CFIRE

The Potential for Mode Conversion to Rail Service in Wisconsin

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16. Abstract The team built upon the Wisconsin Economic Development Corporation's study regarding industries that drive the Wisconsin economy, and complemented the efforts of the Wisconsin Central Group and Wisconsin Manufacturers Commerce by geo-locating shippers and determining their proximity to rail access. Outreach was completed to identify the drivers, incentives and barriers to increasing rail access and the resulting economic impact.			
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Chapter 1: Introduction

In June of 2013, the Wisconsin Economic Development Corporation (WEDC) released *The Wisconsin Economic Future Study: Statewide and Regional Analysis*. The economic report provided a snapshot of the state's recent economic performance, as well as an analysis highlighting the industries that "drive" its economy:

> "From an economic perspective, driver industries are relatively concentrated in a region and produce more goods than can be consumed locally. These companies sell their products outside of the region, thereby bringing new monies back into the region. Thus, they drive regional economic growth." (*1*)

Manufacturing activity accounts for 15.4 percent of Wisconsin employment and 19 percent of the state's gross product. All but one of the 37 driver industries identified in the WEDC report are manufacturers. Combine the driver industries' importance with the state's reliance on agriculture and a mining sector reinvigorated due to frac sand, and it is obvious that getting goods exported out of the state to domestic and global markets is crucial for individual companies as well as Wisconsin's economy as a whole.

In order for companies to achieve profitability, transportation infrastructure must be in place to provide companies with the ability to get raw materials, intermediate goods, and finished products from source to market. Do Wisconsin shippers have the access to the freight rail transportation network that they need in order to do this economically? The WEDC report (*1*) would lead us to believe the answer to that question is no. As the report states, "Transportation and logistics costs for some products exceed the cost of goods sold for the product. Manufacturing executives encourage the development of regional rail hubs or multimodal distribution centers to better connect them and their goods to customer bases throughout the state and across the country."

Intermodalism is one avenue shippers can utilize to access the rail network without being located directly on a rail line, and can generally be thought of as the movement of goods by the combination of two or more modes of transportation. Specifically, intermodalism involves the use of a container to move freight without handling the goods themselves when changing modes, while transloading incorporates multiple modes to move freight but with the handling of the goods at the intersection of the different modes. This handling of goods can include the containerization of bulk commodities or the transfer of the contents of a container into a different container or into regular truckloads (*2*). The type of intermodal move is characterized by the container used to transport the freight: international intermodal traffic utilizes either a twenty- or forty-foot equivalent unit container while domestic intermodal traffic utilizes either a semi-trailer that is placed on a rail car or a 53-foot container to move freight. Class 1 rail networks, intermodal terminals, equipment, and business models are, for the most part, designed to optimize the movement and supply chains of international containers.

Intermodalism takes advantage of the most optimum characteristics of the various modes used. For example, this strategy can take advantage of the economies of scale associated with moving freight long distances via rail as well as the flexibility to service the first and last mile using trucks. Both the public and private sectors seek ways to increase the volume of freight moved intermodally. While the details may vary, the benefits of using rail instead of truck are commonly accepted:

- Increased fuel efficiency: Railroads doubled their fuel efficiency between 1980 and 2014, making them four times more fuel efficient than trucks (*3*), consuming roughly 320 British thermal units (Btu) per ton-mile compared to 1,390 Btu per ton-mile for trucking (*4*).
- Reduced greenhouse gas emissions (GHGs) and pollutants: shipping by rail versus truck can reduce GHGs by two-thirds (*5*), and reduce other pollutants significantly due to trucks emitting 6-12 times more pollutants than rail on a per ton-mile basis (*6*). The Association of

American Railroads (AAR) states that if five percent of freight shifted from truck to rail, it would be the same as removing 1.8 million cars from the road (800 million gallons in fuel and nine million tons of GHGs) (*3*).

- Reduced congestion: The AAR cites the *2015 Urban Mobility Scorecard*, which monetized the costs of roadway congestion in 2014 at $160 billion (6.9 billion hours of wasted time and 3.1 billion gallons of fuel). With one train's carrying capacity being equal to several hundred trucks, the 175 million tons of 2012 rail freight that originated from, terminated in, or moved through Wisconsin would have required 9.7 million additional trucks (*7*).
- Reduced highway maintenance costs: Removing heavy trucks from roadways can extend the life of the pavement. The average impact of one tuck is equivalent to approximately 4,000 cars on flexible pavements and 6,200 cars on rigid pavements (*8*).
- Increased economic competitiveness: According to the state's rail plan, "A growing economy in Wisconsin requires a strong multimodal transportation system," and, "More efficient access to the freight rail system, such as new intermodal facilities and continuing state support of short lines, can lower transportation costs for shippers," that can then be leveraged to "help retain existing work forces and businesses and attract new ones."
- Increased access to domestic and global markets.

The U.S. Department of Energy's 2013 report *Freight Transportation Modal Shares: Scenarios for a Low-Carbon Future* mentions that sustainability is gaining popularity in the private sector. This includes the incorporation of the sustainability metrics discussed above (GHG and pollutant emissions and fuel efficiency) into the supply chain decision-making process, a rise in programs and certifications, such as the Environmental Protection Agency's SmartWay, that recognize and validate sustainability efforts, and a growing recognition of the supply chains' role in helping a company achieve "greenness." However, despite this growing interest in sustainability, projections of continuing environmental regulations benefitting and inducing intermodal rail shipments (*9*), and the fact that intermodal is the rail industry's fastest growing market segment (*10*), the report also highlights some remaining challenges that will limit the amount of freight that can shift to the intermodal segment:

- Trucking's ability to outcompete other modes when considering the totality of cost, speed, and reliability from the shipper's perspective.
- Shipper's ability to obtain environmental efficiency gains via purchasing new or retrofitting old trucks, or through other pieces of the supply chain, such as changes in packaging or relocation of warehousing and distribution facilities.
- The limited market size from which to gain market share via mode shift (the tonnage of freight moving over 500 miles is smaller than the amount moving less than 500 miles).

Government agencies can influence modal shift by planning for and investing in non-highway infrastructure. At the federal level, Congress passed the FAST Act in late 2015, which has tasked the U.S. Department of Transportation (USDOT) with creating a National Freight Strategic Plan and identifying a National Multimodal Freight Network. The overarching goal of this mandate is to "ensure that the Network provides a foundation for the United States to compete in the global economy," and, among other things, to "improve network and intermodal connectivity." Through a number of programs utilizing both formulaic funding and competitive grant structures (Sec. 1105 *Nationally Significant Freight and Highway Projects*, Sec. 1109 *Surface Transportation Block Grant Program*, and Sec. 1116 *National Highway Freight Program*), Congress has permitted (limited) federal transportation infrastructure dollars to be used by states for non-highway projects that will increase the connectivity between modes of transportation. These include freight intermodal or freight rail projects, increasing access into and out of terminals where freight is exchanged between modes (examples include ports, intermodal terminals, grain elevators, or other facilities

related to agriculture, mining or forestry), or intelligent transportation systems that increase truck freight efficiencies inside the boundaries of intermodal facilities. These programs seek to complement the existing Transportation Investment Generating Economic Recovery (TIGER) Grant program.

At the state level, Wisconsin has a long history of supporting multimodal transportation with two funding programs specific to rail, the Freight Railroad Preservation Program (FRPP) and the Freight Railroad Infrastructure Improvement Program (FRIIP). Other states are also active in improving the connection between road and rail. One example is Kansas' State Rail Service Improvement Fund, which seeks to improve rail access for businesses (*11*). The state has recently selected two cities for the development of transload facilities (*12*). A second example is the Linking Iowa's Freight Transportation System (LIFTS) program, which is intended to provide grants to projects with public benefits and help meet the changing demands on Iowa's multimodal freight system (*13*).

Given this background, research was undertaken to collect information related to the freight rail system in Wisconsin, and Wisconsin shippers' attitudes towards rail and intermodal services, in particular. Researchers were also interested in the state's shippers' proximity to rail access points and the effect proximity has on shippers' use of rail and intermodal networks to move their goods from production to consumer.

This report outlines the four tasks completed during this research project. Chapter Two provides a review of Wisconsin rail-related planning, policy, and research documents, as well as other freight rail literature. This chapter provides a brief history of rail in Wisconsin, descriptions of the various Class I and short line freight rail networks operating in the state, analysis of the state's freight market by mode, information regarding freight rail's economic impact, a discussion of public agencies' interest in multi-modal freight networks, and lastly challenges facing the state's freight rail system.

Chapter Three provides information and opinions obtained from 16 Wisconsin shippers regarding their operational and logistics profile, rail access and usage, and rail funding and other resources. A copy of the survey can be found in Appendix A.

Chapter Four discusses the data and methodology used by researchers to determine the proximity between Wisconsin companies shipping freight and access points to the rail system, as well as results from the spatial analysis.

Chapter Five discusses the data and methodology researchers used to estimate potential modal conversion from trucking to intermodal for Wisconsin shippers in the Food & Beverage, Paper Products, Plastics, and Machinery industries.

Chapter Six provides a number of conclusions and recommendations.

Chapter 2: Review of Wisconsin Rail Literature

A number of documents pertaining to freight rail in the state of Wisconsin were reviewed to gain an understanding of the current state of the freight rail network and system. These included a number of academic studies as well as reports and plans produced by the Wisconsin Department of Transportation (WisDOT). A number of non-Wisconsin based documents were reviewed as well.

History

The Wisconsin Historical Society places an initial *official declaration of interest* in the newly created and expanding American railroad network at a Milwaukee public meeting held in the fall of 1836 (*14*). Meeting attendees sought to "petition the territorial legislation to incorporate a company to construct the proposed lead-mine route." As is still the case today, rail transport was seen by businessmen and territorial officials as a way to foster economic gain by connecting origins with destinations more efficiently than the other modes of the day—roads and water. Of particular interest was connecting the lead mines in the southwest part of the territory, which, in 1829, employed over 4,000 miners and produced approximately 13 million pounds of lead, with ships on Lake Michigan. With the addition of growing forestry and agricultural (particularly wheat) industries in the territory, Wisconsin's first railroad was commissioned in 1847 prior to its official statehood in 1848. On February 25 of 1851, the first train in Wisconsin traveled from Milwaukee to Waukesha. By April of that year, service between the two cities included a daily freight train and a daily passenger train. Expansion westward from Lake Michigan to the Mississippi River was completed in 1857 with rail depots, first in Prairie du Chien then in La Crosse in 1858 (*15*).

"The introduction in the mid-19th century freed business and industry from the need to locate near sea, river, and canal ports. Within a matter of decades, railroads opened much of the interior of the country and freight transportation costs dropped." (*16*) This was the case in Wisconsin, where producers of raw materials received "better prices and expanded marketing opportunities" (*17*) from being reliably connected to markets and population centers on the east coast, despite not being located along a main Atlantic-Pacific route.

With more than 7,600 miles and at least one depot in every county, the state's network reached its peak during the 1920s (*18*). Noted by James P. Kaysen in 1937 were two factors impacting the railroad network's expansion and contraction within the state: being situated between the Great Lakes (particularly Chicago) and the Northwest, and its "vast timber resources of the north half of the state." Impacts from these factors can still be seen in the evolution of the state's network today.

The 1970s brought a laundry list of headwinds to face the railroads. These included, among other things:

- Out-of-date and overbearing government regulations.
- Increased modal competition from substantial public investments in both an interstate roadway and inland waterway systems.
- Deferred infrastructure maintenance.
- General financial deterioration within the railroad industry as the overall economy experienced energy supply shocks (notably in 1973 and 1979), an economic recession (1973-1975), and the passage of the Railroad Revitalization and Regulatory Reform Act of 1976, which loosened regulations on rates, line abandonment, and mergers (*9*).

A number of railroad companies went bankrupt during this time, including the Milwaukee Road (*19*). The impact on Wisconsin's rail network was considerable. According to the *Wisconsin Rail Plan 2030*, Wisconsin ranked number one in the nation in terms of rail miles proposed for abandonment and number three in rail miles at risk for abandonment. "By 1975, almost 1,300 miles

of track in Wisconsin (22 percent of the state's rail network) was threatened with abandonment." The Milwaukee Road's bankruptcy alone accounted for nearly one quarter of the state's rail miles (one half of southern Wisconsin's), and impacted service to the state's eight largest cities, 16 of the largest 20 cities, and a total of 184 communities.

Wisconsin legislators responded with the 1977 Freight Railroad Preservation Program (Statutes 59.968 and 66.30) in order to "preserve and continue freight rail service throughout the state." (*20*) The legislation allowed an individual county or groups of counties to form rail transit commissions in order to acquire rail infrastructure (i.e. rail lines, ties or bridges), rehabilitate rail infrastructure, and operate rail lines via lease or contract with a railroad service provider over land that is owned by the Wisconsin Department of Transportation (WisDOT). It also gave WisDOT the "first right of acquisition" to purchase any abandoned rail rights of way, and allowed the agency to direct state dollars to local governments to assist with rail infrastructure investments or operations. By 1980, the program had already preserved nearly 500 miles of operating rail track that may have otherwise been abandoned.

Federal legislators also acted with the passage of the Staggers Rail Act of 1980 to "provide for the restoration, maintenance, and improvement of the physical facilities and financial stability of the rail system of the United States." Congress found, among other things, that most transportation within the country at that time was competitive, that regulations concerning railroads had become "unnecessary and inefficient," that railroad industry earnings were the lowest when compared to other transportation industries and were not adequate to cover needed capital improvements, and that "modernization of economic regulation for the railroad industry with a greater reliance on the marketplace" was "essential in order to achieve maximum utilization of railroads." (*21*) The Staggers Act gave railroad companies the ability to consolidate and restructure their networks in order to remove non-profitable and/or redundant portions, increased pricing flexibility allowing them to compete with both other railroad companies but also with other modes, and made it easier to sell rail lines to new, short line railroads. In the Staggers Act, pricing flexibility included the legalization of railroad-shipper contracts, improving the railroad companies' ability to service its customers and plan for future asset utilization.

Impacts from the Staggers Act have been considerable. The Office of Rail Policy and Development of the Federal Railroad Administration reports a 65 percent reduction in train accident rates between 1981 and 2009, and an improved financial condition for the industry with yearly investments of $6 billion by the industry to improve infrastructure and equipment. A total of $511 billion in rail capital improvements and maintenance expenditures were made between 1981 and 2009 (*22*). The AAR highlights a number of positive impacts including:

- Improved market share when measured in ton-miles: now above 40 percent after a steady decline from 75 percent in the 1920s to 35 percent in 1978.
- Improved return on investment: after declining for decades, the railroad industry posted, on average, an ROI of 4.4 percent in the 1980s, 7.0 percent in the 1990s, and 9.4 percent between 2000 and 2014.
- An increase in worker productivity: up 139 percent since the Act's passage.
- A decline in rates: a 43 percent reduction in average inflation-adjusted rail rates mean "the average rail shipper can move close to twice as much freight for about the same price it paid more than 30 years ago."
- Proliferation of new, short line and regional railroad companies providing service: about 45,000 rail miles in 49 states and employing 18,000 people. (*23*)

The *Wisconsin Rail Plan 2030* points out the combination of deregulation in the railroad industry from the Staggers Rail Act of 1980 and deregulation in the trucking industry from the Motor Carrier Act of 1980 "changed the face of the freight railroad industry."

Not all of the effects of the Staggers Act were positive for the rail system. By 1986, rail lines servicing freight in Wisconsin dropped by over 2,000 miles. Efforts by WisDOT and regional transit commissions preserved over 200 of these rail miles for public usage. Ultimately, between 1980 and 1989 roughly one fifth of the state's network (1,200 rail miles) was permanently abandoned (*24*). In 1992, Wisconsin legislators expanded the pool of rail stakeholders eligible for state funding to include rail carriers. WisDOT also modified the original grant-based rail preservation program into its current state and created a revolving loan program called the Freight Rail Infrastructure Improvement Program (FRIIP).

Wisconsin's freight rail network continues to evolve as the state seeks to balance an inherent mismatch between the needs of Wisconsin shippers and the goals of Class I rail carriers. The geographic locations, shipping needs and characteristics of Wisconsin shippers are not always aligned with Class 1 rail carriers' desire to optimize their transportation networks and their economic and business models. This is illustrated through the continual buildup of rail corridor miles that are state owned or operated by the Rails-to-Trails Conservancy (RTC), including the acquisition, rehabilitation, and construction between Kiel and Saukville, Fitchburg and Oregon, and Madison and Reedsburg. It can also be seen in the loss of freight rail service, particularly the loss of intermodal service in the Fox Valley region and, more recently, in Milwaukee.

Freight Rail System

In its 2014 report, *Moving Freight in Wisconsin: Accomplishments and Emerging Issues*, WisDOT inventoried the state's rail network at 3,300 miles of track with approximately 600 of those being state owned. In total, 13 separate railroads operate in the state including four Class 1's (the Burlington Northern-Santa Fe, Canadian National, Canadian Pacific, and Union Pacific), six short line or regional (the Escanaba & Lake Superior, East Troy Railroad Co., Progressive Rail, Tomahawk Railway, Wisconsin Great Northern, and Wisconsin & Southern Railroad), and three switching and terminal operators (the Madison Terminal Railway, LLC, Rail & Transload Inc., and the Port of Milwaukee). What follows is a brief description of the various freight railroad networks operating in Wisconsin. For a more detailed description, including the geographical locations of divisions and historical references, see WisDOT's *Wisconsin Rail Plan 2030*.

Burlington Northern-Santa Fe (BNSF)

The BNSF Railway network consists of 32,500 route miles covering 28 states (most of which are west of the Mississippi River) and three Canadian Provinces. It currently operates 25 intermodal facilities with the closest to Wisconsin being located in the Chicago region (four terminals) and in Minneapolis (one terminal). It services the five major east-west gateways in the United States (Chicago, St. Louis, Kansas City, Memphis, and New Orleans), and nine international gateways (five to Mexico and four to Canada) (*25*).

The BNSF Railway in Wisconsin measures about 276 miles and runs along the Mississippi River corridor between the Minnesota and Illinois borders. The rail line carries primarily overhead traffic through Wisconsin, which serves as the connection between Chicago and the Twin Cities, thus providing access to markets in the northwest (Portland, Seattle, and Vancouver) and their subsequent connections to Asia. It also maintains rail lines in Superior, WI to service the Twin Ports of Duluth-Superior and coal shipments from the western United States (*26*).

Canadian National (CN)

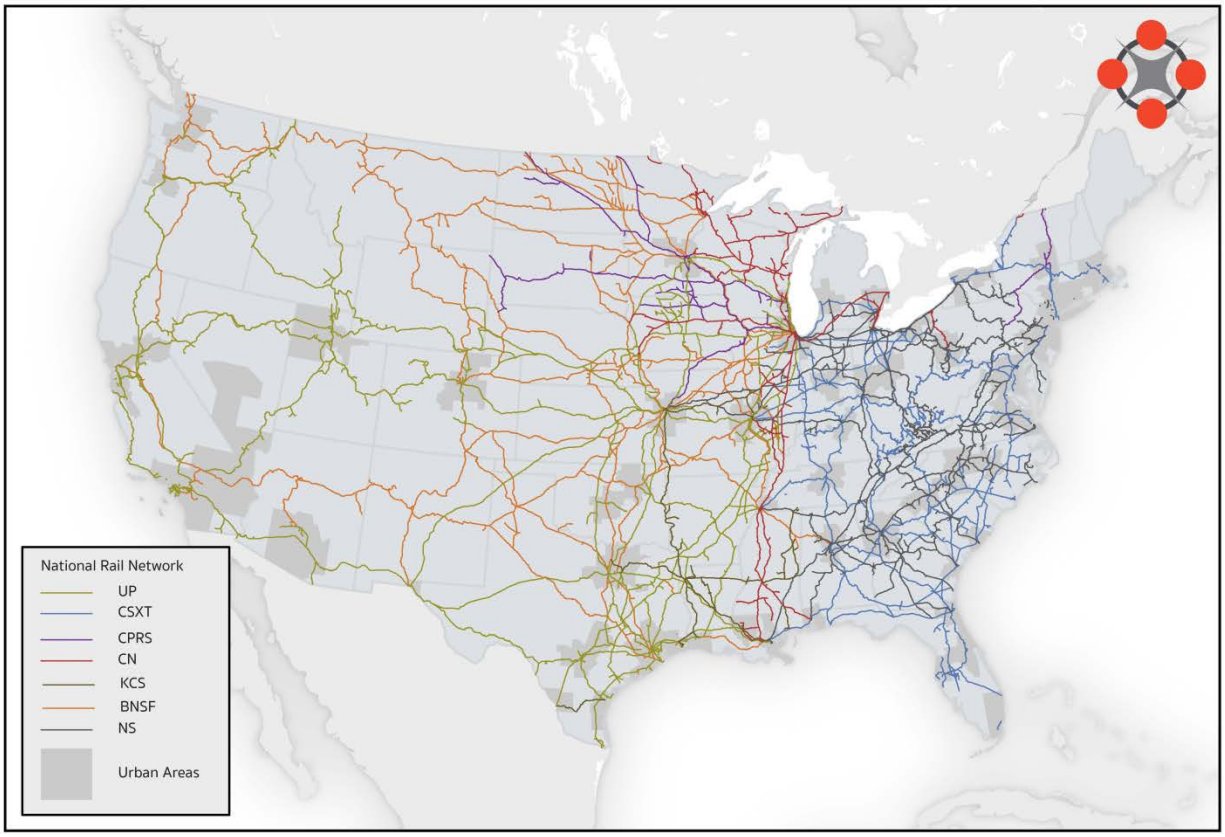
The Canadian National railways covers nearly 20,000 miles and provides services to and connections between 10 international maritime ports on three separate coasts: the West Coast (3), the East Coast (5), and the Gulf Coast (2). The CN network operates 20 intermodal facilities including terminals in the major east-west gateways of Chicago, Memphis and New Orleans (*27*).

The CN network is the largest rail network in Wisconsin, operating approximately 1,578 miles of track (*28*). The main line travels south east from Superior to Neenah via Stevens Point, and then south to the Illinois border in western Kenosha County. It provides a connection between the Chicago region and Canada's west coast marine ports servicing Asian markets. Besides the main line, a number of branch lines provide service connections and extend in both the east-west and north-south directions. Within Wisconsin, CN operates a public intermodal facility in Chippewa Falls and a private intermodal facility in Arcadia. Additional intermodal access is provided for Wisconsin shippers by two terminals in the Chicago region (Chicago and Joliet) and one terminal in Minneapolis, MN.

Canadian Pacific (CP)

The Canadian Pacific rail network covers roughly 14,000 miles in Canada and the United States. The Canadian portion on the network spreads east-west from Montreal to Vancouver, while the U.S. portion is found in the Midwest (North Dakota, Minnesota, Wisconsin, Illinois, Iowa, Missouri, and Kansas) and the East Coast (Pennsylvania and New York). Its network provides intermodal service at 10 facilities (three in the United States and seven in Canada) and transload services at over 150 locations (84 in the United States and 77 in Canada). It also provides access to two east-west gateways: Chicago and Kansas City.

Within Wisconsin, CP's network equates to over 310 miles, and serves as Amtrak's Empire Builder line between Chicago, Milwaukee and Minneapolis, as well as the Hiawatha Service between Chicago and Milwaukee (*29*). The mainline begins in La Crosse and travels eastward to Camp Douglas, turns southeast to Milwaukee, and then heads south to the Chicago region. It also has track connecting Superior to Duluth, MN and a small-branch line extending from the Illinois border to Janesville. Additionally, it services other areas of the state via trackage rights, haulage rights, and leased lines. Wisconsin shippers can access the network via intermodal terminals (one in the Chicago region and one in the Twin Cities), ten transload locations in Wisconsin, and along CP's line along the Mississippi River corridor at various points in Minnesota and Iowa.



Map 2.1 Class 1 Railroad Network of the United States

Union Pacific (UP)

The Union Pacific rail network includes over 32,000 miles of rail track in 23 states, and provides service to every major marine port on the West and Gulf coasts, each of the five major east-west rail gateways (Chicago, St. Louis, Kansas City, Memphis, and New Orleans) and all six major international gateways with Mexico. In total, it reaches about 7,000 communities, and can trace its history in Wisconsin back to 1858 when track was laid on the St. Croix River north of Hudson.

The UP owns about 927 miles of track in Wisconsin. The main line connects Minneapolis to Chicago and runs southeast from Hudson to Milwaukee, and then south from Milwaukee to the Chicago region. It also services communities between Milwaukee and Sheboygan and communities in Jefferson, Rock, and Walworth counties via branch lines (*30*).

Wisconsin & Southern Railroad (WSOR)

The Wisconsin & Southern Railroad operates on 802 miles of rail lines in Wisconsin and Illinois, servicing a total of 20 counties in southern Wisconsin and one county in northeastern Illinois. Most of its main and branch lines are former Milwaukee Road tracks that were proposed for abandonment during the late 1970s and early 1980s. It operates three terminals (Horicon, Janesville, and Madison) and provides warehousing and transloading services at a number of locations throughout its network. It provides access to the Mississippi River at Prairie du Chien and provides opportunities to interchange with Class 1 railroads in Janesville (CP and UP), Madison (CP), Milwaukee (CP), Granville (UP), Slinger (CN), and Crawford (BNSF), as well as access to all Class 1's and a host of short line railroads via trackage rights south from Milwaukee and southeast of Fox Lake into the Chicago region (*31*).

Escanaba and Lake Superior

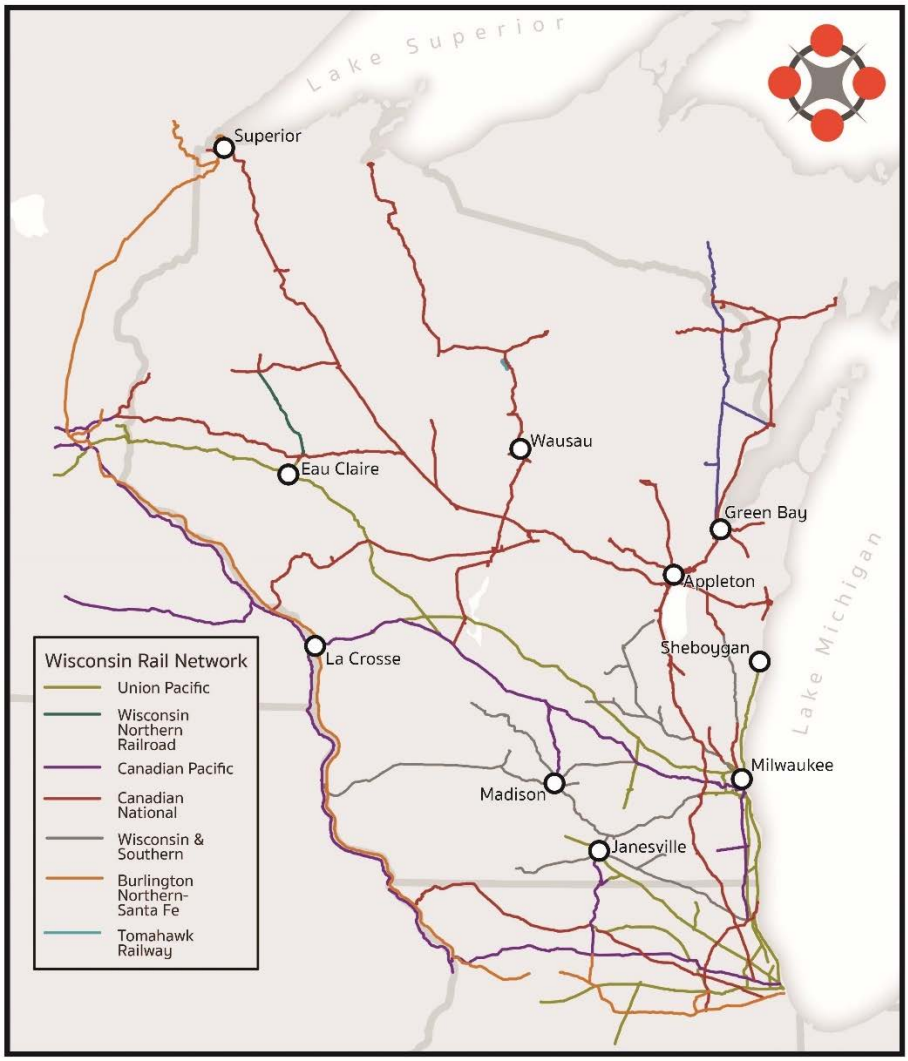
The Escanaba and Lake Superior Railroad Company operates over 235 miles of rail track in northeastern Wisconsin and the Upper Peninsula of Michigan. Its main line extends north of Green Bay to the Michigan border at Iron Mountain, MI. It has two branch lines in Wisconsin connecting Oconto Falls and Marinette to the main line, and connects with the CN in Green Bay, Marinette, and Pembine (*32*).

