WISCONSIN DEPARTMENT OF TRANSPORTATION

WISCONSIN NORTHWOODS FREIGHT RAIL STUDY

June 2018

ACKNOWLEDGEMENTS

This report is a product of the combined efforts of the Wisconsin Department of Transportation (WisDOT) and the Northwoods Rail Transit Commission (NRTC). WisDOT is grateful to the NRTC members and the economic development professionals from Barron, Florence, Forest, Iron, Langlade, Lincoln, Marathon, Marinette, Oconto, Oneida, Price, Rusk and Vilas Counties for helping to develop and promote the business survey that serves as the foundation of this study. We also extend our thanks to the many businesses that chose to participate in the survey by providing us with their essential input and information for this research project. A list of businesses that were invited to participate in the survey is presented in Appendix 4.

Table of Contents

Figures

Tables

Appendices

APPENDIX 1: COUNTY FREIGHT PROFILES
APPENDIX 2: MEETING MINUTES
APPENDIX 3: NRTC MINING EDITORIAL
APPENDIX 4: LIST OF BUSINESSES SURVEYED

EXECUTIVE SUMMARY

The purpose of the Northwoods Freight Rail Study update was to reassess the need for rail service in the counties that make up the Northwoods Railroad Transit Commission (NRTC). This was accomplished through outreach with NRTC members, economic development officials, business owners, shipping companies, rail users and other interested stakeholders. This study builds upon the findings of the Wisconsin Northwoods Freight Railroad Market Study, published in September 2013. [1]

Since publication of the initial Northwoods Railroad Study, railroad service has continued to be an issue for northern Wisconsin businesses. Additional rail segments have been abandoned or are no longer served. Shipping rates and car availability are not what businesses hope they would be. Many companies that would prefer shipping by rail are currently shipping by truck.

The study area is composed of 13 Wisconsin counties: Barron, Florence, Forest, Iron Langlade, Lincoln, Marathon, Marinette, Oconto, Oneida, Price, Rusk and Vilas. Nine northern Michigan counties were also included in the study: Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Menominee, Marquette and Ontonagon. As of 2018, these 22 counties and their representatives are the members of the NRTC.

CHALLENGES FACING THE RAIL INDUSTRY IN THE NORTHWOODS

The current rail industry in the Northwoods faces great challenges. Offering rail service at a competitive price is challenging due to a number of factors:

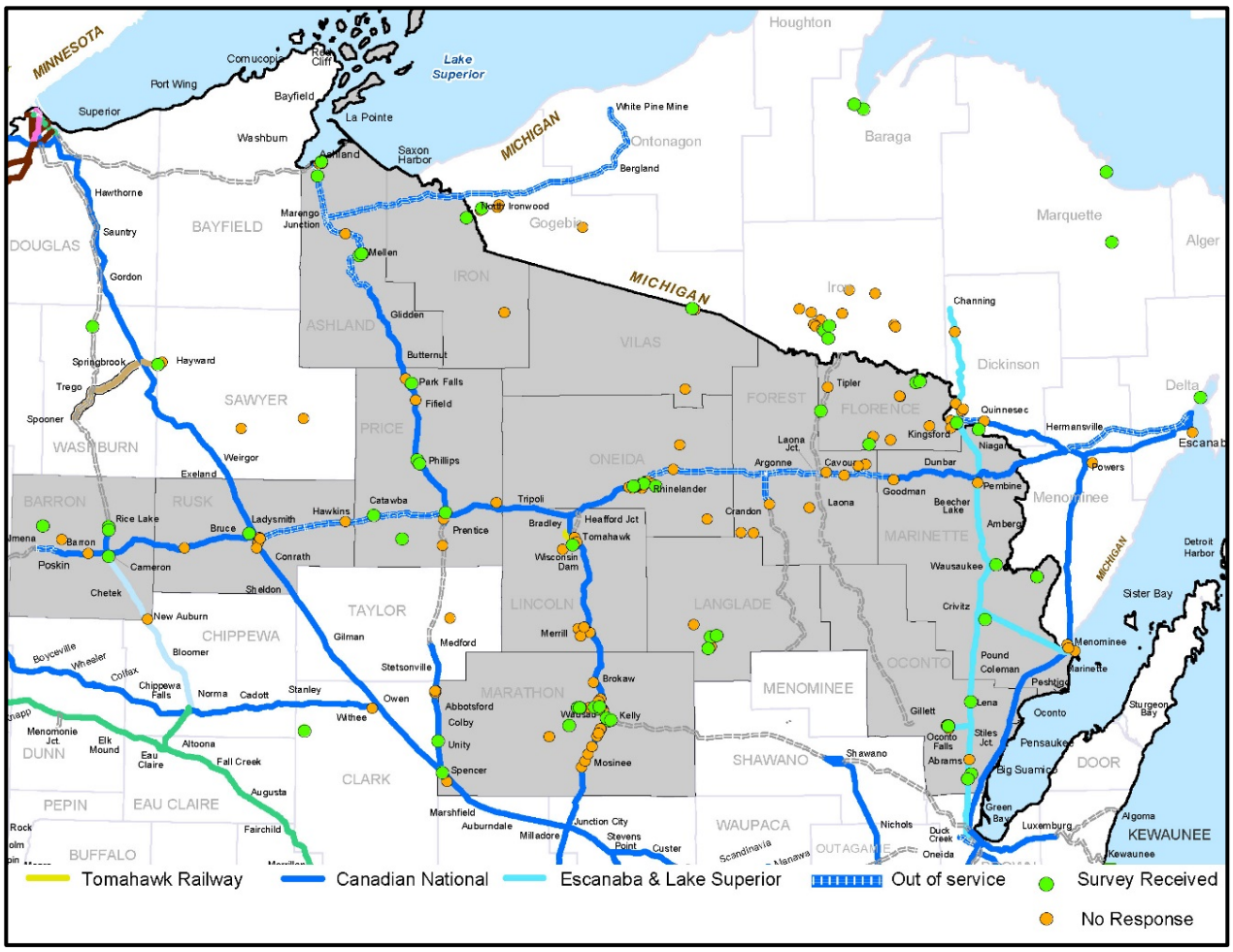
- number and location of customers
- frequency of service
- availability of rail cars
- lack of truck to rail transload facilities
- out-of-service rail lines causing indirect and longer rail routes

Commodities such as logs require several trains and switching points, which causes delay and increases the price to the customer. Although logs and wood products are northern Wisconsin's and northern Michigan's top commodities by volume, shipping logs is not always profitable for a railroad company.

SURVEY RESULTS

A major component of the study was a business survey to learn about the current transportation needs of Northwoods businesses. Questions asked about their physical business location, location(s) of customers, preferred methods of transportation to ship/receive goods, commodities they import/export, their volumes and reasons for using/not using rail service. The survey was mailed to 200 businesses in northern Wisconsin and upper Michigan.

[1] http://northwoodsrail.org/wp-content/uploads/2013/FINAL%20Northwoods%20report.pdf



The 2018 Northwoods Freight Rail Study encompasses 13 Wisconsin counties and nine Michigan counties. The Northwoods survey was sent to 200 businesses (shown as the green and orange circles). The orange dots represent businesses that were sent a survey but did not respond, while the green dots represent businesses that did respond.

Seventy-four businesses responded to the survey, for a total response rate of 37 percent. Takeaways from the surveys included the following:

- Logs, lumber, wood and pulp products were the top shipped and received commodity.
- More than 90 percent of businesses use hired truck carriers to ship their products.
- More than 95 percent of outbound freight is staying in the Midwest, United States.
- Lower shipping rates were the number one improvement needed for businesses to consider using rail.
- Unavailable rail service was the number one reason for not using rail service.
- More than 10.5 million tons of logs, lumber, wood and pulp products are shipped or received annually by 41 businesses.
- Trucks carry 85 percent of all logs, lumber, wood, and pulp products total weight for the surveyed businesses. Approximately 73 percent of all shipped and 99 percent of all received logs, lumber, wood, and pulp products are carried by truck.

- If the 41 businesses who currently truck logs, lumber, wood, and pulp products completely transitioned to rail, 105,218 additional rail cars could be added to the rail system annually in this commodity alone. This would remove 343,984 trucks annually from Wisconsin roads.
- If conditions improved, current rail users could ship an additional 950,000 tons of freight each year.

FINDINGS

As in 2013, the survey results indicated that there is potential for additional shipments to be made by rail under improved conditions. These conditions include lower shipping rates, infrastructure investment, more car availability and service.

Despite many challenges, the rail industry in the Northwoods counties continues to show potential. Escanaba and Lake Superior (ELS) saw their volumes increase by 16 percent in 2016, suggesting there is growing potential in the railroad industry in this region. CN reopened the seven-mile Ladysmith to Tony line and will serve a log landing at the Rusk County Industrial Park.

There have been discussions between Genesee & Wyoming (G&W) and CN regarding leasing lines to serve local demands. Lines of note include the following:

- Mosinee to Bradley
- Bradley to Prentice
- Prentice to Ladysmith (currently out of service)
- Prentice to Ashland
- Bradley to Rhinelander
- Rhinelander to Goodman (currently out of service)/Pembine

There is also continued interest by G&W and ELS railroads in leasing some of the CN routes to better serve local businesses, potentially reopening several out-of-service lines. The lack of businesses and products shipped on the rail line enables CN to justify the embargo of lines.

An investment in railroad infrastructure is needed in northern Wisconsin – the future of Northwoods businesses is in question without shortline rail options.

RECOMMENDATIONS AND NEXT STEPS

Below is a list of recommendations and next steps to consider:

- The Wisconsin Department of Transportation (WisDOT), Michigan Department of Transportation (MDOT), NRTC, Tri-County Rail Team, participating counties and Michigan Tech University should continue to share data and findings from their studies and research.
- Survey results from this study should be used to help identify travel lanes of specific origins and destinations that can assist with other efforts in the Great Lakes Forest Region. In January 2018, funds to conduct a $200,000 planning study for the Alger County-Upper Peninsula Forest Projects Rail Study project were approved. The study will investigate solutions for effective rail transport of the forest products industry in Michigan's Upper Peninsula.
- The Wisconsin Economic Development Commission (WEDC) and NRTC should combine efforts on business proposals for companies that want to ship or receive goods via rail. This would include identifying interested businesses, inventorying existing and potential volumes and

looking at potential sites for collaboration. The proposals could be presented to business development and real estate personnel at the operating railroad companies who can provide advice on availability of rail accessible sites and service potential.

- All stakeholders should promote WisDOT's grant and loan assistance programs[2] to businesses looking for help with rail-related infrastructure improvements. Programs include the Freight Railroad Infrastructure Improvement Program (FRIIP), Freight Railroad Preservation Program (FRPP), Transportation Economic Assistance (TEA) and the State Infrastructure Bank (SIB) Program.
- To maximize effective communication, NRTC, Tri-County Rail Team and all railroad transit commissions statewide should prioritize their issues and deliver a unified message to legislatures, businesses and railroads. These groups should work with local municipalities and businesses to create and carry out action plans to stabilize and grow railroad businesses.
- The NRTC should work with member counties and local businesses to establish a contacts list and facility location inventory for its rail users. The list would include specific contacts for each facility and provide the means for future group communication. The contact list could be used for businesses to discuss issues and concerns as well as a starting point for future studies.
- The NRTC should work with its rail users to inventory current facilities and commodity volumes and provide projections on changing needs over the next decade. Organized data of this type could help attract future rail service.
- Representatives of the operating railroads should continue to investigate possible options for shortline service and leasing/purchasing options.
- An inventory of deficient infrastructure (tracks and bridges that need repair) and cost estimates for repair would help determine the overall investment needed to reopen out-of-service lines.
- Additional discussion and study is needed to determine if transload/intermodal facilities would benefit NRTC member counties. Specifics would include the location, size and business types that could use the facility as well as who would pay for the land and fund the infrastructure.
- There is a need to improve relationships and trust between RTCs, County Economic Development Officials, local businesses and the railroads. Past efforts to work together have been challenging. Developing a platform for effective communication could benefit all stakeholders.
- The potential for mining exploration work in northern Michigan, including the Porcupine Mountains, Copperwood Mine, Back Forty Mine, Eagle Mine and the White Pine Mine should be examined. Potential destinations and routes to be used through Wisconsin should be identified.
- WisDOT will provide on-line mapping of all active and out-of-service rail lines and stations, including aerial imagery in the area. This information could be used by the NRTC and local businesses to identify potential transload facilities.
- Research is needed regarding the log car shortage before no cars are available. WisDOT will identify if there is a role for its loan programs. Log needs for the paper industry need to be confirmed and forecasted.

[2] http://wisconsindot.gov/Pages/doing-bus/local-gov/astnce-pgms/aid/default.aspx

CHAPTER 1: Introduction

During the 2011 Governor's Freight Summit, Wisconsin shippers and manufacturers expressed concerns about the lack of rail service in the northern part of the state. As a result, WisDOT completed a study called the Northwoods Freight Railroad Market Study (2013).

In 2017, due to continuing concerns, WisDOT was again tasked with studying rail service in northern Wisconsin. WisDOT coordinated with the Northwoods Railroad Transit Commission (NRTC) on this update. Identifying businesses with the potential to ship by rail, or to ship more by rail, will make the NRTC counties and their businesses more attractive to railroad companies that could provide service.

Major components of the study include:

- an overview of Wisconsin's current freight rail network
- a summary of the NRTC and its rail preservation efforts
- county profiles with economic conditions and commodity flow
- a business survey looking at shipping patterns
- meetings with the three operating railroads

The survey of businesses in northern Wisconsin and the Upper Peninsula of Michigan was designed to identify:

- businesses that currently ship by rail and those with the potential to ship by rail
- origins and destinations of commodities
- type and volume of products shipped to and from their facilities
- infrastructure improvements that could allow businesses to better utilize rail

Figure 1 shows the study area and the businesses that were surveyed. More than 200 businesses that were identified as shipping by rail or having an interest in shipping by rail were contacted. 74 businesses replied to the survey, a response rate of 37 percent. The results of the survey along with overall recommendations can be found in Chapters 6 and 7 of this study.

