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Intermodal Terminal Opportunities for Wisconsin and Eastern Minnesota

Final Report

December 28, 2023

The Objective of the Wisconsin Intermodal Freight Facility Study is to determine the economic viability, operational feasibility and potential location for trail-truck intermodal services in Wisconsin.

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Opinions

Unless otherwise indicated, the opinions herein are those of the authors and do not necessarily reflect the views of the North Central Wisconsin Regional Planning Commission.

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Executive Summary

This report is sponsored by the Wisconsin Department of Transportation's FRIIP program and key sponsors have provided matching funds in its support. The report's purpose is to identify, investigate and analyze potential demand for domestic, international, private and public intermodal freight service in the Wisconsin/Minnesota (WIMN) region.

The following questions will be explored herein:

- There are eight lanes (> 750 miles) supporting the region's freight which could be converted to Intermodal service given shipper commitment and carrier support.
- Given the current lift count at terminals supporting the region, at what point will their cumulative capacity be exhausted?
- Given the changes in regional GDP, what new ports and new lanes are emerging and does this support intermodal development?
- How many greenhouse gas emissions are reduced if regional freight could reduce 250 highway miles?
- Does the region have adequate warehouse infrastructure to support intermodal growth?
- Is the UP Minneapolis yard capable of supporting international volumes or is a larger terminal needed in the region?
- What percentage of intermodal loads which used Green Bay, Stevens Point, Neenah, Port of Milwaukee would use a Wisconsin terminal if one existed?

Benefits of Intermodal Transportation

Intermodal freight service is defined as the long-haul movement of domestic and international shipping containers and truck trailers by rail, i with a truck or water movement at one or both ends of the service.

By combining the best attributes of different transportation modes, intermodal can effectively and efficiently extend the economic reach of the local economy, and used to transport imports, exports, bulk raw materials, finished manufactured products, consumer goods, food and agriculture. Intermodal has been the fastest-growing rail traffic segment over the past 25 years. This growth has been fueled by railroad investment in new terminals, technologies, track capacity, advance signal systems, route clearances to accommodate double stack trains as well as new car types and locomotives. .

Intermodal services introduce significant efficiencies into the supply chain, benefitting operators, shippers, transportation network users, local communities and the general populace:

- Intermodal rail transportation is three to four times more fuel efficient than trucks, which can reduce greenhouse gas emissions by up to 75% and directly improve corporate environmental sustainability performance.
- One intermodal train can carry several hundred containers and/or trailers. Fewer trucks on existing roadways will reduce congestion during peak usage periods, particularly in urban areas lower capacity roads. Reducing the volume of heavy haul trucks also extends the lifespan of bridges, roads and associated infrastructure, minimizing delays and reducing the financial burden of repair and reconstruction.
- Reducing the numbers of long-haul trucks also permits manufacturers and producers to help address the worsening shortage of drivers.

Current State of WI/MN Region

Railroad intermodal hubs in Minneapolis and Chicago have historically provided terminal access to the North American Intermodal Network (Figure 1 below). Many of these terminals currently operate at or near capacity and are severely congested, impacting the viability of intermodal service. Drayage connecting the WIMN region to these terminals has increased in cost while current routes and congestion have dramatically reduced capacity and efficiency.

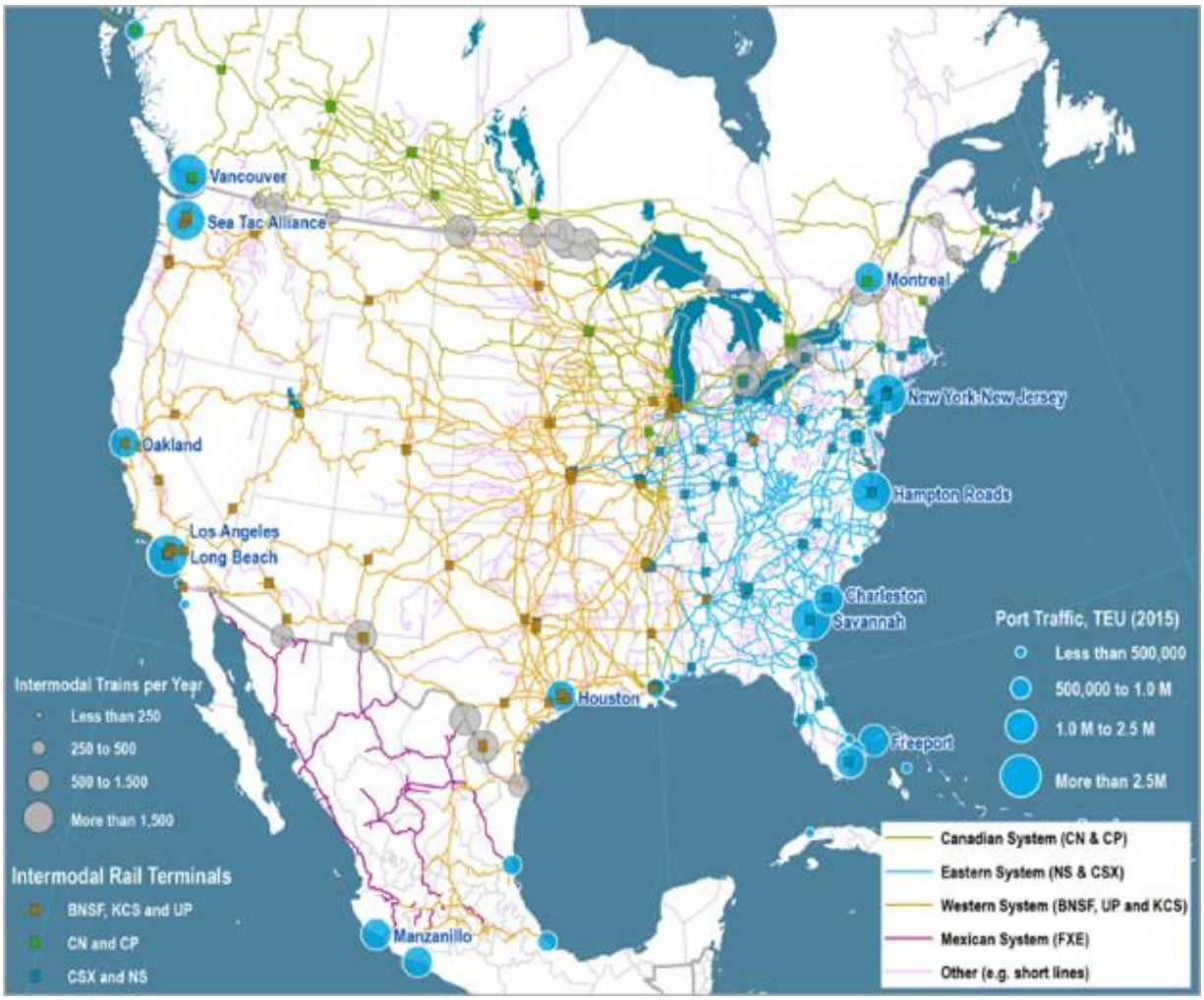


Figure 1 North American Intermodal Network Source: IANA

Southeast Wisconsin benefits from its proximity to the Chicago Intermodal Complex, which is served by six Class 1 railroads through more than 20 intermodal terminals. While Western Wisconsin has convenient access to rail terminals in Minnesota, the cost of bringing containers to Northern or Central Wisconsin can be prohibitive.

Wisconsin has some physical barriers in the Milwaukee area which limit capacity by precluding the movement of double stack trains. A recent improvement to a critical switch used by both CPKC and UP to access the Chicago CREATE corridor has the potential to allow for more trains on this congested rail corridor, but current contractual track and haulage rights act to limit availability of routes and potential intermodal connections.

Opportunities

After the pandemic's "bullwhip" effect on the supply chain, rail carriers have explored new avenues to increase intermodal freight volumes:

- Investment in private terminals and publicly sponsored industrial developments, often operated by short line rail carriers.
- New transportation networks, created by mergers, which expand and improve North-South rail services.
- New private container assets are being introduced to the network, and incumbent rail carriers are seeking growth opportunities within their existing service areas.
- Analysis has identified 18 potential sites for freight rail development, which should be promoted for prospective business attraction via Wisconsin and Minnesota Economic Development entities.
- Changing rail service and terminal models, new marine service to Port of Duluth, and marine development may increase container interest to Northwest, Northeast and Southeast Wisconsin.
- The CPKC merger will strengthen north-south freight lanes with new train starts and services.
- A new state of the art terminal is being built in Bensenville, IL where Eastern and Western Canadian flows will merge with flows to and from Mexico. The majority of Wisconsin RPCs indicate that economic development requests for Intermodal Service are growing. Eight long haul routes can generate sufficient Density for new intermodal service.
- Public and economic benefits resulting from operation of double-stack trains, in the Milwaukee-to-Chicago corridor, warrant a determined attempt to obtain available Federal funding for rail and passenger infrastructure improvements.

1.0 The Intermodal Industry

The Intermodal Association of North America (IANA) defines intermodalism as the movement of cargo in shipping containers or trailers by more than one mode of transportation. IANA estimates that 95% of manufactured goods move intermodally. Container vessels, ports, terminals, railroads, and trucks are essential for international intermodal service. The system's components require tracking, timing, and balancing of resources to operate effectively and efficiently. The system also requires sufficient cargo volume, lane balance, and rail-network integration to justify its establishment and sustain its viability. Transloading of cargo may involve several modes but is not unitized with standardized containers or trailers.

According to IANA, the industry generates $59 Billion in revenue annually, yet amounts to less than 10% of the trucking industry and less than 20% of the total third party logistics industry. The largest container ships can carry 19,224 TEU's per vessel. There are more than 17 million TEUs which operate in this global trade and 202,000 loaded TEU's are handled each day in the United States. In 2022, approximately 55 million loaded TEUs were handled by marine operators.

There are more than 2 million domestic containers which support the intermodal network. On a typical day, 60,000 domestic containers and trailers are moved by rail. These domestic and international containers are supported by 757,213 chassis registered in IANA's equipment database. These domestic and international shipments move between 350 marine and inland intermodal terminals reported to IANA.

Motor carriers provide important first and last mile services. IANA had 496,726 drivers registered in their driver data base as of 2023, representing 13,601 motor carriers. It is estimated that 98 million drayage moves are completed annually, which supports $22.5 Billion in annual revenue for the drayage industry.

Rail is an essential component of intermodal, in 2022 more than 18 million domestic and international container loads were moved across the Class 1 railroad network.

Third party logistics company's and private equipment owners account for a $5.5 Billion segment of the total intermodal business.

A. Intermodal Industry Benefits

Intermodal service combines the environmental and economic benefits of rail with the flexibility of truck service to accommodate shippers and receivers, who may not have direct railroad access or sufficient freight volumes to efficiently load traditional railcars.

IANA reports the following estimated benefits of intermodal freight service.

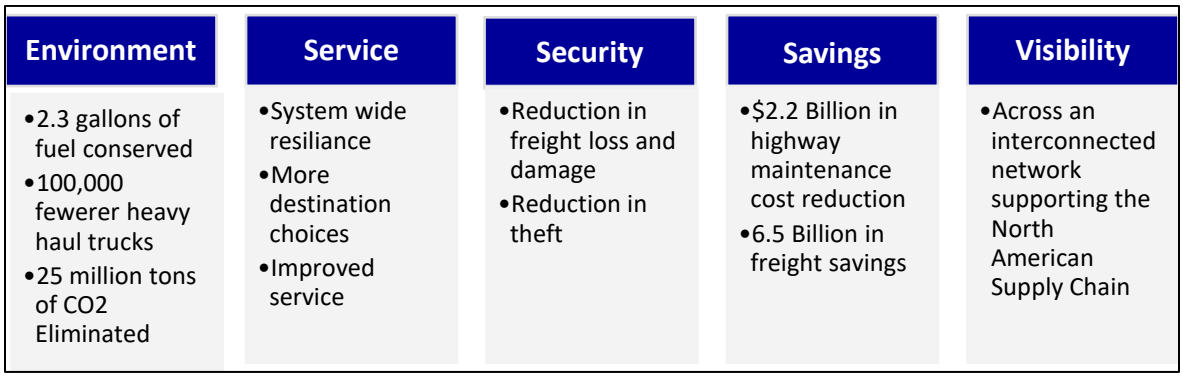


Figure 2 Benefits of Intermodal Service.

Intermodal in the United States is comprised of domestic and international elements, that can be both competing and collaborative. International intermodal service uses containers meeting International Organization for Standardization (ISO) requirements and moving through gateway ports. Domestic intermodal service can use ISO boxes, trailers, or 53-foot boxes.

IANA's 2021 data indicates that in the North American market there were 52 million containers handled by vessel, 17 million moves by rail and 98 million moves (drayage) by truck. These operations generated $51 billion in revenue for intermodal system users. The intermodal system saves billions of gallons in fuel, significantly reduces emissions, and reduces the costs of road repair.

The micro-economic objective of intermodal service is to lower the total transportation cost for the shipper by utilizing the best aspects of ship, rail, and truck transportation. Beyond the basic freight rate, total transportation cost encompasses several other elements including in-transit inventory, handling, insurance, storage, ordering, lost sales, reliability and quality-of-service. Knowledgeable shippers regularly assess total costs when selecting service partners, and the intermodal network must be economically sound to ensure its sustainability.

B. Components of the Intermodal Freight System

I. Users and Affected Parties

The intermodal freight system is operated exclusively by collaborative private enterprises, who share a common goal to provide safe, efficient, reliable intermodal service with a reasonable return on investment. This goal has driven the development of unit trains, terminal infrastructure, specialized equipment, locations, and key service parameters. These enterprises encompass:

- Cargo owners (shippers and consignees),

- Intermediaries that coordinate and arrange for transportation services, and
- Carriers (marine, rail, dray and delivery) that physically move the cargo.

Railroads do not sell intermodal service directly to cargo owners. Rather, they provide transportation services to asset owners and third-party logistics providers (3PLs) and intermodal marketing companies (IMCs) who coordinate between carriers, shippers, consignees, terminal operators, and intermodal equipment manufacturers.

While not direct users of the intermodal freight service, several public and private entities are affected by it:

- Local, State and Federal governments
- Communities that host a terminal, warehouse or distribution facility
- Financial institutions
- Private citizens who share the highway/road network with commercial vehicles

II. Containerized Cargo

The Census Bureau and the IANA define containerized cargo as furniture, home goods, appliances, electronics, building material and garden equipment supplies, health and personal care products, clothing and accessories, sporting goods, hobby, musical instruments and books, merchandise store goods, food and beverages, automotive parts and construction materials which are unitized. Bulk products may also be containerized and secured by the shipper but require additional loading equipment and securement.

III. Coordination and Connectivity

For an intermodal system to operate efficiently, multiple moving parts need to be coordinated. The physical parts include the containers, chassis, rail locomotives, rail well-cars, truck tractors, semi-trailers, marine vessels, terminals, and terminal equipment. Timely information is as critical as the physical assets to track, locate and maintain equipment and meet carrier schedules.

Continuing advances in data management technologies have enabled the electronic transfer of critical information required to manage millions of boxes and the funds to pay for operations. Terminals need to have robust computers securely linked to carriers, shippers and, where bonded cargo is handled, U.S. Customs. The size of intermodal terminals and the mobility of the associated workforce, are making portability and reliable remote connectivity increasingly important. Integrated computer systems support equipment tracking, improve security, track productivity, and enable billing. These systems require constant updating for new software and security.

IV. Ocean Carriers

Ocean carriers represent more than 50% of the containerized movements in the intermodal system below is a listing of container ship companies, routes and container equipment ownership.

2002 Top Ocean Carreirs Volumes and Routes

Rank	Ocean Carrier	Total Ships	TEUs	Alliance	Africa	Australia	Asia	Caribbean	C. America	EC & S. America	Europe	E. Med	India	Middle East	Mexico	WC & US	W. Med
1	Mediterranean Shipping Co	662	4,337,384	2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Maersk	737	4,279,760	2M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	CMA CGM Group	578	3,274,775	Ocean Alliance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	COSCO Group	475	2,928,114	Ocean Alliance		✓	✓		✓	✓							
5	Hapag-Lloyd	246	1,741,980	The Alliance	✓												
6	ONE (Ocean Network Express)	209	1,526,937	The Alliance			✓	✓		✓	✓						
7	Evergreen Line	200	1,504,564	Ocean Alliance			✓	✓	✓	✓	✓		✓				✓
8	HMM Co Ltd	76	820,520	The Alliamce			✓										
9	Yang Ming Marine Transport C	93	666,164	The Alliamce			✓	✓			✓						
10	Zim	125	451,855	2M/Non Alliance			✓	✓		✓		✓			✓	✓	✓
11	Wan Hai Lines	146	410,764	Non Alliance													
12	PIL (Pacific International Line)	87	282,655	Non Alliance													
13	KMTC	68	156,995	Independent													
14	IRISL Group	32	149,042	Independent													
15	X-Press Feeders Group	95	145,615	Independent													
	Top 50 Total	*5,108*	*24,579,557*														

Alliance Summary	Ships	TEUS	PCT of Top 50
2M Alliance	1,524	9,068,999	37%
Ocean Alliance	1,253	7,707,453	31%
The Alliance	1,253	4,755,601	19%
Top 50 Independent	1,078	3,047,504	12%

Data Source: Alphaliner Top 100: 02/04/2021

Figure 3 International Container Equipment

V. Containers

Most containers (boxes) in international trade are 20, 40, or 45 feet in length and designed for safe handling and transport worldwide using standardized equipment. The term for container use is a twenty-foot equivalent unit (TEU). The International Standards Organization (ISO) box standard encompasses several variations that allow a variety of cargo to be transported through the intermodal service. These variations include high cube or standard, some containers offer refrigeration. Containerized cargo can be loaded on trains and/or on vessels, with greater efficiency and less loss/damage, than bulk cargo.

Most of the 34.5 million ISO containers are owned by marine carriers. Container vessel need to have boxes in both load and discharge ports, as they carry cargo on both legs of their journey. When ISO boxes are moved inland and out of vessel rotation the vessel operator must purchase more boxes to maintain service. Thus, marine carriers are reluctant to send ISO boxes to inland locations unless there is quick turnaround to maintain vessel rotation.

The North American intermodal service uses ISO boxes, as well as with domestic 48- and 53-foot domestic containers designed to stack with the ISO boxes. The domestic service also

employs trailers on flat cars (TOFC) or piggyback. North American domestic units are rarely utilized for international movements, due to limited road size in other countries and inconsistent availability of handling equipment that meets the ISO standard for international containers. The market value of the North American intermodal service containers exceeds $40 billion.[i] In 2018, the North American intermodal service moved more than 35 million TEUs and is growing at the rate of 6 percent per year.

An emerging class of domestic container owners is contracting with the railroads directly. Multimodal trucking companies providing truck and intermodal service such as JB Hunt, Swift and Schneider along with large retailers such as Amazon, Walmart and Intermodal Intermediaries such as Hub Group, STG and others purchase rail service to move their private fleets. These services are then customized to meet cargo owner demands.

VI. Drayage and Chassis

Ultimately all containers unload or load cargo at an end user, and most are moved to and from the location by truck. Movement to and from a terminal by truck is called drayage and ISO containers require a roadworthy chassis for drayage. Chassis may be leased from equipment providers, or owned by large transportation firms and fleet owners such as JB Hunt and Schneider. Fleet-owned chassis are usually not available for public leasing. There are currently over 740,000 chassis registered in the IANA's Global Intermodal Equipment Registry (GIER) database, representing over 100 intermodal equipment providers.

Driver hours-of-service regulations, increasing highway congestion, and the shortage of long-haul drivers are increasing drayage cost and time. Traffic congestion and resulting delays in the study region are especially difficult along the I-94 corridor approaching, and within, the Chicago metropolitan area. [ii]Because drayage companies will deliver the cargo from the intermodal terminal to the consignee, minimizing drayage distances from the terminal increases driver utilization, operational efficiency.

Empty chassis are usually stored/maintained onsite at a terminal or at an offsite equipment depot (Figure 4). There may be additional facilities for special needs units, such as hazardous materials or refrigerated units. Ready access to roadworthy equipment during hours of operation is critical to maximize driver utilization so onsite storage is preferred, but terminal space constraints or close proximity of multiple terminals may make off-site equipment depots the better option. Chassis may also be stored at trucking firms or secure warehouse locations. Equipment depots can be owned by the terminal user or a third party.

Figure 4 Chassis Pool Storage at a Large Class 1 terminal

VII. Intermodal Lanes

Intermodal lanes support networks which compete with other railroad carriers. To be profitable these lanes are driven by density and frequency to provide a domestic truck alternative or to support an international trade corridor. There are several operating scenarios common for intermodal service to be successful. For Wisconsin intermodal to be successful, one or more of these conditions must be met. Wisconsin's primary challenge is that the largest population centers are within 250 miles of North America's largest intermodal hub system where six Class 1 railroads compete, each trying to best their closest competitor's schedule. For Wisconsin to succeed in their effort to develop intermodal service, a cost-effective network must be built which adds value to the existing network without compromising competitive schedules. Lanes must be long enough for intermodal economics to be able to generate a positive return on investment for the railroads.

Long Haul Intermodal Lanes (International and Domestic)

Intermodal systems operate on lanes that create economies of scale, unit train operations reduce transportation costs and maximize asset utilization. The four Class 1 that serve the study region have determined that a minimum line haul of 700 miles and terminals spaced at least 250 miles apart provide the best network optimization for freight.

Railroads will utilize unit trains of 200 double-stack cars carrying over 400 containers on a single non-stop trip. This point-to-point large scale service means terminals work best in populated urban areas located more than 700 miles apart that provide the cargo volume to support unit trains.

Imports and exports utilize rail networks that provide access to intermodal terminals at gateway ports. The largest container ports in the U.S. are Los Angeles and Long Beach, CA. There are some terminals in sparsely populated areas where raw materials or manufactured products are produced in sufficient quantities to support network train balance. International cargo volume typically exceeds the domestic intermodal volumes and drives train schedules to the predominant urban points of consumption. In some corridors UPS schedules become the service benchmark. USP is the largest domestic rail customer using intermodal today.

In some corridors domestic containerized cargo may be mixed with international boxes. From a rail operators' perspective, they are most profitable when fully loaded trains operate from end to end across their entire network. Terminal volume is a secondary consideration if there is a balance of inbound and outbound freight. International containers are typically 20' or 40' long while domestic containers are typically 53' long. Water borne carriers encourage the trans-shipment of export and import cargo from ISO boxes to domestic 53' boxes for several reasons and this practice can increase the cost of imports and exports and also requires warehouses or cross docks to accomplish this transfer. Shippers may also incur higher coastal labor costs for loading and/or unloading containers. The mixing of domestic and international freight and container ownership creates complexity at a terminal and often requires additional support services and auxiliary drop lots or container yards to segregate equipment and chassis.

Intermodal Short Haul Options

The railroads providing service east of the Mississippi have shorter intermodal lanes than the western railroads, but the closest the east coast rail tracks come to the study region is Chicago. Under 500 miles is usually considered a short haul intermodal rail distance but this is an approximate definition with exceptions. Four common types of short haul intermodal services are listed in Figure 5.

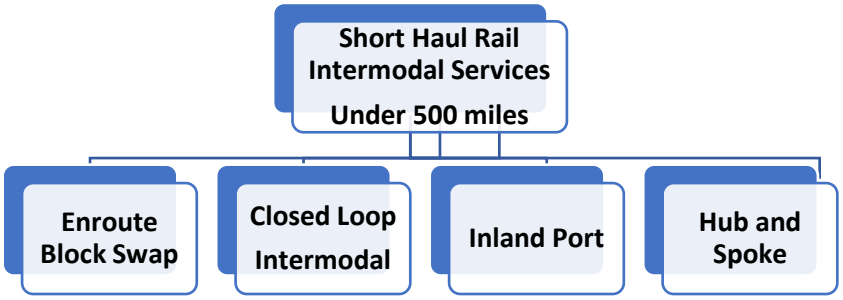


Figure 5 Types of Short Haul Intermodal Rail Service

Using the **En-route block swap** model, intermodal car blocks are set out or picked-up from intermediate terminals along long haul train routes. These blocks are then processed at the intermodal terminal. In some cases, such as in Shell Rock, Iowa the short line operates the terminal to support the Class 1 railroad because the volumes processed are below the Class 1's

volume requirement threshold. This system provides an opportunity for short line railroads to support intermodal service, at a secondary level. This model can reduce dray costs from large Class 1 terminals to rural areas. Many of these secondary terminals do not offer daily service.

A **closed loop intermodal service** is when a railroad operates between two intermodal terminals for a shipper as part of the production process. Triple Crown was a railroad intermodal service which supported the auto industry and moved product for OEMs between production points and assembly plants in Detroit and St. Louis.

An **inland port intermodal** service is when a railroad provides service from an inland intermodal terminal directly to an ocean port. This operation is an effort to move the international cargo off the ocean dock to allow for greater thruput. These inland ports provide equipment location information from the dock to the inland ports so that manufacturers at the inland port can reliably track inventory in the supply chain pipeline. As international volumes grow, this inland terminal capacity is becoming increasingly important because of the lack of room to expand dockside.

A **hub and spoke short haul** service was pioneered by CSX in North Baltimore, Ohio (about 65 miles outside of Toledo). The 500-acre terminal processes 30 trains per day and anticipated 2,000 lifts per day. This service was modeled after FedEx where regional freight from the other CSX terminals in Ohio, Michigan and Pennsylvania could be assembled to long haul trains. This service was designed as part of the National Gateway Network which was funded by a 2010 TIGER grant, supported by three states and Mid-Atlantic ports.

In 2018 CSX and BNSF created a joint service which allowed the six regional Midwest terminals to assemble full trains in North Baltimore, Ohio and bypass Chicago with an interline train to the West Coast. A service such as this could conceptually be created in Wisconsin, assembling freight form Northeast and Southeast Wisconsin, Central and Northwest Wisconsin at some point in the state on either one of the four western railroads, bypassing Chicago bound to or from Mexico. U.S. Infrastructure Grants could be leveraged as in this example to improve end to end transit times by running through Chicago rail chokepoints.

A 2017 study of the economics of short haul intermodal options analyzed examples of successful and unsuccessful short haul lanes including several in this study region. The two key economic indicators for successful short haul service evaluated in the study were “(a) the competitive rate per unit that can be charged and (b) the annual volume of revenue units.”

Intermodal Lane Imbalance

Lane balance is a term which means every inbound loaded container leaves loaded. Lane balance benefits the shipper the drayage carries, the railroad and the community. Carriers

realized better asset utilization. When loaded boxes are flowing in both directions freight rates are, on average, lower for all shippers as no one is paying to move an empty container and the community benefits by fewer empty container repositioning moves on regional routes.

Wisconsin and Minnesota export more products than they import, especially agricultural products. With more exports than imports, rail and truck international movements along traffic lanes are unbalanced. Lane imbalance limits access to empty containers for Minnesota and Wisconsin exporters. Inbound consumer goods dominate intermodal movements to Wisconsin and Minnesota, rates for inbound shipments also assume some empty repositioning cost. Exporters typically ship lower value freight, and these products cannot support long haul drayage movement to urban terminal centers. Inbound products need to be delivered close to distribution centers and warehouses and population centers. These structures are found near large urban regions.

Ocean carriers do not want their containers waiting for extended periods at an inland port and will return them empty to keep them available for the higher rated imported cargo. This can result in a lack of empty containers for export. The seasonality of containerized agricultural exports further exacerbates the imbalance of boxes.

Agricultural products that benefit from containerization are typically legumes, and identity preserved (IP) commodities. They benefit from containerization by keeping the product secure and uncontaminated through the supply chain ensuring a higher price for the product. Ocean carriers are interested in transporting these products by container but are wary of the empty container being moved to a destination in Asia where the container is used as the primary storage unit. Most of the ISO containers in the study region are emptied in the Chicago or the Twin Cities region. DeLong and other grain marketing companies have set up grain transloading sites near the Chicago intermodal terminals to load containers to heavier weight than allowed on interstate highway networks. Since container rates are made by the load not the weight, this provides an economic advantage for the grain merchandiser. The lack of empty containers in the study region means that long truck trips (drayage) are needed to bring empty boxes from Chicago or other surplus points in the network. The quantity of containerized agricultural products is small in comparison to the bulk pulse crops, corn, and soybean production in the study region. Lane imbalance was a contributing factor in the closure of CP's intermodal terminal in Milwaukee, WI. Lane imbalance inhibits building intermodal terminals in rural areas because agricultural outbound products exceed inbound products.

Not all Class 1 railroad lanes in Wisconsin are of similar density or capacity. An understanding of the freight flows and the railroad network match is discussed later in the report.

VIII. Intermodal Terminals

This study is tasked with analyzing possible intermodal terminal locations. There may be producers in the study region with sufficient volume of cargo to justify the development of a private terminal. A public port or transit authority may have an interest in the development of a terminal which may benefit a cluster of regional shippers. The creation of a private terminal would be strictly between that firm and the railroad providing service and would not provide access to the public. This study focuses only on possible public terminal options in the study region.

Terminals are essential nodes in the intermodal container flow. Terminals are sized based upon the frequency of service, the type of service (domestic or international) and the volume of freight handled. To be truck competitive loads must be processed to and from the train usually within a two-hour window. All rail terminals require a Uniform Intermodal Interchange Agreement to discharge containers from rail control to drayage control. This Interchange is managed by the Intermodal Association of North America. Storage, access rules and fees are determined by the terminal owner.

Terminals may be owned by the railroad, by a private company such as Ashley Furniture in Arcadia, WI or by a third-party operator such as a short-line railroad or a Port Authority or other entity. A public terminal is available to any customer and access is typically governed by a contract agreement. Private terminals provide a service to a single, usually large, customer and access by the public is very restricted if allowed at all. Some states create inland port authorities to help support economic development. Terminals are not considered a public utility.

Marine terminals or major urban areas can encompass hundreds of acres and handle millions of containers per year. Terminals in rural regions may handle as few as ten thousand containers per year. Services offered by terminals vary greatly. Some terminals may have the ability to repair chassis and/or containers and handle any type of container. Other terminals may be limited to domestic or international containers but not both. Some may store empty containers on site, others require off site storage and interchange between modes. The services offered are driven by any of the following: customer needs, space availability, asset owner preference and profitability.

All terminals require security, access gate(s), track, storage space, equipment handling devices, utilities, load and driver screening capabilities and trained personnel. The quantity of any of these attributes will be tied to demand. A rail-truck intermodal terminal is usually located on land owned by the railroad but there are occasionally ones located on property not owned by a railroad. The terminal may be operated by railroad employees, but it is more common for a

third-party to operate the terminal, avoiding the costs associated with unionized railroad employees.

Locations for terminals are based on several factors. The most critical are available suitable level land, modal connectivity to key highway routes, adequate customer base, Class I rail access, compatibility with the cargo flow on the rail network, competition, neighborhood acceptance, zoning and profitability. Later in this chapter these factors will be examined in more detail as they are used to evaluate potential public terminal areas in the region. Fundamentally any intermodal terminal must provide network value to the carrier's core system.

Terminal Hours of Operation

The terminals are closely coordinated with the railroads that serve the terminal. However, the terminal property including tracks may not be rail owned, as is the case with the Duluth, MN Intermodal terminal. Even in rail owned intermodal terminals the operator may be a third party. Using a third party to operate the terminal reduces the cost of labor by not having the operating personnel classified as railroad employees. Rail service can be daily as is the case for the St. Paul, MN BNSF terminal, or twice a week as occurs in the CN Chippewa Falls, WI terminal. The frequency of rail service is driven by demand and rail network coordination.

To serve shippers, terminals have hours of operation when boxes can enter their secure location. Larger terminals, such as the BNSF Midway terminal in St. Paul MN, may operate 24/7. In most cases smaller terminals will restrict gate hours as their volume does not justify round-the-clock operations.

Inland Rail/Truck Intermodal Terminal Cargo flow

Upon arrival at an intermodal terminal gate the dray driver will need to present authorization allowing the driver to pick up and/or drop off a box. Larger terminals may have more than one gate, often one for entrance and another for exit. Electronic authorization is increasingly required both for faster clearance and use in load planning, Terminals have a deadline for dropping off boxes so that trains can be planned and loaded for an on-time rail departure. Figure 6 below is representative of a computerized intermodal terminal operation. This figure was prepared in 2004 by Paul Corry and Erhan Kozan who prepared an article entitled Dynamic Container Train Planning. The proceedings were included in the Fifth Asia Pacific Industrial Engineering and Management Systems Conference, 12-15 December 2004, Gold Coast, Australia, p. 30.4.13

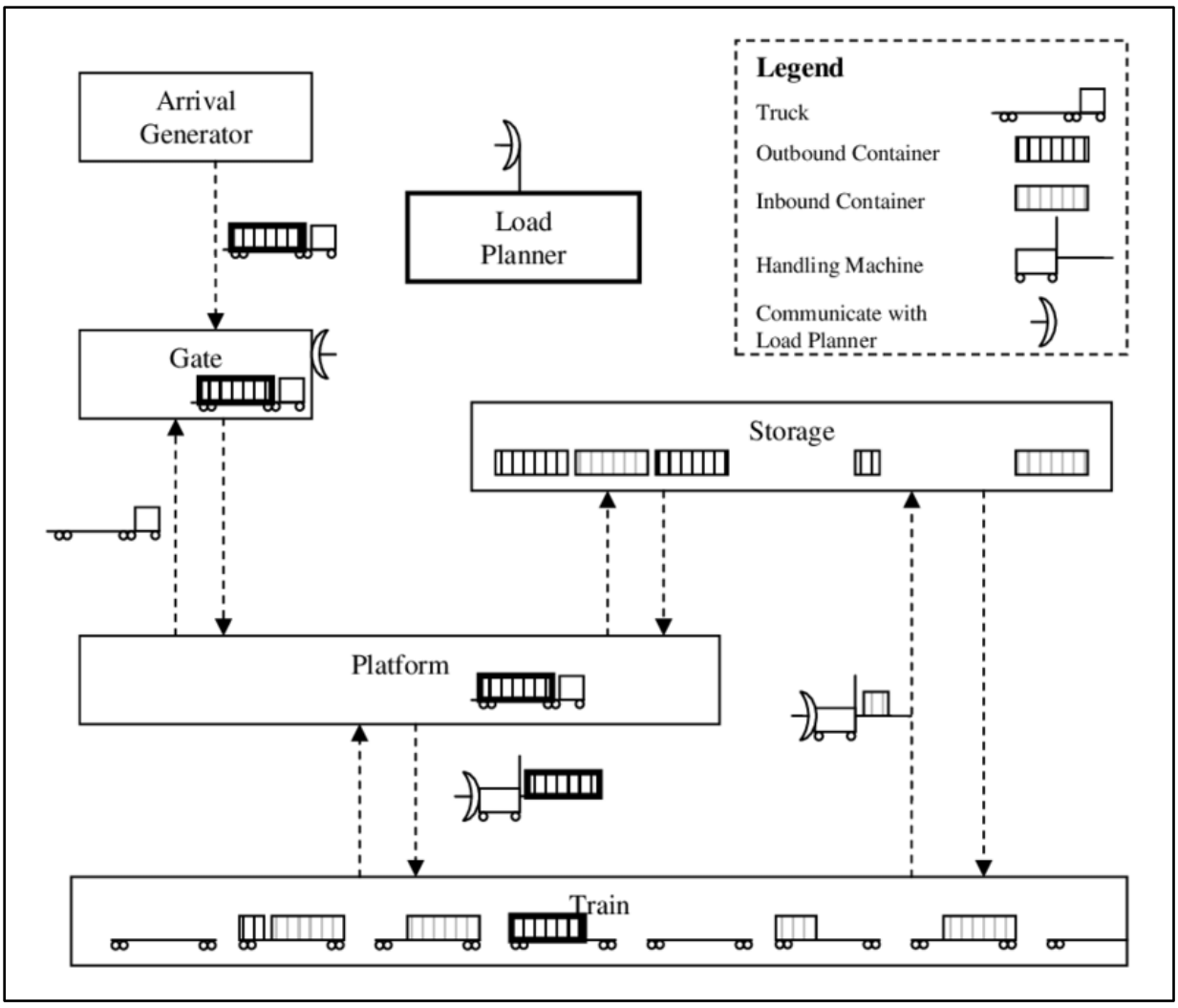


Figure 6 Use of Computer Systems in an Intermodal terminal.

Loaded ISO containers require weighing and this maybe at the gate area or certified by the shipper. Domestic containers may also be weighed prior to entry to ensure that the stated weight is correct. When the gate approves entry, the driver proceeds either directly alongside the rail line or to the storage area. There may be a central area (platform) where boxes are moved on and off the chassis. All intermodal terminals undertake container interchange between modes. Each container exchange between modes or storage locations is termed a lift. Lifts are a measure of productivity and a revenue generator in terminals. Each time the container is lifted that activity is tracked and charged to the shipper.

To move containers, the terminal will need to have lift equipment. For smaller terminals a single top pick or equivalent will be sufficient, provided they are properly maintained. The equipment size needed depends on how high containers will be stacked when stored both on the ground and on the rail cars. The height of stacked containers in a “grounded system” is also

determined by the ability of the stowage lot to accept the footprint of loaded containers without the containers tipping or sinking into the surface. A tilt of six degrees or more off center may be enough to prevent equipment from picking up a box using its corner castings.

Terminals may elect not to stack their containers in a grounded system but have them on wheeled chassis. This type of system means chassis can be, for a significant time, engaged in storage of the containers and not moving boxes.

Wheeled operations have benefits for rail intermodal terminals. Trucks can enter gates and pull pre-staged containers without requiring yard equipment. After inspecting for roadworthiness, the trucker departs through the exit gate. Moving wheeled chassis also results in fewer damage claims, and wheeled parking usually does not require reinforced pavement like grounded slots. A major downside is that this operation requires a lot of idle chassis. Another issue is that wheeled systems require extensive acreage, and the expansion of a wheeled storage system may not be feasible if land is limited.

Figure 7 Top Pick Lifting a Domestic Container (Photo Dr. Richard D. Stewart)

Either a grounded or wheeled system will require lifting equipment and a flat surface suitable for moving fully loaded containers by the lifting systems. They will also need to have trained operators and timely repair services available. If refrigerated, heavyweight or hazardous cargo is expected to be handled at a terminal then additional space, equipment and training will be required.

Terminals have evolved over time to meet demand.

C. Pop-up Terminals

A pop-up terminal concept was developed during the supply chain challenges which developed during the pandemic in 2020. Many of these facilities were privately owned and operated and relied on a reduced train schedule that supported unit train volumes for each service event. In some locations these terminals were subsidized with temporary incentives, where the shipper was given a per-container rebate.

These facilities were privately owned and operated with low volumes of 10,000-20,000 lifts per year and often had limited-service schedules. These terminals were designed as a bypass option to avoid congested at over-burdened network terminals.

Rail mergers and acquisitions can result in a network optimization reset, new trade lanes such as a focus on Mexico and alter business flows and influence changes in warehouse support requirements. Another rail operating trend referred to as Precision Scheduled Railroading (PSR) also recently impacted rail network flows. The new operating model aimed to reduce the number of sorts and handling within the network to increase train velocity in the system. This operating transformation increased rail system capacity allowing for new service innovations.

Rail owned property such as yards and storage in transit terminals that previously supported freight handling functions may be repurposed. New use cases for this repurposed land usually requires modifications to meet the current and projected use cases which many include intermodal. The availability of rail owned land adjacent to Class 1 tracks may be repurposed for pop-up terminals that can grow as demand increases. The decision to set up a pop-up terminal is not done without significant planning and communication with the Class 1 railroad.

D. Paper Ramps

A paper ramp was a terminal arrangement which was popular in the 90's where a Class 1 railroad could test market volumes and customer acceptance before they committed to changing their network. A drop-lot was created which had a subordinate role to an existing network terminal. A round-trip drayage service was provided to the paper ramp, which was secured. Shippers could drop-off or pick-up loads or empties at the paper ramp. An example of this service was a paper ramp in Fort Smith, Arkansas which supported a large manufacturing firm. The Fort Smith terminal supported a supply of empty equipment for the manufacturer to load and the railroad benefited by improving northbound freight out of Dallas/Fort Worth. The paper ramp helped balance an imbalanced freight lane for the Class 1 and provided the manufacturer with a ready supply of empty equipment for loading. By offering round trip service to the satellite terminal from the network facility, drayage costs could be reduced. The term paper ramp was used because a shipper's "paper shipping documents" listed this as an intermodal ramp even though it was a depot and not necessarily connected to the mainline intermodal terminal.

Intermodal has evolved over time and various methodologies have been used to support emerging markets, and competitive strategies to improve service. Railroading has a long history and has many attempts to create services to convert fright movements from truck to rail without cannibalizing their base carload business. Any new service design requires proprietary discussions with the rail carrier and the customer and generally a fright volume commitment overtime.

E. Benefits of Intermodal Service

Three principal parties may benefit from a rail/truck intermodal service. Carriers are looking for increased revenue and freight volumes, cargo owners maybe looking for more capacity, lower freight rates and the public may have interest in economic development and job creation. Each of these groups benefits from the availability of intermodal service although these services also have associated costs to access (i.e. terminal and transport to the terminal), storage fees, transport containers (in some cases) and warehousing, inventory carrying costs and maintenance. Because the cost of infrastructure is significant, over the past fifteen years public private partnerships and state and federal grants have increasingly been used to fund intermodal and rail service expansion. This section outlines the general benefits that typically result and/or are factored into public private partnerships. This is not a benefit cost/analysis because the cost of the development of these facilities was not part of the scope of the work. However, we will identify the economic benefits that may accrue to intermodal users in the study area based upon several sample corridors which are long enough to be desirable for Class 1 railroads.

I. Benefits to Carriers:

Railroads, 3rd party logistics firms (3PLs), Non-Vessel Operating Common Carriers (NVOCCs), equipment providers, chassis manufacturers and drayage firms benefit based upon the services they provide. Railroad operating models which serve private terminals benefit when private terminal operators provide the site, the infrastructure, the equipment, and the labor. For rail intermodal networks the carriers also benefit by pushing the most expensive first and last mile costs to the intermodal service arranger, leaving the railroads with a simplified, high-density hook and haul business model which connects long-haul terminals.

Using double stack intermodal rail cars in unit train service enables the railroads to increase productivity. Aggregating freight at a central terminal reduces the needs for sidings, switching, power units and related costs. A reliable intermodal system allows railroads to gain new customers without the need for rail access to the customer's facilities, and without the overhead of a sales and customer service network to support each shipper. While the intermodal rail cars may be railroad owned, pooled (i.e., TTX) or leased, most of the containers will not. The terminals can be operated by non-railroad employees, which in some cases reduces cost, but at port terminals ILA or ILWU labor can increase the terminal handling costs.

Asset based carriers (ABCs) such as truckers, third parties or large shippers with private fleet operations often compete with intermodal on some lanes. The asset owners are increasing their privately owned fleet of equipment and chassis and are growing market share. The trucking industry has struggled for years with a shortage of qualified drivers. In October of 2022, the American Trucking Association estimated the trucking industry was short nearly 78,000 drivers, just short of the historical record high of 81,000 drivers in 2021. The association predicts that the number could grow to 160,000 by 2031 if current trends continue. The truck driver shortage will likely continue despite a recent increase in wages. While there is no single cause for the driver shortage so solutions will be complex. Without drivers there are delivery delays that erode the transit time advantage trucks typically have over intermodal rail. The volatility of diesel fuel prices coupled with increasing congestion in urban areas have combined to adversely impact the cost and time factors which impact truck service in the supply chain.

Industry asset-based carriers like the Hub Group and JB Hunt realize that on selecting long haul freight lanes, the use of intermodal service can be an advantage. Wisconsin based trucking companies Marten and Schneider utilize some rail intermodal lanes, but not all. The companies are paid to move the cargo on a door-to-door service and use intermodal on select designated lanes where appointment times will allow for the substitution of intermodal's longer transit times. The primary benefits that asset-based carriers provide are the same customer service team for either road or rail operations, they provide shipment visibility from door-to-door movements, and rail line hauls on long lanes provide fuel cost savings.

Intermodal's longer transit time is factored into supply chain planning by third party logistics firms and customers. If rail intermodal reliability is high the increased time is readily adjusted. The 3PLs and IMC's negotiate lane rates with the railroads, the larger the annual volume, typically the lower the per-unit price. The intermodal service is then packaged with first and last mile truck delivery and customer service support, which includes door-to-door load tracking. Intermodal marketing firms strive to engage their clients by recommending intermodal where it is efficient, with the fewest out-of-route miles and where service is reliability consistent.

In general, the first and last mile of intermodal cargo is moved by truck, unless the train has access to an on-dock terminal to load directly to the ship. Drayage is most productive when the length of haul is relatively short. Highway congestion in urban areas may reduce the optimal drayage distance. Drayage is provided on a round-trip basis, and the carrier must accept responsibility and liability for the condition of the equipment while it is on the street. Draymen must file their insurance documents with IANA and complete an interchange form for the equipment upon departing and arriving at the terminal. The common heuristic is for drayage companies to provide three turns per day to cover the cost of their labor and equipment. Because of the time taken to load and unload the container at the customers or at the terminal, driver pay is often based on a "Per Trip", mileage-based zone due to the extended times to inspect, and process equipment interchanges.

II. Shipper Benefits

Lardner's Law posits that when transportation costs are reduced the geographic range of a product's competitive pricing is extended outward. The lower transportation cost enables the product to reach new markets and/or lower prices in existing markets, both of which can result in higher sales volumes. Both carrier and shipper need to be dedicated to establishing a reliable cost-effective intermodal system. When these efforts are successful, the total cost of the product declines with positive benefits to the shipper.

All truck movement is faster and more flexible than current rail/truck intermodal lanes. Long haul trucking (LHT) rates are higher and more volatile than intermodal costs. Intermodal has grown because of rail's lower total transportation price vs. LHT rates. Intermodal rates are made up of the drayage origin rate, rail linehaul, terminal operations and drayage destination rate, storage and dwell fees and other accessorial charges including a fee for service. Individual shippers usually cannot access intermodal rates directly from the railroads. Small shippers often work with an Intermodal Marketing Companies (IMC), whether asset-based, non-asset-based or a combination of both. The shipper usually receives a single invoice for the intermodal shipment from the IMC.

In some lanes which are imbalanced, empty repositioning costs are factored into lane pricing.

Shippers face tradeoffs in using intermodal. High value cargo is more secure on rail well cars than LHT that may stop enroute leaving the vehicle unattended. They will need to access rail approved containers that in the case of a 53-foot trailer are reinforced for lifting. The reinforcement reduces the over-the-road payload carried by the van when drayed. The load will have to be secured for the unique movements of rail transport.

Overall shippers can realize total cost savings with a reliable scheduled intermodal rail service. These cost savings can be passed on in lower retail prices, higher profit margins and market expansion. With intermodal service shippers who want the EPA Smartway certification will have an advantage using intermodal shipping vs straight long-haul trucking. While many trucks are also Smartway certified there is a difference in fuel consumption between the two modes favoring intermodal.

III. Public Benefits

Highways are extremely expensive to build and maintain. Studies indicate that trucks cause significantly more damage to highways than cars. In 1979 the National Academy of Sciences stated that properly designed highways are built to withstand the truck and passenger vehicle traffic that travels on them.

However, they also noted that excessive damage would occur when.

> *"(1) the pavements are under-designed for the amount of truck traffic that is actually using them.*

(2) trucks, through overloading generally, are imposing heavier axle loads than anticipated; or

(3) other factors not properly evaluated in design have affected the ability of pavements to support traffic."

For a variety of reasons such as budgets, weather, and soil composition, not all highways are built or properly maintained for extensive heavy truck traffic. Removing trucks from the highway to intermodal trains reduces wear on the highways. Fewer long-haul trucks reduce the number of crashes resulting in a safer highway network.

Highway congestion increases travel time, fuel consumption, air pollution and the probability of accidents all of which adversely impact the public. A 2019 study found that the average Chicago driver lost 138 hours annually in congested traffic with a negative economic impact to the city of approximately $1.5 billion. Considering how much of the traffic in the region is destined to either stop or pass through Chicago, moving trucks off the highway to rail is in the public interest. Switching a portion of the LHT traffic to intermodal rail will have a net positive impact on the costs of highway congestion.