Tomahawk Railway (Genesse & Wyoming)

The Tomahawk Railway is a shortline railroad operating six miles of track in the Tomahawk area. It connects with the CN and provides warehousing and transloading services (*33*).

Wisconsin Northern Railroad (Progressive Rail, Inc.)

The Wisconsin Northern Railroad is a shortline railroad operating in Chippewa and Barron Counties. It connects with the UP in Norma and services six communities, including Chetek, New Auburn, and Bloomer (*34*).



Map 2.2 Wisconsin Railroad Network.

Freight Market

The state's freight network of roadways, railways, waterways, and airways supports the movements of goods that can be classified as either originating within, terminating within, both originating and terminating within, or passing through Wisconsin. In general, these aggregated freight flows can be described as truck heavy with significant volumes of overhead traffic (freight that does not originate from or terminate in Wisconsin).

Data from the 2012 Commodity Flow Survey (CFS) in Tables 2.1 and 2.2 show the unbalanced nature of Wisconsin's freight system: more freight (257,515 thousand tons) terminates within the state than originates (234,984 thousand tons). Using the Freight Analysis Framework (FAF) dataset to separate freight movements into those that occur within the state (229,895 thousand tons), are exported from (107,185 thousand tons), or imported to the state (152,941 thousand tons), amplifies the unbalanced ratio while also highlighting the amount of freight moving from one point in Wisconsin to another. However, both datasets show that when evaluating freight movements by their associated dollar value, Wisconsin brings in more money from the goods it produces and ships out of the state. The CFS data shows a positive balance of approximately $43.6 billion, but when accounting for movements just within the state ($141.1 billion). The overall trade balance is estimated at $3.2 billion ($180.9 billion worth of goods from Wisconsin and $177.7 billion to Wisconsin). Both datasets also point to an imbalance of freight rail tonnage: CFS data puts it roughly at a 2.75-to-1 ratio of 2012 terminating-to-originating tons and the FAF estimates the 2013 ratio to be 3.25-to-1 (65.04 million tons imported into Wisconsin, 20.07 million tons exported from, and 1.98 million tons within).

Table 2.1 Commodity Flow Survey Tonnage Data by Mode for the U.S., Midwest, and Wisconsin (2012).

	UNITED STATES		MIDWEST REGION				WISCONSIN			
*Tons (thousands)			*Originates*		*Terminates*		*Originates*		*Terminates*	
All Modes	**11,299,409**		**3,126,301**		**3,157,909**		**234,984**		**257,515**	
Truck	8,060,166	71.3%	2,263,674	72.4%	2,234,379	70.8%	199,171	84.8%	194,165	75.4%
Rail	1,628,537	14.4%	500,509	16.0%	607,221	19.2%	19,265	8.2%	53,147	20.6%
Other	1,341,322	11.9%	269,691	8.6%	255,100	8.1%	12,567	5.3%	8,829	3.4%
Truck & Rail	213,814	1.9%	77,375	2.5%	37,842	1.2%	3,981	1.7%	1,374	0.5%
Rail & Water	55,570	0.5%	15,052	0.5%	23,367	0.7%	0	0.0%	0	0.0%

Table 2.2 Commodity Flow Survey Value Data by Mode for the U.S., Midwest, and Wisconsin (2012).

	UNITED STATES		MIDWEST REGION				WISCONSIN			
*Value (millions)			*Originates*		*Terminates*		*Originates*		*Terminates*	
All Modes	**$13,852,143**		**$3,687,506**		**$3,358,138**		**$311,937**		**$268,383**	
Truck	$10,132,229	73.1%	$2,812,420	76.3%	$2,608,385	77.7%	$253,057	81.1%	$218,306	81.3%
Rail	$473,070	3.4%	$172,783	4.7%	$147,186	4.4%	$6,912	2.2%	$7,842	2.9%
Other	$3,014,035	21.8%	$602,618	16.3%	$558,325	16.6%	$47,637	15.3%	$40,248	15.0%
Truck & Rail	$224,833	1.6%	$98,054	2.7%	$41,186	1.2%	$4,331	1.4%	$1,987	0.7%
Rail & Water	$7,976	0.1%	$1,631	0.0%	$3,056	0.1%	$0	0.0%	$0	0.0%

According to data estimates from the AAR (Table 2.3), Wisconsin's freight rail imports and exports could be described as being top heavy and concentrated: 32,913,000 tons (or 57 percent) of Wisconsin's import rail traffic in 2012 was coal, and 10,036,000 (49 percent) of its exported rail traffic was stone, sand, and gravel. Wisconsin's use of coal in the creation of electricity (over half of its total 2012 production) and the state's prominence in frac sand production were drivers in total tonnage terminating and originating in the state. Nationally, Wisconsin ranked fifth and second for those commodities respectively. Government regulations, political forces, and economic shifts in global, national and local scope will substantially impact these key Wisconsin freight rail markets going forward.

Table 2.3 Wisconsin's Top Commodity Data by Tonnage and Value from the American Association of Railroads Data (2012).

	Commodity	Tons		Carloads	
Originated Rail Traffic	Stone, sand, gravel	10,036,000	49%	97,800	43%
	Farm Products	3,373,000	16%	34,000	15%
	Ground Minerals	1,390,000	7%	14,000	6%
	Lumber & Wood	1,030,000	5%	14,000	6%
	Chemicals	995,000	5%	10,800	5%
	Other	3,801,000	18%	59,500	26%
	TOTAL	**20,625,000**		**230,100**	
Terminated Rail Traffic	Coal	32,913,000	57%	276,200	50%
	Metallic Ores	8,449,000	15%	78,600	14%
	Farm Products	3,148,000	5%	30,800	6%
	Pulp & Paper	3,022,000	5%	36,200	6%
	Chemicals	2,743,000	5%	29,500	5%
	Other	7,215,000	13%	106,200	19%
	TOTAL	**57,490,000**		**557,500**	

CFS data also show that, when compared to the entire United States or to the Midwest Region, Wisconsin's freight system relies more heavily on the trucking industry to export raw materials, intermediate goods, and finished products. The trucking industry captured about 85 percent of Wisconsin's export tonnage versus roughly 72 percent for both the Midwest and national markets. Wisconsin exports, when measured in dollars, show a similar relationship, with trucking capturing 81 percent of Wisconsin exports versus 73 and 76 percent for the United States and Midwest Region, respectively. The trucking industry also moves a larger percentage of Wisconsin's imports by tonnage and value when compared to the United States and Midwest Region. Freight rail's market share of Wisconsin's originating tonnage and its originating and terminating value all lag what is seen across the entire United States and within the Midwest Region, but it captures about the same percentage of terminating tonnage as rail freight does across the larger Midwest Region, which is more than U.S. average.

The amount of freight that simply passes through the state is substantial. The Wisconsin Rail Plan 2030 reports that roughly 65 percent of the value of all goods utilizing the Wisconsin freight network in 2007 would be classified under one of the "within" categories, with the remaining

percentage consisting of freight that is passing through, or overhead traffic. In particular, the state's rail network devotes an even larger portion of its capacity to accommodate overhead traffic. Figure 2.4 shows rail tonnage data points from 1996-2000, 2007, and 2011-2014. While each type of rail move experienced positive growth between 2000 and 2007, overhead traffic increased the most, capturing 47 percent of rail tonnage by 2007 (86.3 million tons). This is almost as much as originating (10 percent and 19.1 million tons) and terminating (43 percent and 79.2 million tons) rail moves combined. Furthermore, 2007 rail intermodal traffic over the Wisconsin freight rail network measured in at 18 million tons with overhead traffic capturing over 96 percent of the tonnage. More recently, the increases in Bakken oil being shipped across Wisconsin to eastern refineries has caused drastic increases in overhead rail traffic.

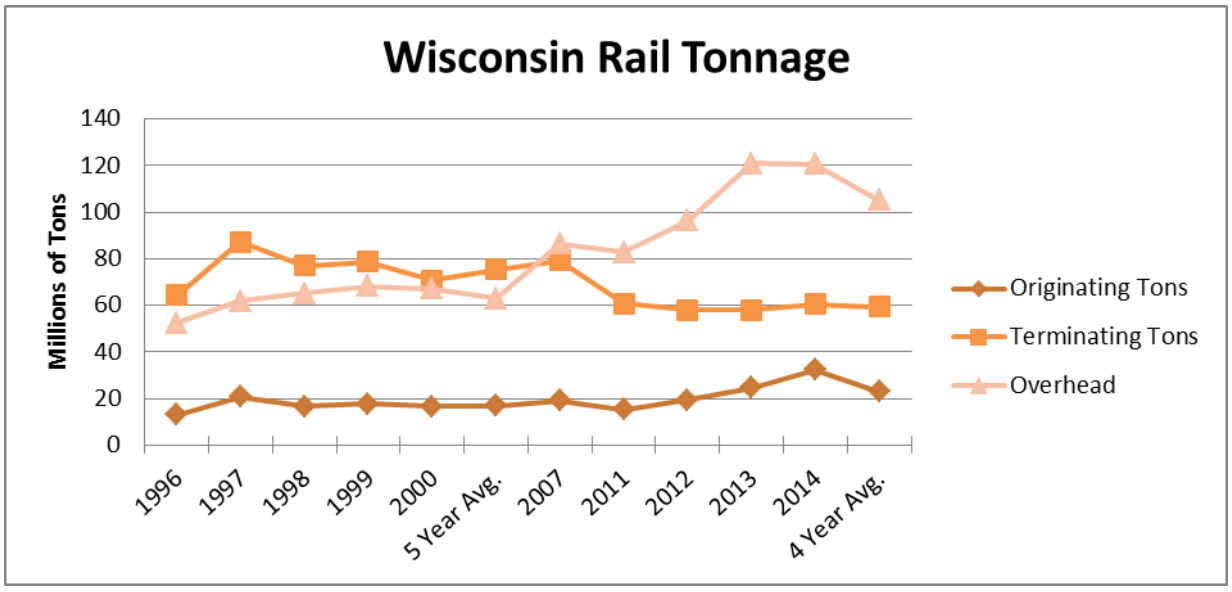


Figure 2.1 Wisconsin Rail Tonnage Data by Type of Move (1996-2000, 2007, and 2011-2014)[1].

Economic Impact

The transportation industry impacts the economy in two distinct ways. The first is through the production of transportation-related goods, such as cars, trucks, motorcycles, railroad locomotives and cars, airplanes, and boats, together with the component parts and systems required to form these finished products. These goods also contribute through the economic multipliers of their associated commerce and service activities. The second, and more pervasive, role of transportation is as an "input into the production process" (*35*) of all other industries. Transportation is a key component of the process as raw materials, intermediate goods, and finished products move from place to place through supply chains. This function, whether provided in-house or outsourced, represents a cost to shippers and, ultimately, is a factor into whether a company can compete in domestic and global markets (*36*).

"Wisconsin has a diverse multimodal transportation system that supports the state's quality of life and economic growth. Rail is a critical component to the state's entire transportation network." (*37*) Among other things, freight rail's positive contributions include:

[1] Data for 1996 through 2000 and the five-year average came from WisDOT's WI Rail Issues & Opportunities Report (2004); data for 2007 comes from WisDOT's WI Rail Plan 2030 (2014); and data for 2011-2014 and four-year average comes from a WisDOT data file.

- Improved efficiency of the entire multimodal transportation system
- A low-cost and energy-efficient mode for many of the state's diverse industries with particular benefit for shippers of high-volume, lower value, or heavy commodities and goods
- Reduction in costs associated with inventories and warehousing when rail cars are utilized within the supply chain as "moving warehouses"

Two previous studies have analyzed the impacts from the rail industry on Wisconsin's economy in terms of generated jobs, incomes, and taxes: WisDOT's *Economic Impact Analysis: Saukville to Kiel Railroad Abandonment* from October of 2004 and UW-Extension's *Economic Contributions of the Railroad Industry to Wisconsin: A Focus on the Publicly-Owned Railroad System in Southern Wisconsin* from January 2013.

The first study was initiated when, in June of 2014, The Wisconsin Central Ltd. filed an application seeking to abandon the approximately 37-mile Plymouth Line north of Saukville and south of Kiel due to light volumes (206 carloads in 2003 and 199 in 2002), extensive deferred maintenance (*38*), and insufficient revenues (realized and forecasted) to support necessary rehabilitation investments[2]. At the request of local businesses, residents, officials, and state representatives from the six impacted communities, the Wisconsin Department of Transportation conducted an economic impact analysis to address concerns regarding the loss of freight rail service to the region (*39*). Through a series of interviews with the seven businesses utilizing the rail line, the authors determined the direct, indirect, and induced impacts on the economy including jobs, income, and tax revenue. The WisDOT also interviewed non-rail-served businesses within the communities and public officials to forecast potential future freight rail service demand that might be generated from a modal shift or planned rail-served industrial parks. Findings included:

- The seven rail-served businesses directly accounted for 145 year-round jobs and $5.8 million in income, and indirectly accounted for, or induced, another 109 year-round jobs and $3.9 million in income. If forced to divert rail shipments to truck, the businesses would realize an increase in annual costs of approximately $210,000.
- A strong consensus emerged from those interviewed that freight rail service is an important recruiting tool, that loss of service would diminish the communities' abilities to keep existing and recruit new businesses to the area, and that the rail corridor needed investments to rehabilitate it.
- Three businesses within the corridor were potential users, and future demand would come from industries involving farm products, lumber, pulp and paper, non-metallic minerals, rubber and plastics, and food processing.
- Impacts from two future rail customers both employing 60 people would directly result in an additional $4.9 million in personal income, as well as 186 indirect and 65 induced jobs with associated personal income of $11.2 million and $73 million in economic activity.
- Four of the communities indicated at least conceptual plans for future rail-served industrial parks, and 10 instances from the preceding two years were identified where businesses with rail needs had expressed interest in locating in the region.

Southern Wisconsin businesses served by the publicly owned railroad system were the subject of the second study, an economic impact analysis published by Steven Deller at University of Wisconsin–Extension in January of 2013. Researchers were interested in the economic impact of losing freight rail service on businesses located on one of the four publicly owned freight corridors: Wisconsin River, East Wisconsin Counties, the Pecatonica, and the Pink Lady. They derived results by analyzing business responses to the potential scenario of not having access to freight rail services. Businesses were asked to select among three choices: cease operations, relocate to

[2] In March, 2015, a $19.1 million rail restoration project began on an 11-mile stretch of rail corridor adjacent to this line from Plymouth to Kohler. Project plans also include consideration of constructing a multimodal facility. http://www.wisbusiness.com/1008/150325_Sheboygan_Economic.pdf

an area with rail services, or shift to other means of transportation, such as trucking. A good number of shipper responses were provided, and in general, the results showed a "majority of firms would shift to trucking and continue operations, albeit with lower profits." Other key findings included:

- 60.5 percent of surveyed firms employed less than 50 employees and were more likely shipping smaller volumes over rail, making a shift to trucking more likely. Roughly, only 20 percent of businesses employed more than 150 people.
- Businesses from the plastics and the lumber and wood products industries represented the largest portion of the sample followed by businesses in the grain and grain by-products industry and businesses shipping fertilizer. However, these businesses do not represent the highest volume shippers which were the rock, limestone, and sand shippers.
- 83.3 percent of businesses reported rail service to be either "somewhat" or "very" important to their business (22.6 and 60.7 respectively).
- Using the most conservative scenario, businesses responding that they were "very likely" to close or relocate, represented 5,900 jobs, $309.6 million in labor income, $506.8 million in total income, $964.2 million in industry sales, and $56.6 million in local and state government tax receipts from direct, indirect, and induced economic activity.

Public Agency Support

Federal Push

With the signing into law of the FAST Act by President Obama on December 4, 2015, Congress created a National Multimodal Freight policy to be administered by USDOT. This policy provides direction and a framework for officials at the state and local levels to follow as freight becomes further integrated into the policy, planning, and programming efforts of transportation agencies across the nation. The program's goals include the increase in the safety, efficiency, and reliability in the movement of freight; the generation of national or regional economic benefits and an increase in the economic competitiveness of the United States; the reduction in highway congestion; and the improvement in the connectivity between modes of freight transportation.

Taking into account the multimodal nature of the transportation system, limited funding opportunities are available for projects through Sec. 1105. *Nationally Significant Freight and Highway Projects* (a competitive grant program) and Sec. 1116. *National Highway Freight Program* (formulaic funding). Eligible projects include those that are "a freight intermodal or freight rail project" or are "within the boundaries of public or private freight rail or water facilities (including ports), and that provide surface transportation infrastructure necessary to facilitate direct intermodal interchange, transfer, and access into or out of the facility." Types of facilities specifically mentioned in the Act include grain elevators and agricultural, mining, forestry, and intermodal facilities. Previous iterations of the TIGER Grant program have had similar aims and targeted similar multimodal projects as those described within the FAST Act. Since 2009, seven TIGER programs have dedicated nearly $4.6 billion in funds for improving multimodal projects across the country with roughly 21 percent ($985.4 million) supporting rail infrastructure (*40*).

The Act also requires USDOT to create a National Strategic Freight Plan every five years as well as an associated National Multimodal Freight Network. Through the process of creating a network at the National level, it is hoped states will mirror the efforts in order to better inform USDOT as to components of the national network but also to identify the components of the network that may not rise up to national prominence but has impact at the state and local levels.

State Efforts

In its long-range multimodal transportation plan *Connections 2030*, the WisDOT lays out its vision for the state's transportation system as "an integrated multimodal transportation system that maximizes the safe and efficient movement of people and products throughout the state, enhancing economic productivity and the quality of Wisconsin's communities while minimizing impacts to the natural environment." Through various stated policies that act as guides for planning efforts and funding programs, WisDOT has supported, and continues to support, the freight rail network and its integration within the state's multimodal system.

WisDOT explicitly connects three of its stated policies to the freight rail system. In doing so, the agency highlights its role as a provider of funding and technical support for rail improvements. Since WisDOT does not provide any freight rail service, this also demonstrates a goal to increase the reach of freight rail service through acquisitions and coordination. The first policy listed in *Connections 2030* is to "Partner with stakeholders to ensure that freight movements are safe, reliable and provide positive environmental and community impacts." With this, WisDOT takes on the role of a "facilitator" and "advocate" between interested parties, which are varied. Stakeholders include, from the private sector, the freight carriers (railroad, trucking, and marine shipping companies), freight shippers (Wisconsin businesses), terminal operators, and third-party logistics firms and, from the public sector, local transportation agencies such as metropolitan planning organizations and regional planning commissions, local municipal and county governments, marine ports, the Federal Railroad Administration, and the Wisconsin Office of the Commissioner of Railroads. An indication of these efforts include the recently created Freight Advisory Committee, the annual Freight Railroad Conference, continual support of rail transit commissions, and past Governor's Conferences on Freight. In particular, the dynamic and interactive nature of this policy is evidenced with the production of the 2013 *Wisconsin Northwoods Freight Rail Market Study* in response to a lack of freight rail service in northern Wisconsin identified by stakeholders during the first Governor's Conference in November of 2011.

The second freight rail-related policy in *Connections 2030* is to "Ensure that freight rail remains a viable transportation mode for Wisconsin shippers." With this, WisDOT continues to invest in the state's publicly owned railroad system by acquiring rail lines when appropriate, funding projects focused on track and bridge improvements, and preserving abandoned rail corridors by purchasing rights of way for future rail use. WisDOT also assists in maintaining Wisconsin shippers' connections to the rail system by supporting the development and continuation of rail transit commissions, which were specifically created in the late 1970s to allow state funding to be used for rail improvements. Currently, seven rail-transit commissions (RTCs) provide rail service in 34 Wisconsin counties (*41*). While the RTCs own the infrastructure and are responsible for any improvements (rail line, ties, ballast, and bridges), the land is owned by WisDOT and most activities, including the operations and maintenance, are contracted out to railroad companies (*20*). The RTCs represent public support at the local level.

The third explicit freight rail policy from WisDOT's *Connections 2030* is to "Support individuals and businesses related to transportation." WisDOT utilizes both grant and loan funding streams. While the Transportation Economic Assistance Program (TEA) is a multi-modal program that focuses on retained or new jobs for the state, the FRIIP and the FRPP are rail specific and focus on connecting shippers to the rail network. The stated purpose of the programs is to "help preserve or increase a community's tax base and provide funding to build projects that could not have been financed in their entirety by the private sector." Since 1989, the TEA program, which provides grants up to $1 million while requiring a 50 percent match from local governing bodies, has awarded $22,562,952 worth of grants accounting for 4,432 new jobs and 4,746 retained jobs over 82 different rail-related projects. Since 1985, the combination of 10-year, low- or no-interest FRIIP

loans, FRPP grants, and local funds have resulted in $326,966,974 worth of rail infrastructure investments[3].

Efforts supporting rail by WisDOT implicitly impact other stated policies in addition to those directly listed in *Connections 2030*. For example, by providing rail corridors that would otherwise have been abandoned, WisDOT positively impacts other policy goals, such as transportation efficiency and roadway safety, by removing trucks from the road and reducing congestion.

Challenges

Wisconsin's freight rail network, and shippers' utilization of it, faces a number of challenges that have been documented in a number of studies. As part of the effort to create the *Wisconsin Rail Plan 2030*, WisDOT surveyed rail stakeholders and the general public to identify the top rail issues, needs, and concerns. Among those identified as pertaining to freight rail were: limited capacity (weight and speed restrictions particularly on publicly owned portions), lack of rail network access via facilities to transfer freight between rail and other modes, and a lack of demand (or aggregated demand) for freight rail service. A lack of intermodal containers has also been identified and studied in the state as inhibiting shippers' ability to utilize the freight rail network.

These challenges should be understood via a system-within-system paradigm instead of as standalone issues. First, Wisconsin's freight rail network and system are set within the larger, national, and in particular, Class 1 network and system. Second, freight is a derived demand, and as such, is subject to global and macro-economic forces as well as regulation and policies set at the national and international levels of government.

Wisconsin's freight rail system is situated within a continental rail system. As a result, it can suffer when railroad companies seek to optimize their business models and individual rail networks. In particular, this can be seen in the Class 1 railroad companies' preference for unit trains over carload shipments servicing small shippers and the resulting positive return on investments to support such a model (*42*). As a result, small shippers with rail-competitive freight that "cannot guarantee large, consistent blocks of traffic that correspond to the operational needs of the railroads are increasingly forced to investigate alternative modes, usually truck." Researchers found this to be an issue when studying the Sauk to Kiel rail corridor. Operational costs associated with intermodal transfers of containers and trailers on flat cars (both within and between railroad companies) are also hampering the growth of domestic intermodal traffic. "As long as capital and capacity remains limited, domestic traffic will be undermined by the more profitable long-distance international traffic." (*9*) Besides the WSOR's network in southern and south eastern Wisconsin, the vast majority of rail service is provided by Class 1 networks.

Simple geography is an issue for Wisconsin shippers as the state and its rail network is situated just north of Chicago and east of the Twin Cities. The busiest transcontinental rail gateway in the country with over 1,200 comuter, intercity passenger, and freight trains a day (*43*), Chicago is the heart of the national and continental freight rail system. Chicago's proximity essentially creates a funnel for freight that wants to travel by rail. Both Wisconsin and non-Wisconsin freight originating in, or destined for, Asian markets or the Pacific Northwest access Chicago by traveling through Wisconsin via Superior or the Twin Cities, while Wisconsin freight from, or to, any other major U.S. market or international gateway travels through the Chicago gateway before moving on to its final destination. Because of the congested rail traffic in the region, getting through the Chicago gateway can take anywhere from hours to days, creating service and reliability issues for Wisconsin shippers. This Geography also challenges stakeholders interested in building additional intermodal ramps within the state. Class 1 railroads prefer draying Wisconsin freight over the roadways to either Chicago or the Twin Cities versus disrupting their networks by stopping trains to add or remove a small number of railcars along the way.

[3] See Appendix B and Appendix C for list of FRIIP, FRPP, and TEA projects and associated levels of job creation and funding.

With freight being a “derived demand,” a number of global variables stemming from participation in the economy can induce changes to freight flows including volume and the geography of freight being shipped as well as the mode chosen to accomplish supply chain tasks. Changes in the location of the world’s manufacturing activity during the late 20th century and into the 21st—a result from large discrepancies in global labor rates—impacted origin-destination pairs and the links within the multimodal transportation system supporting trade (*44*). This can be visualized as the West Coast ports and Class 1 railroad networks forming land bridges to the Midwest, Southeast, and East Coast metro regions. Recent history provides a look into economic forces playing a role in both the ramp-up and ramp-down in freight volumes and flows. “It must be acknowledged that the surge of American imports was based on a debt driven process supported by a massive wave of asset inflation, namely in real estate, enabling many consumers to borrow against the paper value of their equity…by late 2007, the global financial system began a phase of deflation with massive defaults and downward revisions of asset prices. This, in conjunction with an ongoing debasement of the US dollar led to a notable drop in port and rail traffic, but an increase in exports.” (*9*)

Responses to the 2007-2009 recession here in Wisconsin saw a modal shift to trucking to accommodate a slowdown in production and associated smaller volumes of inputs. Inertia then set in. Companies who had historically shipped via rail reconfigured manufacturing plants and shipping facilities to optimize for trucking. In order to switch back to rail, cost savings would have to be substantial to justify the reconfiguration of operations (*35*).

Recent increases in global oil production—U.S. shale production, in particular—have combined with a slowdown in global oil demand to dramatically lower the price of oil. Fluctuations in the price of oil impact the rail network on two fronts. First, lower costs associated with oil encourage shippers’ modal decisions. Lower costs typically encourage trucking while higher costs encourage rail. Second, increases in U.S. oil production have impacted traffic volumes on other portions of the rail network. For example, the increase of oil being transported by rail out of the Bakken Shale Play in the West, has at times stressed the entire network’s capacity and equipment availability. Ultimately, it has impacted the carriers’ ability to service other customers, particularly when it coincided with other stress-inducing events such as extreme weather or seasonal shipping spikes. Increases in shale oil production have also increased the volume of exported Wisconsin frac sand (*45*).

Policies and regulation must be mentioned, as well. Recent federal policies and regulation, with regard to the use of coal in the production of electricity, has drastically reduced the amount of coal demanded and, therefore, the amount carried by the railroads. U.S. railroads originated under 70,000 coal carloads toward the end of 2015 compared to roughly 95,000 toward the end of 2013 and 100,000 in 2014. When compared to year-over-year weekly coal carloads from 2013-2015 (ranging from 100,000 to 110,000), 2016 volume is off to an even rougher start, averaging just 75,000 (*46*).