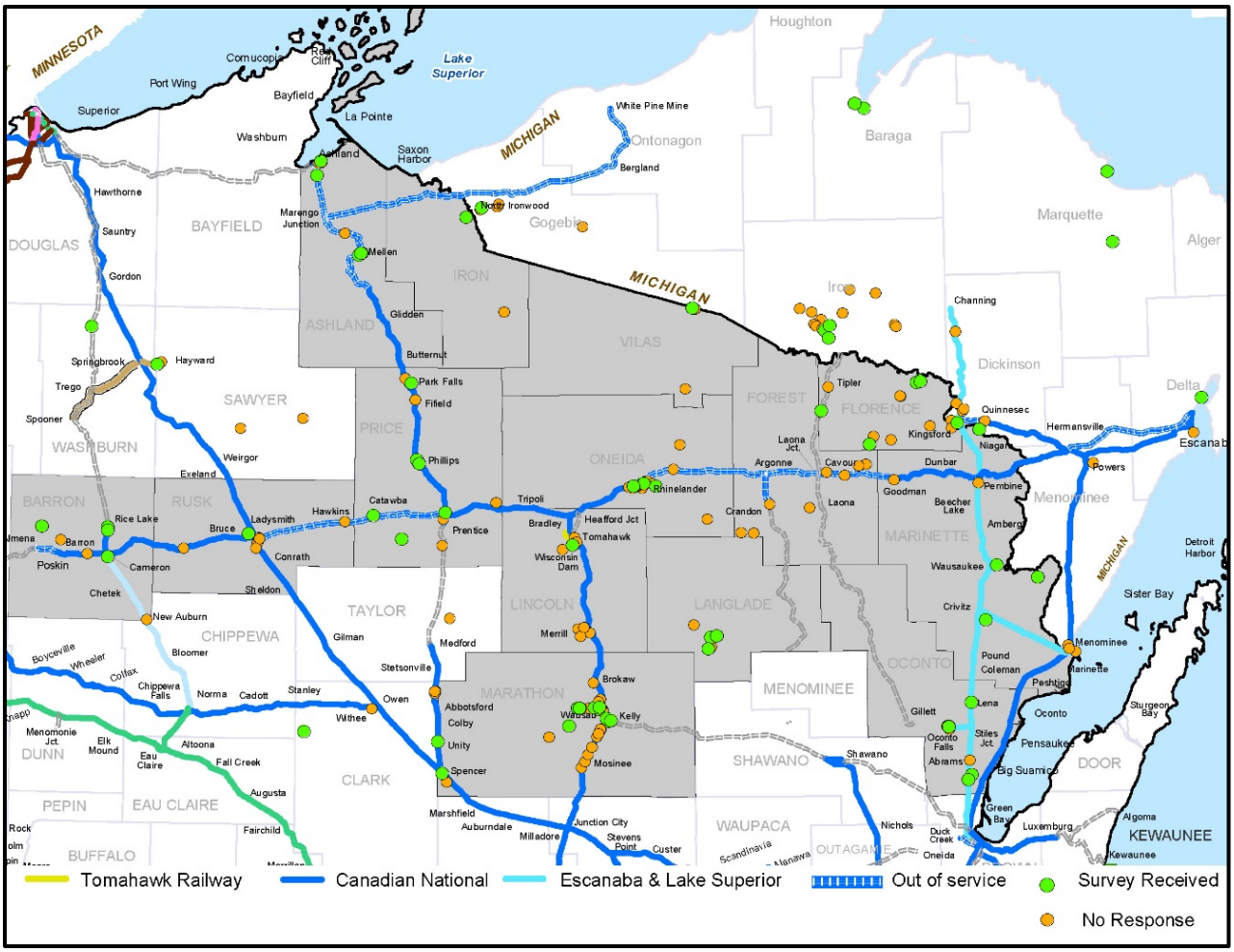


Figure 1: Surveyed Businesses

CHAPTER 2: Wisconsin's Current Freight Rail Network

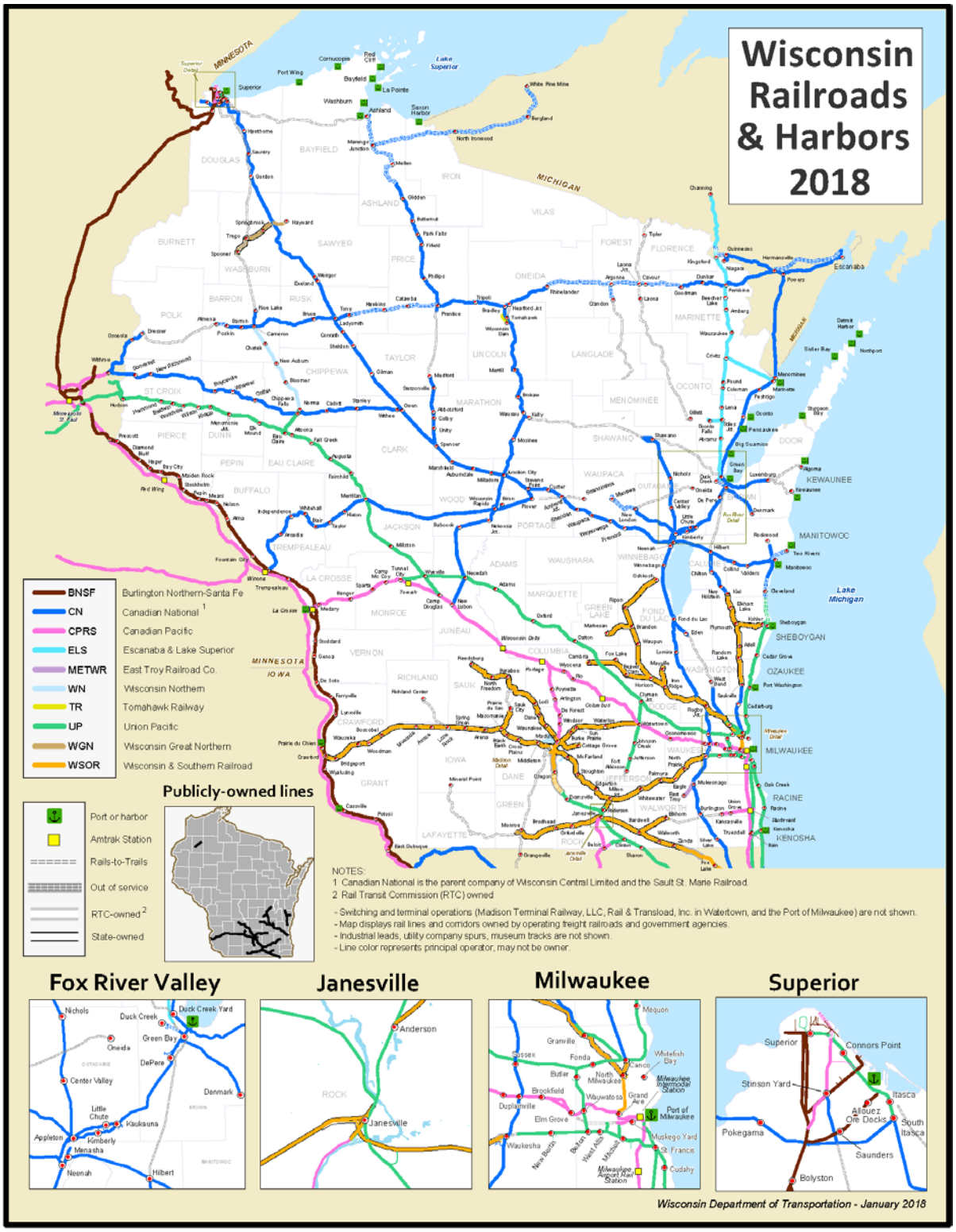


Figure 2: Wisconsin Railroads and Harbors Map - 2018

Currently Wisconsin's rail system (Figure 2) consists of a network of mainlines, branches, industrial leads, spurs, rail yards and terminals. Currently, active rail lines total more than 3,300 track miles and serve 59 of Wisconsin's 72 counties. This represents about two percent of the nation's rail network.

The state's rail network includes inactive lines still in private rail company ownership and former rail corridors that have been preserved for possible future transportation use. These corridors are protected under rail banking agreements or are currently being used as trails under the protections of the National Trails System Act.

STATEWIDE COMMODITY FLOW

Nearly 580 million tons of freight moved to, from, within or through Wisconsin in 2015. Rail transported 35.6 percent (206 million tons) of the total freight tonnage and 28 percent (more than $158 billion) of the total freight value. Table 1 presents the statewide modal breakdown.

Table 1: Statewide Freight Commodity Flow

Wisconsin Freight Shipments by Tonnage, 2015 (all modes)					
	Outbound	Inbound	Within State	Overhead	Total
Rail	29,423,497	63,337,833	3,710,230	109,825,402	206,296,962
Truck	97,500,185	74,935,325	127,698,328	45,910,778	346,044,616
Water	18,090,116	9,285,361	21,027	-	27,396,503
Air	52,700	55,625	9,795	-	118,120
Other	9,292	111,538	-	9,484	130,315
TOTAL	**145,075,790**	**147,725,682**	**131,439,380**	**155,745,664**	**579,986,517**

Source: IHS, Transearch freight database 2015

The major commodities by weight transported by rail in 2015 included coal, oil/gas, nonmetallic minerals (sand/gravel), and farm products. Table 2 and Table 3 provide the tonnage and value of statewide rail commodities. Table 4 through Table 7 display the commodity movements by inbound, outbound, internal, and overhead shipments.

Table 2: Top Wisconsin Commodities by Weight, Transported by Rail

Commodity	Tons	% of Total
Coal	38,566,916	18.7%
Crude Petroleum or Natural Gas	27,578,553	13.4%
Nonmetallic Minerals	24,629,607	11.9%
Chemicals or Allied Products	21,994,078	10.7%
Farm Products	17,638,671	8.6%
Metallic Ores	15,471,328	7.5%
Food or Kindred Products	12,097,501	5.9%
Miscellaneous Mixed Shipments	11,466,465	5.6%
Lumber or Wood Products	9,653,444	4.7%
Pulp, Paper or Allied Products	7,539,520	3.7%
All other	13,157,919	9.5%
Total	**206,296,962**	**100.0 %**

Source: IHS/Global Insight, 2015 Transearch database

Table 3: Top Wisconsin Commodities by Value, Transported by Rail

Commodity	Dollars	% of Total
Miscellaneous Mixed Shipments	$56,101,231,297	35.5%
Chemicals or Allied Products	$25,282,273,466	16.0%
Transportation Equipment	$23,247,223,776	14.7%
Pulp, Paper or Allied Products	$9,388,233,943	5.9%
Crude Petroleum or Natural Gas	$8,992,894,755	5.7%
Food or Kindred Products	$7,587,453,935	4.8%
Farm Products	$5,216,217,790	3.3%
Primary Metal Products	$3,841,768,591	2.4%
Petroleum or Coal Products	$3,167,899,145	2.0%
Lumber or Wood Products	$2,701,303,071	1.7%
All other	$12,477,366,158	7.9%
Total	**$158,003,865,927**	**100.0%**

Source: IHS/Global Insight, 2015 Transearch database

Table 4: Top Inbound Wisconsin Commodities by Weight, Transported by Rail

Commodity	Tons	% of Total
Coal	38,023,728	60.0%
Metallic Ores	9,847,714	15.5%
Chemicals or Allied Products	3,564,477	5.6%
Farm Products	2,768,725	4.4%
Pulp, Paper or Allied Products	2,700,176	4.3%
Lumber or Wood Products	1,853,960	2.9%
Food or Kindred Products	1,320,240	2.1%
Clay, Concrete, Glass or Stone	1,267,540	2.0%
Petroleum or Coal Products	828,881	1.3%
Waste or Scrap Materials	352,596	0.6%
All other	809,796	1.3%
Total	**63,337,833**	**100.0%**

Source: IHS/Global Insight, 2015 Transearch database

Table 5: Top Outbound Wisconsin Commodities by Weight, Transported by Rail

Commodity	Tons	% of Total
Nonmetallic Minerals	20,443,138	69.5%
Farm Products	2,662,378	9.0%
Chemicals or Allied Products	1,642,409	5.6%
Food or Kindred Products	1,024,512	3.5%
Clay, Concrete, Glass or Stone	1,004,824	3.4%
Pulp, Paper or Allied Products	928,260	3.2%
Petroleum or Coal Products	594,832	2.0%
Waste or Scrap Materials	468,996	1.6%
Lumber or Wood Products	341,320	1.2%
Miscellaneous Mixed Shipments	186,000	0.6%
All other	126,828	0.4%
Total	**29,423,497**	**100.0%**

Source: IHS/Global Insight, 2015 Transearch database

Table 6: Top Commodities by Weight, Transported by Rail within Wisconsin

Commodity	Tons	% of Total
Nonmetallic Minerals	1,059,985	28.6%
Farm Products	1,040,753	28.1%
Lumber or Wood Products	611,268	16.5%
Pulp, Paper or Allied Products	325,480	8.8%
Chemicals or Allied Products	235,468	6.3%
Waste or Scrap Materials	141,540	3.8%
Clay, Concrete, Glass or Stone	113,520	3.1%
Food or Kindred Products	82,400	2.2%
Transportation Equipment	50,160	1.4%
Petroleum or Coal Products	47,920	1.3%
Fabricated Metal Products	1,736	0.0%
Total	**3,710,230**	**100.0%**

Source: IHS/Global Insight, 2015 Transearch database

Table 7: Top Commodities by Weight, Transported by Rail through Wisconsin (Overhead)

Commodity	Tons	% of Total
Crude Petroleum or Natural Gas	27,578,329	25.1%
Chemicals or Allied Products	16,551,724	15.1%
Farm Products	11,166,815	10.2%
Miscellaneous Mixed Shipments	11,095,785	10.1%
Food or Kindred Products	9,670,349	8.8%
Lumber or Wood Products	6,846,896	6.2%
Metallic Ores	5,623,614	5.1%
Petroleum or Coal Products	4,273,122	3.9%
Pulp, Paper or Allied Products	3,585,604	3.3%
Clay, Concrete, Glass or Stone	3,100,116	2.8%
All other	10,333,048	9.4%
Total	**109,825,402**	**100.0%**

Source: IHS/Global Insight, 2015 Transearch database

CHANGING ECONOMY IMPACTS TRANSPORTATION INFRASTRUCTURE

County roads, state and federal highways and freight rail systems provide the means to transport raw and processed goods throughout Wisconsin and to other states and countries. Changes in the economy and increased demand for certain commodities translate into changing demands on the state's transportation infrastructure network.

Northern Wisconsin's economy relies on tourism, forestry, paper industry, manufacturing and nonmetallic mining. Over the past decade, frac sand mining has received increased attention in Wisconsin due to the role that the state's high-quality white northern silica sand plays in the extraction of natural gas and oil from the nation's shale reserves.

Hydraulic fracturing ("fracking") extracts natural gas or petroleum from deposits in sedimentary rock known as oil shale. The process pumps a pressurized mixture of sand, water and chemicals deep into the underground shale formations, fracturing them. The resulting fissures are held open by the sand particles, so the oil or gas can flow up the well. The procedure requires sand that has a high quartz (silica) content and well-rounded grains. Wisconsin's mines produce some of the highest quality frac sand in the country.

Even though sand and gravel have been extracted in Wisconsin in the past, the increase in demand for frac sand increased the demand for freight infrastructure in the central and western counties. Rail service and rail car availability have played a critical role in the most recent development of the frac sand sector. For each well to be fracked, approximately 60 carloads of frac sand are required to prop open the fissures. Demand for the covered hoppers used to transport frac sand peaked between 2011 and 2013, with 70,000 of these cars in service in early 2014; more than a third of those cars had been delivered in the previous five years.[3] Wisconsin's growth in frac sand production was aided by the presence of freight rail lines in the sand-producing areas of the region. By contrast, Minnesota's lack of sufficient rail capacity was noted as a limitation on their ability to develop the sector.[4]

Two major rail projects in Northwestern Wisconsin attest to the importance of frac sand production. In 2012, Canadian National completed a $35 million rehabilitation of 40 miles of rail between Ladysmith and Poskin (west of Barron) to serve Superior Silica Sands.[5] This allowed for cost-effective transportation of frac sand to shale deposits in North Dakota, Texas and Pennsylvania. According to a report by financial consulting firm Raymond James (2012), it was estimated that sand producers saved as much as $10 per ton shipping by rail.[6] Subsequently, another processor, Source Energy Services, opened a facility along that corridor in Weyerhaeuser. By the close of 2013, CN had reported a 300 percent market growth in frac sand over a five-year period, with 50,000 carloads moved that year.[7]

In addition to CN's investments to serve the frac sand sector, in 2014, Union Pacific invested $30 million to improve and expand the rail yard in Altoona, compelled by additional traffic generated by frac sand.[8]

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[3] https://www.chase.com/content/dam/chasecom/en/commercial-bank/documents/equipment-insight-vol9-sept2014.pdf

[4] https://www.minneapolisfed.org/~/media/files/pubs/fedgaz/12-07/sand_surge_fedgazette_july_2012.pdf

[5] https://www.cn.ca/en/news/2012/08/media_news_invest_wisconsin_frac_20120813

[6] Marshall J. Adkins and James M. Rollyson. Hi Crush Partners LP, Launching on High Quality, Low Cost Frac Sand and Producer Hi Crush with MO2 (September 14, 2012): 3. Quoted in Environment & Energy Publishing, accessed at http://www.eenews.net/stories/1059982951

[7] https://www.cn.ca/en/news/2013/12/another-state-of-the-art-frac-sand-producer-locates-on-cns-wisconsin-network

[8] http://www.weau.com/home/headlines/Railroad-improvements-coming-to-Altoona-section-of-track--256640061.html

As quickly as the market for frac sand seemed to grow, the market contracted beginning in 2014. Many factors were involved, but the primary reason was a sharp decline in oil prices. Oversupply of oil led to an eventual drop in demand for production rigs at the three most productive domestic shale deposits: Bakken (centered in western North Dakota), Eagle Ford (arcing across southern and eastern Texas) and Permian (across west Texas and southeastern New Mexico). These three areas accounted for 89 percent of shale oil production in the United States.

For a period in 2015 and 2016, the rapid drop in active rigs led to a sharp drop in sand production, with layoffs at several Wisconsin sand producers and closing of operations that were not cost-effective. The covered hopper cars that had been in great demand just months earlier were suddenly parked for storage – between 25,000 and 40,000 cars were sitting idle in the fourth quarter of 2016. But then, with the rebound in oil prices to $57 per barrel, mine operations and the rail car market both perked up by April 2017, following increases in oil production and rig counts.[9] A potential factor favorable to the recovery of the frac sand proppant sector was the reported increase in the volume of sand used in each well drilled: as much as three times previous standards.[10]

Also indicative of a potential rise in demand for frac sand, the Energy Information Administration forecasts that crude oil production in the United States will reach a record high in 2018, led by a large increase in production from the Permian Basin. Further, the production per well for new wells (as charted on a months-of-operation timeline) shows that peak and sustained production have both risen each year from 2014 to 2017, as operators apply changing techniques to maximize output per well.[11]

In Wisconsin, sand production resumed at two mines in late 2016 after a year-long hiatus; however, the announcement of the reopenings noted the sand products would be sold to other customers besides hydraulic fracturing.[12] Estimates for the market demand for frac sand for 2017 ranged from 45 to 55 million tons, down from the peak demand of 60 million tons in 2014.[13] As of mid-2017, the Wisconsin DNR estimated that 92 facilities were actively serving the frac sand mining industry, while another 32 were inactive.[14]

OTHER CHANGING BUSINESS SECTORS IN NORTHERN WISCONSIN

Recent plant closings and lay-offs in the paper and packaging industry diminished the need for rail service in northern Wisconsin. Once the dominant industry in many parts of the state, paper-making has undergone attrition over the past few decades, as foreign competition and reduced demand for printed goods brought many mills to a standstill. Since 2000, 19 paper mills have closed in Wisconsin. Between 2005 and 2015, one-third of Wisconsin's paper mill jobs were lost.[15] Many of these mills produced coated paper that is used in magazines and other glossy printing applications. However, most of the remaining mills may not be as vulnerable to closings. Of the mills remaining, 90 percent of their products are tissue, packaging and specialty papers; these markets are identified as stable or growing.[16]

[9] Railway Age, May 2017. https://issuu.com/railwayage/docs/may_railway_age
[10] https://www.wiscontext.org/energy-industry-weighing-how-bullish-be-wisconsin-frac-sand-2017
[11] https://www.eia.gov/todayinenergy/detail.php?id=34212
[12] https://www.wpr.org/two-wisconsin-frac-sand-mines-resume-operation
[13] https://www.wiscontext.org/energy-industry-weighing-how-bullish-be-wisconsin-frac-sand-2017
[14] http://dnr.wi.gov/topic/Mines/ISMMap.html
[15] https://www.marketplace.org/2017/09/06/world/paper-mill-jobs-meant-comfortable-lifestyle-Wisconsin-before-globalization
[16] https://www.wpr.org/demand-paper-mills-decline-while-market-tissue-sanitary-paper-expected-rise

TRUCK TO RAIL DIVERSION POTENTIAL – FREIGHT CHOICE MODELING

To estimate the potential amount of freight that could move by rail rather than truck, to or from the study area, WisDOT modeled its 2015 commodity flow data. The distance of freight trips and the weight and value of the commodities provided the means for estimates. Although the study area includes shorter railroad travel distances between its origins and destinations compared with national railroad travel distances, this analysis attempts to look at the potential for additional railroad shipments by applying five classification models to analyze the current freight mode choice patterns between truck and rail. The methodology is applied to a group of commodities that are moved by both truck and rail; however, the methodology can also be applied to a specific commodity.

Based on the models, the truck shipments that the models predicted as rail shipments range from 1,630,000 to 14,500,000 tons (0.6 to 5.4 percent of the Wisconsin truck shipments), or 74,000 to 763,000 truckloads (0.6 to 6.0 percent of the Wisconsin truck shipments), or $0.61 to $5.56 billion in value (0.6 to 5.5 percent of the Wisconsin truck shipments). The false positives (shipments moving by truck but predicted to move by rail) range from 96,000 to 1,302,000 tons (0.5 to 6.8 percent of the Northwoods truck shipments), 5,000 to 54,000 truckloads (0.5 to 6.0 percent of the Northwoods truck shipments) and $12.4 to $280 million in value (0.2 to 4.2 percent of the Northwoods truck shipments). This indicates that the most optimistic of the models shows the potential for an additional 1.3 million tons to be shipped by rail, rather than truck, on an annual basis.

METHODOLOGY

Freight mode choice is an area transportation planners and policymakers have vigorously researched. Discrete choice models have been popular among planners because of their predictive strength and interpretability for policy analyses. Recent studies have also considered several other models and measured their predictive strength, such as tree-structured models, neural networks, etc. In this study, four classification models were applied: 1) recursive partitioning and regression tree (rpart) model, 2) logit model, 3) linear discriminant analysis (LDA) and 4) random forest model. The statistical software 'R' was used to conduct the study.

Factors affecting the freight mode choice vary widely. Common factors include logistic, modal, commodity and firm characteristics. For this analysis, commodity and firm characteristics were analyzed: ton-mile and value per ton of shipments. In general, rail is considered more efficient than truck for shipping bulky commodities over a long distance. Also, commodities that are fragile and high value are not commonly moved by rail, primarily due to commodity and modal characteristics.[17] Thus, we expect ton-mile and value-per-ton variables to have a correlation with the freight mode choice.