Railroads are a key component of North America's transportation network. Increasing intermodal traffic on the railroads improves their ROI and enables the railroads to expend capital in maintenance, safety, and expansion. These improvements increase the ability of companies to further use the rail network for a wide variety of cargos. The public benefits in lower transportation costs, less pollution and energy consumption; and a safer transportation network.

F. Study Region's Current and Past Intermodal Service

There are currently seven operating intermodal terminals in the study region. One of the terminals, Ashley Furniture in Arcadia, WI is private, and the rest are open to the public. Two public terminals, UPs in St. Paul, MN and CN's in New Richmond WI, are new since 2020. All terminals are served by one of the Class 1 railroads, BNSF, CP, UP and CN. The terminals are located either in northwestern Wisconsin or eastern Minnesota. Four of the public terminals are within 50 miles of the Twin Cities Metro region providing a short drayage distance to that market. CN's terminal in Duluth MN is the only terminal that can handle marine container traffic loaded on and off vessels. The new UP terminal in the Twin Cities is listed as providing only domestic service to the west coast. The other terminals handle both domestic and international traffic. There are several container depots and drayage companies providing support.

The table below lists the current intermodal terminals operating within the study region. Their size and volume have been documented for comparison purposes.

Current Public Intermodal Terminals in the Study Region

Rail Carrier	Terminal Location	Domestic (D) and/or International (I) hours of service	Estimated Annual Container Volumes	Approximate Acreage
BNSF	St. Paul, MN Midway	D/I Terminal gate open 24 hours, 7 days a week	Before the recession, over 260,000 lifts were done per year. The theoretical capacity for the intermodal is up to 338,000 lifts per year	44 acres
UP	525 Kasota Avenue SE Minneapolis	Domestic Service to Los Angeles, CA Gate hours of operation: M-F 8am-6pm Sat/Sun 8am-12noon	Started 2021 as a pop-up terminal it was improved with over 20,000 in 2022, the goal is 100,000	55 acres
CP	Minneapolis, MN - Shoreham Yard	(D/I) Terminal gate 24 hours a day starting Monday at 0600 until Saturday at 1600; Sunday at 0600 and closes at 1600. Empty Depot: Monday through Friday 06:00 – 18:00;	Over 100K	70 acres 26 of which have been used for ramping and container-trailer storage operations.
CN Duluth Cargo Connect	Duluth, MN	(I) Hours of Operation: Mon - Fri: 07:00 - 18:00; Sat: 08:00 - 12:00; Sun: Closed	An estimated below 30,000	Approximate 15-30 acres with improvements to allow stacking
CN	New Richmond, WI	(I) Handling Auto and Ocean Container. Terminal gate Mon - Fri: 06:00 - 18:00 Sat - Sun: 06:00 - 16:00	Started in 2021 Under 30,000	58 Acres for both autos and containers.
CN	Chippewa Falls, WI	(D/I) Twice-week container service. A grain transfer facility. Terminal gate hours of operation: 07:00 - 18:00 M- SA	Under 20,000 About 13,000 in 2017	Approximate 20 acres with some expansion area

Figure 8 Current Study Region Intermodal Terminals

The study region's four Class 1 railroads do not have single line service to the U.S. southeast and east coast ports or eastern U.S. domestic markets. To transfer to east coast railroads shippers must either use intermodal terminals in Wisconsin and Minnesota and interchange to

an eastern carrier in Chicago or dray by truck to east coast railroad intermodal terminals. Due to the relatively short distance from Wisconsin to Chicago or the Twin Cities it is often faster and less expensive to dray the container to the Class 1 terminal.

Depending on the railroad connections the transfer may be done with the containers staying on the intermodal rail cars in what is called a steel wheel interchange. Depending on rail contracts, there may be switching and interline transfer fees added to the cost. Rail and terminal schedules can extend the container transfer time from one carrier to another to more than one day. A rubber tire transfer is often preferred but requires a container to be grounded by one railroad and trucked to the second railroad in Chicago. The rubber tire transfer could be longer or shorter than a steel wheel transfer, the cost to truck between terminals, combined with the rail rate is often not competitive so driving containers to and from the study area is typically preferred due lower costs and transit times.

Short Haul Intermodal in the Study Region

When Wisconsin Central operated intermodal terminals in Neenah, Green Bay and Stevens Point it was operating a combined hub and spoke with a block swap at the CN interchange. CN does essentially the same short haul service for Chippewa Falls, New Richmond and Arcadia. At one time the Escanaba & Lake Superior ran a closed loop intermodal service. The Twin Cities & Western Railway (TCW) offered a hub and spoke service between Montevideo, MN, and CPs Twin Cities terminal. The CN Duluth, MN terminal is a block swap at the CN Terminal in Superior but could also become an inland port service if Duluth starts marine container operations.

Examples of Depots and Container Repair Facilities in the Study Region

Operator	Location	Service
CTX - Commodity Transfer www.ctxtruck.com	Minneapolis	Secure depot for storage and retrieval of boxes
Forward Intermodal www.forwardair.com	Minneapolis	Customs bonded secure storage facility
Forward Intermodal www.forwardair.com	St. Paul, MN	Container Yard Primary maintenance & Repair Shop.
Valley Express www.valleyexp.com	Duluth, MN	Customs bonded and secure depot for storage and retrieval of boxes
Aim Transfer & Storage Inc.www.aimtransfer.com	Oak Creek, WI	CY with full warehousing capability

Figure 9 Examples of CY and Container Depots in the Study Region

Class 1Railroad Terminals in the Study Region

Class 1 railroads are defined by the Association of American Railroads as a railroad generating more than $490 million in operating revenue annually. Intermodal service is a product of Class 1 railroads, however short lines and regional railroads may act as terminal operators or supporters of a Class 1 intermodal network.

Rail lines that move unit trains between two locations are primary rail lines creating lanes. They may also be referred to as a main line that is used for through trains. The term main line may have different applications by different railroads. For this study the term "primary line" is the principal artery of the Class 1 system from which branch lines, yards, sidings, and spurs are connected. Railroads prefer that intermodal terminals are on or close to their primary rail lines enabling the fastest rail service. Intermodal service is designed to compete within 24 hours of standard dry van truck transit times. With few exceptions intermodal service operates on the fastest and highest density Class 1 railroads. If terminals are located off the primary rail line network, extra train handling is required which typically increases transit times and reduces reliability.

In the study area the CP and BNSF terminals in the Twin Cities are adjacent to primary rail lines and provide domestic and international service.

Sixty percent of BNSF business revenue comes from domestic intermodal traffic. BNSF has daily intermodal trains from Midway, St. Paul to Chicago traveling one-way about 420 miles.

UP's terminal is on a secondary rail line providing domestic intermodal service to California. Transit times are on average slower than other Class 1 networks to this site. The domestic lanes served by UP's terminal are:

East Los Angeles to Twin Cities & Twin Cities to East Los Angeles or Northern California (Lathrop) to Twin Cities & Twin Cities to Northern California (Lathrop).

All intermodal terminals, to be successful, need a customer base that can guarantee a volume of intermodal cargo that is sufficient to provide a reasonable ROI for the investment in the terminal and a revenue stream to cover operational costs. Intermodal terminals are located where Class 1 railroads, with sufficient distance between terminals, to create independent utility and which will add network value, lane balance, and return an acceptable ROI. Intermodal rail networks are designed to run on the primary, high density rail networks and aim to match or exceed competing end to end rail networks. Priority is given to long haul container traffic. Intermediate terminals between the end-to-end rail networks are rationalized based upon the incremental value they add to the end-to-end traffic volumes. In an example from the West Coast to Chicago – the longest lane a western railroad can operate, if the train is fully loaded at either end of the network, an intermediate terminal will struggle to maintain service because end-to-end, long- haul freight is prioritized.

Branch line Intermodal terminals in the study region

When considering a new intermodal terminal in the study region it is important to consider the merits of branch line locations versus mainline locations.

Branch line terminals require that the railroad set out container train segments for branch line locomotives and crews to deliver cargo to secondary terminals. Unless the intermodal cars are connected to merchandise trains there may be small or marginal economic efficiency. Without loaded containers coming and going on the branch line the shipper's freight costs will be higher. The railroad will also have to maintain the track and right-of-way that may be suffering from declining non-intermodal traffic. The branch line terminal user needs to accept limited rail service. Intermodal terminals on branch lines can operate successfully but have a lower standard of service.

Chippewa Falls, WI is a hub-and-spoke public terminal, which is served twice a week with container rail cars that are switched in Stevens Point, WI where this branch line junctions with CN's primary line. Menards is the keystone customer for the terminal that started in 2012. Menards benefits from a very short 15-mile dray from the CN intermodal terminal to its Distribution Center (DC) and the ability to move overweight road containers with cargo such as tile to their DC. The terminal handles about 6,000 inbound and 7,000 outbound containers per year. Examples of outbound cargo include agricultural products loaded into containers from the River County Coop. CN did try to encourage drayage from the Twin Cities to the Chippewa Falls terminal without generating significant market growth. The limited twice a week rail service, longer rail transit times, an over 100-mile dray to the Twin Cities and wetlands near the terminal are all likely deterrents to expansion of this facility.

Ashley Furniture has a private intermodal terminal in Arcadia, WI where they handle over 13,000 40-foot containers per year on a 3,050-foot spur. They have parking for 400 chassis with 300 owned by Ashley. The company's website lists their terminal of one of only seven private intermodal terminals in the U.S. and this is an indication of how infrequent the establishment of private terminals is. Ashley contracts directly with the CN for these shipments and performs their own drayage service.

The public Duluth, MN intermodal Terminal is located within 12 miles of CN's primary line at CN's Pokegama, WI yard. The Duluth terminal provides a Container Freight Station which performs transhipment and warehousing services. This allows shippers to consolidate shipments to take full advantage of container weight and cubic capacity providing shippers additional economies of scale. This terminal has the capability to handle overweight cargo. The Duluth terminal also has the potential to be marine served. For Wisconsin shippers to access

this terminal, containers must meet Interstate truck size and weight rules which restrict trucks carrying divisible loads to 80,000 GVW if traveling via interstate highways.

The public CN New Richmond, WI terminal opened in 2021 on a CN branch line that connects to the CN primary line in Owen, WI about 115 miles from the terminal. The Chippewa Falls terminal is 75 miles from CN's New Richmond facility on the same branch line. The 58-acre site includes an asphalt surface to allow for the processing and handling of new automobiles and intermodal containers. The terminal provides CN intermodal service to the growing Twin Cities consumer market. The New Richmond terminal links shippers to CN's three-coast network and serves a range of import and export industries. These industries include agricultural products such as soybeans and grain, as well as automotive and finished consumer goods and forest products. The terminal was developed with support from the state of Wisconsin, local government officials and area export shippers.

There is continued interest by government agencies and shippers in establishing additional intermodal terminals in the study region. The growth of the Twin Cities population and concurrent markets has resulted in Class 1 railroads CP and CN respectively adding terminals in St. Paul and New Richmond, WI. Wisconsin DOT's intermodal sub-committee's study utilized survey methodology to try and determine potential intermodal demand. The response rate and percentage of shippers participating was low, generating minimal interest from the railroads in adding terminals in Wisconsin.

Private terminals, such as Ashley furniture's Arcadia location, may be established if the cargo volume and ROI are acceptable to the Class 1 railroad. Regional and short line railroads can establish and operate intermodal terminals without conforming to criteria that a Class 1 railroad may require for one of their intermodal terminals. However, that special operation may be closed if a Class 1 acquires the terminal, and if it is not generating an acceptable ROI or no longer fits the Class 1 network. This has occurred in the study region.

When CN acquired Wisconsin Central Railroad in 2002 there were branch line intermodal terminals in Green Bay, WI and Neenah, WI. The Wisconsin Central Railroad did not have a terminal in Chicago, IL so they had to develop an agreement with a Class 1 railroad to land container trains from Wisconsin to Chicago. As intermodal traffic grew in Chicago, Wisconsin Central got pushed out of northern Illinois terminals of Bedford Park and Corwith. The merger with CN solved this terminal problem but unfortunately Wisconsin freight has to travel to the the CN south Chicago location. This extra transit time through Chicago often precluded a same day rail connection to an eastern or western railroad. These Wisconsin terminals handled 21,500 and 8,000 thousand boxes per year respectively. The Green Bay terminal dealt mostly with trailers and very few containers. Within two years of the merger these terminals were shut down. Their level of operation did not provide the ROI and/or network compatibility needed by

CN. The Neenah terminal had one lift machine and one hostler. Neenah had a percent split between trailers and containers of 60 / 40 and only used a wheeled system for storage of maximum of 70 trailers.

Figure 10 Wisconsin Central Neenah Intermodal Yard in 2001 (Photo Alyssa LaValley)

In the mid-1990s CP operated, in addition to the Shoreham, MN yard, two other facilities handling intermodal freight, one in Thief River Falls, MN and the other at Portage, WI in the study region. The research team was unable to find either the annual lift or rationale for eliminating these intermodal terminals. The CP yard in Portage is approximately 17 acres with a considerable portion of the property covered with existing track. There is good highway access. However, draying from Madison and Milwaukee catchment areas would require a significant backtracking vs. continuing to intermodal terminals in Chicago so this former site was not evaluated.

The short line railroad WATCO recently purchased CN track in northern Wisconsin and the Upper Peninsula of Michigan. WATCO created the Fox Valley and Lake Superior Railroad (FOXY) to serve parts of the study region. As FOXY develops their service model, opportunities for intermodal service may develop. WATCO's trackage and haulage rights with their Class 1 connecting railroads will dictate their ability to establish viable intermodal service. Some Class 1 agreements have limited the number of unit trains WATCO can interchange per day.

In examining the development and operation of terminals in the study region the following findings will inform evaluation of potential sites:

Summary of Study Region Terminal Attributes

- All public terminals in the study region have either been built on railroad owned land or public land.
- Arcadia, WI is the exception, but it is NOT open to the public.
- Study region terminals have been developed around keystone customers.
- Railroads espouse a minimum of 10,000 to 30,000 annual lifts for establishment of pop-up terminals but have made exceptions in the study region for opening and closing.
- 20,000 lifts requires about 10 to 25 acres depending on equipment ownership and domestic or international services offered.
- Reasons for terminal closures in the study region include insufficient freight volumes. insufficient lane balance, insufficient return on investment.
- Terminals are established to serve either international, domestic traffic flows or both.
- Railroads usually but not always avoid opening internally competing terminals (within 250 miles of each other). Terminals are frequently coupled with locomotive refueling and or crew change points.

The analysis of the prior terminals in the study region will inform the determination of potential service and location trade-offs when developing future service.

G. Logistics Trends

After the bullwhip effect of the pandemic and the associated economic policies, the supply chain gained the White House's attention. Following unprecedented port and rail terminal congestion, the following 10 trends were assembled by the Association for Supply Chain Management. Five of these trends deal with technology, freight visibility and advanced data integration, an area in which railroads have lagged behind in, especially when it comes to door-to-door visibility of intermodal containers. Thirty percent of the trends focus on agility and close collaboration with the customer, which has also been difficult for intermodal transportation buyers since the railroads wholesale their intermodal service to equipment owners and Third-Party Logistics arrangers. For intermodal to gain market share versus over-the-road truck, investment in technology and freight visibility tools is essential.

To gain market share intermodal services and terminals must keep up with current trends and be ready to support the information and visibility needs of modern supply chains.

1. Advanced analytics and automation

Advanced analytics and automation will continue to accelerate requiring greater shipment visibility. Data-driven decision-making, transportation execution efficiency and the need for predictability will play a great role in the development of agile supply chains and profitability.

Data security will be a critical priority. Advance analytics and automation will also require the reskilling employees as systems become more sophisticated.

2. Supply chain talent

Supply chain talent is critical to supporting ongoing industry advances. People at all levels of the supply chain will be required to support new ways of working. Future workers will need foundational skills in data analytics. Organizations will need to be prepared to reskill and retrain workers to support more sophisticated data driven supply chains in the future.

3. Visibility

Visibility will be a key objective for organizations under pressure to achieve true transformation, satisfy customers and capture new markets. As the ability to track and trace goods to the source is increasingly expected by consumers, the internet of things will continue revolutionizing real-time visibility. New business models and collaboration within and beyond organizational boundaries will require better information and communication.

4. The rise of e-commerce

The rise of e-commerce is affecting today's supply chains. E-commerce and omnichannel fulfillment will continue to shape the way organizations identify and establish key priorities, creating challenges with regards to scale and network efficiency while producing new opportunities to gain competitive advantage. This will impact the frequency and volume of inventory replenishment and will require a reliable and flexible transportation system.

5. Supply chain resilience

Supply chain resilience will continue to require data expertise, novel solutions and strong collaboration among global networks that are highly complex and interconnected. Key strategies include diversification of suppliers, production capabilities and transportation processes, as well as finding alternative materials and nontraditional partnerships. Resilient supply chain design will also be critical to mitigating adverse events faster than the competition, providing excellent customer service, and generating value and market share.

6. Supply chain agility

Supply chain agility will be essential to creating flexible networks that can effectively respond to dynamic customer demand and ever-increasing uncertainty. It will be important to proactively identify ways to increase responsiveness through variable cost structures. However, as there is no one-size-fits-all approach, organizations must also foster continuously innovative cultures. The agile supply chains of the future will be those that can react quickly to changes, delays and unexpected events in order to meet customer expectations, outpace the competition and drive growth.

7. Digital supply chains

Digital supply chains will continue to be essential elements of numerous trends on this list, including visibility, resilience and agility. Digitized networks use technology to augment workflow and data collection — meaning that this trend has ramifications on both talent and data infrastructures. Successfully digitizing supply chains requires large-scale sensor implementation via the internet of things; shared internal and external interfaces, such as cloud-based networks; and process automation and verification. The adoption of tools such as blockchain, artificial intelligence and machine learning will meaningfully improve decision-making.

8. Cybersecurity

Cybersecurity is critical to protecting networks from cyberattacks, which continue to be a dominant threat to supply chains around the world. The explosion of data and data-driven organizations through previously mentioned digital tools is creating many more areas of vulnerability. This interconnectedness means supply chain partners can inadvertently expose each other and their customers to privacy breaches, identity theft and worse. Expect greater collaboration when safeguarding networks, devices, people and programs. In addition, more organizations will choose to invest in redundancy, firewalls, and advanced antihacking technologies and employee training.

9. Customer-centricity

Customer-centricity is on the minds of supply chain professionals everywhere, as consumer expectations continue to expand and — as noted earlier — people demand ethical, sustainable business practices. Managing a successful supply chain will require upskilling talent with greater cross-functional and analytical skills so people have the training to support these new levels of customer-centricity. Those supply chains that find ways to meet today's escalating and intense customer expectations at the lowest cost will prevail.

10. Artificial intelligence and machine learning

Artificial intelligence and machine learning, key components of numerous trends on this list, are foundational to integrating people, processes and systems in a wide array of operational environments. The technology-driven evolution to industry 5.0 — which involves a more collaborative approach, as well as partnerships between humans and robots — will have significant impact on supply chain functions such as planning, demand management and fulfillment. As machines learn, improved insights will be discovered, leading to significant transformation, advancement and competitive advantage.

I. The Intermodal System of Systems

The figure below shows the primary Intermodal system in North America which is a subsystem of the Class 1 rail network. The system consists of U.S., Canadian and Mexican railroad, ports and inland terminals.

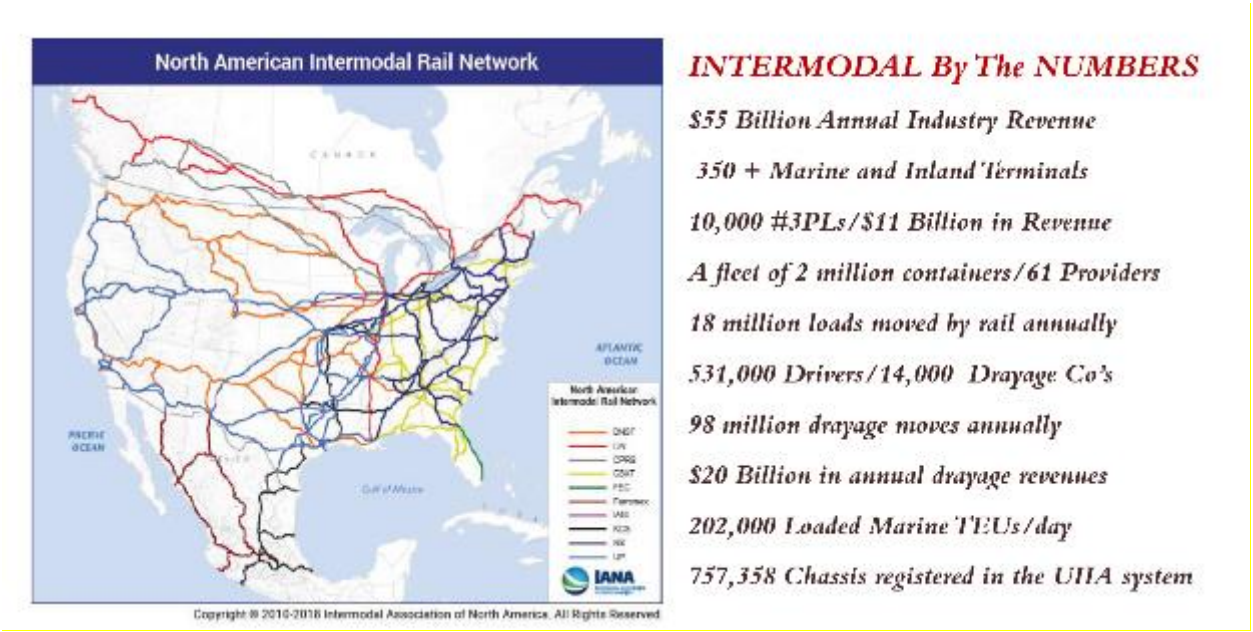


Figure 11 Intermodal Corridors

II. State of Intermodal

"Intermodal" is a term which refers to both domestic and international shipments. The two segments are typically defined by container size. International cargo moves in 20' and 40' containers, typically owned by ocean carriers who historically provided chassis to move containers to the North American customer. Between 2009 and 2011 ocean carriers pushed chassis ownership and management to drayage community and chassis pool providers in an effort to reduce ocean carrier costs and improve safety.

Domestic freight is divided into 53' containers or privately owned trailers. The chassis for privately owned containers are provided by container owners or are arranged for with chassis pool providers, which pushes a matching function at the railroad terminal, requiring terminal operators to match the right wheels with the right containers. Trailers are provided by domestic owners and require less labor at the terminal but cannot be stacked, reducing the revenue per unit for the railroad.

International containers are typically allowed a more generous negotiated dwell time at the terminal, while domestic containers have a much shorter terminal free-time allowance.

Historically International volumes were the baseload volumes which defined the intermodal rail network of terminals, however since the pandemic, domestic private containers have grown

while domestic rail owned containers have dropped. This reduction in intermodal volume has resulted in railroads creating new lanes to support North South markets and smaller pop-up terminals to encourage freight growth. The figure below shows how these intermodal products have shifted after the pandemic between September 2022 and September 2023.

Intermodal Association of North America Volumes			
September 2023	**M/M**	**Y/Y**	**YTD**
International	**-3.80%**	**-10.20%**	**-11.90%**
Private Domestic Container	-3.30%	9.80%	2.20%
Rail Domestic Container	-5.10%	-11.10%	-21.00%
Total Domestic Container	-3.60%	5.00%	-3.50%
Short Trailer	-7.90%	-36.60%	-20.70%
53' Trailer	1.90%	-15.80%	-25.90%
Total Domestic Trailer	-0.70%	-22.00%	-24.40%
Domestic	**-3.40%**	**2.50%**	**-5.70%**
Grand Total	***-3.60%***	***-4.00%***	***-8.70%***

Figure 12 IANA Dec 2023

Length of haul is a key factor for railroads, the longer the haul the more revenue per unit is generated. The Figure below shows the Intermodal Association of North America's unit count by mileage band from October 2019 to September 2023. Of interest is the exceptional volatility of the international volume per quarter and an erratic but less volatile domestic shift. In late 2021 the North American Terminals were congested, resulting in a dramatic loss of efficiency and productivity. This resulted in a shift to east coast ports which have an average length of haul less than 1500 miles. The long-haul traffic greater than 2000 miles was shifted from west coast to east coast shown in the figure below.

Based upon the Class 1 railroad market areas, this resulted in significant freight drops for BNSF, UP and CN who have been a preferred gateway for West Coast imports.

For the study area this change in length of haul for both domestic and international volumes signal an opportunity for new freight lanes and changes in coastal port preferences. The freight volume analysis for the region matches this trend and is favorable for the development of intermodal service volumes to match new lanes and services provided by the CPKC merger.

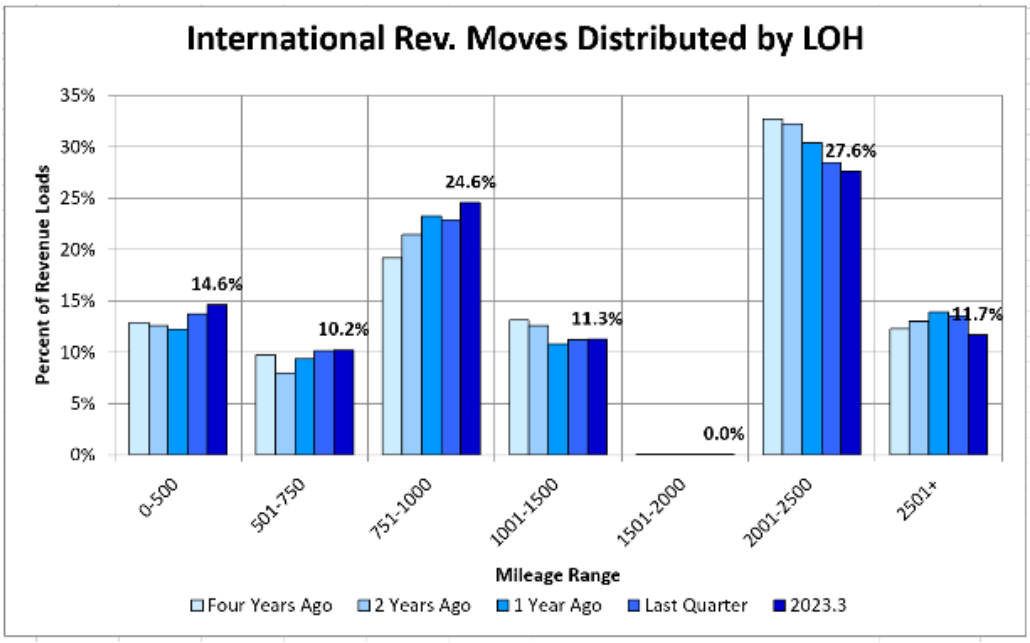


Figure 13 International Volume Trends

Domestic volumes less than 1500 miles have seen diversion to truck, while long haul traffic more than 2000 miles still moves by intermodal service.

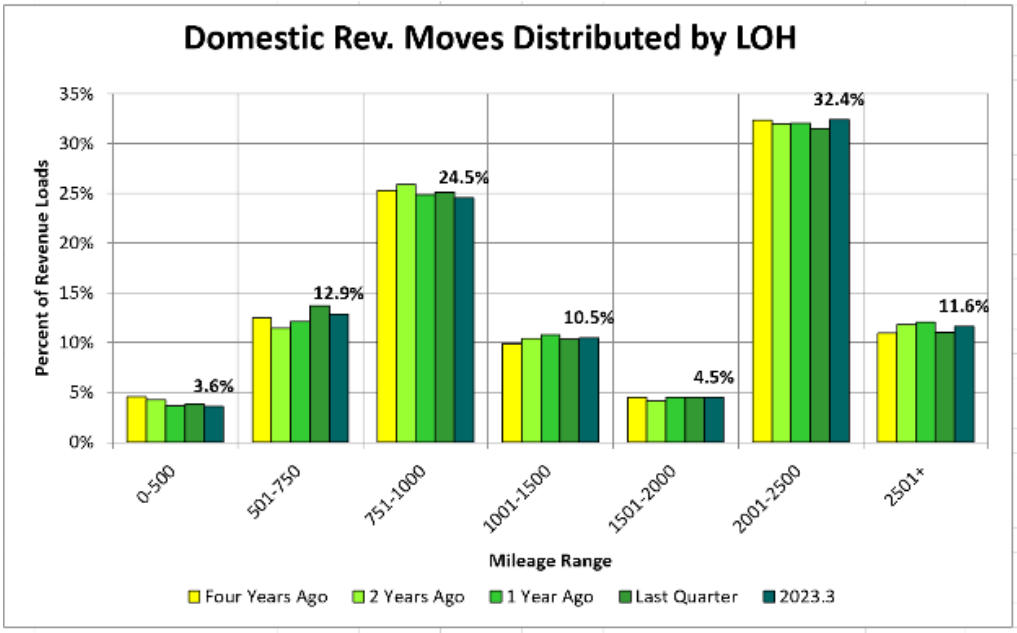


Figure 14 Domestic Volume Trends

This type of shift impacts the study area in two ways. First the western railroads are now seeking new rail volumes to fill gaps left by diversion from West Coast to East Coast Ports,

second this creates new domestic opportunities for private fleet owners to expand to new markets.

Privately Owned Domestic Containers

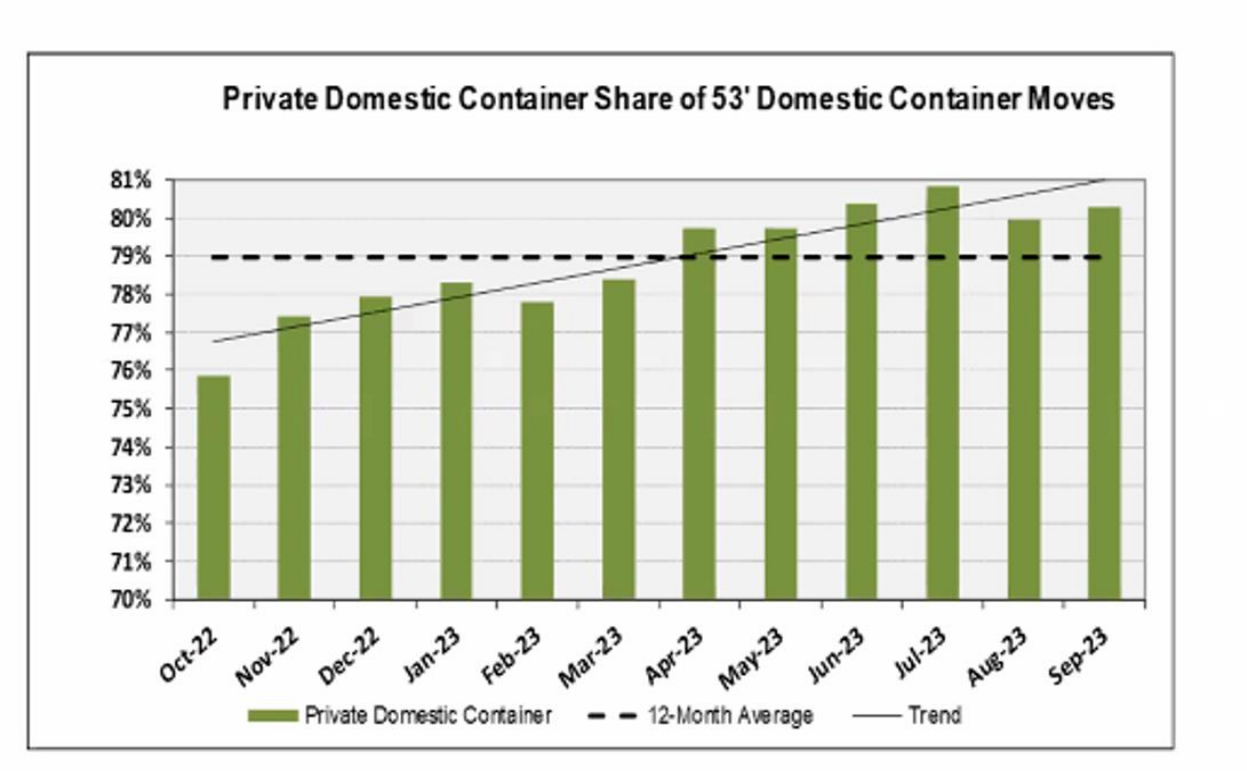
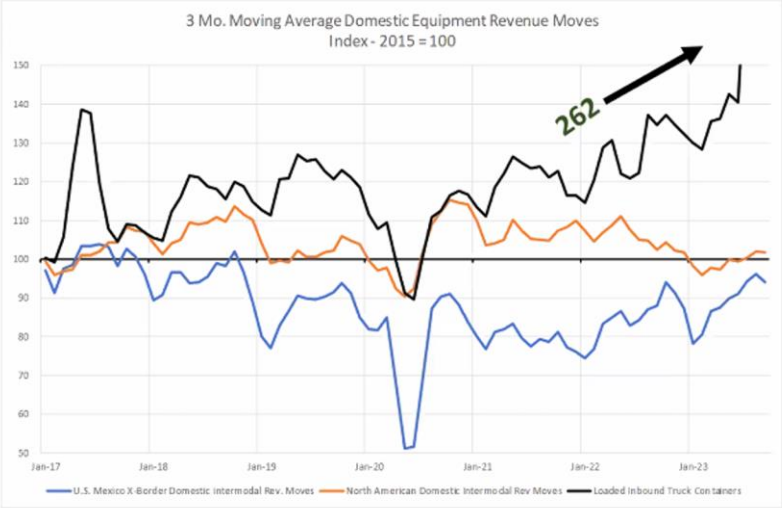


Figure 15 Private Domestic Container Share Growth

Ownership of the domestic container fleet is shown in figure 16. Private container volumes are controlled by a relatively few equipment owners who bring scale, density and balance to the rail networks. Walmart, Amazon and others have invested in containers and entered into direct contracts with railroad operators. This allows the equipment owners to build networks mixing and matching rail corridors and carriers to match their volume flows. This also allows container owners to triangulate equipment moving across the North American rail network, not simply back and forth on fixed routes. Railroad investment in pooled equipment is declining, allowing carriers to focus on terminals, locomotive power and expansion.

The CPKC merger which was approved in 2023 allowed a new end to end service which connected the Canada to Mexico with a new single line rail service with brought faster service and efficiency at the US. Mexico border with less delay. This new service was quickly responded to by other western carriers leading the way to the new north-south rail corridor of more than 1000 miles. The figure below shows industry response in container deployment to this new service.

Private domestic containers are leading the way in north-south container lane development and are driving new single line railroad service for intermodal shippers.



Change in Revenue Moves – Q3 2023 versus prior year

	Domestic Intermodal	Private Dom. Con.	Rail Dom. Con.
Intra-Mexico	97.6%	1005.7%	25.9%
Cross Border	6.9%	43.1%	-19.1%
North America	-0.7%	6.9%	-15.7%

Figure 16 2023 Mexico Service Expansion Source: IANA 2023

III. Intermodal Networks

The map below shows the rail lines across North America and the circles represent terminals. The size of the circle indicates the terminal volumes. Freight from the study area flows to terminals outside the region. According to TTX less than 40% of the east coast international container volume moves by rail in contrast to the greater than 60% of international container volume on the west coast moves by rail.

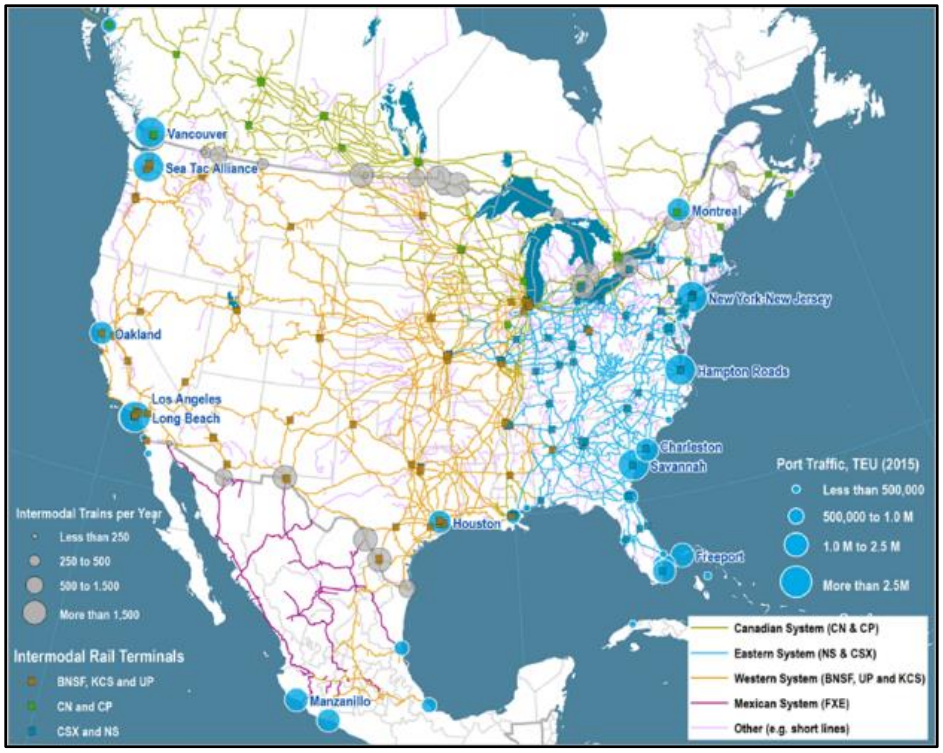


Figure 17 North American Intermodal Network

IV. Private Investment in Domestic Containers

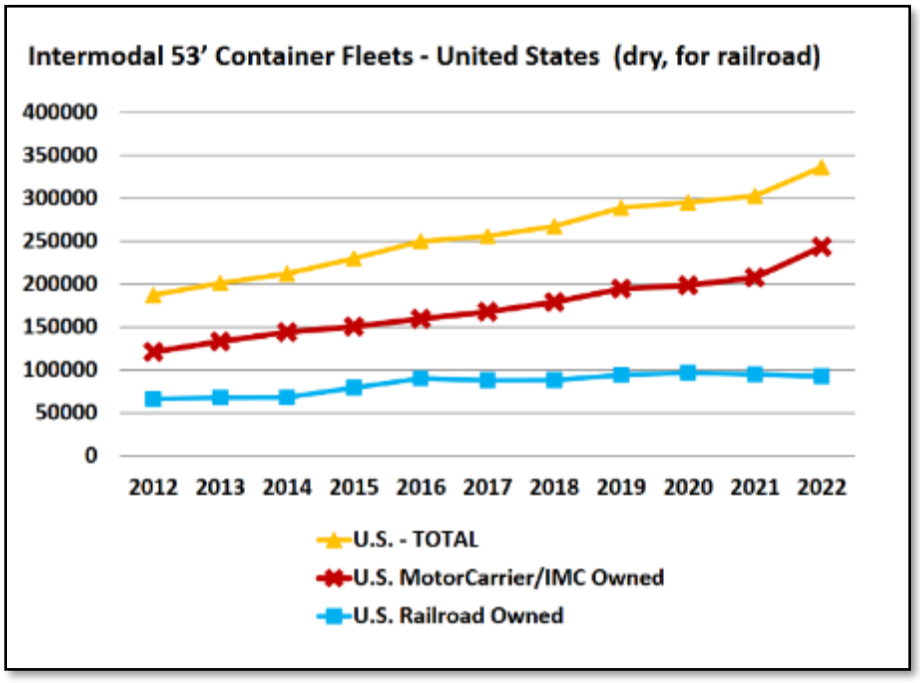


Figure 18 Container Ownership 2012 - 2022 Source IANA

Domestic Containers

In 2021 there were 207,885 domestic containers owned by motor carriers or 3PL's, by 2022 there was a 17% increase in private domestic containers. This represents a unit count increase of 35,790 units.

The U.S. Railroad owned fleet of 53' containers increased to 336,500 from 302,950 the previous year. The Canadian Railroads added 600 containers in 2022, to the base of 14,600, for a 2022 fleet of 15,200 units.

This recent change in ownership represents opportunity for the study area as these private fleets look for growth in new north-south lanes not previously offered. Fleets may be looking for competitive advantages in private terminals or new partnerships with key anchor customers.

Refrigerated Fleet

Nine 53' refrigerated container fleet owners have increased their asset base from 3,485 containers in 2021, to 5,885 privately owned refrigerated containers in 2022. This represents a 2,400 unit increase or a 69% growth pattern in one year. The study area has significant cold chain producers, which currently dray refrigerated trucks to Chicago intermodal terminals to save a day of shelf time.

Drayage Considerations

The graphic below shows the intermodal terminals in Northeast Illinois which is among the largest intermodal complexes in North America.

The Benefits of draying to Chicago include:

- 19 different intermodal terminal locations and service areas.
- Single line rail haul to destination market improves supply chain speed to market and reduces the second cost of a regional railroad.
- Drayage operators need 1-2 days' notice to plan a route for drivers to maximize hours of service time.
- Empty equipment is plentiful in Chicago and is a source of empties for Wisconsin.
- The drayage market in Chicago is efficient and balances local and regional deliveries with access to specialty equipment like tri-axel chassis.

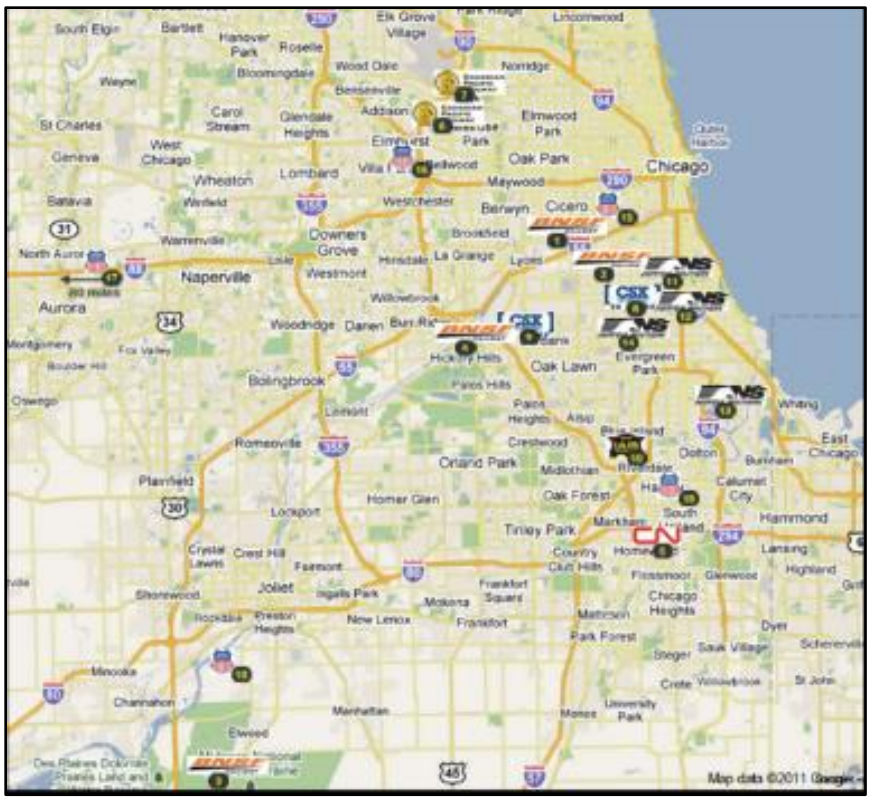


Figure 19 Chicago Intermodal Terminal Map

The Drawbacks of draying containers to Chicago include:

- Chicago ranks #2 in the nation in the 2023 INRIX 2023 Global Traffic Scorecard.
- Since drayage is typically a roundtrip service, an extended dray is expensive.
- The uncertainty of container availability makes load planning difficult for extended service lanes.
- The number of containers moving to Chicago is not tracked but the primary route to NE Illinois is via I-94 through Milwaukee, which is facing increasing regional congestion.
- Due to the lack of intermodal terminals, there are fewer drayage companies and drivers available to serve the study area.

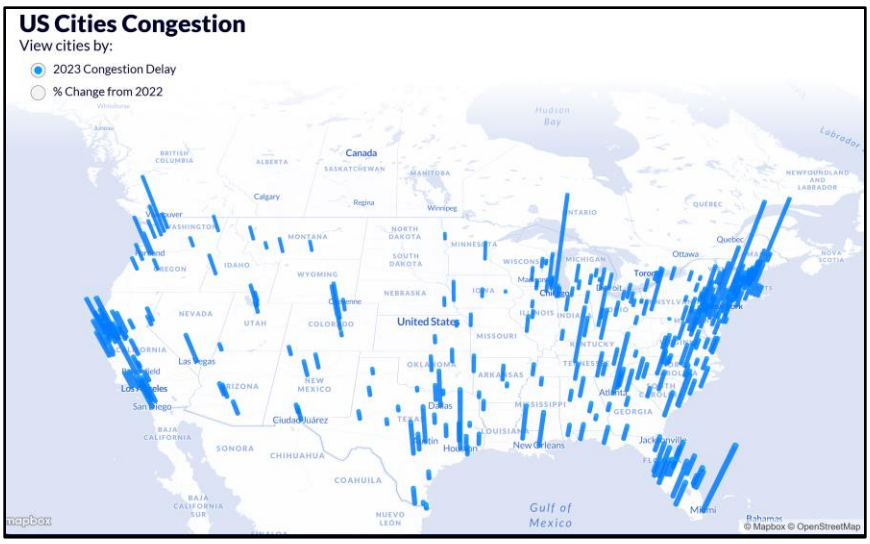


Figure 20 INRIX 2023 Global Traffic Scorecard – showing traffic congestion by city.

What Percentage of Intermodal Containers grounded in Chicago are drayed to Wisconsin?

Due to the lack of data for door-to-door intermodal movements, public agencies have a difficult time estimating drayage movement on public roads. Most MPO's do not distinguish between domestic or international containers and do not differentiate intermodal as being different mode than over-the-road trucks which further complicates multimodal planning efforts. Public data can identify rail container movements from rail terminal to terminal but when the containers leave the terminal few data sources pick up the first or last mile of the container movement. In 2023 U.S. DOT listed 66 truck-to-rail intermodal connectors in the State of Illinois connecting to the National Highway System. The majority of these rail connectors are in Northeast Illinois. Understanding intermodal movements which cross state lines at key midwestern hubs and the impact this freight has on highway congestion, is a long-term planning issue for which there is no immediate solution.

In Chicago, Class 1 railroads are expanding intermodal capacity in the region. CPKC is expanding their intermodal terminal in Bensenville, BNSF recently expanded Cicero, IL, CN recently announced a terminal expansion in Channahon, IL. UP closed Rochelle, IL in 2017 and expanded a terminal in Will County, IL. According to TTX intermodal container volume numbers container growth tracks U.S. GDP.

V. Lift Counts in Neighboring States

The figure below shows the intermodal container facility activity in 2020 and 2021 the most recent data provided by Chicago Metropolitan Agency for Planning.

