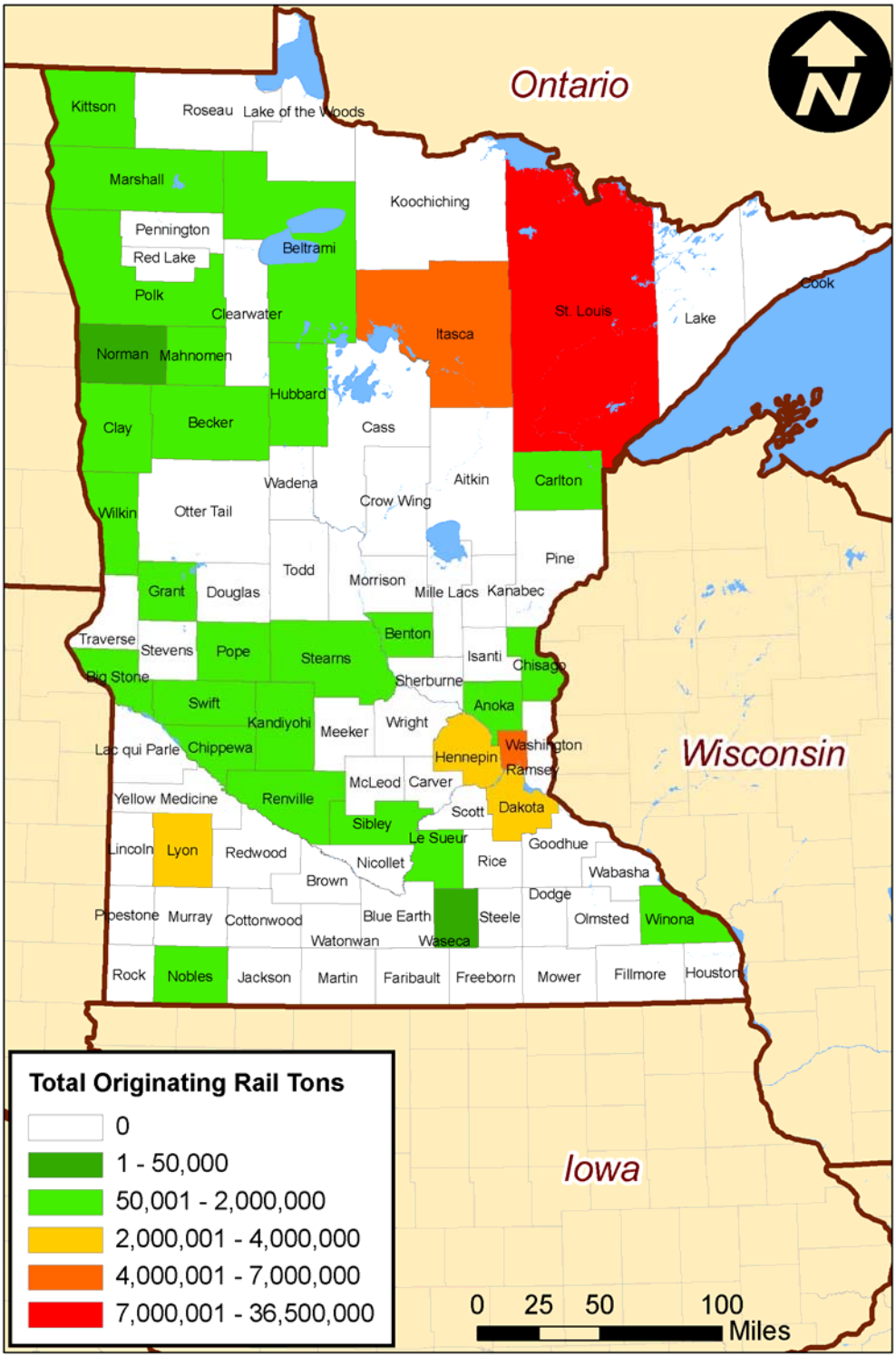
Lake and St. Louis Counties lead all others with the most terminating tonnage – 13.6 and 12.2 million tons respectively. The large number of rail terminations in these counties is due to the many iron ore shipments between the mines and the ports of Lake Superior. Hennepin, Dakota, and Washington Counties, located in the Twin Cities metropolitan area, each had over 3 million terminating rail tons.

The significance of intrastate (trips that both originate and terminate in Minnesota) rail traffic is depicted in Figures 4.29 and 4.30, with the former showing volume by county of origin, and the later by destination. The leading volume generator remains St. Louis County, with its high-volume taconite production originating over 22.5 million tons. Likewise, Lake and St. Louis Counties also lead in intrastate terminating tonnage, each with over 9 million tons, and again primarily from taconite production.

Reflecting the long-haul, high-volume nature of modern railroading, no other counties originated more than 365,000 tons of intrastate traffic in 2007. By the standards of modern railroading, these are modest volumes, which, assuming a loading weight of 100 tons per car for a bulk commodity, would amount to only 3,600 carloads. For terminating volumes of intrastate traffic, the volumes were even lower, with only Hennepin and Washington Counties having over 250,000 tons.

Figure 4.27 Total Tonnage Originating in Minnesota Counties

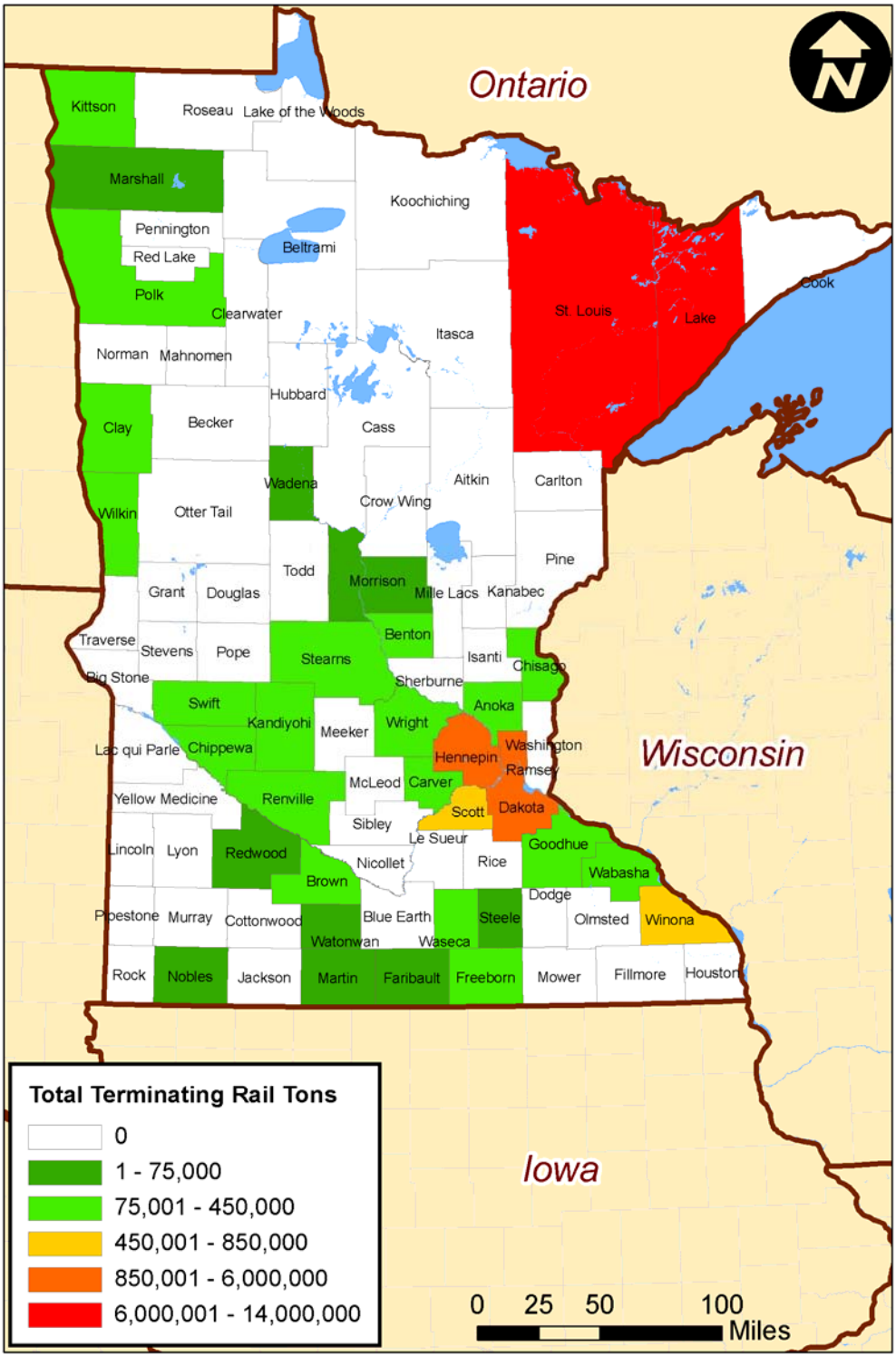
2007



Source: 2007 STB Waybill.

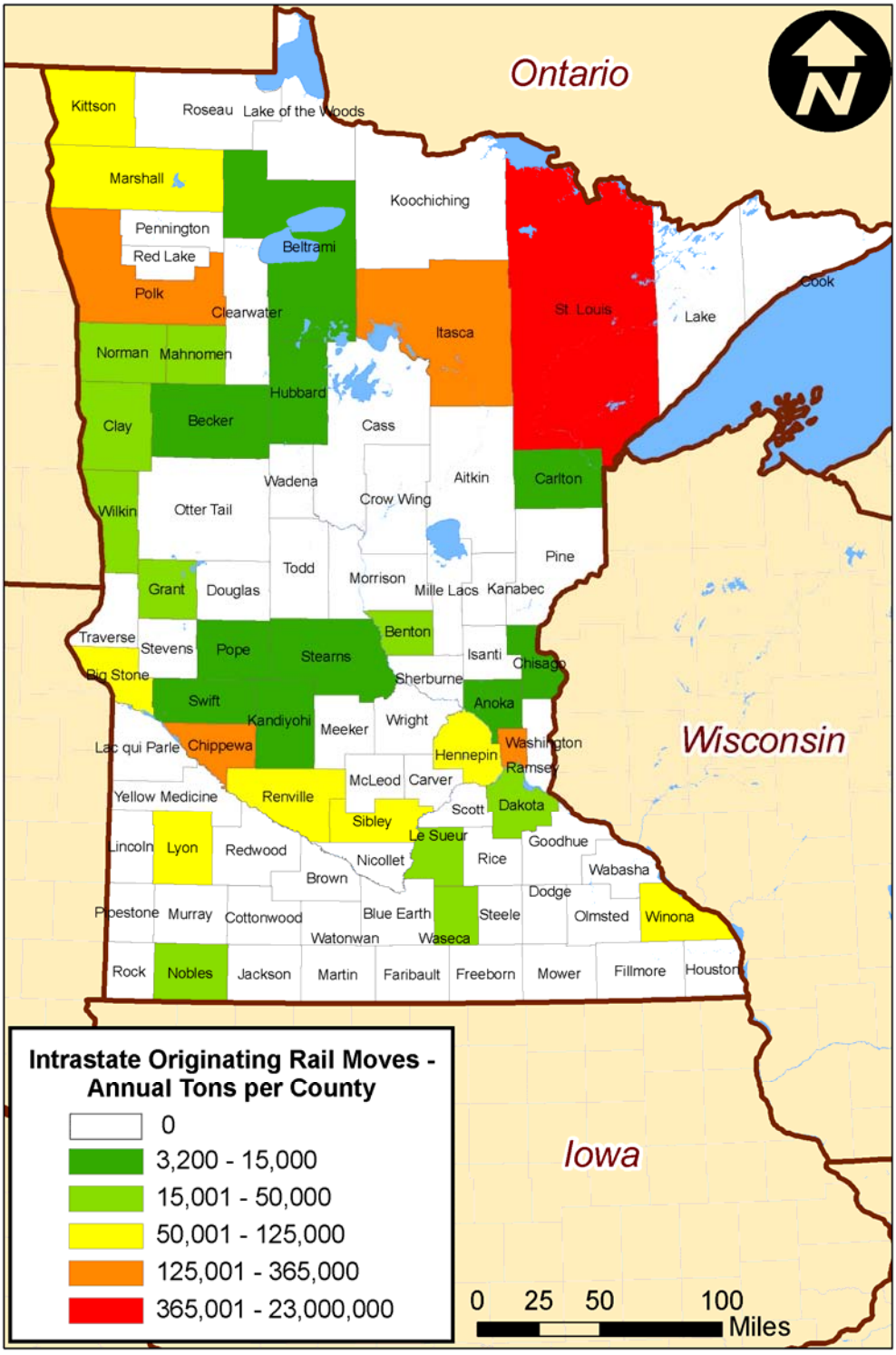
Figure 4.28 Total Tonnage Terminating in Minnesota Counties

2007



Source: 2007 STB Waybill.