Each model has different statistical assumptions, which puts limitations on a model from capturing complete freight shipment characteristics. In addition, depending on the nature of available data, one model might be more appropriate over the other models. Comparing the results of multiple models may provide a broader picture of freight mode choice patterns.

DATA

The Transearch database was used to analyze the freight mode choice between truck and rail in Wisconsin. The database is updated annually and draws from public as well as private sources and

[17] Federal Highway Administration, The Role of the National Highway System Connectors: Industry Context and Issues

surveys. Transearch provides commodity flows at a four-digit level Standard Transportation Commodity Codes (STCC) at a county level. The database contains more than 340 commodity types, four shipping modes and modal and firm characteristic variables,[18] which allows analysts to conduct a wide range of transportation-related analyses. Table 8 shows a summary of goods moved by truck and rail in Wisconsin.

Table 8: Commodity Flows in Wisconsin

	Truck	Rail
Shipment records	917,337	2,880
Tons	300,133,838	96,471,560
Loads	15,018,416	947,193
Value	$ 283,854,729,719	$ 23,237,213,265

The data is further filtered by commodities that are moved by both truck and rail. After filtration, 78 commodities at a four-digit level STCC remained. After removing empty hauling shipments, the final dataset used for the analysis is summarized in Table 9.

Table 9: Commodities Moved by Truck and Rail in Wisconsin and the Northwoods region

	Wisconsin		Northwoods RTC	
	Truck	Rail	Truck	Rail
Shipment records	282,484	2,858	32,392	203
Tons	183,624,984	86,531,142	19,176,147	5,337,581
Loads	8,885,691	848,551	887,944	54,610
Value	$ 84,358,536,415	$ 22,431,495,550	$ 6,723,301,318	$ 969,025,386

EMPIRICAL RESULTS

Common statistical performance measures of a classification model are accuracy and sensitivity. Accuracy measures the percentage of all correct predictions, and sensitivity measures the proportion of correctly predicted rail observations to all rail observations. Table 10 summarizes the accuracy and sensitivity of the models.

Table 10: Accuracy and Sensitivity of the Models

	RPART	LOGIT	LDA	Random Forest
Accuracy (%)	99.3	99.2	99.0	99.9
Sensitivity (%)	42.0	37.3	4.7	89.4

[18] IHS MarkIt, Transearch. Viewed Oct 9, 2017. https://www.ihs.com/products/transearch-freight-transportation-research.html

The accuracy ranges from 99.0 to 99.9 percent, and the sensitivity ranges from 4.7 to 89.4 percent. The random forest model performs best in classifying modes in terms of accuracy and precision. The prediction made by a model that differs from the actual mode is comprised of false positives and false negatives. A false positive is a truck shipment that a model predicted as rail shipment. A false negative is a rail shipment that a model predicted as truck shipment. Table 11 and Table 12 summarize false positives in Wisconsin and the Northwoods region.

Table 11: Truck Flow and False Positives in Wisconsin (000s)

	Tons	Loads	Value
Wisconsin	268,265	12,730	$101,410,546
RPART	6,370 (2.4%)	281 (2.2%)	$828,918 (0.8%)
LOGIT	14,500 (5.4%)	763 (6.0%)	$5,559,666 (5.5%)
LDA	3,354 (1.3%)	139 (1.1%)	$785,706 (0.8%)
Random Forest	1,630 (0.6%)	74 (0.6%)	$611,116 (0.6%)

Table 12: Truck Flow and False Positives in the Northwoods region (000s)

	Ton	Load (Truck)	Value
Northwoods	19,176	888	$6,723,301
RPART	96 (0.5%)	5 (0.5%)	$19,568 (0.3%)
LOGIT	603 (3.1%)	31 (3.5%)	$280,195 (4.2%)
LDA	1,302 (6.8%)	54 (6.0%)	$12,353 (0.2%)
Random Forest	105 (0.5%)	5 (0.5%)	$43,350 (0.6%)

CONCLUSION

Transearch statewide freight shipment data was used in conjunction with four classification models to identify freight mode choice patterns. Performance measures were used to estimate the predictive strength of the models based on ton-miles and value per ton. The random forest model had the highest predictive strength in terms of accuracy and precision. Although the models do not account for all the important variables affecting freight mode choice, firm and commodity characteristics variables captured well, in terms of accuracy, the patterns in Wisconsin. In addition, false positives, which are truck shipments that a model predicted as rail shipments, were identified. Based on ton-miles and value per ton variables, false positives range from 1,630,000 to 14,500,000 tons (74,000 to 763,000 truckloads) in Wisconsin, and 96,000 to 1,302,000 tons (5,000 to 54,000 truckloads) in the Northwoods region. Based on the results, not all shipments were moved by the expected mode, and further examination of these shipments can help identify other factors influencing freight mode choice and limitations of the current freight transportation system in Wisconsin.

CHAPTER 3: Rail Transit Commissions and Rail Preservation

Wisconsin's efforts to preserve freight rail service began with the passage of an amendment to the state constitution in 1992 that allowed state dollars to be used to purchase rail infrastructure. Rail Transit Commissions (RTCs) have been created to help preserve rail service or the potential for rail service and to influence policies on the future use of rail corridors if rail service is discontinued.

Grant agreements between WisDOT and the RTCs determine how the lines can be used. Much of the responsibility for operations and management is transferred to the RTCs that, in turn, contract with private railroads for service.

Wisconsin has approximately 718 miles of publically supported rail corridors that are jointly owned by the state and seven RTCs. Currently, 624 of these miles are publically owned and operated primarily by Wisconsin and Southern Railroad (WSOR). Wisconsin also has more than 700 miles of rail corridors preserved in the Rails to Trails Program. See Table 13 for a list of RTCs and their member counties and Figure 3 for a map of their locations.

RTCs are staffed by their member municipalities and, in some cases, by regional planning commission staff. Their respective level of activity and scope of efforts vary significantly. The commissions continue to be important partners with WisDOT in preserving rail service. In this partnership arrangement, WisDOT provides resources, information, staff support, general oversight and funding. The commissions provide project management, matching funds and coordination with shippers, freight rail operators and local governments.

Table 13: Wisconsin Rail Transit Commissions

Name	Created	WI Counties	Purpose
East Wisconsin Counties Rail Consortium	1970s	Winnebago Dodge Green Lake Washington Fond du Lac	Manages 150 miles of track in cooperation with Wisconsin & Southern Railroad (WSOR)
Pecatonica Rail Transit Commission	1978	Rock Iowa Green Lafayette	Manages 34 miles of track between Monroe and Janesville, as well as a recreational trail between Monroe and Mineral Point
South Central Wisconsin Rail Transit Commission	1978	Dane Green	Manages 59 miles of rail corridor that is currently a recreational trail
Wisconsin River Rail Transit Commission	1980	Crawford Dane Grant Iowa Rock Sauk Walworth Waukesha	Largest and most active commission manages 254 miles of track; contracts with WSOR to provide service over its network

Name	Created	WI Counties	Purpose
Pink Lady Rail Transit Commission	1988	Sauk	Created to work with Union Pacific Railroad, communities, and shippers to maintain area rail service
Washburn County Rail Transit Commission	1998	Washburn	Manages 18 miles of rail line and currently has an operating agreement with the Wisconsin Great Northern Railroad
Northwoods Rail Transit Commission	2012	Ashland Florence Forest Iron Langlade Lincoln Marathon Marinette Oconto Oneida Price Rusk Vilas	Organized to negotiate on behalf of its counties and take actions designed to improve local rail service for the communities of northern Wisconsin and the Upper Peninsula of Michigan

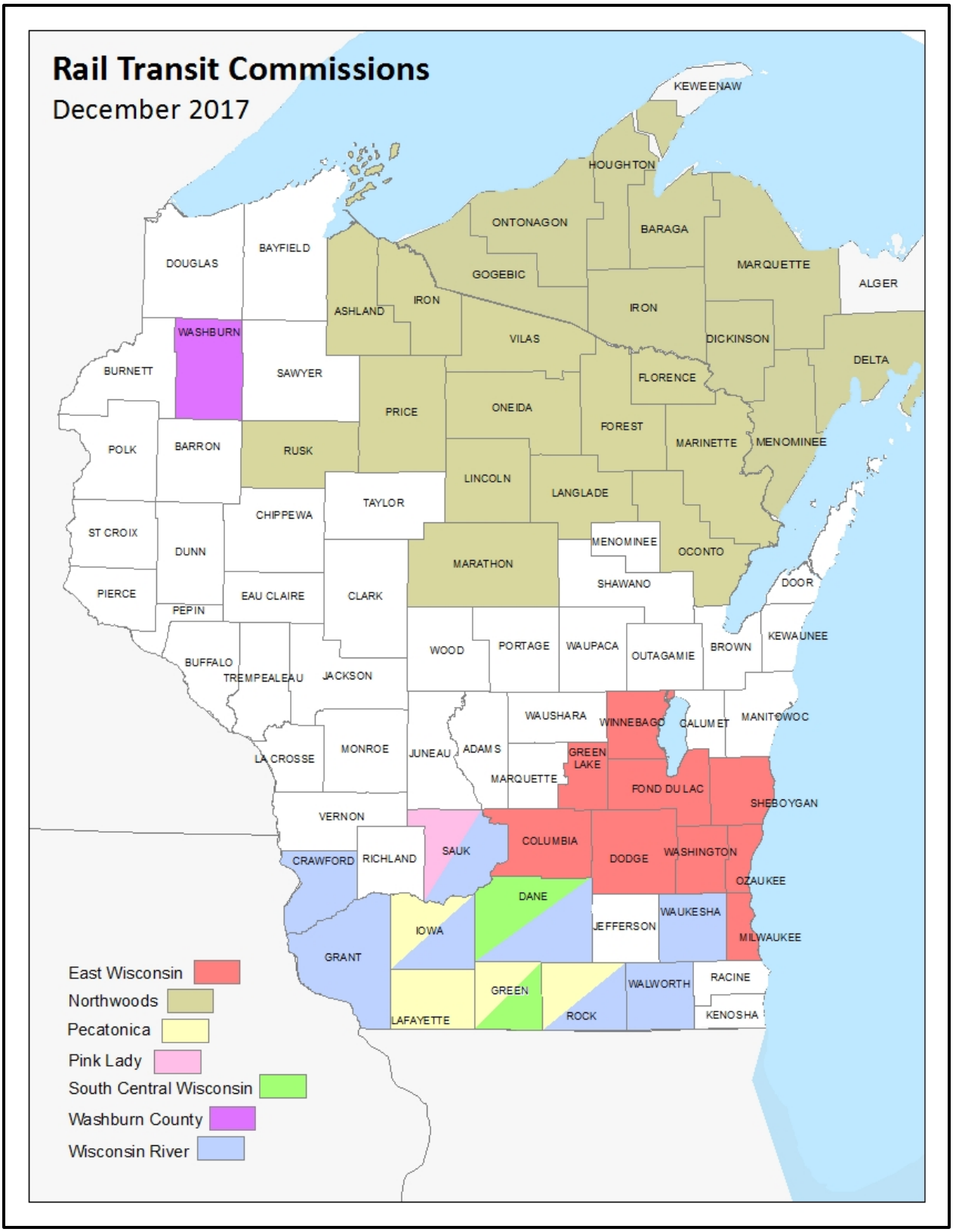

Figure 3: Wisconsin Rail Transit Commissions-2017

NORTHWOODS RAIL TRANSIT COMMISSION

The Northwoods Rail Transit Commission (NRTC) was officially recognized by the State of Wisconsin in May of 2012. The purpose of the NRTC is to work with the operating railroads and area businesses to build and maintain quality rail service. In the spring of 2013, the NRTC consisted of 10 northern Wisconsin counties that had banded together "to sustain and enhance safe, reliable and efficient rail service critical to the businesses, communities and economies in northern Wisconsin and the Upper Peninsula of Michigan." Recognizing the importance of formally allowing input from counties in Michigan's Upper Peninsula, the NRTC members approved revising the articles of incorporation in 2013. This revision recognized the statutory authority from each state that permitted the NRTC. It thereby allowed for development of a formal interstate cooperation agreement, which permits counties in Michigan to formally join the group and participate[19]. State approval of this agreement was received in late 2013[20].

The negotiations that led to the interstate cooperation agreement not only brought in the new counties from Michigan, but also encouraged other Wisconsin counties to join. The counties added to the NRTC in 2013 included the Wisconsin counties of Oconto and Marathon and the Michigan counties of Ontonagon, Iron and Dickinson. The counties added to the NRTC in 2014 included the Wisconsin county of Iron and the Michigan counties of Gogebic, Houghton and Menominee. Three counties in Michigan were added to the NRTC in 2015: Baraga, Delta and Marquette[21].

The NRTC is composed of two representatives from each member county; they serve staggered two-year terms. The commission has an elected Chair, Vice-Chair and Secretary/Treasurer that serve one-year terms. The current representatives are:

Wisconsin Representative(s)

- Ashland County: Gary Kabasa and Dale Kupczyk (Vice Chair)
- Florence County: Wendy Gehlhoff and Fran Modschiedler
- Forest County: Don Dehart and Ron Karl
- Iron County: Joe Pinardi and Kelly Klein
- Langlade County: Dave Solin and Angie Close
- Lincoln County: Kevin Koth and Derek Woellner
- Marathon County: Alan Christensen (Secretary/Treasurer) and David Nutting
- Marinette County: Mike Cassidy and Tricia Grebin
- Oconto County: Paul Ehrfurth and Gary Frank
- Oneida County: Stacey Johnson and Bill Liebert
- Price County: TBD
- Rusk County: Andy Albarado (Chair)
- Vilas County: Jay Verhulst

[19] http://northwoodsrail.org/wp-content/uploads/2013/Minutes/NRTC_Notes_Apr_2013_revised.pdf
[20] http://northwoodsrail.org/wp-content/uploads/2014/02/NRTC_Notes_Nov_2013.pdf
[21] http://northwoodsrail.org/minutes/

Michigan Representative(s)

- Baraga County: Gale Eilola and Bill Menge
- Delta County: David Rivard and Peter VanSteen
- Dickinson County: Barb Kramer and Joe Stevens
- Gogebic County: Joe Bonovetz and Tom Laabs
- Houghton County: Al Koskela and Tom Tikkanen
- Iron County: TBD
- Marquette County: Scott Erbisch and Steve Schenden
- Menominee County: Steve Gromala
- Ontonagon County: Carl Nykanen

WISCONSIN RAIL ASSISTANCE PROGRAMS

WisDOT currently has three local government rail assistance programs: Freight Railroad Infrastructure Improvement Program (FRIIP), Freight Railroad Preservation Program (FRPP) and Transportation Economic Assistance (TEA) Program. The FRIIP offers loans to enable the state to encourage a broader array of improvements to the rail system, particularly on privately owned lines. It also provides funding for other rail-related projects, such as loading and transload facilities. The FRPP provides grants to local units of government, industries and railroads for preserving essential rail lines and rehabilitating them following purchase. A third WisDOT funding source, the Transportation Economic Assistance (TEA) program, also assists with rail-related projects. The TEA program provides grants to governing bodies, private businesses and consortiums for up to 50 percent of the costs of road, rail, harbor and airport projects that help attract employers to Wisconsin or encourage business and industry to remain and expand in the state.

Additional information regarding WisDOT rail assistance programs can be found on the WisDOT website or in the Wisconsin Rail Plan 2030.

CHAPTER 4: Northern Wisconsin Study Area

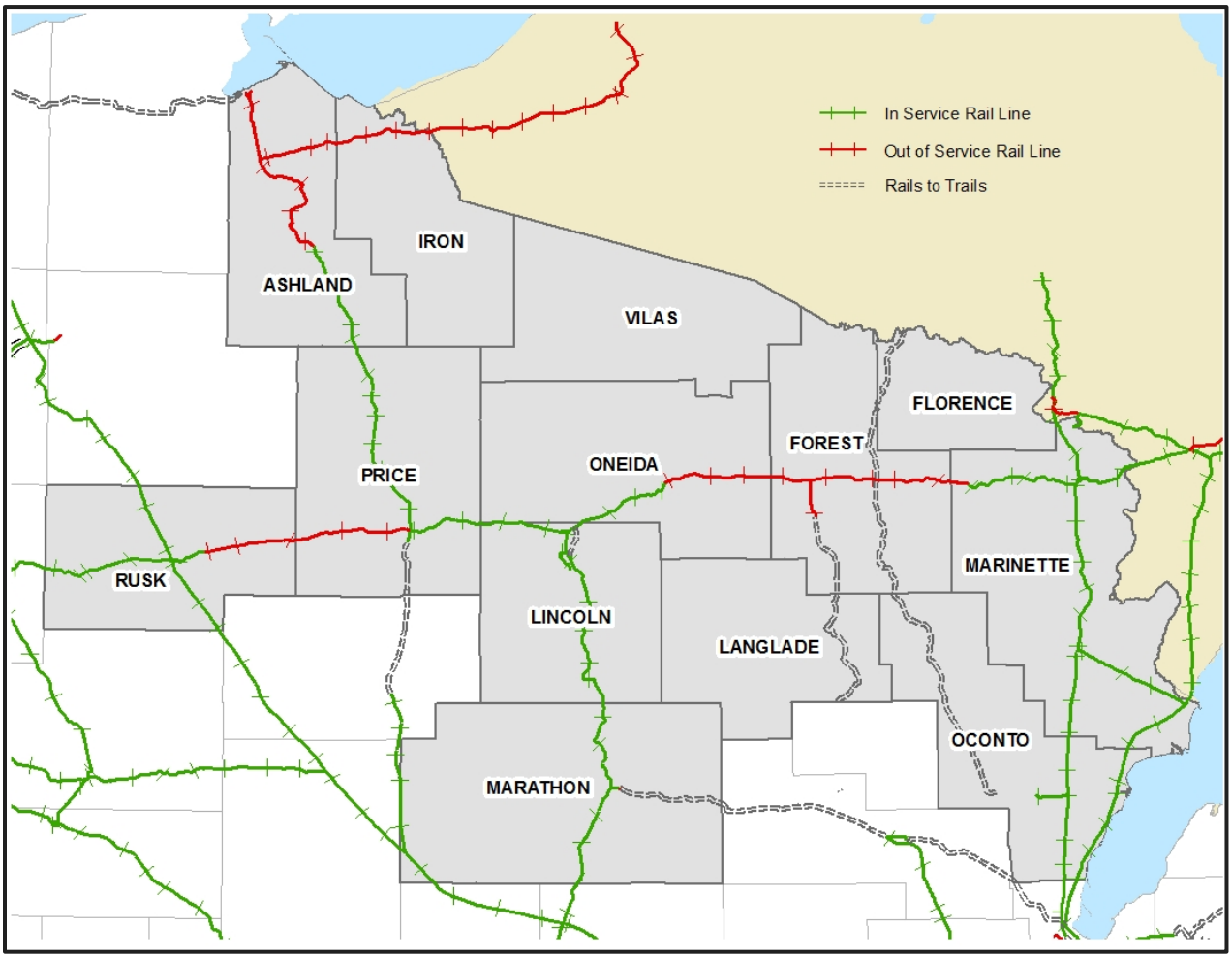

Figure 4: Northwoods Wisconsin Study Area

Nearly 350,000 people live in the 13 counties that make up the NRTC study area. This is a 9.4 percent increase in population since 1970, but a 0.8 percent decrease since 1990. The median household income for these counties was $43,876 in 2011-2015, below Wisconsin's median household income of $52,701 for the same time period.[22] There are more than 10,000 establishments in the study area and more than 650 manufacturing facilities.[23]

These 13 counties represent diverse populations and industries. While northern Wisconsin may be known for tourism, forestry and mining, the region's economy is also made up of a variety of manufacturing-related industries that rely on an efficient freight infrastructure system to transport their commodities.