Chicago Intermodal Facility Lift Counts (2021 & 2020)					
Railroad	**Facility**	**Annual Lifts 2021**	**Annual Lifts 2020**	**Variance**	**YOY Variance %**
BNSF	Corwith	844,271	860,785	-16,515	-1.92%
	Willow Springs	582,121	592,701	-10,580	-1.79
	Cicero	465,932	457,878	8,054	1.76
	Logistics Park	888.883	789,919	98,964	12.53
	Subtotal	**2,781,207**	2,701,283	79,924	2.96
UPRR	Global I	133,119	228,500	-95,381	-41.74
	Global II	428,882	340,573	88,309	25.93
	Yard Center	130,628	124,424	6,204	4.99
	Global III	14,831	4,066	10,765	264.76
	Global IV	667,504	624,769	42,735	6.84
	Subtotal	1,374,964	1,322,332	52,632	3.98
CSX	Bedford Park	909,437	886,662	22,775	2.57
	59th Street	305,527	276,204	29,323	10.62
	Subtotal	1,214,964	1,162,866	52,098	4.48
NS	47th Street	521,223	585,691	-64,468	-11.01
	63rd Street	332,412	342,091	-9,679	-2.83
	Calumet	237,028	220,516	16,512	7.49
	Landers	382,329	374,996	7,333	1.96
	Subtotal	1,472,992	1,523,294	-50,302	-3.3
CN	Markham	550,895	620,000	-69,105	-11.15
	Joliet	45,905	60,000	-14,095	-23.49
	Subtotal	596,800	680,000	-83,200	-12.24
CP	Bensenville	157,751	183,806	-26,055	-14.18
	Schiller Park	64,291	65,097	-806	-1.24
	Subtotal	222,042	248,903	-26,861	-10.79
	Grand Total	**7,662,969**	**7,638,678**	**24,291**	**0.32**

Figure 21 CMAP Intermodal Lift Count

Despite the pandemic, the Chicago region lift counts by carrier continued to grow due and the fact that Chicago is the largest intermodal gateway in North America, where six Class 1 carriers interchange cargo with access to multiple networks and variety of intermodal lanes with broad geographic access. The Chicago region is also a primary hub for North American supply chains.

2.0 A Data Driven Approach to an Intermodal Analysis

The objective of this analysis was to review and analyze public data to describe and visualize the intermodal system that the industry leverages to create competitive transportation solutions. The intermodal system has domestic and international equipment owners, rail, ocean and over-the-road carriers, public and private terminals, warehouses, producers, distributors and value-added service providers such as Third-Party Logistics providers, NVOCCs and Intermodal Marketing companies, which are primarily for-profit organizations, which protect shipment data as a competitive advantage. The goal of this analysis is to aggregate freight and to identify under-served freight corridors for which intermodal service may be viable and to come to visualize a common understand of intermodal opportunities for the study area.

Data is essential to plan, manage, make freight routing decisions and measure performance. Data required to monitor these conditions include:

- Commodity identification
- Freight quantities (volume) and value
- Carriers and service networks, nodes and facilities
- Location and movement status
- Equipment location and condition
- Terminal and facility attributes
- Infrastructure capacity, condition, physical barriers and operational attributes

A. Data Sources and Methodology

I. Data Sources

There are many public and private data sources available to describe freight transportation. These sources are generally purpose built to describe specific industry driven qualitative and quantitative conditions. Data is often used to describe cargo flows, inform performance measures such as volume and transit times. Data collection is sometimes sporadically collected over different time periods making it difficult to join data points into a single database. Data concerning commodity definitions can be different depending upon what mode is being used. Railroads use Standard Transportation Commodity Codes (STCC) whereas Census data uses a Standard Classification of Transported Goods (SCTG). It is common practice for data collected for one purpose to be used to describe another set of transportation variables. Challenges exist when linking data sets. Data is dynamic and in constant flux.

Data is often proprietary, examples include information related to rail network capacity, railroad haulage and trackage rights. Shared network operations and physical barriers can be

difficult to determine, particularly as it relates to privately owned transportation networks and assets. Contract data between carriers and customers is also generally proprietary.

Public data is used by a wide variety of organizations, both public and private, for evaluating existing business and economic activity and freight movements within specific regions. Data which is publicly accessible contributes to the rationale for utilizing the information and is a practical first step for most studies. Each data set referenced is described below:

CoStar - Is a commercial real estate information company founded in 1987 and specializes in tracking commercial real estate across all uses and ownership, including industrial, office, retail, hospitality, warehousing/distribution centers and others. The information they provide includes data from the largest commercial real estate holding companies such as CBRE and JLL and provides accurate updates to site specific facilities over time as new expansions are added, new facilities built, or existing structures removed. Their database includes more than 6 million property transactions and more than 11 million lease and sale comparisons nationwide. This data set was used for warehouse and real estate analysis outside of the most populated urban areas and was used to identify warehouse locations, facility sizes and acreage in the study area. There were known warehouse facilities missing from the database likely because the facilities had not been sold or leased recently or were defined as supporting more than just a warehousing function.

Country Land Records - Were used to identify land parcels and ownership, acreage and addresses of sites with rail service which may be available for intermodal or transload use.

Descartes Datamyne - One of several companies that provide detailed international container data for global trade, utilizing a variety of customs and ship manifest documentation. The attributes of this data are quite detailed for each container entering or exiting any port across 230 countries. The data presented in the charts/figures below in the Import and Export analysis (Figures 25 through 32) include all container freight entering or exiting the U.S. between 2016 and 2020 and either originated from or destined to the study region of MN & WI. This information provides greater clarity regarding the connectivity of the study region to international markets, specific commodities being exported or imported, which ports are utilized to access or reach those international markets and the countries of importance.

Federal Rail Administration - The FRA historically maintained data and information on rail freight volumes across all rail networks in the U.S. This information is still maintained under the Association of American Railroad, but no longer publicly available without paying a fee to Railinc/Railway Corporation. The rail densities provided in this analysis was obtained prior to AAR ownership and reflect average rail tonnages between 2015-2020. This information provides a network line density illustration of flows for Class I rail networks, as illustrated in Figure 9 in red. The FRA also provides track classification information that is an indicator of the maximum safe speed at which a train can operate.

Freight Analysis Framework (FAF) - The Bureau of Transportation Statistics, in partnership with the Federal Highway Administration (FHWA), produces the Freight Analysis Framework (FAF) data. FAF integrates data collected from several different sources to create a comprehensive pattern of freight movements between states and major metropolitan areas, considering all modes of transportation. FAF utilizes information from various sources, including the Commodity Flow Survey and international trade data from the Census Bureau on different industry sectors (e.g., agriculture, extraction, construction, utility, service, etc.). The baseline and most current edition available is FAF version 4 (FAF4) that provides a database of shipment tonnage and value by region or by state of origin and destination, commodity type, and mode. Detailed information regarding freight movements originating and ending within a particular state can be obtained, including both the value (in $M) and volume (in tons) by commodity type and mode. The following figures (Figures 1-8) illustrate total freight shipments into and out of Minnesota and Wisconsin, first in aggregate (by value and tons) and then via rail and truck (tons). These figures illustrate the freight connectivity to different states and for that allocated to highway, the potential for intermodal opportunities.

The National Transportation Atlas Database (NTAD) - Provided by the U.S. Bureau of Transportation Statistics provides a nationwide geographic datasets of transportation facilities and networks associated with different modes of transportation and other geographic information related to transportation. The geographic datasets include spatial information for transportation networks by mode, intermodal logistics terminals and the related attribute information for these facilities. For each database, metadata documentation is also available. The data can be used for modal transportation analysis to support decision-making procedures at national, regional, state and local level. This data set was last updated in 2015.

FRA Railroad Waybill Sample – FRA data was purchased to evaluate rail corridor volumes to determine freight density and use.

Transearch - Provided by Wisconsin Department of Transportation but was only available for the state and limited counties in Eastern Minnesota and had a restricted use license. While this data was helpful in the identification of production locations it was not useful for long lane freight corridor analysis due to the limited geography is reported.

Trade Associations - Were also a source of selective transportation, facility data and asset information. Intermodal Association of North American (IANA) provided a public summary of data and selected corridor information. Armstrong and Associates provided selected Third-Party Logistics resources and trend data. Intermodal Association of Chicago provided equipment ownership and intermodal gate activity data which was used to supplement freight movement analysis.

US Bureau of Economic Analysis (GDP) - The bureau of economic analysis provides the lowest geographic aggregation of economic activity at the county level for all U.S. counties, and

metropolitan regions. In some areas, the metropolitan regions can intersect different counties. The data provided in this analysis is publicly available and illustrates gross domestic product (GDP) and the percent change in GDP for all counties in MN & WI. This data provides a more granular level representation of economic activity which include the production of goods and services. This data was used to identify production, workforce and other industrial production information.

County level GDP data utilized in this analysis is from 2020 information and was released by the BEA in December 2022. This information is presented in Wisconsin and Minnesota study region maps, illustrating the spatial heterogeneity of the study region's economic output and activity.

US Bureau of Transportation Statistics, Intermodal Transportation Data - The bureau of transportation statistics maintains an updated list of all intermodal terminals in the U.S. This includes truck, rail and waterborne facilities (port). The data utilized here represents the most updated intermodal terminal list available from the Bureau of Transportation Statistics, released to the public in November 2021. The data set includes attributes such as terminal name, address, rail companies providing service, type of equipment handled (TOFC/COFC) and the site location, identified by latitude/longitude. In this study we illustrate the location of facilities, as provided in Figure 22 below.

Websites - Were used to supplement data identified from other sources and to provide visualization information.

B. Methodology to Analyze Networks and Cargo

The methodology used for this analysis identified data sources which described and defined the components of the intermodal freight transportation system by commodity, mode, volume, geography and characteristics of terminals, locations. Physical infrastructure limitations and barriers such as bridge and overpass clearances were considered. Contract restrictions such as trackage and haulage rights were examined.

Step 1 identified locations and regions which possessed favorable attributes needed to support a successful intermodal facility. This effort relied on a balanced approach using both qualitative and quantitative data (historical and forecasted), which was available in the public domain and privately held information identified in interviews. Historical information, while helpful in understanding past freight activity, is often not entirely accurate representing future freight possibilities, given the fluid and dynamic nature of business, economic and freight activity. And the agencies which produce historical data aggregate it to a level which is difficult to dissect at the regional or local level and make it available only after two or three years have passed. And many entities involved in the success of an intermodal facility (carriers, shippers, public agencies, intermediaries, landowners, etc.), are reluctant to share proprietary data.

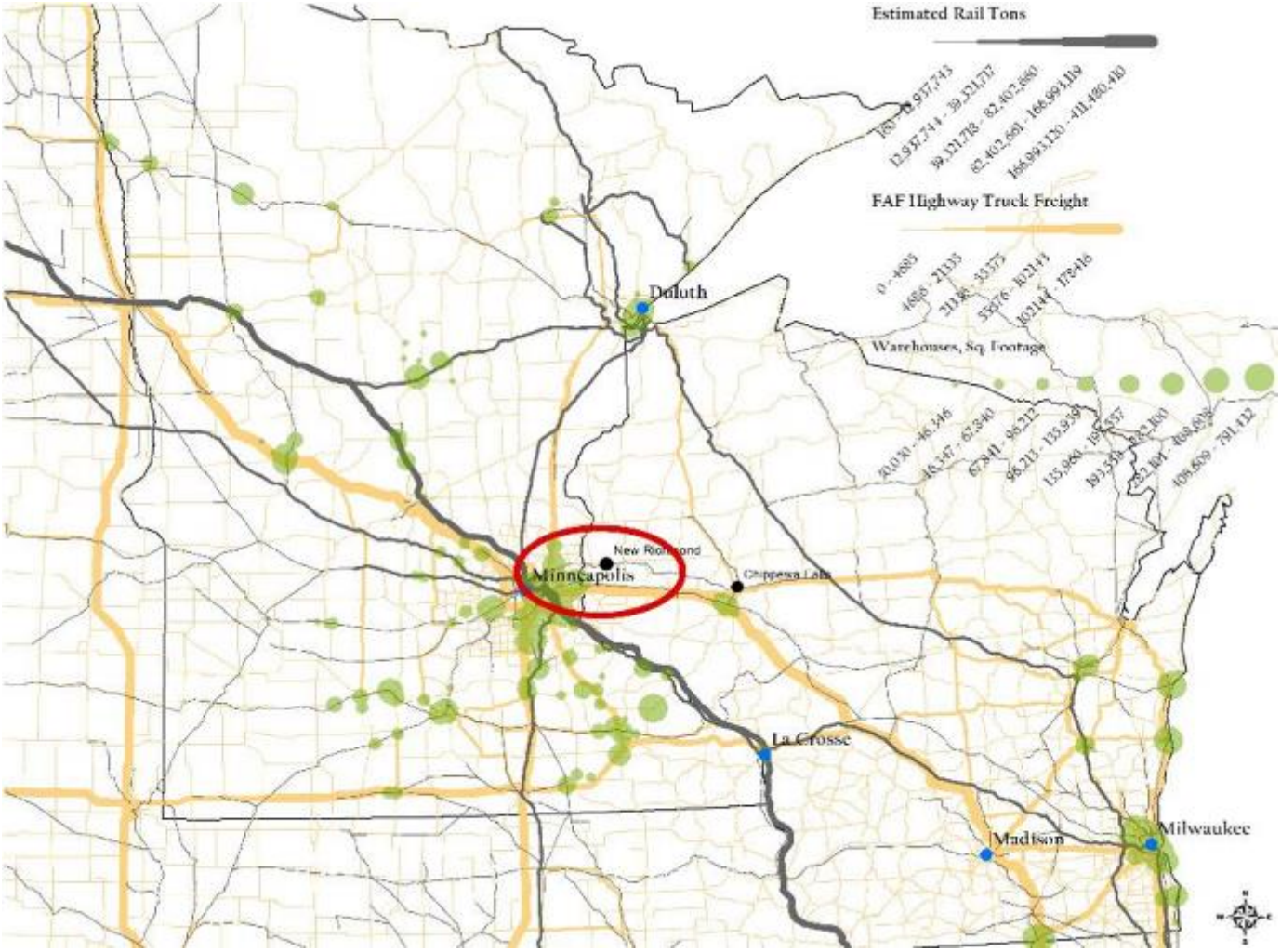


Figure 22 Truck and Rail Volumes and Existing Intermodal Locations for the Study Region

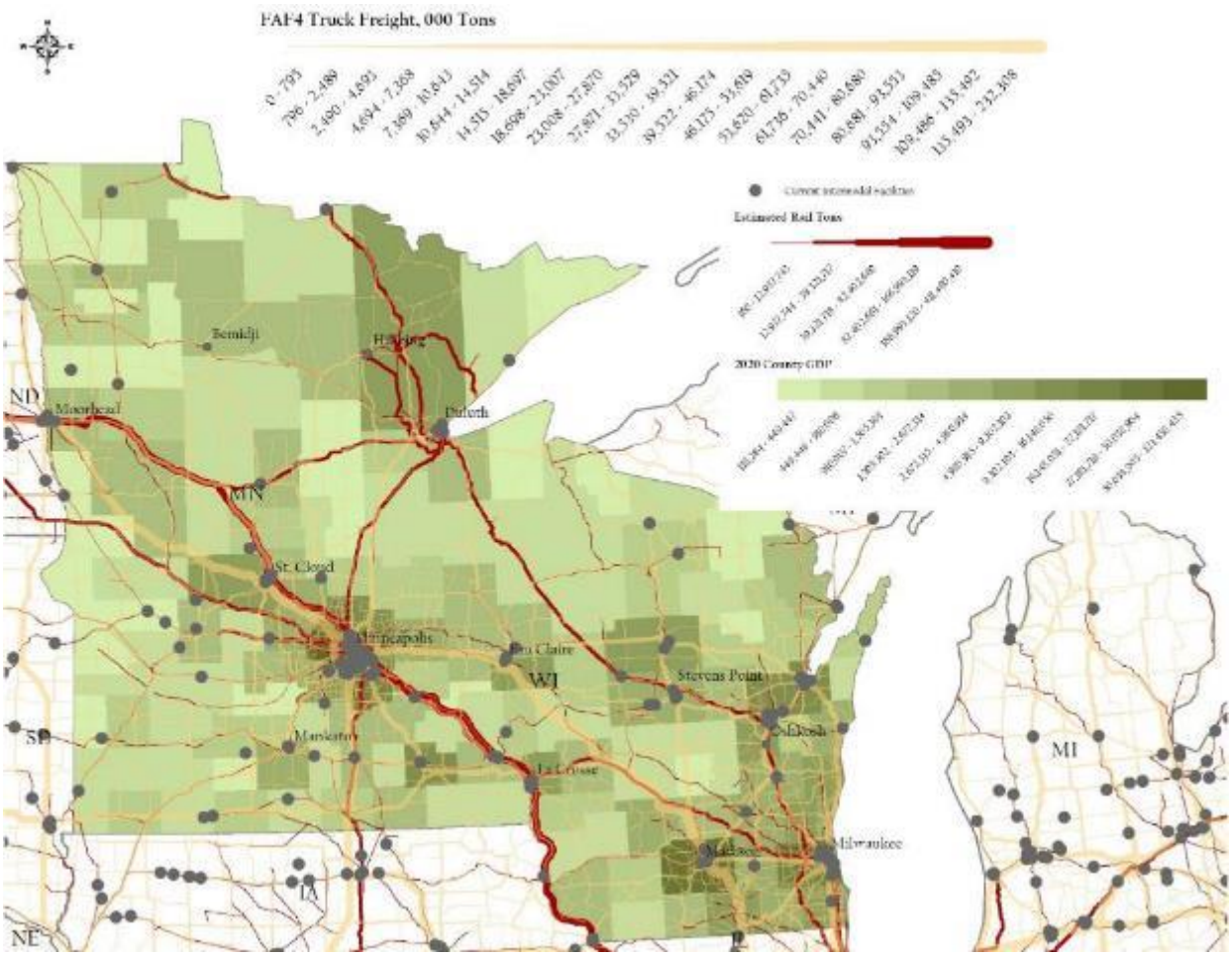


Figure 23 Rail and Truck Network Tons and County GDP with freight terminals noted by black dots.

The maps in Figures 22 and 23 display data from these different sources, including county level GDP, FAF4 highway truck freight flows, total rail tonnage density for all Class I rail movements and the location of existing intermodal terminals, all for the study region of MN & WI. It is visually apparent that the existing concentration of intermodal facilities is heaviest in and around Minneapolis, MN and to a lesser extent in the southeastern corner of WI. It is also evident the heaviest density of truck freight in the study region is along I-94 between Moorhead, MN and down through Minneapolis, MN and Madison, WI. The heaviest density of rail tonnage is on the BNSF line, paralleling that same I-94 corridor. That BNSF rail line connects the Chicago, IL market to the international export/import gateway of the Pacific Northwest port of Seattle and Tacoma, WA.

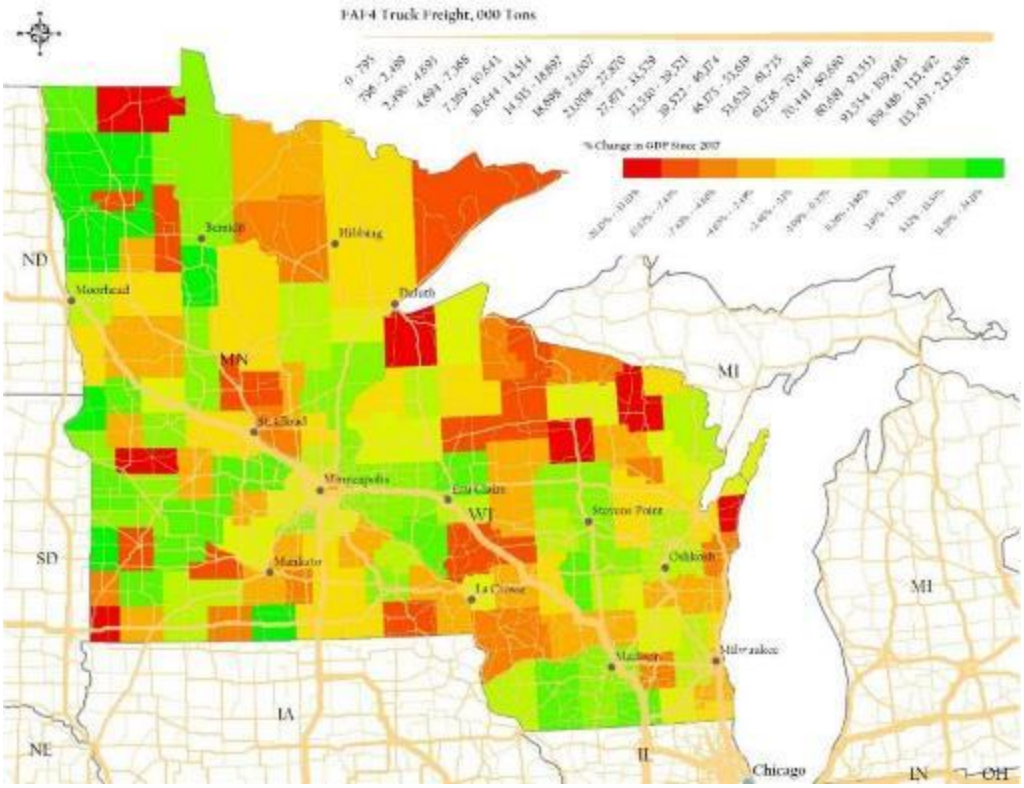


Figure 24 Rail and Truck Network Tons on top of Percentage Change in County GDP

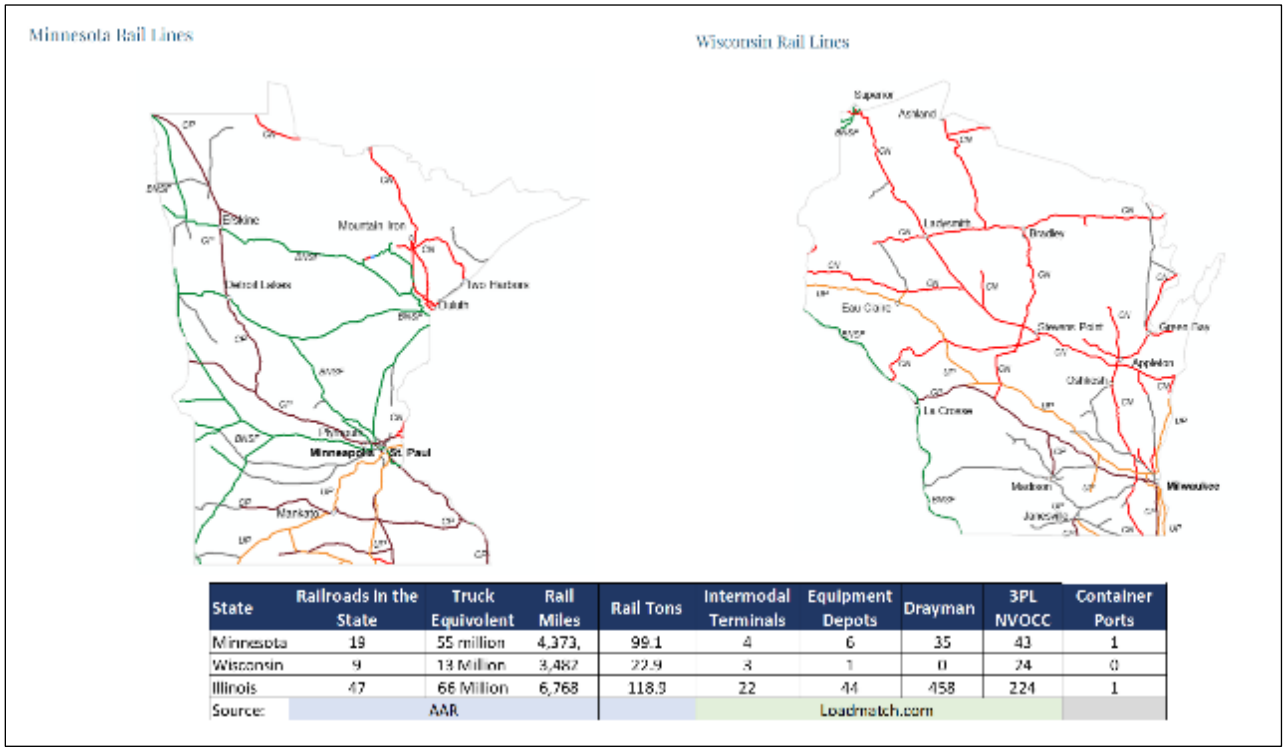
The most productive areas of economic output, shown in Figure 24 are generally near the urban centers of Minneapolis/St. Cloud, MN, Madison & Milwaukee, WI and Duluth, MN. But the areas which have experienced the greatest growth in economic activity since 2007 are highlighted in green in Figure 10, in most cases just outside those urban core regions of economic activity. This includes areas just east of Minneapolis, MN (Eau Claire, MN), south of Madison, WI, near Stevens Point, WI and the northwest corner of MN.

Imported containers destined to MN & WI exceeded 300 thousand TEUs over the five-year period of 2016-2020, peaking in 2018 at 372 thousand TEUs. The commodities inside those containers represent a diverse range of industries, including machinery and manufactured products (nuclear reactors, boilers, appliances), electrical equipment, furniture, plastics, and vehicles. The top 10 commodities of imported containers destined to MN & WI account for 66 percent of all imported containers to MN & WI, implying that the distribution of commodities is not concentrated in only a handful of industries but rather spread across many product types. Inbound international container volumes would therefore exhibit greater resiliency and consistency over time and less dependent on business cycles of any one or handful of businesses or industries. These inbound containers arriving to MN & WI are also heavily dependent on west coast ports for entry, with L.A./Long Beach, CA representing 33% of imported containers followed by Seattle/Tacoma, WA representing 28%. The eastern ports of

NY/NJ (15%) and Baltimore, MD (2%) and Norfolk, VA (9%) collectively represent only 26% of all inbound container volumes arriving to MN & WI. The explanation for why the west coast ports dominate inbound containers is due to the country where the majority of MN & WI container imports originate. China represents 46% of all container imports destined for MN & WI, followed by Taiwan (6%) and Hong Kong (5%). Products arriving from Asia, particularly southeast Asia, typically find quicker access to Midwest markets through west coast ports and Class I rail (Union Pacific or BNSF).

I. Step 1 –Identify Transportation Networks

Intermodal service is produced by a Class 1 railroad. The figure below shows the Class 1 rail corridors in each state in the study area. The box under the state maps show the number of intermodal terminals, the number of draymen and 3PL and NVOCC freight arrangers in each state. Statistics for Illinois were included due to proximity to the WI SE population area. This represents the transportation network which supports intermodal service in the region.



State	Railroads In the State	Truck Equivolent	Rail Miles	Rail Tons	Intermodal Terminals	Equipment Depots	Drayman	3PL NVOCC	Container Ports
Minnesota	19	55 million	4,373,	99.1	4	6	35	43	1
Wisconsin	9	13 Million	3,487	22.9	3	1	0	24	0
Illinois	47	66 Million	6,768	118.3	22	44	458	224	1
Source:		AAR				Loadmatch.com			

Figure 25 Class 1 Railroad Lines, Drayage firms and Freight Intermediaries within the Region.

II. Railroad Networks

Wisconsin and Minnesota are connected to the two western U.S. and two Canadian Class 1 rail networks. These networks connect the region to domestic and international markets.

The CN currently operates four terminals in the region with terminals in 1) Chippewa Falls which support inbound merchandise for Menards and export agriculture. The 2) New Richmond

terminal was developed to support auto distribution and a private terminal in 3) Acadia, WI supports Ashley import furniture. The 4) terminal is located in Duluth/Superior and supports a Container Freight Station to aggregate multimodal freight transportation. The Port of Duluth is currently working on the development of a container trade.

Prior to the CN acquisition of Wisconsin Central, intermodal terminals served by this network included Stevens Point, Neenah and Green Bay, WI. These facilities were closed shortly after the CN rail acquisition. The CN has recently sold more than 650 miles of track in Northern Wisconsin to a short line. The short line is attempting to reestablish rail service on these low density lines. Figure 26 shows the CN network which connects Atlantic, Pacific and Gulf coast ports including an extensive North-South corridor following the Mississippi River.

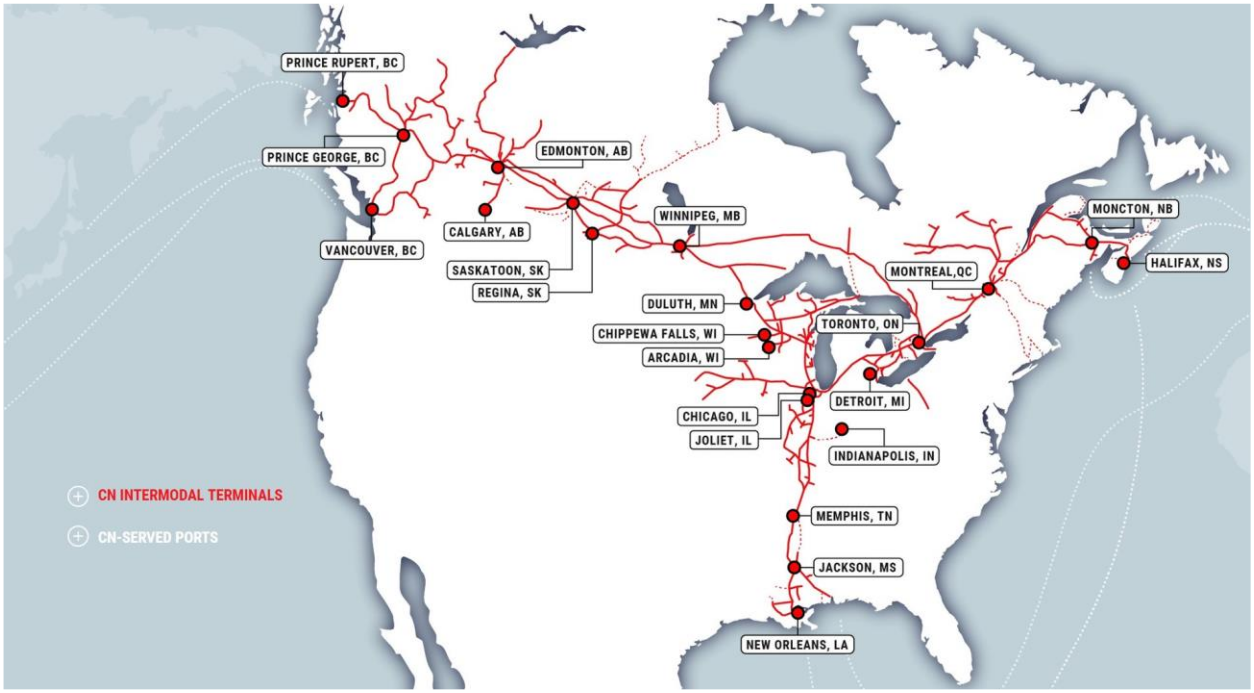


Figure 26 The CN Intermodal Terminal and Route Network

The CPKC is the newest rail network due to the recent merger of Canadian Pacific and the Kansas City Southern Railroad. This merger has created new single line North American rail service connecting Canada, the U.S. and Mexico. Primary beneficiaries of this merger include ag and auto manufactures. New direct single line Intermodal service is now more competitive with truck service.

Recent Intermodal developments on the CPKC include:

CP LLoydsminster (Edmonton) CP's new intermodal facility in Edmonton will be a key location for moving goods between Edmonton and the rest of the world. Positioned on a 240-acre site, the facility will benefit multiple stakeholders and attract other investment in the area. Phase 1 primarily focuses on an auto-handling facility. When this phase is completed, several components in addition to the auto-handling facility will be in place. These include site clearing, topsoil stripping, and rough grading; four loading pads; a paved parking area for 851 cars and paved access road; street and area lighting; and security fencing and compressed air system. Also, an 8,858' train building track is being built parallel to the mainline and a large storm drainage system is being installed, including a storm pond, collector system, and drainage areas for the auto-handling track and paved areas. Figure 27 shows the CPKC network and intermodal terminals.

Figure 27 The CPKC Intermodal Terminal and Route Network

The map below shows the rail density for the new CPKC flows vs the CN flows. CPKC has more direct access to Mexico with the new network. CN acquired Illinois Central in 1998 and follows the Mississippi River flowage. Figure 28 shows that the CN network is more freight density than the CPKC.

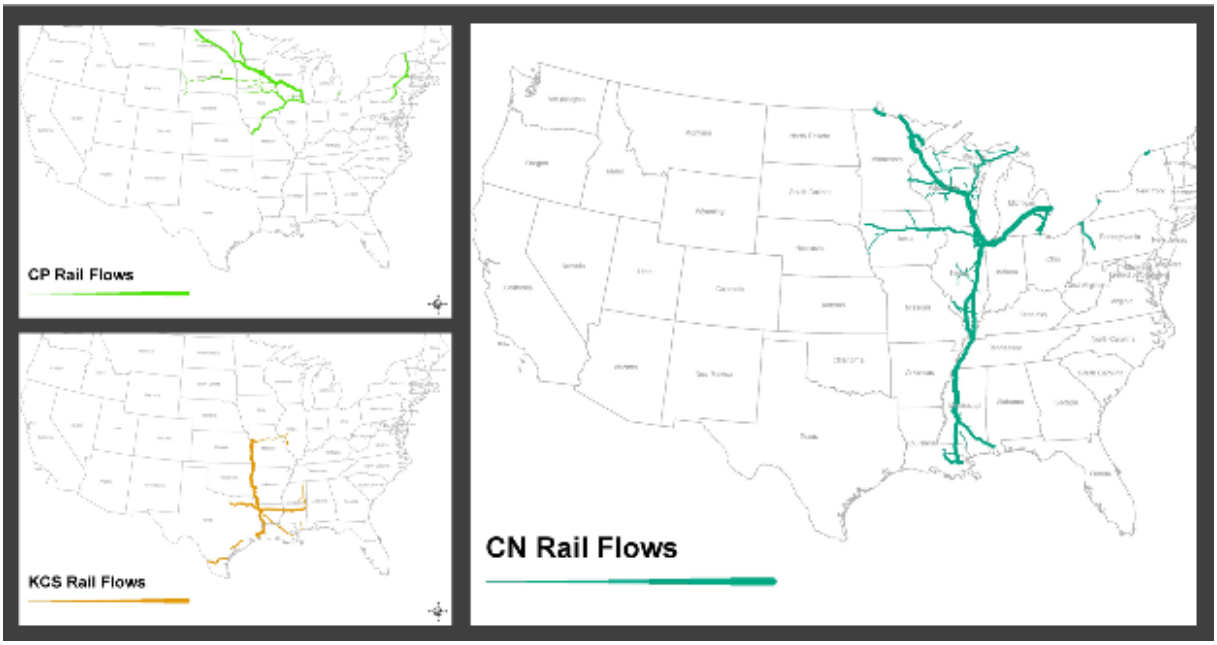


Figure 28 CPKS and CN Rail Density Flows

The BNSF spent millions of dollars upgrading the Northern Tier route which runs through North Dakota in an effort to increase capacity for the Dakota Bakkan oil boom. This investment created a double track mainline from Minnesota west. The oil market has shifted yet BNSF still has a high-capacity railroad to move freight via the Great Northern Corridor, connecting the West Coast ports to Midwest consumers and producers. BNSF has the largest intermodal terminal in Minnesota and has the greatest number of ton miles in the State of Minnesota. The BNSF route closely follows the river in Wisconsin and the topography is not conducive for rail expansion. The BNSF team of industrial development professionals has been doing site visits along their mainline between Minneapolis and Chicago and Omaha to Chicago in search of suitable locations for all forms of rail development.

Rochelle Transload/Intermodal Development The City of Rochelle is working on the redevelopment of a frac sand facility, located adjacent to a city owned transload terminal to support ag exports over the Northwest Seaport Alliance terminal complex in the Pacific Northwest. The BJRY terminal operator would build up to two trains per week in the next five years which would be switched to the BNSF for delivery to the West Coast. This investment is being made solely by the City of Rochelle with state and federal grants. The BJRY short line will operate the proposed intermodal terminal out of a transload yard which was open in 2018. It is anticipated

that this facility would capture up to 117,000 containers per year, which was what the UP handled prior to closing their intermodal complex in Rochelle.

A private hay export operation was developed in Nebraska, which consists of empty containers being repositioned to a certified rail site. The hay is then loaded and moved by unit train for export. This service is provided twice per week based upon demand. This type of program was developed to address drought and climate change. A similar program was recently developed outside of Phoenix, AZ on state land acquired in a public sale.

BNSF has a site certification program which identifies optimal rail-served sites and conducts in-depth reviews of ten economic development criteria to determine if the site meets BNSF's stringent readiness standards, which are intended to minimize development risks customers may face. BNSF has 34 certified sites across their rail system but there are none identified in Wisconsin. These sites range from 67 acres in Becker, MN to a 1,625-acre site in Shafter, CA.

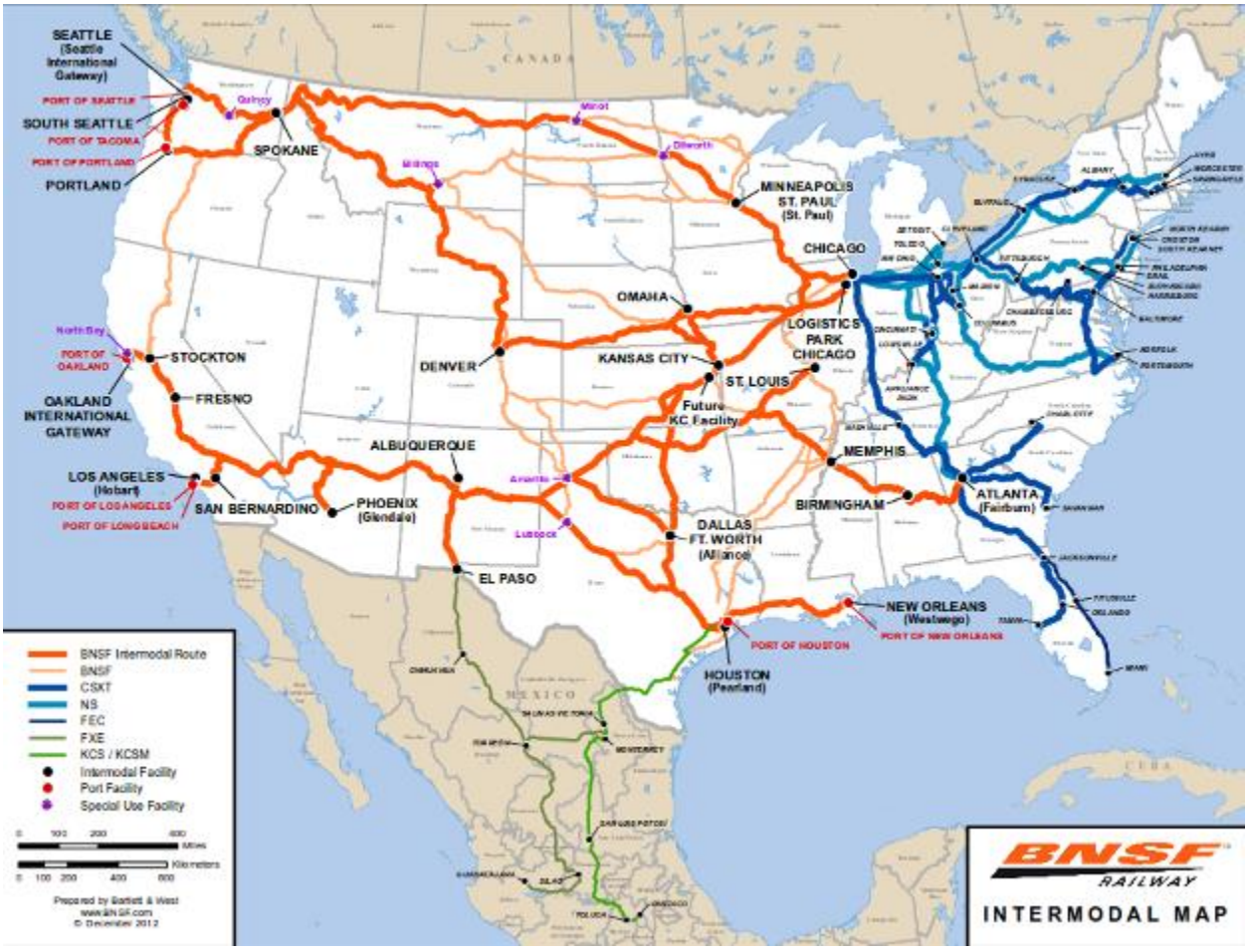


Figure 29 The BNSF Intermodal Terminal and Route Network

The Union Pacific Railroad operated a roadrailer train in conjunction with the Norfolk Southern Railroad between Detroit and Minneapolis until the Ford plant in St. Paul in closed and this fleet of hybrid intermodal trailers needed to be replaced. The original service ran roadrailer equipment to a terminal in Minneapolis. This facility was reopened in 2021 for a domestic container owner and operates between the Twin Cities and Los Angeles. Due to space considerations an international container service is not offered at this time.

Savage Railport-Southern Idaho terminal for the export of containerized hay and other agricultural commodities; it will be the first to serve the state of Idaho. Reported by Railway Age magazine, Savage, a transload terminal operator said it will construct and operate the terminal at UP's rail yard in Pocatello. The terminal was expected to launch by mid-year 2021. The Savage team will load containers onto railcars, which UP will haul to Northwest Seaport Alliance ports in Tacoma and Seattle, WA in an effort to provide faster services to Asia and other world markets. Union Pacific's unique collaboration with Savage uses intermodal containers heading to the Northwest ports. This partnership leverages container availability and the round trip and saves truck drayage costs for Idaho shippers by providing a direct rail option. The initiative will also allow more Idaho businesses to access global markets. As one of the top agricultural export gateways in North America, the Northwest Seaport Alliance worked with Savage, Union Pacific Railroad, the city of Pocatello and the state of Idaho for partnering on this innovative project to support U.S. farmers and agricultural exports. The new service will help lower export costs and increase volumes through the Washington ports.

Mid-Willamette Valley Intermodal Center is a 64-acre multimodal center in Millersburg, Oregon connecting rail, truckers and ocean carriers to the Valley's natural resource-based economy and the Pacific Northwest Seaports. This project cost $34.5 million and opened in early 2023. It received Connect Oregon State funding to support economic development while reducing road congestion.

Cold Connect, A Wallula, WA facility built on the Union Pacific, started a refrigerated rail shipping operation in 2006 as Railex, and was a hub for transporting Northwest produce. Union Pacific sold the facility to Tiger Cool Express, a private operator with a fleet of refrigerated containers. The Tiger Tri-Cities Logistics Center will benefit the entire agricultural and manufacturing community in the three-state region by providing cost-effective and environmentally friendly transportation capacity. Initially, service was intended to be offered between: Wallula and the Northwest Seaport Alliance on-dock facilities for dry imports and exports (in ISO equipment), as well as between Wallula and Chicago (and beyond) with Tiger Cool Express refrigerated domestic containers. The service scope is expected to eventually expand into other markets, such as the I-5 corridor and Mexico.

Shell Rock, Iowa located on the Iowa Northern Railway along with Watco a terminal operator and the Union Pacific will launch an internationally focused intermodal service through the newly developed Butler Intermodal Terminal in Shell Rock. The service provides an alternative to larger Midwest rail hubs and is expected to provide shippers with a cost-competitive option that reduces long-haul trucking miles. UP will transport eastbound intermodal shipments from the ports of Los Angeles and Long Beach and interchange with the Iowa Northern Railway for final deliveries to the Butler Intermodal Terminal.
Watco will provide in-terminal operations and handle intermodal containers upon arrival and for departure. Watco also will provide drayage services, and coordinate transload activities for customers reloading containers for westbound export. The Iowa Northern Railroad was recently purchased by the CPKC and this transaction will be reviewed by the STB in 2024. It is unclear if this innovative service design will be supported by the new Class 1 railroad network.

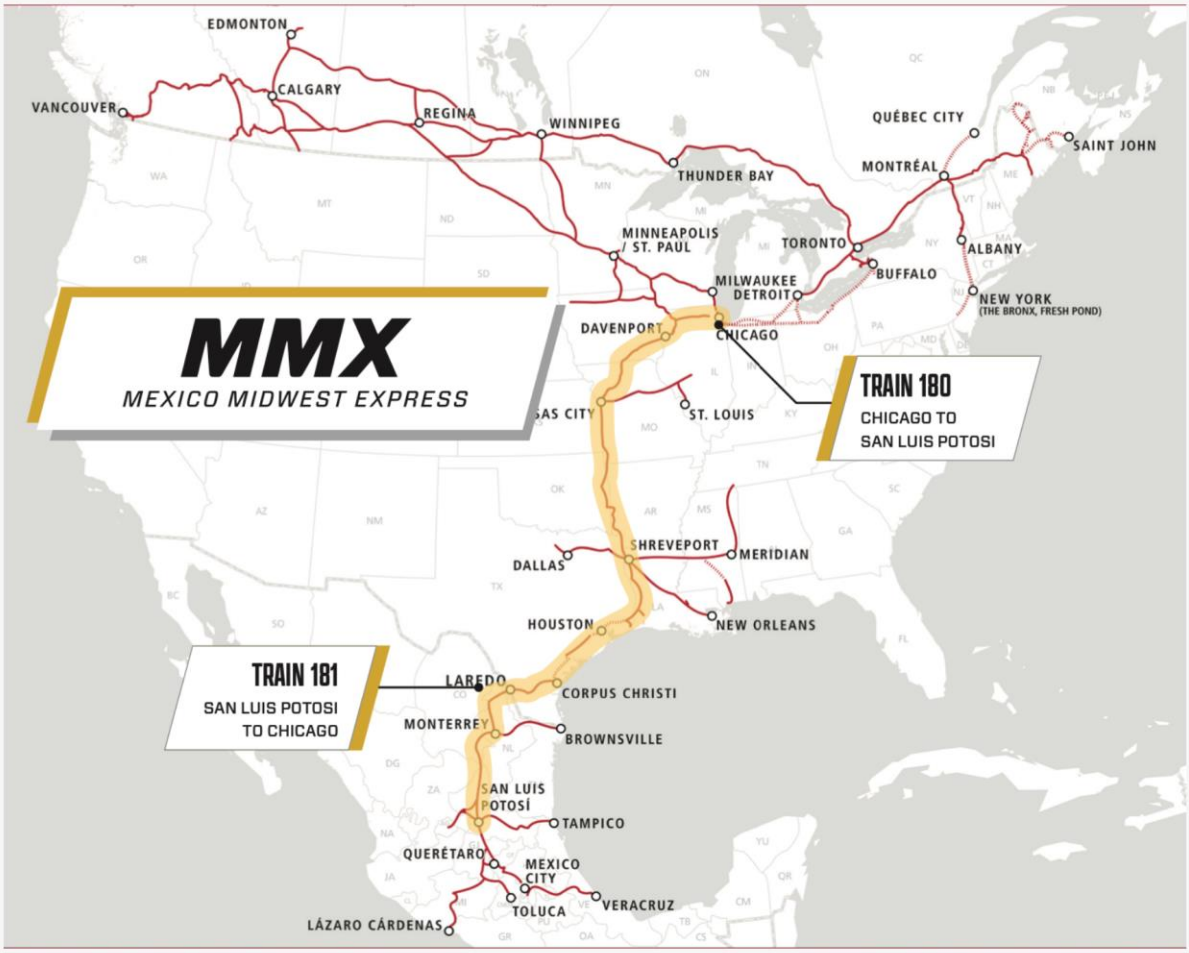
These new terminals share a common theme in that they have joined public and private interests in the development of intermodal terminals which are supported by the Class 1's. These examples include public funding, the introduction of privately owned containers filling a transportation need. They also illustrate the challenges of bringing users and carriers together.

New North South Intermodal Train Service Lanes

Due to geopolitical uncertainty a lot of supply chain managers are bringing production back to North America. Historically railroads grew by linking east-west networks. These new service

designs are leveraging our North American resources and labor pool. These new service lanes have sparked new terminal development and are taking freight share from trucks.