The *2004 Wisconsin Rail Issues and Opportunities Report* highlighted capacity issues for the state’s publicly owned railroad system: “Much of the existing state owned railroad track cannot meet future rolling stock and marketplace needs” as much of it was originally built to accommodate speeds and weights of a by-gone era. The *Wisconsin Rail Plan 2030* specifically discusses WSOR’s 10-year capital plan, which estimated annual costs to upgrade ties and rails to accommodate heavier car loadings at $16.3 million ($19.7 million per year if expanded to include all public line segments), as well as WisDOT’s analysis estimating a total of $29.5 million needed in capital improvements to rail bridges within the publicly owned railroad network to support the heavier loads. The need for capital improvements is not unique to Wisconsin: “A commensurate level of public and private investment needs to be made in inland intermodal transportation. Without improvements to increase capacity and improve speed, reliability, and the costs associated with intermodal and transmodal transfers (rail to rail), goods movement will remain dominantly serviced by trucking over increasingly congested highways.” (*9*)

In its draft of the *National Freight Strategic Plan*, USDOT discusses the relationship between intermodal connections and the ability of shippers to leverage "cooperation" between modes to positively impact the system's resiliency, reliability, safety, and security (*47*). A number of reports have highlighted the issue in Wisconsin as the closures of intermodal ramps in Green Bay, Neenah, Stevens Point, and most recently, Milwaukee have left Wisconsin with one in-state public ramp in Chippewa Falls and one in-state private ramp in Arcadia (*48*). The *WEDC Future Economic Study* recognized this and the WisDOT has recognized this as an issue for some time. Most recently, its *Wisconsin Rail Plan 2030* noted that the department "is committed to improving the state's intermodal connections." (*49*)

The lack of intermodal containers available to Wisconsin's shippers for shipping goods has negatively impacted their ability to ship internationally. According to the *Evaluating Export Container Pooling Options in MN, WI, and MI's Upper Peninsula* report, "Exporters in the upper Midwest have reported that they are unable to obtain a sufficient number of containers to load with export products." This can be particularly troublesome for shippers with irregular or small volumes.

The USDA prepares a weekly report—using up-to-date bookings and reservations—on the availability of various international shipping containers used in transpacific trade lanes by six carriers: COSCO, Evergreen, Hanjin Shipping, Hapag Lloyd, Yang Ming Transport Corporation, and OOCL. Figure 2.2 provides a snapshot of the supply issues in the Minneapolis region. This shows negative supplies of 40-foot dry, 40-foot high cube, and 40-foot refrigerated containers; zero supply of 20-foot refrigerated containers; and only 44 available 20-foot dry containers for the week of February 3-9, 2016. When projecting out into the following two weeks, all categories have negative or zero available containers. While there is a ready supply in the Chicago market, the container pooling report states high costs associated with draying the container to the shipper and then back to the intermodal rail head ($700-$800 plus a fuel surcharge according to drayage companies interviewed for the container pooling report) can make the freight move uneconomical. The report outlines a number of issues impacting the supply of containers in the study region, including, but not limited to:

- Lack of container depots in the study region
- Ocean shipping companies, the owners of the containers, seeking to maximize their equipment utilization (and return on investment) by limiting the length of time a container is not in use
- Increase in the transshipment of goods from an international container to a domestic container closer to the ocean ports of entry
- Chassis management
- Lack of tracking systems to locate empty containers

Table 2.4 USDA Container Availability Data for Minneapolis and Chicago (February, 2016).

Container Type	Week	Minneapolis	Chicago
20 Foot Dry	Feb. 3-9	44	1,383
	Feb. 10-16	-5	1,832
	Feb. 17-23	-22	2,484
40 Foot Dry	Feb. 3-9	-124	754
	Feb. 10-16	-165	802
	Feb. 17-23	-236	1,090
40 Foot High Cube	Feb. 3-9	-102	1,426
	Feb. 10-16	-66	1,614
	Feb. 17-23	-111	1,918
40 Foot Refrigerated	Feb. 3-9	-14	241
	Feb. 10-16	-17	232
	Feb. 17-23	-20	253
20 Foot Refridgerated	Feb. 3-9	0	7
	Feb. 10-16	0	1
	Feb. 17-23	0	-2

Container availability fluctuates greatly throughout the year (Figure 2.2 and Figure 2.3), and this variability also adds a level of uncertainty for shippers when deciding which mode to utilize.

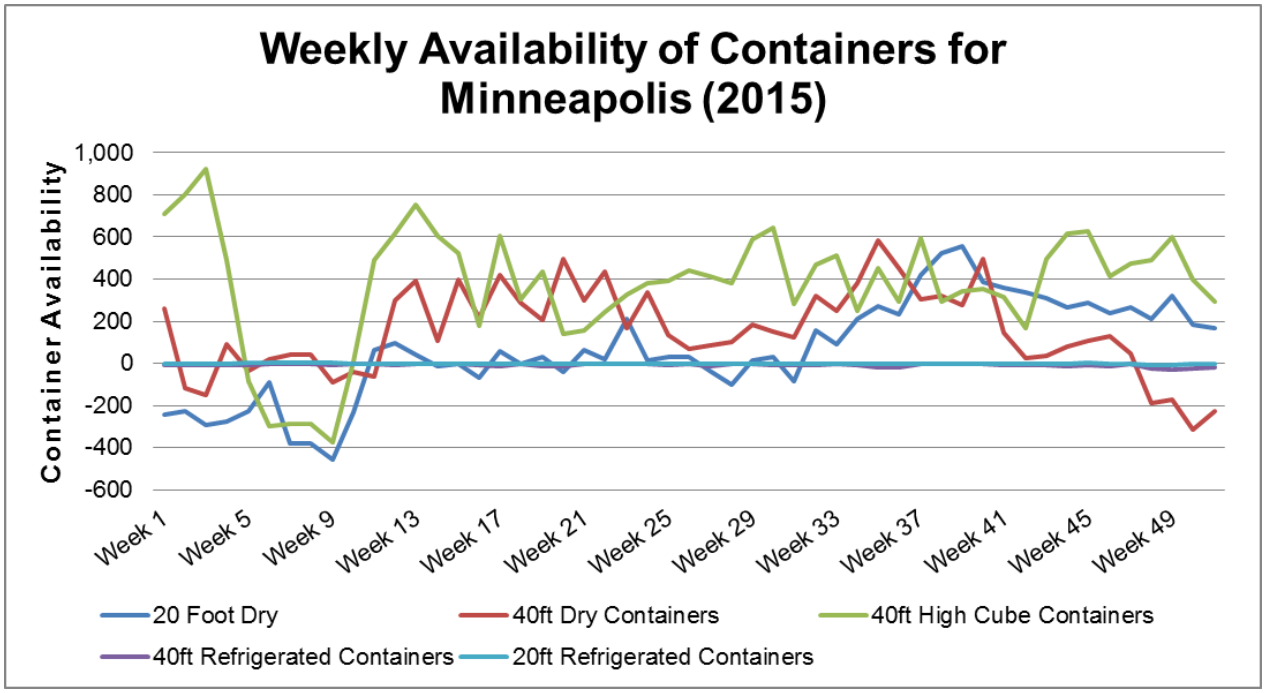


Figure 2.2 USDA Container Availability Data for the Minneapolis Region, 2015.

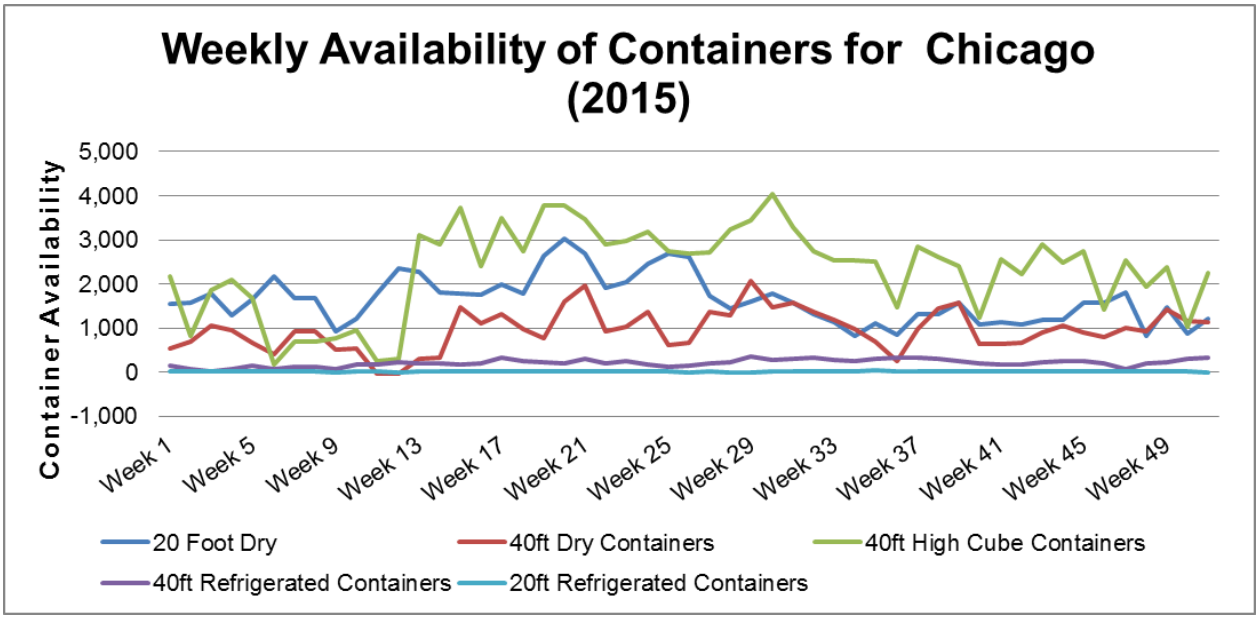


Figure 2.3 USDA Container Availability Data for the Chicago Region, 2015.

Chapter 3: Survey of Wisconsin Shippers

In 2015, twelve Wisconsin rail-served shippers were contacted about their railroad usage. Rail users were geographically diverse within the state of Wisconsin and represented a wide variety of products, including agriculture, salt, logs, paper, sand, stone, distribution/warehouse functions, plastics, fertilizer/chemicals, food products, recycled materials and scrap. Four additional shippers were contacted who had no rail sidings, but did use intermodal or transload networks.

Thirty-two questions were asked, which provided insight into four subject areas: 1) Operational Profile, 2) Logistics Profile 3) Rail Access and Freight Rail Use, and 4) Rail Funding and Resources. Surveys were conducted between March and August of 2015.

Summary

Among Wisconsin shippers who participated in the survey, those who use rail are growing at a faster pace than the national economy and employ more than 50 employees. More than 70 percent of the shippers served by rail indicate that rail service is a requirement for their suppliers or customers, therefore, it is essential to maintain service. Shippers who use rail count Midwest origins and destinations as the largest trading region with more than 60 percent of their suppliers and customers located within the Midwest. Rail shippers also note that destinations in the South, Canada, and to a lesser extent, Mexico and the Pacific Northwest are important transportation lanes. Rail shippers are moving product by rail over 1,000 miles and many own private fleets or have contract trucking arrangements or shuttle services to move product by truck from 40 to 400 miles. This allows the shippers to move smaller amounts of product short distances and, in some cases, accounts for first and last intermodal/transload miles. Several large rail users maintain rail spurs which can handle 13-50 rail cars at a time, many of these users have multiple production facilities and more than one railroad relationship. The largest rail users are shipping bulk products which are more efficiently handled in a rail network.

Many rail served shippers feel that railroads are difficult to deal with and dictate business relationships. Roughly half of the rail-served shippers is making facility improvements using internally generated funds. Most rail users note that the rail network needs some improvement to better handle their freight. Many were familiar with Wisconsin rail improvement programs but have not used them.

Shippers without rail spur service tend to be more favorable about rail access and operations. This non-rail segment uses transload and intermodal facilities mostly outside Wisconsin. Many note transload services are often not price competitive with truck.

Both rail-served and non-rail access customers felt that intermodal service was more reliable than carload service. Rail shippers note that, many times, the end user will dictate rail shipment; some note rail access is a requirement for doing business in the bulk chemical markets. Rail sales people and Third Party Logistics providers are counted as important sources of information. Additionally, websites for carriers are used frequently for planning purposes.

Railroads earn a medium mark for favorable relationships with customers and with industries reliant on rail shipments. Rail users reported that local communities tend to have an unfavorable view of railroads and cite them as being noisy and dirty and for creating traffic disruptions at grade crossings.

Operational Profile

Rail shippers tend to have a larger staff at the facility than non-rail shippers. Part-time and seasonal employees are more likely to be used at rail service facilities. Buyers tend to select or indicate inbound service requirements. Dispatchers or transportation planners tend to manage

outbound rail service relationships and service requirements. Most of the survey responders have more than 90 percent of their rail and truck traffic under some sort of contract, which precludes short-term mode switching.

Logistics Profile

Rail car shipments are loaded to 140,000 to 190,000 lbs. depending on the commodity and car type. Rail carload shipments move 1,200 to 1,500 miles on average, with some shipments to or from the West Coast moving 2,300 miles. Several shippers owned their own trucking fleets and used rail. In these situations, the trucks were used for short-haul transportation ranging from 40 miles (moving sand to transload facilities) to 300 miles (full truckloads used for regional delivery). For-hire trucks were used for shipments of 400-500 miles. Intermodal shipments were used in 1,000- to 2,000-mile lanes but were loaded with less average weight than trucks.

Rail shippers often mentioned several facilities within the state both on Class 1 and short line rail networks. Investments have been made in rail spurs, however, one large truck and intermodal user indicated that they eliminated their rail siding to expand their manufacturing facility.

Most rail-served facilities indicate extended hours of operation, especially during seasonal periods.

Without exception, Wisconsin shippers are concerned about truck capacity and a driver shortage. Some have tried to become more truck friendly, many are concerned about the availability of long-distance trucking capacity. Others note truck shortages during seasonal peaks and for specialized tank fleets.

Rail Access and Freight Rail Use

When asked about rail access and use, rail-served shippers indicated that they use rail because it is more efficient (especially for bulk products) and it is less expensive than four equivalent trucks. Some note that suppliers or customers require rail services as a term and condition of doing business. Some reported that they use rail to hedge transportation capacity. Others, who expressed concerns over long-haul truck capacity, own their own local trucks to assure local capacity.

Interestingly, interviews revealed that some shippers, moving different products from one another, are sharing truck-to-rail transload facilities. One shipper specifically requested CN to open the Green Bay intermodal terminal; however, the tracks are no longer at that facility. Chicago was the most frequently mentioned intermodal terminal, followed by St. Paul, MN, Rochelle, IL, Chippewa Falls and Arcadia, WI. When asked if an intermodal facility within 200 miles of their facility would be of interest, many noted that the network connections are what drives the intermodal choice and, therefore, use would be dependent on the markets served by the facility. One shipper mentioned that density, service, and competitive prices were essential for intermodal service, and that those combinations in Wisconsin were not available. Several international shippers indicated that Chippewa Falls is full and does not meet their needs. Other intermodal users mentioned service and reliability is better when they use intermodal versus rail carload. This is important for the processed food manufacturers who must comply with freshness dates.

Transloading seemed to be a less popular rail option and to be perceived as often not cost competitive. Users noted transload use in Green Bay, Appleton, Milwaukee, Stevens Point, Windsor, La Crosse, and Winona, MN, and that transloads have to be nearby (40-60 miles) for the economics to work. Most users felt that an adequate number of transload facilities were available across the state. Non-rail served shippers mentioned they would use transloads more often if paid for by the shipper. Others mentioned that transload services often cost more than the value of the product shipped.

Some shippers noted investments in rail facilities in states that receive freight from Wisconsin may mean that rail service can be expanded within Wisconsin. Paper and logging industry respondents

named a rail car shortage as a barrier to doing business with the railroads. In particular, they noted declining market conditions that make it difficult to invest in rail and rolling stock improvements. Most shippers advised caution when it comes to rail investment, citing the need for rail service and transit time requirements before rail investments. Most mentioned that carriers and shippers both should have a stake in the investment. Many shippers mentioned current service levels as a barrier to moving more by rail.

When asked if losing rail service would be a show stopper or would require facility relocation, 70 percent indicted that business conditions require rail service. When asked what factors would influence a rail use increase or decrease, most mentioned that the economic conditions of purchasing industries (oil and gas) or the customer production/demand levels drive the quantities shipped. While some are concerned about truck availability, others named slow growth of rail use due to limited lanes served by their current carrier, monopolistic pricing, and unreliable service as key factors impacting growth.

Most rail shippers noted some tension (or a “medium” ranking on a scale of low/medium/high) in their rail relationships. Some cited seasonal issues (winter). Some objected to being told how to run their business in order to preserve rail service. Several felt that railroads were monopolies. Intermodal service was viewed more favorably, but access is limited. Log landings were mentioned as essential to the logging industry. Others said that service was more important than price and that service has been erratic and hard to plan around. When asked how their industry views the railroads, most gave “medium” scores. One commented that railroads are a necessary evil that are often difficult to deal with. Shippers mentioned that often community neighbors have a negative (“low” ranking) view of railroads, naming noise, dirt and blocked crossings as points of pain for neighborhoods.

Rail Funding and Resources

Three shippers mentioned rail investment projects underway at their facilities or at their customer facilities. These investments are primarily self-funded. Rail spurs need ongoing maintenance and those costs are paid for by the shippers. Several shippers mentioned that rail network improvements were needed, namely weight-restricted loadings and a need for more log landings and rail cars.

Shippers were aware of WisDOT’s Freight Railroad Infrastructure Improvement Program (FRIIP), Freight Railroad Preservation Program (FRPP), and Transportation Economic Assistance (TEA) programs, but, by and large, do not use them. When asked about public investment in rail networks, shippers were split, with the majority saying public dollars should not be invested in the rail programs. Exceptions were identified by one user, suggesting that public investment was needed in urban areas such as Chicago (the ongoing CREATE program). One small shipper on a short line supported public investment in rail networks. Shippers with no rail access commented that public-private partnerships, where shippers and carriers both make investments, seemed to be the most fair way of planning for expansion.

Railroad sales people and Third Party Logistics providers are doing a good job of working with rail users and are the primary source of rail information in Wisconsin. Railroad webpages are also used frequently. Half of the users are involved in trade associations, which focus on rail and get information through personal networks.

Chapter 4: Spatial Analysis of Shippers' Proximity to Rail Access

The Wisconsin Transportation Builders Association (WTBA) claims that 95 percent of Wisconsin's businesses are located within five miles of an interstate. This provides many businesses in the state with an important economic advantage of transportation productivity. A comparable statistic for the number of businesses within five miles of a rail line does not exist. Even if it did, this would be like comparing apples to oranges. Just because a business is located next to a rail line does not mean it has access to the network. In order to get a comprehensive understanding of Wisconsin shippers' access to rail, and how it varies in different regions of the state, researchers conducted spatial analysis using multiple definitions of 'access' to determine proximity in minutes and miles.

Study Area

Analysis covers the state of Wisconsin and portions of Minnesota and Illinois.

Data

Data for the following spatial analysis can be broken down into three categories: shipper (origins), rail access points (destinations), and the network dataset (the roadway network).

The basis for the shipper data were those companies listed as part of a driver industry, defined as being relatively concentrated in a region and produce more goods than can be consumed locally, in *The Wisconsin Economic Future Study* (Wisconsin Economic Development Corporation, June 2013). To get the companies into a format friendly to a geographic information system (GIS), researchers utilized Esri's 2013 Business Locations and Summary Data (Esri contracted with Dun & Bradstreet for the business dataset and provides various attributes including name, address, industrial coding, and other information) and Google Maps to validate the name, location, and industrial classification. This process allowed researchers to update the original WEDC dataset by deleting, adding, and/or modifying business locations and industrial classifications. This produced a point shapefile consisting of 2,250 points (2,094 being non-rail served), with each point representing a potential buyer or seller of freight. By using the WEDC dataset, readers are able to get an idea of the "who" and "where" of these shippers (names and county location are given in the WEDC report) while the Esri software licensing prohibits sharing of the business data. Analysis results are aggregated and no individual business information is reported. Distribution centers were not included in the WEDC analysis and therefore are not used in this analysis despite the fact they attract and generate large amounts of freight volumes.

Rail access points in this study are any spurs or sidings that the researchers determined to have the ability to transfer freight between rail and another mode. Access points were determined in a couple of ways. For one, a number of railroad companies operating in the state provided the locations of shippers on their network. The railroad-provided shipper data was imported into the GIS by either geolocating the addresses into a point shapefile from an Excel worksheet or by overlaying WisDOT's rail line shapefile onto an Esri imagery basemap in order to digitize the access point (spur or siding). These were then validated against Google Maps and noted as being "verified." "Non-verified" points of rail access along each rail corridor/sub throughout the entire state were identified using the method of overlaying WisDOT's data onto an imagery basemap. Researchers identified 807 different points of rail access throughout the state with 480 being verified. Additionally, the *MAFC Regional Freight Study* identified 23 operational intermodal terminals within the study area and these were also considered as rail access points.

A roadway network dataset contains information needed to determine a "best route" between an origin and destination point. This includes, among other attributes, the length of and speed limit on a road segment, addresses located within a road segment, and whether or not left turns and "U-

turns" are allowed at intersections. Outputs from a network analyst tool are generally the time it takes to traverse, and the length of, the path between an origin and a destination. Esri's *streets4* network dataset from ArcGIS 2013 was used in the analysis.

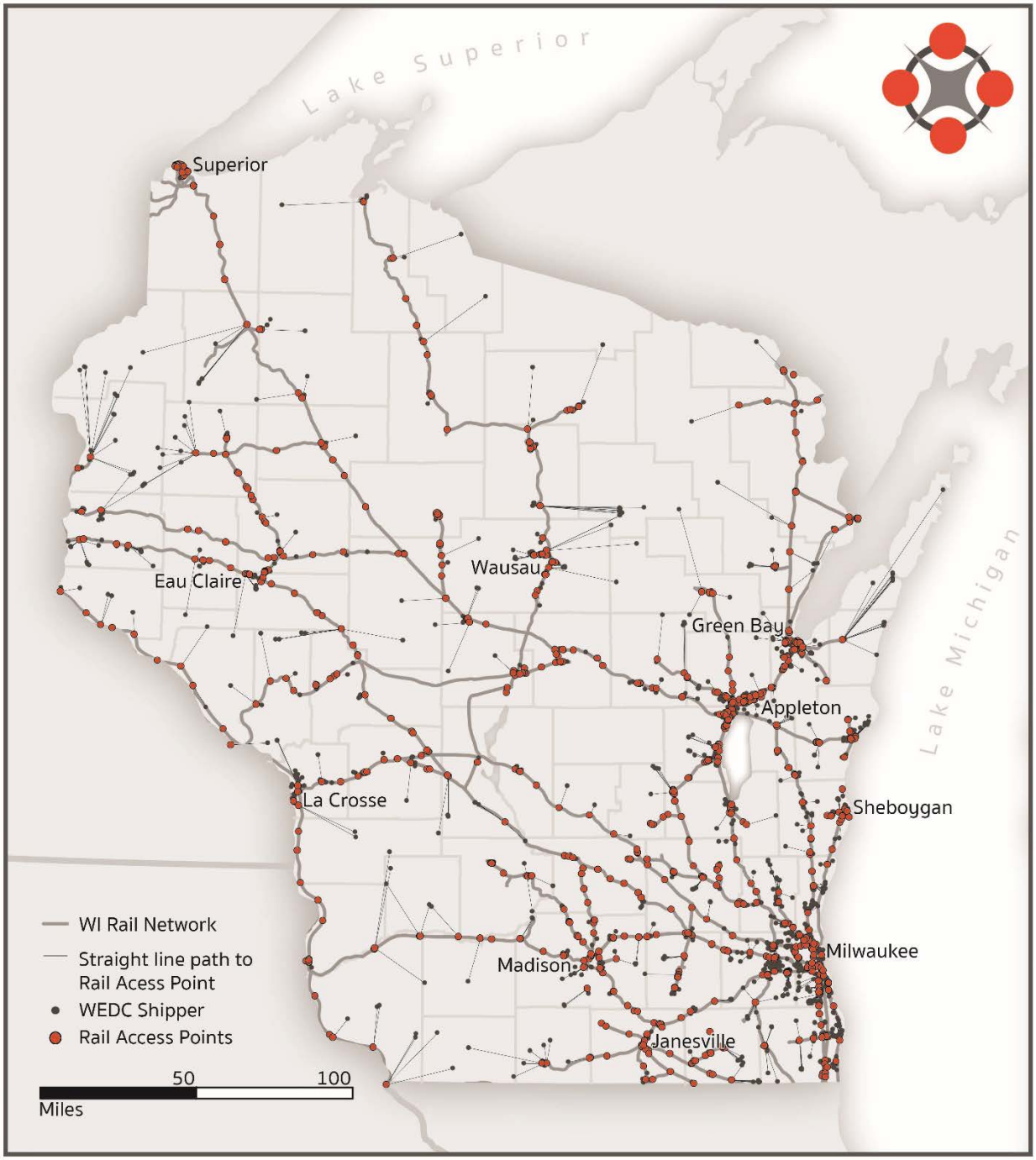
Methodology

Researchers used Esri's Network Analyst extension to create scenario-based origin-destination (O/D) cost matrices between shippers and access points as well as the service areas for individual access points. One O/D cost matrix provided the distance and time between the shippers and access points. Its output data was analyzed using ArcMap and Excel. On the maps, service areas are polygons representing the area covering routes extending outward from a rail access point—for example, 10 minutes or 20 miles from an intermodal terminal. These polygons can be used to select shippers that are located within, or outside of, the user-defined breaks, and are also used to display the geographical reach using maps.