[22] U.S Census Bureau; "State & County Quickfacts"; generated by Liat Bonneville; <http://quickfacts.census.gov> (16 August 2013).
[23] Wisconsin Department of Workforce Development, 2012.

RAILROAD HISTORY

Railroads have been an integral part of Wisconsin's transportation system and economy since 1847. Wisconsin's railroad network peaked around 1920 at about 7,600 miles. From 1920 to 1929, abandonments exceeded new construction, and this pattern continued and accelerated for the remainder of the Twentieth Century.

The history of rail service throughout northern Wisconsin has included operations that serve customers within the state as well as overhead transportation (serving customers with both origins and destinations outside of the state). Virtually all the development and construction of the rail corridors currently in existence occurred in the 45-year period from the end of the Civil War (1865) through 1910.

Most of the corridors across the region were north-south, including the current dominant corridor for overhead traffic – the CN route between Duluth/Superior and Chicago. While timber and ore shipments were critical for the north-south lines, the region's development was catalyzed and sustained by a west-east overhead corridor – the initial Soo Line corridor between Minneapolis/Saint Paul, Minnesota and Sault Ste. Marie, Michigan/Ontario.

In 1987, the Soo Line divested itself of some of its low-density lines, selling them to Wisconsin Central Limited (WCL). Pulp and paper products, lumber and wood products, and clay/glass/stone composed more than half of its commodity volume at its inception[24]. A 1991 study noted that 60 percent of WCL car loadings were related to the paper industry[25].

In the early 1990s, WCL went through a phase of expansion. The company purchased Soo Line's Ladysmith – Superior and C&NW's Cameron – Superior lines, giving WCL a corridor from Superior to Chicago. WCL also acquired the former C&NW line from Green Bay to Ishpeming, Michigan via Marinette and Escanaba.

Through the 1990s, CN became increasingly reliant on WCL as a bridge line between Superior and Chicago, under a 1996 partnership between CN, WCL and CSX for a transcontinental intermodal shipping corridor[26]. The link became even more crucial in 1998, when CN acquired Illinois Central, providing CN with direct access to ports along the Gulf of Mexico[27]. In 2001, WCL was acquired by CN for $800 million, plus assumption of $400 million in WCL debt[28].

Subsequently, WCL/CN began paring back the system. The largest piece to go through formal Surface Transportation Board (STB) abandonment was from Shawano to Crandon; however, WCL/CN also withdrew service from Prentice west to Ladysmith (prior to 2008)[29] and from Rhinelander east to Goodman (between 2008 and 2012). A segment that had its service discontinued between Ladysmith

[24] Statistics of Regional and Local Railroads, Economic and Finance Dept., Association of American Railroads, 1988.

[25] Ralph O. Gunderson and J. Scott McDonald, Wisconsin Railroads: Success in the Heartland; UW-Oshkosh, Sept. 1991.

[26] "CSX Joins the 'Superior Connection;'"Railway Age, May 1, 1996, summary accessed at http://www.highbeam.com/doc/1G1-18313829.html

[27] Stephen Franklin, "Illinois Central Goes To Canadian National Railway," Chicago Tribune, February 11, 1998 http://articles.chicagotribune.com/1998-02-11/business/9802110374_1_railroad-mergers-canadian-national-railway- canadian-firm

[28] "Canadian Railway to Buy Wisconsin Central," New York Times, January 31, 2001, http://www.nytimes.com/2001/01/31/business/company-news-canadian-railway-to-buy-wisconsin-central.html

[29] Wisconsin Dept. of Transportation, Draft State Rail Plan 2030, Chapter 3: http://www.dot.wisconsin.gov/projects/state/docs/railplan-chapter3.pdf

and Poskin was rebuilt in 2012 as the opening of a new frac sand processing facility generated sufficient revenue to restore service[30].

Since publication of the initial Northwoods Market Study in 2013, CN petitioned to abandon the segment from Argonne to Crandon in 2014 and announced discontinuation of service between Rhinelander and Goodman in 2017. Following flooding in 2016 that caused substantial bridge damage, CN embargoed the line from Morse to Ashland in mid-2016, and officially discontinued service on that segment in 2017.

For additional detail on the history of railroads in Wisconsin, see the 2013 Wisconsin Northwoods Freight Rail Market Study or the Wisconsin Rail Plan 2030.

RAIL SHIPMENTS TODAY

Inbound Freight

In 2015, more than 77 percent of the freight that was shipped to the study area was transported by truck. More than 10 million tons were shipped by truck (valued at nearly $9 billion), while about three million tons (valued at $480 million) moved to the area by rail. The top commodities shipped to the study area by truck were nonmetallic minerals, farm products, gas/oil, lumber or wood products and food or kindred products. Most of these shipments came from the Wisconsin counties of Chippewa and Brown as well as from the neighboring states of Michigan, Minnesota, Iowa and Illinois.

The top commodities shipped to the study area by rail were coal, pulp or paper products, lumber or wood products, chemicals or allied products and food or kindred products. Most products were delivered from Brown County, Wisconsin and Wyoming, Alberta, and Indiana.

Table 14 shows the inbound carload history for each NRTC county from 2011-2015, along with a comparison to 2007. The source of this data is IHS Transearch databases.

[30] "CN to invest $35 million in Wisconsin to serve Superior Silica Sands frac sand plant and other producers in future," Canadian National web site, August 13, 2012, accessed at http://www.cn.ca/en/news/2012/08/media_news_invest_wisconsin_frac_20120813

Table 14: Inbound Carload History (2011-2015)

	2007	2011	2012	2013	2014	2015
Ashland	80	-	40	120	-	-
Florence	-	-	-		-	-
Forest	160	-	-		-	-
Iron	-	-	-		-	-
Langlade	-	-	-		-	-
Lincoln	280	2,044	1,776	2,040	2,196	1,044
Marathon	22,834	31,484	28,644	29,584	28,164	22,484
Marinette	4,296	1,956	1,320	1,360	1,640	1,440
Oconto	160	80	40	40	120	-
Oneida	1,000	796	520	720	560	1,680
Price	560	840	800	1,448	880	1,000
Rusk	572	40	-	120	188	80
Vilas	-	-	-	-	-	
Total	**29,942**	**37,240**	**33,140**	**35,432**	**33,748**	**27,728**

Outbound Freight

In 2015, 87 percent of the commodities that were shipped out of the study area were shipped by truck. The remainder was sent by rail or water. Nearly 19 million tons of freight (valued at $11 billion) originated in counties within the study area.

More than 16 million tons of goods were shipped from the study area by truck (worth around $10.5 billion). Some of the top commodities were nonmetallic minerals, farm products, lumber or wood products and concrete. Common destinations include Brown and Outagamie Counties in Wisconsin as well as locations in Illinois, Minnesota and Michigan.

More than 2.3 million tons of commodities were shipped from the study area by rail (valued at more than $493 million). Top commodities shipped by rail are the same as those moved by truck. Major destinations for these rail shipments were Wood and Outagamie Counties in Wisconsin as well as Ontario and Ohio.

Table 15 shows the outbound carload history for each NRTC county from 2011-2015, along with a comparison to 2007. The source of this data are IHS Transearch databases.

Table 15: Outbound Carload History (2011-2015)

	2007	2011	2012	2013	2014	2015
Ashland	1,040	1,240	1,028	1,088	960	840
Florence	-	-	-	-	-	-
Forest	80	-	-	-	-	-
Iron	40	-	-	-	-	-
Langlade	-	-	-	-	-	-
Lincoln	6,760	6,000	5,900	5,208	5,320	6,040
Marathon	9,520	7,640	7,200	6,920	5,840	5,680
Marinette	7,240	4,920	5,560	5,320	4,440	3,480
Oconto	648	540	860	836	-	40
Oneida	120	320	-	240	120	-
Price	2,720	2,400	2,800	4,120	2,080	1,600
Rusk	80	680	360	760	8,172	9,482
Vilas	-	-	-	-	-	-
Total	**28,248**	**23,740**	**25,720**	**26,505**	**28,946**	**27,162**

COUNTY FREIGHT PROFILES

Appendix 2 of this report provides economic and freight activity analyses for each Wisconsin county in the NRTC study area. Each county profile contains information about major industry and employment activity, freight flow and lists of major shippers and receivers of freight. The data describes the county's freight activity in relation to other counties or regions in and out of the study area and includes information about major commodities, major state trading partners and the type of transportation that was used.

FEDERAL RAILROAD ADMINISTRATION FREIGHT STATIONS

"Freight station" is a term used by the Federal Railroad Administration (FRA) to describe a location where commodities are transferred from one mode of transportation to another (usually from rail to truck or truck to rail). Freight stations can be found as a layer on the FRA's web-based railroad map, which is available to the public.[31]

Freight stations may include various types of freight handling configurations such as rail spurs, yards, sidings, terminals and intermodal (container) facilities. These freight stations were established on or near the rail corridor to provide rail service for area businesses.

[31] http://fragis.fra.dot.gov/GISFRASafety/

Identifying the locations and freight handling capabilities of the freight stations in the study area could assist in improving or restoring rail service along segments of the railroad line. Details about each freight station can be found in the 2013 Wisconsin Freight Railroad Market Study. The locations of the facilities can be found online in the FRA web map.

CHAPTER 5: Surveying Northwoods Businesses

SURVEY METHODOLOGY

The Wisconsin Northwoods Freight Rail Market Study published in September of 2013 surveyed 1,094 businesses that appeared to have the potential to use rail, based on the types of commodities they handled. The recipients were located primarily in the 10 counties that made up the NRTC at the time: Ashland, Florence, Forest, Langlade, Lincoln, Marinette, Oneida, Price, Rusk and Vilas. Of the 1,094 businesses surveyed, a total of 190 surveys were returned to WisDOT, a response rate of 17.3 percent. The results of the survey indicated that 39 of the businesses that returned the survey currently use rail service and 43 businesses did not use rail, but would be interested if service and infrastructure needs were met. These 82 businesses were carried over from the 2013 study as the starting point for the 2017 update.

The 2017 study was expanded to include Iron, Oconto, and Marathon Counties – NRTC members added after the 2013 study was completed. NRTC counties in Michigan were also given the opportunity to identify businesses to receive the survey. The goal was to generate an additional 68 businesses to achieve a mailing list of a minimum of 150 total businesses. Through the research provided by the study team, NRTC and economic officials, the 2017 survey generated an additional 128 businesses to be surveyed, and the survey was mailed to 210 businesses. From this list, 10 businesses were either closed or addresses were returned to sender, leaving 200 businesses that received the survey by mail.

In November 2017, business surveys were distributed via email and postal mail, and businesses had 60 days to respond to the survey. Two weeks before the survey closed, economic development officials were sent a survey reminder and a list of received responses per county to date. Each EDC was asked to forward the reminder to their businesses contacts encouraging survey participation.

In addition to the 200 businesses that received a mailed survey, another eight businesses participated by filling out the online survey. In total, 74 businesses responded to the survey (26 by mail and 48 online), which is a response rate of 36 percent. This response rate was more than double the 17.3 percent response in 2013. The 2013 study collected data from 39 rail shippers, and the 2017 study collected data from 27 additional rail users, expanding the list of known rail shippers to 66.

THE SURVEY

The Northwoods Freight Rail survey was mailed and emailed to 200 businesses in northern Wisconsin and the upper peninsula of Michigan. Respondents could take the survey online through a Survey Monkey weblink or complete the hardcopy survey and return it by mail in prepaid envelopes. Seventy-four surveys were completed. Responses by county are summarized in Tables 16 and 17.

Table 16: Surveys Sent and Received in Wisconsin By County

WI Counties	Surveys Sent	Survey Responses Received	Survey Response
Ashland	10	6	60%
Barron	8	4	50%
Clark	5	1	20%
Florence	12	4	33%
Forest	9	1	11%
Iron	2	2	100%
Langlade	5	3	60%
Lincoln	8	2	25%
Manitowoc	1	1	100%
Marathon	37	13	35%
Marinette	6	4	67%
Oconto	13	4	31%
Oneida	16	4	25%
Polk	1	0	0%
Price	12	6	50%
Rusk	7	1	17%
Sawyer	6	1	17%
Taylor	1	0	0%
Vilas	3	1	33%
Washburn	1	1	100%
Winnebago	1	1	100%
Wood	1	1	100%
Total	**61**	**165**	**37%**

Table 17: Survey Responses Sent and Received in Michigan by County

Michigan Counties	Surveys Sent	Survey Responses Received	Survey Response
Alger	1	0	0%
Baraga	2	2	100%
Delta	2	1	50%
Dickinson	7	2	29%
Gogebic	4	1	25%
Iron	16	5	31%
Marquette	1	2	50%
Menominee	3	0	0%
Total	**13**	**35**	**37%**

The survey asked respondents to answer either 15 or 19 questions depending on the answer to question 11: do you currently ship or receive freight by rail?

- If businesses shipped or received freight by rail, the survey continued to questions 12 to 19.
- If businesses did not ship or receive freight by rail, the survey jumped to questions 20 to 24.

Therefore, the maximum number of responses for questions 1 to 11 was 74. Thirty-five respondents answered "yes" to question 11, so 35 was the maximum number of responses for questions 12 to 19. Thirty-seven respondents answered "no" to question 11, so 37 was the maximum number of responses for questions 20 to 24. Two respondents did not answer question 11 so their survey ended at that point, and no further data was included for questions 12 to 24.

SUMMARY OF SURVEY QUESTIONS

Below is a detailed summary of the survey question responses.

Question 1: Tell us about yourself.

In this question, company name, address, respondent name and email address were requested. Of the 74 responding businesses, 61 were from Wisconsin and 13 were from northern Michigan. Additionally, 47 respondents provided a contact name and 45 provided business contact email addresses.

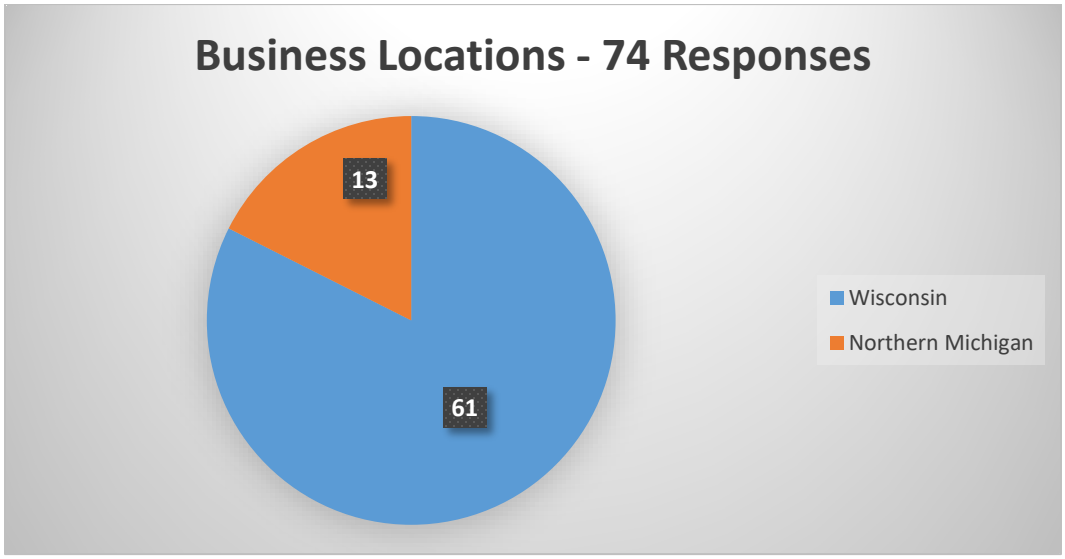

Figure 5: Location of Businesses Surveyed by State

Question 2: Do you ship and/or receive freight?

Of the 70 businesses that responded to this question, 61 indicated their business currently ships freight in some capacity. Sixty businesses responded to the question about receiving freight, and a total of 46 businesses received freight by either car, truck, rail, air or water.

Figure 6: Businesses that Ship and/or Receive Freight

Outbound Freight Questions

Questions 3 to 6 deal with outbound freight activities.

Question 3: If you ship freight, what products or raw materials do you ship out? What was the approximate volume of products or raw materials shipped out in calendar year 2016?

Of the 60 businesses that responded to this question, the top four products or raw materials that businesses shipped out were logs, lumber, wood products and pulp (35); metal/steel/aluminum (9); food products (5); and plastics products (3). Other materials shipped with less than three responses included aftermarket and miscellaneous parts, animal bedding, concrete, crushed rock, fertilizer, gasoline/fuel oil/propane, lubricants, pellets, stone products, veneer and weighing equipment.

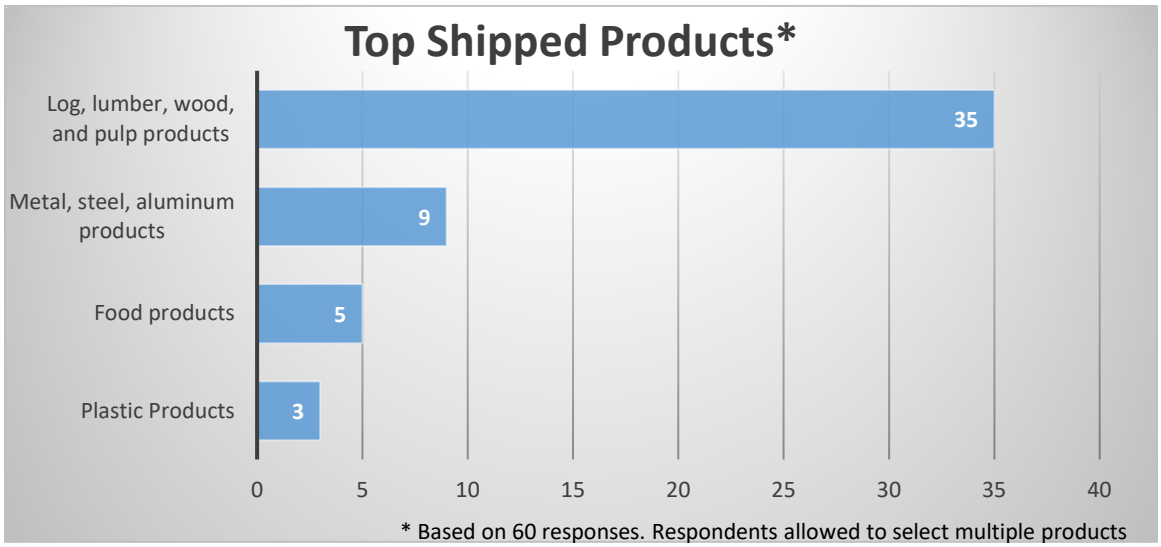

Figure 7: Top Products Shipped from Surveyed Businesses

Logs, Lumber, Wood Products and Pulp: Because respondents' answers varied in units (i.e., cords, rail cars, board feet, tons, cords and pounds) conversions were made to standardize the data.[32] For this report, units are presented in tons, which represent 2,000 pounds. Of the 35 responding businesses that ship logs, lumber, wood products or pulp, volumes ranged between three and 1,253,000 tons annually, with an average of 158,814 tons shipped per respondent business. Five of these businesses were located in Northern Michigan, and the ranges of volume shipped by these businesses were between 111,813 and 665,109 tons, with an average of 262,385 tons per year.