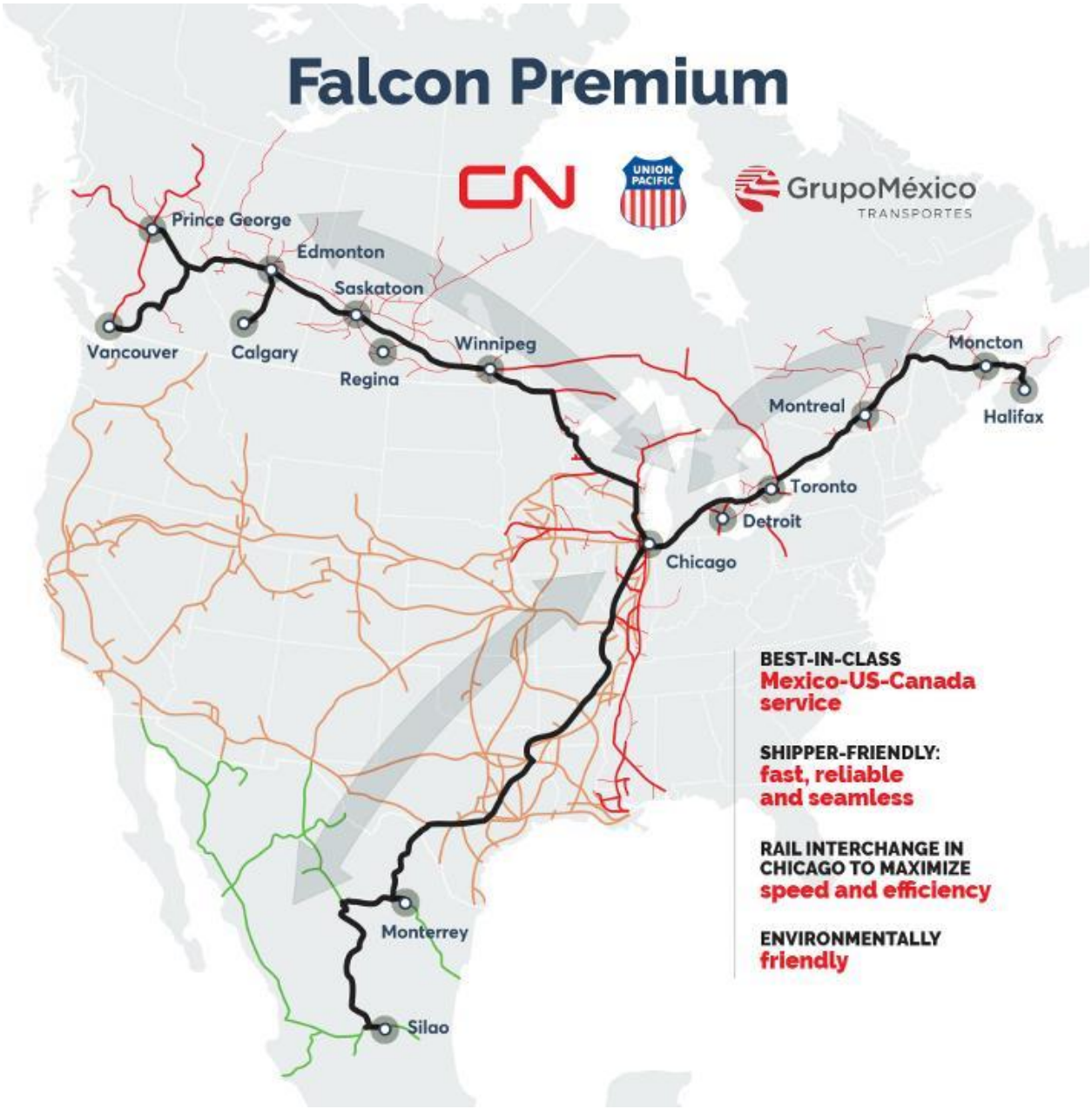
CPKC New Mexico Midwest Express Intermodal Service. As a result of the successful CP and KCS $31 Billion-dollar end-to-end merger a new intermodal service has been launched combining the resources and connections of these two rail carriers. CPKC is focusing on the Mexico to Chicago market and is investing in terminal upgrades in Bensenville, IL to merge Canadian, U.S. and Mexican freight lanes. This new single line rail service runs 2,150 miles in four days. This service was built to support the high transportation standards of the auto and refrigerated produce customers, however others will also benefit from this effort.



Canadian Pacific Kansas City's Mexico Midwest Express trains link Chicago with Monterrey and San Luis Potosi, Mexico. CPKC

The Canadian National in partnership with Union Pacific and Ferromex have developed a service which leverages the CN's EJE rail by-pass around Chicago. This service is built to support Monterrey, Mexico to Toronto, Ontario in five days, with handoffs between the three railroads. The route map is shown below. This new service is estimated to take 350,000 truckloads off the

road between these three North American countries. This represents new intermodal growth for railroads.



The UP and the CN will interchange in Chicago, IL to create a bi-national service between Canada and Mexico. This service will handling auto parts and other products in privately owned 53' equipment, EMP and CN owned containers. Terminals which participate in this service are shown with black circles on the map below. This new operation is aimed at reducing border crossing times and improving sustainability by taking trucks off the road.

The map below shows current rail flows in North America.

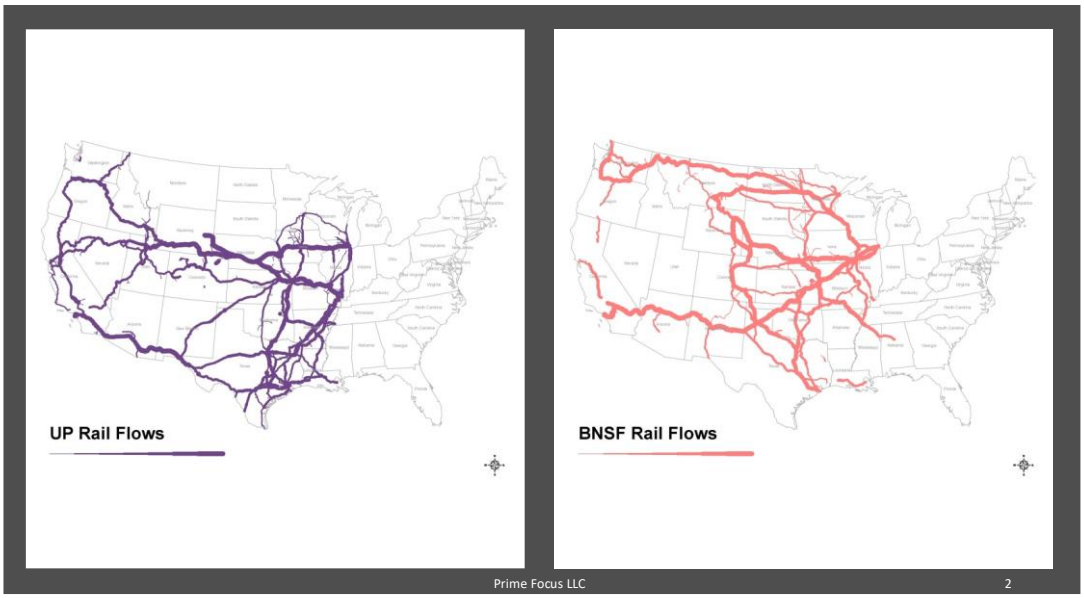


Figure 30 UP and BNSF Network Density Map

In figure 30 the heavier the line, the greater the cargo flow. UP flows in WI and MN are below system average as illustrated in the map above, with opportunity for growth. But the UP can not handle intermodal in Wisconsin due to clearance restrictions in the Milwaukee area which restrict double stack container trains. The BNSF freight system has a stronger presence in Minnesota and operates along the Mississippi River in Wisconsin. This BNSF corridor does not have much available flat ground to develop in support of an intermodal terminal.

Figure 31 The Union Pacific Intermodal Terminal and Route Network

III. Railroad Opportunities

Prior to the pandemic railroads wanted to tightly control the terminal operations in order to achieve high on-time service performance. Terminals are where the most service failures occur and also where the greatest costs are incurred. In an effort to grow and regain market share, railroads have begun to outsource terminal operations to some short lines. The further development of certified sites, featuring master planned developments and transload operators who can provide custom services has resulted in a new class of intermodal service.

Wisconsin and Minnesota should actively pursue the identification and development of certified sites capable of loading containers.

Private terminals which may be funded locally by short line or transload operators can provide cost effective labor and customized services for bulk exporters. Warehouses or storage facilities may also be needed to support inbound consumer products.

Private container ownership has been a growing trend. Trucking companies have increased their container fleets in an effort to support more sustainable, climate-friendly options. Large

retailers such as Amazon and Cold Chain Refrigerated Containers such as the Tiger Cool fleet have purchased equipment for greater control over their service. These asset owners are also creating interline service networks across multiple Class 1 Partners. Wisconsin and Minnesota Trade Associations should coordinate with these organizations in order to access equipment and provide balance for new North-South international freight flows.

Private asset owners, like ocean carriers tend to build selective railroad and terminal networks. The figure below illustrates a representative network of a private intermodal asset provider.

Figure 32 Representative Asset Owner Network

IV. Drayage Networks

Every intermodal drayage provider must have an active equipment interchange with the Intermodal Association of North America with current insurance for pulling equipment. These carriers' pick-up or drop-off loaded and empty equipment at the rail terminal and at the shipper or receiver facility. They are responsible for inspecting the equipment to ensure it is roadworthy for the first and last mile journey. Some carriers specialize in international freight while others serve domestic shippers. Some carriers specialize in cross-town movements which move containers from one terminal to another rai terminal. Some drayage operators provide

off terminal container storage to avoid terminal storage charges. Drayage.com provides a listing of drayage carriers listed by state and by rail terminal location.

As of 2023 there are 458 drayage carriers which serve the Illinois intermodal complex, eighty-five of these firms specifically state they do not serve Wisconsin. Fourteen of the 458 carriers are Wisconsin based carriers with the majority of them located in the Southeastern counties of the state. Six draymen serve the terminal in Chippewa Falls, WI, however all companies are based in Minnesota. Minnesota has thirty-five active drayage companies located in Minneapolis St. Paul which serve the four rail terminals there. Two of these firms also support the intermodal terminal in Duluth. MN.

The following table illustrates the Average Drayage Rates from Chicago and Minneapolis rail terminals to the study area as of Spring 2023.

Metro	State	City	Base + Fuel	One-Way	Per Mile
Chicago Area	WI	Kenosha	$672	75 miles	$4.62
Chicago Area	WI	Milwaukee	$769	108 miles	$3.55
Chicago Area	WI	Madison	$942	147 miles	$3.21
Chicago Area	WI	Eau Claire	$1,704	328 miles	$2.56
Minneapolis Rails	WI	Eau Claire	$530	97 miles	$2.71
Minneapolis Rails	MN	Duluth	$646	158 miles	$2.04

Figure 33 Average Drayage rates between Chicago and Minneapolis in Spring of 2023

V. Drayage Opportunities

Drayage is a specialty type of truck transportation because providers are responsible for the round trip of a container between the customers and the rail terminal. This type of service is typically time based and efficiency is measured in terms of turns per day. When highway congestion or loading/unloading times at the customer location is uncertain the drayage provider must still operate within the FMCSA hours of service rules. The greater the distance between the rail terminal and the customer location, the more uncertainty there is. The greater the distance traveled, the greater the truck operation and maintenance and driver labor costs are. Firms based in Illinois prefer to focus on local business because of the flexibility when it comes to matching containers and customers. When longer haul container service is required it is harder to manage the variability in a day's worth of assignments.

Opportunities exist for intermodal users if equipment depots could be established to support the short-term storage of empty equipment. Having storage or sufficient density in selected

lanes could allow for the coordination of round-trip freight or load/load movements. At one time CN provided a paper ramp in Northeast Wisconsin to encourage loaded container movement each way. However, because the drayage company holds the interchange documentation on each container until it is returned to the rail terminals this introduces more risk for the drayage operator. There are logistics firms that specialize in equipment matching. If regional shippers participated in this type of service drayage costs, and equipment availability certainty could be improved.

VI. Ocean Carrier Networks

Ocean network supply will likely surpass 2024 cargo demand providing a reduction in ocean freight rates. The back-ups at container ports and rail congestion have mostly been resolved, however for much of the year international imports have lagged as retailers are working down excessive inventories. Trans-shipment at the ports has continued to grow, resulting in more cargo transferring to domestic containers for inland distribution. Increased interest rates have put pressure on inventories and are changing distribution centers and fulfillment strategies. An emphasis has been placed on the expectation of input and raw material shortages and scenario planning to seek secondary and backup sourcing plans.

The figure below shows a typical ocean carrier inland network. Ocean carriers build their inland network around their core business relationships and network balance.

Figure 34 Representative Ocean Inland Network

Top Five Global 2024 Trade Trends

Since nearly half of all intermodal shipments support international trade, trends impact gateways and port selection and also impact ocean carrier volumes.

- Cyber Security Risks and Disruptions – shippers and transportation partners are looking for secure data portals to protect sensitive commercial and transportation data.
- Geopolitical Tensions – War and acts of terrorism have disrupted key transportation routes passing through the Suez Canal resulting in extended sailing times around Southern Africa.
- Resilient Access to Manufacturing Inputs – has led to multiple sourcing strategies for key components.
- Distribution Center Allocations and Inventory Flow Changes - reflecting consumer spending and commercial channel choices.
- Investment in Technology will increase logistics visibility and freight flow choices.

As new intermodal terminal developments pop-up, so does the demand for new technology to support freight visibility, resiliency and changing inventory flows.

VII. Ocean Carrier Opportunities

Ocean carriers are interested in growing their base of customers. Of the ocean carriers contacted none were interested in funding or investing in new rail service sites. Ocean carriers rely on the rail carriers to provide pricing to the terminals and to arrange for terminal handing services. For a new location or facility to be attractive to the ocean carrier, business volumes must be sufficient to entice the railroad to stop. The railroad cost to serve the new location in addition to the drayage cost to serve the terminal must be considered cost effective given the next closest terminals supported by the ocean carrier.

In the study area container yards operated by drayage companies may offer ocean containers available for loading. These facilities may provide container access for exporters, if insufficient volume is available to justify a new terminal.

VIII. Step 2 - Identify Public Warehouses Capacity

Warehouse Networks

The e-commerce boom has heralded an unparalleled demand for sophisticated warehousing and distribution centers. As a result, there is a need for strategically located warehouses to meet these expectations, which is, in turn, fueling warehouse construction even during record interest rates. While 2020 witnessed a lull in warehouse construction, this very slowdown is now the catalyst for a burgeoning demand for newer, state-of-the-art warehouses driven by the need to fill the gaps in storage and distribution facilities. State-of-the-art facilities need a stronger footprint to support racking and lift equipment, while increased technology is increasing the draw on local utilities.

The latest trends in warehouse management include robotics, inventory transportation, fleet management, and the Internet of Things (IoT). The transition from manual work to digital automation and the reduction of human involvement in hazardous tasks make warehouses safe and lower operating expenses. Forecasts suggest that by mid-term (2025), the warehouse automation market will grow by 1.5 times to reach a market value that could surpass **$37.6 billion**. Mobile robots, notably automated guided vehicles (AGVs) and automated mobile robots (AMRs) for transporting materials and goods within the warehouse, are central to this growth. These robots promise to redefine the conventional landscape of warehousing with enhanced precision, speed, and efficiency, which will streamline tasks and reduce human errors. Among the pioneering devices are wireless barcode scanners, which help warehouse teams perform more efficiently. The wearable scanners are available in various options. However, most of them are designed to add intelligence to picking, sequencing, and sorting processes by communicating essential data that workers need to attain maximum productivity. The figure below shows the potential productivity impacts of warehouse trends.

Top Nine Warehouse Trends Forecast in 2024

Trend Description	Productivity Impact
Warehouse Automation	32%
Warehouse Management Systems	15%
Inventory Tracking Systems	12%
Wearables	10%
Internet of Things	9%
Immersive Reality	8%
Warehouse Security	7%
Sustainable Systems	6%
Fleet Management Systems	1%

Figure 35 Warehouse Trends 2024

The optimal intermodal train is two hundred containers (or up to 400 TEUs), which represents a mix of 20',40' and 53' equipment. If we assume that a 53' long, 8' wide container has 3,830 available cubic feet capacity of cargo space that would represent 766,000 cubic feet of freight. A trainload of containers represents a substantial volume of freight which either needs a robust freight market of manufactures and consumers to process it or several warehouses which can support forward inventory.

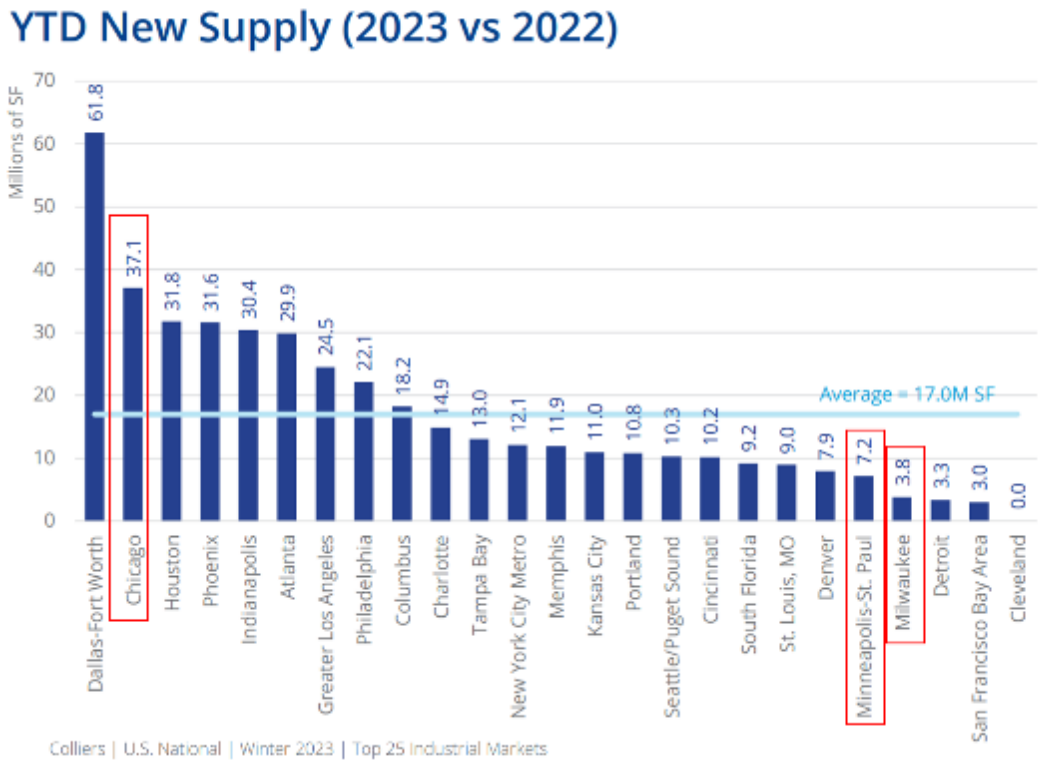


Figure 36 Top 25 Industrial Markets showing Millions Square Feet of Warehouse Capacity

According to Colliers, Chicago ranks #2, Minneapolis ranks #20 and Milwaukee ranks #21 in the Winter 2023 top twenty-five industrial Warehouse Market showing new warehouse supply. The average new supply is 17 million SF with metro areas in the South exceeding the average. Chicago likely exceeds the average due to the intermodal activities of the Class 1 railroads.

IX. Warehouse Opportunities

Warehouse opportunities are the most complicated node in the logistics network because they are highly sensitive to interest rates and are rapidly adopting new technologies to reduce labor costs. This has driven real estate firms to seek areas where utilities are available to run the newest generation of robotics and new sites are also seeking floors which can support picking equipment which is scaling new interior heights. These productivity increases are essential to keeping labor costs in check, especially in an environment where it is difficult to hire workers.

Warehouses and/or large producers are essential to aggregate trainload volumes. A typical train can move up to 200 domestic containers or up to 400 TEU's. To efficiently load intermodal trains freight is assembled or disaggregated close to the terminal. The CoStar database (utilizing 2019 data) was queried to identify and map locations where storage is available to process intermodal cargo within the study region of Minnesota and Wisconsin. Warehouse data was grouped by Minnesota DOT region and then average values were determined for average site acreage, square foot capacity and number of facilities.

MN Freight Region	Facilities Per Region	Million SQ FT	Total Region Acreage
Region 1	76	13.30	1424
Region 2	103	2.90	1261
Region 3	68	4.80	782
Region 4	51	3.60	510
Region 5	330	29.50	2686
Region 6	95	8.40	1452
Region 7	82	6.80	744
Region 8	5	0.50	108
Total	***810***	***69.80***	***8967***
Wisconsin DOT Region	**Facilities Per Region**	**Million SQ FT**	**Total Region Acreage**
Region 1	20	1.50	138
Region 2	0	0.00	0
Region 3	46	4.10	265
Region 4	25	2.90	429
Region 5	222	20.90	8653
Total	***313***	***29.40***	***9485***
Source Costar 2019			

Figure 37 Warehouse Facilities in Study Area

To start warehouse and distribution centers were identified. These are locations where inbound consumer goods are aggregated before they go to the final retail locations. Transportation networks were also layered upon the study region. In the map below the black lines represent rail tonnage, the yellow lines represent highway truck traffic, and the green dots show the warehouse locations. The size of the dots represents the relative size of the distribution center.

The map below is an illustration of the composite transportation attributes and warehouse reporting.

- Yellow lines represent the highway cargo density, and these lines tend to highlight the interstate network.
- The black lines represent the railroad volumes by line segment. BNSF lane volumes are the highest in the region.
- Faint black lines represent the short line rail tonnage.
- The green circles are scaled to represent the square footage of the facility.
- Warehouses are concentrated in urban areas. In Wisconsin there are few warehouses in central Wisconsin near paper producers.

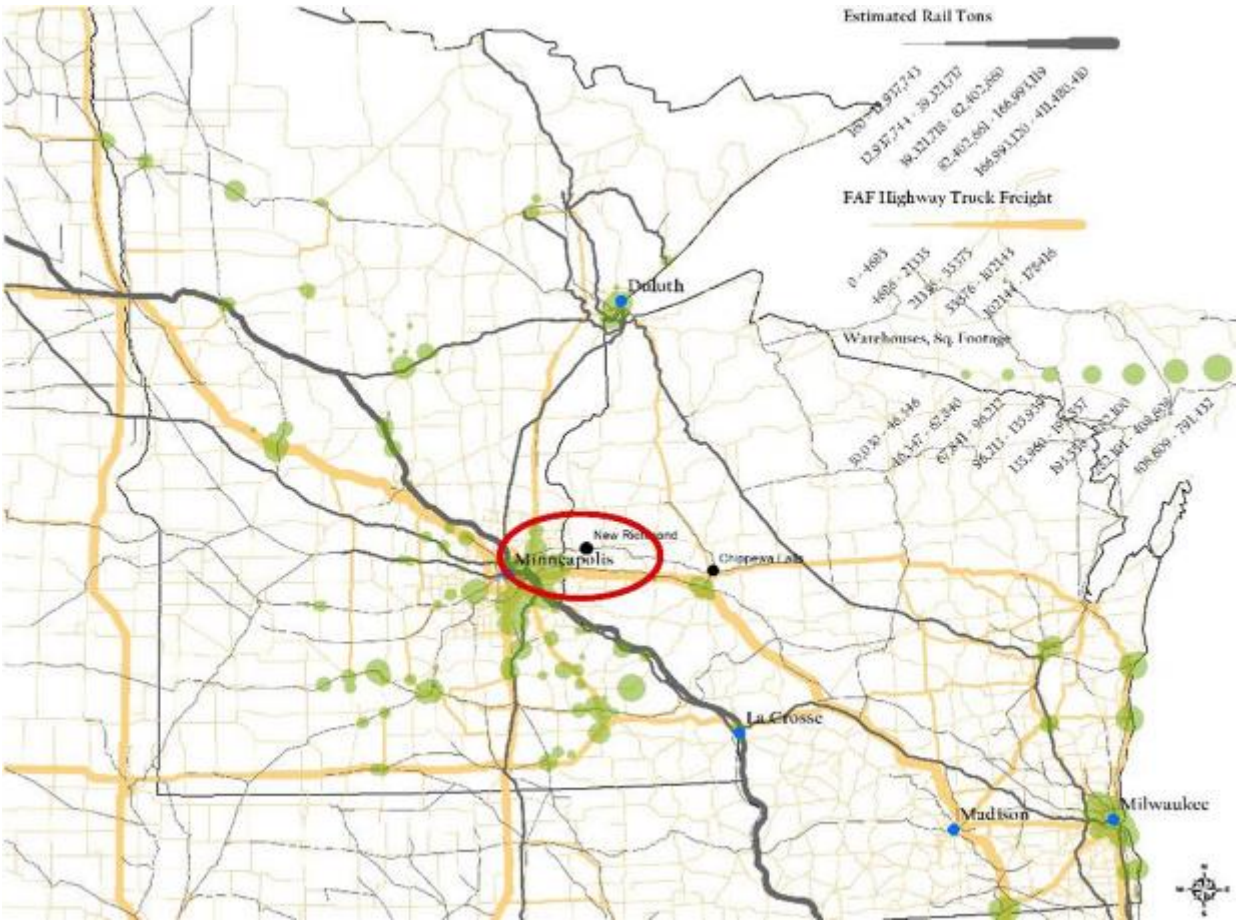


Figure 38 Freight Density by Mode and Warehouse Capacity

The figure above shows warehouse locations, represented by the green dots. The size of the dot indicates the size of the warehouse facility. The yellow lines represent truck volume and the black lines represent rail volume. The width of the line indicates freight volume. Warehouses cluster around locations where rail and highway networks intersect.

X. Step 3 - Identify Freight Concentration

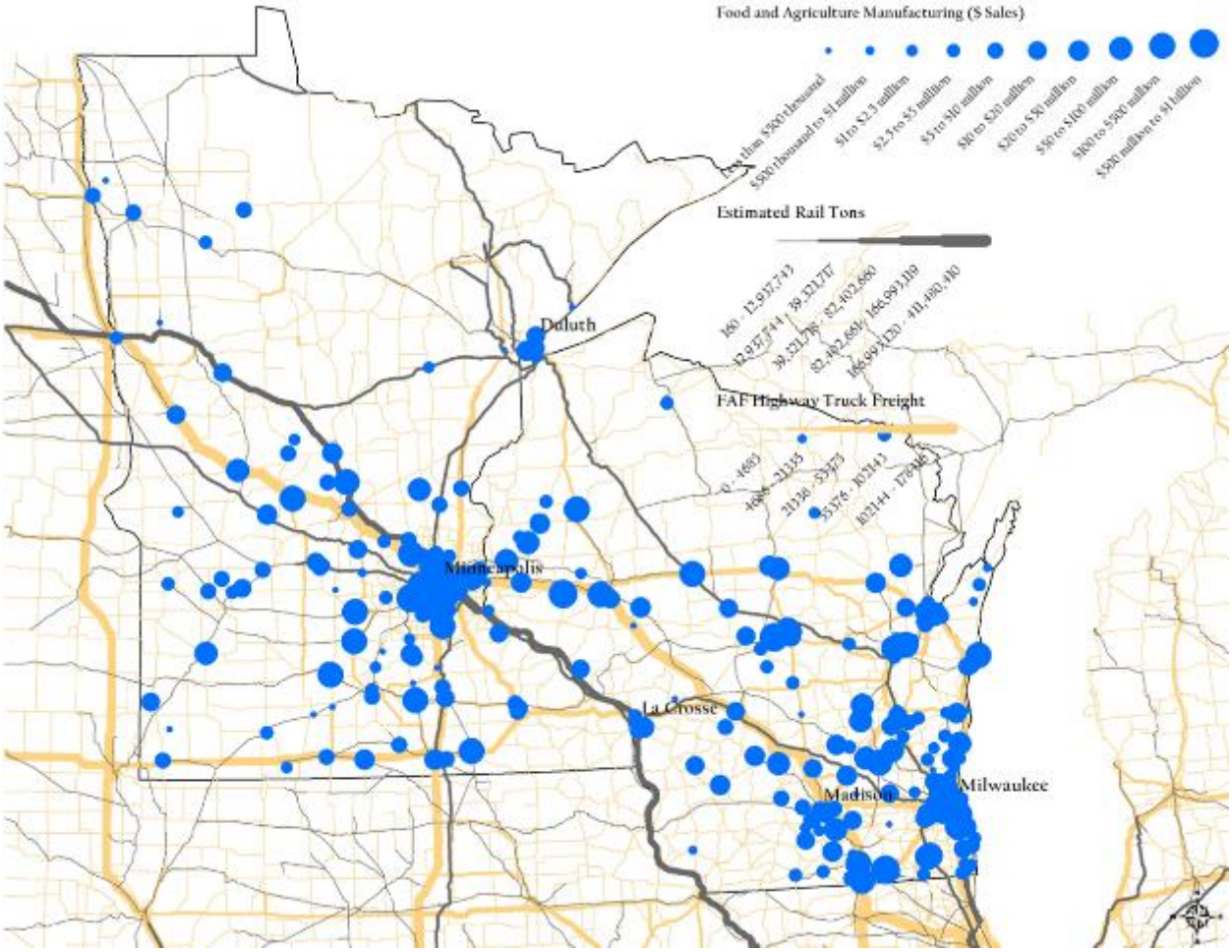


Figure 39 Producer and Manufacturing Facilities

The figure above illustrates concentrations of food and agriculture manufacturing in the study area. The blue circles represent estimated sales values for each facility. The base map shows yellow highway tonnage and black railroad tonnage. Southeast Wisconsin has a strong concentration along Lake Michigan in part due to utility access. Because Wisconsin has such a disparate array of manufacturing finding a central location to concentrate density maybe difficult

XI. Step 4 - Export and Import Opportunities

Until recently international intermodal volumes exceeded domestic volumes.

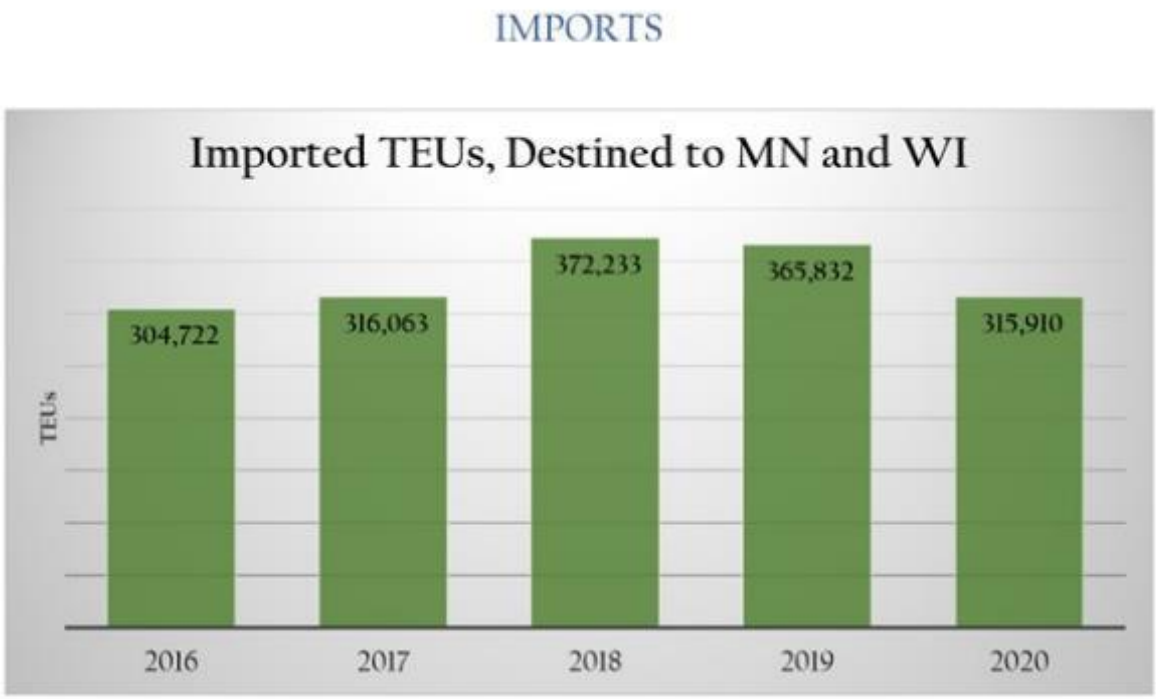


Figure 40 Total Import Containers Destined to Study Region

If we assume 200 containers per train as an average, in 2019 the study region would have received 1,829 container trains per year or 1,452 containers per day assuming 252 working days per year.

The top ten commodities to the study region represent 66% of all the imports. What is not shown in this graphic is the import cargo which lands in Illinois and is drayed North to Wisconsin or Minnesota.

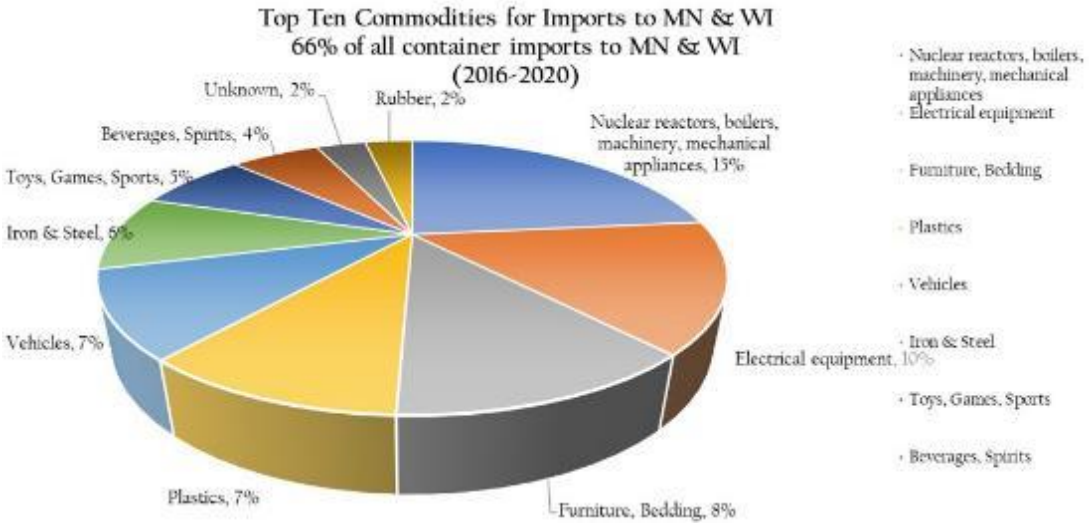


Figure 41 Top Ten Commodities for Import Containers Destined to MN & WI

Of the top 10 commodities imported to the region 8% likely moves over the Ashley private terminal. Vehicles (7%) would move via auto trains potentially to New Richmond, WI, but the remaining products while mostly high value, would support the regions manufacturing base.

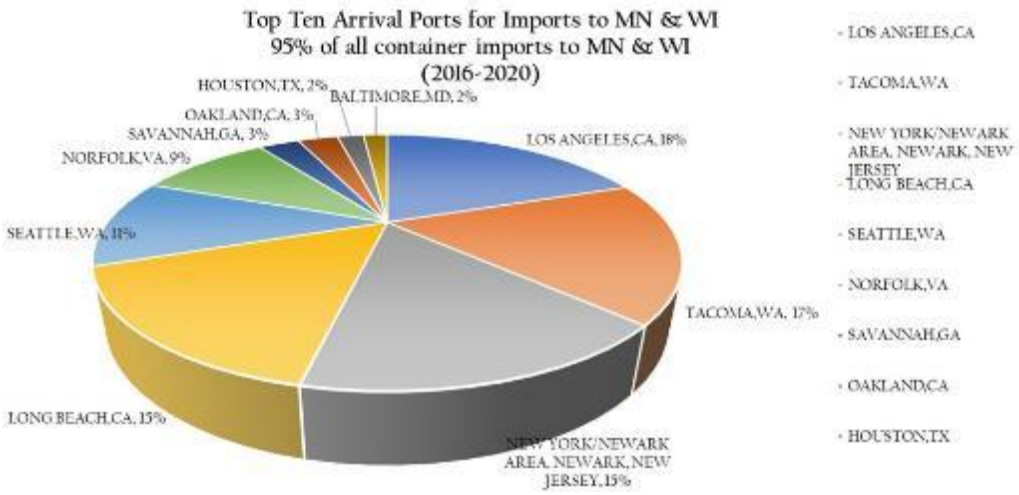


Figure 42 Top Ten Arrival Ports for Imported Containers Destined to MN & WI

During this time period 64% of the ports supporting the region were on the West Coast, however as recent labor concerns grow, more freight is being diverted to the East Coast. Only 2% moved to Texas.

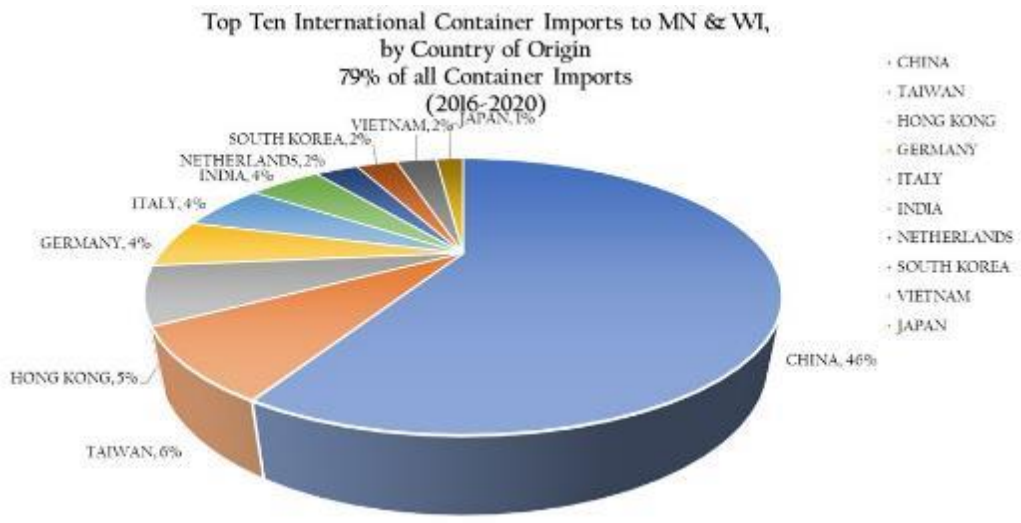


Figure 43 Top Ten International County of Origin for Container Imports Destined to MN & WI

Trade patterns are changing as a result of the pandemic and more on-shoring, re-shoring and Friend-Shoring trends may shift the strong trade routes which support trade with China.

International container exports leaving the study region of MN & WI exceed that arriving as imports, as illustrated in Figure 19. Between 2018 and 2020, export container volumes have increased from 431 to 454 thousand TEUs. And those export commodities are also concentrated into fewer industries, primarily agricultural, food and natural resource-based products. The top ten export commodities leaving MN & WI account for 81 percent of all container exports from the study region, with oilseeds, grains, and fruit (26%) and residue & waste from food industry (23%) representing the largest two categories. Other significant export products include cereals (5%), dairy produce (2%), meat (2%) and pulp wood (3%).

Similar to the imported container products arriving in MN & WI, the export container freight relies heaviest upon the west coast ports, particularly L.A. / Long Beach, CA (47%) and Seattle/Tacoma, WA (13%). This economic relationship between MN & WI and markets in Asia for both imports and exports reveals the balanced trade that compliments intermodal efficiency and equipment (and labor) utilization and also favors locations in the study region which has access to one of the Class I railroads servicing the west coast ports (Union Pacific or BNSF). The export containers leaving MN & WI are less concentrated in China (15%) but are heading to other southeast Asian countries, including Taiwan (12%), Indonesia (11%), Vietnam (9%), South Korea (7%), Thailand (5%), Philippines (5%), Japan (5%) and Malaysia (2%).

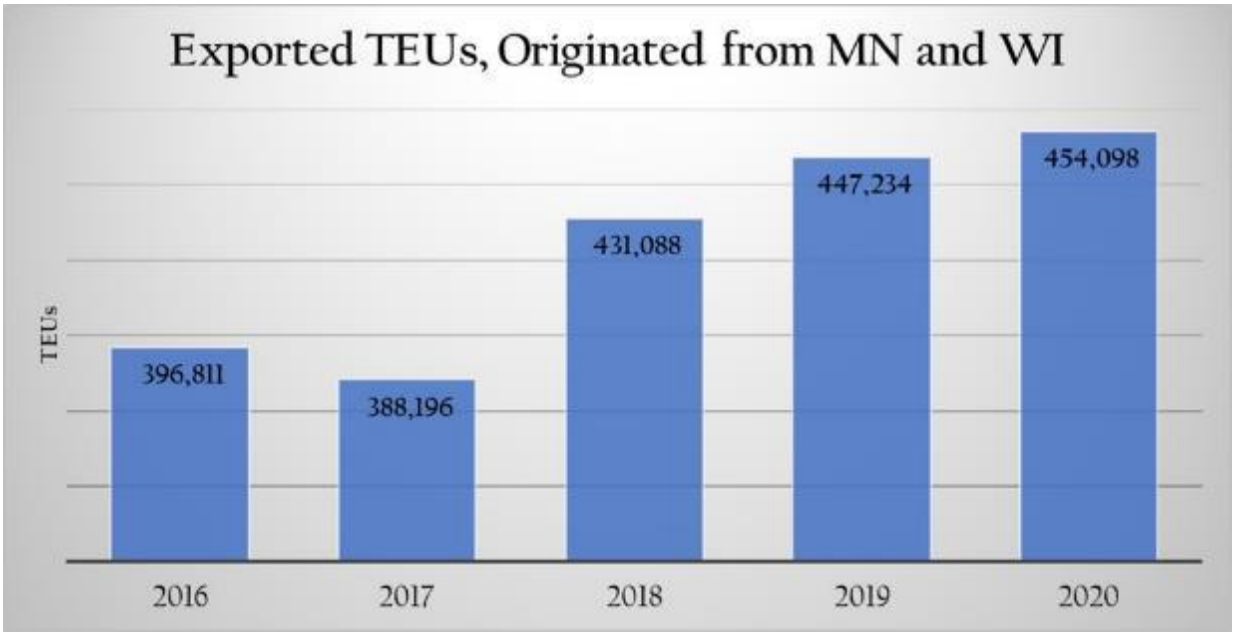


Figure 44 Total Export Containers Originating from MN & WI

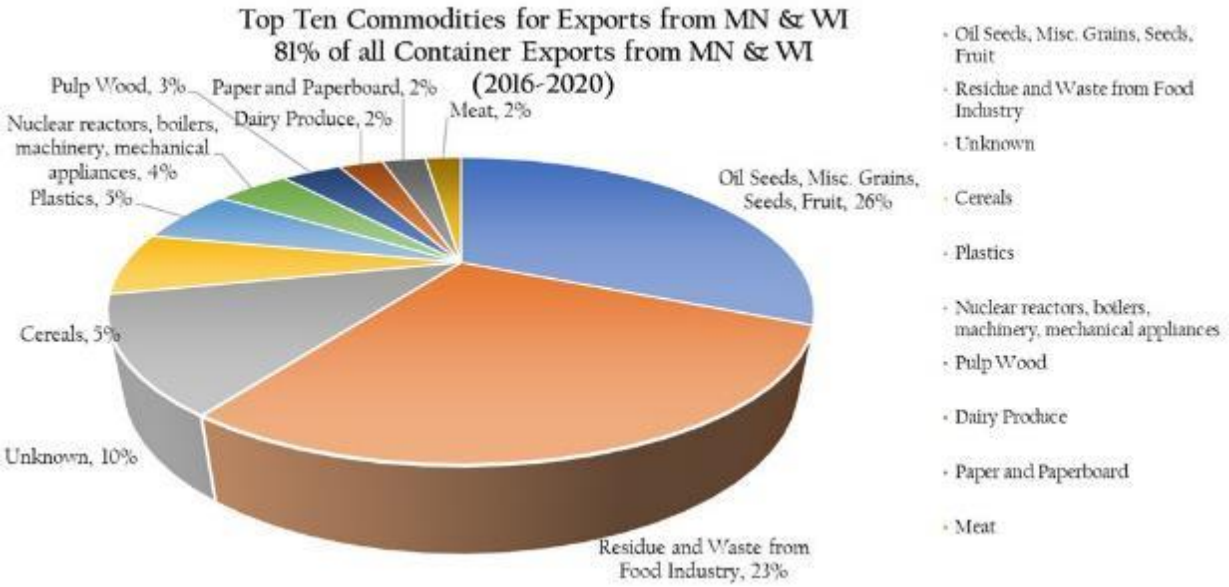


Figure 45 Top Ten Commodities of Exported Containers from MN & WI

The export of grains may be higher than reflected by this graphic as much of the export containerized grain is trucked to transload facilities close to the Joliet Elwood intermodal complex.

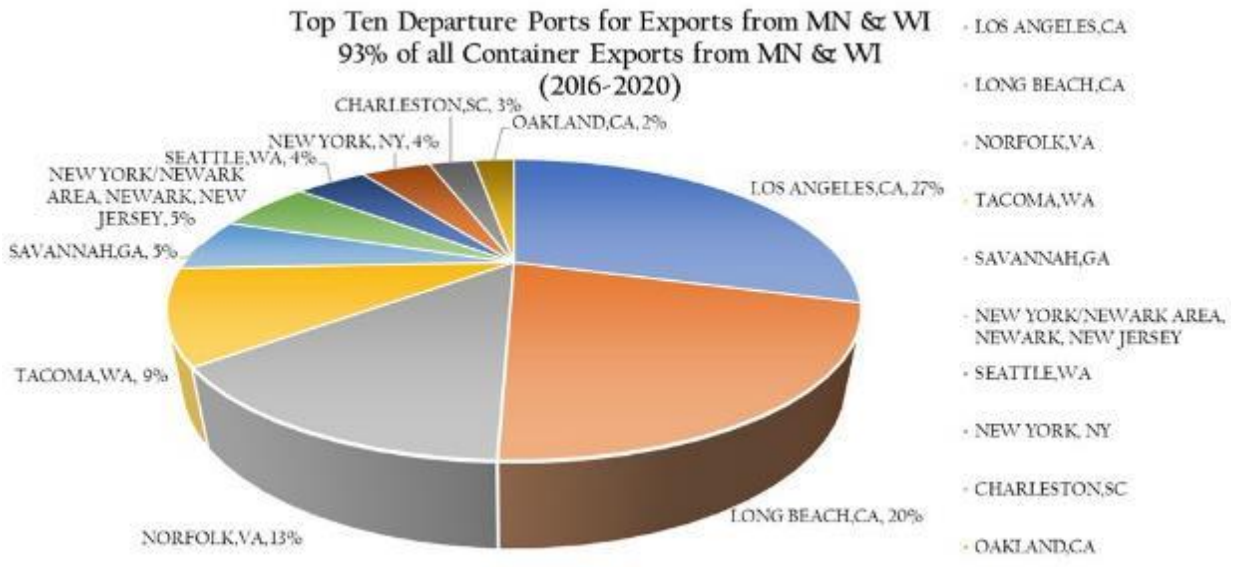


Figure 46 Top Ten Departure Ports for Exported Containers from MN and WI

While the study region is directly connected to the Pacific Northwest, Midwest ag products complete with bulk exports from Washington, Idaho and Oregon. Because few heavy exports are produced in Southern California much of the containerized grain from the Midwest flows to Los Angeles and Long Beach as a backhaul commodity.

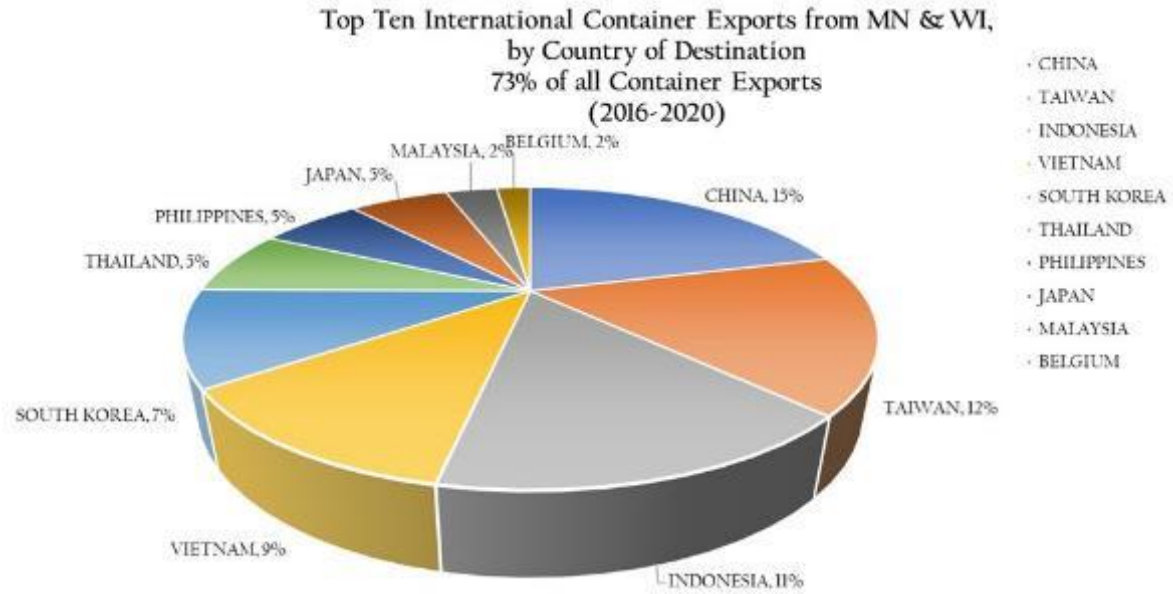


Figure 47 Top Ten International County of Destination for Container Exports from MN and WI

Much of what is exported to China, Taiwan, Indonesia and Vietnam is animal feed and food products. Wisconsin produces some of the highest quality soy sauce which is consumed in the far east.