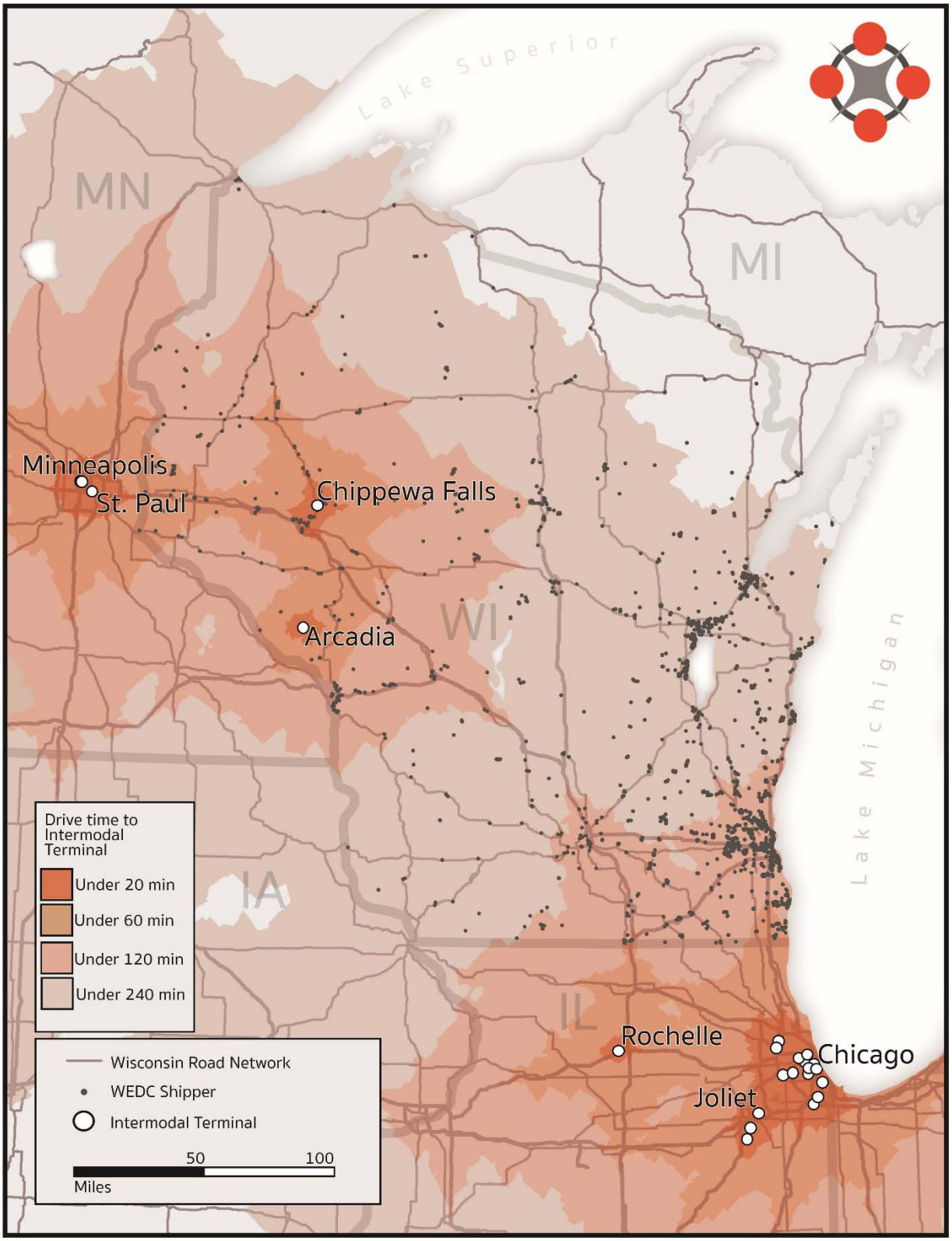
Proximity for the O/D matrices and service areas was computed based on the shortest path as measured in minutes. The analysis does not include considerations such as value-added capabilities or any other services offered at the rail access point, the number of connections to other rail carrier networks or other transportation modes (such as highway corridors), or the quality and capacity of the accessed rail line (such as maximum speed or weight allowed on the line), all of which can factor into a shipper's access point selection decision. The analysis was conducted with the assumption that traffic was traveling at the posted speed limit.

Rail access was defined in a number of different ways to determine the state's shippers' proximity to the rail network. These four scenarios are described below:

1. "Shared Access" (Map 4.1) – an analysis under the assumption that each of the 807 identified rail access points within the state represented open, or public access, to load and unload freight onto the rail network. This scenario is considered the most aggressive analysis and somewhat unrealistic. However, researchers felt it was an interesting comparison to the way roadway access functions. The total number of WEDC shippers identified with on-site rail access was 156. These shippers were not included as "shippers" in the analysis (or in the subsequent scenarios), but the associated rail access points were included as points of access for other shippers to utilize.
2. "Current Intermodal Market" (Map 4.2) - an analysis of shippers' proximity to the region's currently operating intermodal terminals. This is considered the most conservative analysis, and includes the intermodal terminals in Wisconsin (2), those in the Chicago region (18), and those in the Twin Cities region (3).

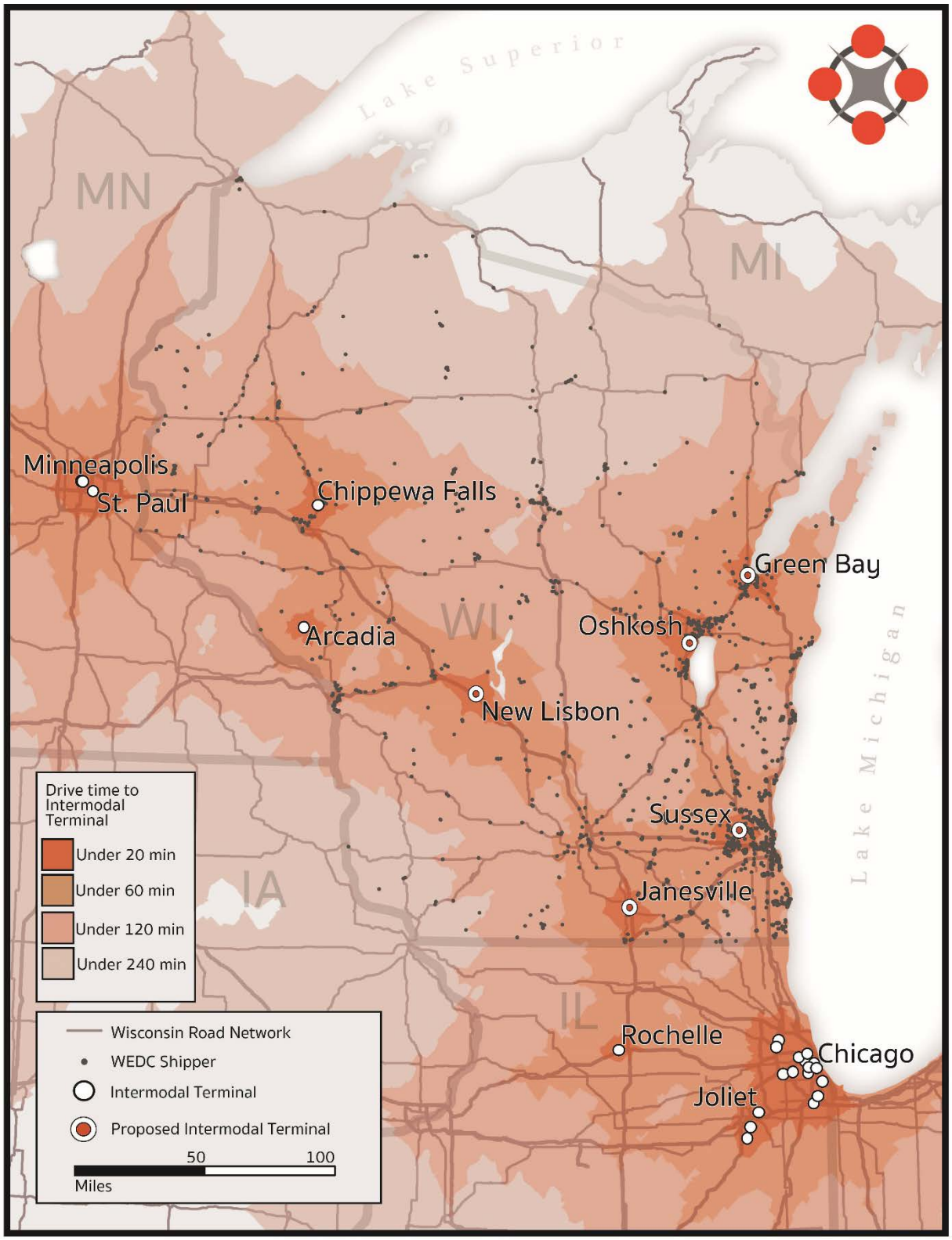


Map 4.1 "As the Crow Flies" Relationship Between Each Wisconsin Driver Business and the Closest Rail Access Point.



Map 4.2 Service Areas for Currently Operating Intermodal Terminals Based on Travel Time.

3. “Expanded Intermodal Market” (Map 4.3) - an analysis of shippers’ proximity to the intermodal terminals which are currently operating in the region as well as five proposed terminals in Green Bay, Janesville, New Lisbon, Oshkosh, and Sussex. These sites were selected based on stakeholder input conveying past and current interest and/or efforts to host an intermodal terminal, and other unique attributes making them plausible locations:
    - The Green Bay site would give businesses access to Interstates 41 and 43, a connection to the Port of Green Bay, direct access to CN rail lines, is in close proximity to the Escanaba & Lake Superior rail network, and sits within a concentration of manufacturing activity.
    - The Janesville site provides direct access to Interstate 90 and is close to Interstate 43, has access to three rail networks (CP, UP, and WSOR), and is situated within concentrations of manufacturing activity.
    - The New Lisbon site does not have a lot of manufacturing activity surrounding it, but is equidistant to the major metropolitan areas of Chicago and the Twin Cities, has CN and CP within its jurisdiction, is in close proximity to UP lines within Juneau County, and is intersected by Interstates 90 and 94.
    - The Oshkosh site would give intermodal rail access to shippers within the Fox Valley and would provide direct access to the CN network and Interstate 41.
    - The Sussex terminal is located within the most densely populated region of manufacturing activity within the state, would have direct access to the CN network and be less than three miles from both the CP and UP networks. It is also in close proximity of Interstates 41, 43, and 94, and could serve as an inland rail terminal for the Port of Milwaukee.



Map 4.3 WEDC Shippers' Proximity to Intermodal Terminals, Including Five Proposed Intermodal Terminals.

With respect to carriers and proximity, it should be noted that the researchers assumed shippers would utilize the terminal that was in closest proximity to their location. Under this assumption, national carriers such as Norfolk Southern and CSX do not enter the picture. However, it is possible that the closest intermodal terminal carrier may not be the best suited for a given shipper's needs. A shipper may feasibly need access to a particular, or multiple, Class 1 terminals because each carrier services different end markets from particular terminals[4]. Figure 4.1 shows the proximity distribution for WEDC shippers by carrier in the current marketplace. The low values for CN are a result of having terminals in Chippewa Falls and Arcadia. In terms of proximity within the Chicago region, the closest Chicago regional terminal is generally UP's Global II terminal in North Lake, IL; from here, the rest of the region's terminals range from roughly five to 75 minutes (or five to 70 miles) (Figure 4.2).

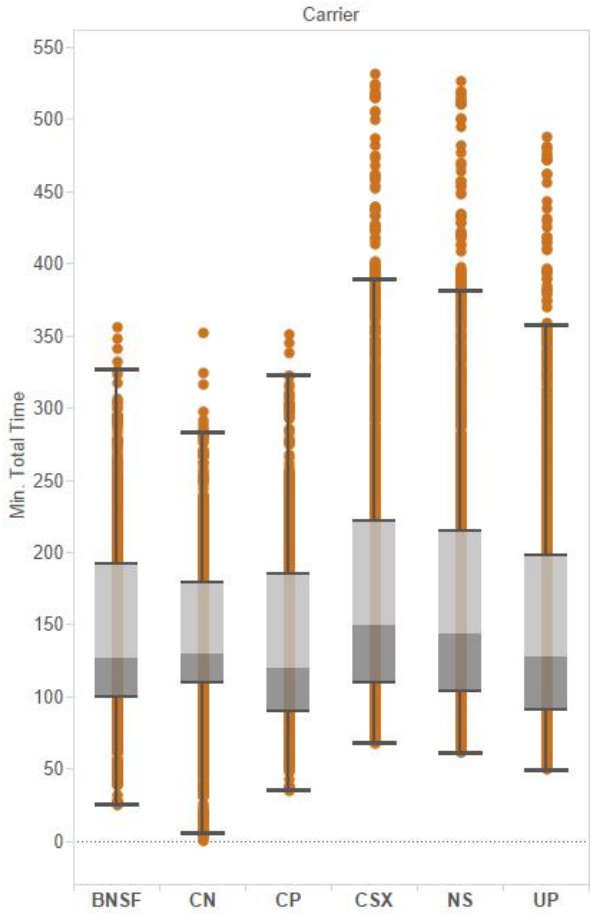


Figure 4.1 Box and Whisker Plot Showing Range of Proximity Measured in Minutes for Each Shipper to Nearest Intermodal Terminal per Carrier.

[4] A general guide to intermodal service lane connections can be found in the MAFC's Regional Freight Study online at: http://midamericafreight.org/rfs/network-inventory/rail/intermodal-facilities/

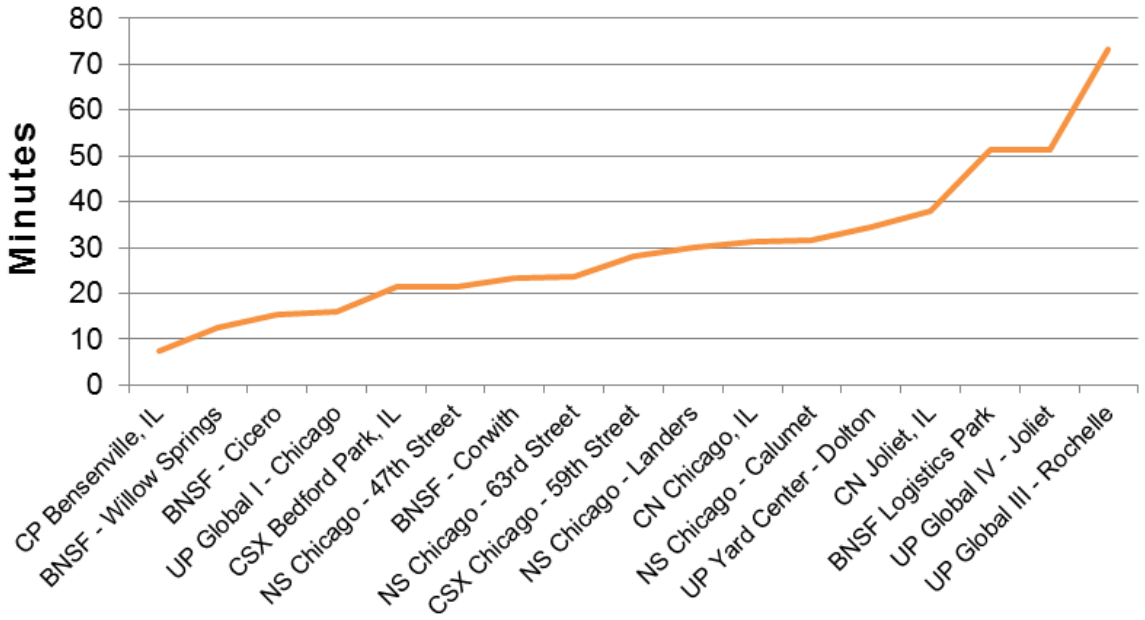
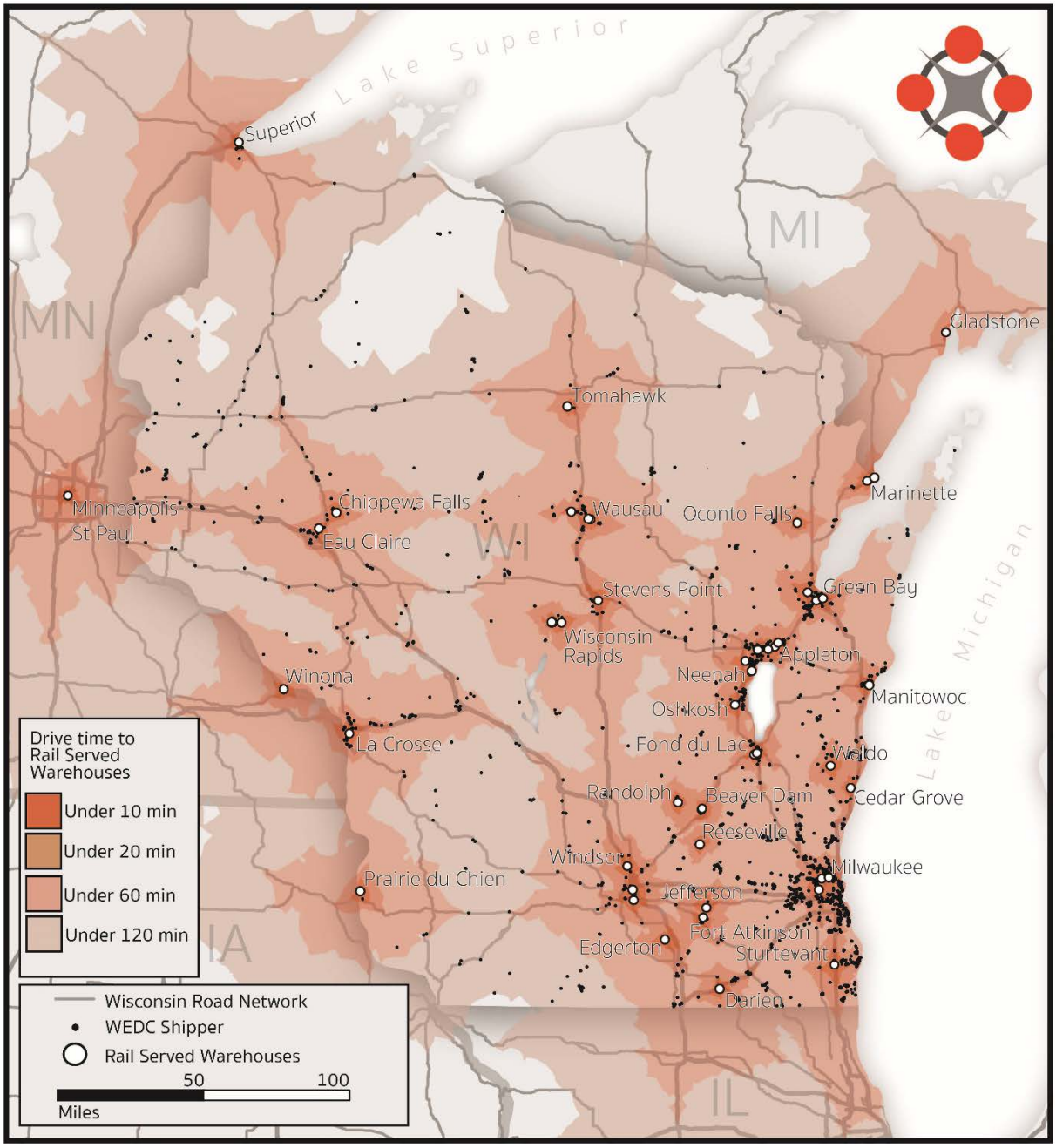


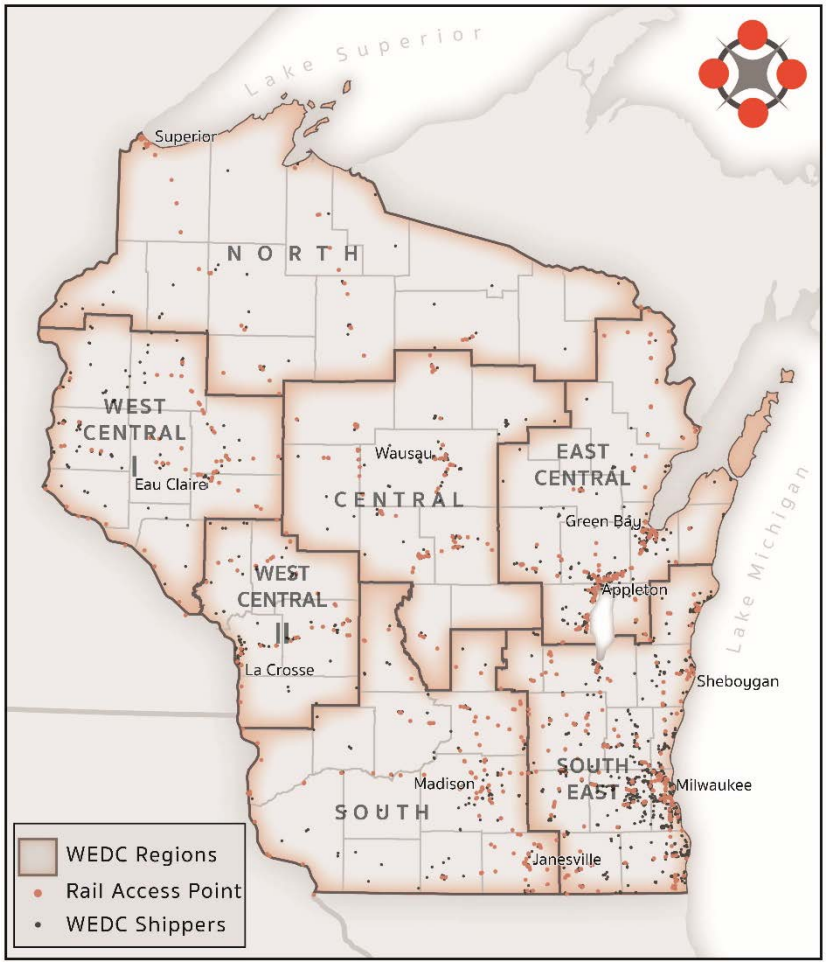
Figure 4.2 Distance in Minutes Between the UP Global II Terminal in Northlake, IL and the Rest of the Chicago Region Terminals.

4. "Rail-Served Warehouses" (Map 4.4) – an analysis using only rail-served warehouses access points. Researchers identified a total of 53 rail-served warehouses throughout the state where shippers could transload freight between road and rail systems.



Map 4.4 Rail-Served Warehouses' Service Areas Based on Travel Time.

Researchers also conducted proximity analysis by regions of the state based on regional definitions from the WEDC's *Wisconsin Economic Future Study* (Map 4.5). Looking at the number of access points per region, the South East, East Central, and South regions dominate, accounting for just over 71 percent of the rail access points in the state with approximately 31, 22, and 17 percent respectively. This is no surprise as the majority of driver businesses (roughly three out of four) are located in the South East and East Central regions. The South region is the only one that has more rail access points than WEDC drivers, which is due to the presence of WSOR in that region.



Map 4.5 WEDC Regions

Table 4.1 Number and Percentage of Rail Access Points and WEDC Drivers by Region.

Region	Rail Access Points		WEDC Drivers	
Central	82	10.04%	130	5.78%
East Central	182	22.28%	435	19.33%
North	49	6.00%	64	2.84%
South	144	17.63%	136	6.04%
South East	255	31.21%	1,225	54.44%
West Central I	67	8.20%	155	6.89%
West Central II	38	4.65%	105	4.67%

Results

When using the term “access” in the broadest sense, more than half of Wisconsin’s driver businesses are within a five-minute drive of some sort of rail access. The shortest drive was well under a minute, the longest was 134.5 minutes, and the mean drive was 6.9 minutes with a standard deviation being 10.5. Roughly 12 percent of shippers are located within a one-minute drive of a rail access point, 64 percent are within five minutes, and 83 percent within 10 minutes.

Conversely, only 22 of the 2,094 shippers are located further than an hour's drive from a rail access point. Figure 4.3 shows the extremely skewed nature of this scenario.

The distribution of travel times is drastically different when "rail access" is defined as the use of an intermodal terminal to transfer freight between highways and rails in the current marketplace. In this scenario, only 36 of the 2,094 shippers are within 20 minutes of a rail access point, and only 185 shippers are within an hour's drive. The majority of shippers (1,109, or roughly 53 percent) fall between a 60-minute and 120-minute drive (Figure 4.5). Wisconsin shippers were, on average, 116 minutes away from an intermodal terminal with the shortest trip being under a minute, the longest being just under five-and-a-half hours away, with a standard deviation of 50.5 minutes.

The impact on WEDC shippers' proximity to intermodal rail service by introducing five terminals throughout the state would be considerable (Figure 4.4). Roughly one out of four, or 542, WEDC shippers would be within a twenty-minute drive compared to the 36 that currently experience that convenience. Furthermore, 80 percent (1,657 shippers) would be within an hour's drive (a ten-fold increase over the eight percent of shippers currently within that proximity), and most importantly, only 69 shippers would find themselves outside of the two-hour drive considered to be the cut-off for optimal drayage service times (versus roughly half of the WEDC shippers in the current market).

Within the current intermodal marketplace, 185 WEDC shippers are within an hour's drive of an intermodal terminal: 91 are closest to a Wisconsin terminal (74 to Chippewa Falls and 17 to Arcadia), 51 to a terminal in the Chicago region, and 43 to the Twin Cities. All of the 36 shippers that are located within 20 minutes are closest to either the CN terminal in Chippewa Falls (33) or the CN terminal in Arcadia (3). Overall, the vast majority of WEDC shippers (1,622 or 77 percent) are closest to a Chicago regional terminal (Table 4.2), but are in excess of an hour's drive.

It is interesting to note the changes in intermodal regions' market share between the current marketplace scenario and the proposed scenario. The proposed terminals would capture roughly 86 percent of the market with almost half of those shippers being closest in proximity to the Sussex terminal (Table 4.3). Combining the proposed terminals with the existing Wisconsin terminals in Chippewa Falls and Arcadia would put approximately 95 percent of the WEDC Shippers nearest to an in-state terminal. The Twin Cities region would experience essentially no change (the BNSF terminal in St. Paul would lose one shipper), and the Chicago terminals would only capture two percent of the market. Rochelle completely drops from the list due to the introduction of a terminal in Janesville.

Using researcher-identified rail-served warehouses within, and in close proximity to, Wisconsin as the defined points of rail access, shows substantial WEDC shipper proximity improvements over the proposed intermodal market scenario (Figure 4.6). Almost one out of three WEDC shippers are within a 10-minute drive of a rail-served warehouse, and 1,306 (62 percent) find themselves within a 20-minute drive compared to 542 (26 percent) under the proposed intermodal market scenario. The number of shippers within an hour's drive improves to 1,927 (92 percent) versus 1,657 (79 percent), and while 69 shippers find themselves a two-hour's drive out from an intermodal terminal in the proposed scenario, only nine are that far away from a rail-served warehouse. It should be noted that the level of proximity to rail access for Wisconsin shippers provided via rail-served warehousing and transloading operations is achieved without the large financial commitments required to build and operate the proposed intermodal market—infrastructure is already in place.

Table 4.2 List of the Current Intermodal Facilities that Were the Closest Terminal, and the Number of Shippers for the Terminal.

to Intermodal Facility	Shippers	Percentage	
Chippewa Falls	321	15.33%	
Arcadia	77	3.68%	19%
Minneapolis (CP)	22	1.05%	
St. Paul (BNSF)	52	2.48%	3.53%
Bensenville (CP)	617	29.47%	
North Lake (UP)	814	38.87%	
Rochelle (UP)	191	9.12%	77.46%

Table 4.3 List of the Current and Proposed Intermodal Facilities that Would be the Closest Terminal, and the Number of Shippers for the Terminal.

to Intermodal Facility	Shippers	Percentage	
New Lisbon	128	6.11%	
Oshkosh	345	16.48%	
Janesville	174	8.31%	
Sussex	895	42.74%	
Green Bay	268	12.80%	86.44%
Chippewa Falls	153	7.31%	
Arcadia	16	0.76%	8.07%
Minneapolis (CP)	22	1.05%	
St. Paul (BNSF)	51	2.44%	3.49%
Bensenville (CP)	9	0.43%	
North Lake (UP)	33	1.58%	2%

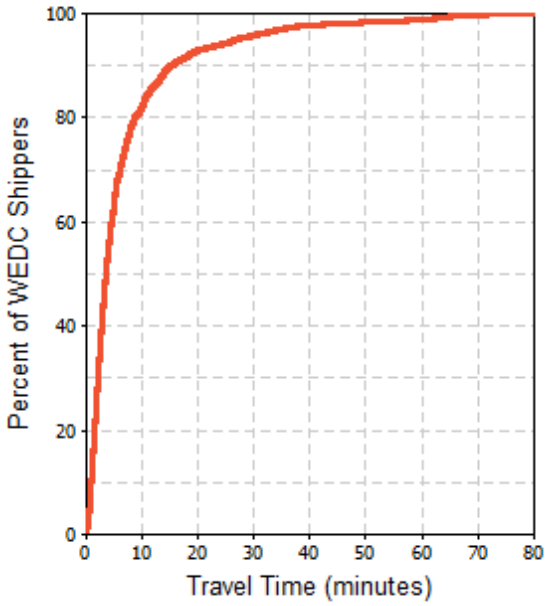


Figure 4.3 Cumulative Distribution of Shippers' Proximity/Travel Time to Nearest Rail Access Point in "Shared Access" Scenario.