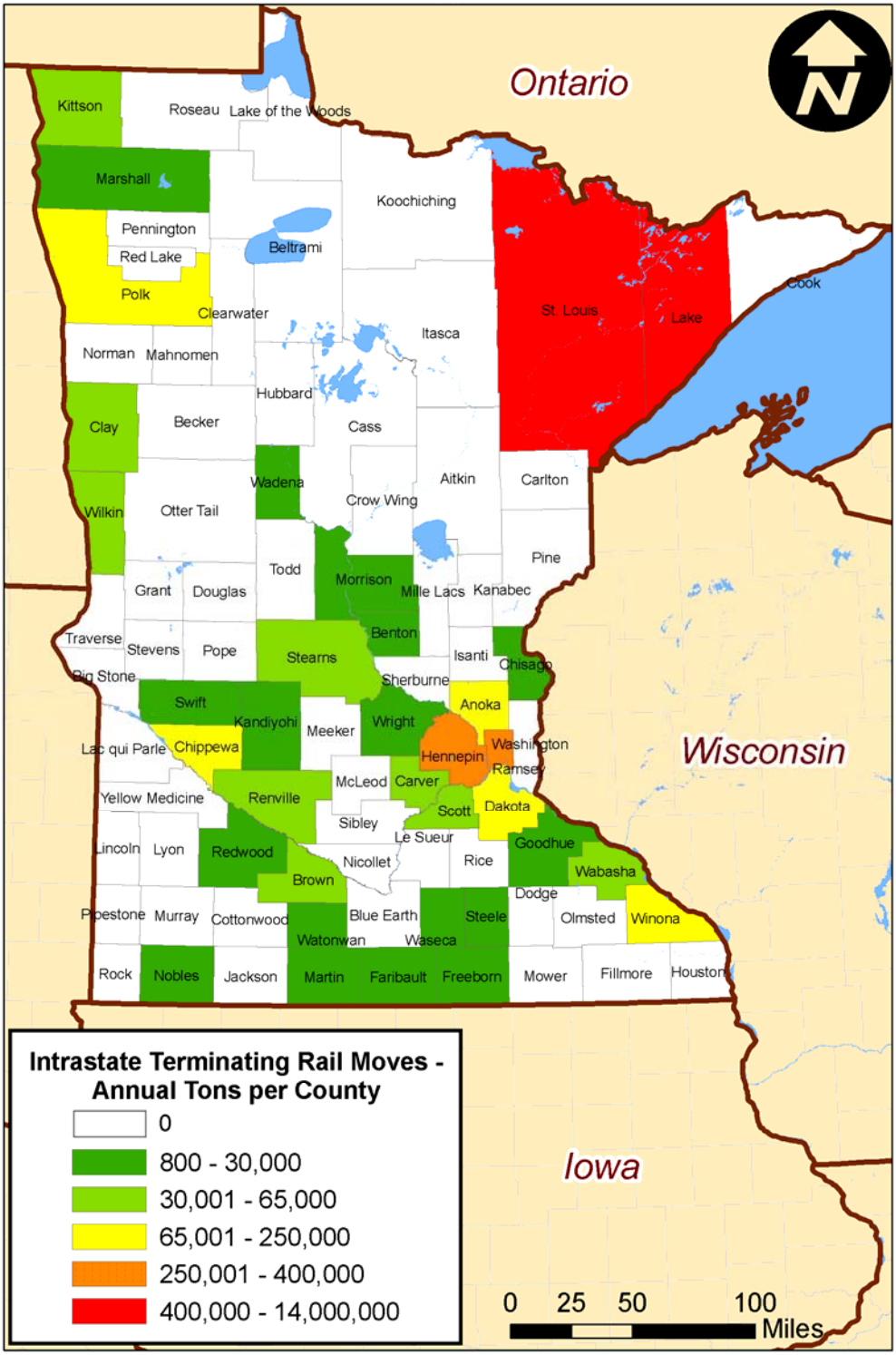
Figure 4.29 Minnesota Intrastate Originations by County (Tons)
2007



Source: 2007 STB Waybill.

Figure 4.30 Minnesota Intrastate Terminations by County (Tons)

2007

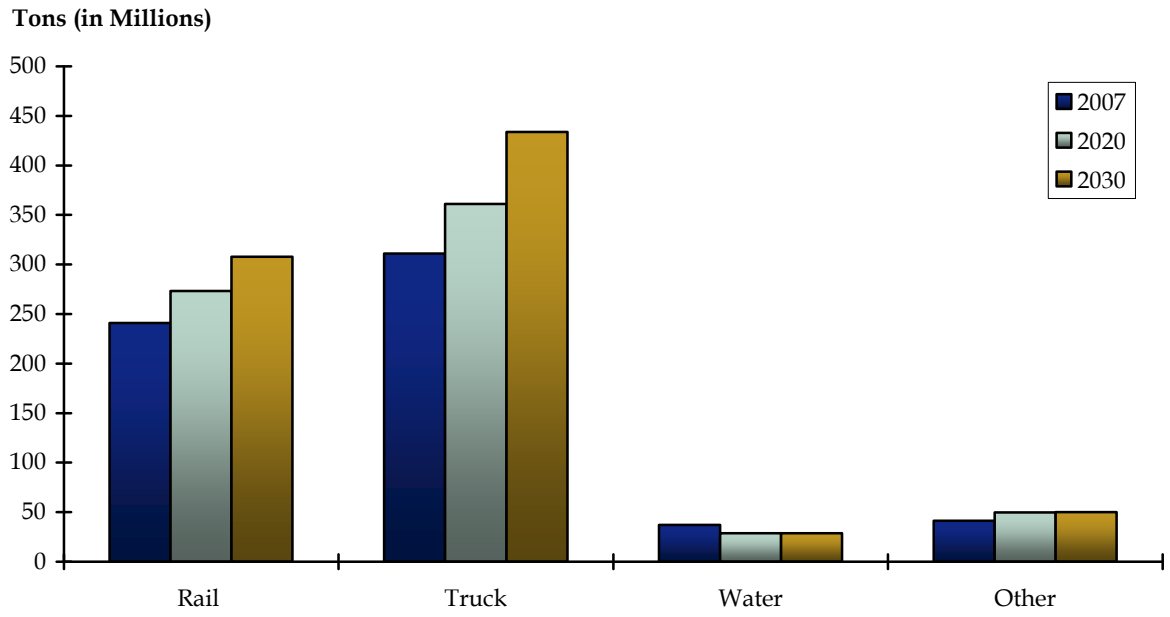


Source: 2007 STB Waybill.

4.3 Current and Projected Nonrail Traffic

In 2007, Minnesota's nonrail freight modes (truck, air, water, and other) moved over 390 million tons of freight, as shown in Figure 4.31. Trucks carried the vast majority of this freight – over 311 million tons – and by 2030 they are expected to handle over 430 million tons. Waterborne freight is expected to decline by almost 25 percent over the next two decades from its current level of 37.2 million tons to approximately 28.6 million tons in 2030. "Other" freight, made up primarily of pipeline shipments to and from Canada, is expected to climb by approximately 9 million tons annually, from 41.4 million to 50.2 million tons in 2030. Air cargo, which is not represented in Figure 4.31, accounted for approximately 480,000 tons in 2007 and is expected to climb to approximately 600,000 tons in 2030.

Figure 4.31 Modes by Tonnage
2007 to 2030



Source: TRANSEARCH.

Truck freight is even more dominant when measured by value. As shown in Table 4.1, Truck freight in Minnesota accounted for nearly $820 billion in value in 2007 and is expected to increase to over $1.5 trillion in 2030. Air, water, and other modes carry only a small fraction of nonrail freight in Minnesota, as measured by value.

Table 4.1 Mode Comparison by Value (all nonrail traffic)
2007 to 2030

Mode	2007	2020	2030
Truck	$817,067,922,802	$1,074,832,354,456	$1,525,019,674,159
Air	$2,304,998,572	$3,144,128,796	$4,405,054,039
Water	$4,981,338,610	$5,047,538,720	$5,762,136,225
Other	$13,950,414,836	$16,972,581,004	$17,684,320,015

Source: TRANSEARCH.

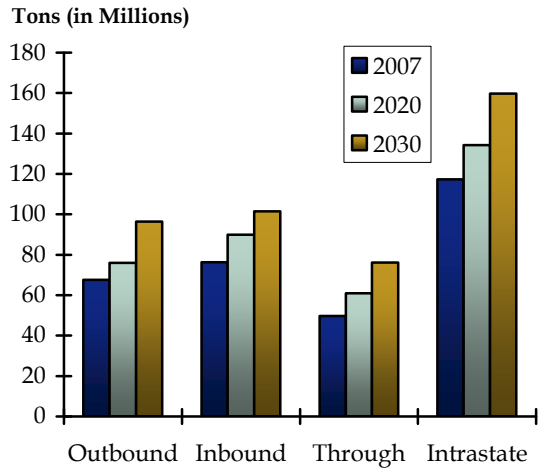
The following sections detail the top commodities, trade partners, and movement types for each of these modes.

Motor Freight

Movement Types. Measured by tonnage, intrastate truck trips are the largest single group, with over 190 million tons in 2007 (Figure 4.30). Outbound truck freight originating in the State amounted to just over 67.5 million tons and truck freight terminating within the State from outside Minnesota came to 76.4 million tons. Approximately 50 million tons of freight was moved through Minnesota to and from origins outside of the State. All of these movement types are expected to grow over the coming two decades. In 2030, outbound and inbound truck trips are expected to move 96.4 and 101.4 million tons respectively. Through truck freight is expected to increase to 76.2 million tons and intrastate truck trips will transport nearly 160 million tons.

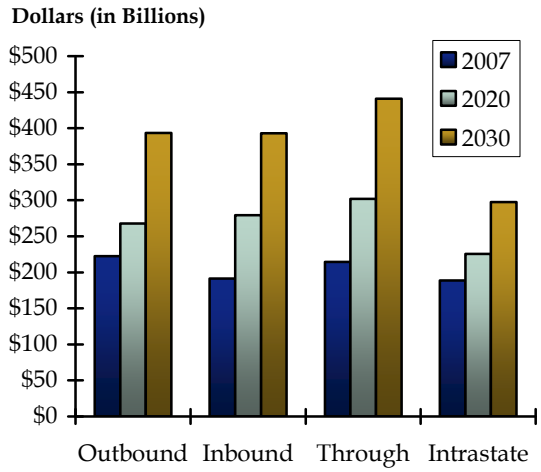
As shown in Figure 4.32, when measured by value, inbound, outbound, intrastate, and through truck trips appear very similar, all are between $222 billion (outbound) and $189 billion (intrastate). However, differing growth rates in the value of these shipments is expected to result in a growing disparity over the next two decades. In 2030, the value of through movements is projected to be over $440 billion, values of inbound and outbound movements are both expected to be just over $390 billion, and intrastate shipments are expected to amount to just under $300 billion.

Figure 4.32 Truck Movement Types by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.33 Truck Movement Types by Value
2007 to 2030



Source: TRANSEARCH.

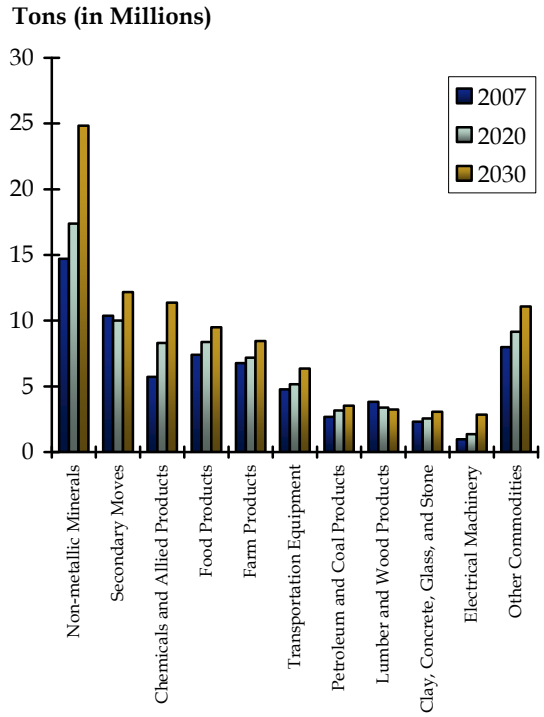
Top Commodities – Motor Freight

Outbound Commodities. The top 10 outbound commodities by tonnage account for approximately 88 percent of total outbound truck tons, and are expected to account for a similar portion of total outbound tonnage in 2030. The leading outbound commodity is nonmetallic minerals with over 14.7 million tons and 16 percent of total outbound tonnage (Figure 4.34). The second highest outbound commodity group is secondary (warehouse) moves with over 10.3 million tons and 11 percent of the outbound share. The remaining top five outbound commodities include food products (8 percent), farm products (7 percent), and chemicals and allied products (6 percent). Of the remaining top 10 outbound commodities by tonnage, shipments of transportation equipment are expected to climb from 4.8 to 6.4 million tons in 2030, while the remaining commodities are predicted to remain below 5.0 million tons annually. Outbound shipments of electrical machinery, however, are predicted to exhibit extremely strong growth, climbing from below 1 million tons in 2007 to over 2.8 million tons in 2030.

Figure 4.35 details the top 10 outbound commodities moving by truck based on value. Secondary movements are by far the largest commodity group, with a total value of over $81 billion, representing 37 percent of the value of all goods moving outbound from the State by truck. Electrical machinery and equipment is the second most valuable outbound commodity moving by truck, with a value of over $37 billion, representing nearly 17 percent of the total. Chemical products, instruments, and nonelectrical machinery each represent between 6 and 8 percent of the total value of outbound truck shipments.

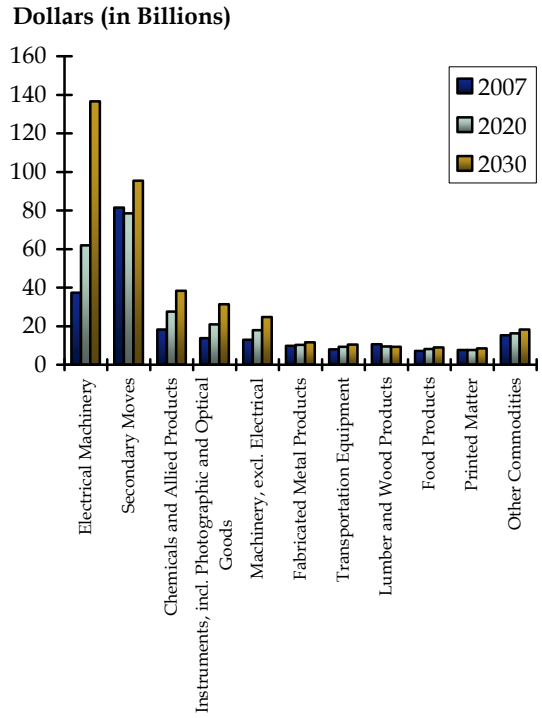
Outbound shipments of all other commodities are expected to remain relatively stable through 2030.