XII. Step 5 - Identification of Mode Conversion Opportunities for Intermodal Networks

For railroads to devote resources and route capacity to prospective intermodal markets the railroad must deep this as a profitable and sustainable business.

The various transportation carriers, across all modes significantly influence intermodal terminal outcomes in a wide variety of capacities. The Class I railroads each have their own unique, national geographic network of customers (and rail infrastructure) to whom they provide transportation services. Their cost function is quite high for short distance moves and therefore typically prefer longer, dedicated services to maximize efficiency and operating margins. As a result, they exist in both a complimentary and competitive sphere with truck carriers who generally outperform rail for shorter distances, but also provide most of the origination/distribution for long-haul rail. At shorter distances, truck carriers dominate due to the high costs associated with starting, stopping and loading/unloading trains. As distances increase, rail becomes more competitive and for certain types of products and lanes, clearly outperforms truck. Therefore, the intermodal opportunity zone for moving freight off truck and onto intermodal rail is generally above 250 miles, but below 1,500 miles where rail freight already dominates. But it depends on the particular Class I railroad, the variety of truck carriers operating within the region and for the international freight segment, the ocean carriers. The ocean carriers own the containers they are moving and can influence international container availability, service and rates based upon balancing inbound and outbound freight traffic. What each and all the carriers do collectively will impact available volumes from the cargo owners (shippers) and vice versa.

The below graph from the US DOT National Rail Plan illustrates the strength intermodal and truckload have by mileage.

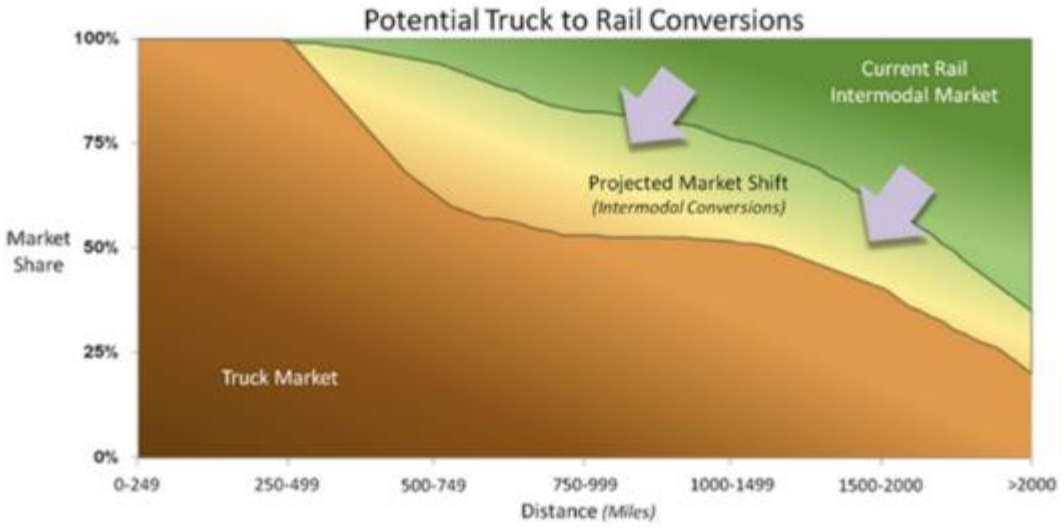


Figure 48 Potential Truck to Rail Conversion Source: The National Rail Plan

1. Publicly Available Freight Data Sources (Historical)

Figure 49 Rail Intermodal Moves Lane Density

The first map to the left is an example of public data prepared to visualize the existing intermodal freight lanes. This visualization illustrates the rail connections to container ports on the coasts and also shows how these ports connect to inland population centers. Note the strong east west freight flows.

The second set of maps below provide a visualization of the tons and values of freight that originates (produced or outbound) and destined (consumed) in the study area of Minnesota and Wisconsin. The information in these maps helps depict how the economy of the study region is linked to all other states in the U.S., and vice versa by illustrating freight activity

moving in either direction. Differentiating between volume (tons) and value can also reveal those places where higher valued goods may warrant increased intermodal service, particularly those lanes that are currently dedicated to truck service.

The map below shows total freight originating or terminating in the region by value in 2023.

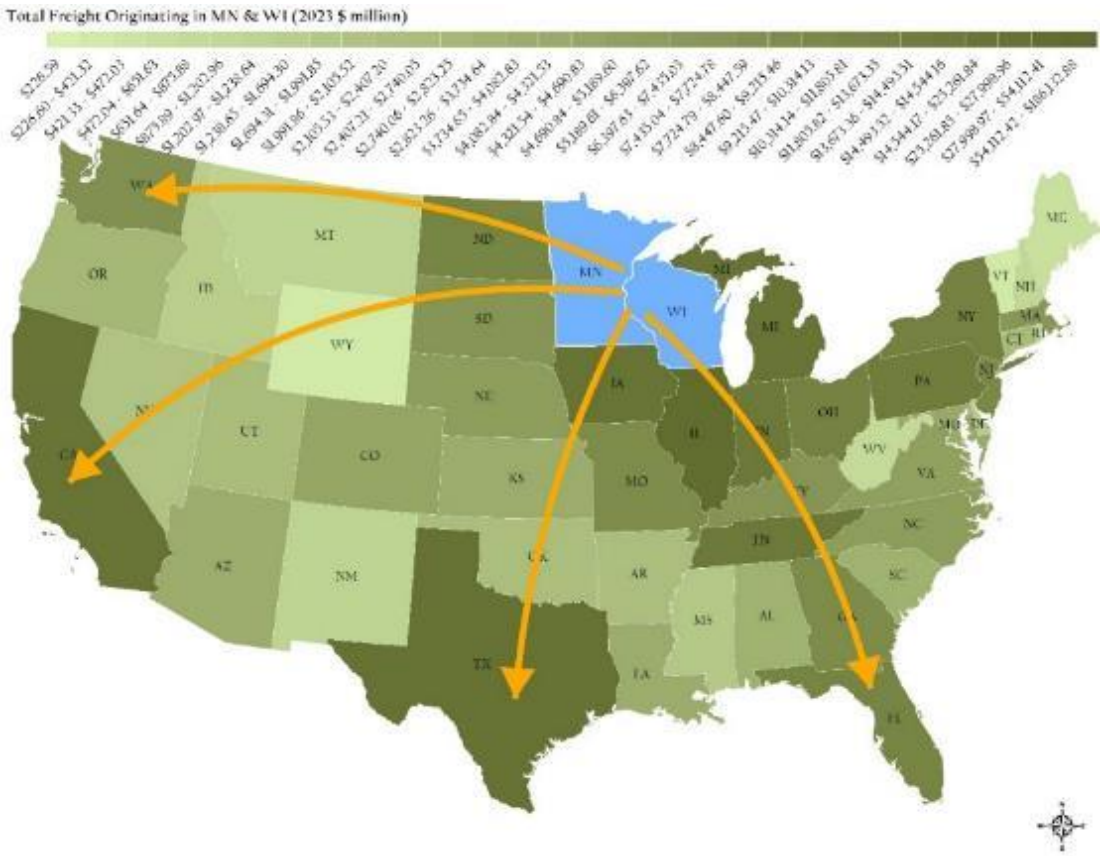


Figure 50 Total Freight Originating in MN and WI by value.

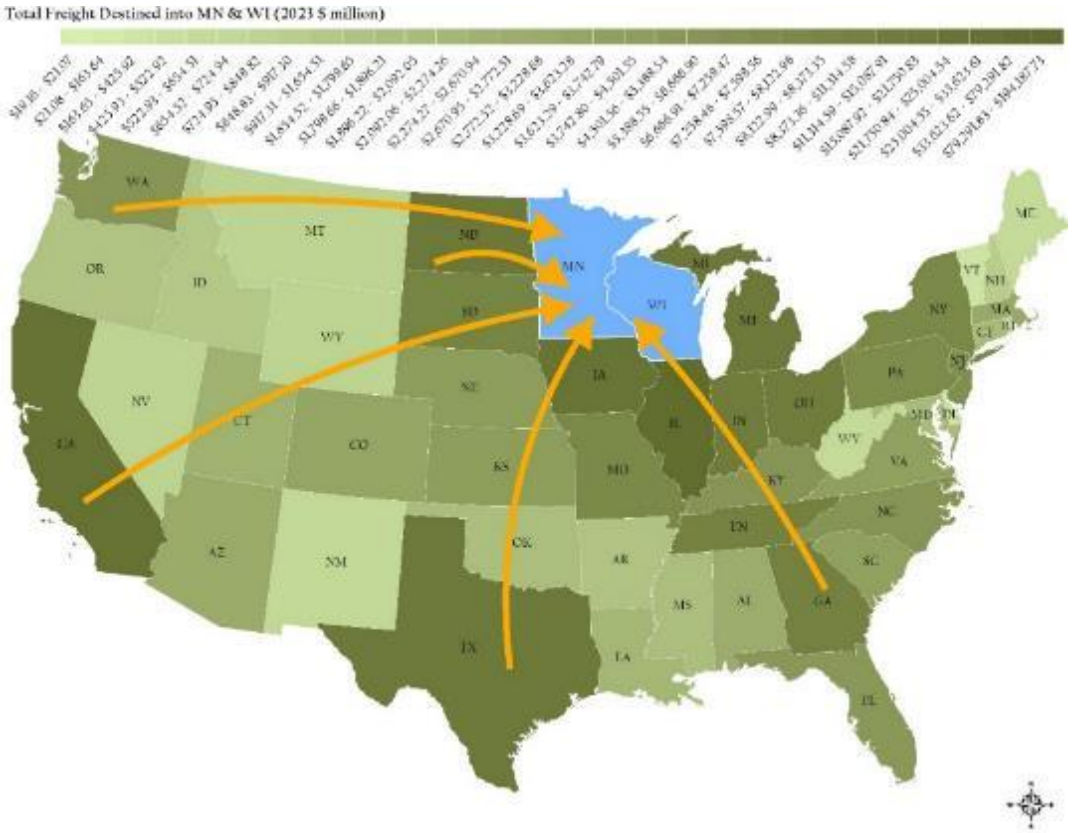


Figure 51 Total Freight Destined to MN and WI by Value

Figures 50 and 51 show that value of freight to and from the study region. International freight coming from port cities travels a longer distance than domestic high value cargo which is more regional in nature. Figures 52 and 53 include all modes, but in aggregate reveal how connected the economies of Wisconsin and Minnesota are to states geographically distant, such as California, Texas, Washington, and Florida.

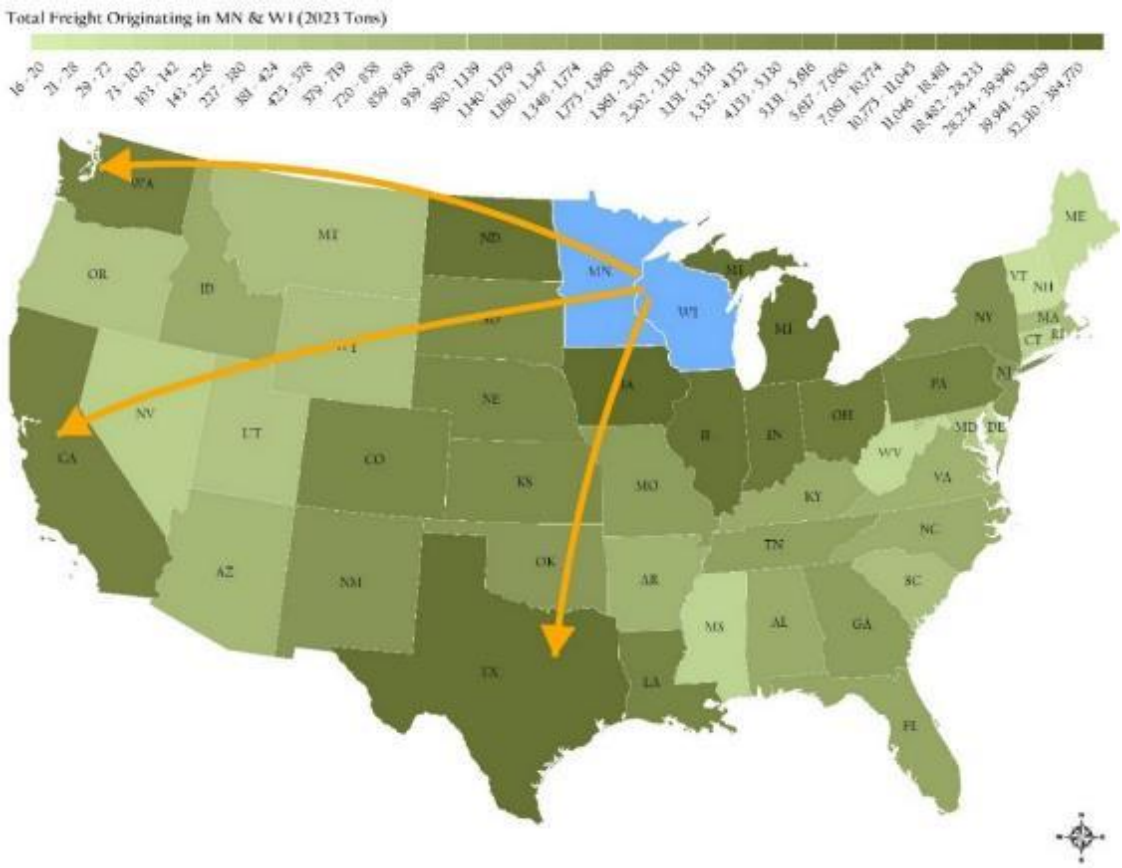


Figure 52 Total Freight Origination from MN and WI by Tonnage

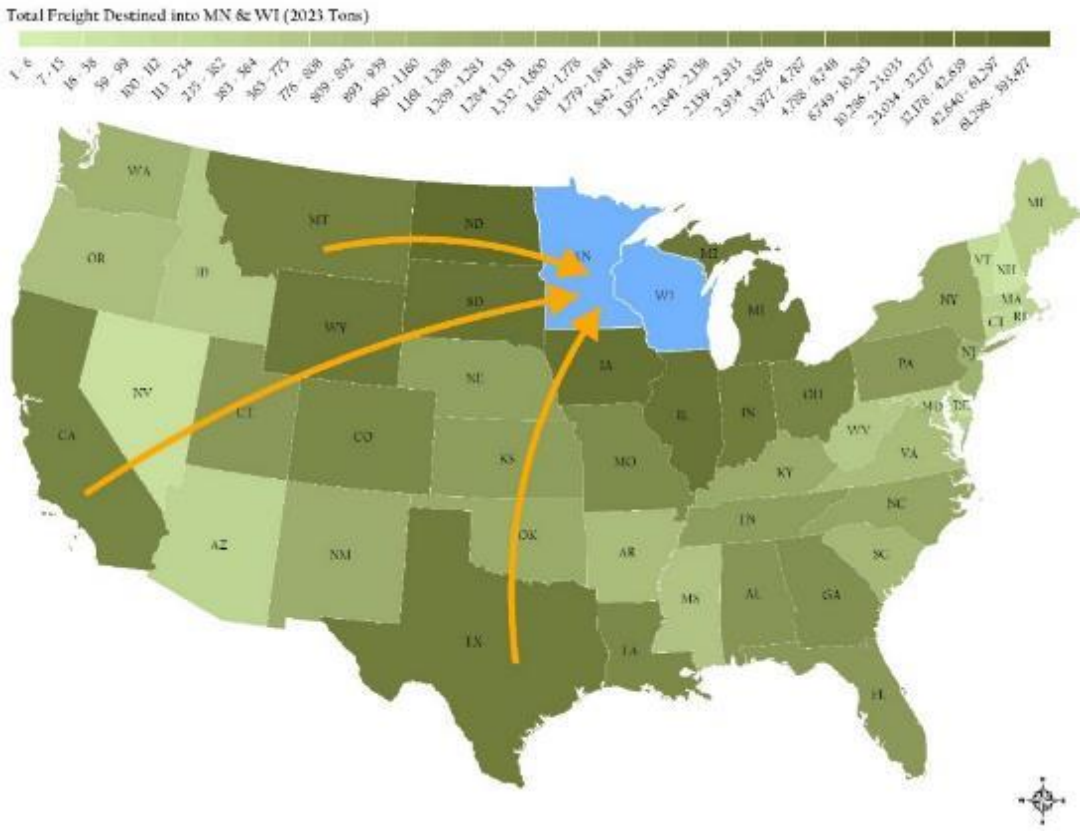


Figure 53 Total Freight Destined to MN and WI by Tonnage

Figures 52 and 53 reflect tonnage moving to and from the study region. More than 50% of the total tonnage moved is regional in nature. Comparing Figures 50 and 51 to Figures 52 and 53 also reveals that tonnage connectivity is more sensitive to distance, as greater regional interactions between nearby states are revealed. It also speaks to the agricultural and resource-based activities for these regions.

Total Rail Freight originating or Termination in the Region by 2023 Tons

Figure 54 Total Rail Freight Originating from MN AN WI by Tonnage

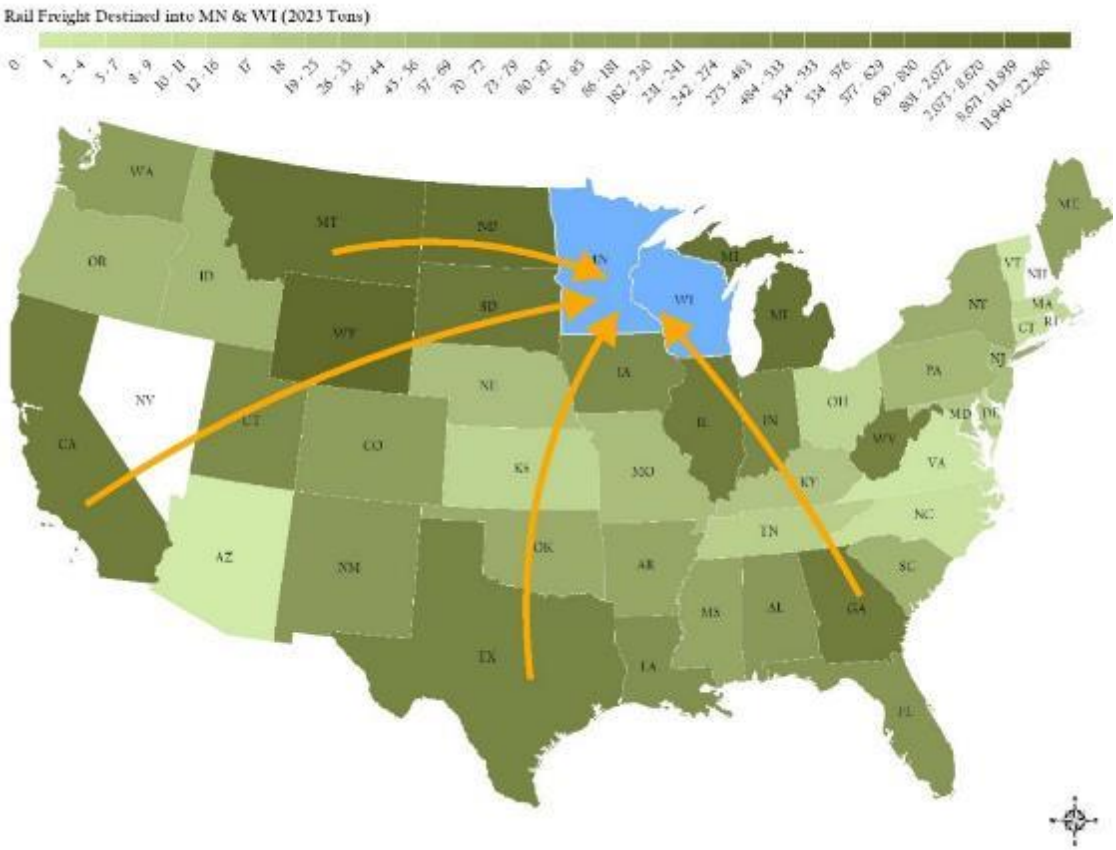


Figure 55 Total Rail freight Destined to MN and WI by Tonnage

Figures 54 and 55 show rail tonnage to and from the region. These maps illustrate the long-haul rail business model of Class I railroads, but also reveal how the mill/processing capability in Minnesota and Wisconsin captures agricultural and resource commodities from the upper Plains states of Montana, North & South Dakota and Wyoming.

Total Truck Freight Originating and terminating in the Region by 2023 Tons

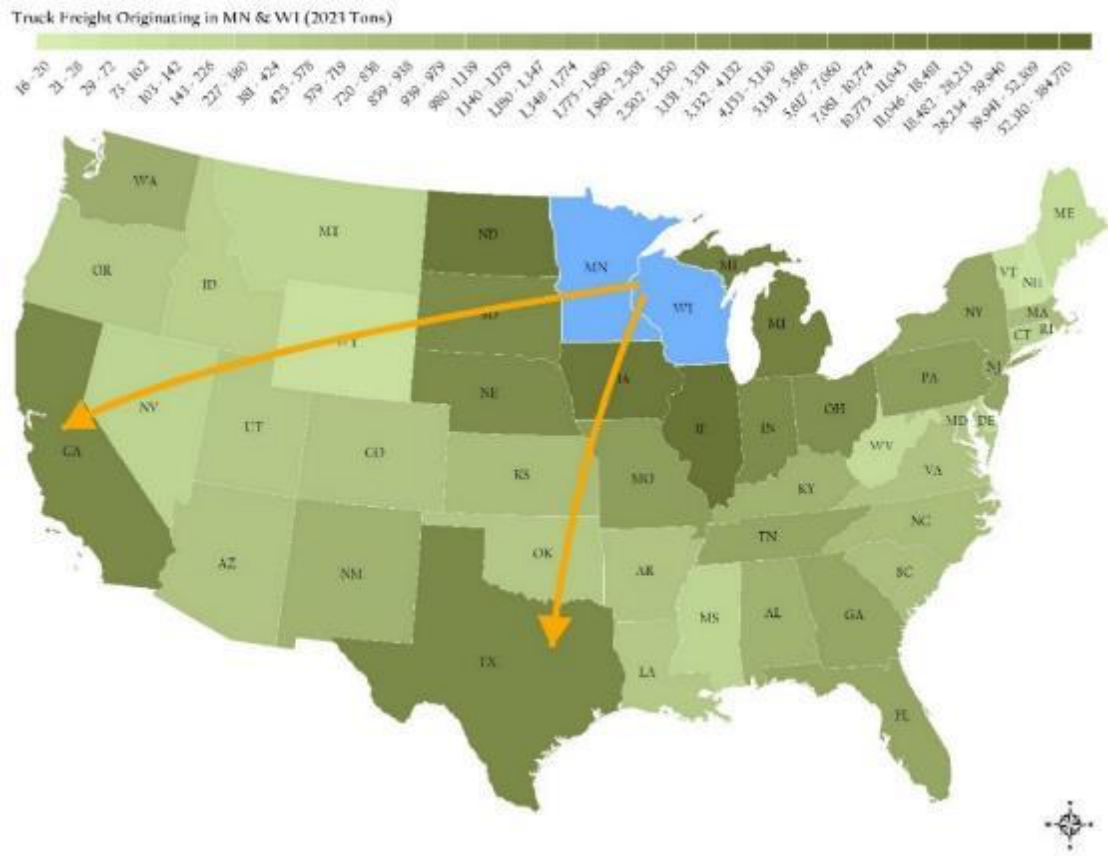


Figure 56 Total Truck Freight Originating from MN and WI by Tonnage

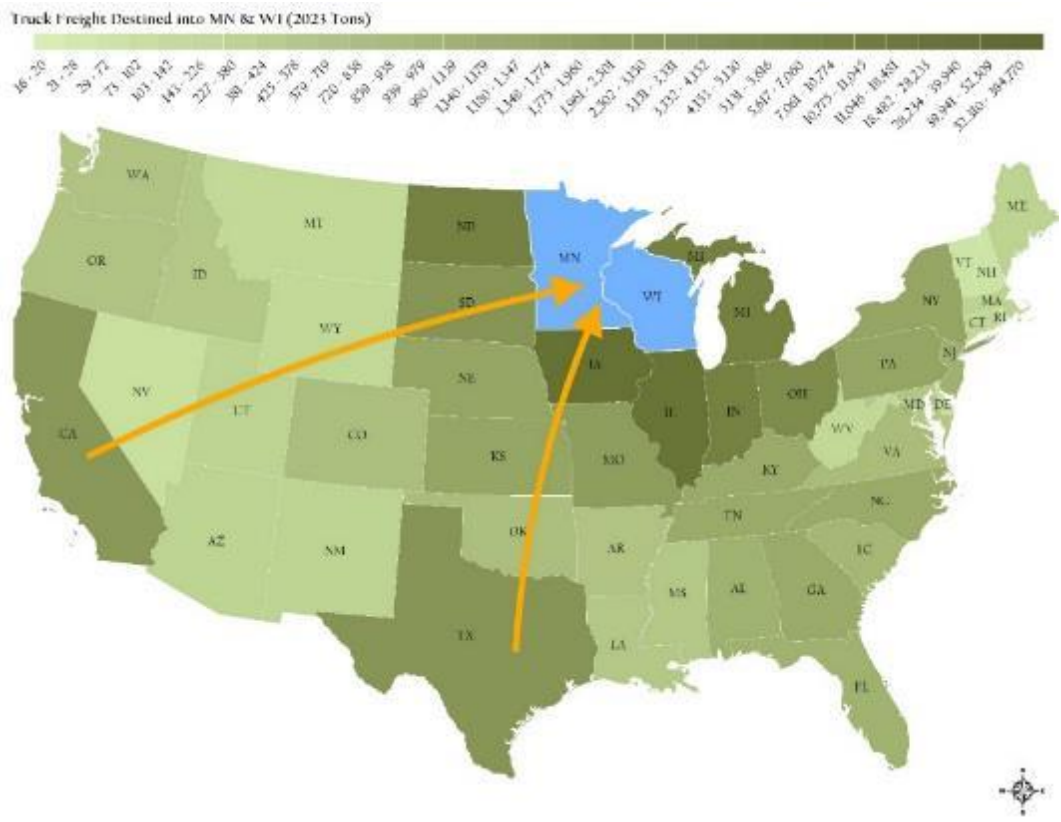


Figure 57 Total Truck Freight Destined into MN and WI by tonnage.

Total truck freight is more concentrated in closer proximity supporting regional clusters; however, TX and CA show sizeable freight gateways for international trade, both inbound and outbound. Some proportion of this long-distance truck freight is eligible for shifting to intermodal rail with significantly less energy requirements and transportation cost.

Products leaving MN & WI are heavily concentrated into those states geographically nearby (IA, IL, IN, MI, OH, PA & NY) but also to distant population centers in California and Texas, as illustrated by the darker green regions. The route to Florida is also a significant freight corridor for freight both originating from and destined to MN & WI, as illustrated by the concentration of freight values in KY, TN, GA, and FL . There are some minor differences between comparing the aggregate inbound and outbound value versus tonnage of freight from and to MN & WI. The connection to the distant markets of WA, CA and TX is apparent for both value and tonnage, but not so for the southeastern markets for tonnage.

Those states with the greatest rail freight connectivity for outbound shipments from MN & WI are WA, TX, CA and the collection of CO, KS, OK and NM. Rail shipments returning to MN & WI primarily are concentrated from the upper Midwest (MT, ND, WY and SD), TX and CA. As expected, those states representing dominant truck freight markets are more geographically closer to MN & WI but also include CA and TX.

Step 6 Identification of Select Single Line and Interline Intermodal Lanes over 750 Miles

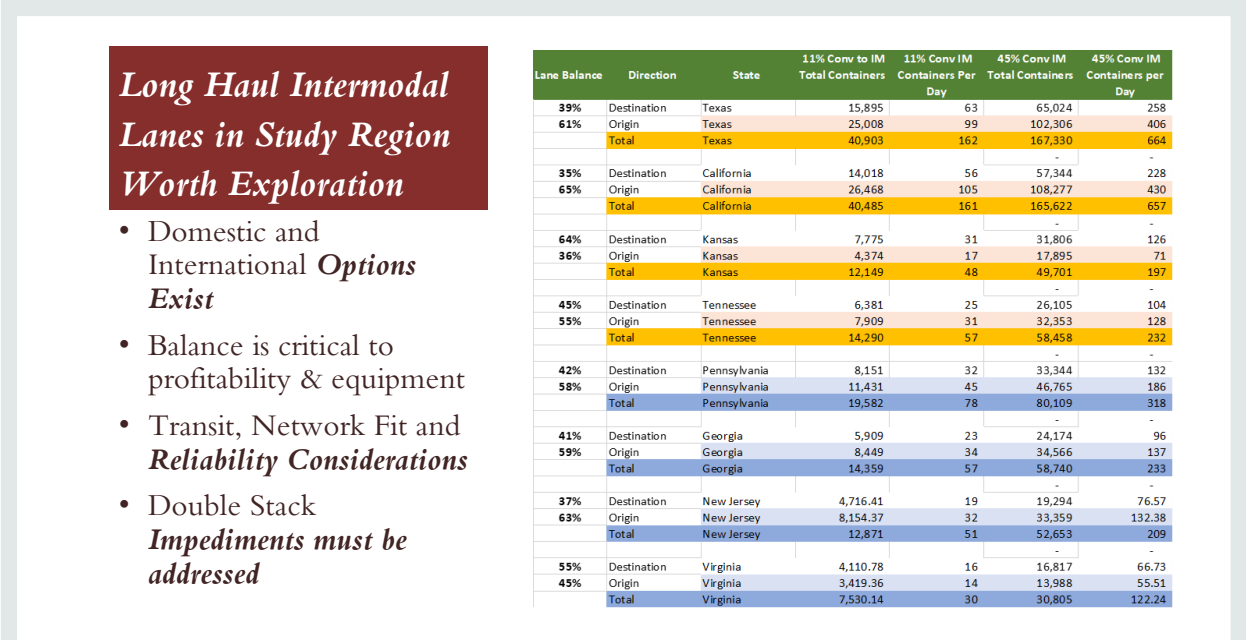
Eight states were selected representing the highest truck tonnage and a representative single line rail corridor (shown in yellow). The blue shading represents a two-line haul to states with coastal ports, in theory connecting to the largest container ports.

The graphic taken from the National Rail plan shows a mode conversion band between 11% and 45% percent of the truck tonnage.

The analysis then looked at lane balance. A lane which is nearly balanced is highly valued by the rail carrier. If a lane is imbalanced there is an opportunity to take share from the trucks if a core group of shippers would commit to the rail service and rates.

Rail service is assumed to operate 252 working days per year. In consultation with the four Class 1 railroads, it was determined that with a multi-year commitment a service schedule with one or two train per week could be contracted for if the private terminal would provide an operator and funding to develop the terminal, in addition to 10,000 to 20,000 lifts per year. For a more traditional daily intermodal service, operated by a Class 1 railroad volumes of 200,000 or more lifts per year would be required.

At the 11% conversion rate of truck tonnage, markets in Texas and California appear to be viable. Of note in the Texas lane more freight is moving northbound and freight from the study region would be a desirable balance option.



Lane Balance	Direction	State	11% Conv to IM Total Containers	11% Conv IM Containers Per Day	45% Conv IM Total Containers	45% Conv IM Containers per Day
39%	Destination	Texas	15,895	63	65,024	258
61%	Origin	Texas	25,008	99	102,306	406
	Total	Texas	40,903	162	167,330	664
					-	-
35%	Destination	California	14,018	56	57,344	228
65%	Origin	California	26,468	105	108,277	430
	Total	California	40,485	161	165,622	657
					-	-
64%	Destination	Kansas	7,775	31	31,806	126
36%	Origin	Kansas	4,374	17	17,895	71
	Total	Kansas	12,149	48	49,701	197
					-	-
45%	Destination	Tennessee	6,381	25	26,105	104
55%	Origin	Tennessee	7,909	31	32,353	128
	Total	Tennessee	14,290	57	58,458	232
					-	-
42%	Destination	Pennsylvania	8,151	32	33,344	132
58%	Origin	Pennsylvania	11,431	45	46,765	186
	Total	Pennsylvania	19,582	78	80,109	318
					-	-
41%	Destination	Georgia	5,909	23	24,174	96
59%	Origin	Georgia	8,449	34	34,566	137
	Total	Georgia	14,359	57	58,740	233
					-	-
37%	Destination	New Jersey	4,716.41	19	19,294	76.57
63%	Origin	New Jersey	8,154.37	32	33,359	132.38
	Total	New Jersey	12,871	51	52,653	209
					-	-
55%	Destination	Virginia	4,110.78	16	16,817	66.73
45%	Origin	Virginia	3,419.36	14	13,988	55.51
	Total	Virginia	7,530.14	30	30,805	122.24

Figure 58 Eight Long Lanes at 11% and 45% Conversion Assumptions

If conversion rates were higher more service frequency could be designed.

Assuming an 11% conversion to Intermodal it is estimated that there could be significant public benefits for the region.

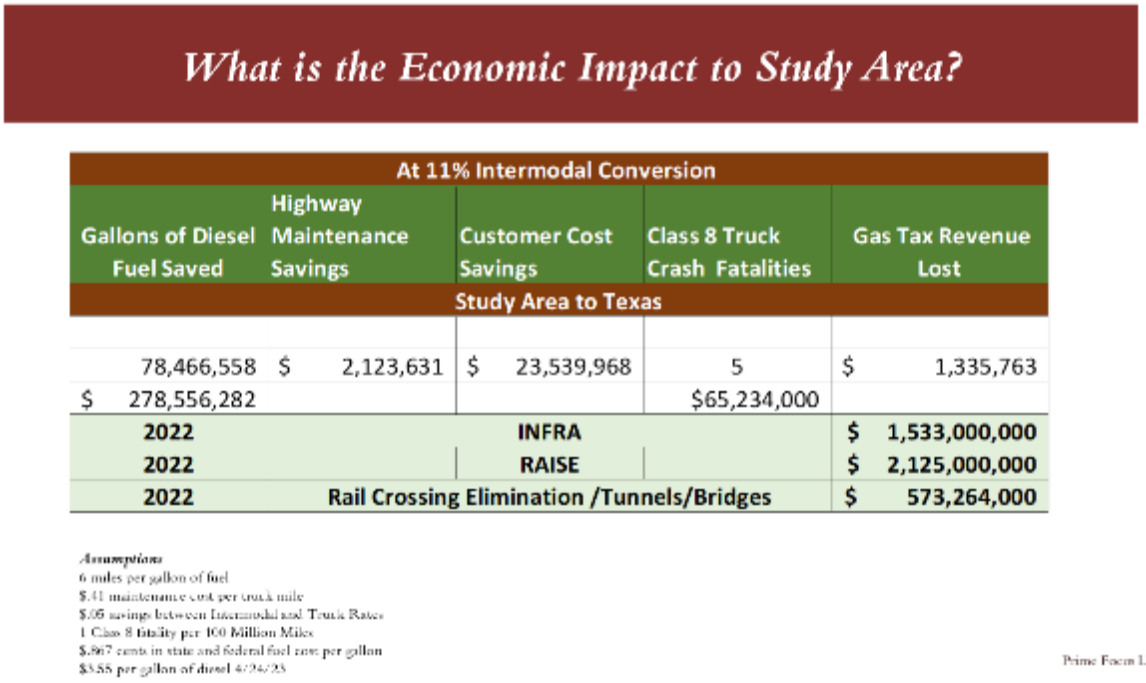


Figure 59 Economic Impact to Study Region

There is an unprecedented amount of funding available through federal and state grants to support infrastructure development If the MN & WI to Texas lane was selected, assuming a conversion rate of 11% of the current truck tonnage significant public benefits could be generated in the following areas:

- 78,466,558 gallons of fuel could be saved reducing carbon emissions and fuel costs by $278 million per year.
- Highway maintenance savings would be reduced due to less freight tonnage on the roads which is estimated to be $2,123,631 per year.
- Customer freight savings is estimated to be more than $23.5 million per year.
- Five fatalities would be eliminated based on national average miles saved.
- Wisconsin and Minnesota may also lose gas tax revenues of $1.3 million annually.

There are multiple federal infrastructure grants for which intermodal terminal design and development as well as rail grade crossing elimination projects would be eligible.

The opportunity to develop one or more terminals will require local support from key stakeholders.

XIII. Determination of Network Parameters

The focus of this project was to conduct research on the economic viability and operational potential for an intermodal terminal somewhere within the study region of Eastern Minnesota and Wisconsin. The factors (and therefore necessary information/data) that contribute to that decision are many, given the variety of entities involved in the operational success of an intermodal terminal (see diagram below). Collectively, these entities, through their activities, can impact the likelihood of success for an intermodal terminal, illustrated below.

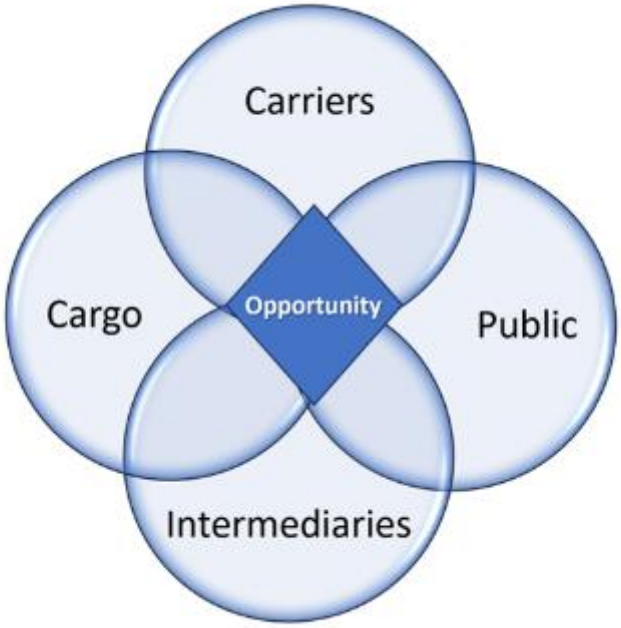


Figure 60 Ecosystem of Intermodal

Carriers include 6 Class 1 railroads, 13,601 IANA UIIA interchange holding drayage companies and 61 equipment providers, public stakeholder include more than 300 U.S. Container and Inland Port entities identified by the 2021 Infrastructure report, economic development organizations, states, counties, communities and public agencies. Intermediaries include NVOCC's, Third Partly Logistics firms, consolidators, equipment owners and freight transportation companies who hold railroad contracts. Cargo owners represent the largest group of stakeholders and ship both domestic and international cargo.

Rail Carrier Networks have benefited from carrier reinvestment. The AAR reports that between 1980 until 2019 America's freight railroads have invested $710 billion, averaging approximately $26 billion per year over the past five years. Railroads are safer and have the best hazardous material safety record of all surface transportation modes. Derailment rates are down 31% since 2000.

Rail Carrier Opportunities include improved freight visibility while cargo is in transit. Despite many systems technology improvements freight visibility across shippers, receivers, carriers and intermediaries could still improve as increasing pressure to manage inventories and

"amazon like" delivery information increases as the bar for e-commerce raises consumer expectations.

Cargo Networks are growing as a result of intermodal carrier asset investments. Private truckers, and container owners are investing at a greater pace than railroads, expanding access to the intermodal network. Public investment in private terminals is growing, as demonstrated in the new joint ventures and pop-up terminals which have come online since 2019. The need for resilience and back-up options is becoming more prevalent as climate change, geopolitical uncertainty and sourcing disruptions still have a significant impact on supply chain performance.

Cargo Owners (Shippers)

The cargo owners represent the underlying economic need for transportation services, either for outbound products accessing domestic or international markets, or for inbound products distributed to local and regional consumer markets or inputs utilized in domestic processing/manufacturing. The volume of product shipped depends heavily upon the transportation service provided (frequency, travel time, reliability, consistency, free of damage, etc.) and the cost. Generally, a balanced volume of outbound and inbound freight traffic leads to greater intermodal efficiency, as outbound cargo shippers utilized the inbound empty containers and often receive discounted container rates to access international markets. The study region of Minnesota and Wisconsin represents significant outbound product markets rooted in agricultural & food products, as well as forest products and other manufactured good.

Intermediaries

The freight consolidators often own no equipment or terminal facilities yet bring value via scale efficiencies through their ability to match carriers and cargo owners. Using expert transportation intermediaries brings firsthand knowledge of freight options that span multiple geographies and transportation networks. Intermediaries can often achieve better service and rate agreements with carriers given the larger volumes, which span multiple industries, with less seasonal variations. Freight concentration can lead to better overall equipment and labor utilization for the carriers. Better service and rates lead to greater cargo volumes and a greater market reach to more geographically distant markets. Intermediaries often have access to better information improves supply chain visibility, which is a critical factor in the success of intermodal terminals.

Public Agencies

There are many different local, state, regional and federal agencies which may impact freight movements and can likewise affect the success/failure of an intermodal terminal. Port districts may levy taxes for infrastructure improvements which advance economic growth and contribute to greater public benefit. State and regional transportation authorities have broad

influence on the permitting processes for construction of new rail or highway (bridge) accessing potential intermodal facilities or other facilities throughout the state where private Class I railroads operate. And economic development agencies, through their efforts attracting businesses to the region and state can positively influence the freight economy. This is particularly true in areas where economic development efforts attract new businesses that build large warehouse/distribution centers. Regional Planning Commissions and Economic Development Agencies report site selection interest in available intermodal and rail facilities.

3.0 Site Analysis

A. Evaluation Methodology

In examining the development, operation, and closure of terminals in the study region the following findings informed the evaluation of potential sites.

- All public terminals in the study region have either been built on railroad owned land or public land. Arcadia, WI is the exception, but it is not open to the public.
- Study region terminals have committed keystone customers.
- Railroads espouse a minimum of 10,000 to 30,000 annual lifts for establishment but make exceptions in the study region for opening and closing.
- Annually handling 20,000 lifts requires approximately 20 acres depending on the storage system for private terminals.
- Reasons for terminal closure in the study region include insufficient freight volumes, insufficient lane balance- requiring expensive empty equipment relocation, not meeting minimum return on investment.
- Terminals established in the study region serve either international, domestic or both operations.
- Railroads usually but not always, avoid opening internally competing terminals.
- Shippers carefully estimate out-of-route mileage when considering an intermodal terminal. For example, it is highly unlikely that a Madison company will go sixty miles north to a terminal in Fond Du Lac rather than going the 130 miles to Chicago. An exception would be if that terminal offered a unique/better destination, service and/or rates.
- Shippers trucking containerizable cargo would shift to intermodal if the service offered is reliable, provides total cost savings and a mutually beneficial relationship occurs between the carriers and shippers.

Based on literature reviews and the analysis of open and closed terminals in the study region, it is evident that successful inland rail terminals need to meet certain criteria for investment and successful operations. Intermodal terminals will be located where Class 1 railroads believe that they will generate new cargo for their network, have lane balance, make an acceptable ROI, and

have future growth potential. A 1995 study examined options for new intermodal terminals in the Twin Cities metropolitan area. In their methodology they utilized criteria similar to those used in this study in evaluating potential locations.

Evaluation criteria for a new intermodal terminal in the study region

A rating scale has been created to assess existing rail sights for potential terminal locations in the study region. Wherever possible quantitative assessment is used. Qualitative determinates are based on industry rubrics, research heuristics, and interviews. Potential intermodal traffic is assumed to be a mix of domestic and international containers.

The following analysis is not intended to promote any location. The objective is to determine how potential locations fit rail intermodal terminal selection criteria. The assessment is based on an overview with significant caveats. Rail and other property owners may not want to use the sites for intermodal operations for reasons outside of the review criteria. Adjacent landowners may oppose a terminal location and through re-zoning or other actions prohibit operations even at an ideal site. A terminal location meeting all the criteria may not be acceptable to a railroad to other financial or planning decisions. The railroad providing service will make the ultimate decision on terminal location. Sites identified in this report may also be good candidates for secondary transload operations where cargo is loaded into car types other than containers.

I. Criteria 1 - Connection to a Class 1 Railroad

Rail connectivity: To reach coastal ports and/or distant population markets the terminal needs to be served either directly or indirectly by a Class 1 railroad. Terminals that are within a few miles or on a Class 1 railroad's primary line and adjacent to a large cargo generating location are ideal from the railroad's viewpoint. The railroad can maximize asset and labor utilization, service rail equipment, control market access and better plan the flow of rolling stock into their network. There needs to be sufficient room in the yard to make up the consist for an intermodal unit train of up to 200 containers. If the intermodal cars need to be moved to another larger yard to connect with a unit train this is a disadvantage to smooth network flow and increases transit times and adds cost.

There can be contracts (operating rights) between railroads that allow a railroad that does not own the track (a foreign railroad) the right to move their locomotives and cargo on that rail line. This is termed trackage rights. If the foreign railroad can move its cars but not power units, it has haulage rights. A short line railroad terminal whose track connects with one or more Class 1 railroads that the short line has haulage or trackage rights can be successful if other criteria are met. The operating rights between railroads are proprietary and subject to change. From a western railroad's perspective, the containerized cargo generated in this new terminal would

flow into their network to arrive at their other intermodal terminals over 700 miles distance. The Interline transfer of containers in Chicago either by rail or rubber tire should be minimal if any.

Another reason that intermodal access to primary rail is favored is to allow higher speeds. The Federal Railway Administration (FRA) designated the maximum speed that trains may travel depending on track conditions. Tracks that generate the highest revenue will be upgraded and maintained first. This means trains operating on branch lines usually have a slower operating speed that can impact service and the time it takes to get an intermodal car into the long-haul network. The track speed limits for Wisconsin railroads as of June 2022 are shown in the map below Figure 60. Track classification is a factor in terminal site selection. Because of rail traffic, track repairs, weather, car weight, switching and other safety reasons, railroads may operate their trains lower than the maximum allowed. The average service speed is lower than maximum track speeds.

Rail density is determined by the tonnage moving on the route. Density may be reflective of the funding required for track maintenance; low-density tracks usually generate lower revenue. Building intermodal terminals on higher density primary lines leverages higher quality trace and faster train speeds. However, the downside of routing intermodal trains on high density lanes is that it may be difficult to add additional intermodal volumes if the network is operating near the maximum safe number of trains. Expanding capacity may require additional or longer sidings or double tracking. Intermodal terminals on low density branch lines such as Chippewa Falls, New Richmond and Arcadia feed into the primary lines and will impact primary line network capacity. For this study it assumed that the four Class 1 railroads have the capacity on the primary lines in the study region to take on additional intermodal traffic.

Figure 61 FRA Wisconsin Track classifications.

The table below shows the point spread that will be used to rate potential terminal sites. The higher the point value the more desirable the condition.