Graphic depicts one full cord of wood, which is equivalent to 2.1 tons of weight

Cumulatively, these 35 businesses ship over 5.5 million tons of logs, lumber, wood products and pulp, which equates to approximately 213,788 semi-trucks annually (586 semi-trucks daily) or 65,394 rail cars per year (180 rail cars daily). Using these figures as representative samples, the average of the respondents would load 6,109 semi-trucks annually or 1,869 rail cars per year with these commodities.

Metal, Steel and Aluminum Products: The type of freight businesses shipped included mining parts, trailers, electrical panels, heavy equipment machinery and machinery parts, metal ends, fabricated steel, scrap aluminum, metal shavings and bolts. Because of the wide variety of equipment and size shipped in this category, it was not feasible to convert all data to tons. Of the nine respondents, four provided answers in a measurement of weight. These businesses provided ranges between 1,000 and 12,800 tons per year with an average of 6,459 tons. Using these figures as representative samples, the average of the respondents would load 248 semi-trucks annually or 76 rail cars per year with these commodities.

Food Products: The type of freight businesses shipped included cheese, potatoes, beans, oats, wheat, peanut products and dry milk powder. Of the five responding businesses that ship food products, volumes varied greatly between 1,200 and 135,000 tons, with an average of 48,524 tons. These businesses were all located in Wisconsin. Using these figures as representative samples, the average of the respondents would load 1,867 semi-trucks annually or 571 rail cars per year with these commodities[33].

Plastic Products: The type of plastic products shipped included plastic bags and film. Of the seven responding businesses that ship plastic products, volumes varied between 5,000 and 24,299 tons, with an average of 11,433 tons. These businesses were all located in Wisconsin. Using these figures as

[32] https://www.reference.com/science/convert-board-feet-tons-4d6b36f0b4f03598 Converting board feet into tons – 0.0023172750963701 * x board-feet equals weight in tons;

https://www.revenue.nh.gov/mun-prop/property/documents/timber-conversion-formulas.pdf Converting cords to tons – 1 cord = 2.1 tons;

https://www.revenue.nh.gov/mun-prop/property/documents/timber-conversion-formulas.pdf Converting cords of chips to tons – 1 cord = 2.6 tons;

A full cord of wood assumes that the wood is arranged in a way that all the individual pieces are stacked (aligned, parallel, touching, and compact) and fit within the following dimensions: 4 feet high x 4 feet wide x 8 feet long.;

https://www.csx.com/index.cfm/customers/resources/equipment/railroad-equipment/ A 50' standard boxcar can carry between 70-100 tons, depending on pulp or wood. For sake of this conversion, 85 tons per car is assumed.

[33] http://business.tenntom.org/why-use-the-waterway/shipping-comparisons/ It is assumed that one semi-truck can transport 26 tons of products per load

representative samples the average of the respondents would load 440 semi-trucks annually or 135 rail cars per year with these commodities.

Question 4: Of your outbound freight's total volume, what percentage is shipped by each mode?

Fifty-seven businesses (90.5 percent) indicated that they currently use a hired truck carrier to haul their products. Twenty-eight (44.4 percent) use their own trucks, while 14 businesses (22.2 percent) use direct railroad loadings. Six respondents use some combination of water and/or air to ship their products/freight.

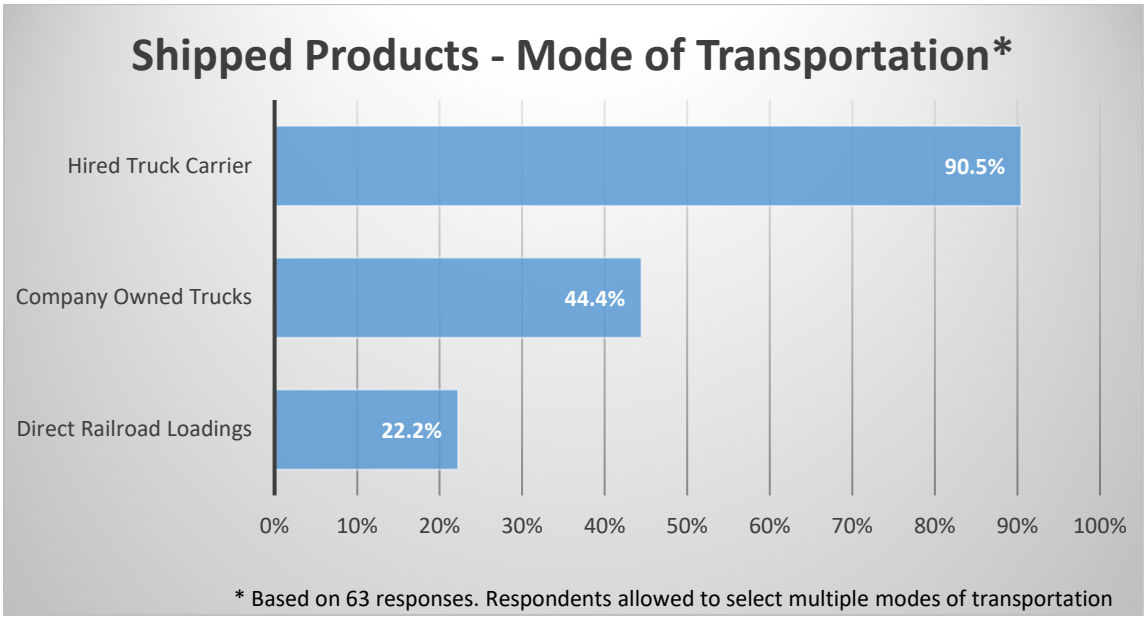

Figure 8: Mode of Transportation used to Export Products

Twenty-three businesses[34] use a combination of truck and rail exchange facilities. The following locations were identified:

Table 18: Truck and Rail Exchange Locations

Truck and Rail Exchange Location	Number of Businesses
Chicago, Illinois	6
Minneapolis, Minnesota	2
Chippewa Falls, Wisconsin	2
Crivitz, Wisconsin	2
Oshkosh, Wisconsin	2
Pembine, Wisconsin	1
Mellen, Wisconsin	1
Sobieski, Wisconsin	1
Spring Brook, Wisconsin	1
Beecher, Wisconsin	1
Mass City, Michigan	1

[34] Businesses can identify more than one facility

Truck and Rail Exchange Location	Number of Businesses
Sidnaw, Michigan	1
Iron River, Michigan	1
Marinette, Wisconsin	1
Ladysmith, Wisconsin	1
Prentice, Wisconsin	1
Wausau, Wisconsin	1
Waukesha, Wisconsin	1
Chetek, Wisconsin	1

Question 5: Where does your outbound freight go to in Wisconsin?

All 72 Wisconsin counties received freight from the study area. Of the 50 businesses that responded to this question, Marathon County was the top destination (38 percent of businesses). Milwaukee (34 percent), Wood (32 percent), Outagamie and Price Counties (30 percent) were the next top destinations. Waushara and Ozaukee Counties were the lowest destinations in Wisconsin (10 percent of businesses).

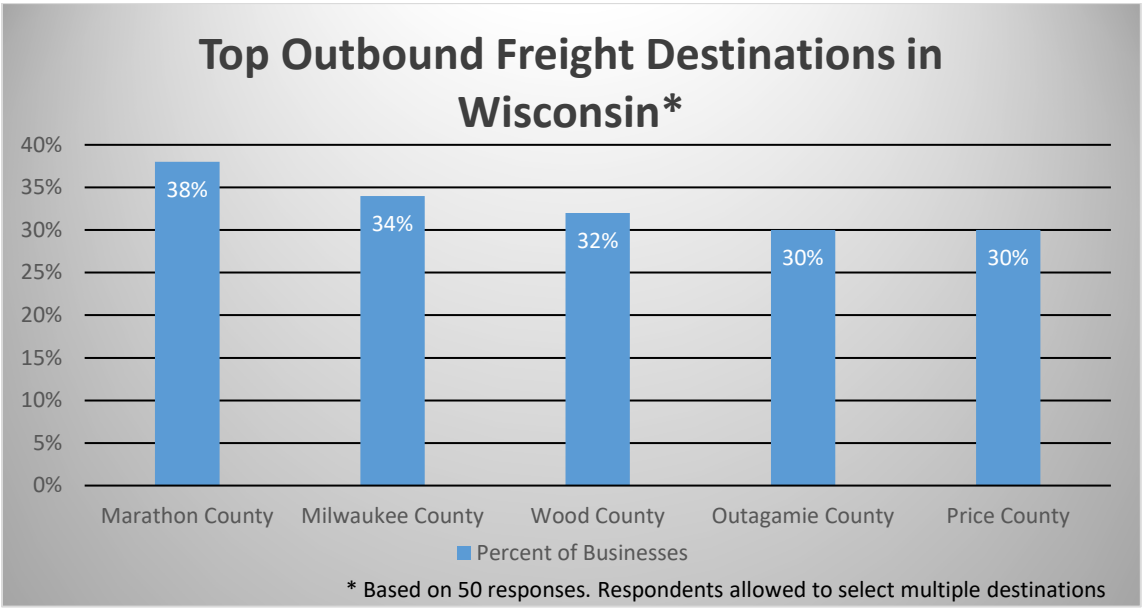

Figure 9: Top Outbound Freight Destination in Wisconsin

Question 6: Where does your outbound freight go in North America?

Of the 65 respondents, 62 (95.4 percent) indicated the United States - Midwest was a destination of their goods/products. This includes the states of Wisconsin, Minnesota, Iowa, Kansas, Missouri, Illinois, Indiana, Kentucky, Ohio, Michigan. The United States – Northeast received 30 responses (46.9 percent) and included Maine, New Hampshire, Vermont, New York, Massachusetts, Connecticut, Rhode Island, Pennsylvania, New Jersey, Maryland, West Virginia and Virginia. The United States - South received 24 responses (37.5 percent) and included Arkansas, Mississippi, and Louisiana. All United States regions had at least 19 responses with the Mountain Central region as the lowest; Montana, North Dakota, South Dakota, Wyoming, Colorado, and Nebraska.

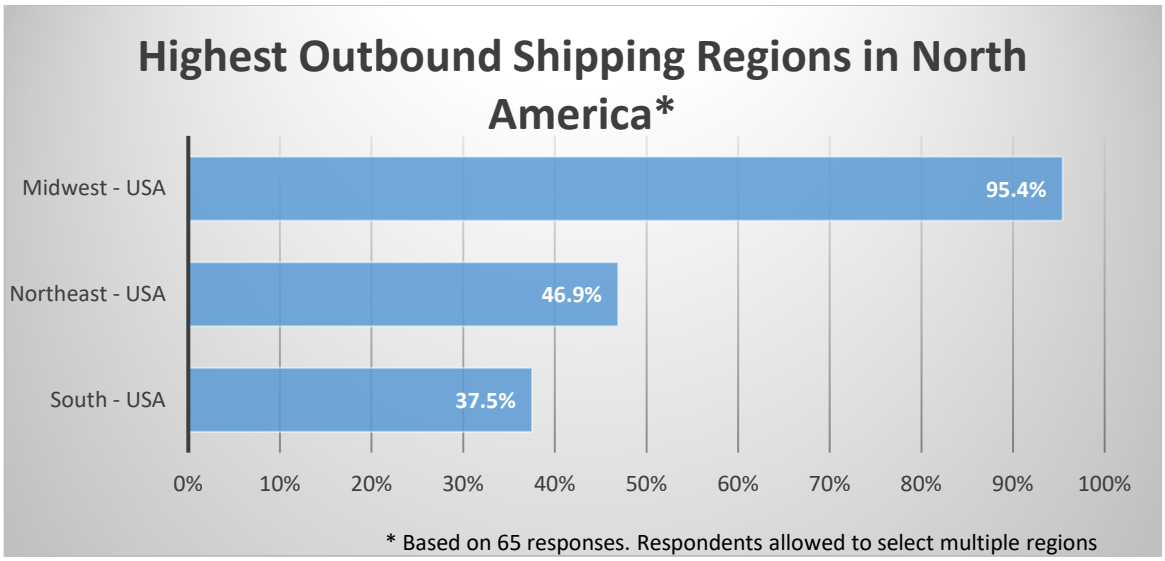

Figure 10: Highest Outbound Shipping Regions in North America

Outbound freight is being sent internationally, within North America. Almost 25 percent of the businesses ship to Eastern Canada, Western Canada and/or Mexico.

Inbound Freight Questions

Questions 7 to 10 covered inbound freight activities.

Question 7: If you receive freight, what products or raw materials are shipped in? What was the approximate volume of products or raw materials shipped to you in calendar year 2016?

Of the 50 responding businesses, the top three products or raw materials that businesses received were logs, lumber, wood products, pulp (24), metal/steel/aluminum (12) and plastics products (4). Other materials shipped with less than three responses included bulk liquids, fertilizer, food products, gasoline/fuel oil/propane, glass and lubricants.

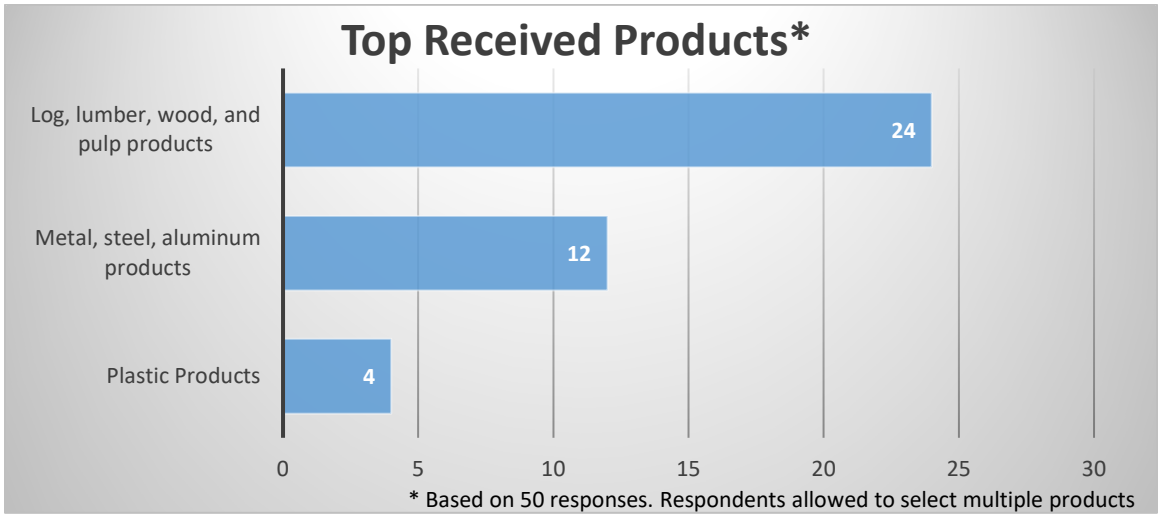

Figure 11: Top Received Products from Businesses Surveyed

Logs, Lumber, Wood Products and Pulp: Of the 24 businesses that receive logs, lumber, wood products and/or pulp, volumes ranged between 60 and 1,853,820 tons, with an average of 183,815. Cumulatively, these 24 businesses receive 4,962,368 million tons of logs, lumber, wood products and pulp, which equates to approximately 58,381 rail cars per year or 160 rail cars per day. Using these figures as representative samples, the average respondent would load 7,953 semi-trucks annually or 2,433 rail cars per year with these commodities.

Logs, lumber, wood products, and pulp are the number one shipped and received rail commodity in Wisconsin and Northern Michigan

Metal, Steel and Aluminum Products: The type of freight that businesses received included aluminum, electrical parts, engine and machine parts, metal and steel. Because of the wide variety of equipment and size shipped in this category, it was not feasible to convert all data to tons. Of the twelve respondents, eight provided answers in a measurement of weight. These businesses provided ranges between five and 52,000 tons per year with an average of 14,416 tons. Using these figures as representative samples, the average respondent would load 555 semi-trucks annually or 170 rail cars per year with these commodities.

Plastic Products: The type of plastic products shipped in included plastic resin pellets and membranes, packaging material, bags and film. Of the four responding businesses that ship plastic products, volumes varied between 30 and 27,478 tons, with an average of 8,152 tons. Using these figures as representative samples, the average respondent would load 314 semi-trucks annually or 96 rail cars per year with these commodities.

Question 8: Of your inbound freight's total volume, what percentage is shipped by each mode?

Of the 50 businesses that responded to the survey, 46 (92 percent) indicated that they currently use a hired truck carrier to haul their inbound products. Seventeen (34 percent) use their own trucks, while 12 businesses (24 percent) use direct railroad loadings. Five respondents use some combination of water and/or air to ship their products/freight. Eight businesses[35] use a combination of truck and rail exchange facilities. The following facilities were identified:

[35] Businesses can identify more than once facility, and some businesses did not identify a rail exchange facility

Table 19: Truck and Rail Exchange Locations

Truck and Rail Exchange Location	Number of Businesses
Chicago, Illinois	2
Auburndale, Wisconsin	1
Merrill, Wisconsin	1
Mukwonago, Wisconsin	1
Wausau, Wisconsin	1
Kalamazoo, Michigan	1
Iron River, Michigan	1
Minneapolis, Minnesota	1
Various	1

Question 9: Where does your inbound freight come from in Wisconsin?

Businesses in all 72 Wisconsin counties shipped freight to the study area. Of the 40 responding businesses, 47.5 percent of businesses indicated they had incoming freight from Marathon County. Other counties rating the highest for incoming freight included Milwaukee and Brown (32.5 percent) and Ashland, Florence, Lincoln, Price and Vilas (30 percent). Northwoods businesses had the lowest levels of inbound freight from Walworth County (5 percent) and Dane, Dodge, Grant, Iowa, Lafayette, Ozaukee, Rock, Vernon, Washington (7.5 percent of businesses) also ranked near the bottom.