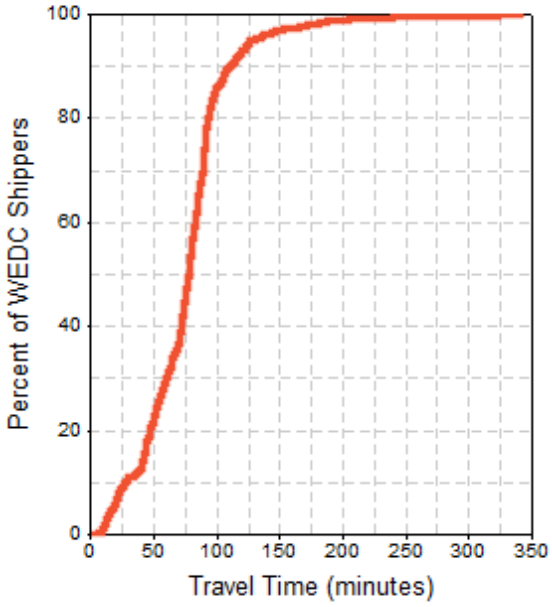


Figure 4.4 Cumulative Distribution of Shippers' Proximity/Travel Time to Nearest Intermodal Terminal in "Expanded Intermodal Market" Scenario with Five Proposed Terminals.

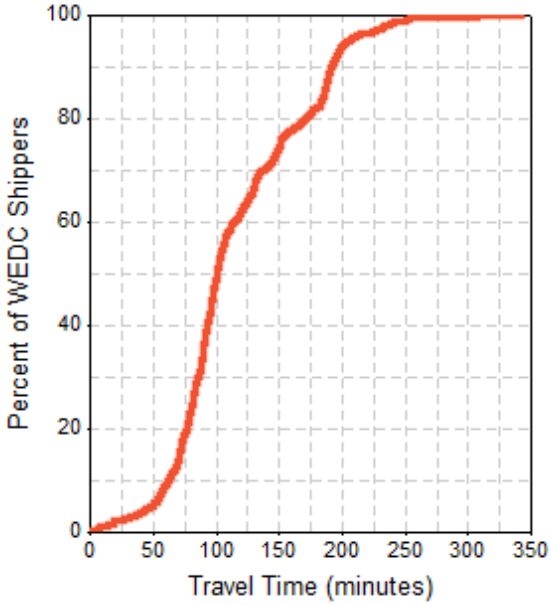


Figure 4.5 Cumulative Distribution of Shippers' Proximity/Travel Time to Nearest Intermodal Terminal in "Current Intermodal Market" Scenario.

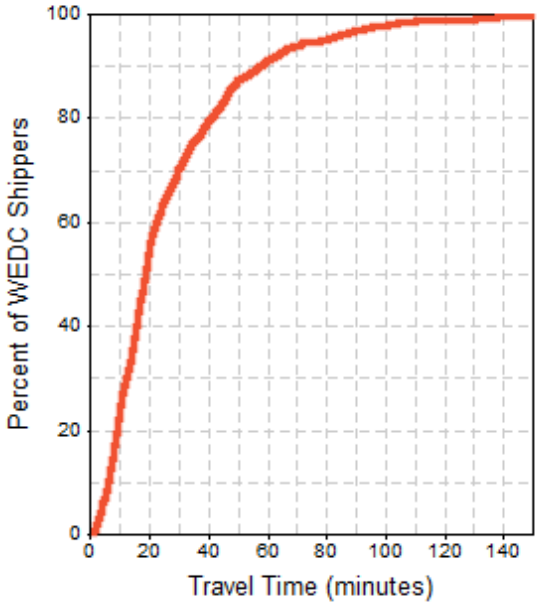


Figure 4.6 Cumulative Distribution of Shippers' Proximity/Travel Time to Nearest Rail-Served Warehouse.

Regional Analysis

WEDC shippers' proximity to rail access varies between different regions of the state. Under the "Shared Access" scenario, the North region is the only region where a significant portion of the shippers must travel longer than 20 minutes to reach a rail access point (Figure 4.7). In the other regions, only outliers must travel that far.

It is no surprise that the lowest average travel time in the current intermodal marketplace is found in the West Central regions due to the CN terminals in Chippewa Falls and Arcadia, and to some extent, the terminals in the Twin Cities (Figure 4.9). All but one of the Central region non-rail served shippers and a portion of non-rail served shippers in the North region also benefit from these terminals. In contrast, all but one of the non-rail served shippers in the East Central region are closest to terminals in the Chicago region, which results in the highest average drive time amongst all regions at 198 minutes versus 156 and 133 for the North and Central respectively. All of the 1,171 non-rail served shippers in the Southeast region, and 108 of the 130 in the South region are located closest to a Chicago region intermodal terminal.

The addition of the five proposed Wisconsin intermodal terminals has the largest impact on shippers' proximity in the East Central region where 75 percent of the shippers are now within a 30-minute drive of rail access, and all but a few outliers are within a 50-minute drive (Figure 4.8). Furthermore, whereas the minimum drive time in the current intermodal market is greater than 150 minutes, the maximum drive time a shipper faces is under the 150-minute mark. Similar shifts occur for the South region around the 100-minute mark and the South East around the 50-minute mark. The Central and West Central regions are less impacted due to their proximity to the CN terminals. The introduction of new terminals has little impact on a majority of the shippers in the North region as well; however, the 13 or so shippers in the fourth quartile do see improvements in travel time.

The East Central and South East regions are clearly the top two serviced regions by rail-served warehouses having an average drive time of 16.97 and 28.65 minutes respectively. Rail-served warehouses provide WEDC non-rail served shippers in the East Central region with drives of less than 20 minutes for 284 of the 381 shippers, less than an hour for 365 shippers, and less than 90 minutes for all but two. All 1,171 non rail-served shippers in the South East region are within 60 minutes, while 798 of those are within 20 minutes. The drive time distributions for the Central, South, West Central I and II regions are somewhat comparable (Figure 4.10). Average drive times for the regions are 28, 40, 45, and 29 respectively. Researchers only identified one rail-served warehouse in the North region (Superior) creating a wide range of drive times for the shippers located in the region from 5 to 145 minutes. Seven shippers are within 20 minutes, seven between 20-60 minutes, and the other 41 shippers must travel over an hour. The average business in the North region can expect to travel 80 minutes to its nearest rail served warehouse, while the state's total average drive time is roughly 24 minutes.

Regional travel time data under the four scenarios is provided in Figure 4.7 thru Figure 4.12 using box plots[5]. They are presented using two different time scales: one ranging from zero to 180 minutes showing 20 minute increments, and the second ranging from zero to 350 minutes showing 50 minute increments. The groupings suggest that the "Rail-Served Warehouse" scenario is of more likeness in terms of service proximity to the most aggressive scenario (Shared Access) than it is to the most conservative scenario (Current Intermodal Market).

[5] Box plots are used to assess and compare sample distributions. The box demarcates the first quartile of data (the bottom of the box where 25% of the data values are less than or equal to), the median value (the line inside the box where half of the data values are less than or equal to), and the third quartile (the top of the box where 75% of the data values are less than or equal to). The lines extending from the box represent the upper and lower limits, while the asterisks show outlier values.
Upper Limit = Q3 + 1.5(Q3 – Q1).
Lower Limit = Q1 – 1.5(Q3 – Q1)

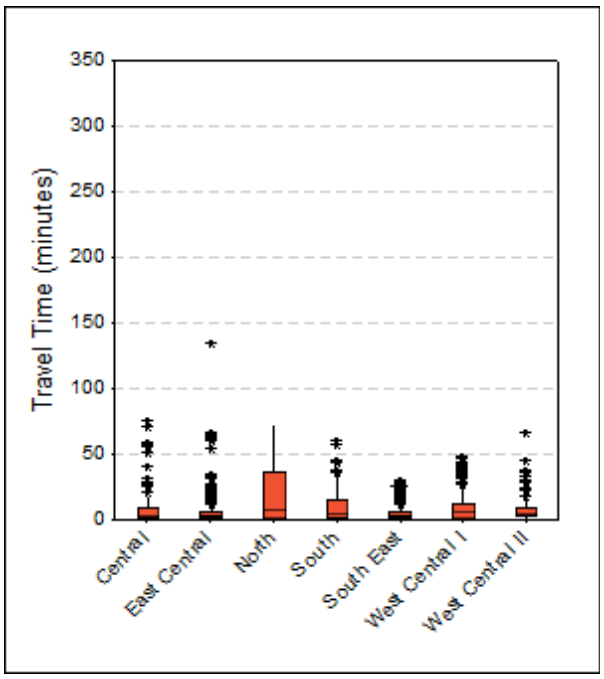


Figure 4.7 Travel Time Distribution for WEDC Shippers to Nearest Rail Access in "Shared Access" Scenario (0-350 scale).

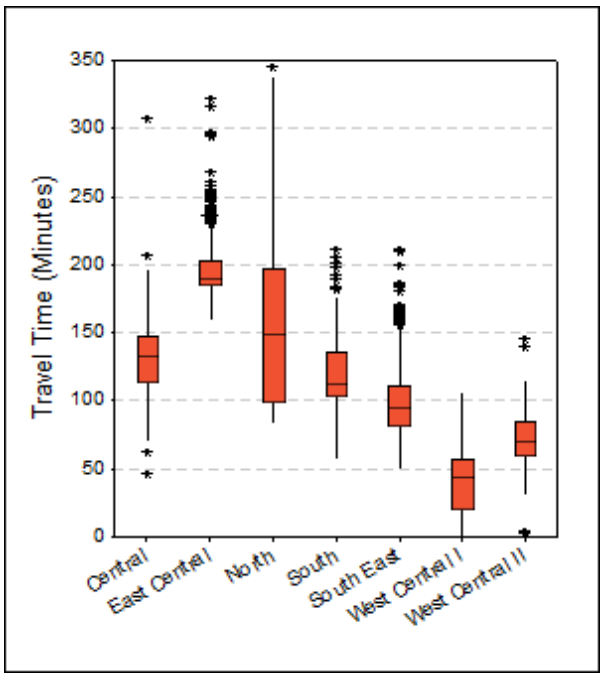


Figure 4.9 Travel Time Distribution for WEDC Shippers to Nearest Intermodal Terminal in "Current Intermodal Market" Scenario.

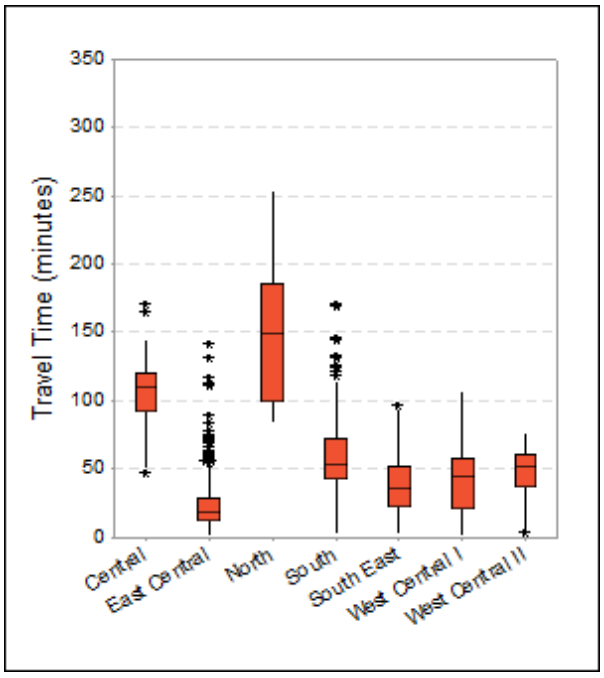


Figure 4.8 Travel Time Distribution for WEDC Shippers to Nearest Intermodal Terminal in "Expanded Intermodal Market" Scenario with Five Proposed Terminals.

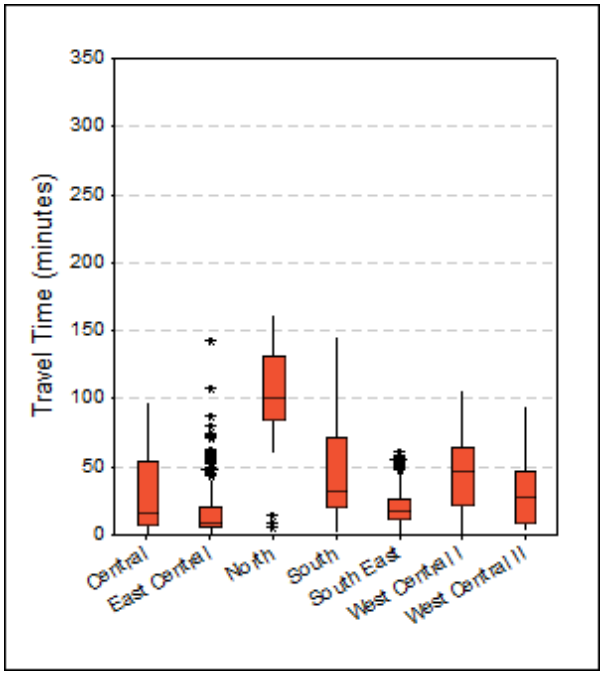


Figure 4.10 Travel Time Distribution for WEDC Shippers to Rail-Served Warehouse (0-350 scale).

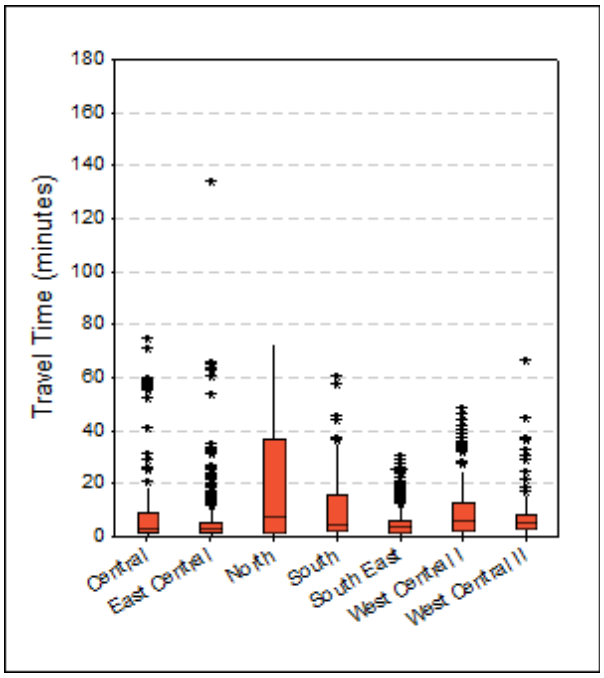


Figure 4.11 Travel Time Distribution for WEDC Shippers to Nearest Rail Access in "Shared Access" Scenario (0-180 scale).

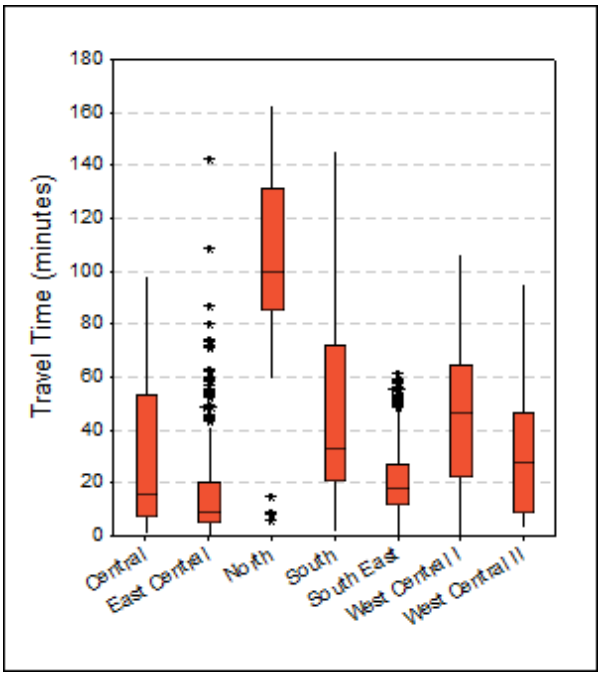


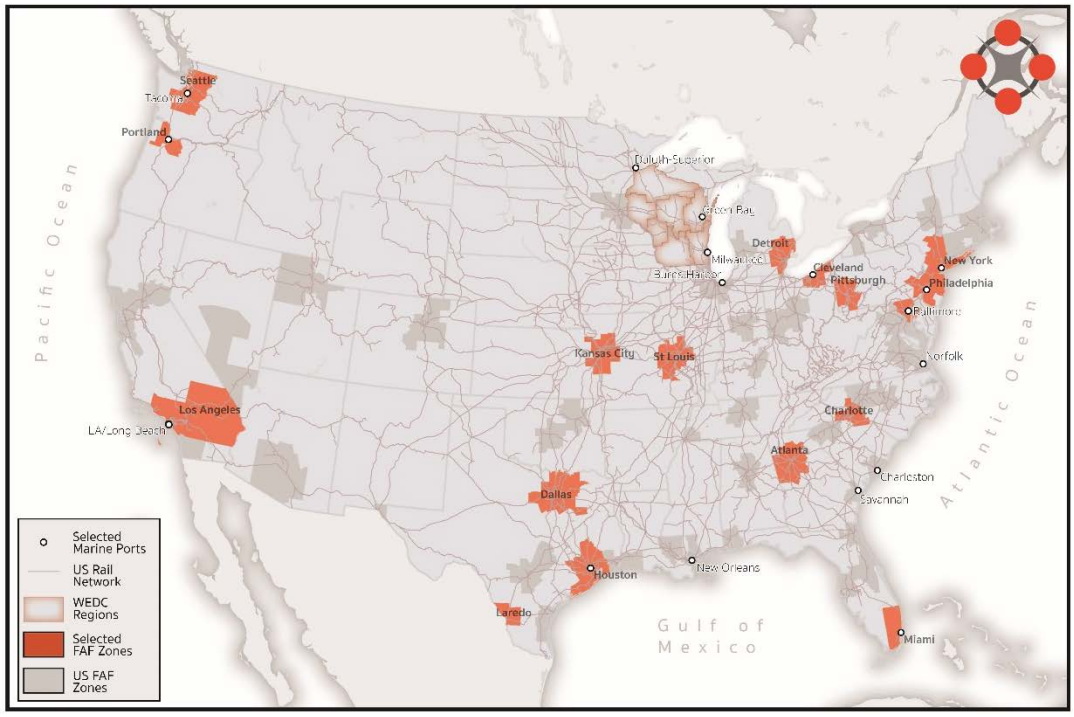
Figure 4.12 Travel Time Distribution for WEDC Shippers to Rail-Served Warehouse (0-180 scale).

Chapter 5: Estimation of WEDC Shippers' Potential Demand for Rail Service

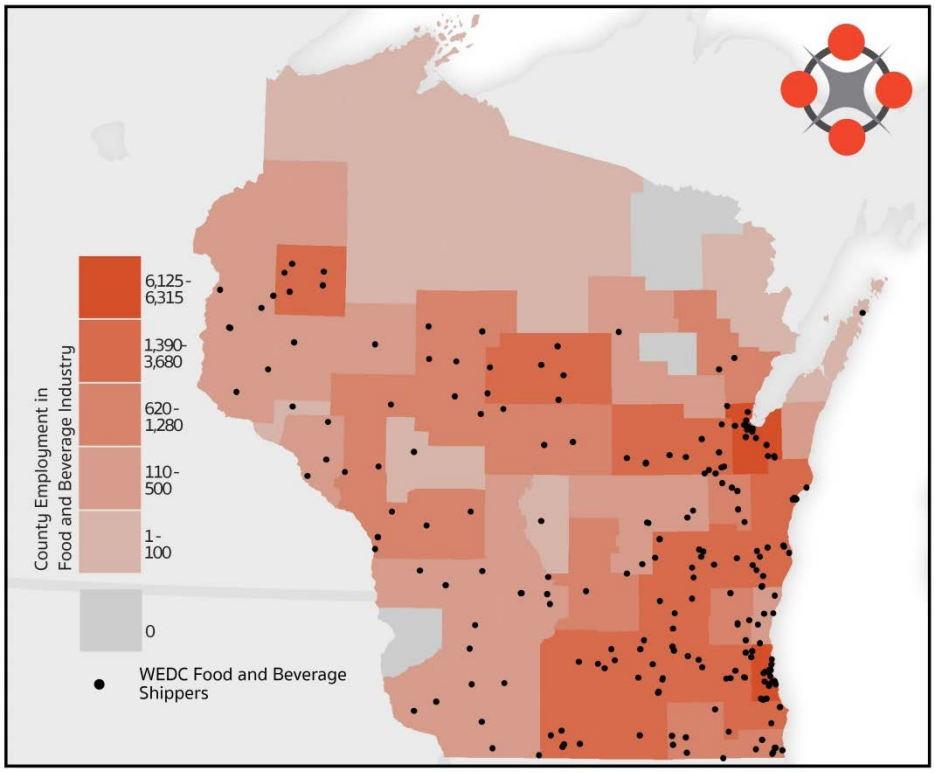
Researchers were not only interested in changes to shippers' proximity to rail access with the introduction of five intermodal terminals throughout the state, but also how the change in proximity would potentially impact the shippers' ability to economically utilize the intermodal rail system. Utilizing USDOT's Intermodal Transportation and Inventory Cost Model (ITIC), researchers estimated the modal shift from trucking to intermodal rail in annual trips and tonnage based on minimum total logistics costs on a per-shipper basis for four select commodity groups. The total logistics costs are compared using a base-case-versus-policy-case analysis.

Study Area

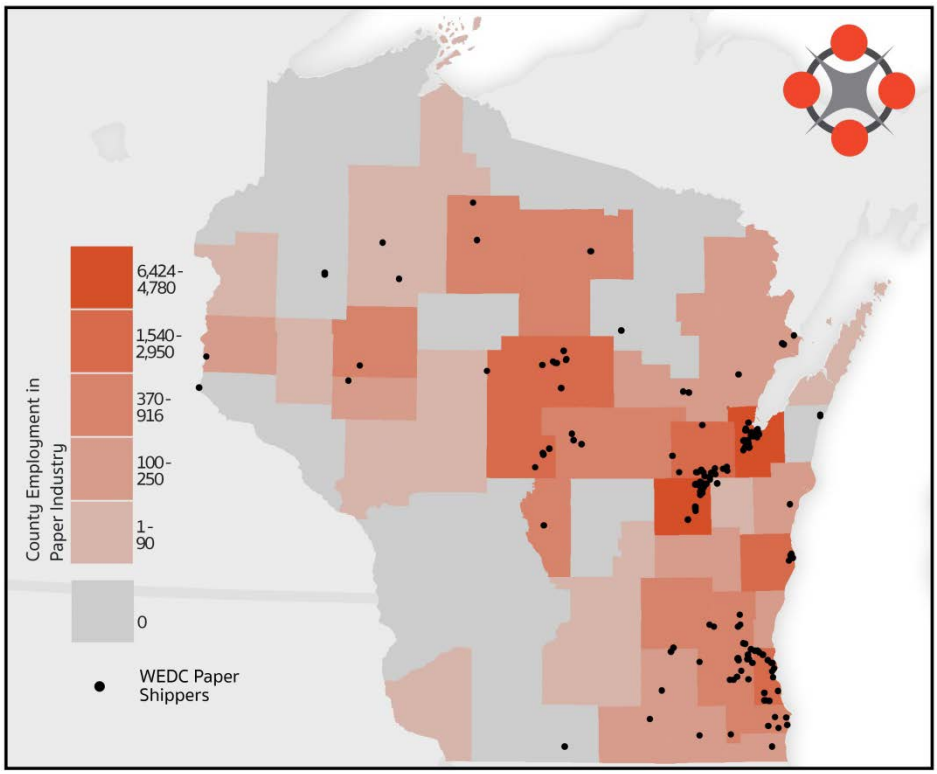
Analysis covers the state of Wisconsin (the locations of WEDC shippers in selected industries, potential locations for intermodal terminals, and regions within the state down to the county level), regional intermodal terminals in Illinois and Minnesota, and various U.S. metro regions across the nation (the individual or aggregated FAF zones in Map 5.1). In general, the study is interested in the volumes of select commodities moved between origins and destinations represented by the Wisconsin manufacturers from the WEDC shipper dataset in Chapter 4 and the U.S. metro regions. Industries analyzed include Wisconsin manufacturers exporting food and beverage finished products (NAICS 311 and 312); Wisconsin manufacturers exporting paper products (NAICS 322); Wisconsin manufacturers exporting machinery finished products (NAICS 333); and Wisconsin manufacturers importing plastics and rubber inputs (NAICS 326). Employment data from the County Business Pattern database show concentrations of employment within the state for the manufacturing industries of food and beverage (Map 5.2), paper products (Map 5.3), plastics (Map 5.4), and machinery (Map 5.5).



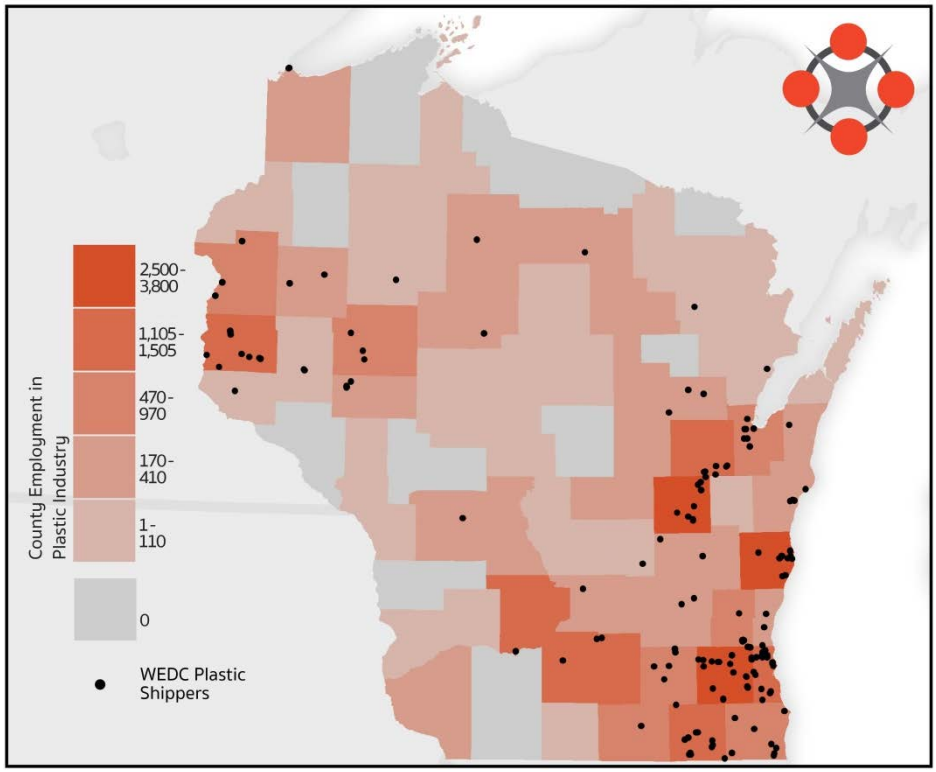
Map 5.1 Study Area for Estimation of Potential Modal Diversion from Truck to Intermodal Rail.