Criteria 1: Connection to a Class 1 Railroad	Points
Location on the primary line of a Class 1 rail and can join to unit trains. A stop for crew changes and/or fueling.	**5**
On branch line of Class 1 railroad short distance (5-50 miles) to primary line, no interline fees, possible increase in service frequency with short haul	**4**
On branch line of Class 1 moderate distance (50-150 miles) to primary line, no interline fees, less frequent service due to haul distance. Yards with limited space to stop and service an intermodal unit train. May require moving cars to another yard.	**3**
Connecting with a short-line railroad, interline fees, short-line has no limits on cargo type or train length	**2**

Connecting with a short-line railroad, interline fees, short-line has limits on cargo type or train length or any rail network, unable to handle double stack rail cars or leased TTX cars.	**1**

II. Criteria 2 - Land for Terminal Development

At a bare minimum, intermodal terminals will require acreage that can handle forecasted demand including peak season volumes. Containers handled per day and annually are typical productivity measures. To reduce the need for acreage and expedite the movement of containers in and out of the terminal, limits are put on free storage time and shippers are charged demurrage when free time is exceeded. The average dwell time of each type of container is a productivity measure. The rail tracks within the terminal need to be adequate for expected rail operations. In addition to trackage space there is a need for, paved areas able to handle container lift equipment, trained personnel, lighting, security fencing, computer systems, weighing systems, and dedicated lift equipment that can handle ISO and domestic boxes moving them to and from stacks to rail cars or trucks. They will also need to have timely repair services available. Capital will be required to establish and operate the terminal. Without an adequate (market comparable) return on investment (ROI) access to investment funds will be difficult if not impossible. The railroad's preference is to own the property so that they have control over the terminal even if it is managed by another entity. The use of public land for the terminal is a viable option for railroads depending on the terms of the lease. Railroads have utilized intermodal terminals built on non-railroad private property by building spurs into the facility but as noted before, this is very uncommon.

Terminals that are within a few miles or on a class 1 railroad's primary line and adjacent to a large cargo generating location are ideal from the railroad's viewpoint. The railroad can maximize asset and labor utilization, service rail equipment, control market access and better plan the flow of rolling stock into their network. Using land already owned by the railroad reduces capital cost, regulatory burdens, and zoning issues.

The decline in carload rail traffic originating and/or terminating in the study region has resulted in not only a decline in tracks but underutilization of existing rail yards. There may be adequate space in yards owned by the Class 1 and short line railroads that could be repurposed for an intermodal terminal if there were sufficient volume, lane balance and ROI.

The capacity of a terminal based on its available land is a dynamic and somewhat arbitrary measure. As noted, before the land needed for storage capacity is impacted by selecting

grounded or wheeled operations. Duluth's intermodal terminal expanded its capacity by investing in substructure, pavement allowed for stacking loaded containers.

Class 1 railroads in the study region have publicly stated that a viable intermodal terminal will need to move a minimum 10,000-30,000 TEUs annually. Based on existing and prior terminal operations a minimum of 15 to 20 acres will be needed to sustain 20,000 lifts annually. The stacking system, tracks needed for non-intermodal railroad operations, buildings, drainage locations, elevation will all impact the net terminal space. This needed land heuristic is based on existing and prior terminals in the region.

Except for the CN intermodal terminal in Duluth that was built on public land, all public intermodal terminals currently operating in the study region are railroad owned property. Private or public property can be utilized but it would need to be able to have rail access, be able to be purchased, or have the railroads agree to a long-term lease. Currently there are no private owners in the study region with viable land who have publicly expressed an interest in establishing an intermodal terminal and participating in the study. This study will only review railroad or adjacent public property.

The table below shows the point spread for evaluating sites in the study region. The higher the number the more favorable the ranking.

Criteria 2: For Terminal Development: Note: final land suitability will require engineering studies for drainage, weight footprint, utilities, and other factors beyond the scope of this study. For this study it is assumed that adjacent land currently owned/used by the railroad is suitable.	**Points**
Land owned by railroad providing service to the terminal is suitable land and could be available to build a secure facility to support 20,000 containers per year and has direct access to rail, with space for potential traffic and growth. More than 20 acres.	**5**
Land owned by railroad providing service to the terminal is suitable land and could be available to build a secure terminal with direct access to rail and with space for potential traffic, but future expansion will require space currently used by the railroad for other operations. About 20 acres.	**4**
Land owned by railroad providing service to the terminal is suitable land to build a secure terminal with direct access to rail, with space for potential traffic, and growth but all or a large portion of the area is currently used by the railroad for other operations.	**3**
Available land owned by railroad providing service to the terminal is suitable land available to build a secure terminal with direct access to rail, with space for	**2**

potential 20,000 containers per year but no expansion without acquisition of suitable adjacent non-railroad owned land.	
Available land owned by railroad providing service to the terminal is not large enough to support 20,000 units per year with direct access to rail and land available for expansion is unsuitable due to zoning or wetlands or residential issues.	**1**

III. Criteria 3 - Highway Access

Successful drayage in and out of the terminal requires reasonably close access to interstate or four lane highways unless the end users are in an adjacent industrial park. Trucks operating, especially at night, through residential areas to gain access to a terminal creates ill-will and local ordinances may limit dray times or even gross vehicle weights. On occasion this has been an issue for the operation and/or expansion of terminals in the Twin Cities. Congestion can also be a drawback as this reduces productivity along with increasing costs and pollution.

The table below shows the point values for the ranking conditions used to evaluate potential intermodal sites. The higher the point value the more desirable the condition.

Criteria 3: Highway Access to the terminal and to major highways needs to be suitable for loaded containers/trailers.	**Points**
The highways to terminal gates are in non-residential areas and suitable for heavy truck traffic with minimal congestion. The highways connect to the interstate system that is a short (2-15 miles) distance away. Upgrades are unnecessary.	**5**
The highways to terminal gates are in semi-residential areas and suitable for heavy truck traffic with minimal congestion. The highways connect to the interstate system that is a short (2-15 miles) distance away. Upgrades are unnecessary.	**4**
The highways to terminal gates are in semi or non-residential areas and suitable for heavy truck traffic with minimal or moderate congestion. The highways connect to the interstate system that is a moderate (15-30 miles) distance away. Upgrades may be necessary.	**3**
The highways to terminal gates are in residential areas and may not be suitable for heavy truck traffic or heavy congestion. The highways connect to the interstate system that is a short (2-15 miles) or moderate (15-30 miles) distance Upgrades may be necessary.	**2**

The highways to terminal gates are in semi or non-residential areas but not normally used by heavy truck traffic. The highways connect to the interstate system that is a long distance (30 or more miles) away. Significant upgrades may be necessary. Any of these may result in a 1-point ranking.	**1**

IV. Criteria 4 - Drayage Capacity

Unless there is congestion a drayage driver can cover about 300 miles per day and conform to hours-of-service regulations. Drayage companies serving terminals with catchment areas nearby (under 50 miles) are usually paid by the round-trip container movement which is primarily time based but can vary by mileage zone. Longer drays may be compensated by the mile traveled. For either drayage payment method, time is of the essence and terminals need to have uncongested access roads, timely gate processing times, and a computer system to expedite truck arrivals and departures. Ensuring the smooth flow of boxes in and out of the terminal requires sufficient roadworthy chassis. The number of trucks that can move in and out of the terminal during working hours and the time required for the truck turnaround are productivity measures. Considering the geography of the study region, a one-way dray distance of thirty miles was considered optimal. This means that a terminal location with significant inbound and out-bound cargo within a thirty-mile radius would rank highest in terms of drayage. The table below shows the values used to rate a site location. The larger the number the more desirable the site.

Criteria 4: Drayage Capacity from cargo generation locations to and from the terminal can be costly. Drayage fees on short hauls are usually charged per trip. Longer distance drays can be charged per mile with additional fees if hours of service limits are exceeded.	Points
The typical dray between the terminal and most cargo sources is a short (10-30 miles) distance away on relatively uncongested routes.	**5**
The typical dray between the terminal and most cargo sources is a short (10-30 miles) distance away on moderately congested routes.	**4**
The typical dray between the terminal and most cargo sources is a moderate (30-50 miles) distance away on uncongested or moderately congested routes.	**3**
The typical dray between the terminal and most cargo sources is a moderate (30-50 miles) distance away on heavily congested routes.	**2**

The typical dray between the terminal and most cargo sources is a long distance (50 or more miles) away on uncongested routes.	**1**

V. Criteria 5 - Catchment Area

Population density is an indicator of potential intermodal cargo demand. Whenever possible intermodal terminals are built to provide service to large population centers. Large metropolitan areas equate to employment, housing, and related consumption. The derived demand for transportation to serve a population will not always be balanced. Inbound movement requirements may exceed or fall short of outbound shipments. Without a population base the likelihood of significant inbound containerized cargo diminishes. However, population numbers for a city alone are not a clear indicator of trade lane flows.

The cargo generating area is referred to as a terminal's catchment area. The geographic area covered by the catchment area will not be uniform as the shape is determined by distance, ease of access, competing intermodal terminals, and geographic barriers. Backtracking will be at a minimum. For example, if a container that was going to Chicago was drayed from Milwaukee to Fond Du Lac to get on an intermodal train bound for Chicago that would probably not be cost or time effective even if the distance to Fond Du Lac was shorter.

The rule of thumb for drayage distance from the terminal to the catchment area is 10% to 15% of the rails primary haul distance. This means terminals on a 1000-mile rail journey would each have maximum catchment drayage distances of 150 miles each. The catchment area for population density analysis was conservatively set at 75 miles with adjustments for internally competing terminals.

Railroads are reluctant to set up intermodal terminals on their tracks that may compete or create issues for their network. The assessment of competition is not only based on the cargo available in a catchment area but also the lanes being used. Heuristics are that intermodal terminals in moderate cargo generation areas should be at least 250 miles from one of their own terminals. For this analysis the research team set 150 miles as the optimal distance from the internal competing public intermodal terminal.

Railroads may accept internal competing terminals close together provided there is adequate volume for each terminal, the ROI is acceptable for each terminal and there is network compatibility with each terminal. This situation is occurring in the study region. CN has established four intermodal terminals within a 150-mile radius. The intermodal terminals were designed for specific customers and freight types. New Richmond, WI was designed to support finished vehicles. Arcadia, WI, is a private terminal dealing exclusively in internation imports. Chippewa Falls, WI was established to support Menards import flows with export ag as a backhaul with limited service and Duluth, MN was designed to be a general purpose intermodal terminal which supports a container freight station. Of critical importance is that these

terminals were established because large customers committed to moving intermodal freight. These keystone customers enabled starting and continuing intermodal service from these terminals.

VI. Employment trends in the study region

The major metropolitan areas of the study region have all shown a steady increase in employment over the decade from 2013-2023. According to the U.S. Bureau of Labor Statistics the states of Wisconsin and Minnesota respectively had about a 7.3% and 7.7% growth in nonfarm employment from January 2013 to January 2023.

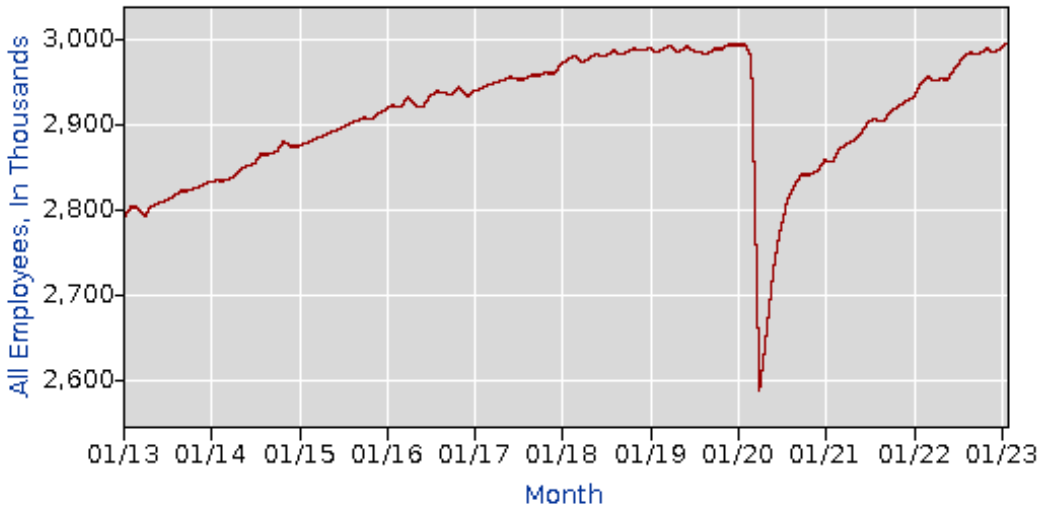


Figure 62 Wisconsin Employment 1/2013 - 2785.6 thousand, 1/2023 2989.9 thousand.

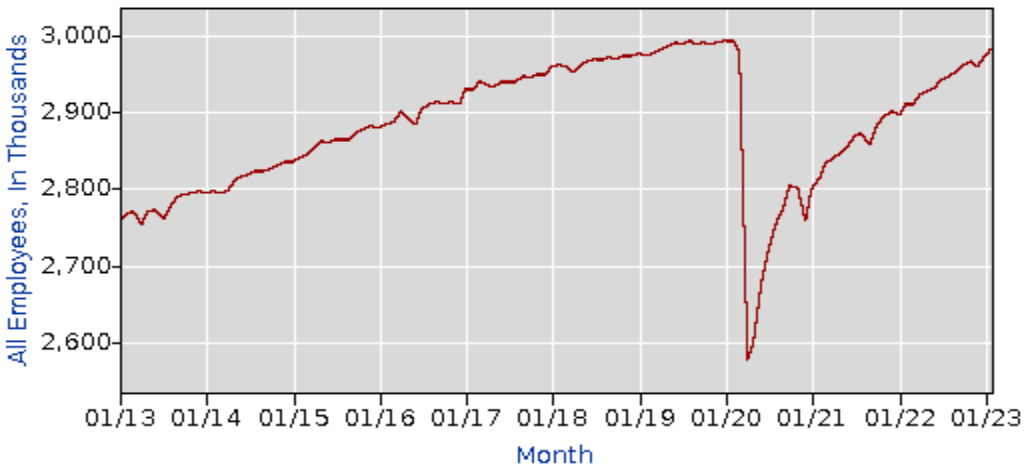


Figure 63 Minnesota Employment 1/2013 - 2758.0 thousand, 1/2023 – 2972.9 thousand.

Southeastern Wisconsin's nonfarm employment growth was about 9.5%, slightly exceeding both states' overall nonfarm employment growth rates. (See appendix 4) Madison's decade long nonfarm employment growth exceeded 10%. Northeastern Wisconsin's nonfarm employment growth was about 7.8%, slightly exceeding both states' nonfarm employment growth rates. The Western and Central Wisconsin experienced growth but a lower rate than the other regions. The Twin Cities' 8.7% growth rate exceeded both states' respective increases.

Manufacturing employment is an indicator of a region's production of possible outbound cargo. During the decade Janesville's 27% growth in manufacturing jobs exceeded Madison's 25% increase but both were far behind Green Bay's 47% growth. Wausau experienced a respectable 21% growth in manufacturing employment and an impressive 50% increase in mining, logging, and construction employment. The Twin Cities has a solid 10.5% increase in manufacturing jobs.

The 2021-2022 year over year increase in overall employment in Wisconsin's largest counties shows continued growth (See figure 63).

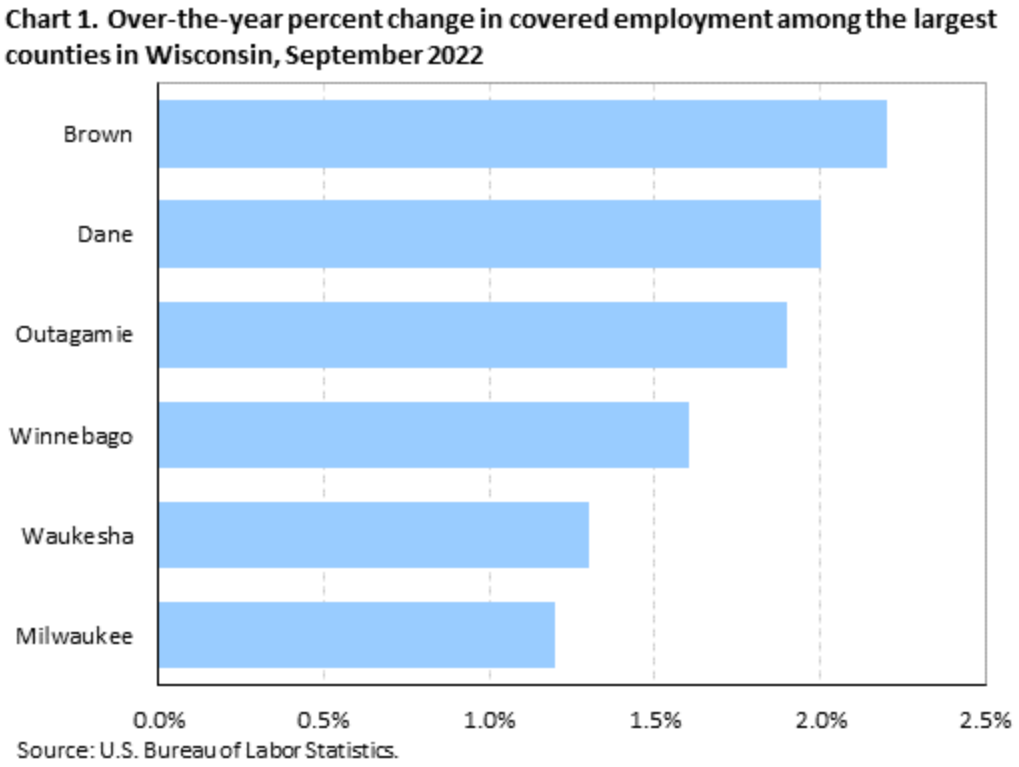


Figure 64 Employment Growth 2021-2022 in Wisconsin's Largest Counties

The continued upward employment numbers in the study region are an indicator of expanding outbound cargo movement. These business activities in turn generate inbound freight in the form of raw materials, work in progress to support the business activities. The growing employed population creates demand for consumer items that need to be shipped to the region. The higher the point values the more desirable the location.

Criteria 5: Catchment area. Population base that will generate sufficient containerized cargo to justify an intermodal terminal. Internal competing terminals need to be at least 150 miles away. Ideally the catchment area will have inbound and outbound cargo approaching lane balance.	**Points**
The catchment area is more than 150 miles from any internal competing intermodal terminal. The population base in catchment area exceeds two million people	**5**
The catchment area is less than 150 miles but more than 100 miles from any internal competing intermodal terminal. The population base in the catchment area is between 2,000,000 and 1,500,000 people	**4**

The catchment area is less than 150 but more than 100 miles from any internal competing intermodal terminals. The population base in the catchment area is between 1,500,000 and 1,000,000 people.	**3**
The catchment area is less than 150 but more than 100 miles from any internal competing intermodal terminal. Population base in catchment area is between 1,000.000 and 500,000 people.	**2**
Population base in catchment area is less than 500,000 people or internal competing terminals are less than 100 miles apart.	**1**

VII. Criteria 6 - Keystone Customers

To establish a ranking criterion for the attributes to determine potential keystone customers the study team researched and analyzed the location of warehouses, and distribution centers in the 75-mile catchment regions. Warehouses may support inbound products for local distribution or outbound products produced locally which may be distributed on a national or international scale. These distribution patterns are unique based upon local production and consumption patterns. A Keystone Customer may be a warehouse or a producer.

A large concentration of distribution facilities in a catchment area correlates to high freight movement. A high concentration of production facilities is another indicator of a potential customer base. However not all production is containerized. Taconite and coal are heavy and dense but are rarely containerized. Grain is also heavy and dense but only a small percentage of production is containerized. The cargo generated needs to be physically and economically containerizable. For example, relatively low value wheat is more economically shipped by bulk rail cars, but high value legumes or identity preserved soybeans may be best served by intermodal service. To model the potential outbound keystone customers the study collected data on containerizable production sources in the study region. These sources were screened by commodity description and length of haul. These locations were mapped by location to determine density within the possible terminal catchment locations.

Another metric used is the number of trucking firms located in each catchment area. Trucking firms exist where there is transportation demand. The potential for intermodal growth, especially in the domestic market, is all truck cargo over 700 miles that can be converted to the truck/rail/truck intermodal network with service which can be consistent and reliable.

A new intermodal terminal represents a significant investment, equipment, labor, and network changes for a railroad. There is an expectation that this major commitment by the railroad(s)

will be matched by a commitment to use the service by customers. Ideally new intermodal customers agree prior to construction to utilize the terminal for several years. Becoming a committed keystone customer will involve private negotiations with the railroads to ensure that there are supply chain benefits for the customer in shifting from truck to intermodal service. The final operating agreements will have to be financially viable for all parties.

The table below lists the point spread used to rank the locational attributes. The higher the point value the more desirable the location.

Criteria 6: Keystone customer base: The catchment area needs to have inbound and outbound cargo opportunities. Warehouses, distribution Centers, production facilities and trucking firms are indicators of a potential customer base.	**Points**
A large diverse customer base with warehouses/distribution centers, production facilities and trucking firms are in the catchment area. The customer base provides moderate lane balance.	**5**
A large diverse customer base with warehouses/distribution centers, production facilities and trucking firms are in the catchment area. The customer base provides uneven lane balance.	**4**
A moderately diverse customer base with warehouses/distribution centers, production facilities, and trucking firms are in the catchment area. The customer base provides moderate lane balance.	**3**
A moderately diverse customer base with warehouses/distribution centers, production facilities and trucking firms are in the catchment area. The customer base provides uneven lane balance.	**2**
A small customer base of warehouses/distribution centers and production facilities exists.	**1**

A keystone customer base is so critical to the success of a terminal that its criteria may be weighted by railroads in the evaluation process above other criteria. Groups of shippers and drayage companies working together to ensure adequate lifts of inbound and outbound cargo will likely be the most powerful force in bringing a railroad to the table to consider a new intermodal terminal location. These rankings have equal weight for all criteria. Future users of the model may elect to increase the weight for certain criteria. This would not adversely impact the model's viability.

VIII. Criteria 7 - Terminal Support

Terminal Support is an evaluation criterion which focuses on local support from units of government (State, RPC's, MPO's, Counties, Cities) and users in support of the development of the terminal. This step assumes there is interest from the serving railroad. This element is best scored by community stakeholders and was not completed for each of the sites evaluated. Wherever possible factors such as the probability of support or opposition have been applied in rankings. However, to fully apply Criteria 7, it will be necessary to involve state, regional and community partners in determining the level of support. The partners' involvement would only occur after carriers and shippers have determined that a site has potential for investment and development.

Many parties are involved in the establishment and operation of an intermodal terminal. In areas of moderate cargo generation opposition by one or more of these parties may nullify or at least increase the cost of establishment. Ideally all parties support a new terminal because the local economy will benefit from the facility. Governmental support can be quantitatively measured in the form of incentives such as grants or loans, land-use and zoning, and support for highway access. Active support can be found in state rail plans that promote intermodal freight movements. Local support examples can be streamlined uniform permitting processes and incentives. Public support is usually qualitative but is critical. The higher the point value the more desirable the location is.

Criteria 7: Terminal support. A new intermodal terminal opposed by the public or government entities will face considerable obstacles. Conversely a new intermodal terminal supported by the community and all governmental entities, with access to incentives will be able to move forward quickly and confidently.	Points
The relevant public and government entities actively support the establishment of an intermodal terminal at this location. Incentives such as tax increment financing, zoning changes and grants are available to potential operators who meet requirements. The public expresses strong supports for the governmental actions and the terminal.	**5**
The relevant government entities actively support the establishment of an intermodal terminal at this location. Incentives such as tax increment financing, zoning changes and grants are available to potential operators who meet requirements. The public expresses mixed support for government actions and the terminal.	**4**

The relevant government entities actively support the establishment of an intermodal terminal at this location. The public expresses strong support for the governmental actions and the terminal.	**3**
The relevant government entities actively support the establishment of an intermodal terminal at this location. The public expresses some opposition to the governmental actions and the terminal.	**2**
Any of these warrant a one-point ranking. The relevant government entities do not actively support the establishment of an intermodal terminal at this location. The public expresses strong opposition to any governmental support and the terminal.	**1**

IX. Selection Process for Possible Terminal Sites

The study region was divided into four areas. The Southeast area encompassed primarily the Milwaukee metropolitan area. The Northeast region included the Fox River corridor and the coast of Lake Michigan. Locations were evaluated in the central part of Wisconsin. The western section included sites in Wisconsin and Minnesota. Parcels of rail served property were assigned to each region. Public data sources were used to score each of the seven criteria. The

Criteria 1: Rail Connection - Rail networks and trackage rights (where information was publicly available) were identified to determine access within the study region and in the case of short lines or regional railroads, access to a Class 1 was essential.

Criterial 2: Land for Terminal Development - A review was undertaken of any possible railroad owned or public properties along the rail lines in the study region. Non-railroad owned, private property was not considered since intermodal terminals were established in the study region except for Arcadia, WI have all been on either rail owned or public property.

A parcel search was undertaken to determine land ownership and approximate acreage. The acreage given is an approximate total for each site. This total does not necessarily reflect the area that would be available for intermodal use. Determining the actual available space would require engineering studies and assessment of railroad current and future need for any existing track, buildings, or laydown area. Locations not fitting the criterial were eliminated. Eighteen possible sites were determined to be viable and justified for further examination.

Criteria 3: Highway Access - Road access between each possible terminal site and the nearest Interstate highway were assessed for suitability using the metrics for criteria.

Criteria 4: Drayage Capacity - A thirty-mile dray circle was put around every viable site to help determine possible customers.

Criteria 5: Catchment Area - Population is an indicator of probable consumption that in turn reflects likely inbound cargo in the form of consumer items. A 75-mile circular catchment area was determined with minimal backtracking for drayage. The population base within that catchment area was determined using the latest county population databases. The actual shape of the catchment area will depend upon the intermodal terminal's rates, service, and reliability along with drayage/trucking costs.

Criteria 6: Keystone Customers - Warehouse, distribution centers, production facilities and truck traffic metrics were used to approximate probable customers.

Criteria 7: Terminal Support - Quantitative metrics of support such as grants or loans were cataloged, and interviews of economic development agencies provided an important qualitative aspect. A top score of 5 was only given where there was prior evidence of positive support such as grants for rail development.

Table 4.8 shows the list of 18 potential intermodal terminal sites evaluated by the research team. Acreage listed is an approximate total area. There may be limits on the actual land available for intermodal use.

Caveats in terminal rankings:

1. The railroads that own the terminal property have not provided any proprietary information regarding land usage, strategic plans, network movements or investment strategies. These factors would impact a railroad's decision process regarding any intermodal terminal.
2. Connectivity access for Union Pacific (UP) was downgraded to the lowest ranking because height restrictions under highways and bridges in southern Wisconsin prohibit the use of double stack intermodal cars. While single stack cars could be used it would not be cost effective for any railroad. These limits on UP means they cannot run double stack trains across their primary line running between Wisconsin and Illinois. If the height limitations were eliminated, then UP's possible terminal locations would be some of the highest ranking. Removing the barrier would also enable UP to consider other intermodal routes not currently in their network.
3. Data regarding the location of warehouse, distribution centers and production facilities does not include the type of product each facility handles.
4. When determining highway access the current condition of the highway was not assessed but was assumed to meet state and or federal highway standards.
5. The population base served by each terminal's catchment area is an approximation based on the latest available estimates of each county's entire population.

6. The potential keystone customer assessment is based on production facilities for containerizable cargo along with warehouses and distribution centers located within the 30-mile dray and the catchment area.
7. While the most up to date quantitative data formed the basis for ranking there is an element of subjectivity in assessing the data. Analysis with access to proprietary information and or more current data sets may reach different conclusions. The objective of the ranking process was to systematically assess if there were any possible intermodal locations in the study region which could support intermodal development.

X. Possible Terminal Sites Evaluated

Locations Serving Railroads	Latitude Longitude	Approximate Acreage*	Land ownership
Milwaukee, WI – UP Butler yard	Lat .43° 6'0.82"N Long. 88° 3'47.15"W	62	UP Railroad
Milwaukee, WI – UP Jackson Park	Lat. 42°59'57.16"N Long. 87°57'47.59"W	25	UP Railroad
Milwaukee, WI – CPKC - Port	Lat. 43° 1'5.89"N Long. 87°54'0.86"W	10 plus	Port Authority – City of Milwaukee
Milwaukee, WI – CPKC-Muskego	Lat. 43° 1'43.62"N Long. 87°56'46.46"W	52	CPKC Railroad
Sussex, WI - CN	Lat. 43° 6'32.59"N Long. 88°12'6.88"W	33	CN Railroad
Neenah, WI - CN	Lat. 44°10'30.90"N Long. 88°28'13.72"W	28	CN Railroad
Oshkosh, WI - CN	Lat. 44° 0'28.46"N Long. 88°32'6.11"W	7	CN Railroad
Oshkosh, WI - WSOR	Lat. 43°59'11.75"N Long. 88°36'52.20"W	11	Public – City of Oshkosh
Fond Du Lac, WI - CN	Lat. 43°49'2.33"N Long. 88°28'36.07"W	29	CN Railroad

Sheboygan, WI - UP	Lat. 43°43'34.90"N Long. 87°44'10.46"W	24	UP Railroad
Wausau, WI – FOXY CN & UP &	Lat. 44°56'24.38"N - Long. 89°36'35.02"W	17	FOXY (WATCO) Railroad
Stevens Point, WI – CN	Lat. 44°30'47.64"N Long. 89°32'54.32"W	60	CN Railroad
Adams	Lat. 43°57'20.77"N Long. 89°49'52.16"W	32	UP Railroad
Tomah, WI - CPKC	Lat. 43°59'17.88"N Long. 90°30'26.27"W	27+	CPKC Railroad
Necedah, WI – UP & CN	Lat. 44° 0'52.07"N Long. 90° 4'29.29"W	40	Public – City of Necedah
Altoona, WI - UP	Lat. 44°48'30.28"N Long. 91°26'0.59"W	60	UP Railroad
La Crosse, WI - BNSF	Lat. 43°50'56.04"N Long. 91°13'55.77"W	25	BNSF Railroad
Winona, MN - CPKC	Lat. 44° 2'38.06"N Long. 91°38'20.59"W	10 and 8	CPKC Railroad

Figure 65 Potential Terminal Locations Evaluated

*Note acreage is approximate total it does not necessarily reflect the exact area that would be available for intermodal. Actual space would require engineering studies and assessment of railroad current and future need for any existing track, buildings, or laydown area.

Figure 66 below, provides rankings for all evaluated locations. Appendix 6 provides an in-depth evaluation of each of the 18 locations.

18 Possible Terminal Locations and rail service	Criteria 1 Class 1 Access	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone Customer	Criteria 7 Terminal Support	Total

Milwaukee, WI – UP Butler	1	5	5	5	5	5	3	29
Milwaukee, WI – UP Jackson	1	5	5	5	5	5	3	29
Milwaukee, WI – CPKC-Muskego	4	4	5	5	5	5	5	33
Milwaukee, WI – CPKC - Port	3	4	5	5	5	5	5	32
Sussex, WI - CN	3	3	4	4	5	5	4	28
Neenah, WI - CN	5	2	4	5	4	5	4	28
Oshkosh, WI - CN	3	1	2	3	4	5	2	20
Oshkosh, WI - WSOR	1	2	4	4	4	5	5	25
Fond Du Lac, WI - CN	5	5	4	5	4	5	4	32
Sheboygan, WI - UP	1	4	4	4	4	4	3	24
Stevens Point, WI – CN	5	3	4	3	4	3	4	26
Wausau, WI -FOXY	3	3	4	3	2	3	3	21

Adams, WI - UP	1	4	3	3	2	3	2	18
Tomah, WI - CPKC	4	4	5	5	2	3	4	27
Necedah, WI - UP	1	3	3	3	2	3	2	17
Altoona, WI - UP	1	4	4	2	3	3	3	20
La Crosse, WI - BNSF	5	5	5	4	3	3	4	29
Winona, MN - CPKC	4	2	3	2	2	2	3	18

Figure 66 Ranking of Potential Sites in The Study Region

Possible Terminal location coverage in rail networks

Class 1 railroads would like to expand their intermodal markets. Growth will occur when a terminal can tap new markets without going out of network or taking cargo from existing terminals. The following are examples of the market coverage of some of the possible terminal locations in rail networks.

CN Options

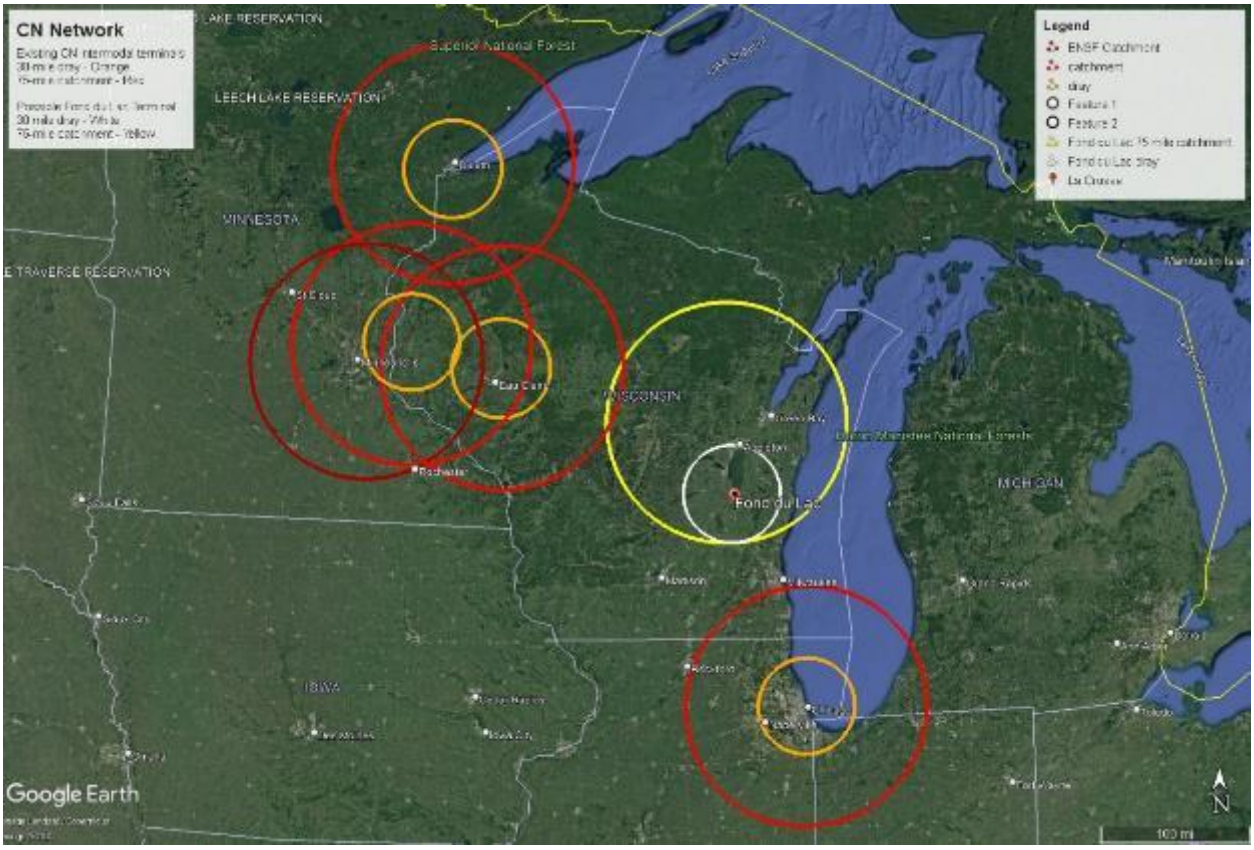


Figure 67 Possible Fond du Lac, Wisconsin Terminal in Study Region

The Fond du Lac site on CN's primary line was highly ranked. Figure 66 provides a geographical perspective of how this potential site would overlap exiting CN terminals' drayage and catchment areas. The orange circles represent a 30-mile dray radius from existing public CN intermodal terminals. And the red circles are the 75-mile catchment areas for those terminals. Fond Du Lac's dray is the white circle, and the yellow is the 75-mile catchment area.

Service at Fond du Lac would depend on the needs of the customer base. There could be international going to the east and west coast gateway ports along with Canadian destinations. If the ROI for the railroad was acceptable and shippers lowered their total cost, it may be worthwhile to offer short haul service between Chicago and Fond du Lac. The volume of the Fox River valley industrial base's production may justify direct domestic intermodal service to Memphis, TN, Jackson, MS and New Orleans, LA bypassing Chicago. The length of haul for these destinations is 690, 893 and 1079 miles respectively.

CPKC Options

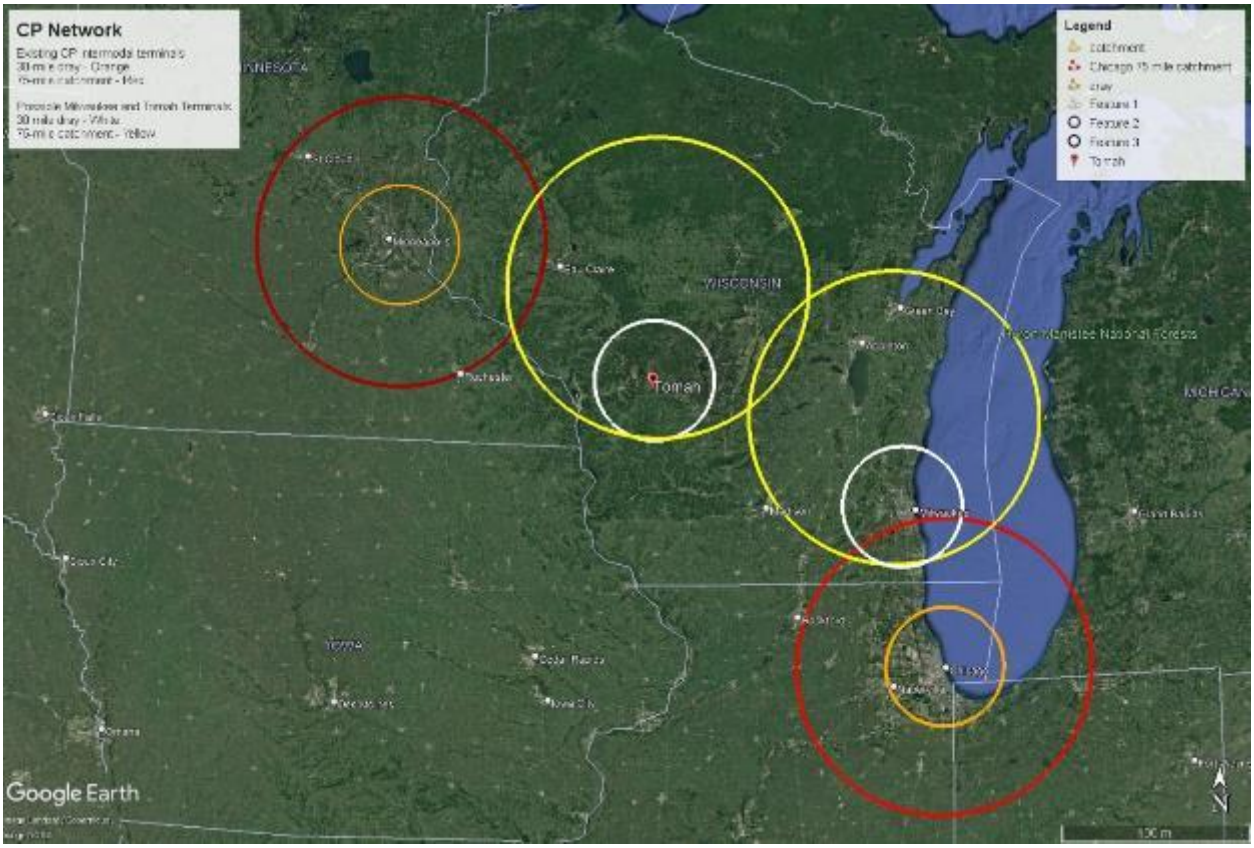


Figure 68 Possible Tomah and/or Milwaukee, WI Terminals in Study Region

The Tomah and Milwaukee sites on CPKC's primary line were highly ranked. Figure 68 provides a geographical perspective of how this potential site would overlap existing CPKC terminals' drayage and catchment areas. The orange circles represent a 30-mile dray radius from existing public CPKC intermodal terminals. And the red circles are the 75-mile catchment areas for those terminals. Tomah's and Milwaukee's white circles are dray and yellow circles are 75-mile catchment areas.

Milwaukee will generate the highest inbound and outbound volume. The port facility on a branch line offers the option of linking to marine container movement. Muskego is adjacent to the primary line. The impact on the yard's ability to handle intermodal after passenger rail upgrades are made is unknown. Tomah is a distribution hub served by ten trucking companies and may generate more cargo than expected for the population and business base.

Service at either terminal would depend on the needs of the customer base. There could be international going to the coastal gateway ports and Canadian destinations. The volume of the Milwaukee metropolitan area's industrial base and population may justify direct domestic intermodal service to Dallas and Houston Texas if possible bypassing Chicago. Once CPKC and

KCS have fully merged this route would be an all-CPKC line haul of over 1000 miles. There is the possibility that intermodal cargo currently being drayed to Chicago from the Fox River valley area may utilize a Milwaukee terminal to avoid a dray that extends beyond the hours-of-service limits. This will occur only if the intermodal load fits into the CPKC network.

UP Options

UP terminals would have all received some of the very highest rankings if they could offer double stack service. Not having the clearance for double stack trains limits benefits shippers, the railroad, and the public. The following is an evaluation of those locations that would be very highly ranked with double stack service available.

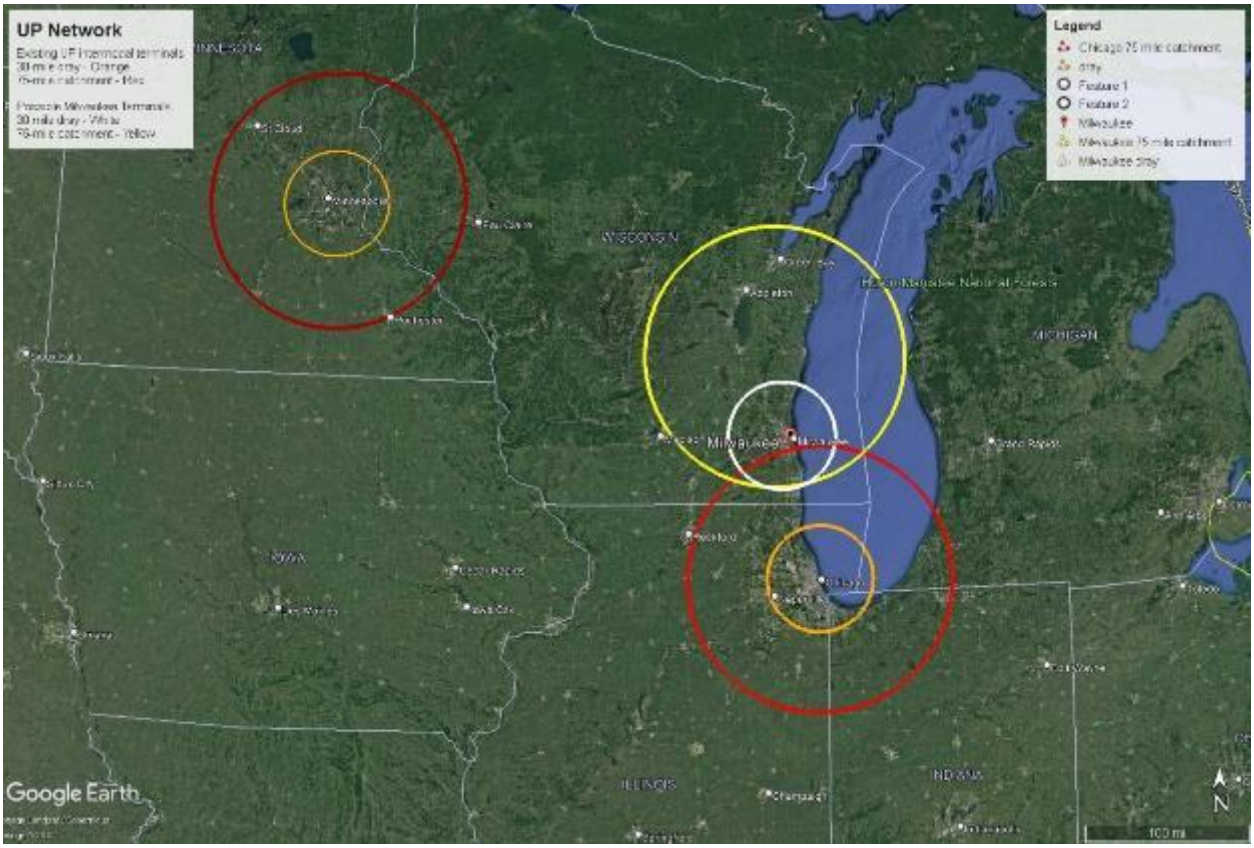


Figure 69 Possible Milwaukee, WI Union Pacific Terminal in The Study Region

The Milwaukee sites on UP's primary line were highly ranked. Figure 69 provides a geographical perspective of how these potential sites would overlap exiting UP's terminals' drayage and catchment areas. The orange circles represent a 30-mile dray radius from existing public CPKC intermodal terminals. And the red circles are the 75-mile catchment areas for those terminals. Milwaukee's dray are the white circles, and the yellow circles are the 75-mile catchment areas.

Milwaukee is likely to generate the highest inbound and outbound volume. Service at either terminal would depend on the needs of the customer base. There could be international going to the LA/Long Beach gateway ports. The volume of the Milwaukee metropolitan area's industrial base and population may justify direct domestic intermodal service to Dallas and Houston Texas by UP, if possible bypassing Chicago. This route would be an all-UP line haul of over 1000 miles. As congestion increases there is the possibility that intermodal cargo currently being drayed to Chicago from the Fox River valley area may utilize a UP Milwaukee terminal to avoid a dray that extends beyond the hours-of-service limits. This will occur only if the intermodal load fits into the UP network.

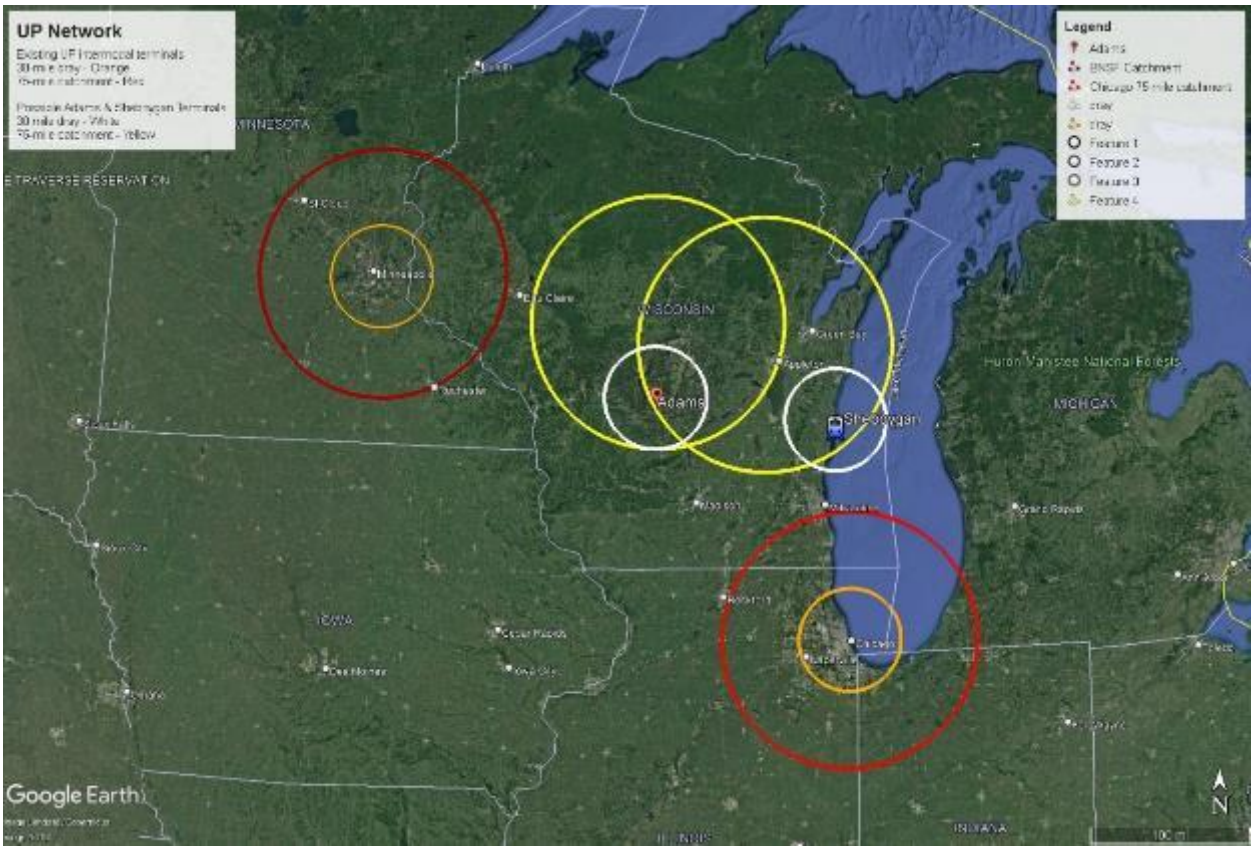


Figure 70 Possible Adams or Sheboygan, WI Union Pacific Terminals in the Study Region

The Adams and Sheboygan, WI sites on UP's lines were highly ranked. Figure 70 provides a geographical perspective of how these potential sites would overlap exiting UP's terminals' drayage and catchment areas. The orange circles represent a 30-mile dray radius from existing public CPKC intermodal terminals. And the red circles are the 75-mile catchment areas for those terminals. Adams and Sheboygan's drays are the white circles, and the yellow circles are the 75-mile catchment areas.