Figure 4.34 Top Outbound Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.35 Top Outbound Commodities by Value
2007 to 2030



Source: TRANSEARCH.

Tables 4.2 and 4.3 detail the average distance that these commodities were transported. Interestingly, of the top commodities by tonnage, the six commodities that traveled the longest distances also are top outbound commodities by value. And, not surprisingly, the top outbound commodities by tonnage tend to travel shorter distances by truck than the top outbound commodities by value – the top outbound commodities by tonnage are trucked on average 765 miles while the top outbound commodities by value are trucked on average 990 miles.

Table 4.2 Average Truck Miles – Top Outbound Commodities by Tonnage
2007

Top Outbound Motor Freight Commodities by Tonnage	Average Truck Miles
Lumber and Wood Products	1,075
Transportation Equipment	1,052
Chemicals and Allied Products	1,024
Electrical Machinery	949
Secondary Moves	945
Food Products	818
Farm Products	540
Clay, Concrete, Glass, and Stone	478
Petroleum and Coal Products	467
Nonmetallic Minerals	295

Source: TRANSEARCH.

Table 4.3 Average Truck Miles – Top Outbound Commodities by Value
2007

Top Outbound Motor Freight Commodities by Value	Average Truck Miles
Instruments, Photographic, and Optical Goods	1,117
Lumber and Wood Products	1,075
Transportation Equipment	1,052
Chemicals and Allied Products	1,024
Printed Matter	1,019
Machinery, excluding Electrical	977
Electrical Machinery	949
Secondary Moves	945
Fabricated Metal Products	914
Food Products	818

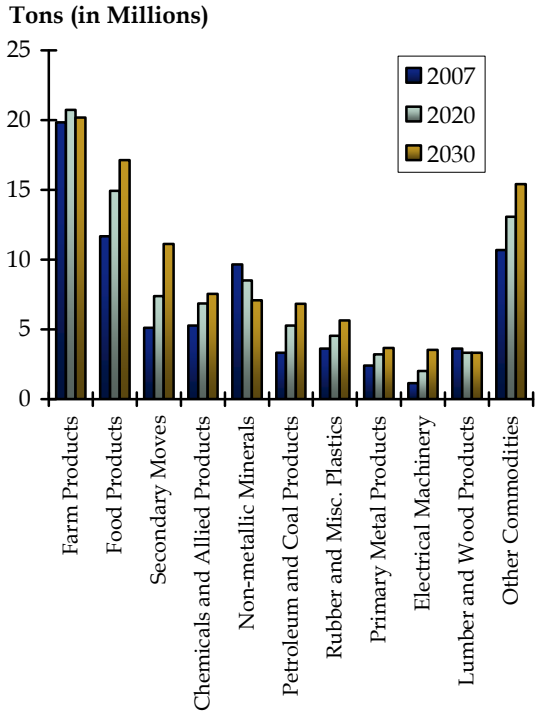
Source: TRANSEARCH.

Inbound Commodities. The top 10 inbound truck freight commodities by tonnage and value are shown in Figures 4.36 and 4.37. Farm products are the most prevalent inbound commodity at nearly 20 million tons, representing 27 percent of total inbound truck freight. Food products and nonmetallic minerals, at 15 and 12 percent respectively, are the only other commodity groups with greater than a 10 percent share of total inbound truck tonnage. Chemicals and secondary moves each comprise about 7 percent of total inbound truck freight. Among the remaining top 10 inbound commodities by tonnage, shipments of nonmetallic minerals are expected to experience a relatively sharp decline from 9.6 to 7.0 million tons while shipments of petroleum and coal products, rubber and miscellaneous plastics, primary metal products, and electrical machinery are all expected to grow strongly during this period, with shipments of electrical machinery and petroleum and coal products expected to more than double. Shipments of lumber and wood products are expected to remain stable while inbound shipments of all other commodities are expected to rise by approximately 5.0 million tons annually.

Figure 4.37 details the top inbound commodities by value, based on 2030 projections. Electrical Machinery, which accounted for $27 billion (14 percent of inbound truck freight), is expected to increase to $91 billion by 2030 (23 percent of total inbound truck value). Secondary moves are expected to increase from $39 billion in 2007 to $86 billion in

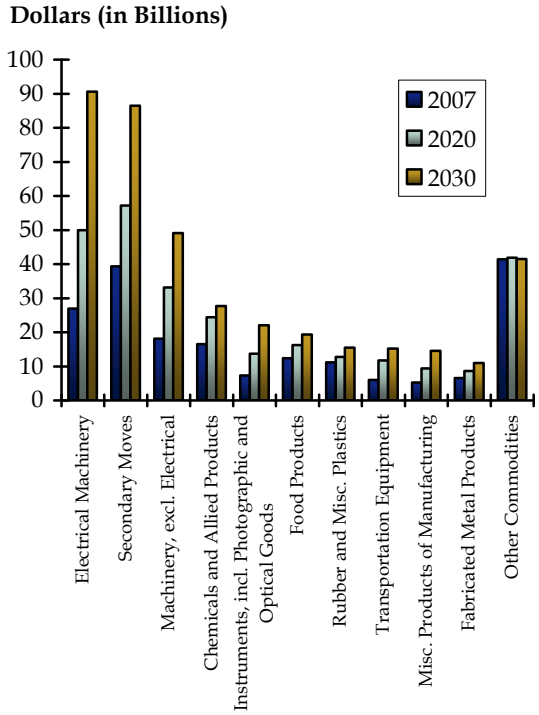
2030, increasing from 20 to 22 percent of total inbound truck value during the period. Nonelectrical machinery also is expected to experience a significant increase, from a 2007 value of $18 billion (9 percent) to $49 billion in 2030 (12.5 percent). Chemicals and instruments are each expected to increase in total value but represent a declining share of total inbound truck value over the next 20 years. Inbound shipments of instruments, photographic and optical goods are expected to more than triple during this period, from $7.3 billion in 2007 to $22.1 billion by 2030. The value of inbound food shipment is expected to increase substantially as well, rising from $12.3 billion in 2007 to a projected value of $19.3 billion in 2030. Inbound shipments of both transportation equipment and miscellaneous products of manufacturing are expected to more than double during this period, while rubber and plastics and fabricated metal products are predicted to grow modestly. The value of all other inbound motor freight commodities is expected to remain stable over the coming years

Figure 4.36 Top Inbound Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.37 Top Inbound Commodities by Value
2007 to 2030



Source: TRANSEARCH.

Of the top five destinations for Minnesota truck freight in terms of value, only Chicago and New York also are top destinations in terms of tonnage. Chicago, which currently is the top destination by value, is expected to see a significant increase in the value of truck

freight being received from Minnesota but the most striking change in trade patterns is the huge growth in the value of truck shipments from Minnesota to the Atlanta, Georgia region. This traffic is expected to increase from its 2007 level of $6 billion to $30 billion in 2030, rising from 3 percent of total outbound truck freight by value to 8 percent in 2030. Shipments to the New York, Los Angeles, and Philadelphia regions are all expected to increase dramatically during this period as well. Together these five regions are expected to receive over 31 percent of total outbound Minnesota truck freight in 2030, up from 28 percent in 2007.

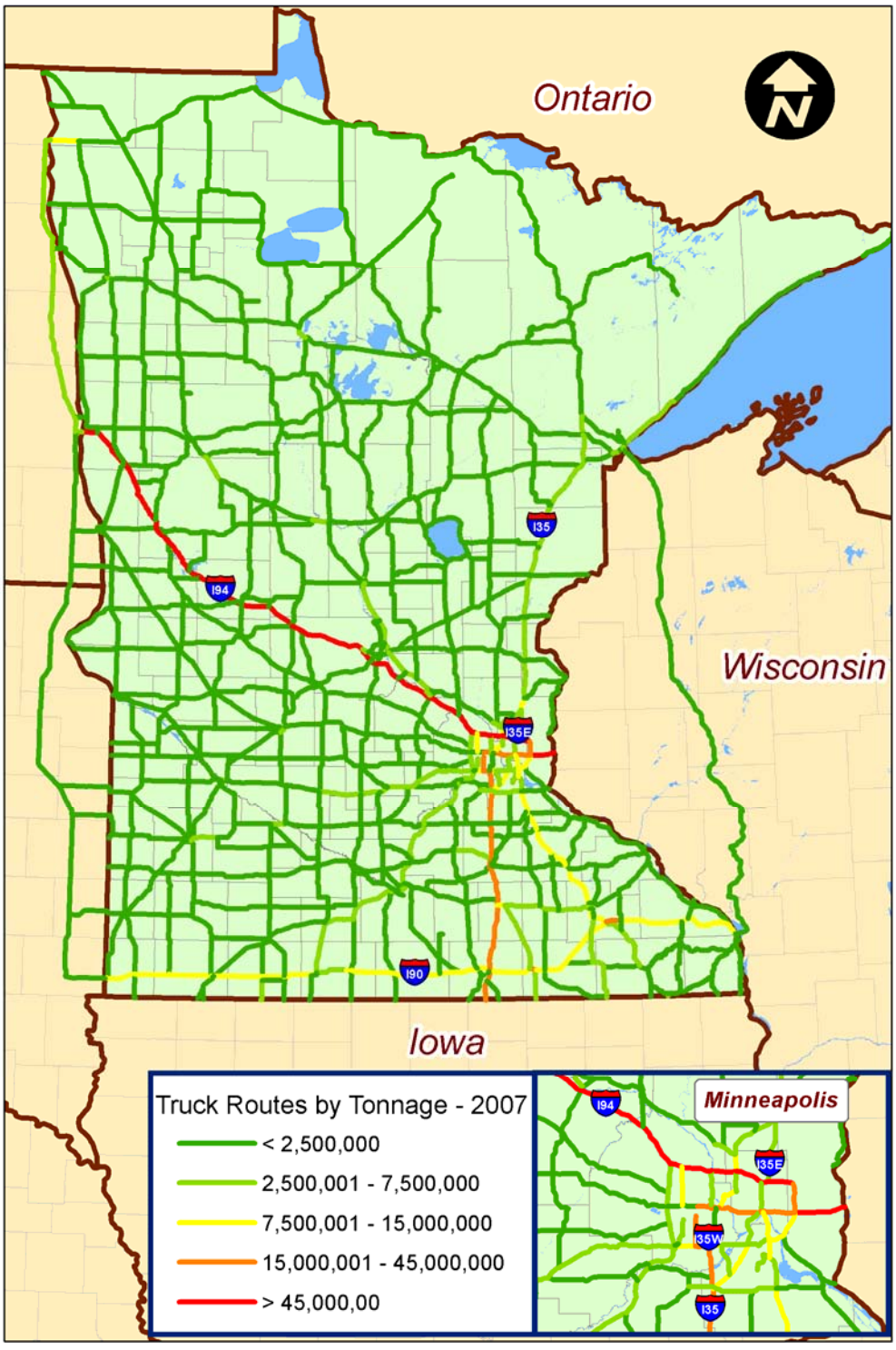
Truck Traffic Within Minnesota

Between 2007 and 2030, truck traffic patterns in the State are expected to remain relatively stable, with interstate highways carrying the highest volumes and exhibiting some of the most significant growth. I-94 will remain the State's most heavily used truck route. The Minneapolis area, at the intersection of I-35 and I-94, also is expected to see a significant growth in truck traffic, as shown on the inset maps in the lower right corner of Figures 1.12 and 1.13. I-90, which crosses the southern portion of the State, along with I-35 south of Minneapolis, which leads to Des Moines – Minnesota's top outbound truck destination by weight, are both projected to carry significantly higher volumes of truck traffic in 2030.

Among noninterstate highways, some of the most significant truck traffic growth is expected on U.S. 52 between Minneapolis and Rochester, Minnesota. Other areas of significant growth include the southwestern and northwestern portions of the State. In the southwest, State Highways 19, 23, and 68, as well as U.S. 68, are all expected to carry over 2.5 million tons per year by 2030. In the northwestern corner of the State, U.S. 2 and U.S. 75, along with State Highway 9 are all expected to carry over 2.5 million tons per year in 2030 and the westernmost portion of State Highway 11 is expected to carry over 15 million tons.

Tables 4.4 and 4.5 detail the average distance that the above commodities were transported. These commodities exhibit a similar trend to the top inbound commodities in that, of the top inbound commodities by tonnage the five trucked the longest distances are all top inbound commodities by value. It also is clear from these tables that the top inbound commodities by value tend to be trucked significantly farther than the top inbound commodities by tonnage, with average trucked distances of approximately 735 and 1,010 miles respectively.

Figure 4.38 Minnesota Truck Traffic by Tonnage
2007



Source: TRANSEARCH.

Table 4.4 Average Truck Miles – Top Inbound Commodities by Tonnage
2007

Top Inbound Motor Freight Commodities by Tonnage	Average Truck Miles
Electrical Machinery	1,149
Chemicals and Allied Products	887
Secondary Moves	867
Rubber and Miscellaneous Plastics	864
Food Products	827
Primary Metal Products	755
Lumber and Wood Products	619
Petroleum and Coal Products	575
Farm Products	507
Nonmetallic Minerals	287

Source: TRANSEARCH.

Table 4.5 Average Truck Miles – Top Inbound Commodities by Value
2007

Top Inbound Motor Freight Commodities by Value	Average Truck Miles
Instruments, Photographic, and Optical Goods	1,258
Miscellaneous Products of Manufacturing	1,253
Machinery, excluding Electrical	1188
Electrical Machinery	1,149
Fabricated Metal Products	915
Chemicals and Allied Products	887
Transportation Equipment	872
Secondary Moves	867
Rubber and Miscellaneous Plastics	864
Food Products	827

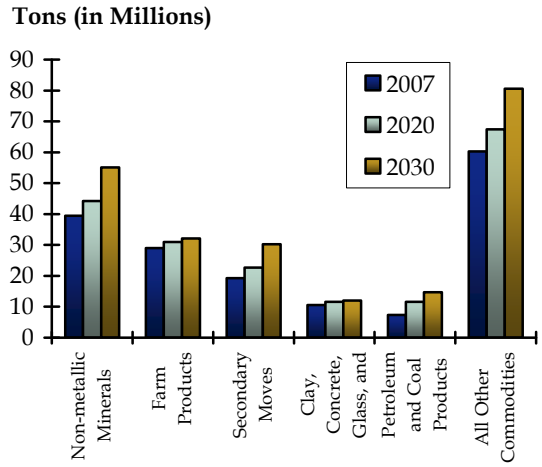
Source: TRANSEARCH.