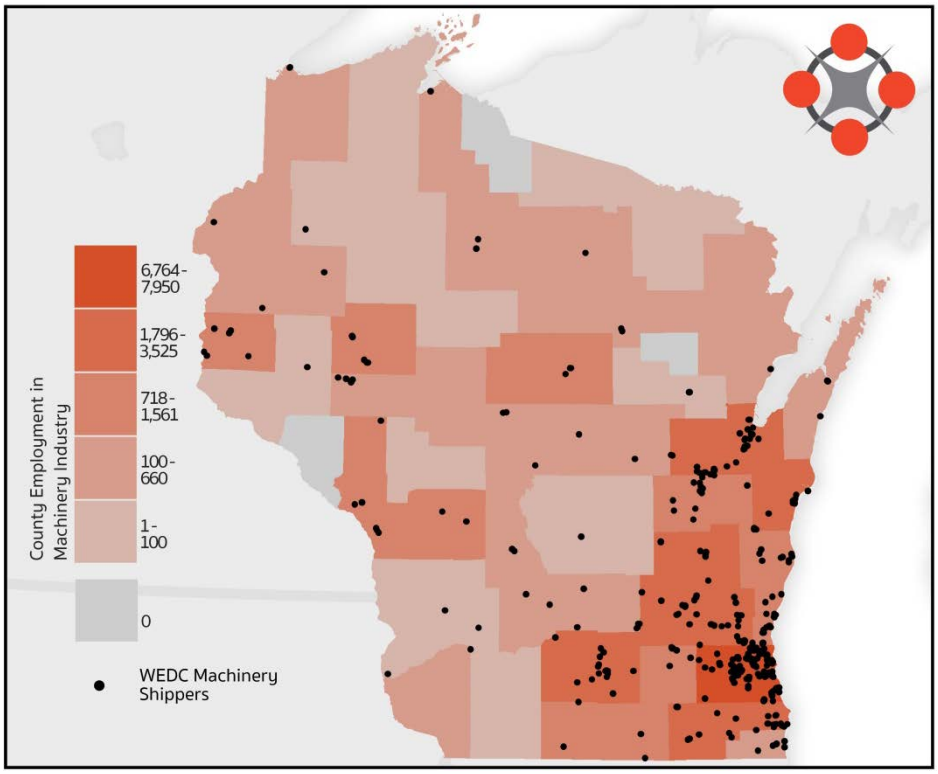
Map 5.2 County Employment Data for the Food and Beverage Manufacturing Industry.



Map 5.3 County Employment Data for the Paper Products Manufacturing Industry.



Map 5.4 County Employment Data for the Plastics Manufacturing Industry.



Map 5.5 County Employment Data for the Machinery Manufacturing Industry.

Intermodal Transportation and Inventory Cost Model

The Intermodal Transportation and Inventory Cost Model (ITIC) was initially created in 1995 as a discrete choice model in conjunction with disaggregated freight movement data for performing policy analysis of issues concerning long-haul freight movement. It provides modal diversion estimates based on changes in transportation infrastructure, operations, or policy. The particular model used in this effort, the Highway-to-Rail Intermodal version, is a slight variation of the model used by the U.S. Department of Transportation to report to Congress regarding its *Comprehensive Truck Size and Weight Study*. It was also used by the National Transportation Research Center to evaluate freight vehicles in various short-haul intermodal lanes (*50*).

"The program develops the tradeoffs that would be made by a receiver who is attempting to minimize the total logistics costs associated with maintaining an inventory of the product for use in manufacturing or wholesale trade. Variables are used to write equations for each of the components of the receiver's total logistics costs as a function of the principal choice variables (i.e. choice of supplier, choice of mode and choice of shipment size). This "between modes" type of decision is more complex, involving the evaluation of tradeoffs in equipment availability, transit time and reliability of delivery, freight loss and damage experience and the size of the potential shipment and its suitability for movement on the mode in question."

According to the model's user manual, a number of variables can affect the choice of supplier, the shipment size, and the mode to transport the freight. These are integrated into the ITIC-IM model, the Highway-to-Rail Intermodal version, and include:

- Type of Receiver: producer, wholesaler, retailer, government, or individual consumer
    - Affects buying decision and choice of supplier (length of haul, carriers available, and purchase price of product) and finally mode choice
- Type of Product: product annual usage, value per pound of product, time sensitivity (shelf life), storage requirements
    - Affects size of shipment and ability of receiver to hold product in inventory and choice of shipment size (cost of ordering, (un)loading, and pickup/delivery) and finally mode choice
- Transport Level of Service Attributes: transit time of mode, reliability of mode, waiting time for equipment
    - Affects cost of capital tied up in transit, safety stock holding cost and ability to serve as emergency, and finally choice of mode
- Commodity Attributes: density of product, weight and cube capacity of vehicle
    - Affects loading of shipment by mode and possible need for consolidation of shipment with others, and finally choice of mode

ITIC-IM Inputs and Parameters

The model's user defined inputs (1-15) and parameters (16-24) are listed and briefly explained below:

1. Commodity (2-Digit STCC or Standard Transportation Commodity Code) - four separate commodity groups were selected for modal conversion simulations: food or kindred products (20); pulp, paper, or allied products (26); chemicals or allied products (28); and machinery (35).
2. Pounds of commodity shipped per year - researchers queried FAF 3.5 2012 estimates to acquire the tonnage shipped between Wisconsin and each of the U.S. metro regions by truck. This total was then divided by the number of non-rail served shippers from the corresponding industry within the study's dataset to come up with the number of annual shipments for each WEDC shipper (Table 5.1). This assumption implies that each shipper within the analysis is identical in terms of volumes of freight shipped as well as maintains a

shipping relationship with each of the metro regions within the analysis. Neither of these assumptions are likely, but allows a generalized analysis to be conducted across the entire state.

Table 5.1 Annual Freight Flows Between Metro Region and Wisconsin

Food and Beverage

Metro Region	Annual Freight Flows	Annual Freight Flows by Truck	Truck %	Avg. Annual Shipments*
Atlanta	615,051,600	546,929,400	89%	64
Baltimore	99,936,200	86,858,000	87%	11
Charlotte	74,884,400	73,942,600	99%	9
Cleveland	165,467,800	164,283,200	99%	19
Dallas	871,541,000	669,657,800	77%	78
Detroit	951,605,600	797,781,800	84%	93
Houston	153,556,800	138,032,000	90%	16
Kansas City	336,089,200	327,339,600	97%	38
Laredo	253,143,400	149,073,600	59%	18
Los Angeles	815,329,200	518,385,800	64%	60
Miami	187,095,000	170,790,200	91%	20
New York	688,034,400	557,860,800	81%	65
Philadelphia	512,397,200	469,801,200	92%	55
Pittsburgh	143,401,400	141,862,000	99%	17
Portland	156,465,200	140,589,000	90%	17
Seattle	334,551,800	104,996,600	31%	13
St. Louis	259,115,600	256,839,200	99%	30

Plastics

Metro Region	Annual Freight Flows	Annual Freight Flows by Truck	Truck %	Avg. Annual Shipments*
Atlanta	126,236,800	94,589,200	75%	19
Baltimore	4,024,800	3,866,800	96%	1
Charlotte	80,268,600	80,211,800	100%	16
Cleveland	186,214,600	182,503,800	98%	37
Dallas	12,044,600	11,680,200	97%	3
Detroit	253,880,200	217,283,600	86%	44
Houston	1,174,666,800	78,915,800	7%	16
Kansas City	26,592,000	23,861,800	90%	5
Laredo	69,929,000	69,333,400	99%	14
Los Angeles	102,135,600	82,462,600	81%	17
Miami	5,650,800	5,048,200	89%	2
New York	125,840,600	102,754,800	82%	21
Philadelphia	73,555,400	29,626,800	40%	6
Pittsburgh	38,968,200	38,037,200	98%	8
Portland	3,058,000	1,880,600	61%	1
Seattle	48,718,800	37,805,600	78%	8
St. Louis	50,843,800	49,684,000	98%	10

Paper

Metro Region	Annual Freight Flows	Annual Freight Flows by Truck	Truck %	Avg. Annual Shipments*
Atlanta	435,645,400	429,273,200	99%	61
Baltimore	125,440,800	119,792,600	95%	17
Charlotte	143,874,600	104,329,800	73%	15
Cleveland	150,257,200	149,830,600	100%	22
Dallas	349,341,400	232,745,800	67%	34
Detroit	788,945,600	553,497,000	70%	79
Houston	15,723,800	14,750,600	94%	3
Kansas City	296,484,600	244,215,200	82%	35
Laredo	492,980,200	207,547,600	42%	30
Los Angeles	717,957,200	441,179,600	61%	63
Miami	72,784,400	68,375,000	94%	10
New York	389,271,200	262,661,400	67%	38
Philadelphia	236,777,200	202,666,800	86%	29
Pittsburgh	38,857,800	38,837,200	100%	6
Portland	58,401,800	53,063,600	91%	8
Seattle	153,171,200	87,883,200	57%	13
St. Louis	347,964,200	303,781,400	87%	35

Machinery

Metro Region	Annual Freight Flows	Annual Freight Flows by Truck	Truck %	Avg. Annual Shipments*
Atlanta	60,405,200	51,136,000	85%	6
Baltimore	103,122,200	99,572,000	97%	11
Charlotte	41,391,400	39,746,600	96%	5
Cleveland	34,555,600	31,805,400	92%	4
Dallas	27,936,400	21,861,000	78%	3
Detroit	658,036,800	568,157,000	86%	62
Houston	47,036,200	43,083,000	92%	5
Kansas City	21,646,800	21,270,000	98%	3
Laredo	126,922,600	123,076,400	97%	14
Los Angeles	88,936,000	53,452,400	60%	6
Miami	37,684,200	36,636,400	97%	4
New York	81,036,600	63,692,800	79%	7
Philadelphia	38,601,800	26,133,200	68%	3
Pittsburgh	23,711,600	23,566,200	99%	3
Portland	72,967,400	63,288,600	87%	7
Seattle	33,611,600	27,086,200	81%	3
St. Louis	12,731,000	12,030,200	94%	2

*(*Value Represents Average Annual Shipments Per Non-Rail Served WEDC Shipper)*

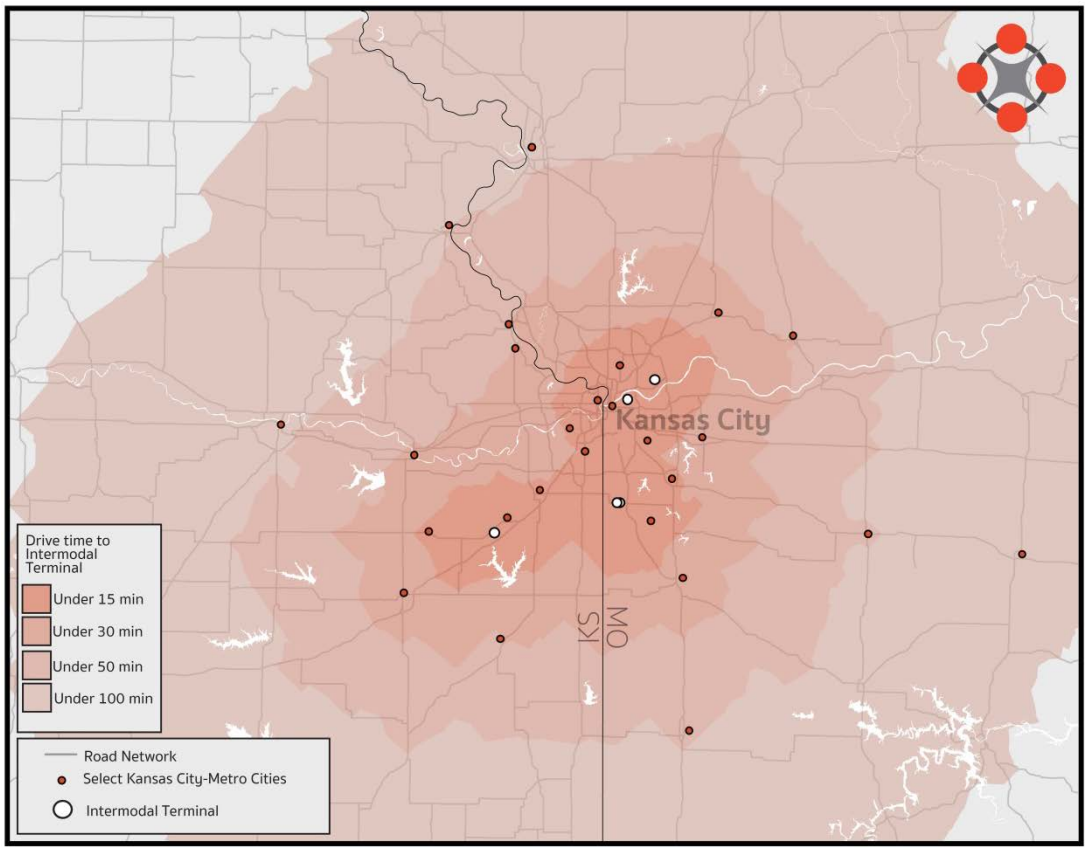
3. Pounds of commodity per shipment – a shipment payload factor was provided by WisDOT and Cambridge Systematics via recent updates to WisDOT's statewide freight model. The payload factors were estimates for 53-foot trailers, are subject to further revisions, and are as follows:

a. Food & Beverage: 44,212.22 lbs.
b. Paper: 48,284.14 lbs.
c. Plastics: 33,221.23 lbs.
d. Machinery: 23,508.40 lbs.[6]

4. Commodity value (dollars) per pound – the commodity values per pound were derived from the 2012 CFS for food or kindred products $0.5541 (SCTG codes 05, 06, and 07); pulp, paper, or allied products $0.6259 (SCTG codes 27 and 28); and machinery $10.1858 (SCTG code 34). A value per pound for plastic shippers was determined by the midpoint between the reported high and low price from the Plastics Exchange $0.62 (http://www.theplasticsexchange.com/).
5. Origin (O) and Destination (D) Pairs: OState, DState, Ofips, and Dfips (Federal Information Processing Standard[7]). The location of Wisconsin's non-rail served shippers served as one-half of the O/D pair with the other being a particular U.S. metro region. These fields in the model are mainly used to identify and track O/D pairs when analyzing the results. U.S. metro regions were chosen based on two criteria: (1) to achieve geographical representation of the United States; and (2) the metro regions represented large trading partners (by truck) with Wisconsin for one or more of the four commodities under analysis.
6. Observed Mode – since researchers used commodity totals moved by truck, the observed mode is "truck."
7. Trucking cost per mile – researchers received general trucking rates (current rates as well as the 12-month high and low) between Wisconsin and each of U.S. metro regions from a third-party logistics (3PL) company. The 12-month high for each region was selected as the trucking rate per mile.
8. Trucking miles – the distance between the shipper and a generalized point within the particular U.S. metro region. The time and distance were derived using a "Network Analyst" tool, and the generalized point was created using the "Feature to Point" tool to obtain the geographic center of the metro region.
9. Trucking Load – the same figure was used as the pounds per shipment.
10. Container type – This field is not applicable for our use of the model. If the observed mode was rail, this value in this field would correspond to the type of rail move: "1" for rail carload, "2" for TOFC (trailer on flat car), and "3" for COFC (container on flat car).
11. Junction Frequency – for the base case, this input was set as "0" since all Class 1 railroads interchange in Chicago, and all loads were assumed to traverse via a Chicago-region intermodal terminal. For the policy case, this input was set as "0" for moves to metro regions served by western railroads or served by both western and eastern railroads, and set as "1" for moves to metro regions served by only eastern railroads.
12. Observed rail revenue per hundredweight (cwt) – This field is not applicable since the observed mode is trucking.

[6] "There is typically no fundamental difference between the use rates of a product traveling by TOFC rail and one moving by truckload truck. Consequently, if the policy question is concerned with diversion from TOFC-to-truck, or from truck-to-TOFC it doesn't particularly matter what the annual use rate is, because the shipment sizes that can be used by the two modes are essentially the same. The tradeoffs that matter in choosing the mode are difference in rates and service quality. At the same annual use, low value and high density would appear to favor TOFC, while high value and high cube would tend to favor truck. COFC movements are typically international shipments, so these same conclusions don't necessarily apply." –ITIC-IM Model User's Manual, page 22.
[7] The FIPS code is a uniformed numerical classification used by the U.S. Census Bureau to identify states, counties, census tracts, and other census defined geographical boundaries.

13. Rail Variable cost per cwt – the model's parameter is preset with a function that uses $0.3106 for the variable cost per mile. This is multiplied by the number of linehaul miles and adds the total lift charges at the origination and destination to figure the total variable cost. This is then divided by the load's hundredweight value.
14. Rail Miles – researchers used the county-to-county distance matrix provided by the Oak Ridge National Laboratory (April of 2011 - http://cta.ornl.gov/transnet/SkimTree.htm).
15. Container Pick-up/Delivery charge - drayage rates used in the model vary depending on where the dray is taking place (Wisconsin or one of the metro regions), and for the dray moves taking place in Wisconsin, the rate depends on whether or not it is a base case or policy case run of the model.
    a. U.S. Metro Regions - researchers utilized an online dray quoting tool to acquire current rates for various metro regions. Origin/destination pairs were created by using the city of the intermodal facilities within the metros, creating 15-, 30-, 50-, and 100-mile bins going away from the facility's location (acquired from Class I websites), and then selecting cities within those bins. Researchers attempted to maintain geographic equity by selecting a city north of the terminal, east, west, south, as well as sought to include other boundaries (a state border or river for example), in order to capture any rate differences within the mileage bins. Map 5.6 shows the Kansas City metro region, and highlights the selected cities researchers used to query the online dray quoting tool. The average dray cost from the 15-30 and 30-50 mile bins from all of the available metro regions ($382.16) was chosen as the dray cost for the non-Wisconsin portion of the freight move for both the base and policy case.



Map 5.6 Kansas City Metro Region and Select Cities within Intermodal Dray Service Bins.

a. Wisconsin Base Case - the model's preset parameters are set to compute drayage costs with the following function: a flat rate of $125 and a variable rate of $1.38 per mile over 30 if the dray is greater than 30 miles. Researchers compared the computed values for each of the shippers to a current zoning rate structure obtained from a 3PL company, and found the model's dray cost estimates were considerably lower than the zoning rate structure. To accommodate, researchers doubled the dray cost to more accurately portray current rates.

b. Wisconsin Policy Case- the model's preset function (discussed above) was used.

16. Line-Haul Speeds - researchers used the model's preset parameters of 30 mph for rail intermodal and 50 mph for trucking. The 30 mph value is close to the historical average (11/21/14 through 11/20/2015) of 29.1 mph for the six Class I's which report their weekly performance: BNSF, CN, CSX, KCS, NS, and UP. The values range from 24.6 to 35.3 mph[8].
17. Relative Transit Time Reliability Factor - researchers used the model's preset parameter values: 0.45 for rail and 0.40 for truck.
18. Freight Loss and Damage as a fraction of freight revenue - researchers used the model's preset parameters: 0.002 for rail and 0.0007 for trucking.
19. Claim payment days - researchers used the model's preset parameters: 90 days for rail and 60 days for trucking
20. Terminal Processing Time (hours) - researchers used the model's preset parameter: 24 hours total with 12 hours figured at the origin and destination terminal.
21. Total Lift Cost - researchers used the model's preset parameter: $250 total represents a $125 lift at origin and destination.
22. Required Service Protection Level (percentage) - researchers used the model's preset parameter, which varies by commodity: food and beverage 97 percent; Pulp, paper, and allied products 90 percent; Chemical and allied products 95 percent; and Machinery 90 percent.
23. Inventory carrying cost percentage - researchers used the model's preset parameter, which varies by commodity: food and beverage 30 percent; Pulp, paper, and allied products 25 percent; Chemical and allied products 25 percent; and Machinery 30 percent.
24. Opportunity Cost of Mode Change - the model's preset threshold is set at 3 percent or $20,000, meaning the total logistics costs for intermodal must be at least 3 percent lower or annually at least $20,000 lower than trucking for the load to divert. This 3-percent threshold was considered to be a conservative estimate for modal conversion. Iterations of the model were also run using a 1.5-percent threshold as well as 0 percent, and these modal conversion estimates were considered to be more aggressive.

Commodity Data Considerations

There are a number of ways to classify commodities including the Standard Transportation Commodity Codes (STCC), the Standard Classification of Transported Goods (SCTG), and classifications created by individual states. Aggregated commodity flow data sources such as the Commodity Flow Survey and the Freight Analysis Framework use the SCTG codes while the Surface Transportation Board's Carload Waybill Sample data uses the STCC codes, and the WisDOT uses its own classification scheme.

[8] http://www.railroadpm.org/home/rpm.aspx

The crosswalk of SCTG commodity codes (which CFS and FAF tonnage is reported as) to STCC commodity codes (which the ITIC-IM model uses) is outlined below:

- Food and Beverage: used SCTG codes 04, 05, 06, and 07 to determine the freight volumes to correspond with the industry groups found in the Wisconsin shipper dataset and recorded within the model as STCC code 20.
- Plastics and Rubber: used SCTG code 24, and STCC code 28[9].
- Paper: used SCTG codes 27 and 28, and STCC code 26.
- Machinery: used SCTG code 34, and STCC code 35.

Base Case and Policy Case Assumptions

The model works by running a base-case iteration followed by a policy-case iteration in order to see the changes in logistics costs associated with the policy change. An example of the base case is represented by the shipper-intermodal terminal connections in Map 5.6. Researchers then introduced the five proposed Wisconsin intermodal terminals from Chapter 4: to induce input changes to the model. An example of the shipper-intermodal terminal connections for the policy case is provided in Map 5.7. The introduction of intermodal terminals essentially reduced the dray and truck miles, increased the number of rail miles, and accounted for the associated changes in costs. While past uses of the model simply relied on changes to the model's parameters to conduct analysis (to the researchers' knowledge), changes to the inputs during this research required considerable work in order to run iterations of the model.

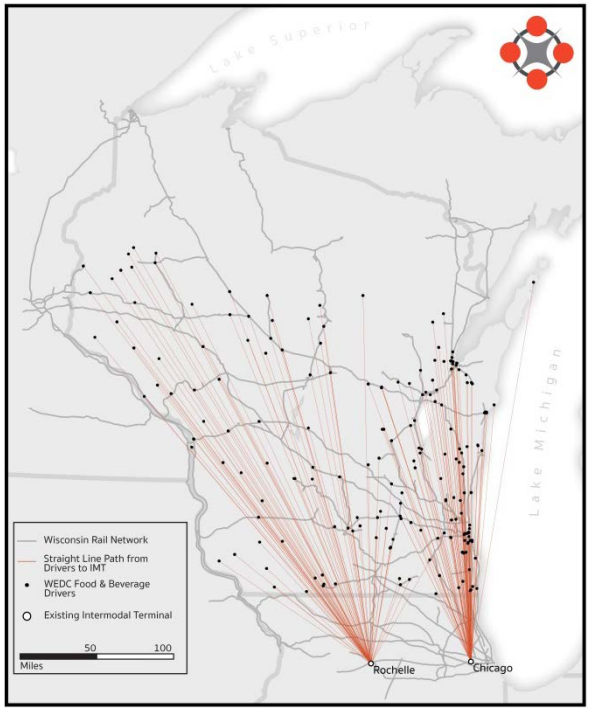
Researchers left the Minnesota and Wisconsin terminals out of the base case iteration, resulting in all shippers draying containers to and from the intermodal ramps in the Chicago region. There is no completely right or completely wrong answer as to whether or not to include these ramps in the base-case analysis. Survey respondents indicated that Minnesota ramps were being used, while discussions with a local 3PL indicated they were precluded from gaining access to the ramps without contracts guaranteeing a consistently high-volume of containers. Discussions at the 2015 Minnesota Freight Advisory Committee (MnFAC) meeting also pointed out that capacity is an issue for shippers within the Twin Cities, forcing them to dray containers to Chicago. Regarding the Wisconsin terminals in Chippewa Falls and Arcadia, capacity issues, the corresponding predominate freight flows from and to the Port of Prince Rupert, and a lack of domestic and reefer service provided researchers with enough justification to remove them from the base-case analysis. Capacity improvements at these terminals to handle diverted freight volumes forecasted by the model were assumed for the policy case analysis, as was the addition of domestic and reefer service. The exclusion of these terminals will most likely overestimate the number of loads identified for modal conversion during the base-case iteration of the model.

Shippers that are closest to a Chicago region terminal were left out of the policy-case analysis since the introduction of new terminals would not change their proximity to an intermodal terminal, nor the associated logistics cost structure. These included: six shippers from the Food and Beverage industry, one from the paper products industry, zero from the plastics industry, and six from the machinery industry.

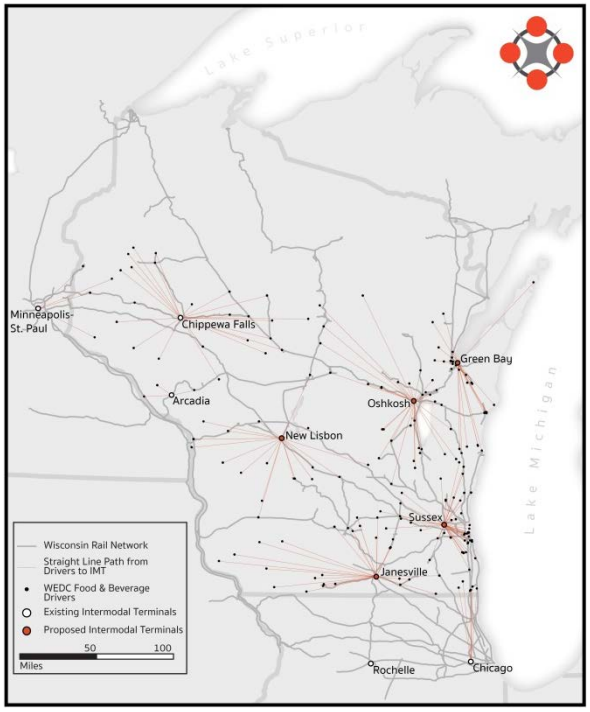
In total, researchers ran three iterations of the model's policy case using different threshold parameter levels required to induce mode change: three percent, 1.5 percent, and zero percent. Essentially, this means that the total logistics costs associated with intermodal rail would have to

[9] The shipment of plastic related commodities causes an issue because the SCTG classification of "Plastics and Rubbers" (Code 24) does not allow an analyst to discern between the raw materials used in the manufacturing process and the outputs (intermediate goods and finished products). The two can have considerably different characteristics in terms of density and value. Within the STCC classification, the raw materials used in the manufacturing process are classified under the code of 28, while the intermediate goods and finished products are classified under the code of 30.

be a certain percentage less than that of trucking for the model to identify a load for modal conversion. The three-percent threshold was the most conservative estimate and the zero-percent was the most aggressive, with shippers choosing intermodal rail as long as the costs were on par with that of trucking.



Map 5.7 WEDC Food and Beverage Shippers' Connections to Closest Chicago Region Intermodal Terminal Used for Base-Case Iteration.



Map 5.8 WEDC Food and Beverage Shippers' Connections to Nearest Intermodal Terminal Used for Policy Case Iterations.

Results and Discussion

Base Case

The base-case iteration of the model identified a number of origin-destination pairs (787) between WEDC shippers and metro regions where annual shipments (20,695) were diverted to rail because the total logistics costs associated with the rail move were three percent less than the total logistics costs associated with a truck move (Figure 5.2). Roughly 17.6 percent of the total Paper Product shipments were diverted to rail, while five percent of Food & Beverage and Plastics shipments were diverted. No shipments of Machinery were diverted to rail during the base case iteration. It should also be noted that a total of 110 shipments were removed from the analysis because the model computed a rail rate below cost. These shipments were either to Kansas City (27 Food & Beverage, 7 Paper Products, 37 Plastics, and 19 Machinery) or St. Louis (8 Food & Beverage, 2 Paper Products, 2 Plastics, and 8 Machinery).