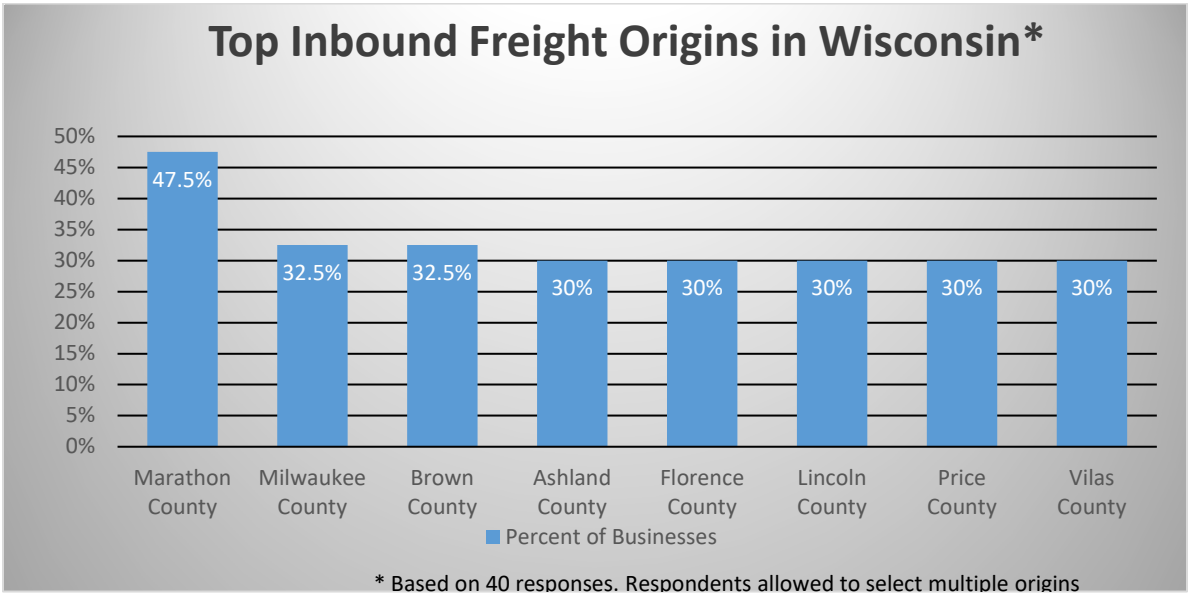

Figure 12: Top Inbound Freight Origins in Wisconsin

Question 10: Where does your inbound freight come from in North America?

For this question, respondents could choose between eight geographic regions in the United States as well as Mexico, eastern Canada or western Canada. Respondents could select all areas that apply. The United States - Midwest Region, consisting of Wisconsin, Minnesota, Iowa, Kansas, Missouri, Illinois, Indiana, Kentucky, Ohio, and Michigan, rated the highest with nearly 81 percent. United States - Southeast (38.3 percent), Eastern Canada (36.2 percent), United States - Northeast (31.9 percent), and United States - Northwest (29.8 percent) regions rounded out the top five. Mexico scored the lowest with only one response (2.1 percent). Other North American areas of low inbound freight were from the United States - Southwest (12.8 percent) and Western Canada (17 percent) regions.

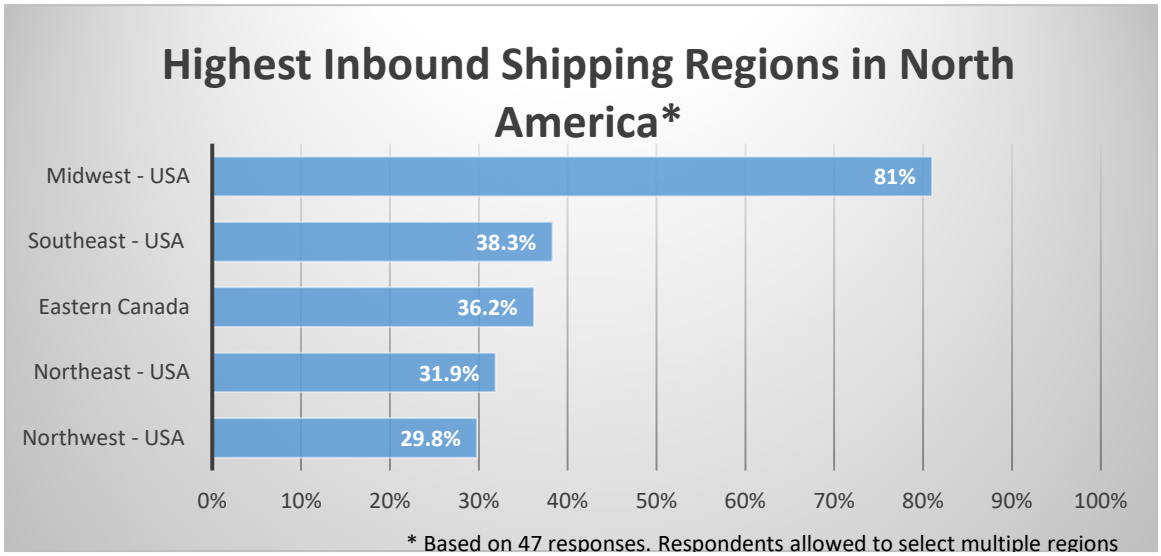

Figure 13: Highest Inbound Shipping Regions in North America

Question 11: Do you currently ship or receive freight by rail?

Of the 72 businesses that answered this question, 35 (48.6 percent) currently ship or receive freight by rail, whereas 37 (51.4 percent) of businesses do not currently use rail.

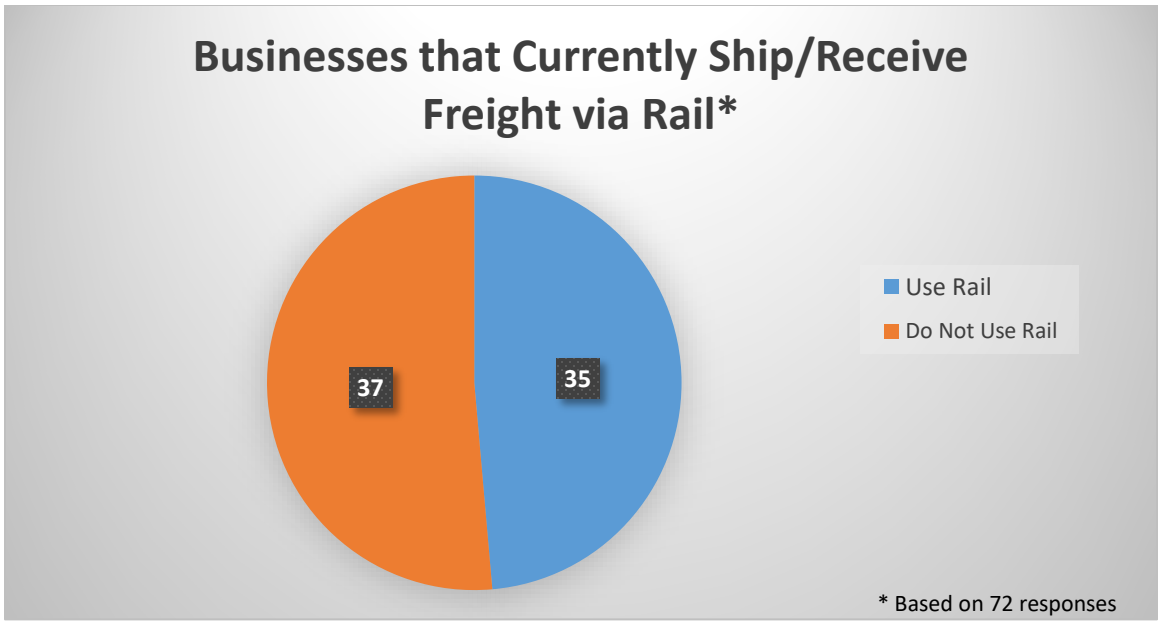

Figure 14: Businesses that Currently Ship/Receive Freight via Rail

Question 12: Are transportation infrastructure improvements (new roads, rail spurs, etc.) needed to utilize, or take greater advantage of, any of the active rail lines in northern Wisconsin?

Twenty-nine comments were provided. Multiple comments were made to reactivate railroad lines, specifically Ashland to Prentice, Ladysmith to Prentice, and Goodman to Rhinelander. Several comments regarded updating, improving or adding additional rail spurs and new intermodal facilities to be located somewhere in the Fox Valley. Three comments centered around increasing track weight and bridge capacity from 263 to 286 tons from Bradley to Stevens Point. Three comments were regarding more frequent and better service, while two comments centered around affordability and rates for railroad shippers.

Question 13: What (if any) changes to your current rail service would need to occur for you to ship or receive more volume by rail?

This question had four choices including lower shipping rates, additional rail cars, more frequent service and an "other" option. Respondents could list more than one answer if desired. Of the 35 businesses who currently ship or receive freight by rail as indicated in question 11, 28 of those businesses answered this question. Twenty-seven respondents indicated lower shipping rates are needed if their business would consider shipping or receiving more volume by rail. Fifteen businesses indicated more frequent service is needed, and 13 cited additional rail cars are needed. Ten "other" responses included additional rail spurs, hiring of a logistics coordinator, dependency of customer needs, opportunities and incentives for businesses to coordinate two-way hauls, reinstating out-of-service lines, access to more public sidings, access to a centrally located intermodal yard and additional short line railroads.

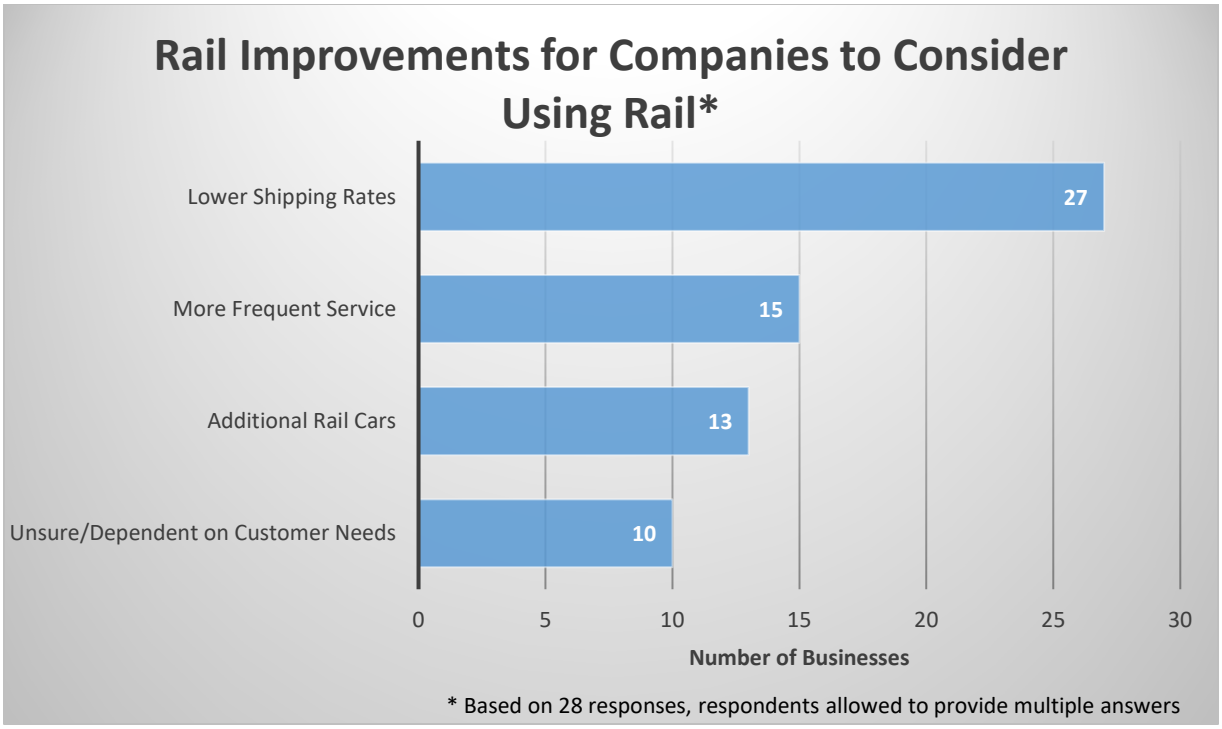

Figure 15: Rail Service Improvements for Companies to Ship or Receive more by Rail

Question 14: If those changes were made, how much additional volume would you consider shipping and/or receiving by rail on an annual basis?

Twenty-five businesses provided feedback to this question. Since this question was asked in an open-answer format, individual responses were compared back to the product and volume that were provided in questions three and seven and an additional volume percentage was calculated. As can be expected, volumes varied greatly.

Ten businesses were unsure of the amount of additional volume they would ship or receive. Some companies either did not provide a number or listed volumes were dependent on customer needs. Eight respondees would increase their shipping and/or receiving volumes from zero to 20 percent, three would increase by 21 to 80 percent and four businesses would increase their shipping and/or receiving volumes by 81 to 300 percent.

A breakdown of the 25 businesses that provided responses regarding additional volume is presented in the following figure.

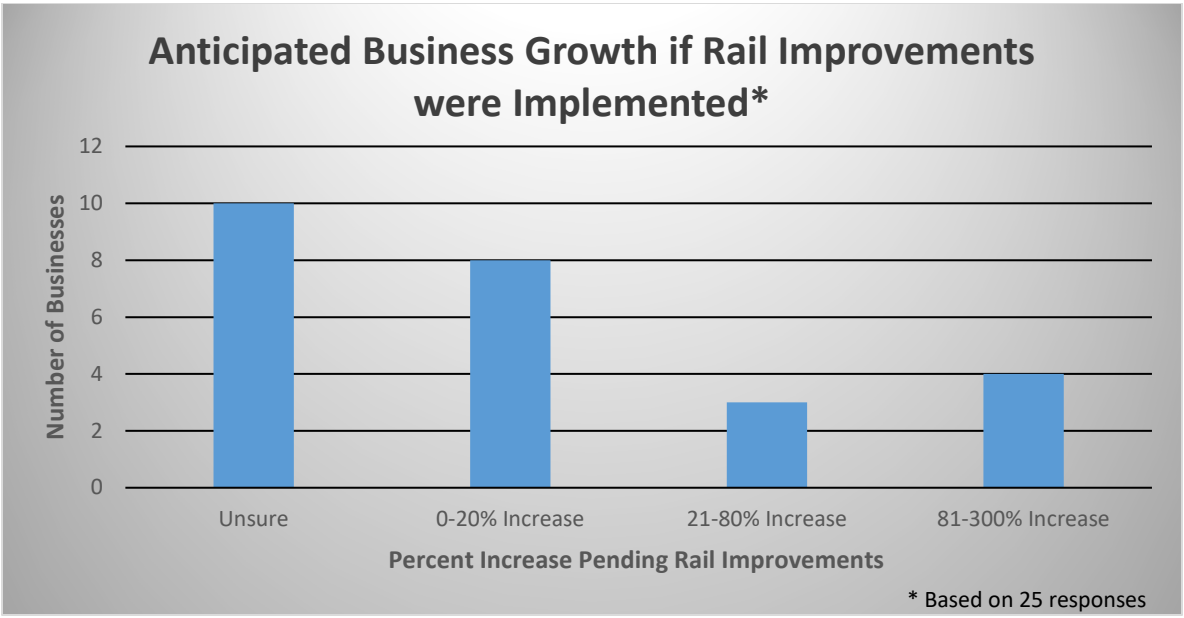

Figure 16: Anticipated Business Growth if Rail Improvements were Implemented

Of these 15 businesses, a total of 949,531 tons of additional product would be shipped or received if changes were made to/in the rail system. From the survey data collected, on average, approximately 63,303 tons of product would be moved by each business. This equates to an extra 11,171 cars per year or approximately 31 rail cars per day in these 15 businesses alone.

Question 15: If a rail line that is not currently being served in Wisconsin was put back into service, would you be able to take advantage of it?

This question received 32 responses. Twelve businesses (37.5 percent) indicated that they would be able to use an out-of-service rail line if it were put back in to service, while seven (21.9 percent) said they would not. Thirteen businesses (40.6 percent) were not sure. The Goodman to Rhinelander, Ashland to Prentice and Prentice to Ladysmith routes were cited most often.

Vacant tracks along the Ashland Subdivision

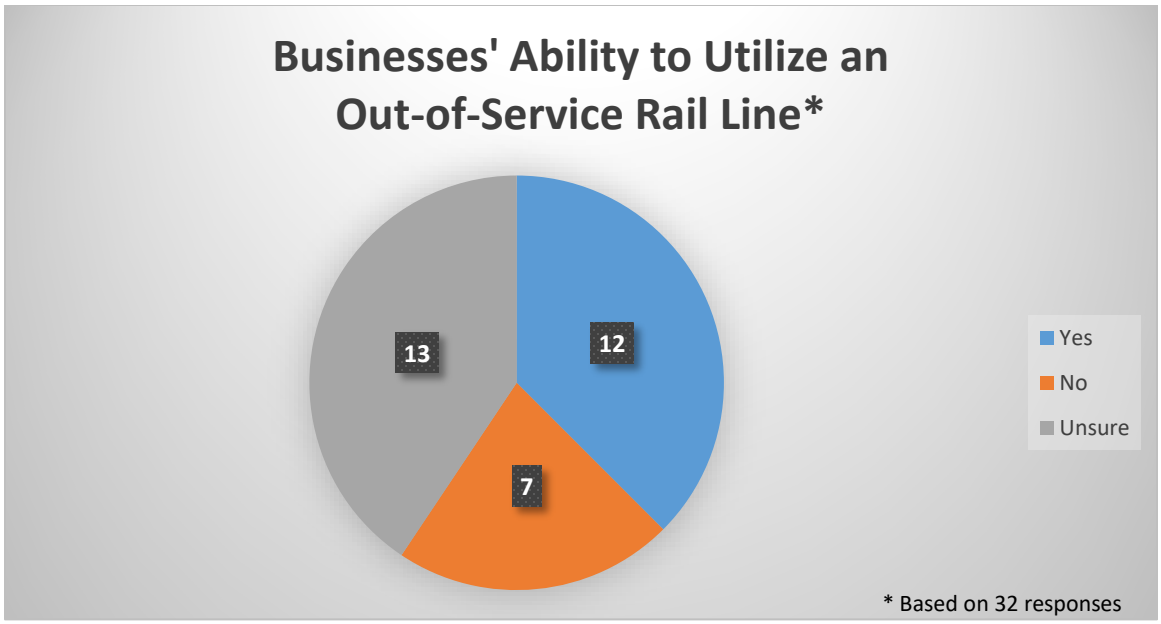

Figure 17: Businesses' Ability to Utilize an Out-of-Service Rail Line

Question 16: Do you utilize an intermodal container facility?