Intrastate/Local Commodities. Figures 4.39 and 4.40 detail the top intrastate/local commodities for truck freight in Minnesota by weight and value respectively. Intrastate freight makes up about 117 million tons and $189 billion of total truck freight moving on Minnesota's highways. Nonmetallic minerals currently are the largest single commodity group moving to and from destinations within the State based on tonnage, with over 39 million tons in 2007, making up 34 percent of total intrastate truck freight by weight. Intrastate truck transport of nonmetallic minerals is expected to increase to over 55 million tons in 2030, maintaining its 34 percent share of total intrastate truck tonnage. Farm products and secondary moves are responsible for 29 million tons and 19 million tons of intrastate truck freight respectively. The other top intrastate truck commodities, petroleum and coal products, and clay, concrete glass and stone amounted to 7 million tons and 11 million tons in 2007 respectively. Together, these five commodities make up over 90 percent of total intrastate truck freight, by weight.

Figure 4.40 details the top five intrastate truck commodities by value. At $135 billion, secondary moves accounted for 72 percent of total 2007 intrastate truck value and these movements are expected to increase to a total value of $213 billion by 2030. The other top five commodities traveling intrastate via truck were valued at between $5 and $7 billion in 2007. The most substantial growth among these commodities is expected to be seen in electrical machinery, equipment, and supplies, which is projected to grow from its 2007 value of $6 billion to $20 billion by 2030. Together, these five commodities are expected to

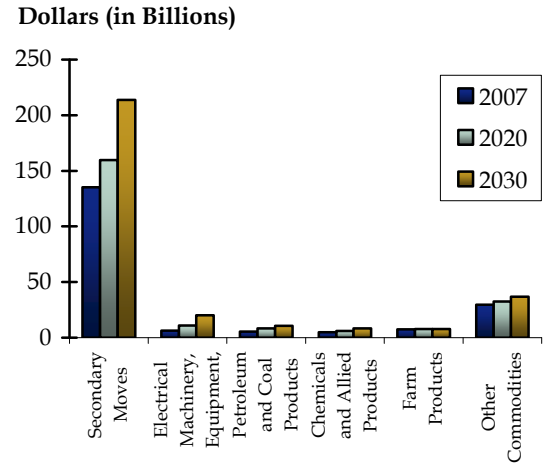
increase their total share of intrastate truck freight value from 84 percent in 2007 to nearly 88 percent in 2030.

Figure 4.39 Top Five Intrastate Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.40 Top Five Intrastate Commodities by Value
2007 to 2030



Source: TRANSEARCH.

Tables 4.6 and 4.7 show the average miles that each of the top intrastate motor freight commodities (by weight and value respectively) were transported in 2007. The top intrastate motor freight commodities by weight averaged only 10 fewer truck miles than the top commodities by value. It also is clear from these tables that the top inbound commodities by value tend to be trucked significantly farther than the top inbound commodities by tonnage, with average trucked distances of approximately 735 and 1,010 miles respectively.

Top Trade Partners – Motor Freight

Figures 4.40 and 4.41 detail the top destinations for truck freight from Minnesota by weight and value respectively. As shown in Figure 4.41, Des Moines, Iowa currently is the top outbound destination for Minnesota truck freight and is expected to remain so over the next 20 years, increasing from 5.6 million tons in 2007 to 9.1 million tons in 2030. Fargo, North Dakota; New York, New York; Chicago, Illinois; and Sioux Falls, South Dakota are other top truck freight destinations, all of which are expected to see significant increases in the amount of truck freight they are receiving from Minnesota over the next 20 years. Together these five destinations account for over 30 percent of all truck freight outbound from Minnesota by tonnage.

Table 4.6 Average Truck Miles – Top Five Intrastate Commodities by Tonnage
2007

Top Intrastate Motor Freight Commodities by Tonnage	Average Truck Miles
Petroleum and Coal Products	146
Secondary Moves	145
Farm Products	122
Nonmetallic Minerals	110
Clay, Concrete, Glass, and Stone	78

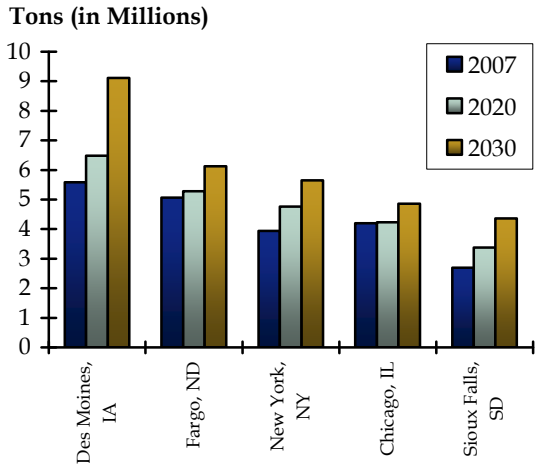
Source: TRANSEARCH.

Table 4.7 Average Truck Miles – Top Five Intrastate Commodities by Value
2007

Top Intrastate Motor Freight Commodities by Value	Average Truck Miles
Petroleum and Coal Products	1,258
Secondary Moves	1,253
Chemicals and Allied Products	1188
Farm Products	1,149
Electrical Machinery	827

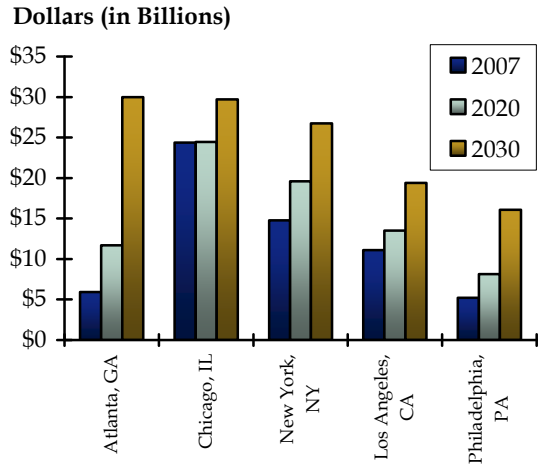
Source: TRANSEARCH.

Figure 4.41 Top Five Truck Freight Destinations by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.42 Top Five Truck Freight Destinations by Value
2007 to 2030



Source: TRANSEARCH.

Of the top five destinations for Minnesota truck freight in terms of value, only Chicago and New York also are top destinations in terms of tonnage. Chicago, which currently is the top destination by value, is expected to see a significant increase in the value of truck freight being received from Minnesota but the most striking change in trade patterns is the huge growth in the value of truck shipments from Minnesota to the Atlanta, Georgia

region. This traffic is expected to increase from its 2007 level of $6 billion to $30 billion in 2030, rising from 3 percent of total outbound truck freight by value to 8 percent in 2030. This increasing trade with the Atlanta region is expected to be driven almost exclusively by shipments of electrical machinery, equipment, and supplies, which was $4.2 billion in 2007 and is expected to climb to $27.3 billion in 2030. Shipments to the New York, Los Angeles, and Philadelphia regions are all expected to increase dramatically during this period as well. Together these five regions are expected to receive over 31 percent of total outbound Minnesota truck freight in 2030, up from 28 percent in 2007.

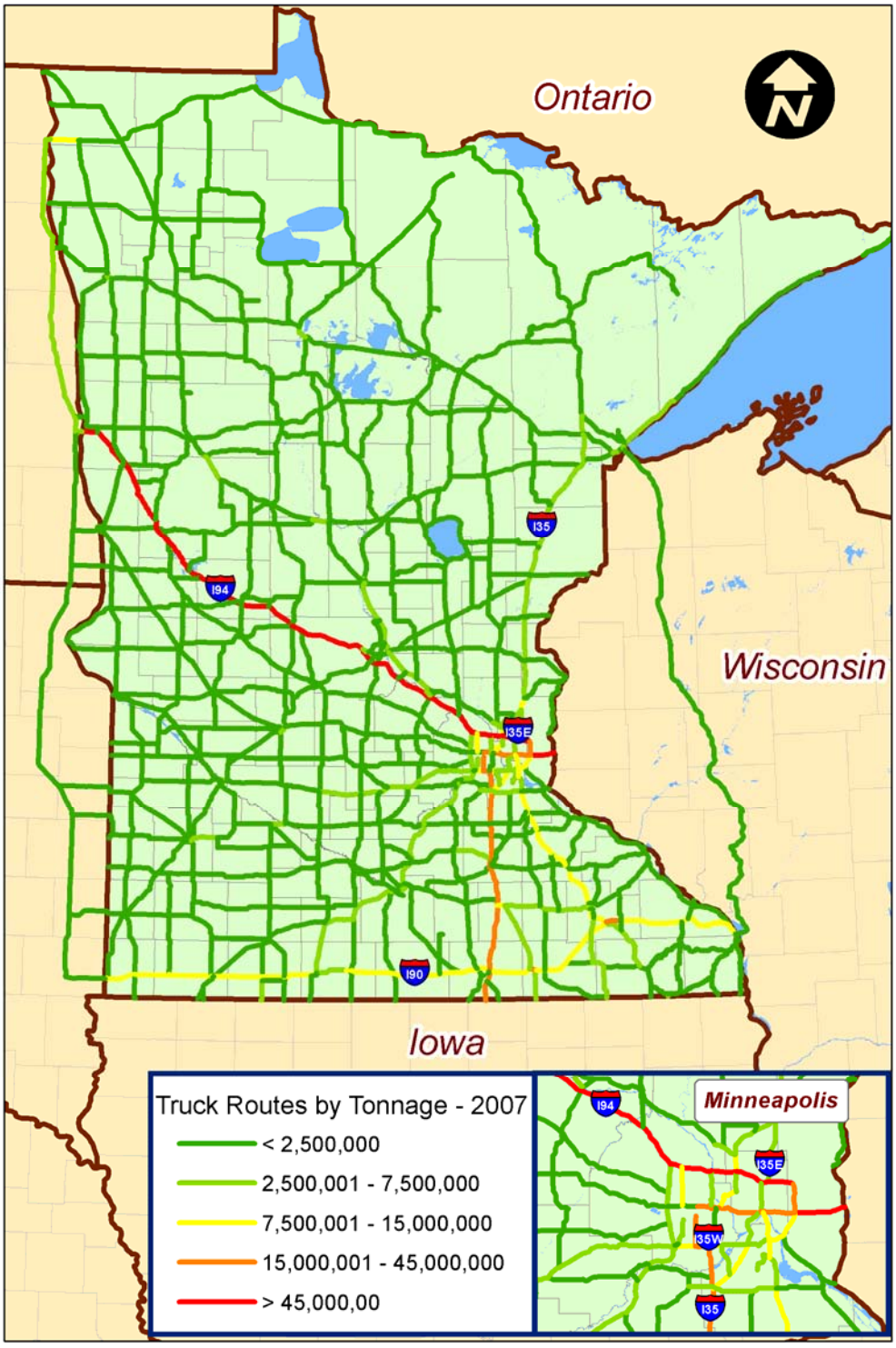
Truck Traffic Within Minnesota

Between 2007 and 2030, truck traffic patterns in the State are expected to remain relatively stable, with interstate highways carrying the highest volumes and exhibiting some of the most significant growth. I-94 will remain the State's most heavily used truck route. The Minneapolis area, at the intersection of I-35 and I-94, also is expected to see a significant growth in truck traffic, as shown on the inset maps in the lower right corner of Figures 4.43 and 4.44. I-90, which crosses the southern portion of the State, along with I-35 south of Minneapolis, which leads to Des Moines – Minnesota's top outbound truck destination by weight, are both projected to carry significantly higher volumes of truck traffic in 2030.

Among noninterstate highways, some of the most significant truck traffic growth is expected on U.S. 52 between Minneapolis and Rochester, Minnesota. Other areas of significant growth include the southwestern and northwestern portions of the State. In the southwest, State Highways 19, 23, and 68, as well as U.S. 68, are all expected to carry over 2.5 million tons per year by 2030. In the northwestern corner of the State, U.S. 2 and U.S. 75, along with State Highway 9 are all expected to carry over 2.5 million tons per year in 2030 and the westernmost portion of State Highway 11 is expected to carry over 15 million tons.