A few metro regions dominate the diverted traffic (Figure 5.3). The model diverted shipments for all but two Food & Beverage producers and all but three Paper product producers to Miami resulting in 3,880 and 1,430 rail shipments. 7,623 paper product shipments destined for Los Angeles were diverted representing products from 121 of the state's 146 shippers. The model also diverted 646 plastic input shipments from 38 shippers and 180 loads of Food & Beverage products between Los Angeles and Wisconsin. Some traffic between Laredo and Wisconsin was diverted to rail, 2,700 shipments from 90 Paper product shippers and 560 input shipments to 40 Plastic producers, as well as 1,020 Food & Beverage shipments from 60 shippers and 264 loads of paper product from 33 shippers to Portland. New York, Philadelphia, Atlanta, Baltimore, and Houston also had shipments diverted to rail.

Policy Case with Three Percent Threshold

The addition of five intermodal terminals in Wisconsin alone had little impact on intermodal rail's total logistics costs for the WEDC shippers. In total, only an additional 3,393 shipments from 266 shippers were diverted to rail: 1.7 percent of food and beverage shipments, 2.2 percent of paper-product shipments, and 0.6 percent of plastic-input shipments. These shipments were concentrated in just two metro areas: Portland, receiving 1,904 of the diverted food and beverage loads and 744 of the paper product loads, and Seattle, receiving 559 paper-product shipments and 96 plastic loads. The other shipments diverted to rail were found in the plastic-input shipments, with 48 coming from Houston, and 42 from Laredo. Each of the Wisconsin intermodal terminals would host a portion of the diverted shipments except Arcadia, which is not the closest terminal to any of shippers within the four industries under analysis (Table 5.4). The distribution of diverted shipments is somewhat balanced, with two tiers becoming apparent: 902 for Green Bay, 880 for Oshkosh, and 724 for Sussex in the top tier, and 371 for New Lisbon, 339 for Chippewa Falls, and 177 for Janesville in the bottom tier.

Table 5.2 Output Summaries from the ITIC-IM Model's Base-Case and Policy-Case Analyses Showing the Number of Loads Diverted to Rail and Those Assigned to the Trucking Mode.

		BASE CASE		*POLICY CASE ITERATIONS*					
		3% Threshold		3% Threshold		1.5% Threshold		0% Threshold	
		Truck	Rail	Truck	Rail	Truck	Rail	Truck	Rail
Food & Beverage	O/D Pairs	3,022	275	2,818	112	1,813	1,117	540	2,390
	Shipments	114,643	6,199	109,183	1,904	71,159	39,928	16,849	94,238
	Tons Shipped	2,495,249	134,475	2,377,623	40,168	1,549,203	868,588	367,502	2,050,289
	Truck VMT	114,718,481	0	107,700,512	0	52,056,423	0	8,631,467	0
	Intermodal Dray VMT	0	959,325	0	147,596	0	3,318,768	0	7,464,016
	Rail Ton-Miles	0	206,052,491	0	83,274,882	0	1,403,289,187	0	2,404,754,717
	Logistics Costs	$326,902,944	$27,687,150	$308,998,639	$8,574,814	$176,279,925	$137,898,644	$31,793,181	$281,217,833
	*Six shippers to Northlake								
Paper Products	O/D Pairs	2,066	407	1,915	136	1,313	738	200	1,851
	Shipments	59,655	12,738	57,925	1,303	41,740	17,488	5,188	54,040
	Tons Shipped	1,416,428	303,477	1,376,447	29,842	995,493	410,796	122,458	1,283,832
	Truck VMT	51,630,199	0	48,666,342	0	28,500,987	0	2,310,450	0
	Intermodal Dray VMT	0	2,817,894	0	65,871	0	1,098,288	0	2,705,427
	Rail Ton-Miles	0	567,866,560	0	62,500,819	0	566,746,538	0	1,212,292,250
	Logistics Costs	$158,240,475	$50,317,392	$151,174,389	$5,865,717	$95,966,535	$59,740,015	$9,192,478	$145,632,498
	*One shipper to Northlake								
Plastics	O/D Pairs	2,423	105	2,354	18	1,488	884	163	2,209
	Shipments	32,465	1,758	31,595	186	19,053	12,728	4,307	27,474
	Tons Shipped	523,011	28,509	509,015	2,975	306,402	205,587	70,318	441,672
	Truck VMT	29,338,308	0	28,432,136	0	12,144,907	0	1,952,947	0
	Intermodal Dray VMT	0	485,604	0	15,680	0	889,377	0	1,636,628
	Rail Ton-Miles	0	43,707,001	0	5,112,035	0	288,891,507	0	456,299,101
	Logistics Costs	$89,330,661	$6,803,449	$86,881,521	$726,250	$43,875,298	$42,675,111	$7,651,518	$78,512,782
	*Zero shippers to Northlake								
Machinery	O/D Pairs	6,671	0	6,569	0	6,569	0	5,294	1,275
	Shipments	58,239	0	57,351	0	57,351	0	47,930	9,421
	Tons Shipped	652,162	0	642,221	0	642,221	0	536,257	105,964
	Truck VMT	52,142,706	0	51,410,279	0	51,410,279	0	35,346,334	0
	Intermodal Dray VMT	0	0	0	0	0	0	0	512,781
	Rail Ton-Miles	0	0	0	0	0	0	0	183,457,115
	Logistics Costs	$409,902,711	$0	$403,880,006	$0	$403,880,006	$0	$315,771,866	$87,710,493
	*Six shippers to Northlake								
Four Commodity Totals	O/D Pairs	14,182	787	13,656	266	11,183	2,739	6,197	7,725
	Shipments	265,002	20,695	256,054	3,393	189,303	70,144	74,274	185,173
	Tons Shipped	5,086,850	466,461	4,905,305	72,985	3,493,319	1,484,971	1,096,534	3,881,756
	Truck VMT	247,829,695	0	236,209,269	0	144,112,597	0	48,241,198	0
	Intermodal Dray VMT	0	4,262,823	0	229,147	0	5,306,433	0	12,318,852
	Rail Ton-Miles	0	817,626,052	0	150,887,736	0	2,258,927,231	0	4,256,803,182
	Logistics Costs	984,376,790	84,807,990	950,934,555	15,166,781	720,001,764	240,313,770	364,409,043	593,073,606
	*Six shippers to Northlake								

Policy Case with 1.5-Percent Threshold

Reducing the required amount of total logistics cost savings associated with an intermodal rail shipment from three percent to 1.5 percent has a considerable impact on the amount of shipments that will divert away from truck, totaling 70,144 annual loads. These diversions are somewhat consistent across the different commodities: for the Food & Beverage industry, a total of 39,928 loads representing 38 percent of O/D pairs and 36 percent of shipments; for the manufacturers of paper products, a total of 17,488 loads representing 36 percent of O/D pairs and 29.5 percent of shipments; and for plastic producers, a total of 12,728 loads representing 37 percent of O/D pairs and 40 percent of shipments. All machinery shipments still remain on the highways utilizing trucks.

A number of metro regions capture the majority of these diversions. Dallas in particular would see 20,053 loads diverted to rail intermodal with 190 of 196 shippers from the food and beverage industry, 145 of 146 paper-product producers, and 101 of 151 plastic shippers diverting their freight from truck to intermodal rail. O/D pairs between Wisconsin and Los Angeles would also be able to shift a large amount of freight to intermodal rail under this scenario: 187 of the 196 food and beverage shippers, 110 of the 151 plastics shippers, and 25 of the 146 shippers of paper products, resulting in a total of 14,665 diverted loads. While not on the same level when compared to Dallas or Los Angeles, the New York and Detroit metro regions would offer a large number of

opportunities for WEDC shippers to divert to intermodal rail: 6,419 loads to and from New York, concentrated in the paper-products and plastics inputs with some food and beverage, and a total of 4,306 loads to and from Detroit pretty evenly distributed amongst shippers within the three industries. Laredo, Houston, Seattle, and Portland were also able to produce sizable amounts of diverted traffic (6,540, 5,561, 4,884, and 568 shipments respectively) building upon intermodal rail traffic from the three-percent threshold scenario.

The diverted shipments are again somewhat balanced among the Wisconsin intermodal terminals with Sussex, Oshkosh, Chippewa Falls, and Green Bay all facilitating the movement of over 10,000 rail intermodal shipments, and New Lisbon and Janesville both providing intermodal rail access for over 5,000 shipments. Sussex not only connects the largest number of O/D pairs with 700, but would also service the most intermodal rail moves with 16,641—the most of which would be food and beverage shipments of 8,848 compared to 4,186 shipments of plastic inputs and 3,607 loads of paper products. Oshkosh would be the second busiest intermodal terminal under this scenario, linking a total of 552 O/D pairs and facilitating the movement of 13,692 shipments (predominately in 6,916 shipments of food and beverage and 5,814 of paper products). While the number of O/D pairs serviced by the Chippewa Falls terminal is lower when compared to those of Sussex, Oshkosh, and Green Bay, the connections it does serve provide more diverted shipments on a per case basis.

Policy Case with Zero-Percent Threshold

Placing the cost threshold of moving freight via intermodal rail on par with that of trucking, results in 55 percent of O/D pairs and 71 percent of shipments being serviced by intermodal rail. Both of those market shares increase to 87 percent if machinery products are removed from the analysis. Roughly 82 percent of food and beverage O/D pairs and 85 percent of the shipments are diverted to rail in this scenario. For paper products, the percentages of O/D pairs and shipments are 90 and 91 percent respectively, and 93 and 86 percent respectively for plastic product inputs. Under this scenario, even manufacturers of machinery are able to divert some of their shipments to intermodal rail (16.4 percent).

A zero-percent cost threshold would offer increased opportunities to divert truck shipments to domestic intermodal rail service to the rest of the metro regions within the study's analysis, such as Atlanta, Baltimore, Charlotte, Kansas City, Philadelphia, and to a lesser extent St. Louis, Cleveland, and Pittsburgh. A large portion of Wisconsin manufacturers of machinery would also be able to divert some of their shipments to intermodal rail to the metro regions of Portland (379 of 394), Laredo (326 of 394), Seattle (323 of 394 shippers), and Houston (247 of 394). Wisconsin shippers of food and beverage products would also divert a large number of shipments destined for New York (10,725 of 12,740).

Decreasing the threshold parameter to divert shipments to rail when the total logistical costs are equal significantly increases the number of shipments into and out of each of the six Wisconsin intermodal terminals as well as the number of O/D pairs serviced. Sussex would be the busiest terminal providing connections to 2,545 O/D pairs and facilitating the movement of 48,506 shipments. Oshkosh and Green Bay would be the next busiest terminals with 41,803 and 35,856 shipments respectively with both having a large proportion of their lifts accommodating the food and beverage and paper product shippers, accounting for 89 and 85 percent of the moves under analysis, respectively. The concentration of diverted shipments in food and beverage products is also seen from the terminals in Chippewa Falls (14,381 of the total 20,551), Janesville (12,981 of the total 18,160), and New Lisbon (10,532 of the total 14,113).

Table 5.3 ITIC-IM Output Totals by Metro Region and Commodity.

	Model Inputs		Base Case Rail		3% Policy		1.5% Policy		0% Policy	
	Shippers	Shipments	Shippers	Shipments	Shippers	Shipments	Shippers	Shipments	Shippers	Shipments
Los Angeles	887	25,889	162	8,449	0	0	322	14,665	322	14,665
Food & Beverage	196	11,760	3	180	0	0	187	11,220	187	11,220
Paper	146	9,198	121	7,623	0	0	25	1,575	25	1,575
Plastics	151	2,567	38	646	0	0	110	1,870	110	1,870
Machinery	394	2,364	0	0	0	0	0	0	0	0
Miami	887	7,258	337	5,310	0	0	2	20	150	316
Food & Beverage	196	3,920	194	3,880	0	0	0	0	0	0
Paper	146	1,460	143	1,430	0	0	2	20	2	20
Plastics	151	302	0	0	0	0	0	0	148	296
Machinery	394	1,576	0	0	0	0	0	0	0	0
Atlanta	887	26,683	4	247	0	0	41	1,031	456	22,098
Food & Beverage	196	12,544	1	64	0	0	0	0	166	10,624
Paper	146	8,906	3	183	0	0	6	366	142	8,662
Plastics	151	2,869	0	0	0	0	35	665	148	2,812
Machinery	394	2,364	0	0	0	0	0	0	0	0
Kansas City	797	12,982	0	0	0	0	2	70	372	10,065
Food & Beverage	169	6,422	0	0	0	0	0	0	125	4,750
Paper	139	4,865	0	0	0	0	2	70	136	4,760
Plastics	114	570	0	0	0	0	0	0	111	555
Machinery	375	1,125	0	0	0	0	0	0	0	0
Baltimore	887	9,123	3	51	0	0	25	425	478	4,630
Food & Beverage	196	2,156		0	0	0	0	0	188	2,068
Paper	146	2,482	3	51	0	0	25	425	142	2,414
Plastics	151	151	0	0	0	0	0	0	148	148
Machinery	394	4,334	0	0	0	0	0	0	0	0
Detroit	887	60,834	0	0	0	0	67	4,306	393	28,205
Food & Beverage	196	18,228	0	0	0	0	17	1,581	132	12,276
Paper	146	11,534	0	0	0	0	15	1,185	127	10,033
Plastics	151	6,644	0	0	0	0	35	1,540	134	5,896
Machinery	394	24,428	0	0	0	0	0	0	0	0
St. Louis	867	12,942	0	0	0	0	5	75	287	7,125
Food & Beverage	188	5,640	0	0	0	0	0	0	84	2,520
Paper	144	5,040	0	0	0	0	1	35	103	3,605
Plastics	149	1,490	0	0	0	0	4	40	100	1,000
Machinery	386	772	0	0	0	0	0	0	0	0
Charlotte	887	8,340	0	0	0	0	42	665	458	6,028
Food & Beverage	196	1,764	0	0	0	0	0	0	165	1,485
Paper	146	2,190	0	0	0	0	7	105	145	2,175
Plastics	151	2,416	0	0	0	0	35	560	148	2,368
Machinery	394	1,970	0	0	0	0	0	0	0	0
New York	887	24,217	45	1,626	0	0	208	6,419	438	19,342
Food & Beverage	196	12,740	12	780	0	0	13	845	178	11,570
Paper	146	5,548	9	342	0	0	87	3,306	136	5,168
Plastics	151	3,171	24	504	0	0	108	2,268	124	2,604
Machinery	394	2,758	0	0	0	0	0	0	0	0
Cleveland	887	14,099	0	0	0	0	4	148	149	4,163
Food & Beverage	196	3,724	0	0	0	0	0	0	30	570
Paper	146	3,212	0	0	0	0	0	0	54	1,188
Plastics	151	5,587	0	0	0	0	4	148	65	2,405
Machinery	394	1,576	0	0	0	0	0	0	0	0
Portland	887	7,409	93	1,284	205	2,648	249	3,216	776	6,017
Food & Beverage	196	3,332	60	1,020	112	1,904	136	2,312	136	2,312
Paper	146	1,168	33	264	93	744	113	904	113	904
Plastics	151	151	0	0	0	0	0	0	148	148
Machinery	394	2,758	0	0	0	0	0	0	379	2,653
Philadelphia	887	17,102	10	420	0	0	76	1,273	473	15,123
Food & Beverage	196	10,780	5	275	0	0	4	220	185	10,175
Paper	146	4,234	5	145	0	0	27	783	140	4,060
Plastics	151	906	0	0	0	0	45	270	148	888
Machinery	394	1,182	0	0	0	0	0	0	0	0
Pittsburgh	887	6,598	0	0	0	0	6	48	278	2,518
Food & Beverage	196	3,332	0	0	0	0	0	0	54	918
Paper	146	876	0	0	0	0	0	0	96	576
Plastics	151	1,208	0	0	0	0	6	48	128	1,024
Machinery	394	1,182	0	0	0	0	0	0	0	0
Dallas	887	21,887	0	0	0	0	436	20,053	483	20,194
Food & Beverage	196	15,288	0	0	0	0	190	14,820	190	14,820
Paper	146	4,964	0	0	0	0	145	4,930	145	4,930
Plastics	151	453	0	0	0	0	101	303	148	444
Machinery	394	1,182	0	0	0	0	0	0	0	0
Houston	887	7,960	3	48	3	48	418	5,609	727	7,030
Food & Beverage	196	3,136	0	0	0	0	190	3,040	190	3,040
Paper	146	438	0	0	0	0	83	249	145	435
Plastics	151	2,416	3	48	3	48	145	2,320	145	2,320
Machinery	394	1,970	0	0	0	0	0	0	247	1,235
Laredo	887	15,538	130	3,260	3	42	353	6,582	679	11,146
Food & Beverage	196	3,528	0	0	0	0	190	3,420	190	3,420
Paper	146	4,380	90	2,700	0	0	55	1,650	55	1,650
Plastics	151	2,114	40	560	3	42	108	1,512	108	1,512
Machinery	394	5,516	0	0	0	0	0	0	326	4,564
Seattle	887	6,836	0	0	55	655	483	5,539	806	6,508
Food & Beverage	196	2,548	0	0	0	0	190	2,470	190	2,470
Paper	146	1,898	0	0	43	559	145	1,885	145	1,885
Plastics	151	1,208	0	0	12	96	148	1,184	148	1,184
Machinery	394	1,182	0	0	0	0	0	0	323	969
Totals	14,969	285,697	787	20,695	266	3,393	2,739	70,144	7,725	185,173

Table 5.4 ITIC-IM Output Totals by Intermodal Terminal and Commodity.

	*BASE CASE**		*POLICY CASE RESULTS***					
	3% Threshold		3% Threshold		1.5% Threshold		0% Threshold	
	O/D Pairs	Shipments	O/D Pairs	Shipments	O/D Pairs	Shipments	O/D Pairs	Shipments
Chippewa Falls	65	1,972	21	339	372	11,348	748	20,551
Food & Bev	35	1,095	17	289	183	7,303	385	14,381
Paper	25	772	1	8	57	1,863	94	2,714
Plastics	5	105	3	42	132	2,182	219	3,017
Machinery	0	0	0	0	0	0	50	439
Green Bay	199	5,376	77	902	467	10,908	1,399	35,856
Food & Bev	38	868	27	459	179	6,014	417	16,575
Paper	111	3,732	40	355	183	3,647	490	14,002
Plastics	50	776	10	88	105	1,247	346	4,252
Machinery	0	0	0	0	0	0	146	1,027
Janesville	46	813	12	177	253	7,208	685	18,160
Food & Bev	39	747	9	153	157	5,469	316	12,981
Paper	7	66	3	24	23	724	60	1,916
Plastics	0	0	0	0	73	1,015	222	2,496
Machinery	0	0	0	0	0	0	87	767
New Lisbon	26	460	25	371	185	5,781	440	14,113
Food & Bev	20	400	19	323	122	4,198	264	10,532
Paper	6	60	6	48	47	1,349	90	2,718
Plastics	0	0	0	0	16	234	47	654
Machinery	0	0	0	0	0	0	39	209
Oshkosh	209	6,031	72	880	552	13,692	1,548	41,803
Food & Bev	35	697	32	544	204	6,916	472	18,856
Paper	143	4,856	38	304	271	5,814	636	18,234
Plastics	31	478	2	32	77	962	256	3,356
Machinery	0	0	0	0	0	0	184	1,357
St. Paul	42	1,333	0	0	210	4,566	360	6,184
Food & Bev	13	624	0	0	28	1,180	51	1,716
Paper	10	310	0	0	14	484	22	616
Plastics	19	399	0	0	168	2,902	285	3,838
Machinery	0	0	0	0	0	0	2	14
Sussex	188	4,457	59	724	700	16,641	2,545	48,506
Food & Bev	85	1,586	8	136	244	8,848	485	19,197
Paper	103	2,871	48	564	143	3,607	459	13,840
Plastics	0	0	3	24	313	4,186	834	9,861
Machinery	0	0	0	0	0	0	767	5,608
Totals	**787**	**20,695**	**266**	**3,393**	**2,739**	**70,144**	**7,725**	**185,173**

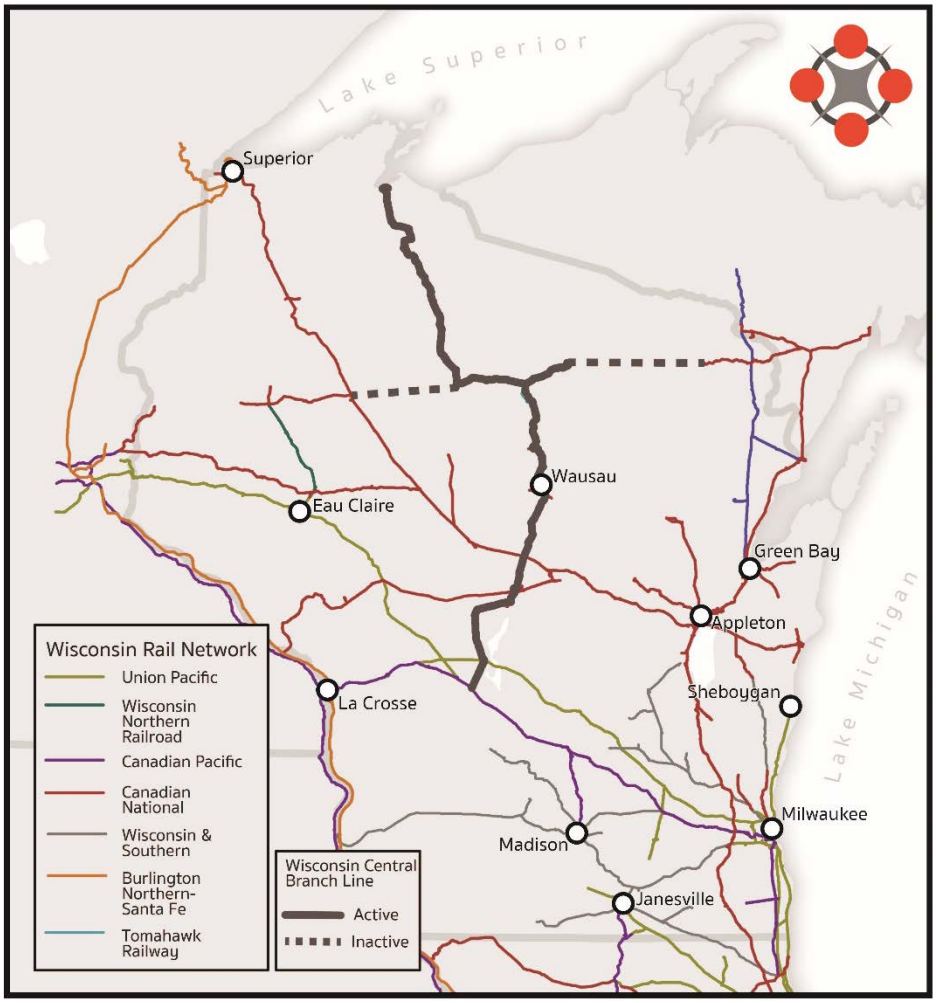
*O/D Pairs and Shipments from the base case are assigned here to the closest proposed intermodal terminal despite being routed to the Chicago region for the base case analysis. Ten Food & Beverage O/D Pairs accounting for 182 shipments and two Paper Products O/D Pairs accounting for 71 shipments remained closest to the Chicago region and were not included in the policy case analysis.

**1.5% Policy Case results include those already shown in 3%, and results for 0% include those from 3% and 1.5%- they are not additional; however, they do not include the results from the base case.

Chapter 6: Conclusions and Recommendations

After conducting a review of related literature, a stakeholder outreach survey, spatial analysis regarding Wisconsin shippers' current and potential proximity to rail access, and analysis of potential modal conversion from truck to intermodal rail, researchers have come to a number of conclusions and recommendations for stakeholders moving forward.

1. Buy-in across stakeholders (public and private) will be vital due to the volume of freight levels being shipped is not readily apparent to accommodate Class 1 business and network model needs. Every shipper with divertible loads will be crucial to the success of future intermodal rail service in the state, and strong positive working relationships will be required to overcome obstacles currently restricting rail access to Wisconsin's shippers.
2. A number of considerations were not included in this analysis including the capacity of rail lines (ability to double-stack rail cars, to accommodate Class 1 weight limits, and maintain Class 1 speed limits across an entire line through the state), value-added capabilities at either an intermodal terminal or transload facility, the fact that distribution centers were not included in the WEDC Shipper dataset, and other pertinent information. These variables will all impact the siting of an intermodal or transload facility and the ability of a facility to provide economical and efficient service to shippers. For example, the model did not forecast as many diverted shipments for the proposed New Lisbon site when compared to those generated by Sussex, Oshkosh, Green Bay; however, its equidistant location between the Twin Cities and Chicago, its proximity to three Class 1's and Interstates 90/94, and the fact it serves as the natural collection point for the Wisconsin Central Branch Line provide opportunities for modal conversion not captured in this research effort by using the WEDC drivers database. A comprehensive survey of rail lines throughout the state would allow a more complete analysis to be conducted, as well as provide transparency to capacity needs throughout the state. The inclusion of distribution centers and the associated freight flows would also provide added freight volumes that would increase the likelihood of gaining increased intermodal service within the state.



Map 6.1 Wisconsin Central Branch Line's intersection with Class I's in Juneau County.

3. The creation of five intermodal terminals in the state would require considerable investments in land, infrastructure, and equipment. More feasible, would be the siting of an initial terminal. Analysis could be conducted on a case-by-case basis, removing the cannibalistic nature of placing five new terminals in the state, and increasing the volumes of diverted freight from truck to rail for each of the proposed terminals. For example, while the model diverted more shipments from the proposed terminal in Sussex, the siting of a terminal in Oshkosh may, in fact, produce more diverted loads due to the fact that it could draw freight from the Fox Valley as well as Green Bay and Milwaukee because of its proximity.
4. Most WEDC shippers do not currently benefit from close proximity to intermodal rail terminals with one public and one private terminal, both in western Wisconsin, and a lack of capacity in the Twin Cities, leaving shippers having to dray intermodal shipments to the Chicago region. However, they do enjoy much closer proximity to rail-served warehouses. Shippers should look to increase the utilization of these facilities in order to gain access to the rail network. WisDOT, other public agencies, and private stakeholders should focus attention and efforts on increasing cost efficiencies associated with transloading operations, which was noted in project surveys and other Wisconsin based rail reports as being uneconomic at this point in time.

5. Stakeholders should focus on ways to increase the availability of containers in the region or supporting new container technologies that would increase the ability of Wisconsin shippers to gain access to rail trade lanes. WisDOT has a strong history of and national reputation for investing public dollars into the state's rail infrastructure in order to maintain rail service for benefit of the state's shippers and residents. If investing public dollars into equipment, including containers, would increase Wisconsin's shippers' ability to access the rail network, then these investments should be made as well. Ultimately, this may not be WisDOT's role, and other stakeholder funds besides FRIIP are needed. State and local economic development agencies, other local funds, as well as private funding are all potential sources to fill this gap. Additionally, federal funds are available especially when projects can show partnerships between public and private interests and collaboration across jurisdictions.
6. The state should look into giving local governments the ability to form port authorities. Currently, state statutes do not include the term, port authority, and this makes Wisconsin the exception when compared to neighboring Midwest states rather than the rule. The Ohio model provides an interesting example to follow. Port authorities at the county level have created inland ports providing shippers with access to the rail network. Supply chains are incredibly local: logistical solutions which prove to be economical for a plastics manufacturer in one place may not work for a plastic manufacturer located somewhere else. The ability to plan and invest must also be local.
7. The state's proximity to the nation's busiest rail hub in Chicago has been generally viewed as a negative by a number of reports. However, this proximity could instead be seen as a positive in that being within a short dray to the region allows shippers to place their freight directly at the rail head of choice, and thereby removing the need for it to be drayed across town between various rail carriers. Also, 3PL companies and other logistical companies in the state have created services tailored to do just this: get Wisconsin freight to and from the Chicago region in an economical and efficient matter. Of note, is the NE WI I-41 and I-43 Circuitous Platform©[10] servicing shippers' import and export flows from inland ports. By reversing the origin of their freight flows, on-boarded shippers have realized gains in reliability, eliminated equipment availability concerns (containers and chassis), fees for detention and demurrage, and are positioned to leverage the platform for future efficiency gains as the platform scales up.
8. With the large percentage of potential diverted shipments being accounted for by the Food & Beverage industry, stakeholders should look into potential partnerships with the Madison Region Economic Partnership and Milwaukee 7. There may be opportunities to collaborate and leverage federal dollars from their recent US Economic Development Administration's Investing in Manufacturing Communities Partnership (IMCP) designations.