This question received 30 responses. Twenty-five businesses that responded to this question (83.4 percent) do not use an intermodal container facility while five businesses (16.6 percent) do.

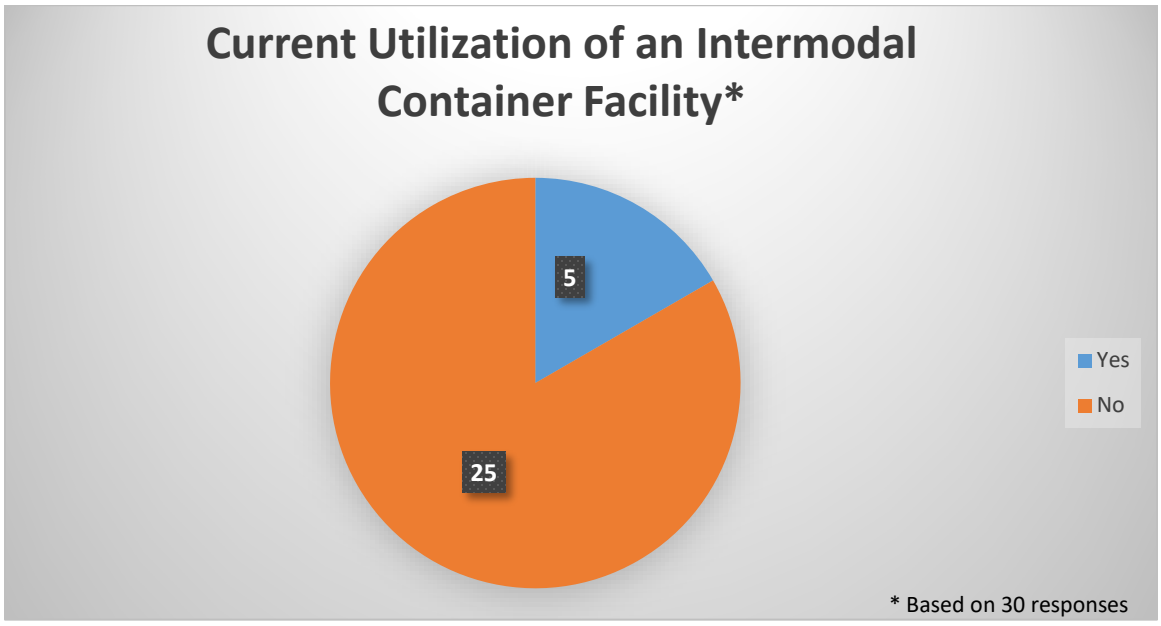

Figure 18: Current Utilization of Intermodal Container Facility

Question 17: Do you currently use a transload facility or log landing for loading and unloading rail cars?

This question received 30 responses. Sixteen businesses that responded to this question (53.4 percent) do not use a transload facility while 14 businesses (46.6 percent) do.

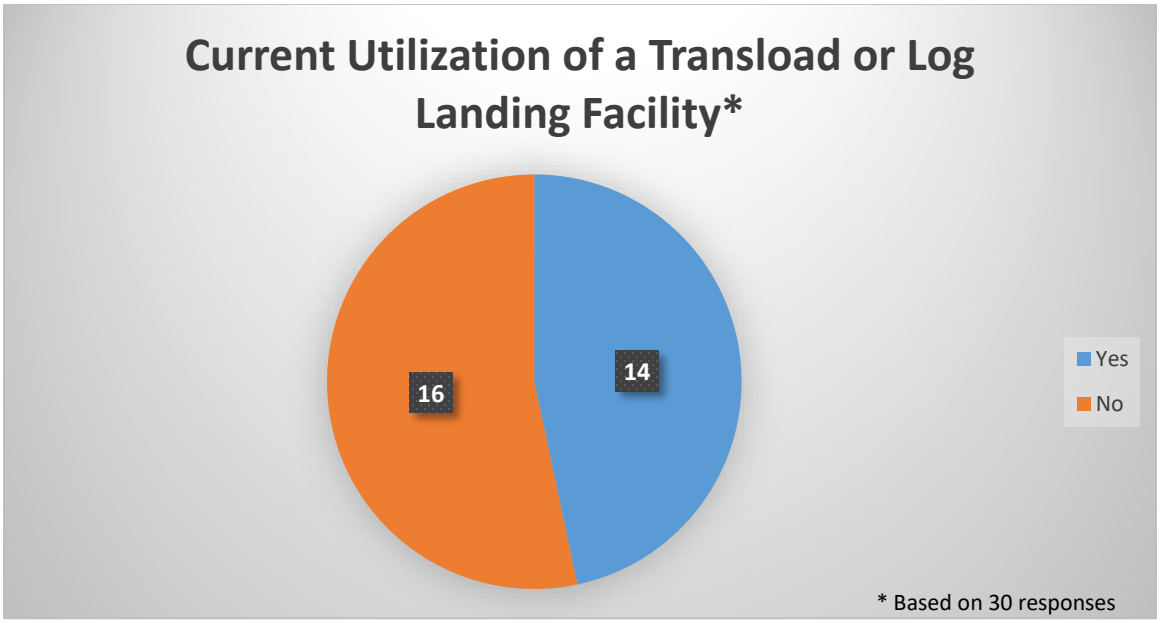

Figure 19: Current Utilization of a Transload or Log Landing Facility

Question 18: If you are interested in a new location for the exchange between truck and rail, where would it be located?

Locations identified included Wausau, Wisconsin Rapids, Green Bay, Oshkosh, Ashland, Antigo, Mellen, Superior, Somerset, Park Falls, Hayward, Stanley, Wausaukee, Crivitz, Dunbar, Goodman, Cavour and Merrill.

Question 19: Do you have any comments or concerns regarding rail service that you would like this study to address?

Below is a summary of the 23 comments that were received.

- Prices are still too high to ship via rail, or increased prices at certain loading points (7)
- Need to upgrade/rebuild rail infrastructure or reinstate out of service lines (3)
- Not enough cars/service (3)
- Some providers not focused on the customer needs and provide poor service (3)
- Rail cars are in poor conditions (2)
- Need for additional intermodal yards
- Sharing of the study data, recommendations between Michigan and Wisconsin DOTs
- Improvements needed for log shippers
- Need to maintain rail service for attracting/retaining Northwoods businesses
- Need to negotiate track leases to a short line so a customer focused rail carrier can provide service to businesses

Question 20: Has your business ever shipped by rail from its current location?

Thirty-six respondents answered this question. Twenty-three (63.9 percent) indicated their businesses have never shipped by rail while 12 (33.3 percent) said they have shipped by rail from their current location. One respondent (2.8 percent) was unsure.

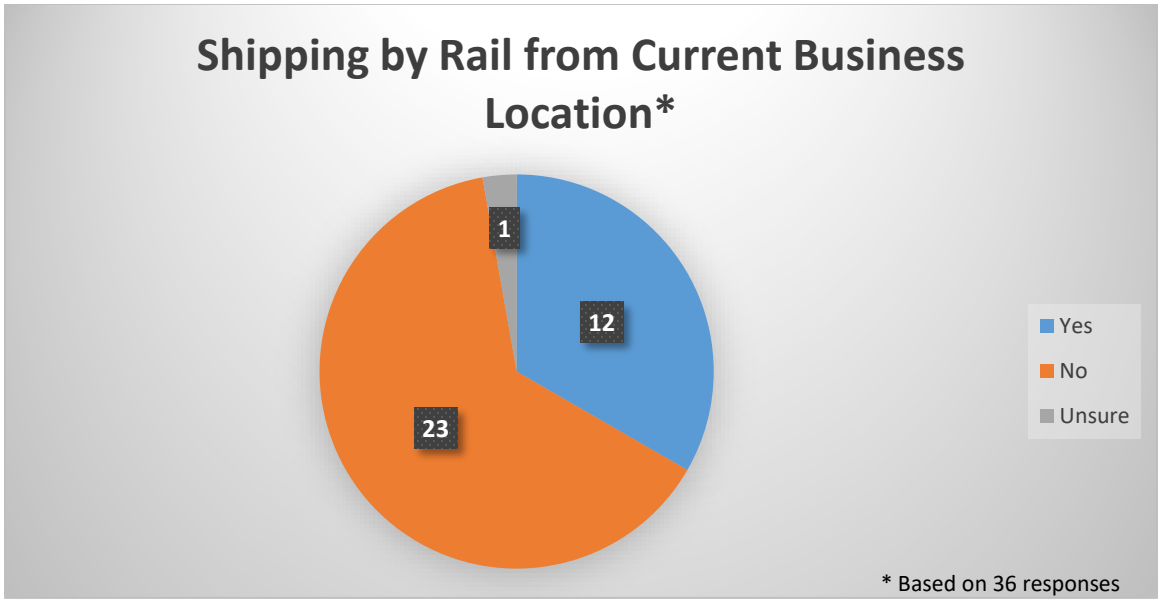

Figure 20: Shipping by Rail from Current Business Location

Question 21: What are the reasons that you don't use rail service? Check all that apply.

For this question, respondents could select more than one answer. Thirty-four businesses responded. Eighteen listed that service is not available (52.9 percent), and 13 cited that it is inconvenient and takes too long (38.2 percent). Other responses stated:

- Service is poor (23.5 percent).
- Less efficient than trucking (20.6 percent).
- Unfamiliarity with rail (17.7 percent).
- Freight not suitable for rail transport (14.7 percent).
- Not enough volume (14.7 percent).
- More expensive than trucking (14.7 percent).
- Lack of interest in exploring rail service (11.8 percent).

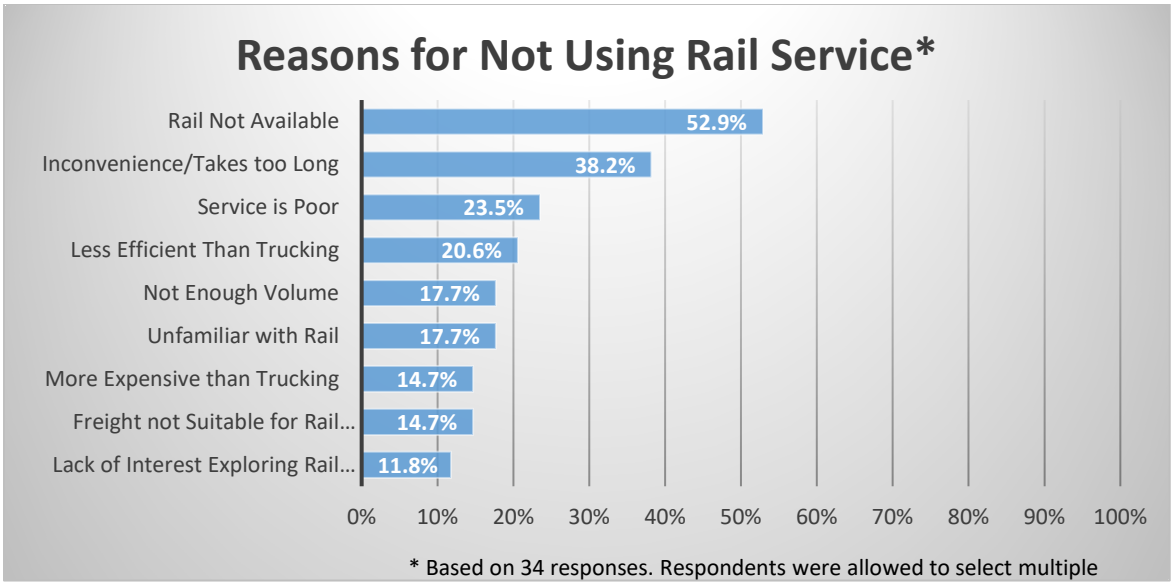

Figure 21: Reasons for Not Using Rail Services

Question 22: If a rail line that is not currently being served in Wisconsin was put back into service, would you consider using it?

Thirty-two businesses responded. Respondents were given three choices: yes, no or not sure. If not sure, the respondent could list which current out-of-service lines would help receive or ship freight more efficiently. Seven respondents (21.9 percent) answered "yes" to the question while five (15.6 percent) answered "no." The rest of the responses answered "not sure." Out-of-service lines that would help receive or ship freight more efficiently were identified from Ashland to Park Falls, Mellen to White Pine and Ladysmith to Prentice.

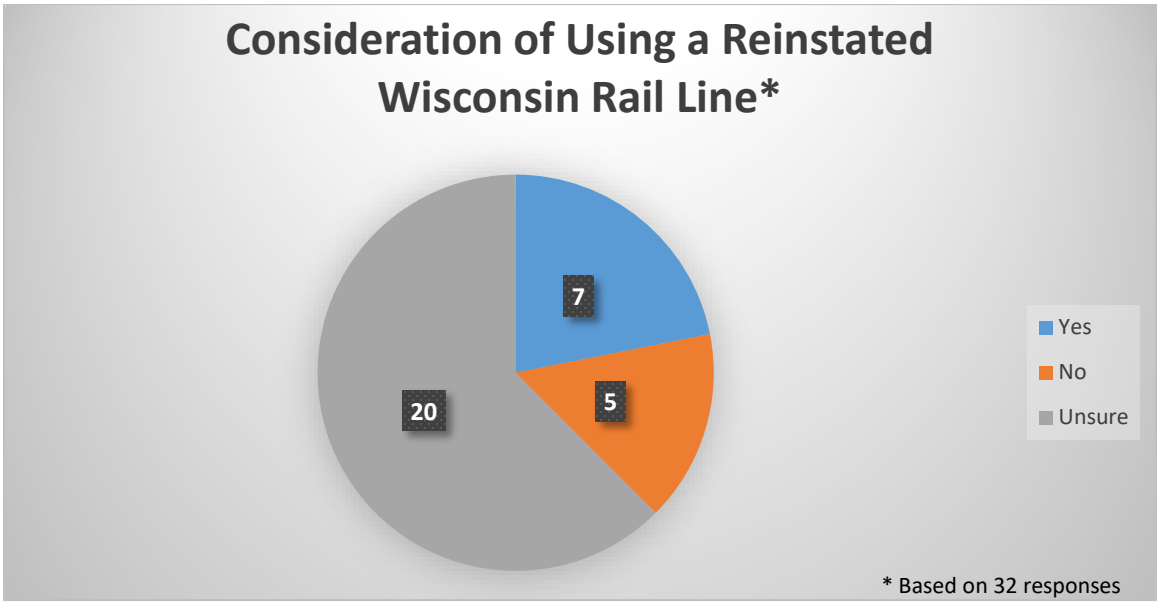

Figure 22: Consideration of Using a Reinstated Wisconsin Rail Line

Question 23: What (if any) transportation infrastructure improvements (new roads, rail spur, loading location, etc.) would you need to ship by rail? Please describe where improvements would be needed.

Ten comments discussed the need for additional spurs, rail sidings, rail trestles or loading and unloading locations between Pembine and Armstrong Creek, Ashland, Antigo, Kennan, Rice Lake, Price County, and Iron River, Michigan. Four comments focused around infrastructure improvements and repairing railways that were damaged in July of 2016 floods. Two comments were not related to infrastructure, stating that better communication, service, and fewer delays are needed. Two commenters felt that infrastructure is in place now for their needs.

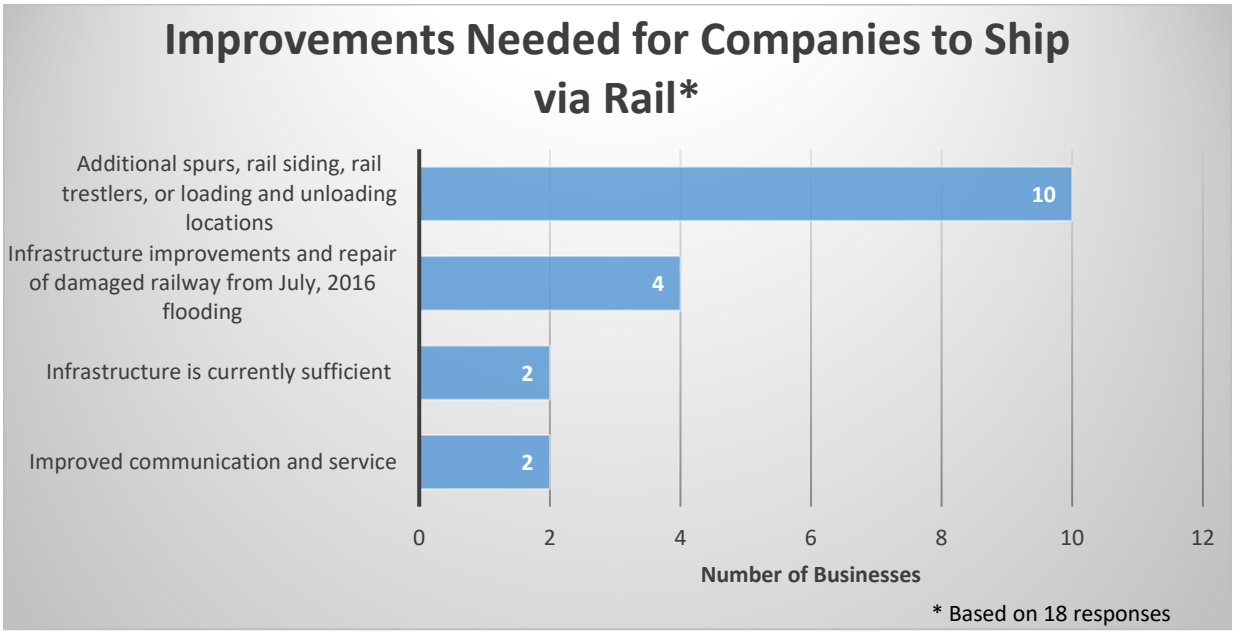

Figure 23: Improvements Needed for Companies to Ship via Rail

Question 24: Do you have any comments or concerns regarding rail service that you would like this study to address?

Below is a summary of the 16 comments that were received:

- Rail carriers are not user friendly.
- Rails carriers not willing to ship logs because it is not a profitable for them.
- Too costly to ship due to lack of service compared to trucks.
- Interest in shipping, but one business alone does not justify the costs.
- Dependability improvement on rail cars on site when needed.
- Interest in shipping more wood, but getting too much wood received from Canada.
- Interested in rail service in Kennan.
- Repairs are needed to reinstate line between Mellen and Ashland.
- Intermodal ramp needed in Northern Wisconsin north of Wausau to help improve costs for businesses.