Adams has an advantage in being adjacent to UP's primary line. Sheboygan is on a branch line but with its proximity to a significantly larger population and production base it is likely to generate the highest inbound and outbound volume. Service at either terminal would depend on the needs of the customer base. There could be international boxes going to the LA/Long Beach gateway ports or domestic as is currently offered out of UP's Minneapolis terminal. The volume of the Fox River Valley's metropolitan area's industrial base and population may justify direct domestic intermodal service to Dallas and Houston Texas by UP, if possible bypassing Chicago. This route would be an all-UP line haul of over 1200 miles.

BNSF Options

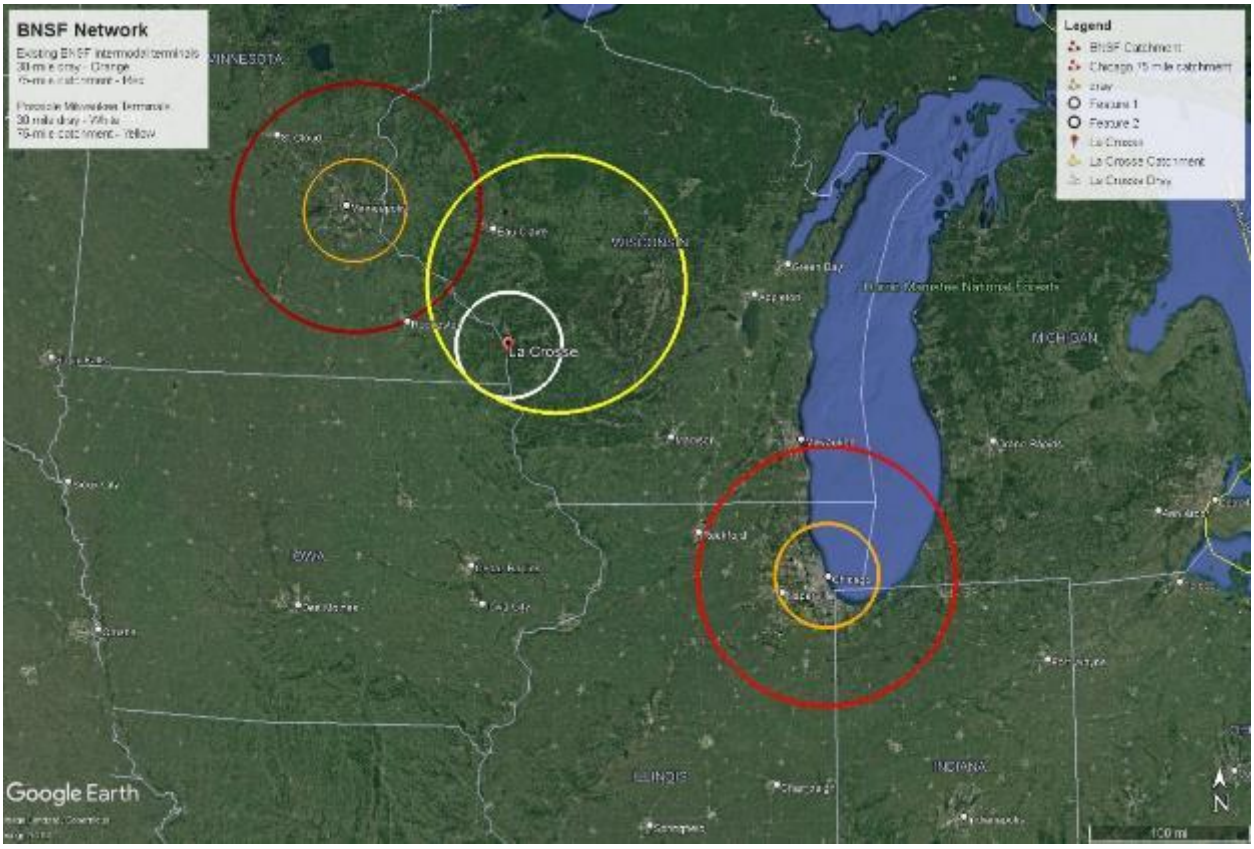


Figure 71 BNSF Terminals in the Study Region

BNSF's primary line follows the Mississippi River basin before heading east to Chicago at Savanah, Illinois. The La Crosse, WI site on BNSF's main line was highly ranked. Figure 71 provides a geographical perspective of how this potential site would overlap exiting BNSF terminals' drayage and catchment areas. The orange circles represent a 30-mile dray radius from existing public CPKC intermodal terminals. And the red circles are the 75-mile catchment areas for those terminals. La Crosse's dray is the white circles, and the yellow circle is the 75-mile catchment area.

La Crosse is 120 miles from the BNSF Midway terminal that still has growth potential. The region around La Crosse is expanding in population and business. This possible site may be an option when Midway reaches capacity. Service could be like that offered at Midway.at either terminal would depend on the needs of the customer base. There could be international boxes going to the LA/Long Beach gateway ports or domestic direct intermodal service to Dallas and Houston Texas if possible bypassing Chicago. This route would be an all-BNSF line haul of over 1000 miles.

B. Conclusions and Recommendations

The bridge clearance issues preventing double stack cars for UP needs to be fixed in partnership with WisDOT. If UP were able to operate through double stack trains in Wisconsin. The rankings of their potential terminals would increase dramatically. Without the ability to operate these rail cars UP is essentially out of the intermodal trade in the study region. The bridge clearance issues preventing double stack cars for UP needs to be fixed in partnership with WisDOT.

I. Southeast Region Summary:

CPKC yards rank the highest. However, if UP were able to double stack their sites they would have the highest rankings. All the potential sites must deal with the fact that 20 intermodal terminals are about 120 miles away in Chicago. The railroads that service Milwaukee do not own any track operating in the eastern part of the U.S. Some of these railroads have trackage or haulage rights on eastern railroads. Switching railroads in Chicago or other locations either by steel wheel or rubber tire adds the expense and time for intermodal shipments headed for the eastern U.S. A short haul intermodal run between a Milwaukee terminal and a Chicago terminal is not cost effective for Class 1 railroads or shippers. There may be sufficient new intermodal cargo to consider a new domestic lane to and from Milwaukee.

II. Northeast Region Summary

A potential difficulty for either Neenah, Fond du Lac, Oshkosh, or Sheboygan would be if a large portion of the intermodal traffic generated in the catchment area planned to use CN only to reach Chicago and then transfer to other railroads. CN' Fond du Lac yard is centrally located for cargo generated in the Fox River valley and has the most available space. Providing CN intermodal rail service to Chicago from a Neenah terminal would only be about 200 miles well below the normal 500 minimum miles for western railroads practicing precision railroading management. A UP terminal in Sheboygan has the potential to capture cargo if UP could provide service that benefits shippers. The double stack clearance issues in southeast WI are a barrier to economical service.

III. Central Region Summary:

Terminals in the Central region of Wisconsin have a smaller population base to support inbound container traffic creating lane imbalance. The terminal locations will require significant drayage on two lane highways to link with cargo generation locations and warehouses. These sites

currently truck cargo long distances, and an intermodal terminal may provide a cost-effective alternative for shippers. UP's yard in Adams or CPKCKC's yard in Tomah have the most potential in terms of available land. UP is hampered by its inability to provide double stack service to Chicago. There would need to be enough intermodal lifts to make a reasonable ROI for the railroad.

IV. Western Region Summary

Altoona has significant terminal options but is close to UP's intermodal termina in the Twin Cities. This location could be an option for another domestic lane but the barrier to double stacking is and issues. BNSF will run out of space in the Twin Cities in the future and the La Crosse location may provide an option for expansion. Winona has very limited open terminal space and is within 150 miles of CPCK's Twin Cities terminal. Highway access to Winona for Wisconsin non-agricultural produces is a problem.

V. Population of Study Region by County

There are counties in Wisconsin that due to their geographical location are best served by the twenty Chicago terminals. They would not benefit from any of the proposed terminal locations.

Chicago IM Terminals Catchment Area	Population
Sauk County	66,900
Kenosha County	169,967
Rock County	164,695
Grant County	52,157
Green County	37,168
Iowa County	23,715
Richland County	17,088
Crawford County	15,954
Burnett County	16,847
Douglas County	44,337
Lafayette County	16,545
Totals	**625,373**

Figure 72 Wisconsin Counties Best Served by Chicago Terminals

Milwaukee IM Terminals Catchment Area	Estimated 2023 Population
Waukesha County	412,105
Walworth County	107,753
Milwaukee County	937,014
Dane County	583,533
Racine County	198,423
Ozaukee County	93,036
Dodge County	89,588
Jefferson County	85,263
Sauk County	66,900
Columbia County	58,988
Manitowoc County	81,335
Green Lake County	19,009
Marquette County	15,649
Calumet County	53,483
Total population base	**2,802,079**

Figure 73 Wisconsin Counties Best Served by Northeast Wisconsin Terminal Locations

Central WI IM Terminal Catchment Area	Estimated 2023 Population
Shawano County	40,560
Wood County	74,045
Portage County	70,485
Chippewa County	67,461
Waupaca County	51,632
Barron County	46,963
Monroe County	46,754
Dunn County	45,914
Polk County	45,208
Price County	14,024
Ashland County	15,988
Oneida County	38,400
Vilas County	23,533
Clark County	34,650
Trempealeau County	31,342
Iron County	6,203
Juneau County	26,733
Waushara County	24,526
Jackson County	21,355
Adams County	20,588
Taylor County	19,679
Langlade County	19,344
Sawyer County	**18,530**
Florence County	4,600
Menominee County	4,261
Rusk County	14,017
Bayfield County	16,583
Washburn County	16,836
Total population base	**860,214**

Figure 74 Wisconsin Counties best served by Central Wisconsin Terminals

Western WI/East MN IM Terminal Catchment Area	Estimated 2023 Population
Pepin County, WI	7,273
Chippewa County, WI	67,461
La Crosse County, WI	122,629
Barron County, WI	46,963
Monroe County, WI	46,754
Dunn County, WI	45,914
Polk County, WI	45,208
St. Croix County, WI	96,293
Eau Claire County, WI	107,801
Vernon County, WI	30,996
Clark County, WI	34,650
Trempealeau County, WI	31,342
Jackson County, WI	21,355
Pierce County, WI	42,569
Buffalo County, WI	13,236
Goodhue County, MN	48,002
Winona County, MN	49,134
Wabasha County, MN	21,300
Olmsted County, MN	168,427
Total population base	**1,047,307**

Figure 75 Wisconsin Counties best Served by Western Wisconsin/Eastern Minnesota Terminals

VI. Study Region Employment Trends

To show economic growth and vitality employment statistics over a ten-year period were compared. Based upon the most recent reporting the time periods of 2013 and 2023 were compared. Wisconsin's largest population centers grew the most with double digit acceleration. Other selected regions were compared based upon the sites analyzed in the criteria comparing potential terminal development.

Southern Wisconsin Nonfarm Wage and Salary Employment 10 Year Growth

Southeast Wisconsin's manufacturing is dominated by Milwaukee however Madison's manufacturing employment grew nearly double the rate of all employment in the region between 2013 and 2023.

Milwaukee +14% growth rate over the decade
Employment January 2013 810.7 thousand
Employment January 2023 837.1 thousand

Madison +14% growth rate over the decade
Employment January 2013 – 357.6 thousand
Employment January 2023 – 407.8 thousand

Janesville +11.7% growth rate over the decade
Employment January 2013 - 61.9 thousand
Employment January 2023 - 69.2 thousand

Northeastern Wisconsin Nonfarm Wage and Salary Employment 10 Year Growth

Northeastern Wisconsin's nonfarm employment growth was about 7.7%, slightly exceeding both states' nonfarm employment growth rates.

Green Bay, WI +8.5% growth rate over the decade
Employment January 2013 -164.6 thousand
Employment January 2023 -178.5 thousand
Manufacturing +47% growth rate over the decade
Employment January 2013 – 28.6 thousand
Employment January 2023 – 31.8 thousand

Appleton +10% growth rate over the decade
Employment January 2013 -115.9 thousand
Employment January 2023 -127.5 thousand
Manufacturing +13.3% growth rate over the decade
Employment January 2013 – 22.5 thousand
Employment January 2023 – 25.5 thousand

Oshkosh +5% growth rate over the decade
Employment January 2013 - 92.0 thousand
Employment January 2023 - 96.6 thousand
Manufacturing -11% decline over the decade
Employment January 2013 – 23.8 thousand
Employment January 2023 – 21.2 thousand

Fond Du Lac +4.6% growth rate over the decade

Employment January 2013 45,4 thousand

Employment January 2023 47.6 thousand

Manufacturing +12.3% growth rate over the decade

Employment January 2013 – 10.5 thousand

Employment January 2023 – 11.8 thousand

Sheboygan +8.4% growth rate over the decade

Employment January 2013 56,7 thousand

Employment January 2023 61.5 thousand

Manufacturing +11.2% growth rate over the decade

Employment January 2013 – 19.7 thousand

Employment January 2023 – 21.9 thousand

CENTRAL AND WESTERN WISCONSIN EMPLOYMENT 10 YEAR GROWTH

Wausau +7.4% growth rate over the decade

Employment January 2013 67,3 thousand

Employment January 2023 72.3 thousand

Growth in manufacturing +21% growth rate over the decade

Employment January 2013 15.7 thousand

Employment January 2023 19.0 thousand

Growth in mining, logging, and construction +50% growth rate over the decade

Employment January 2013 1.8 thousand

Employment January 2023 2.7 thousand

La Crosse +5.6 % growth rate over the decade

Employment January 2013 73.7 thousand

Employment January 2023 77.9 thousand

Eau Claire +5.3% growth rate over the decade

Employment January 2013 82.5 thousand

Employment January 2023 86.8 thousand

Minneapolis St. Paul +8.7% growth rate over the decade

Employment January 2013 1773.6 thousand

Employment January 2023 1929.5 thousand

Growth in manufacturing +10.7% growth rate over the decade

Employment January 2013 184.2 thousand

Employment January 2023 204.0 thousand

C. Beta Test of Evaluation Model

To evaluate the criteria and scoring definitions, two existing terminals within the region are scored. CN's is one of the newest terminals in Wisconsin, located in New Richmond. BNSF is a long-standing terminal on the BNSF located in St. Paul MN. Both terminals compete for freight in the same geographic region. BNSF's Midway terminal is on the main line and CN's New Richmond terminal is on a branch line. BNSF's facility scored the maximum number of points based upon transportation performance for Criteria 1 "Rail Connectivity".

Criteria 1
Class 1 Connectivity

BNSF Midway Terminal

On a FRA Class 4 primary line

60 MPH maximum speed

5 points

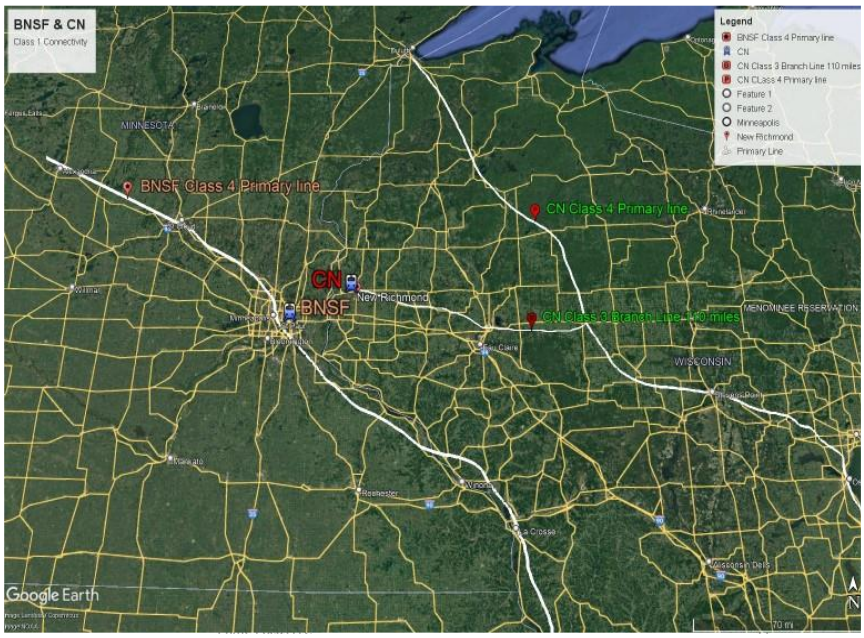
CN New Richmond Terminal

110 mile from CN Class 4 primary

On a FRA Class 3 branch line

40 MPH maximum speed

3 points



Criteria 2 compares available land to develop sites. For this comparison BNSF in St. Paul, MN was compared to CN's New Richmond, WI based upon similarity of ranking these sites tied for this attribute.

Criteria 2: Available Land

BNSF Midway – 44 Acres – 100K Increase in lifts possible no adjacent land RR owned

5 points

CN New Richmond – 52 Acres – Shared with auto lay down No adjacent RR land

5 points

Criteria 3 compares the highway access among selected sites. In this case the rating system separates these two sites by several points.

Criteria 3: Highway Access

BNSF Midway

Some residential driving from gate to MN 51-280

MN-51 is four lane connecting with I-35W and I-94

1.5 miles to I-95

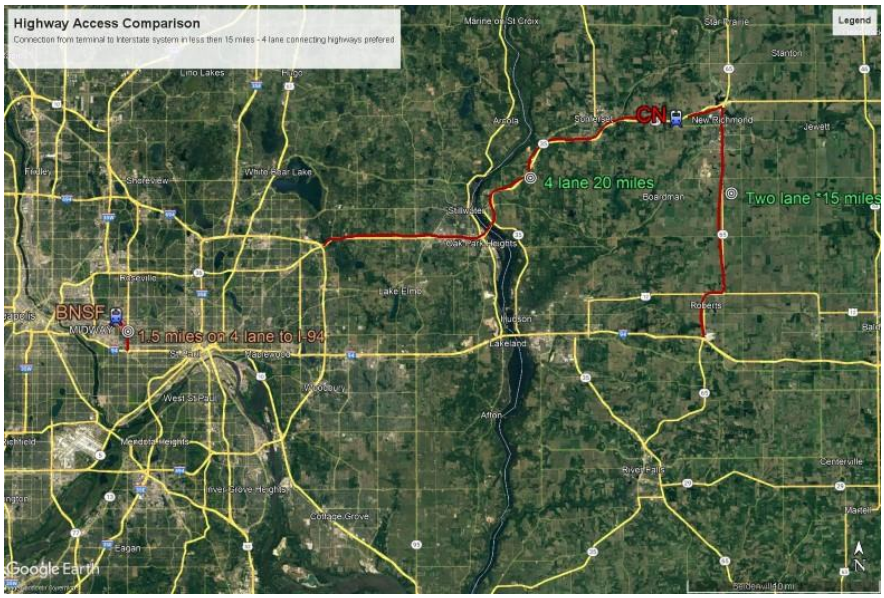
5 points

CN New Richmond

I -94 is 15 miles mostly on 2 lane roads stop and go residential

I-694 is 20 miles on 4 lane roads

3 points



Criteria 4 assesses the drayage distance for a given site. In the map below the two circles overlap. The comparison here shows the urban terminal ranks higher than a rural terminal.

Criteria 4: Drayage Distance (30 Miles)

BNSF Midway

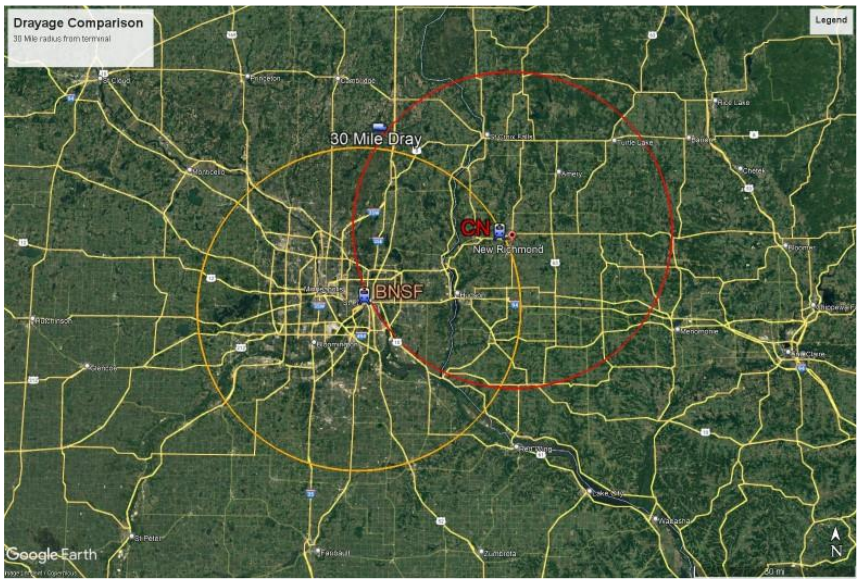
30-mile dray radius covers all of Twin Cities Metropolitan area & road density

5 points

CN New Richmond

30-mile dray radius partially covers Twin Cities Metropolitan area

4 points



Criteria 5 determines the population in a greater catchment area which is a proxy for consumer demand and available workforce. This comparison shows how rural vs. urban locations might compare. While inbound cargo favors population centers, rural areas often produce significant tonnage of export ag products.

Criteria 5: 75 mile catchment Area – population greater than 1.5 million

BNSF Midway

No internal competing terminals

100 mile catchment radius

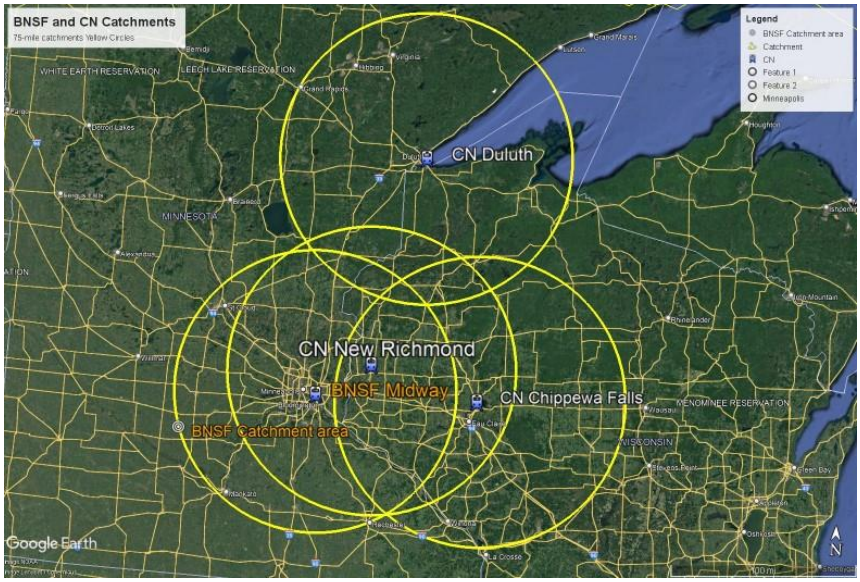
5 Points

CN New Richmond

Internal competing terminals in Duluth 120 miles away and Chippewa Falls 80 miles away.

Chippewa Falls on same branch line

1 Points



Criteria 6 compares Keystone Customers based upon logistics handling facilities.

Criteria 6: Keystone Customers

BNSF Midway

Numerous warehouses, distribution centers, production firms in catchment area

Hub Group, JB Hunt, UPS already keystone customers

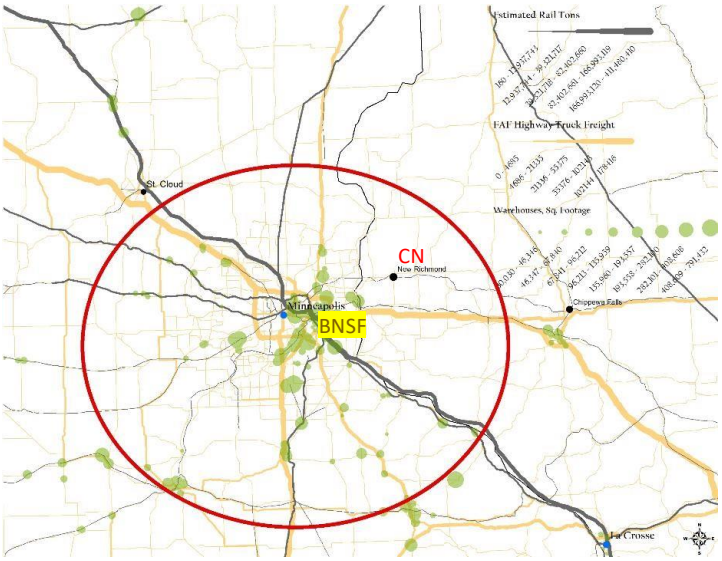
5 points

CN New Richmond

Numerous warehouses, distribution centers, production firms in catchment area

Auto and agriculture companies keystone customers need to build base

4 points



Criteria 7: Terminal Support

Significant support was provided by the county, city, and state of Wisconsin in the development of the CN New Richmond terminal giving it a 5 ranking for terminal support. BNSF's Midway terminal has delt with complaints and opposition to increased truck traffic in adjacent residential areas resulting in a 4 ranking.

	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone Customers	Criteria 7 Terminal Support	Totals
CN – New Richmond	3 – 100 mile branch line	5 – Can expand	4 – 12 m to I-94	4 – 25 m mod congestion	1 – CN Chippewa Falls 75 miles	4 - Auto	5 – State, local support	27
BNSF - Midway	5 – On main line	6 – Can increase by 100K	5 – 1.5 miles to Interstate	5 – >10 miles mode congestion	5 - No BNSF competing terminals	5 – Hub & JB Hunt	4 -Residents want less freight traffic/Noise	33

The Beta Test indicates that the Midway Terminal location is a better site than the CN New Richmond Terminal. This evaluation model is a comparative indicator of terminal potential. It is subject to changes in trade lanes, customer base, politics, and economics. The intermodal terminal must be financially viable for all parties as an ongoing operation. These criteria were

applied to the study region's possible sites for new intermodal terminal locations. The primary purpose of the evaluation is to rank viability and not to promote any one location.

D. Regional Evaluations of Potential Intermodal Terminal Location Evaluations

The sites selected and evaluated in this study appear to have potential for an intermodal terminal, however they were not vetted with the individual railroads for business strategy compatibility. The private business plans of each railroad may preclude the development of intermodal terminals regardless of apparent positive rankings.

I. Southeast Area

Milwaukee, WI – CPKCKC, UP, CN, WSOR, Served

Criteria 1: Class 1 Connection: The following railroad provides service with multiple railyards. The Union Pacific (UP) serves the region however, the UP cannot move double stack trains south of Milwaukee on their lines due to bridge clearance issues. The three Class 1 railroads, (UP, CPKC and CN) networks serve predominantly markets west of or along the Mississippi and all railroads connect to other lines in Chicago. CN's rail line runs north south through Waukesha that is a western suburb of Milwaukee. Five possible sites were evaluated see map 6.1.

Wisconsin Southern Railroad (WSOR) provides service to Milwaukee with property owned by the Wisconsin Department of Transportation. The North Milwaukee yard is WSOR's largest with only 7 acres. UP has a Granville yard (parcel 0409996110) of 21 acres adjacent to WSOR's tracks. There would need to be an agreement with UP to consider this as a WSOR site.

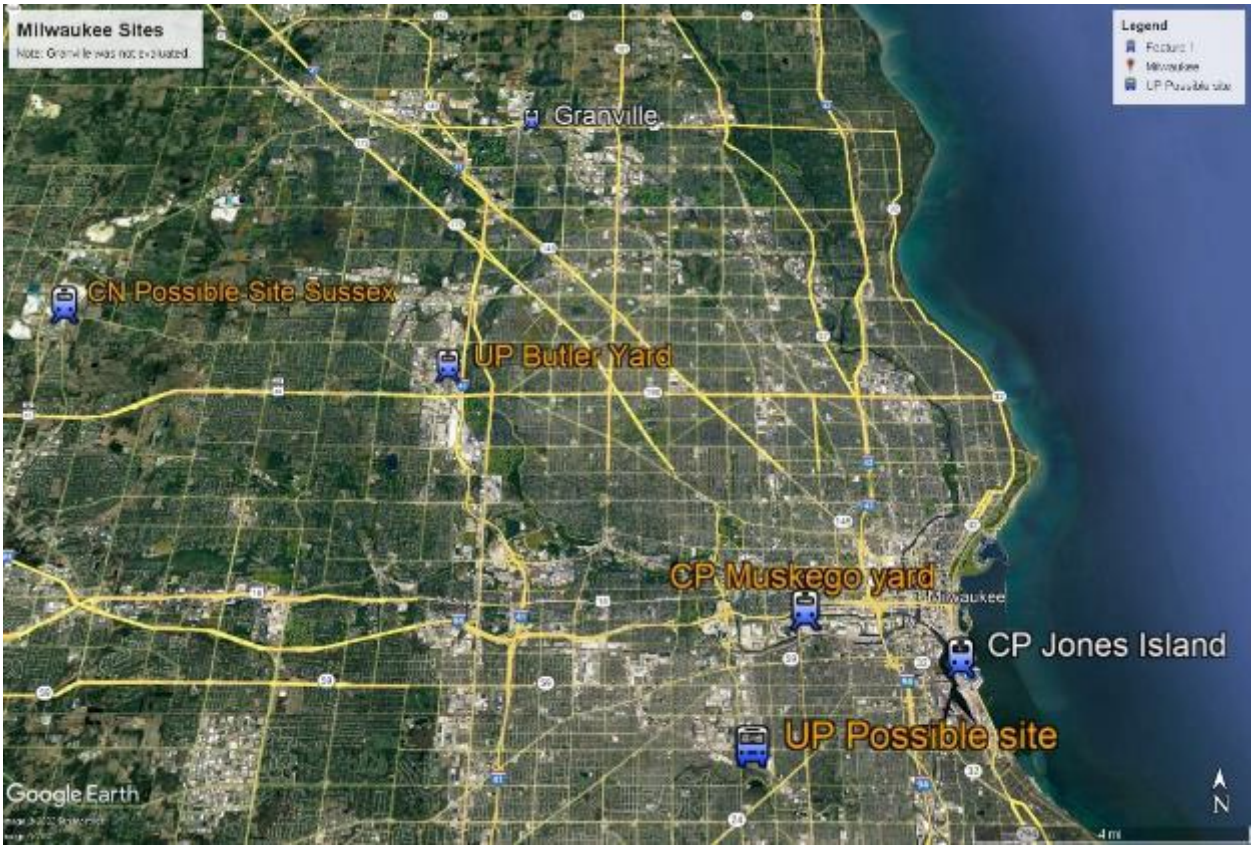


Figure 76 Potential Milwaukee Intermodal Terminal Sites

Criteria 2: Available Land: The Union Pacific (UP) has nine railyards listed with several on a primary line. The largest is the Butler Yard (11926 W. Hampton Ave.). The yard covers about 62 acres and once classified trains, made crew changes, and had a large mechanical shop. In 2019 UP announced that it would reduce operations and close its mechanical shop. Most of the locomotive and car repairs have been moved to other UP locations. The northern area of the yard is about 32 acres. (Parcels 2199998000 and 2189991124). The yard will still have trains moving in and out to serve local customers.[iii] The property has access to interstates and is surrounded by industry and light commercial properties.

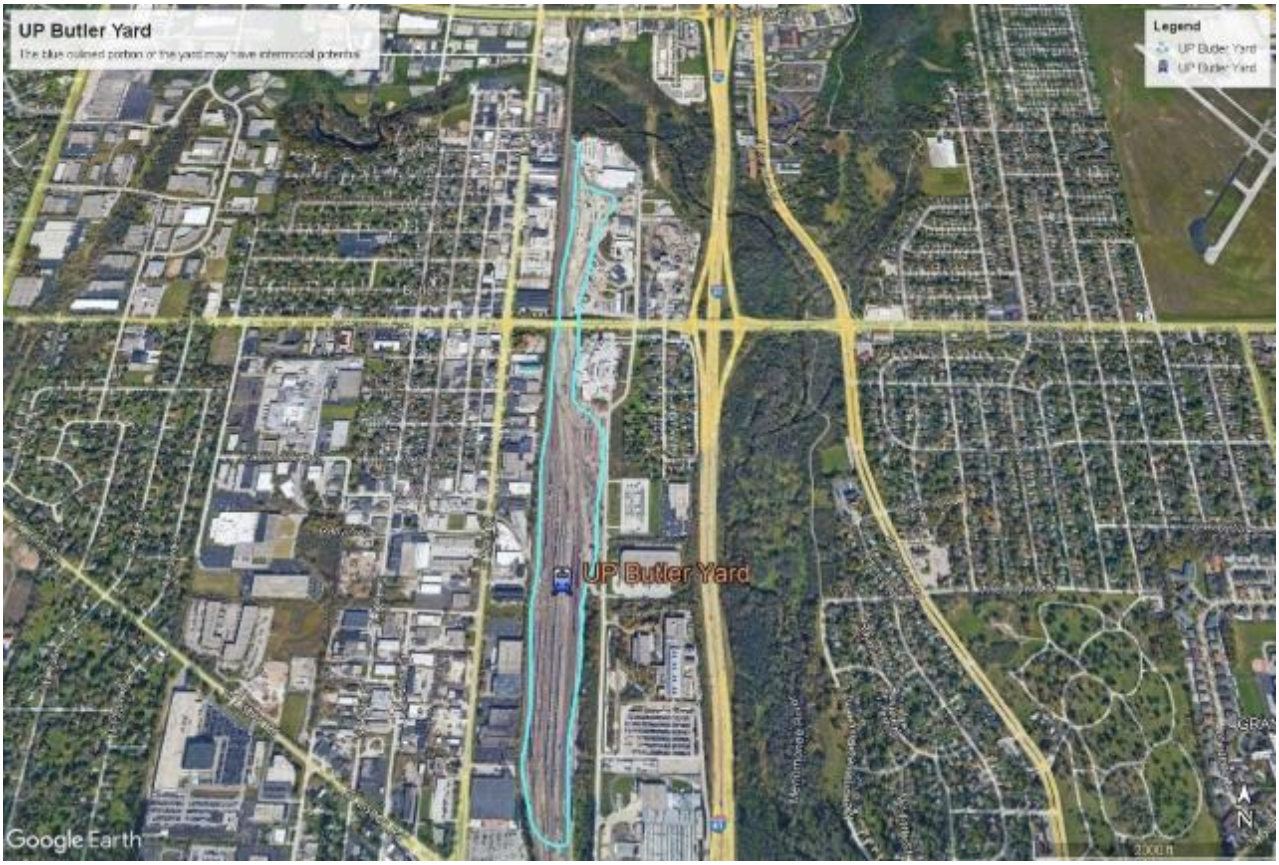


Figure 77 Potential Butler Intermodal Terminal (UP)

Another UP option could be the yard north of Jackson Park. This is an approximately 25-acre site (parcel 4939971000) with Milwaukee County property adjacent just north of the possible site. The county property could provide an opportunity for a public/private partnership intermodal terminal. The inability to move double stack is a barrier to both sites.

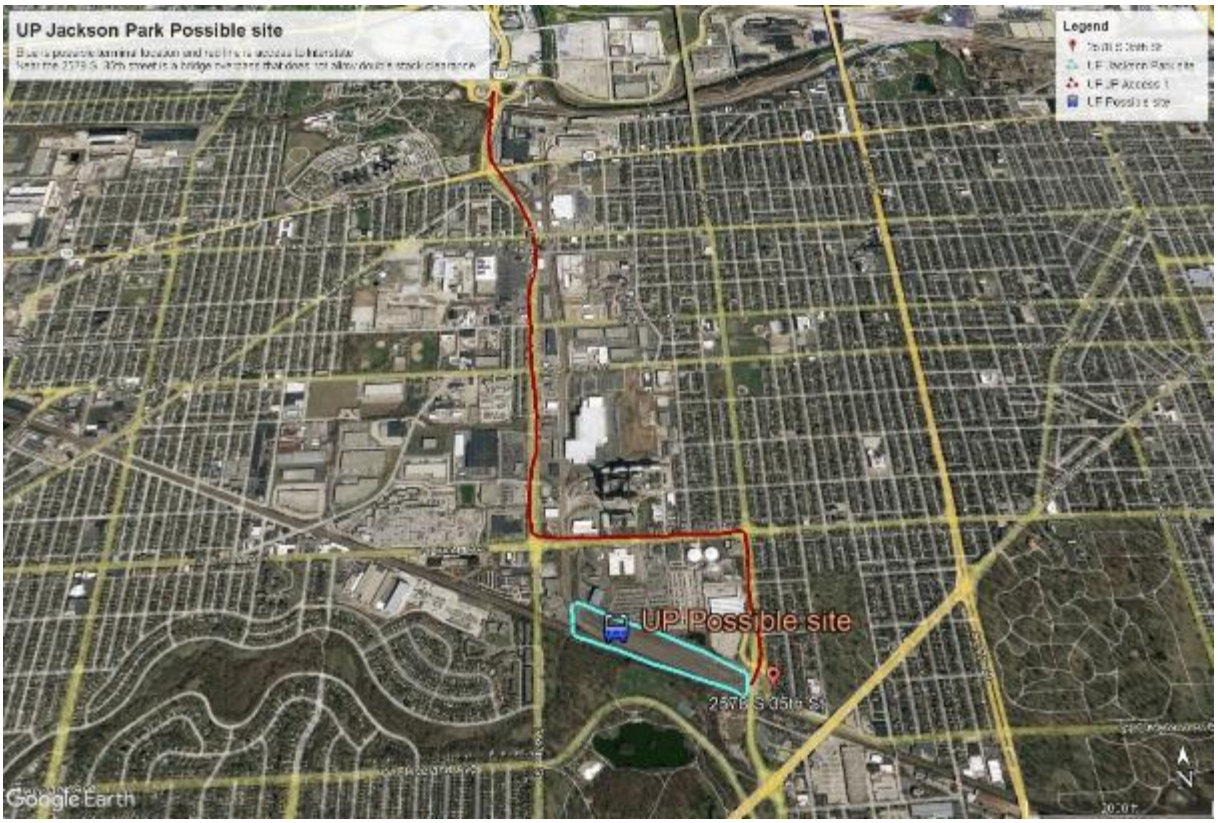


Figure 78 Jackson Park Site (UP)

The Canadian Pacific Kansas City (CPKC) has six railyards. CPKC had a short branch line intermodal terminal on Jones Island in Milwaukee until 2012 with it was closed due in part to lane imbalance and cost cutting. During its last decade in operation this terminal handled the equivalent of 18,000 to 25,000 TEUs annually.[iv] There have been no other intermodal terminals in the Milwaukee since that closure. The approximate 10-acre property used for the intermodal terminal is owned by the City of Milwaukee under the direction of the Port Authority. Adjacent land is also owned by the City of Milwaukee. Intermodal cars will need to be shuttled to another yard to connect with an intermodal unit train.

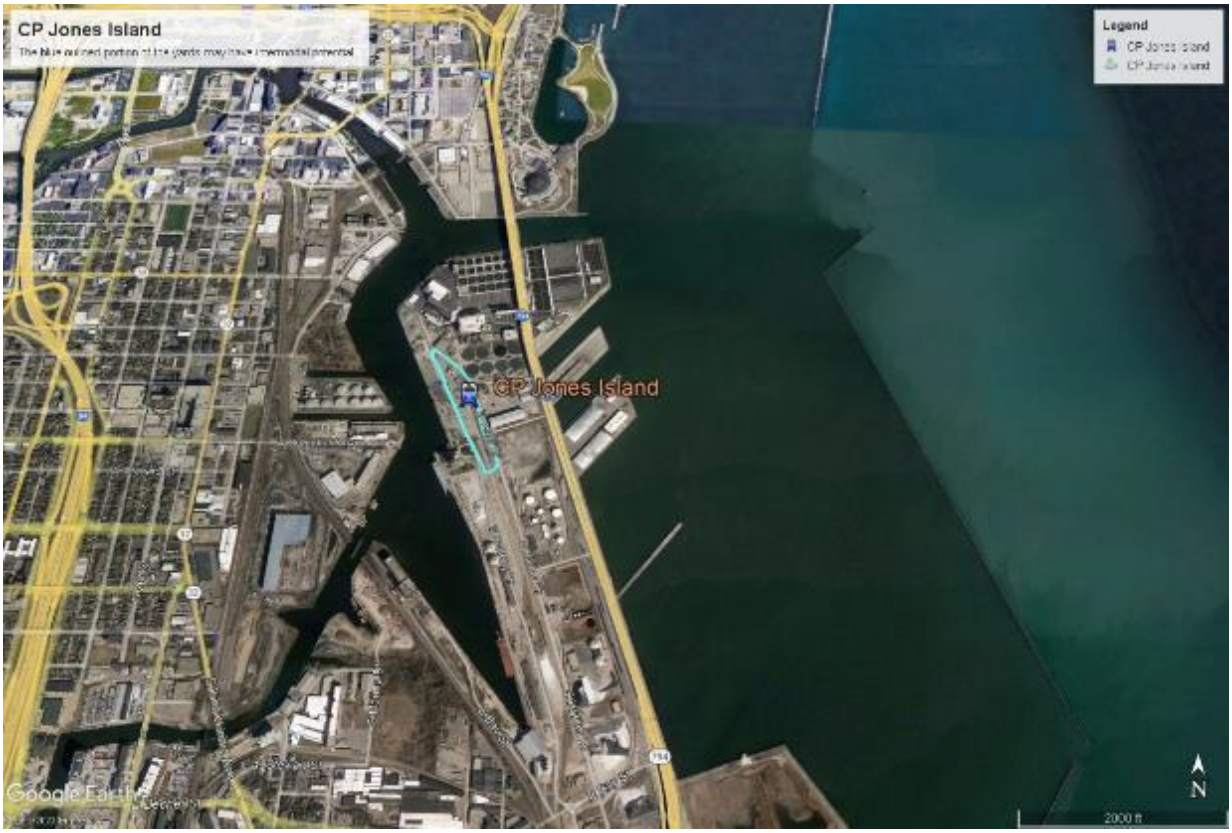


Figure 79 CPKC Jones Island Site

CPKC's largest yard is the approximately 70-acre Muskego yard that is currently out of service while improvements are made for rail passenger service.[v] The blue outlined western end of the yard (parcel 2601) is about 52 acres in size. The property at the western ends of the blue outlined area is owned by the City of Milwaukee. This yard has access to interstates and is surrounded by commercial property.

Figure 80 CPKC Muskego Site

CN has Waukesha yards/sidings adjacent to their primary line at the far western edge of the Milwaukee metropolitan area. None of these yards have space to handle a minimum of 20,000 lifts. There is a 33-acre vacant triangular shaped lot owned by CN with a spur and siding in the village of Sussex. The property borders Du Plainsville Rd and Lisbon Rd with commercial or agricultural land surrounding it. Sussex is 23 miles North Northwest of Milwaukee. While adjacent to the CN primary north-south line using this location would require that the intermodal cars either be moved by a special intermodal consist or coupled to a merchandise train. Stopping an intermodal unit train to switch cars less than 100 miles from another intermodal terminal is not standard operating procedure for western railroads.

Figure 81 CN Sussex Potential Site

Criteria 3: Highway access: The Milwaukee metropolitan area has Interstates I-94, I-43, and I-41 along with several national and state highways providing multiple lane highway access. The Port of Milwaukee has direct access to the Interstate system via 5th Street. The intermodal connectors associated with the port offers access to Interstate 43 as well.

Criteria 4: Drayage distance Milwaukee is 100 to 130 road miles from the Chicago terminals. All other terminals in the study region are over 200 miles northwest. None of the railroads servicing Milwaukee offer through service east of Chicago necessitating an interline transfer in Chicago with delays and added costs. The barrier that Milwaukee faces for drayage is that if the cargo is moving to a point of destination served by railroads other than CPKCKC, UP or CN then the cost of terminal fees, interline transfer fees, and the value of time will likely exceed the cost of drayage.

Criteria 5: Catchment area Milwaukee metropolitan region is the greatest single population density in Wisconsin with well over two million residents. The city is a Great Lakes port capable of handling the largest vessels on the Lakes. The Catchment area would spread out to the north about 50 miles, west some 50 miles and only about 10 miles south. The closer potential customers are to Chicago the greater the chance of drayage to those terminals. Containers bound to or from the east coast railroad would rarely if ever use a west coast RR terminal in Milwaukee

that would require an interchange in Chicago to access the east coast RR. Draying to Chicago would be more cost effective. These facts mean that the catchment area rankings may be overinflated if shippers are using a Milwaukee terminal only occasionally.

Criteria 6: Keystone customers Milwaukee is a large consumer base and has several major manufacturing facilities. Intermodal cargo generation is the most promising in the state. The key unknown is how many customers are moving cargo to and from east coast railroads and an intermodal terminal in Milwaukee would only be a 100-mile trip to Chicago to make an interline transfer. Railroads would not see such a short haul as a cost-effective investment.

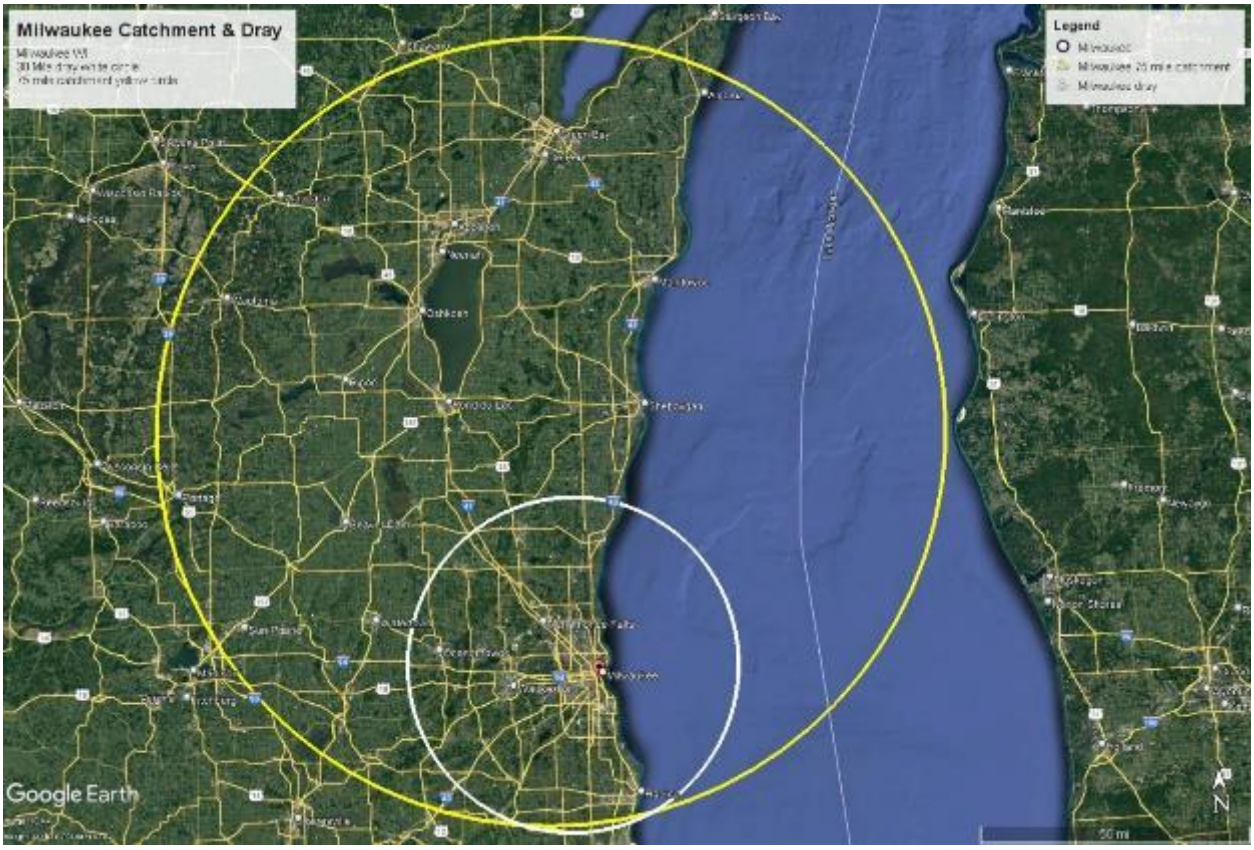


Figure 82 Milwaukee Catchment and Drayage Area

Criteria 7: Terminal support. The port of Milwaukee has secured grants to improve access to the area that included the former CPKC intermodal terminal. Tracks in the Port of Milwaukee are publicly owned and there are over 20 railroad crossings on Jones Island. The CPKC Muskego yard is being developed to improve passenger service and this could be an operational constraint.