[10] The Platform was researched, designed, authored, and copyrighted on September 8, 2015 by GKM, Incorporated.

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Appendix A: Wisconsin Rail User Survey–Winter 2015

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Appendix B: Freight Railroad Infrastructure Improvement Program (FRIIP) and Freight Railroad Preservation Program (FRPP) Loan Data

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Company	Location	Purpose	FRIIP Funds (Loan)	FRPP Funds (Grant)	Local Funds
Pecatonica Rail Transit Commission	Janesville - Monroe	Phase I Rehabilitation		$1,432,874	$358,218
Pecatonica Rail Transit Commission	Janesville - Monroe	Phase II Rehabilitation		$444,070	$1,776,282
WRRTC	Middleton - Prairie du Sac	Rehabilitation		$3,244,624	$811,156
WRRTC	Waukesha	Construction and Rehabilitation		$338,682	$150,671
WRRTC	Janesville - Fox Lake	Rehabilitation		$417,805	$104,451
	Bardwell Jct. - Elkhorn				
WRRTC	Janesville - Madison	Rehabilitation	$30,114	$3,984,556	$966,025
South Central WI Rail	Madison	Rehabilitation of Grade Crossings		$196,684	$49,171
Transit Commission					
WRRTC	Mazomanie - Prairie du Chien	Rehabilitation	$136,343	$727,161	$45,447
	Waukesha - Milton				
WRRTC	Janesville - State Line	Rehabilitation		$3,382,240	
WRRTC	Janesville	Construct run-around		$88,000	$22,000
		Track			
WRRTC	Boscobel - Prairie du Chien	Phase III Rehabilitation	$717,019	$3,824,485	$239,030
WRRTC	Mazomanie - Prairie du Chien	Phase II Rehabilitation	$805,947	$4,298,383	$268,649
WRRTC	Waukesha - Milton	Phase IV Rehabilitation	$578,164	$3,083,538	$192,721
WRRTC	Waukesha - Milton	Phase V Rehabilitation	$745,501	$3,976,005	$248,500
Wisconsin & Southern	Horicon Yard	Line rehabilitation	$525,051		
Wisconsin & Southern	Ripon	Line rehabilitation	$121,874		
Farm City Elevator	Milton Jct	Rail spur construction	$47,710		$11,000
Wisconsin Central	Parkland	Log loading area improvements	$1,200,000		
Wisconsin Central	Glidden	Log loading area improvements	$341,011		
Wisconsin Central	Oshkosh	Track consolidation	$4,887,000		
Wisconsin Central	Bradley - Argonne	Line rehabilitation	$1,362,440		$340,610
WRRTC	Madison - Middleton	Rehabilitation	$526,586	$4,808,456	$840,777
Wisconsin Central	Ashland - Morse	Line rehabilitation	$1,600,074		
Wisconsin Central	Neenah - Menasha	Line rehabilitation	$1,998,736		
WRRTC	Elkhorn - Bardwell Jct.	Rehabilitation	$585,698	$3,123,720	$195,232
Farm City Elevator	Orfordville	Rail spur construction	$54,023		
Wisconsin Central	Morse - Prentice	Line rehabilitation	$2,878,944		
Wisconsin Central	Stanbery	Construct rail siding	$834,495		

Company	Location	Purpose	FRIIP Funds (Loan)	FRPP Funds (Grant)	Local Funds
Wisconsin Central	Green Bay/	Line rehabilitation	$1,123,259		
	Wrightstown				
Farm City Elevator	Darien	Rail spur construction	$96,972		
Badger Grain	Darien	Rail spur construction	$169,000		$25,000
Wisconsin & Southern	Hartford	Line rehabilitation	$472,967	$480,000	$120,000
	- Horicon				
Burlington Consumers Coop	Whitewater	Construct rail served	$319,200		
	(Grain)	grain bin			
Wisconsin Central	Fond du Lac	Track consolidation	$862,637		$306,000
Fox Valley & Western	Fox River Jct.	Construct rail siding	$2,619,000		
Tomahawk Railway	Tomahawk	Construct rail served warehouse	$824,270		
Farm City Elevator	Milton	Construct rail served	$538,000		
		grain bin			
WSOR	Waupun	Rehabilitation	$521,608	$1,148,814	$287,204
Farm City Elevator	Darien	Reconstruct grain loading spout	$342,250		
Wisconsin Central	Arcadia	Line rehabilitation	$1,242,000		
	- Winona				
Wisconsin Central	Akerville	Siding construction	$758,000		
Wisconsin & Southern	Akerville	Siding construction		$382,030	$95,507
Wisconsin Central	Valley Jct.-Taylor	2nd Main, Phase I	$7,663,310		
Wisconsin & Southern	Waukesha	Power switch installation		$254,612	$63,652
Fitchburg - Oregon	Madison - Evansville	Line Acquisition		$859,985	$118,285
Didion Milling	Cambria	Facility Construction	$2,215,000		
WSOR	Ripon - Fairwater	Rehabilitation		$1,030,952	$257,738
Escanaba & Lake Superior	Green Bay - Crivitz	Rehabilitation	$1,494,820	$564,144	$141,036
Cenex - Land O' Lakes	Cylon	Substitute Service	$407,830	$164,800	$41,200
Wisconsin Central	Arcadia - Whitehall	Rehabilitation	$1,010,802		
Tomahawk Railroad	Tomahawk	Warehouse Expansion	$780,000		
WSOR	Ripon	Rehabilitation	$631,067	$432,098	
WSOR	Brandon - Horicon	Rehabilitation	$1,721,154	$367,514	$91,879
Farm City Elevator	Darien	Grain Bin & Facilities	$916,200		
Super Soy Feed	Brodhead	Grain Bin Construction	$370,000		
WSOR	Horicon - Cambria 1	Rehabilitation	$535,842	$1,084,606	$271,151

Company	Location	Purpose	FRIIP Funds (Loan)	FRPP Funds (Grant)	Local Funds
Agriland Coop	Ripon	Fertilizer Facility & Sidetrack	$1,324,300		
United Coop	Horicon	Grain Facility & Sidetrack	$1,003,600		
Wisconsin Central	Royalton	Siding Construction	$1,380,000		
Kewaunee Coop	Luxemburg	Facility Construction	$306,800	$325,000	
Kewaunee Coop	Luxemburg	Facility & Sidetrack	$948,200		
FVW/WCL	Merrillan - Plover	Rehab Phase IV	$4,317,298		
Tomahawk Railroad	Tomahawk	Warehouse Expansion	$737,000		
Duffy Grain, Inc.	Sun Prairie	Grain Facility and Track	$1,540,000		
Southern WI Grain	Evansville	Grain Facility Expansion	$1,160,000		
WSOR	Horicon - Cambria	Rehabilitation	$535,842	$1,941,112	$485,278
WSOR	Janesville - Monroe	Rehabilitation		$720,000	$319,542
WRRTC	Sauk City Bridge	Bridge Stabilization		$480,000	$120,000
WSOR	Madison-	Option to Buy		$5,200,000	
	Watertown				
Southern WI	Evansville	Grain Facility	$1,250,000		
Grain					
Landmark	Evansville	Fertilizer Loadout	$585,000		
Coop		and Storage			
Didion Mining	Cambria	Spur Track &	$1,660,000		
		Soybean Facility			
Farm City	Orfordville	Grain Facilities	$470,220		
Elevator					
United Coop	Beaver Dam	Spur Track &	$1,010,000		
		Storage			
Duffy Grain, Inc.	Sun Prairie	Grain Storage	$603,780		
WSOR	Milton Jct- Anderson	Rehabilitation		$500,000	$125,000
Olson Bros, LLP	Oshkosh-	Rail Sidings, Grain Storage, Ethanol Pipeline & Tank	$1,700,000		
	Utica/Algoma				
Futurewood	Parkland - Superior	Siding & Intermodal Center	$775,000		
Southern WI Grain	Evansville	Grain Facility	$1,550,000		
		Phase II			
Burlington Farmer Supply	Burlington	Grain Facility Expansion	$307,738		
Farm City	Darien	Grain Facility Expansion	$555,000		
Elevator					

Company	Location	Purpose	FRIIP Funds (Loan)	FRPP Funds (Grant)	Local Funds
Duffy Grain, Inc.	Sun Prairie	Bin & Conveyor	$1,105,000		
CINCO J - Riverdale Ag	Muscoda	Grain Bins	$1,005,650		
WSOR	Milton Jct - Anderson	Rehab Phase II		$979,330	$244,832
WNRR	Norma-Rice Lake-Barron	Rehabilitation	$1,450,000		
Badger Grain	Darien	Grain Bin	$699,110		
Coop Plus	Burlington	Fall protection system	$41,830		
WSOR	N. Milwaukee to Hartford	Rehabilitation		$2,316,800	$579,200
WSOR	Kiel to Saukville	Acquisition		$1,728,400	$227,100
Escanaba and Lake Superior	Crivitz to Wausaukee	Rehab Phase 1	$213,741	$1,836,763	$245,450
Agri-Land Coop	Ripon	Fertilizer shed & rail loadout	$382,500		
Renew Energy	Jefferson	Spur tracks, ethanol storage and loadout	$1,900,000		
Landmark Service Coop	Evansville	Grain storage bin	$760,000		
United Ethanol	Milton	Plant trackage, grain storage and loadouts	$2,999,806		
WSOR	Slinger to Hartford	Rehab Phase 2		$2,164,049	$541,012
WSOR	Janesville to Monroe	Rehab		$557,014	$139,254
Port of Milwaukee	Milwaukee	Rehab spur track		$560,000	$140,000
Farm-City Coop	Orfordville	Grain storage bin	$381,883		
Grand River Coop	Markesan	Spur tracks, grain & fertilizer storage	$996,956		
WSOR	Southern WI	Wireless communications system	$2,230,000		
Renew Energy	Jefferson	Spur track, grain storage & loadout	$1,500,000		
Duffy Grain	Marshall	Grain storage bins	$1,195,000		
WSOR	Wheeler Pit to Walworth	Track Rehab Phase 1		$2,874,818	$718,705
WSOR	Janesville, Walworth, Monroe	Bridge Rehab		$184,000	$46,000
WSOR	Janesville, Walworth, Monroe	Bridge Rehab		$776,000	$194,000
WSOR	Hartford to Horicon	Phase 1A tie and ballast		$383,274	$95,819
Escanaba and Lake Superior	Wausaukee to Pembine	Rehabilitation	$208,819	$1,670,553	$208,819
Badger Grain	Darien	High speed loading leg	$256,119		
Millard Grain	Avalon	Rail spur	$1,034,510		
Amsoil	Superior	Rail spur	$2,154,000		
WSOR	System wide	Bridge Rehab		$481,800	$120,450
WSOR	Wheeler Pit to Walworth	Track Rehab Phase II		$3,540,229	$885,057

Company	Location	Purpose	FRIIP Funds (Loan)	FRPP Funds (Grant)	Local Funds
WSOR	Hartford to Horicon	Phase 1B tie and ballast		$1,418,194	$354,549
WSOR	Plymouth to Kohler	Acquisition		$972,251	$22,000
Olsen Bros. Milling	Boscobel	Rail spur and grain bins	$1,850,000		
Specialty Ingredients	Watertown	Spur track and loading facility	$737,700		
Badger Grain	Darien	Grain storage	$911,000		
WSOR	Hartford to Horicon	Track Rehab Phase II		$4,781,064	$1,195,266
WSOR	Madison to Milton Jct.	Phase I ties and ballast		$2,849,200	$712,300
WSOR	Whitewater, Cross Plains, Brodhead	Bridge Rehab		$2,109,816	$527,454
WSOR	Whitewater, Cross Plains, Brodhead	Bridge Rehab		$1,600,000	$400,000
Rat River Railroad	Laona to Cavour	Acquisition		$34,423	
WSOR	Milwaukee to Slinger	Track Rehab Phase II		$1,000,000	$250,000
WSOR	Monroe to Janesville	Track Rehab Phase II	$416,000	$3,328,000	$416,000
WSOR	Madison to Milton	Track Rehab Phase II	$500,000	$4,000,000	$500,000
Glacier State Distribution	Sussex	Transload, side track	$1,331,775		
Glacier State Distribution	Chippewa Falls	Transload, side track	$1,689,018		
Polyack	Zenda	Grain transload facility	$2,468,022		
WSOR	Janesville	Track Acquisition		$4,124,750	$618,689
WSOR	Plymouth to Kohler	Rehabilitation		$12,000,000	$3,000,000
Millard Grain	Avalon	Grain bin, conveyor, rail scale	$868,970		
Zenda Grain	Zenda	Grain bin, conveyor, rail scale	$1,748,949		
WSOR, WRRTC	Madison to Milton	Track Rehab Phase IIB	$1,195,872	$9,566,974	$1,195,872
WSOR, WRRTC	Waukesha realignment	Track Rehab		$1,767,623	$441,906
WSOR, WRRTC	Bridges	Bridge Rehab and Replacement	$455,894	$3,647,149	$455,894
WSOR, EWCRC	N. Milwaukee to Slinger	Track Rehab Phase IIB	$1,326,907	$10,615,254	$1,326,907
E&LS	Wausaukee to Niagara	Track Rehab	$636,659	$5,093,269	$636,659
Zenda Grain	Zenda	2 grain storage bins	$1,500,000		
E&LS	Marinette Marine Spur	Rehabilitation		$1,367,704	$341,926
WSOR	Bridges	Bridge Rehab and Replacement	$500,000	$4,000,000	$500,000
WSOR	Bridge study	Engineering Study	$220,000	$1,760,000	$220,000
WSOR	Saukville to Elkhart Lake	Phase 1 Track Rehab - Ties, Crossings, Turnouts	$804,286	$6,434,286	$804,286

Company	Location	Purpose	FRIIP Funds (Loan)	FRPP Funds (Grant)	Local Funds
Landmark Coop	Evansville	Grain Storage Bin	$1,500,000		
Millard Grain	Avalon	Fertilizer storage tank	$610,000		
Zenda Grain	Zenda	2 Grain Storage Bins	$1,500,000		
WRRTC/UP	Madison area	Acquisition - Preliminary work		$100,000	
WSOR	Fairwater to Markesan	Rehab Ties and Rail & Switches		$4,043,705	$1,010,926
WSOR	Milton Jct. to Anderson	Side Track Construction	$218,041	$1,744,324	$218,041
WSOR	Janesville to Walworth	Rehab Track & Rail & Ties	$625,000	$5,000,000	$1,250,000
WSOR	System Wide	Bridge Rehab and Replacement	$500,000	$4,000,000	$500,000
E&LS	System Wide	Bridge Rehab and Replacement	$229,595	$1,836,763	$229,595
WSOR	Fitchburg to Oregon	Track Rehab - No rail	$286,673	$2,293,380	$286,673
Didion Milling	Cambria	Mainline bypass track, rail scale switch, warehouse addition, loadout facility and a corn unload system upgrade	$2,532,831		
Farm City Elevators	Zenda	Grain Storage Bin	$1,500,000		
Grain Ventures	Oconto Falls	Grain Storage Bin	$820,000		
City of Baraboo	Baraboo	Rehab Rail Spur		$800,000	$200,000
			$119,829,812	**$175,648,109**	**$31,489,053**

Appendix C: Transportation Economic Assistance Program (TEA) Grant Data

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Award Year	Community	Business Name	Business Type	New Job Total	Retained Job Total	Project Description	Grant Award Amount
2014	Sheboygan County	Bemis Manufacturing	Plumbing Products	0	1000	Rehab WSOR rail line from Plymouth to Kohler	$1,000,000
2013	Janesville	GOEX	Specialty Medical Packaging	0	130	Construct a new frontage road, a new rail spur, and add traffic signals at US14/Newville	$650,000
2013	Marinette	Marinette Marine Co.	Ship Builder and repair	136	1000	re-construct three municipal streets to access MMC and rail rehab	$1,000,000
2012	Fond du Lac	McNeilus Steel	steel fabricator & dist.	70	50	construct 2 new rail spurs	$600,000
2012	Sheboygan County	Bemis Manufacturing	Plumbing Products	0	1000	reconstruct/rehab 10.2 miles of WSOR embargoed rail corridor from Plymouth to Kohkler	$1,000,000
2012	Town of Hubbard	Menard inc.	landscape products	56	0	construct rail spur	$278,586
2011	Marinette	Thilmany Papers	pulpwood transload site and biomass operation	15	0	rehab 1500 feet of rail spur at the Beecher rail yard to serve transload site	$73,500
2011	Waukesha	Weldall Manufacturing	precision metal fabricator and production	130	0	construct 2 new rail spurs	$650,000
2009	Ladysmith	Indeck	wood pellet manufacturer	60	0	construct a new rail spur	$300,000
2007	DePere	Green Bay Packaging	mfg. paperboard packaging	5	118	construct 3,878' extension of the industrial lead track and 713' spur	$615,000
2007	South Milwaukee	Bucyrus	mfg. mining and excavation equipment	110	0	new rail switching yard, bedding, re-enforced pads, and Rawson Road reconstruction	$538,429
2007	South Milwaukee	Bucyrus	mfg. mining and excavation equipment	200	0	removal, repair, and installation of 3,700 LF of spur track to include new rail, switch gear, scale, and bumping	$902,175
2007	Watertown	Clasen Quality Coatings Inc.	mfg. confectionary coatings for food industry	45	0	construct 1,668' industrial lead track and 940' of spur track	$225,000
2007	Wisconsin Rapids	Advanced Fiberglass Technologies	mfg. plastic and fiberglass equipment	30	48	construct 1,830' industrial lead track extension and 510' of spur	$256,650
2006	Milton	United Ethanol LLC	ethanol refinery	34	0	construct 1,206' industrial lead track	$139,000
2006	Rhinelander	ABX	mfg. plastics	50	0	construct 822' rail spur and switch, and 574' of siding tracks	$248,760
2006	Wrightstown	84 Lumber	mfg. lumber	15	0	construct 1,949' industrial lead track, side derail, and bumping post	$75,000

Award Year	Community	Business Name	Business Type	New Job Total	Retained Job Total	Project Description	Grant Award Amount
2005	Amherst	Blenker Companies	mfg. trusses, walls, etc.	20	20	construct 1,605' rail spur	$168,000
2004	Mt. Pleasant	Racine Rail Road Products Inc.	mfg. of maintenance of way equipment for RR industry	5	61	construct 1,700' rail spur, including unloading pads and drainage	$325,500
2004	Randolph	United Wisconsin Grain Producers	ethanol refinery	32	0	construct 10,421' of multi-track mini rail yard	$160,000
2004	West Salem	Select Trusses and Lumber	mfg. of structural wood trusses	30	65	construct 3,530' public lead track and 1,055' industrial spur	$403,500
2004	Wrightstown	Coating Excellence International	paper and other products converter	69	0	construct 1,277' rail spur	$193,000
2003	Crescent	Northwoods Distribution Services	trucking/warehousing/logistics	33	0	construct 1,685' and 1,080' rail spurs	$165,000
2003	Milton	Cargill	processor/distributor salt and ag feed	10	25	construct 3,130' industrial lead track and SH 59 RR crossing	$175,000
2003	New London	Perfecseal Inc.	mfg. flexible medical packaging	40	0	construct 1,745' rail spur	$200,000
2002	De Forest	Cartonplast Inc.	mfg. of plastic layer pads for transport	40	0	construct 1,325' public lead and 965' industrial rail spur	$200,000
2002	Marshfield	Wick Building Systems	mfg of modular homes and farm buildings	35	0	construct 778' rail spur	$80,500
2002	Schofield	Merrill Iron and Steel	Structural Steel Fabricator	42	0	construct 700' rail spur	$122,500
2001	Beloit	Frito-Lay	mfg. snack foods	22	85	reconfigure 1,103' of tracks to switch from west and add storage trackage	$259,500
2001	Black River Falls	Land O'Lakes	dairy services cooperative	26	0	construct 300' rail spur	$47,500
2001	Edgerton	Green Tek/CPT Inc.	mfg. and distributor plastic thermo food containers	66	28	construct 910' rail spur and reconstruct 1,300' of Highway Street and Saunders	$377,500
2001	Manitowoc	EPI 04	mfg. plastic shutters, lumber, etc	36	0	construct 1,210' rail runaround track with 2 switches	$175,500
2001	New London	Wolf River Lumber	wholesaler of mfg and dry lumber	30	90	construct 2,606' rail spur	$447,500
2001	Pleasant Prairie	Genesis Cable Systems	mfg low voltage cable wire	70	147	construct 665' rail spur	$276,500
2001	Shawano	Bay Lakes Cooperative	wholesale agri-business cooperative	36	8	construct 2,674' two track rail and 2,480' access road	$220,000
2000	De Forest	Firestone Building Products	mfg commercial roofing	50	0	construct 1,776' rail spur and extend North Stevenson Street 1,125'	$250,000
2000	Jackson	Olympic Building Components	roof and floor trucc mfg.	18	0	construct 717' rail spur	$69,000
2000	Jackson	Midwest Hardwood Corp.	mfg and distributor wholesale	20	0	construct 580' rail spur and 1,200'	$87,896

Award Year	Community	Business Name	Business Type	New Job Total	Retained Job Total	Project Description	Grant Award Amount
			lumber			access roads	
2000	Mazomanie	Sunny Industries	magazine printer	10	0	construct 421' rail spur and utility relocations	$39,000
2000	Rice Lake	Shadow Plastics inc	mfg plastic film and bags	5	30	construct 1,075' rail spur	$87,000
1999	Ashland	Ashland Industries	mfg of earth moving equipment	44	0	construct 1,489' rail spur and 2,000' access road	$204,000
1999	Neenah	Avery-Denison	distributor of contract paper and plastics	75	0	construct 860' rail spur	$72,597
1999	Oconto Falls	McDermid Trucking and Warehousing	common/contract motor carrier and distributor	21	0	construct 2,540' rail spur	$105,000
1999	Racine	Alloc Inc.	mfg wood parquet flooring	100	0	construct 1,225' rail spur	$137,182
1998	Boyd	August Lotz Co.	mfg furniture	25	0	reconstruct 800' of rose street with RR crossing	$92,000
1998	Eau Claire	American Coating Technology	specialty coated paper and packaging products	64	16	construct 1,200' rail spur	$124,000
1998	Menomonie	Ambassador Steel Corp.	dist./fabricator of steel reinforcing bars	12	13	construct 2,570' rail spur	$125,000
1998	Milton	New England Extrusion	mfg plastic bags	19	0	construct 850' rail spur	$53,370
1998	Mt. Pleasant	Liquid Container LP	mfg high density plastic bottles	90	0	construct 2,972' rail spur, include passing track and bridge	$450,000
1998	Wrightstown	Coating Excellence International	mfg. plastic coated paper	27	0	construct 810' rail spur and reconstruct 1,278' of Broadway Street	$135,000
1998	Wrightstown	Spirit Fabs Inc.	steel fabricator for the pulp and paper industry	66	36	construct 2,430' rail spur	$205,000
1996	Amherst	Tomorrow Valley Coop.	Wholesale grain plant	6	0	construct 1,528' rail spur	$30,000
1996	Hartford	Quad Graphics	magazine, catalog, and insert printer	250	0	construct 4,156' rail tracks	$171,918
1996	Pleasant Prairie	Nucon Corp.	Plastic pallet mfg	35	0	construct 1,188' rail spur	$68,412
1996	Pleasant Prairie	IRIS USA	household storage container mfg.	110	0	construct 1,025' rail spur	$124,813
1996	Reedsburg	Pace Industries/Midwest Hardwood	mfg. plastic sheeting and hardwood	51	0	construct 2,750' rail spur, including separate industrial lead tracks for both businesses	$254,150
1995	Portage	Cardinal IG	glass mfg	250	0	construct 4,989' rail spur, 1,800' access road and drainage improvement	$461,738
1995	Shawano	Heritage Veneered Products	mfg door and door parts	10	35	construct 1,937' rail spur	$83,943
1994	Delavan	Stock Lumber	building components	68	32	construct 1,690' rail spur, 2,770' road extension	$348,424

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1994	Kenosha	Horizon Milling	Grain Miller	40	0	construct 8,200' rail spur	$200,000
1994	Mazomanie	Sunny Industries	magazine printer	121	0	construct 800' rail spur, and road construction	$346,781
1994	Pleasant Prairie	PPC Industries	plastic bags and sheets	65	0	construct 1,250' rail spur	$127,101
1993	Appleton	AC Compressor	Industrial compressors	35	15	relocate 4,900' switching yard to facilitate plant expansion	$250,000
1993	Eau Claire	Jennico	household detergents and cleaning products	0	112	construct 1,600' rail spur	$96,511
1993	Hudson	Norflex Inc.	recyclable plastic shrink wrap	28	0	construct 900' rail spur, 1,380' access road, and retention pond	$113,177
1993	Mazomanie	Banks Hardwoods	hardwood distributor	25	0	construct 1,040' rail spur, 610' access road, and retention pond	$110,955
1993	Pleasant Prairie	Lawter International	printing ink compounds	50	0	construct 1,000' rail spur	$200,000
1992	Arcadia	Ashley Furniture	furniture mfg	63	0	construct 2,119' rail spur	$313,733
1992	Horicon	WSOR	short line rr operator	25	0	construct 1,850' rail spur	$63,671
1992	Tomahawk	Louisiana Pacific	waferboard, siding, and concrete forms	106	0	construct 4,370' rail spur and 300' access road	$246,605
1991	Cambria	United Maize	corn milled dry products	25	0	construct 2,610' rail spur	$125,000
1991	Fond du Lac	The Larsen Company	canned vegetable distributor	37	103	construct 5,327' rail spur, and relocate and construct access roads	$687,229
1991	Menomonie	Cardinal IG	flat glass mfg	249	0	construct 3,550' rail spur and improve access roads	$440,761
1991	Milwaukee	Steeltech Mfg.	Military containers	200	0	construct 3,300' rail spur and improve intersections and access road	$877,102
1991	Taylor	Badger Mining Corp.	sand mining operation	12	83	construct 15,514' rail spur and rail bridge	$475,000
1990	Mellen	North Country Lumber	lumber mills and kilns	25	20	construct 1,465' rail spur, rail bridge, and access road	$245,449
1990	Milwaukee	Grace Cocoa	chocolate maker	24	356	construct 2,550' rail spur	$132,450
1990	Rhinelander	Lake Shore Inc.	marine and mining products	60	0	construct 2,281' rail spur, access road, bypass lanes, and accel/decel lanes	$174,520
1990	Ripon	JMS Specialty Food	james, jellies, and cookie containers	35	0	construct 4,192' rail spur	$149,532
1990	Saukville	Charter Mfg.	wire products, metal fasteners, etc	100	0	construct 6,081' rail spur and 3,600' access road	$367,764

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1989	Bloomer	Bloomer Plastics	Plastics and Building Products	45	20	construct 950' rail spur and 4,000' access road	$301,068
1989	Waterloo	Michels Pipeline Construction	rock quarry mining	38	0	construct 5,059' rail spur	$190,000
							$22,562,952

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