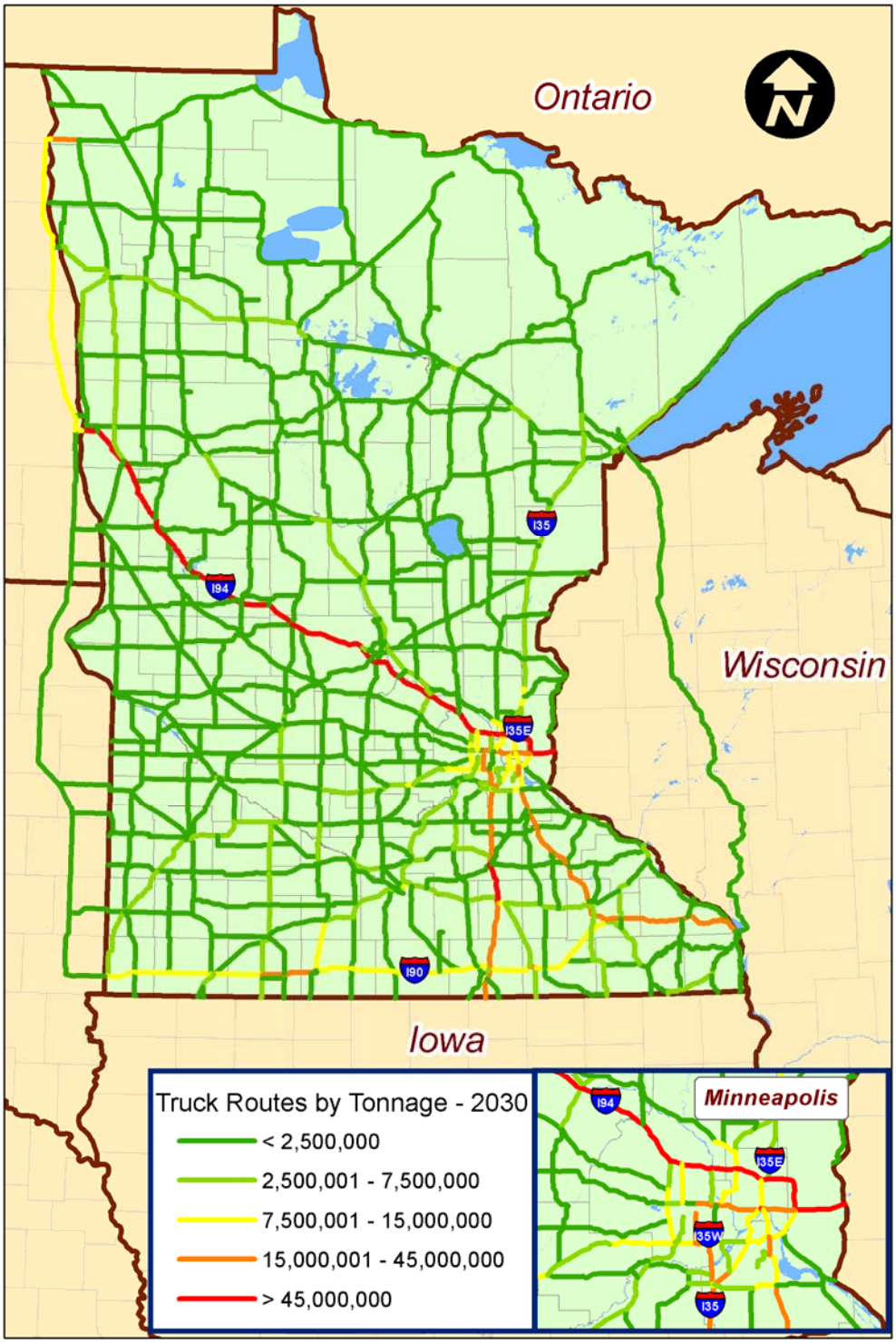
Figure 4.43 Minnesota Truck Traffic by Tonnage

2007



Source: TRANSEARCH.

Figure 4.44 Minnesota Truck Traffic by Tonnage
2030



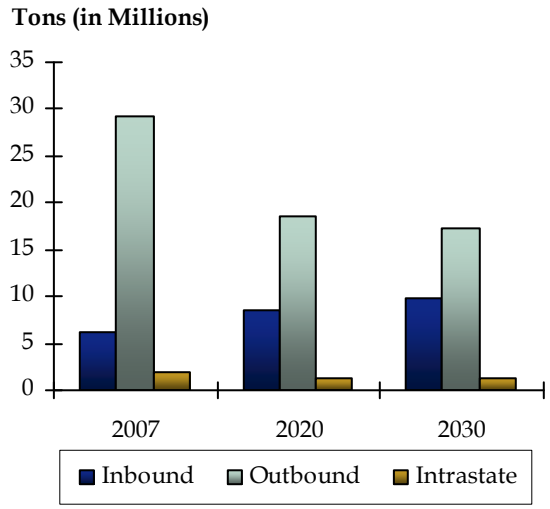
Source: TRANSEARCH.

Waterborne Freight

Movement Types. Figures 4.45 and 4.46 detail the weight and value of inbound, outbound, and intrastate waterborne freight movements in Minnesota in 2007 and the projected weight and value of these shipments in 2020 and 2030. Outbound shipments dominate in terms of both weight and value. Measured by tonnage, outbound shipments are expected to decline significantly from their 2007 level of 29 million tons, to just over 17 million tons by 2030. Intrastate shipments also are expected to decline from their already low level of 1.8 million tons in 2007 to just 1.2 million tons in 2030. Only inbound shipments are expected to increase in tonnage over the next two decades.

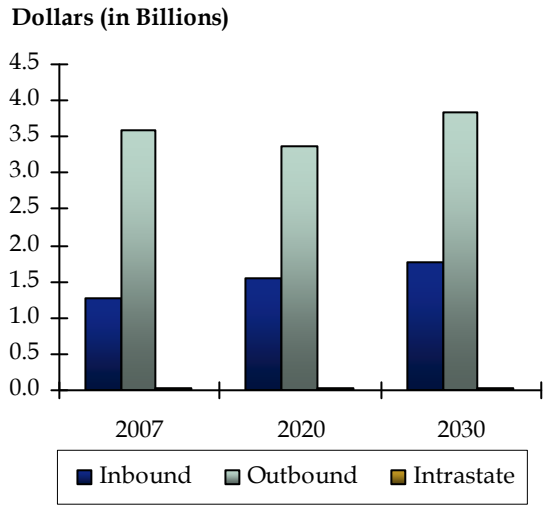
In terms of value both inbound and outbound shipments are projected to see modest increases. Outbound shipments are expected to increase from a total 2007 value of $3.5 billion to 3.8 billion in 2030, while inbound shipments are expected to increase from $1.3 billion to $1.8 billion. Only the value of intrastate shipments, already comparatively small at $20 million in 2007, is expected to decline over the next 20 years, dropping to a projected level of $17 million in 2030.

Figure 4.45 Waterborne Freight Movements by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.46 Waterborne Movement Types by Value
2007 to 2030



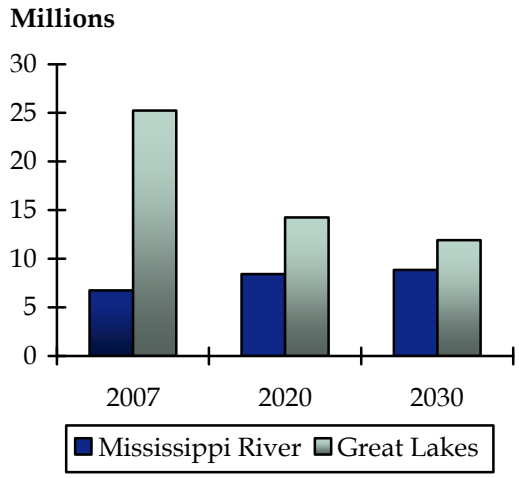
Source: TRANSEARCH.

Great Lakes and Mississippi River Freight. Figures 4.47 and 4.48 detail Minnesota's waterborne freight traffic on the Mississippi River and the Great Lakes by weight and value respectively. While Minnesota's waterborne freight moving on the Great Lakes was far greater than its Mississippi River freight as measured by tonnage in 2007, this disparity

is expected to decline over the coming years due largely to the predicted declines in iron ore production.

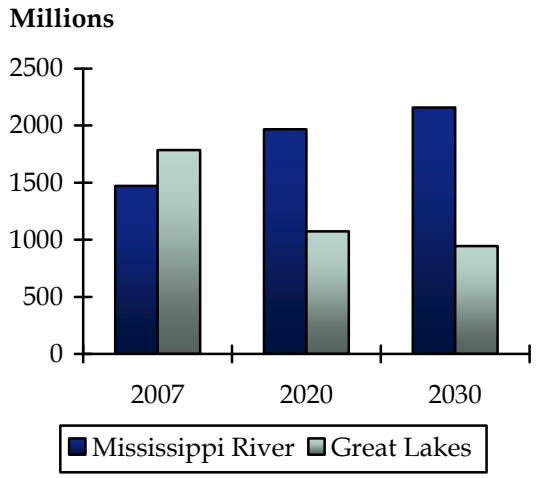
Minnesota's Great Lakes freight was valued higher than its Mississippi River freight in 2007 but, with Great Lakes freight declining and Mississippi River freight growing to over $2 billion annually, by 2030 the Mississippi River is expected to carry more than twice the value carried on the Great Lakes to and from Minnesota.

Figure 4.47 Great Lakes and Mississippi River Freight Movements by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.48 Great Lakes and Mississippi River Freight Movements by Value
2007 to 2030



Source: TRANSEARCH.

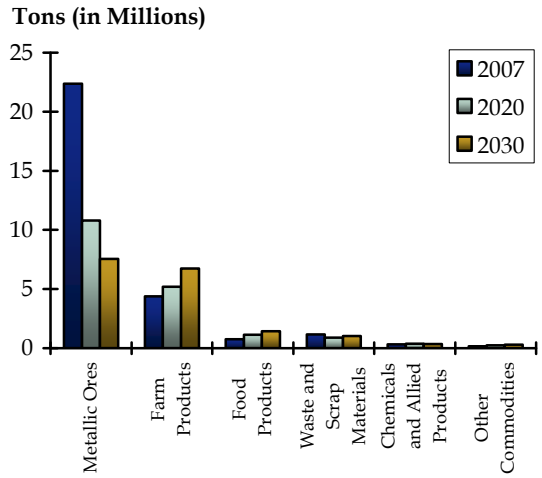
Top Commodities – Waterborne Freight

Outbound Commodities. Figures 4.49 and 4.50 detail Minnesota's top outbound waterborne commodities by both weight and value. Metallic ores are the overwhelmingly dominant outbound waterborne commodity by tonnage, with over 22.3 million tons – three times the combined weight of all other commodities. Farm products at 4.3 million tons in 2007 are the next most dominant outbound commodity. By 2030 waterborne shipments of metallic ores are expected to decline precipitously to just over 7.5 million tons while shipments of farm products are expected to increase by over 50 percent to 6.7 million tons in 2030.

While metallic ores currently are the dominant outbound commodity as measured by value at $1.3 billion, it is projected to decline to just over $450 million by 2030. Farm products, the second largest outbound waterborne commodity by value, are expected to

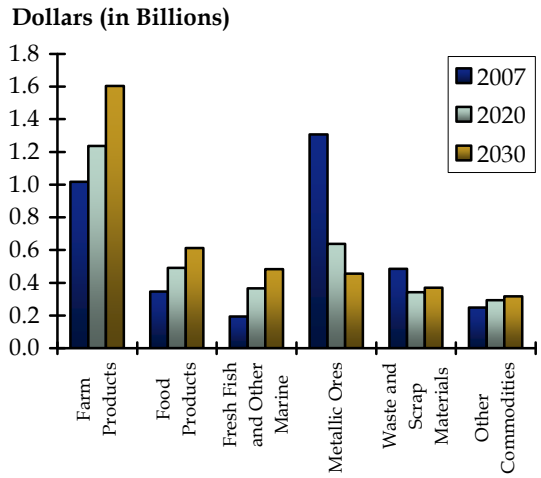
grow to over $1.6 billion in 2030, 60 percent growth over the next 20 years. Fresh fish and marine products are expected to more than double over this period as well, from $193 million to $483 million. Food products are expected to grow more than 50 percent as well during his period, to a total of $612 million. Waste and scrap material shipments are expected to decline by nearly $120 million, to $368 million in 2030.

Figure 4.49 Outbound Waterborne Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.50 Outbound Waterborne Commodities by Value
2007 to 2030

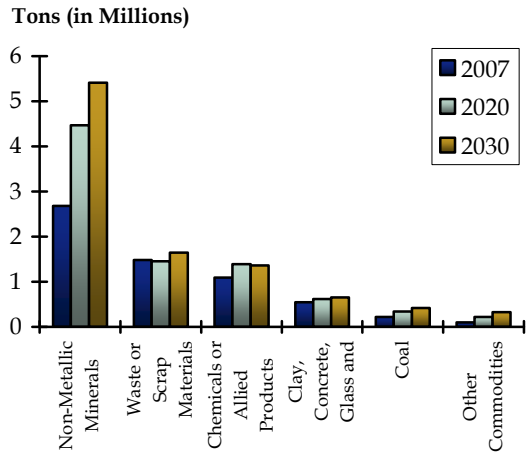


Source: TRANSEARCH.

Inbound Commodities. Figures 4.51 and 4.52 detail Minnesota's top inbound waterborne commodities by both weight and value. The dominant waterborne inbound commodity, in terms of tonnage, in Minnesota is nonmetallic minerals, which is expected to double to more than 5.4 million tons by 2030. Inbound waterborne shipments of waste and scrap materials and chemical products are projected to experience small increases in tonnage to 1.6 and 1.4 million tons respectively. Clay, concrete, glass, and stone shipments are expected to increase to just over 650,000 tons while shipments of coal are expected to increase to 416,000 tons. The combined weight of all other inbound waterborne commodities is expected to increase from 97,000 to 324,000 tons.

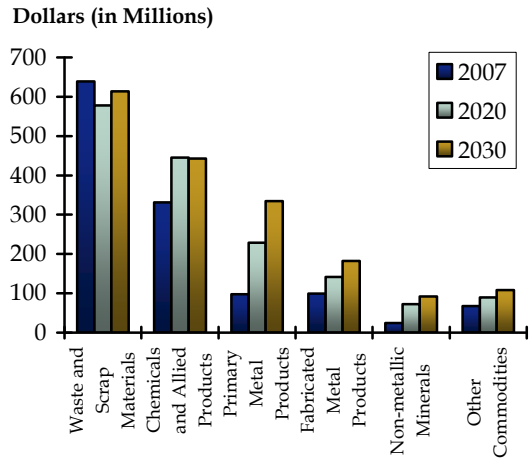
Measured by value, waste, and scrap materials are the dominant inbound waterborne commodity, at over $600 million, and is expected to remain at this level over the coming years (Figure 4.47). Shipments of chemicals and allied products are expected to grow from $331 to $442 million over the next two decades. No other inbound waterborne commodity was valued at more than $100 million in 2007, although inbound shipments of primary metal products and fabricated metal products are both expected to increase by 2030 to $335 and $132 million respectively.