SURVEY RESULTS

Comparisons Between 2013 and 2017

- The 2017 survey response rate of 37 percent was more than double the 17 percent response in 2013.
- The 2013 study collected data from 39 rail shippers, and the 2017 study collected data from 27 additional rail shippers/receivers, expanding the list of businesses that have shipped by rail to to 66.
- The number of respondents answering "yes" to the survey question, "Do you ship or receive freight by rail?" grew from 20.6 percent in 2013 to 48.6 percent in 2017.
- Logs, lumber, wood and pulp products were the top commodity while metal products were the second ranked commodity shipped/received for the surveyed businesses in both the 2013 and 2017 surveys.
- Trucking is, by far, the dominant shipping mode to/from northern Wisconsin businesses. In 2013, more than 92 percent of businesses surveyed shipped or received products by truck while the 2017 survey showed 90.5 percent.
- The 2013 and 2017 surveys both showed that more than 95 percent of the outbound freight is staying in the Midwestern United States.
- Both 2013 and 2017 surveys listed "no service offered" and "less convenient than trucking" as the top two reasons why businesses do not use rail.
- From the 2013 survey, businesses that did not currently ship via rail, but had an interest – only six of 31 businesses responded to the 2017 survey. Of the six respondents, one of them now ships by rail.
- Both 2013 and 2017 surveys showed similar trends to the question, "If inactive rail lines were put back into service, would you use it?"
    - In 2013, 30 percent of surveyed businesses would take advantage of a reactivated line, while 16 percent were unsure depending on location.
    - In 2017, 37.5 percent of surveyed businesses would take advantage of a reactivated line, while 40.6 percent were unsure depending on location.

Additional Survey Takeaways

- The surveyed businesses ship over 5.5 million tons of logs, lumber, wood products and pulp annually. This equates to 65,394 rail cars per year for business respondents in this commodity alone.
- The surveyed businesses ship 72.5 percent (over 4 million tons) of logs, lumber, wood products and pulp via truck. This equates to almost 155,000 truckloads annually.
- The surveyed businesses receive nearly 5 million tons of logs, lumber, wood products and pulp annually. This equates to 58,381 rail cars per year for these businesses in this commodity alone.
- The surveyed businesses receive 99 percent of logs, lumber, wood products and pulp via truck. This equates to almost 189,000 truckloads annually.
- While logs/lumber/wood and pulp products were the highest ranked in the Northwoods counties, they only ranked ninth and tenth respectively for top Wisconsin commodities by weight that were transported by rail (see Table 2 in Chapter 2).

CHAPTER 6: MEETINGS AND COORDINATION

MEETINGS WITH NRTC STAFF AND INTERESTED STAKEHOLDERS

Throughout the Wisconsin Northwoods Freight Rail Study, meetings with NRTC staff and other project stakeholders occurred. The table below summarizes meeting dates and participants.

Table 20: Meeting Dates with NRTC Staff and Interested Stakeholders

Meeting Date	Meeting Type	Attendees
March 28, 2017	NRTC Meeting	WisDOT, NRTC staff
June 29, 2017	Kickoff Meeting	WisDOT, SRF
July 19, 2017	Conference Call – Discuss Study Schedule and Methodology	WisDOT, SRF, Wendy Gelhoff, Andy Albarado, Dale Kupczyk, Betsey Harries
August 29, 2017	Clark County EC – Call	Paul Chellevold, Sheila Nyberg
August 30, 2017	NRTC Meeting	WisDOT, SRF, NRTC staff
October 16, 2017	NRTC Conference Call	WisDOT, SRF, NRTC staff
April 18, 2018	NRTC Presentation	Dan Thyes – WisDOT, Paul Chellevold – SRF, NRTC staff

General Concerns

Members of the NRTC and the newly formed Tri-County Rail Team, which consists of approximately 30 members in Marathon, Clark, and Taylor Counties, noted several concerns, which included:

- Quality of service and lack of short line service is an issue.
- Feeling of railroads dictating where new businesses should locate to receive rail service.
- Lack of open communication between railroad operators and businesses/users.
- Inefficiencies in movement of goods and services, unnecessary need to truck goods to Duluth for cheaper and affordable rates, leading to the feeling of “whatever freight makes the most money is the only items the operators want to haul.”
- Importance of more business opportunities in the Northwoods and those businesses to have options for rail service.
- Desire to improve relationships and work more closely with railroads and operators.
- Disinclined to share business names with railroad operators.
- Improved railroad infrastructure (bridges and tracks) is needed in several areas.
- There are discussions regarding an east-west connection to Escanaba and up to the Upper Peninsula. If this happens, some stakeholders are concerned that if/when mines do open, the timber industry would likely be negatively impacted because operators would only agree to ship the most expensive cargo. There would then be a need for businesses to come together to combine loads to get service. Would the operators even be willing to haul them?
- Michigan DOT would coordinate a 50/50 Category A Program in Michigan.

- Michigan Tech is trying to secure funds for a railroad study in the Upper Peninsula, but would share data from their previous study.
- The Michigan Tech representative stated that Wisconsin should consider transload facility locations. He said the number of "big player" companies are not as many as you would think, but all movements from northern Wisconsin into the Upper Peninsula and to some of the Minnesota log mills should be analyzed.
- Wendy Gehlhoff of the NRTC indicated that it will be critical to include pulp mills in this study.
- There is mine exploration work occurring north of Wakefield. Patrick Tucker, representing Northwoods Environmental Industry, indicated the White Pine Mine has enormous potential via a $300 million operation.
- Some feel that meeting with CN is not useful:
    - CN is only interested in long haul routes (Duluth to Chicago).
    - CN doesn't want to serve intermittent customers.
    - CN is reluctant to serve non-service or low volume lines.

MEETINGS WITH RAILROADS

Three rail companies currently operate within the Northwoods study area; Canadian National (CN), Tomahawk Railway (TR), and Escanaba & Lake Superior Railroad (ELS). The study team met with representatives from each of the rail companies to discuss freight transportation challenges.

Table 21: Meetings with Railroads

Meeting Date	Meeting Type	Attendees
August 30, 2017	Tomahawk Railway	WisDOT, SRF, Susie Klinger
November 21, 2017	Escanaba & Lake Superior RR	WisDOT, SRF, Tom Klimek
December 6, 2017	Canadian National RR	WisDOT, SRF, Brian Buchanan

Tomahawk Railway Meeting

Susie Klinger met with Dan Thyes and Paul Chellevold at the TR office in Tomahawk on August 30, 2017. Ms. Klinger is the General Manager of TR and the General Manager of the Ottertail Valley Railroad in Fergus Falls, Minnesota. She described TR as a safety and customer first organization. She leads Operation Lifesaver, a nonprofit public safety education and awareness organization dedicated to reducing collisions, fatalities, and injuries at highway-rail crossings and trespassing on or near railroad tracks.

TR has 23 employees and operates approximately six miles of railroad in the Tomahawk area. TR provides daily service to the pulpboard mill at Wisconsin Dam, owned by Packaging Corporation of America (PCA) as well as its own 150,000-square-foot warehouse located in Tomahawk. TR has 8 to 10 different customers, including Louisiana Pacific. TR handles more than eight thousand carloads annually, consisting of coal, chemicals, scrap paper and pulpwood inbound as well as pulpboard outbound from Wisconsin Dam to its connection with CN at Tomahawk. (Since this meeting, TR no longer handles coal, reducing annual carloads by 2,000.)

TR operates an eight-person truck shuttle at the mill, and this allows TR to know exactly where every shipment is going and what is on each load. TR takes great pride in their employees' cross-training opportunities, and several employees are cross trained in Expera products.

Ms. Klinger discussed the ongoing negotiations between CN and Genesee & Wyoming (G&W) regarding leasing low density lines to better serve local demands. (Since this meeting, CN has stopped negotiations.) Lines of note include:

- Mosinee to Bradley
- Bradley to Prentice
- Prentice to Ladysmith (currently out of service)
- Prentice to Ashland
- Bradley to Rhinelander
- Rhinelander to Goodman (currently out of service)/Pembine

Ms. Klinger understands CN's business model and knows the out-of-service lines (especially into Ashland) are not worth the cost to operate to CN, but TR is willing to work out a deal to serve customers. She said, "let us take care of the local businesses, and it's a win-win for everybody."

Her goal is to serve customer needs and expressed the importance in evaluating out-of-service lines and working out leasing opportunities with the larger carriers such as CN. TR is interested in learning more about all customers who are interested or consider using rail service. TR is willing to operate leased shortlines in the area.

Ms. Klinger indicated another challenge to serve these businesses in the Northwoods is the shipping track rates. The lack of business and shipping weight allows CN to justify the embargo of lines, but this puts northern businesses in a very difficult place to succeed. Without putting infrastructure in place or being able to serve northern Wisconsin customers with a variety of shipping and storage options, the future of the Northwoods businesses without shortline options is not positive.

Escanaba and Lake Superior Railroad Meeting:

Tom Klimek met with Dan Thyes and Paul Chellevold via conference call on November 21, 2017. Mr. Klimek has been in transportation since 1973 and has held planning positions in various RPCs and DOTs in Wisconsin and Illinois. He is currently the Vice President of Marketing for ELS and is located in Green Bay. His ELS employment began in 1984. ELS currently has 30 customers, approximately 10 to 15 Wisconsin customers at any one time. ELS also works extensively with approximately 20 additional wood producers.

The group discussed several topics, and highlights of the discussion are below.

- Mr. Klimek has been involved with the NRTC for seven years. He believes NRTC needs to engage other freight business stakeholders like the mining industry because it will be a "rough go with just forest products."
- His number one goal is to do what he can to preserve these rail lines and assure that no more lines go out-of-service. ELS saw their volumes increase by 16 percent in 2016, suggesting that there is growing potential in the railroad industry in this region. ELS trains are usually moving a

combination of freight loads, storage cars and rail cars destined for repair at the ELS contract car repair shop.

- ELS operates with a "customers first" approach. Mr. Klimek is the first line of contact for ELS customers. He feels the customers are satisfied with the service ELS brings.
- ELS is interested in potentially purchasing or leasing CN's lines. The question continues to be whether CN has interest in selling any lines, possibly because of the potential of mining opportunities. If CN was willing to lease their out-of-service lines, ELS would be a willing operator.
- ELS serves all the rail customers in Marinette and Menominee as a result of a 2014 switching agreement with CN. The arrangement benefits both carriers in terms of operating savings and increased revenue while providing seamless service to CN and ELS customer.
- The largest commodity shipped is pulpwood logs to paper mills including Verso Paper and Sappi Paper and also to Louisiana Pacific in Sagola, Michigan for the production of oriented strandboard and lumber. Over half of the shipments are local on the ELS. They also move agricultural products including fertilizers, corn, wheat and soybeans out of Oconto Falls. Other commodities transported by ELS are oxidized ore and cement through its bulk transload in Floodwood, Michigan; and LPG, scrap metals, plastic pellets, lumber, and woodpulp to Kimberly-Clark at Marinette, Wisconsin.
- They have a log rail car kit and want to build additional log cars as well as expand the contract car repair and paint shop in Escanaba, Michigan, which currently is home to 75 employees (down from a high of 90 including full time subcontractors). The ELS car shop does contract car repairs for the 10 largest private car owners in North America.
- ELS operating profile is as follows:
    - The CN rail yard in Green Bay near the I-43 bridge is where ELS interchanges traffic to CN. It then goes back to Crivitz with other loads and empties on a schedule of approximately three times per week. Locomotives are housed in Crivitz.
    - Service to Oconto Falls is based upon customer needs.
    - The storage of rail cars along with the car shop and rail freight comprise the ELS business model. Nearly 115 miles of track/sidings can accommodate up to 7,000 rail cars.
    - ELS operates on trackage rights over CN between Pembine, Wisconsin and its headquarters in Wells, Michigan. This also allows for the movement of many rail cars for contract car repairs.
    - Besides its Floodwood bulk site and Kingsford, Michigan transload building, ELS owns 26 acres in Crivitz that could be available as a transload location.
    - The company-wide carloads today are about 50 percent of what they were circa 2000 to 2007 due to the 2010 closing of the Smurfit-Stone Container medium corrugated paper plant in Ontonagon, Michigan.
    - ELS will mark its 40th anniversary under current ownership in 2018.

Canadian National Railroad Meeting:

Brian Buchanan met with WisDOT/SRF staff at Hill Farms Central Office building on December 6, 2017. The meeting was attended by Dean Prestegaard, Dave Leucinger, Rich Kedzior, Matt Umhoefer and Dan Thyes from WisDOT; Paul Chellevold from SRF; and Brian Buchanan from CN.

(NOTE: CN operates in Wisconsin as Wisconsin Central Ltd. (WCL), a wholly owned subsidiary operating company. CN is the ultimate parent company. The U.S. subsidiaries of CN such as WCL operate collectively under the CN brand name.)

Mr. Buchanan has been in the rail business since 1981. He is currently the Manager for Corporate Development for CN in Homewood, Illinois. He worked for Wisconsin Central from 1987 to 2001 and under CN since they purchased Wisconsin Central. Mr. Buchanan coordinates with NRTC and often speaks with Tom Klimek and Susie Klinger, representatives of TR and ELS.

WisDOT and CN discussed several topics and are highlighted below.

- Discussions were held in the past with a possible operator for some of the light density lines in northern Wisconsin but at present these talks are dormant.
- The seven-mile Ladysmith to Tony line has been put back into service to serve a log landing at the Rusk County Industrial Park. Verso Corporation subleased this property from the County. This will replace a log landing along the CN mainline in Ladysmith and allow for more efficient log loading and mainline operations. It also reduces the blocking of crossings in Ladysmith.
- Logging is a "tough business" for railroads. There is a high handling cost due to the many trains and switches needed. The short moves equate to low revenue. Thus, the log operations are not always compensatory (not profitable or break-even in many cases), making it hard for CN to justify service. To be profitable, a large price boost would be required on some moves that would push traffic from rail to other modes of transportation.
- The current log car fleet owned by CN only has several years of life remaining. Any future rail cars would have to be owned and or leased by customers, rather than by the railroad, unless the economics can be improved.
- If the Copperwood mine opens, it would generate traffic to eastern destinations. The volume would not justify re-opening the line from Rhinelander to Goodman. CN would encourage most of the ore movement onto existing rail lines in the Upper Peninsula. Routing this ore through Wisconsin via rail would be circuitous, resulting in additional cost, transit time, and require more cars.
- Mr. Buchanan is aware that some customers and stakeholders are upset with CN due to the lack of service in some areas. He reiterated that for CN to consider serving customers, it must be a profitable business venture. He indicated that to his knowledge, NRTC has not approached CN with any business opportunities or proposals other than running logs to paper mills. He is willing to listen and recommends that, if there are additional businesses, or an increase in business volume, the NRTC should bring that to him.
- There are dedicated business development and real estate people at CN who can assist potential customers. Jim Fountain is the best person to contact at CN for availability of rail-accessible sites.
- There is potential to provide a rail/truck transload location at the site of the former Niagara Paper mill. The mill is demolished, but warehouse and transload buildings are still in place. To move this site forward, infrastructure upgrades such as track and bridge rehabilitation is needed.
- The general idea of transload/intermodal is great, but who is going to pay for the land, construction and operation of the facility?

- There has been a recent uptick in frac sand shipping. CN has built a support yard at Blair in Trempealeau County. The transloading to rail had been done with linear tracks in some cases. Construction is underway at several customers to build loop tracks to allow unit train loading.
- CN's Intermodal growth has been boosted by capacity expansion at Prince Rupert. One basic rule for a ramp site is that you need enough inbound volume of containers to generate capacity for your intended outbound exports. But beyond that, the match back requires that you have the right box (size and container/shipping company) going to the right port. One challenge is coordinating the supply of heavy capacity well cars to handle any heavy loaded containers.
- Duluth's new Intermodal service is doing well. Traffic arrives and departs in the manifest train network.

Chapter 7: Recommendations and Next Steps

After listening to the concerns of stakeholders, meeting with the railroads, and analyzing the results of the survey, the following are the recommendations of this study:

- WisDOT, MDOT, NRTC, Tri-County Rail Team, participating counties, and Michigan Tech University should continue to share data and findings from their various studies and research.
- Survey results from this study should be used to help identify travel lanes of specific origins and destinations that can assist with other efforts in the Great Lakes Forest Region. As of January 2018, funds to conduct a $200,000 planning study for the Alger County-Upper Peninsula Forest Projects Rail Study project were approved. The study, in collaboration with Alger County, NRTC, and Michigan Tech University, will investigate solutions for effective rail transport of the forest products industry in Michigan's Upper Peninsula.
- The Wisconsin Economic Development Commission (WEDC) and NRTC should combine efforts on business proposals for companies that want to ship or receive goods via rail. This would include identifying interested businesses, inventorying existing and potential volumes, and looking at potential sites for collaboration. The proposals could be presented to business development and real estate personnel at the operating railroad companies who can provide advice on availability of rail accessible sites and service potential.
- All stakeholders should promote WisDOT's grant and loan assistance programs[36] to businesses looking for help with rail-related infrastructure improvements. Programs include the Freight Railroad Infrastructure Improvement Program (FRIIP), Freight Railroad Preservation Program (FRPP), Transportation Economic Assistance (TEA), and the State Infrastructure Bank (SIB) Program.
- To maximize effective communication, NRTC, Tri-County Rail Team, and all railroad transit commissions statewide should prioritize their issues and deliver a unified message to legislatures, businesses and railroads. These groups should work with local municipalities and businesses to discuss, create and carry out action plans to stabilize and grow railroad businesses.
- The NRTC should work with member counties and local businesses to establish a contacts list and facility location inventory for its rail users. The list would include specific contacts for each facility and provide the means for future group communication. The contact list could be used for businesses to discuss issues and concerns, as well as a starting point for future studies.
- The NRTC should work with its rail users to inventory current facilities, commodity volumes, and provide projections on changing needs over the next decade. Organized data of this type could help attract future rail service.
- Representatives of the operating railroads should continue to investigate possible options for shortline service and leasing/purchasing options.
- An inventory of deficient infrastructure (tracks and bridges that need repair) and cost estimates for repair would be helpful in determining the overall investment in reopening out-of-service lines.

[36] http://wisconsindot.gov/Pages/doing-bus/local-gov/astnce-pgms/aid/default.aspx

- Additional discussion and study is needed to determine if transload/intermodal facilities would benefit NRTC member counties. Specifics would include the location, size, business types that could use the facility, and who would pay for the land and fund the infrastructure.
- There is a need to improve relationships between RTCs, county economic development officials, local businesses and the railroads. Past efforts to work together have been challenging. Developing a platform for effective communication could benefit all stakeholders.
- The potential for mining exploration work in northern Michigan, including the Porcupine Mountains, Copperwood Mine, Back Forty Mine, Eagle Mine and the White Pine Mine should be examined. The potential destinations and routes to be used through Wisconsin should be identified.
- WisDOT will provide on-line mapping of all active and out-of-service rail lines and stations, including aerial imagery in the area. This information could be used by the NRTC and local businesses to identify potential transload facilities.
- Research is needed regarding the log car shortage. Log needs for the paper industry should be confirmed and forecast. WisDOT will identify if there is a role for its loan programs.