Figure 4.51 Inbound Waterborne Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

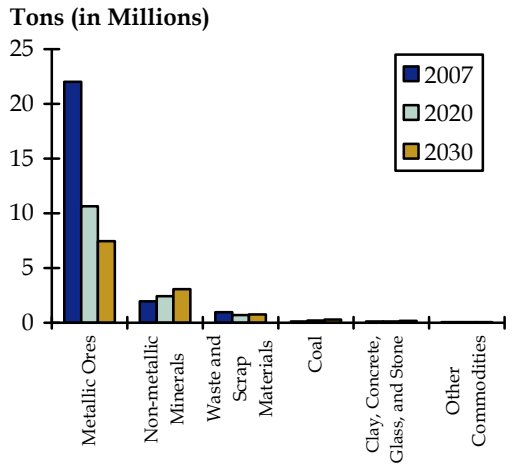
Figure 4.52 Inbound Waterborne Commodities by Value
2007 to 2030



Source: TRANSEARCH.

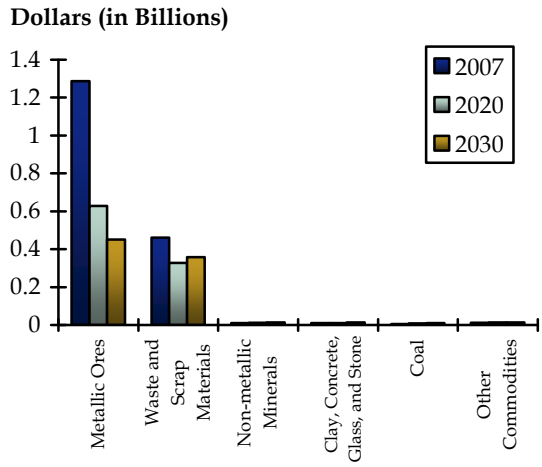
Great Lakes Commodities. The top five commodities traveling to and from Minnesota via the Great Lakes are shown in Figures 4.53 and 4.54 by weight and value respectively. The overwhelmingly dominant commodity in 2007 by both measures was metallic ores. However, over the coming years these shipments are expected to decline precipitously, dropping by more than 50 percent both in weight and value by 2020 and continuing to decline at a somewhat slower pace between 2020 and 2030. Nonmetallic minerals, the second largest of Minnesota's Great Lakes commodities by tonnage is expected to increase by approximately 50 percent from 2.0 million tons in 2007 to 3.1 million tons in 2030. Shipments of waste and scrap materials, the second largest commodity by value and third largest by tonnage, is expected to decline by more than $100 million and 180,000 tons annually by 2030. All other commodities moving to and from Minnesota via the Great Lakes are expected to remain relatively insignificant in terms of both weight and value.

Figure 4.53 Great Lakes Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.54 Great Lakes Commodities by Value
2007 to 2030

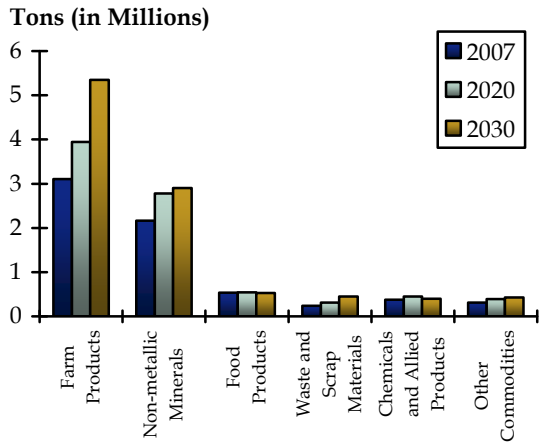


Source: TRANSEARCH.

Mississippi River Freight. Figures 4.55 and 4.56 display the top commodities moving to, from, and within Minnesota via the Mississippi River. By both measures freight on the Mississippi River is significantly more diverse than that on the Great Lakes. Measured by tonnage, farm products are the largest commodity moving to and from Minnesota via the Mississippi River, totaling over 3.1 million tons in 2007 and expected to grow to 5.3 million tons annually by 2030. Nonmetallic minerals, the next largest commodity by tonnage also is expected to grow, climbing from 2.2 million tons in 2007 to 2.9 million tons by 2030. Minnesota's remaining top five commodities moving on the Mississippi River by tonnage, food products, waste and scrap materials, and chemicals and allied products are all expected to remain relatively stable over the next two decades.

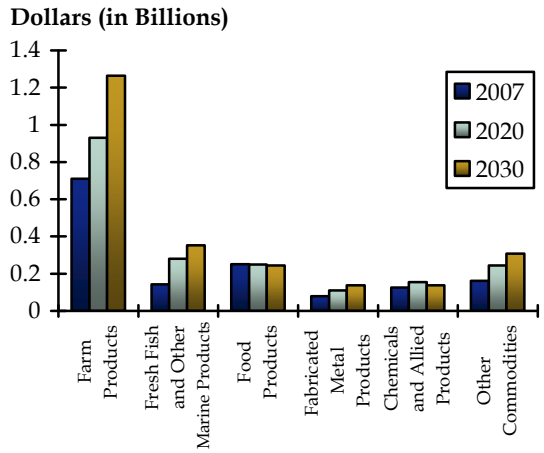
Farm products are Minnesota's largest Mississippi River commodity in terms of value. These shipments, valued at over $710 million in 2007, are expected to increase to nearly $1.3 billion by 2030 – increasing from 48 to 52 percent the value of all of the State's Mississippi River freight value during this period. Shipments of fish and other marine products, Minnesota's third highest value commodity on the Mississippi in 2007 are expected to more than double from $143 million to $353 million by 2030. Shipments of food products, valued at $250 million in 2007 are expected to decline slightly to $244 million in 2030. Shipments of fabricated metal products on the Mississippi River to and from Minnesota, which were valued at $80 million in 2007, are expected to grow dramatically to nearly $140 million by 2030. Shipments of chemicals and allied products are expected to remain relatively stable over this period while the combined value of all other products moving to and from Minnesota on the river is expected to nearly double from $161 to $307 million.

Figure 4.55 Mississippi River Commodities by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.56 Mississippi River Commodities by Value
2007 to 2030



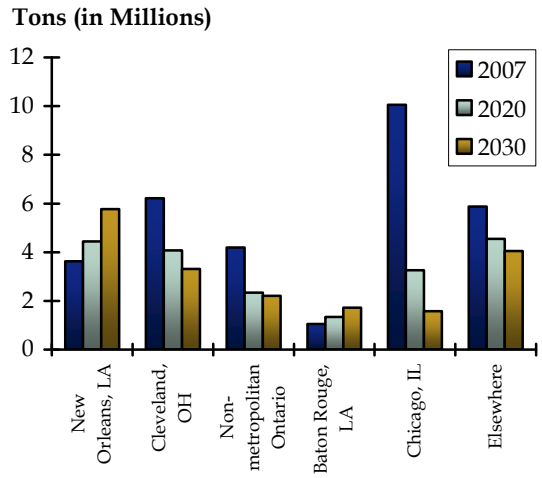
Source: TRANSEARCH.

Top Trade Partners to Waterborne Freight

Outbound Trade Partners. As shown in Figure 4.57, in terms of tonnage, Chicago is the top destination for waterborne goods from Minnesota. Chicago received over 10 million tons from Minnesota in 2007; however these shipments are expected to decrease dramatically over the coming 20 years to a total of less than 2 million tons in 2030. Cleveland, which received over 6 million tons from Minnesota in 2007, is expected to experience a similar drop in waterborne freight from the State in 2030. New Orleans, and Baton Rouge, however are expected to see increasing waterborne freight from Minnesota.

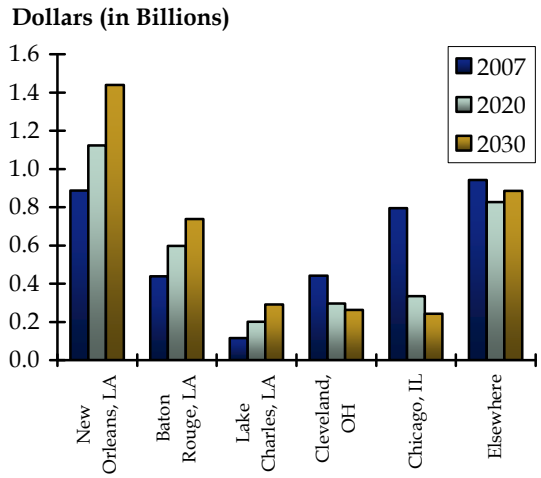
In terms of value, shipments to New Orleans over the Mississippi River System, already the most common destination for waterborne freight from Minnesota, are expected to grow to over $1.4 billion (Figure 4.58). Other destinations in Louisiana along the Mississippi River System are expected to experience strong growth as well. Shipments to Chicago and Cleveland are both expected to experience significant reductions, mirroring the declines shown in Figure 4.58.

Figure 4.57 Outbound Waterborne Destinations by Tonnage
2007 to 2030



Source: TRANSEARCH.

Figure 4.58 Outbound Waterborne Destinations by Value
2007 to 2030



Source: TRANSEARCH.

Inbound Trade Partners. As shown in Tables 4.8 and 4.9, Louisiana ports are the dominant origination point for inbound waterborne shipment, in terms of both weight and value. While the Northern Michigan and Green Bay regions also ship a great deal to Minnesota, in terms of tonnage, they are relatively insignificant, in terms of value.

Table 4.8 Inbound Waterborne Origins by Tonnage
2007 to 2030

	2007	2020	2030
New Orleans, Louisiana	1,523,095	2,159,461	2,357,382
Baton Rouge, Louisiana	568,777	1,810,751	2,004,154
Northern Michigan, Michigan	957,503	1,319,283	1,769,104
Green Bay, Wisconsin	835,866	1,002,325	1,218,527
Elsewhere	1,170,158	1,373,336	1,662,191

Source: TRANSEARCH.

Table 4.9 Inbound Waterborne Origins by Value
2007 to 2030

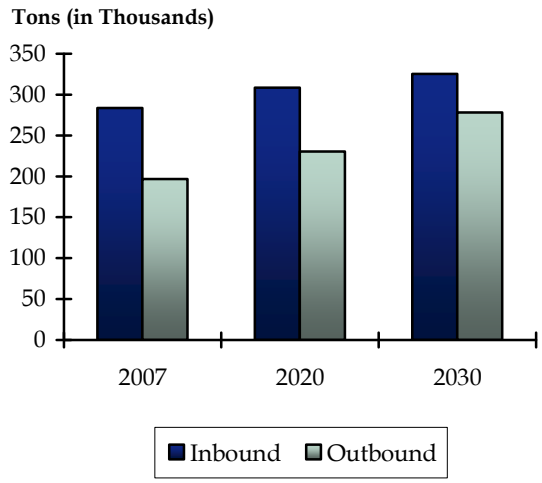
	2007	2020	2030
New Orleans, Louisiana	$413,934,622	$666,134,520	$817,936,081
Baton Rouge, Louisiana	$101,854,625	$185,772,847	$195,899,210
Lake Charles, Louisiana	$46,385,128	$62,695,950	$76,712,278
Northern Michigan, Michigan	$20,624,723	$33,486,758	$52,464,617
Elsewhere	$130,696,313	$166,210,149	$208,648,328

Source: TRANSEARCH.

Air Cargo

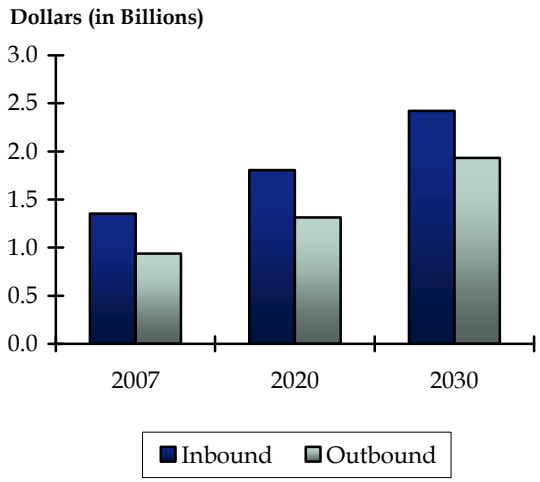
Movement Types. Due to the very high cost of air freight transportation, this type of transport is generally used only for very high-value, low-weight goods. Air cargo movements are expected to climb steadily over the next two decades in terms of both weight and value, as shown in Figures 4.59 and 4.60, with outbound air cargo outpacing inbound in the proportional growth of both tonnage and value over this period. Inbound tonnage is expected to increase by 42 thousand tons during this period, to a total of 326 thousand tons, while outbound tonnage is expected to experience an increase of over 80 thousand tons, to a total of 277 thousand tons. In terms of value, inbound air freight is expected to increase by $1.1 billion to a total of $2.4 billion. Outbound air cargo is expected to more than double during this period, growing by $1 billion to a total of $1.9 billion. There were 200 tons of intrastate cargo moved in Minnesota in 2007 valued at $500,000. This is expected to increase to just over 350 tons and $880,000 by 2030.

Figure 4.59 Air Cargo Movements by Tonnage



Source: TRANSEARCH.

Figure 4.60 Air Cargo Movements by Value

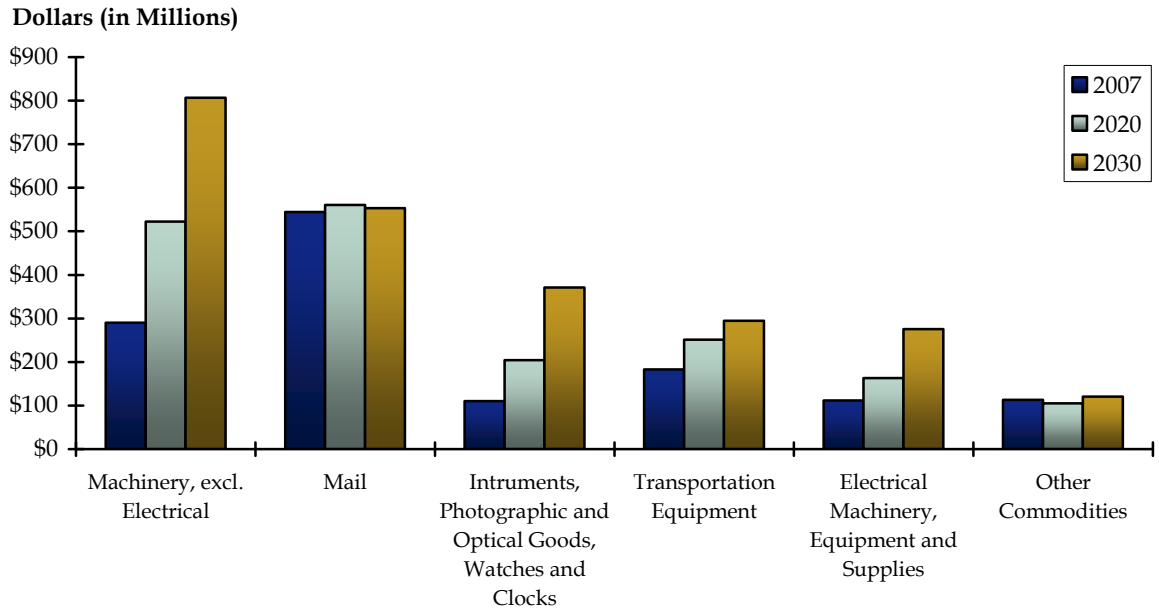


Source: TRANSEARCH.

Top Commodities – Air Cargo

Inbound Commodities. Mail currently holds the largest share of air freight as measured by value, at nearly $545 million in 2007. Machinery is expected to surpass mail as the highest value sector of inbound air freight by 2030, growing from its 2007 value of $290 million to over $805 million by 2030. Instruments and electrical machinery also are expected to grow dramatically over this period, to $370 and $275 million respectively. Inbound air shipments of transportation equipment also are expected to grow significantly over this period. The combined value of all other inbound air cargo is expected to remain at just over $100 million for the next 20 years.

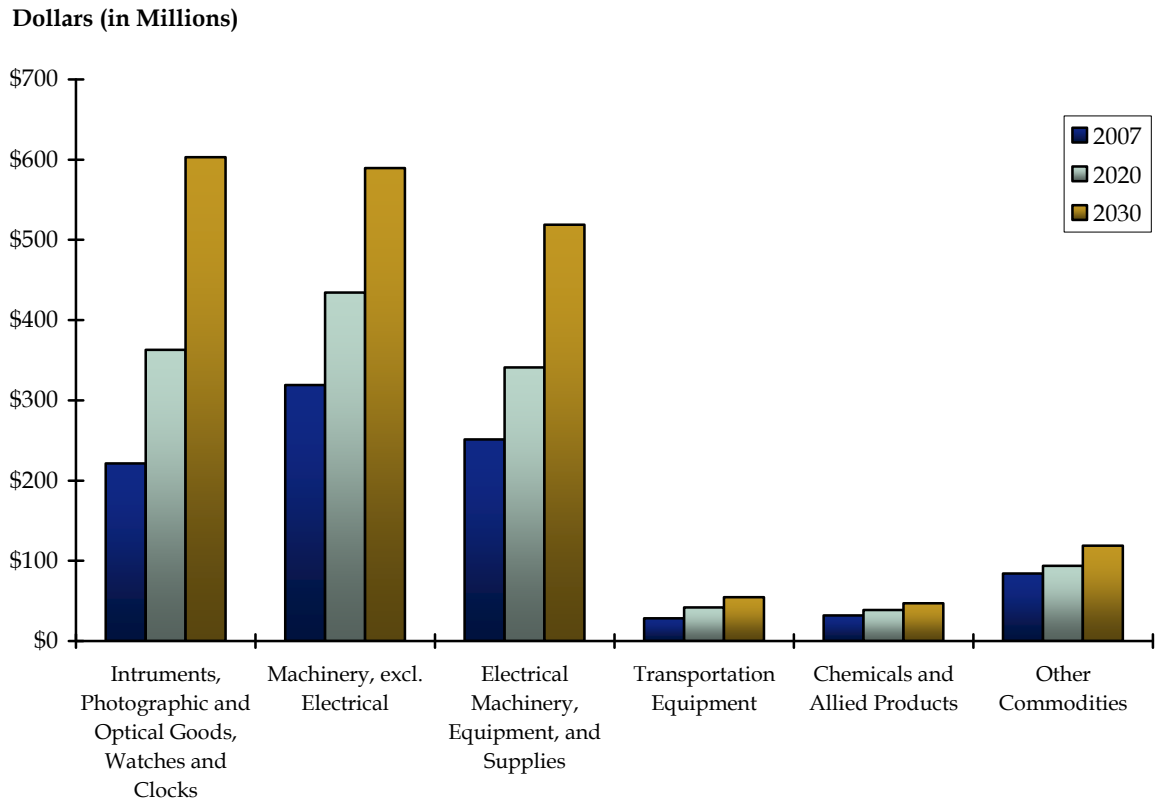
Figure 4.61 Top Inbound Air Freight Commodities



Source: TRANSEARCH.

Outbound Commodities. As shown in Figure 4.62, instruments, machinery, and electrical machinery comprised the vast majority of air cargo outbound from Minnesota in 2007 and are projected to grow significantly by 2030. Instruments are expected to exhibit the largest growth, increasing from just over $200 million to nearly $600 million by 2030. Machinery and electrical machinery are each expected to grow by over $250 million during this period. Air shipments of transportation equipment and chemical products are both expected to grow to approximately $50 million by 2030 from their 2007 values of approximately $30 million. Air shipments of all other commodities are expected to grow from a total value of $84 million to $119 million over the next 20 years.

Figure 4.62 Top Outbound Air Freight Commodities

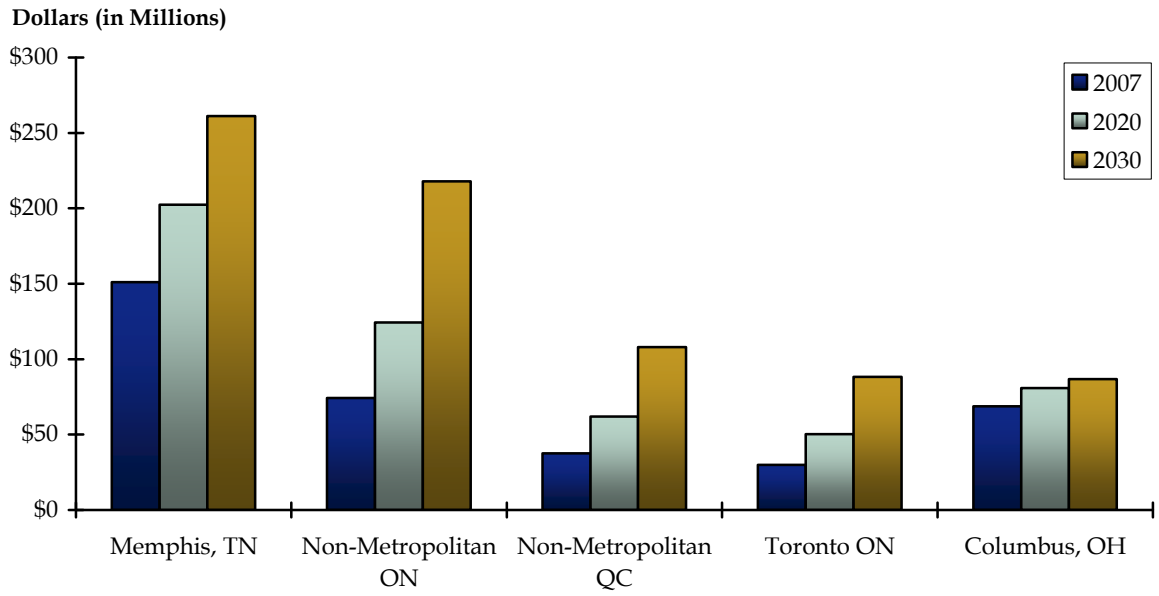


Source: TRANSEARCH.

Top Trade Partners – Air Cargo

As shown in Figure 4.63 the top destination for air cargo from Minnesota is Memphis, which also happens to be the main hub for FedEx. In 2007 twice as much air cargo was shipped to the Memphis area than to any other destination, $151 million. Over the next 20 years, the value of air cargo shipped to Memphis is expected to increase by $110 million, to a total of $261 million. Interestingly, three of the top five destination regions of Minnesota air cargo are in Canada. The only other U.S. region in Minnesota's top five air cargo destinations is Columbus, Ohio, which was DHL's hub. These five destinations receive approximately 40 percent of all airfreight leaving Minnesota and are expected to maintain this proportion through the coming two decades.

Figure 4.63 Top Air Cargo Destinations



Source: TRANSEARCH.

Other Freight

The designation of "other" freight is used in the TRANSEARCH database to classify shipments for which a mode is undefined. These shipments are almost exclusively to and from Canada (over 99 percent). Over 99 percent of this inbound freight, in terms of both weight and value is crude petroleum and natural gas, projected to increase from 10.2 to 12.8 million tons over the period from 2007 to 2030. The value of these inbound shipments is expected to climb from $3.1 to $3.9 billion over the same period.

Outbound "other" shipments are very limited, with a total value in 2007 of $4.9 million and an anticipated value of $6.5 million in 2030. The total weight of these outbound shipments is expected to grow from 41,000 to 46,000 tons between 2007 and 2030.

Through shipments of "other" freight are far greater than inbound or outbound movements, with a total 2007 weight of 31.2 million tons and value of $10.8 billion expected to increase to 37.2 million tons and $13.7 billion in 2030.

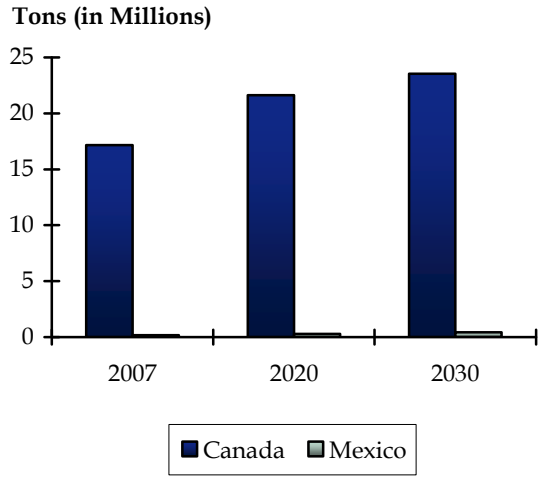
4.4 NAFTA Trade

NAFTA trade (i.e., trade with Canada and Mexico) makes up a large and growing sector of total freight movements to and from Minnesota in terms of both weight and value. The following subsections detail Minnesota's trade with Canada and Mexico, in terms of both weight and value, and outline the top commodities moving between Minnesota and these countries.

Inbound. As shown in Figure 4.64, when measured by weight, imports from Canada far surpass those from Mexico. In 2007, Minnesota received nearly 12.4 million tons of cargo from Canada, while receiving less than 200,000 tons from Mexico – less than 1.5 percent. Over the next two decades, Mexico's imports into Minnesota are expected to more than double but will remain a small fraction of total inbound NAFTA trade in 2030, with less than a 3 percent share.

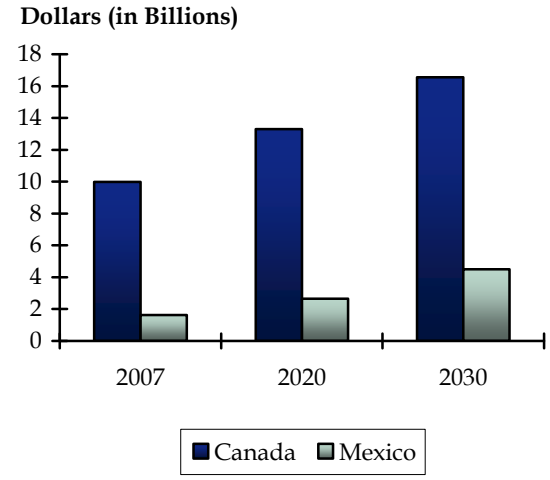
When measured by value, inbound freight from Mexico appears much more substantial (Figure 4.65). While Canada remains the largest international trade partner, shipping over $5.5 billion worth of goods into Minnesota annually, the value of goods coming to Minnesota from Mexico is over $1.6 billion annually. Over the next two decades, Mexico's share of Minnesota's inbound freight from NAFTA countries is expected to grow from its 2007 share of 23 percent to 35 percent ($4.5 billion) in 2030.

Figure 4.64 Inbound Freight from Canada and Mexico by Weight



Source: TRANSEARCH.

Figure 4.65 Inbound Freight from Canada and Mexico by Value

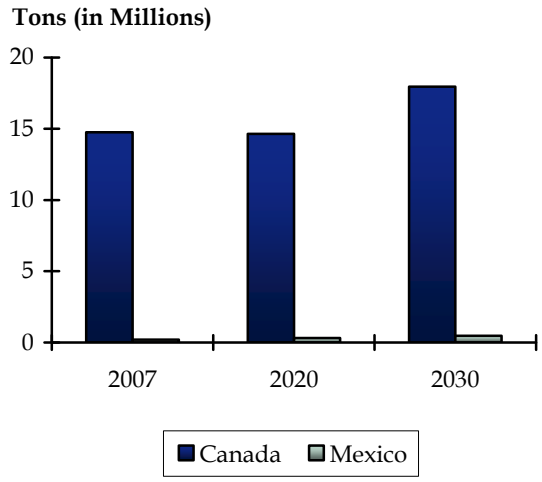


Source: TRANSEARCH.

Outbound. Outbound NAFTA trade from Minnesota exhibits similar trends as NAFTA trade into the State. As shown in Figure 4.66, when measured by tonnage over 98 percent of Minnesota's outbound NAFTA trade is destined for Canada. This is expected to remain stable through 2030, with Canada's portion of Minnesota's outbound NAFTA trade growing to 13.6 million tons (97 percent of the total). During this period, while Minnesota's outbound trade with Mexico is expected to remain a small fraction of its trade with Canada, as measured by weight, it is expected to more than double from 210,000 tons in 2007 to over 465,000 tons in 2030.

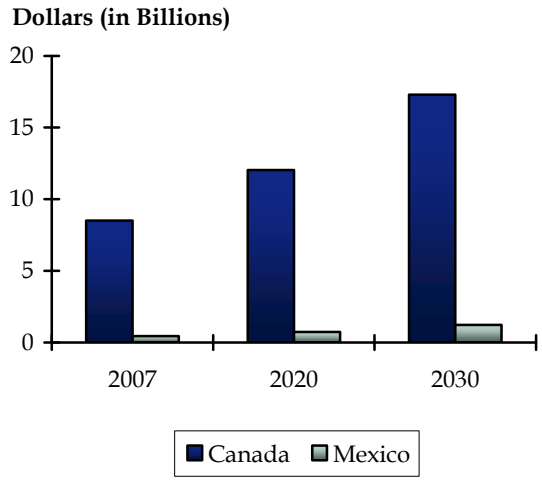
Although Mexico's portion of outbound NAFTA trade, as measured by value, is far greater than its share by tonnage, it is still only a small fraction of what Minnesota exports to Canada, and is expected to climb from 9 to 12 percent of the value of Minnesota's total outbound NAFTA trade by 2030. Exports to Canada are expected to climb from $4.4 to $8.9 billion by 2030.

Figure 4.66 Outbound Tons to Canada and Mexico by Tonnage



Source: TRANSEARCH.

Figure 4.67 Outbound Freight to Canada and Mexico by Value



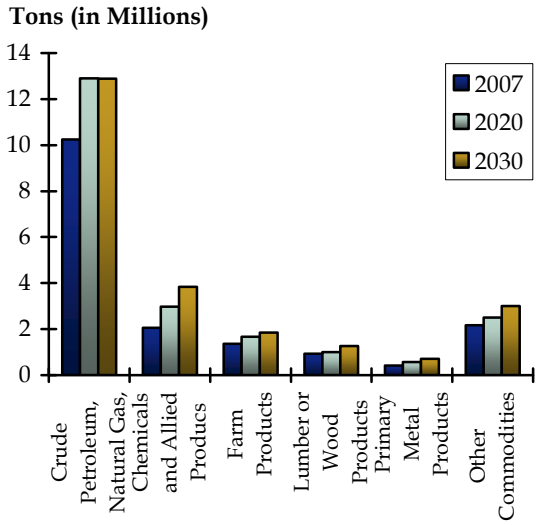
Source: TRANSEARCH.

Top Commodities – NAFTA Trade

Inbound. Figures 4.68 and 4.69 detail the top commodities being shipped into Minnesota from Canada by weight and value. Petroleum products make up the largest share of inbound commodities from Canada, both by weight and value. By weight these products make up over 80 percent of Canada's imports into Minnesota and are expected to maintain this share over the next two decades. By value, petroleum products make up 57 percent of Canadian exports to Minnesota. By 2030, while total annual Canadian exports

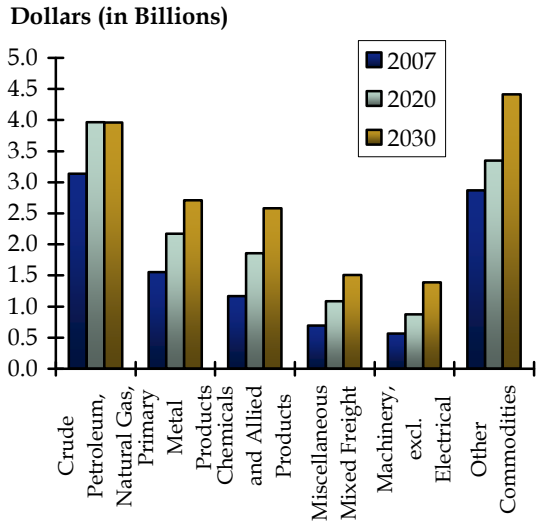
of petroleum products to Minnesota are predicted to climb to $8.5 billion (from their current level of $5.5 billion) their share of total Canadian exports to the State is expected to decline to 46 percent. Other top commodities by tonnage being shipped from Canada to Minnesota include chemical, farm, and food products and nonmetallic minerals. However, none of these commodities exceeded 500,000 tons in 2007 and all are expected to remain well below 1,000,000 tons in 2030. Measured by value, nonelectrical machinery is the second largest Canadian export commodity to Minnesota at nearly $500 million in 2007 and expected to grow to over $1.1 billion in 2030. Canada's electrical machinery exports into Minnesota are expected to exhibit the largest growth over the next two decades, rising from a 2007 value of $135 million to over $485 million in 2030.

Figure 4.68 Top Inbound Commodities from Canada by Tonnage



Source: TRANSEARCH.

Figure 4.69 Top Inbound Commodities from Canada by Value



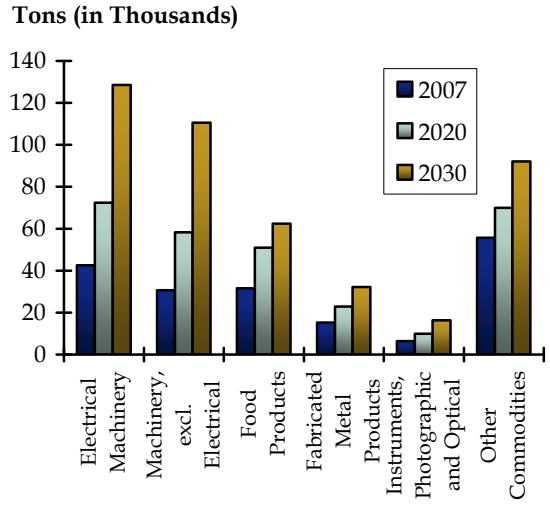
Source: TRANSEARCH.

Figures 4.70 and 4.71 detail Mexico's top exports to Minnesota. Mexico's exports to Minnesota are significantly more diverse than those coming from Canada. Measured by weight, Mexico's top export to Minnesota, electrical machinery, held a 23 percent share of the total in 2007, while nonelectrical machinery and food products each held a 17 percent share. Fabricated metal products and instruments made up 8 percent and 4 percent of the weight of all Mexican exports to the State respectively. Mexican exports of machinery, both electrical and nonelectrical, are expected to grow more than three-fold through 2030.

In terms of value, nonelectrical machinery is the dominant commodity, with a 43 percent share ($695 million) of 2007 Mexican exports to Minnesota. Instruments, photographic and optical goods were the next largest commodity group being exported from Mexico to Minnesota in 2007, at 18 percent of the total ($285 million). Electrical machinery is

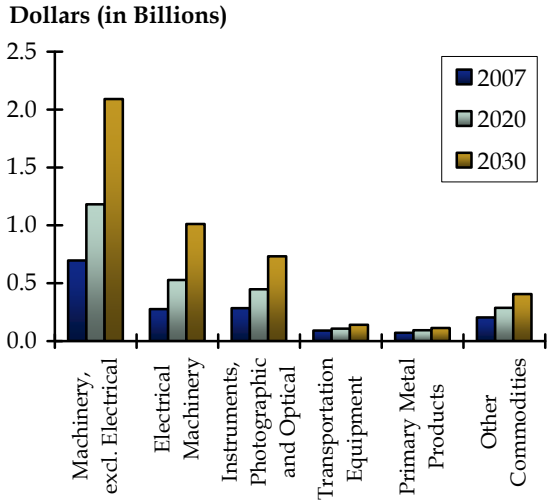
Mexico's third largest export to the State, with a value of over $275 million (17 percent) in 2007. Nonelectrical machinery exports from Mexico to Minnesota will exhibit the greatest gains by 2030, increasing to nearly $2.1 billion and representing 47 percent of the total value of Mexican exports to the State. Electrical machinery also is expected to exhibit a large increase, surpassing instruments, photographic and optical goods as the second largest commodity group entering the State from Mexico.

Figure 4.70 Top Inbound Commodities from Mexico by Tonnage



Source: TRANSEARCH.

Figure 4.71 Top Inbound Commodities from Mexico by Value

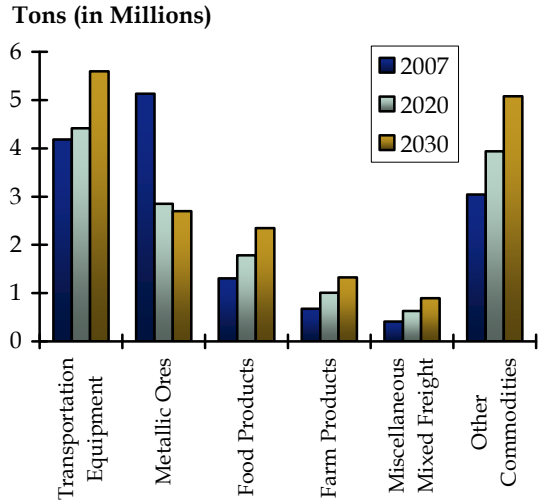


Source: TRANSEARCH.

Outbound. Figures 4.72 and 4.73 detail Minnesota's top export commodities to Canada by weight and value respectively. Metallic ores and transportation equipment currently are largest exports to Canada from Minnesota by weight, each surpassing the combined weight of all other commodities. However, through 2030 exports of metallic ores are expected to decline precipitously from 5.1 to 2.7 million tons per year. Transportation equipment, however, is expected to exhibit strong growth over this period, increasing from 4.1 to 5.4 million tons. Food, paper, and fabricated metal products are all expected to increase steadily over the next two decades but remain below 1 million tons.

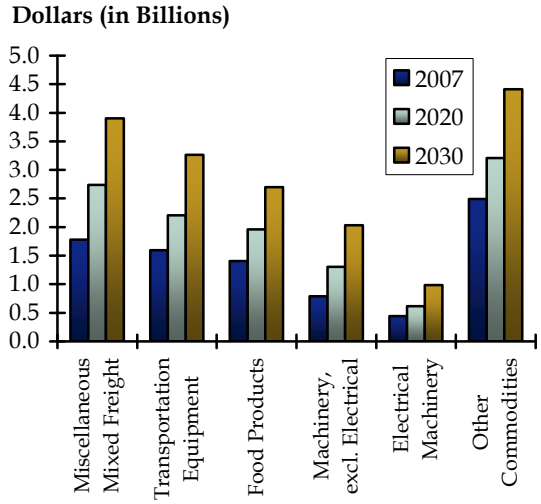
Transportation equipment is Minnesota's largest export to Canada by value, with a 2007 value of over $1.1 billion, which is expected to grow to $2.2 billion by 2030. Nonelectrical and electrical machinery are the State's second and third largest exports to Canada and are both predicted to more than double by 2030. Exports of instruments and photographic and optical goods are expected to exhibit the largest proportional growth, climbing from a value of $185 to $705 million over the period from 2007 to 2030. Exports of food products to Canada also are expected to double during this period.

Figure 4.72 Top Outbound Commodities to Canada by Tonnage



Source: TRANSEARCH.

Figure 4.73 Top Outbound Commodities to Canada by Value

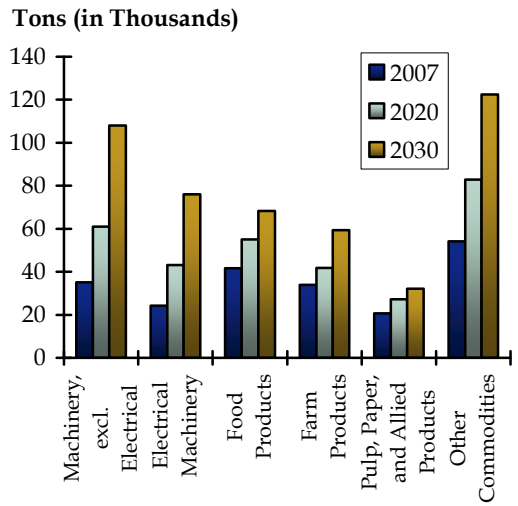


Source: TRANSEARCH.

Figures 4.74 and 4.75 detail Minnesota's top exports to Mexico. Measured by weight, food products were largest single commodity group in 2007, comprising 20 percent (42,000 tons) of the total weight of exports to Mexico. Nonelectrical machinery, the second largest export from Minnesota to Mexico in 2007, is expected to exhibit the largest growth of any commodity through 2030, climbing to nearly 110,000 tons from 35,000 tons in 2007. Electrical machinery also is expected to grow dramatically from 24,000 to 76,000 tons between 2007 and 2030.

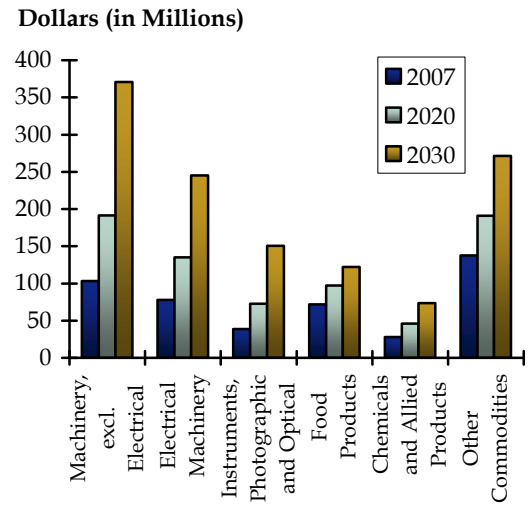
Measured by value, nonelectrical machinery, currently the largest of Minnesota's exports to Mexico, is expected to more than triple, from $103 to $370 million between 2007 and 2030. The value of electrical machinery exported to Mexico in 2030 also is expected to be more than three times its value in 2007, climbing to $245 million. Exports to Mexico of instruments, photographic and optical goods, valued at $38 million in 2007 also are predicted to increase dramatically to $150 million by 2030. Exports of food and chemical products also are expected to exhibit strong growth over this period.

Figure 4.74 Top Outbound Commodities to Mexico by Tonnage



Source: TRANSEARCH.

Figure 4.75 Top Outbound Commodities to Mexico by Value



Source: TRANSEARCH.