Wisconsin and Southern Railroad (WSOR)

The regional Wisconsin and Southern Railroad (WSOR) has three railyards in the Milwaukee region. The WSOR operates in the southern part of the state on publicly owned track. A branch line of the WSOR extends into Chicago terminating at their yard in Clearing, Il.

WSOR has low clearances that do not allow the use of double stack trains on parts of its route, the route is more circuitous requiring switching to other rail networks that have placed limits on.

WSOR service. WSOR's trackage and haulage rights on other railroads are restricted regarding frequency of service and types of cargo.

WSOR was eliminated from the rankings as there were no sites that appear to have the capacity for a minimum of 20,000 lifts per year. WSOR may have partnerships with adjacent landowners or other options that may make a terminal viable.

Milwaukee Area Site Evaluations

Milwaukee Possible Terminal Locations	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals
UP Butler Yard	1 No double stack	5	5	5	5	5	3 WisDOT Bridges	**29**
UP Jackson Park	1 No double stack	5	4	5	5	5	3 WisDOT Bridges	**29**
CPKC Muskego	4 Passenger Rail?	4	5	5	5	5	5	**33**
CPKC Jones Island	3 Branch line shuttle	4 Space constricted	5	5	5	5	5	**32**
CN Sussex, WI	3	3 trackage	4	4	5	5	5	**28**

Figure 83 Milwaukee SE Wisconsin Site Rankings

Southeast Region Summary: CPKC yards rank the highest. However, if UP were able to double stack their sites they would have the highest rankings. All the potential sites must deal

with the fact that 20 intermodal terminals are about 120 miles away in Chicago. The railroads that service Milwaukee do not own any track operating in the eastern part of the U.S. Some of these railroads have trackage or haulage rights on eastern railroads. Switching railroads in Chicago or other locations either by steel wheel or rubber tire adds the expense and time for intermodal shipments headed for the eastern U.S. A short haul intermodal run between a Milwaukee terminal and a Chicago terminal is not cost effective for Class 1 railroads or shippers.

II. Northeast Area

Neenah, WI – CN Served

Criteria 1: Class 1 Connection: Neenah is on CN's primary line. CN's intermodal trains running north south pass through this yard but normally do not stop. There are sidings and tracks laid.

Criteria 2: Available Land: The CN yard in Neenah has about 28 total acres, (parcel #.80205840200). There are two office/shop buildings and a marshalling yard on the property. When this yard was operated by the regional railroad Wisconsin Central (WC) it had an intermodal terminal with an annual volume of over 8,000 lifts.[vi] The WC operated their intermodal terminal on 5 acres of land. The terminal had a mix of grounded and wheeled boxes. The yard is surrounded by dense residential areas and/or commercial buildings. There is virtually no room for expansion on adjacent property.

Criteria 3: Highway access: The terminal is accessed to Interstate 41 via WI Highway 114, Henry Street and McKinley Street. Trucks using this approximately 2-mile route would pass through residential and commercial areas.

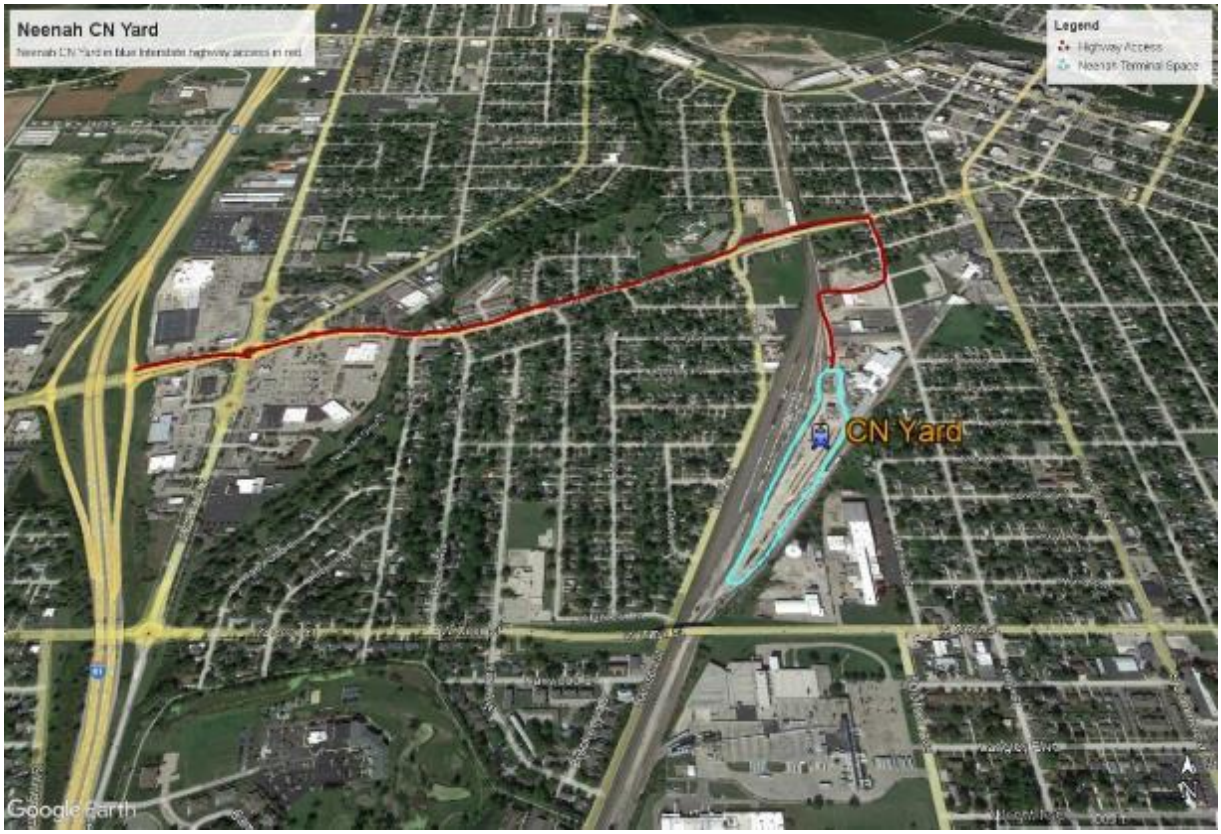


Figure 84 CN Neenah Yard

Criteria 4: Drayage distance This location is 200 road miles from southern Chicago terminals, 187 miles from Chippewa Falls and 282 miles from Minneapolis Terminals. See typical 30-mile dray range Map 6.9.

Criteria 5: Catchment area The Catchment area would spread out about 100 miles to the north, east, and west. The area would extend about 40 miles south before truckers would have to significantly back track along the route to Chicago to reach Neenah. The closer potential customers are to Chicago the greater the chance of drayage to those terminals. Neenah would be on the current dray route from the Fox River valley to Chicago. The 75-mile catchment area would service about 23 of Wisconsin's 72 counties and reach a population base of 1.7 million people.[vii]

Criteria 6: Keystone customers Within 75 miles of this possible terminal location are numerous industries that ship out of the area. There are many warehouses and distribution centers. The area is growing in population creating increased opportunity for inbound containers. The catchment area would encompass the Fox River valley industry locations including the areas north of Green Bay that is 50 miles away to producers on the Lake Michigan shoreline.

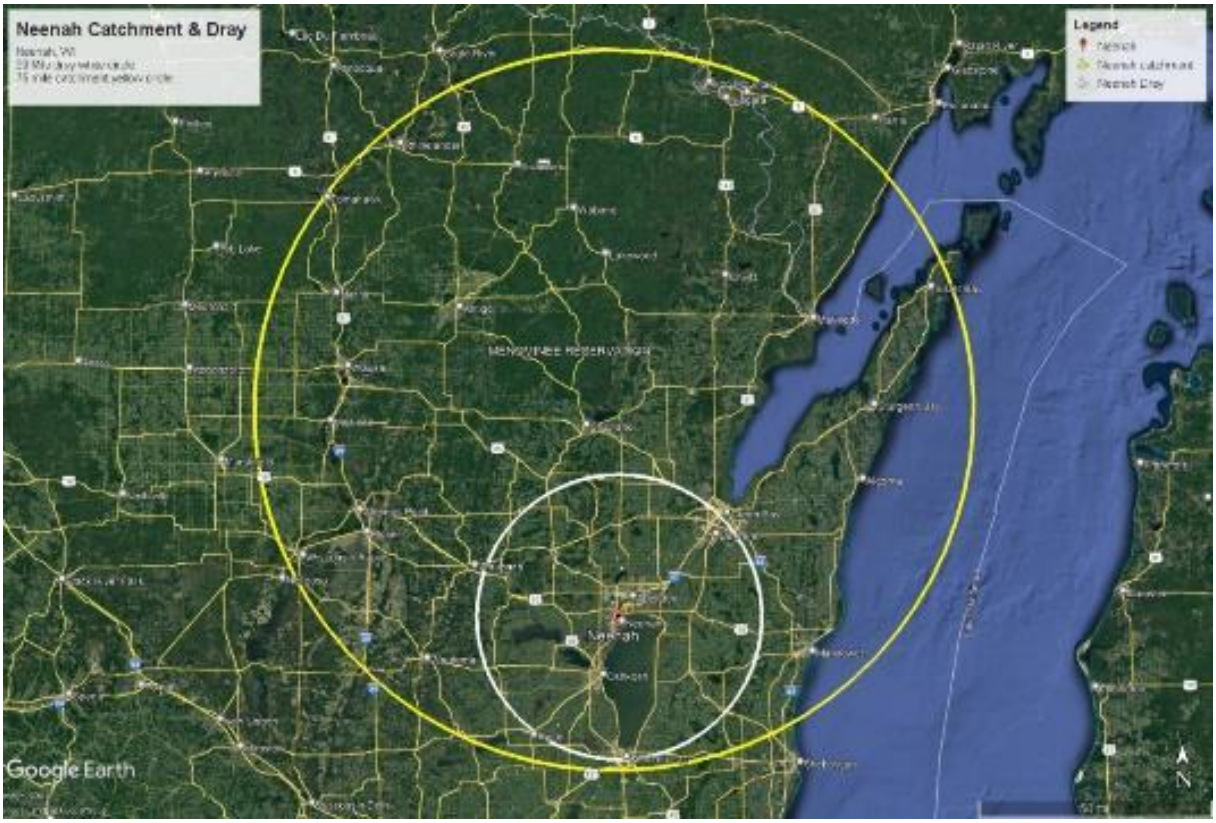


Figure 85 Neenah 30 Mile Drayage Radius in White Circle, Catchment area in Yellow Circle

Criteria 7: Terminal support. Most of the area around this proposed location is zoned residential or commercial and is quite built up with only small non-adjacent vacant land parcels. There may be some opposition to the increase in truck traffic in residential areas.

Neenah Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	*Criteria 7 Terminal Support*	*Totals*
CN Yard	4	2 – less than 20,000	4 – Residential roads	5	4	5	4	**28**

Figure 86 Neenah, WI Site Rankings

Oshkosh – CN and WSOR Served

Criteria 1: Class 1 Connection: Oshkosh located south of Neenah is served by CN on its primary line. However, the possible yard is small with very limited trackage for stopping a unit train. WSOR in Oshkosh can access BNSF, CN, CPKC, CSX, NS, UP via interline transfers. WSOR has limits on trackage and haulage rights on some Class 1 lines.

Criteria 2: Available Land: CN has a small yard in Oshkosh just south of the Fox River at 123 E 10th Ave. This roughly 7-acre yard has several tracks, (Parcels 0303250000, 90301330300). There is no available land adjacent and is unsuitable for an intermodal terminal meeting the minimum criteria of 20,000 lifts per year even if the tracks were removed. There are several industrial spurs but no other CN yards in Oshkosh.

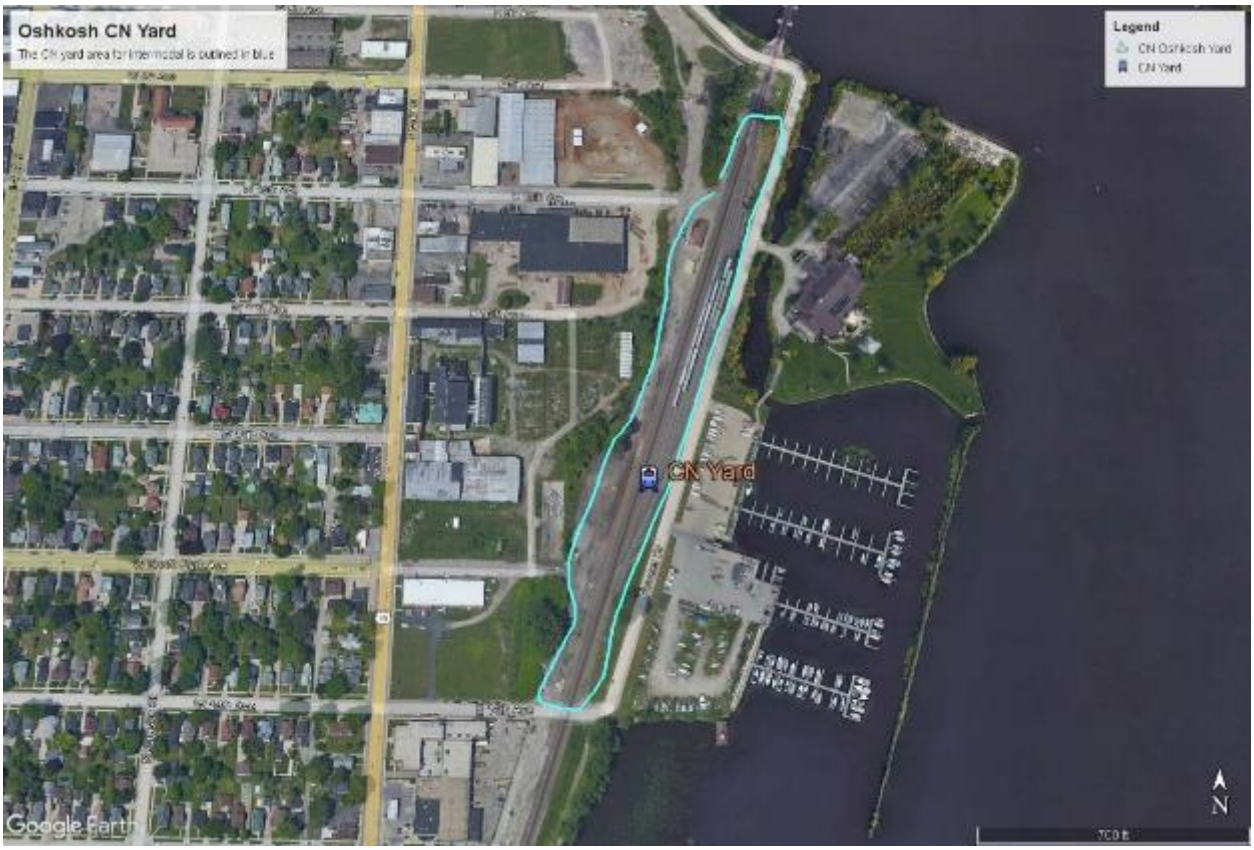


Figure 87 CN Yard - Oshkosh, WI

WSOR has an 11-acre transload terminal located east of Clairville Road in the Southwest Industrial Park in the City of Oshkosh. The investors in the project that was completed in the spring of 2018 were the City of Oshkosh, Wisconsin Department of Transportation, and Watco Companies.[viii] The transload terminal is located on property owned by the City of Oshkosh, (parcel 91334120200), with an adjacent 52 acres of land (parcel 91334120300) that is also city owned. In 2018 WSOR had and may still have options on an additional 20 acres of this land.

The facility features two 1,200-foot-long rail spurs with concrete rams for vehicle loading at the end of each track. One spur serves Oshkosh Corp., the city's largest employer, which manufactures and markets access equipment, specialty vehicles and truck bodies for the defense, refuse hauling, and fire and emergency industries. The second spur is used by Certainteed Corp., 3D Corporate Solutions, Darling Ingredients and Agri Trading.[ix] Container operations would require buildings, lift equipment, security, and additional utilities. How much space for container operations would be available on the current footprint is not clear but it would not support 20,000 TEU's without expansion. In the five years since its completion there have not been any scheduled intermodal trains operating from this location.

Figure 88 WSOR Oshkosh, WI Transload Facility

Criteria 3: Highway access: Access to the CN yard is from U.S. Highway 45 via 10th Avenue. I-41 can be reached by taking Highway 45 to West Park Avenue (WI state highway 44) traveling through several miles of residential neighborhoods to reach the interstate some 3 miles distant. The WSOR transload center is Southwest of Oshkosh and is accessed from the global Parkway that connects to WI state highway 91 that joins I-41.

Figure 89 Oshkosh, WI Yard & WSOR Access

Criteria 4: Drayage distance Oshkosh is 175 miles from the Chicago terminals, 50 miles south of Green Bay, 20 miles north of Fond Du Lac and 188 miles from Chippewa Falls.

Criteria 5: Catchment area Oshkosh's catchment area would extend north past Green Bay and about 20 miles south of Fond Du Lac. The western boundary would be about 70 miles. The 75-mile catchment area would service about 23 of Wisconsin's 72 counties and reach a population base of 1.7 million people.

Criteria 6: Keystone customers Within 75 miles of this possible terminal location are numerous industries that ship out of the area. The large population base is in the Fox River Valley that would bring inbound cargo.

Criteria 7: Terminal support. Using the CN terminal would require truck traffic through significant residential areas on two lane roads. This location is also adjacent to a marina and public park area. The expectation would be that there would be strong local opposition. There was public support and funding for the WSOR transload terminal. The regional communities and the state provided funding and property for the terminal.

Figure 90 Oshkosh, WI 30-mile Drayage Radius (white) Full Catchment Area (yellow)

Oshkosh Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone Customers	Criteria 7 Terminal Support	Totals
CN	3	1 Too small	2 – Residential two lane	3	4	5	2	**20**
WSOR	1 Limit on rights	2 Currently used	4	4	4	5	5	**25**

Figure 91 Oshkosh, WI Site Rankings

Fond du Lac, WI - CN Served

Criteria 1: Class 1 Connection: Fond du Lac is 38 miles south of Neenah on CN's primary line. CN's intermodal trains running north south pass through this yard. There are two roundhouses, repair shops and a large marshalling yard in the village of North Fond Du Lac.

Criteria 2: Available Land: The CN yard was a large repair facility with two round houses. The total yard size is approximately 150 acres. There is approximately 29 acres of land around the northern round house parcels V05-16-17-33-05-001-00 and T11-16-17-17-16-004-00.[x] A significant portion of this is cleared land. Between the roundhouse and western tracks there is adjacent uncleared land north and south is open. The operational status of the northern round house is not known. It would need to be removed for any expansion of a terminal in that area.

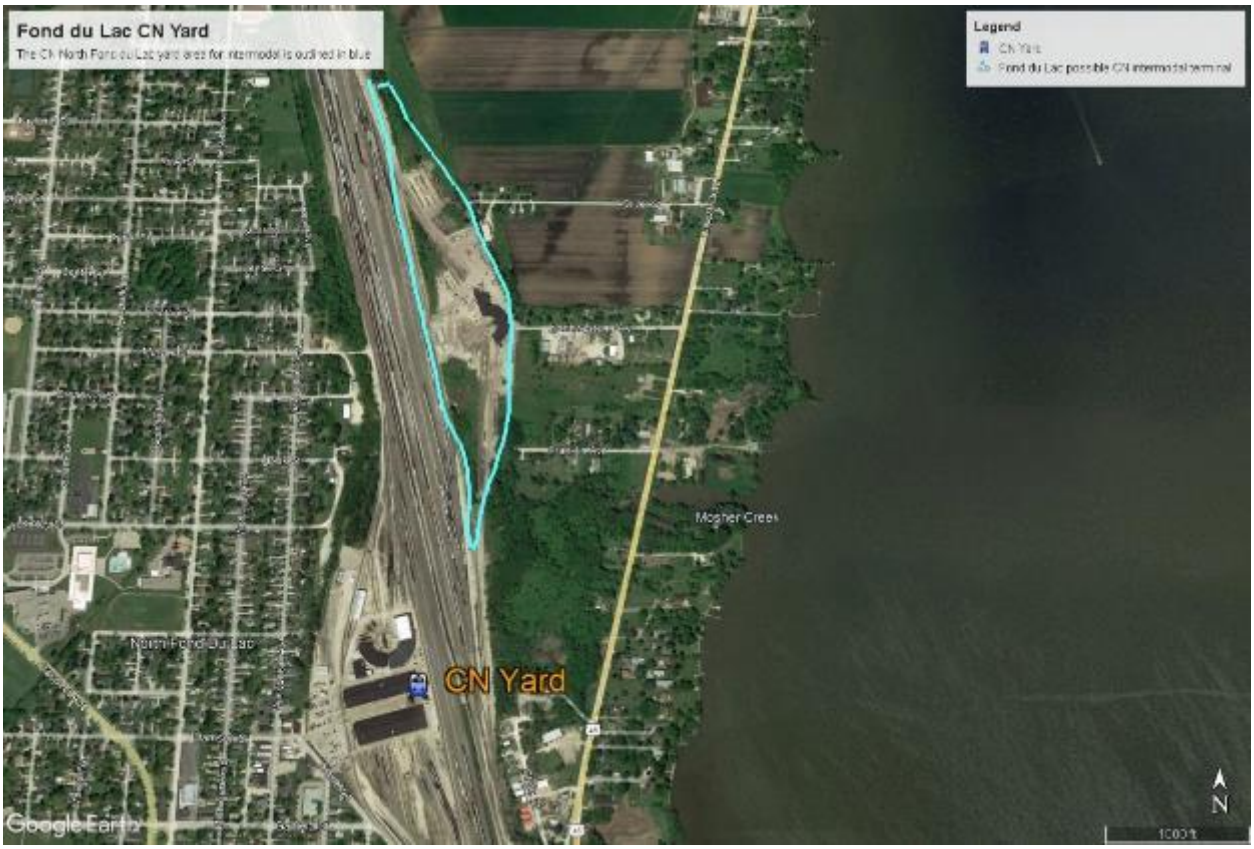


Figure 92 North Fond du Lac CN Yard Possible Terminal Location

Criteria 3: Highway access: The northern round house is accessed via Northwestern Avenue that connects in a quarter mile with US Highway 45. Turning off highway 45 at Lakeshore Drive, then south on N. Peters Ave back to HWY 45 to connect with Interstate I-41. The distance is about 2 miles from CN's rail yard in the village of North Fond du Lac and most of the route is not in residential neighborhoods.

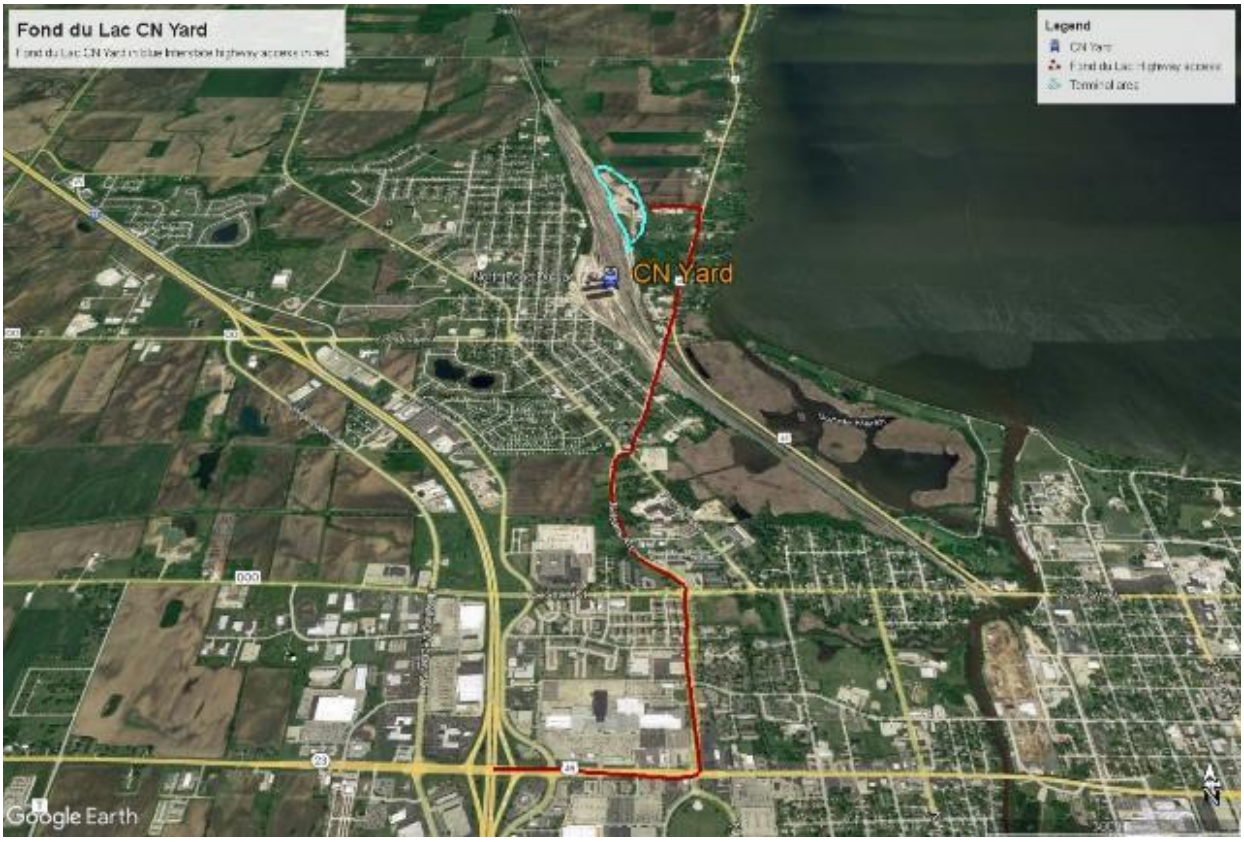


Figure 93 Fond du Lac CN Yard Access

Criteria 4: Drayage distance This location is 305 miles from Twin Cities terminals, 210 from the CN branch line terminal in Chippewa Falls and 160 miles from Chicago terminals. Trucks draying intermodal cargo from the fox river valley industries to Chicago pass through Fond du Lac. Stopping the dray at this location would eliminate overnight drays and related hours of service issues.

Criteria 5: Catchment area The Catchment area would spread out to the north, east, west, and only slightly south of the potential terminal. The closer potential customers are to Chicago the greater the chance of drayage to those terminals. The catchment area would encompass the Fox River valley industry locations and from north of Green Bay that is 90 miles away to the Lake Michigan shoreline. Fond Du Lac would be on the current dray route from the Fox River valley to Chicago. The 75 mile-catchment area would service about 23 of Wisconsin's 72 counties and reach a population base of 1.9 million people.

Criteria 6: Keystone customers Within 75 miles of this possible terminal location are numerous industries that ship out of the area. The area is growing in population creating increased opportunity for inbound boxes.

Criteria 7: Terminal support. Most of the area to the east of the proposed location is zoned industrial or agricultural with a few residential zones. There may be some opposition to the increased truck traffic on U.S. Highway 45 along the shoreline.

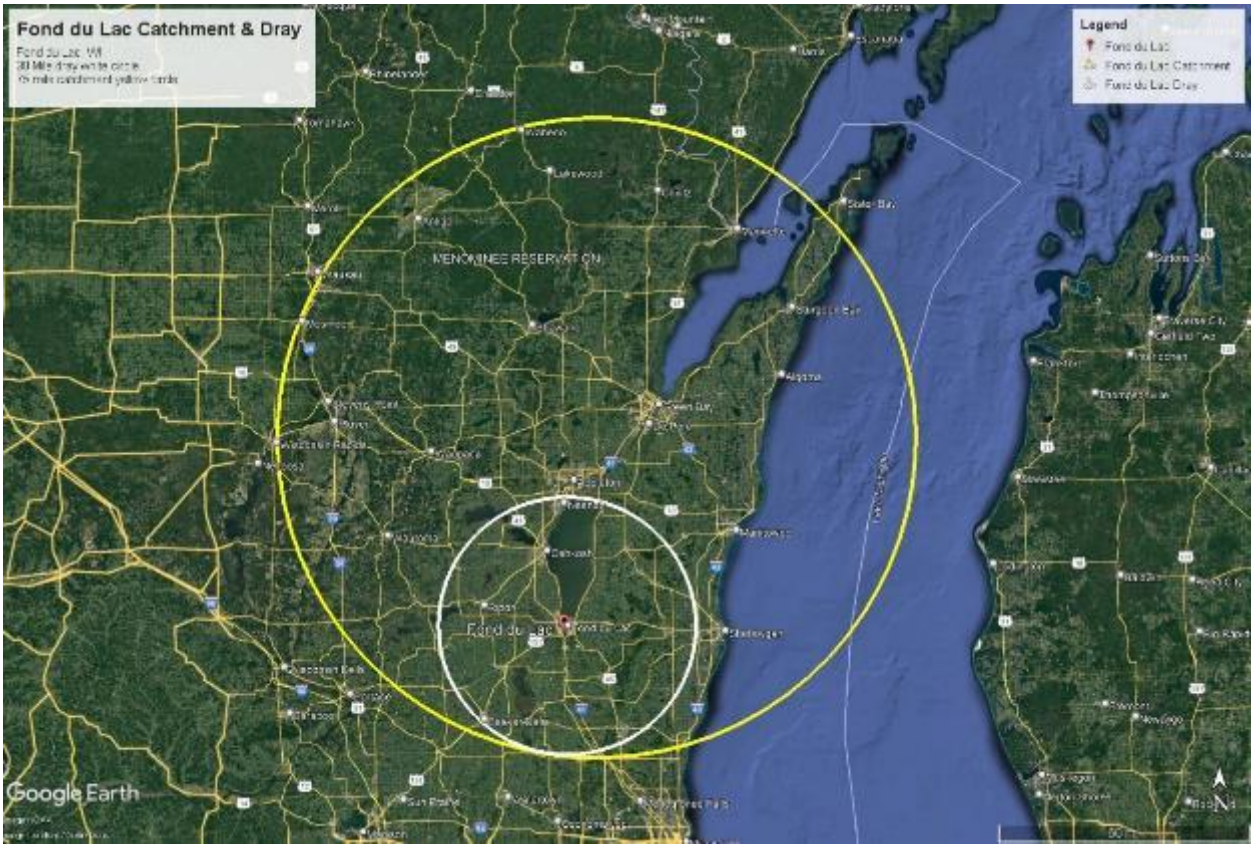


Figure 94 Fond du Lac 30 Mile Drayage (White) Catchment Area (Yellow)

Fond Du Lac Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals
CN North Fond du Lac yard	5	5	4 two lane roads	5	4	5	4	**32**

Figure 95 Fond du Lac, WI Site Rankings

Sheboygan, WI - UP and WSOR Served

Criteria 1: Class 1 Connection: Sheboygan on the shore of western Lake Michigan is served by branch lines of the UP and WSOR railroads. Sheboygan is served by a branch line of the UP coming up from the south and a branch line of the WSOR coming in from the west. UP has the additional hurdle of being unable use double stack cars on their rail line going through Milwaukee to Chicago. WSOR can connect with CN's branch lines. WSOR's route to Chicago is longer and more circuitous than UP' with multiple switches on Class 1 rail lines. WSOR could serve this location provided CN allows WSOR to have haulage and/or trackage rights and allow them to move double stack containers.

Criteria 2: Available Land: The coal terminal and adjacent land is owned by the power company. UP has another yard of about 24 acres (Parcel 59281416790) located just north of where the spur to the coal plant splits off. If the coal trade disappears this yard might present an opportunity for a small intermodal terminal. It may be possible for a terminal at this UP location to have 15,000 annual lifts. WSOR has several industrial spurs and sidings but no property of a size to support a terminal there by eliminating WSOR as a terminal location.

Figure 96 Sheboygan, WI Union Pacific Yard

Criteria 3: Highway access: Access to the UP yard is from WI State Highway 28 to County Road TT/Union Ave that is a designated truck route. The road access is through virtually all commercial areas with a block of residential along CR-TT. Interstate I-43 is less than two miles from the yard access.

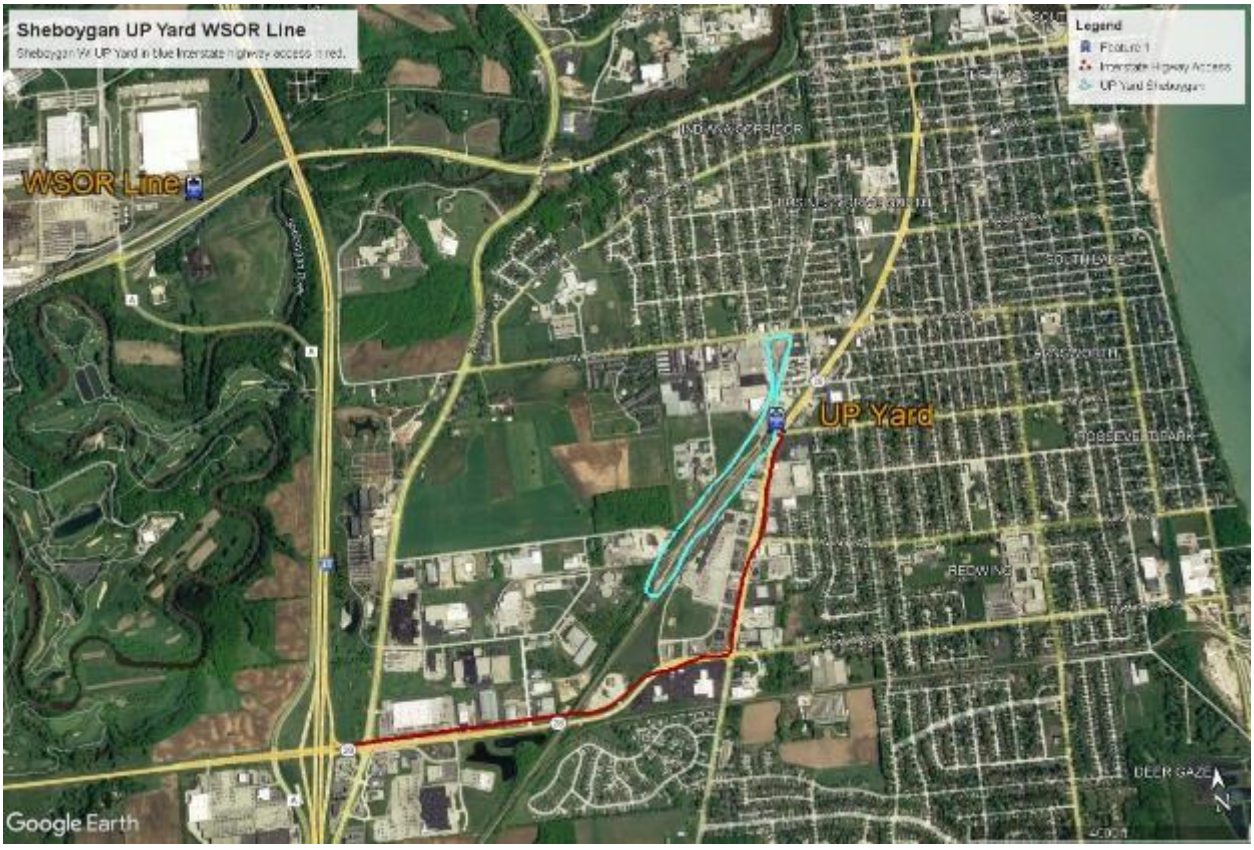


Figure 97 Sheboygan Union Pacific Yard Highway Access

Criteria 4: Drayage distance Sheboygan is 150 miles from the Chicago terminals, 65 miles from Green Bay and 264 miles from Chippewa Falls. Fond Du Lac is 40 miles due west. Green Bay trucks draying intermodal units to Chicago pass within 2 miles of this location.

Criteria 5: Catchment area Sheboygan's catchment area would extend north past Green Bay and west for about 50 miles past Fond Du Lac. The southern boundary would be about 30 miles before backtracking made it cost effective to go to Chicago. The 75-mile catchment area would service about 22 of Wisconsin's 72 counties and reach a population base of 1.6 million people.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are numerous industries that ship out of the area. The large population base is in the Fox River Valley that would bring inbound cargo.

Criteria 7: Terminal support. Most of the area around this proposed location is zoned commercial and access to the site is not through residential areas. The is a residential area to the

north of the site. The location of the gate and where most of the container activity will take place could mitigate potential noise issues. Without the support of WisDOT in addressing the bridge clearance issues in the Milwaukee area this site could not use double stack container cars.

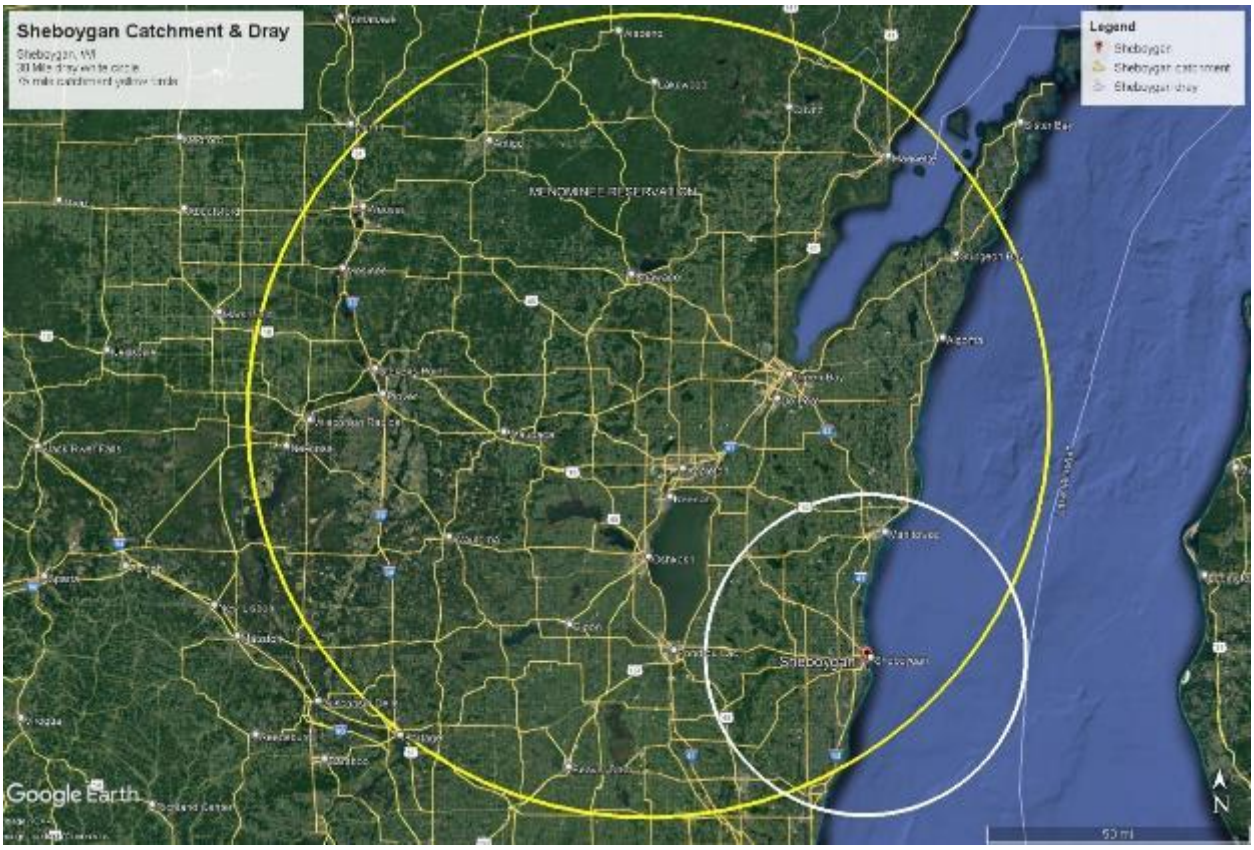


Figure 98 Sheboygan, WI 30-Mile Drayage (White) Catchment Area (Yellow

Sheboygan Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway Access	Criteria 4 Drayage Distance	Criteria 5 Catchment Area	Criteria 6 Keystone Customer	Criteria 7 Terminal Support	Totals
UP	1 branch line and DBL stack	4 may be marginal for 20,000	4 Part Residential	4	4	4	3	**24**

Figure 99 Sheboygan, WI Site Rankings

Northeast Area Summary A potential difficulty for either Neenah, Fond du Lac, Oshkosh, or Sheboygan would be if a large portion of the intermodal traffic generated in the catchment area planned to use CN only to reach Chicago and then transfer to other railroads. CN' Fond du Lac yard is centrally located for cargo generated in the Fox River valley and has the most available space. Providing CN intermodal rail service to Chicago from a Neenah terminal would only be about 200 miles well below the normal 500 minimum miles for western railroads practicing precision railroading management. A UP terminal in Sheboygan has the potential to capture cargo if UP could provide service that benefits shippers. The double stack clearance issues in southeast WI are a barrier to economical service.

III. Central Area

Stevens Point, WI – CN Served

Criteria 1: Class 1 Connection: Stevens Point's CN facilities are along an east-west line with the round house, spur lines and repair buildings on the west side and a marshaling yard on the east side. Steven's Point is a normal primary line stop for crew changes and refueling of intermodal unit trains to and from Canada and Chicago. Prior to 2003 Wisconsin Central operated an intermodal terminal from this location.

Criteria 2: Available Land: CN has an approximately 60-acre yard in the center of Stevens Point. There is very little CN owned property on the west side of the facility that is not currently in use. On the east north of the marshalling yard there is cleared area north of the track and a CN owned wooded lot (Parcel Number: 281240834300103) north of the cleared area. The combined vacant land is about 10 acres. Adjacent to the vacant north lot is residential zoning and conservancy land with trails to the east. There is no adjacent land available for expansion.

Criteria 3: Highway access: The northern round house is accessed via Northwestern Avenue that connects in a quarter mile with US Highway 45. Interstate I-41 is about 2 miles from CN's rail yard in the village of North Fond du Lac and can be reached using US Highway 45. See red line Map A6.3.1

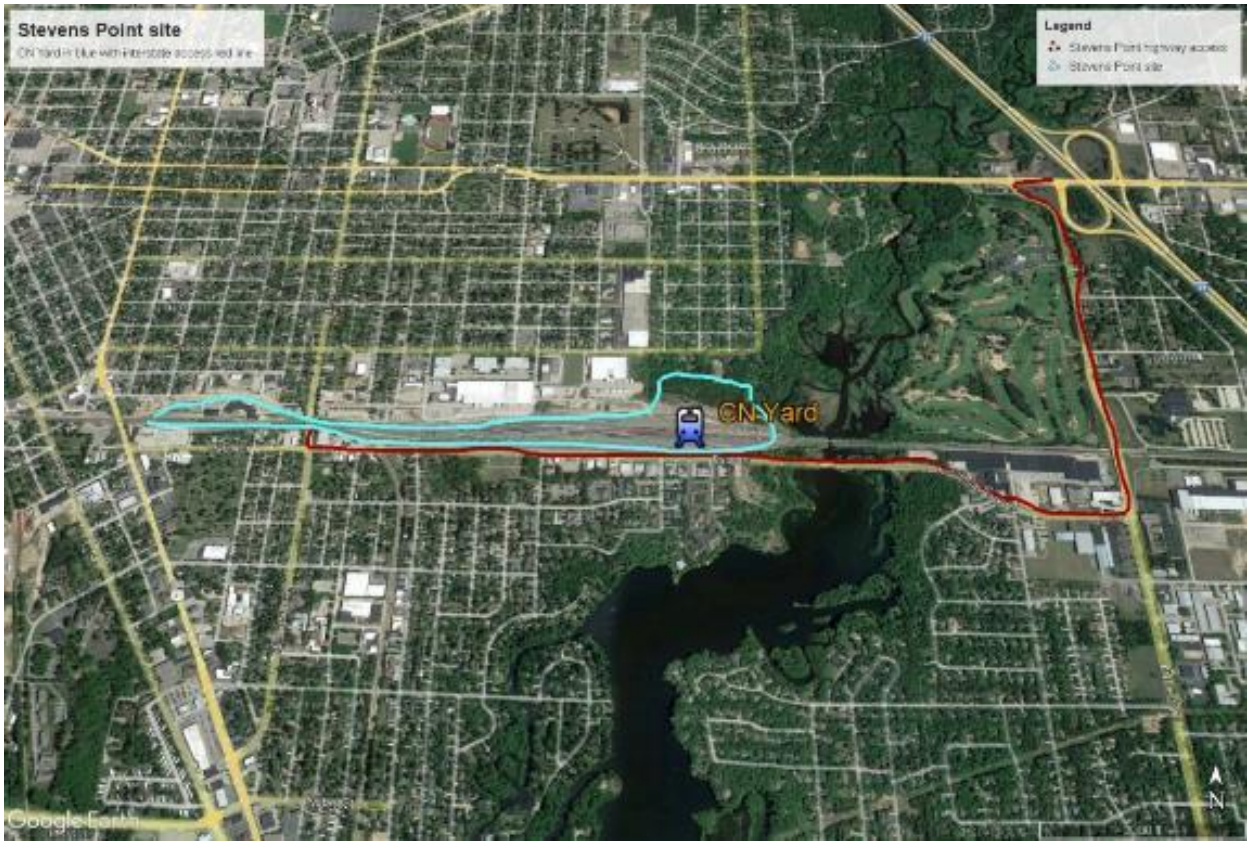


Figure 100 Stevens Point, WI CN Yard Access

Criteria 4: Drayage distance Stevens Point is west of Neenah. It is 215 miles from the MSP terminals, 250 miles from Chicago terminals, and 267 miles from CN Duluth terminal. While it would be only 120 miles from the CN terminal in Chippewa Falls that terminal is on a branch line that comes switches in Stevens Point and too distant to serve the Green Bay and other Fox River valley industry locations that are within the Stevens Point catchment area.

Criteria 5: Catchment area The Catchment area would spread out 75 miles to the north. The area would go east to the Fox River Valley, and west for about 50 miles, and about 50 miles south of the potential terminal. Green Bay is 100 miles away and drayage rates may make it a toss-up in going to Chicago or Steven's point. Businesses east of Fond Du Lac would likely dray directly to Chicago. The population base would be about 1.5 million people.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are several industries in Wisconsin Rapids, the Fox River valley, Wausau, Mosinee, and Waupaca that ship out of the area. This is not a high population density area for inbound freight unless the terminal were used by Green Bay distributors.

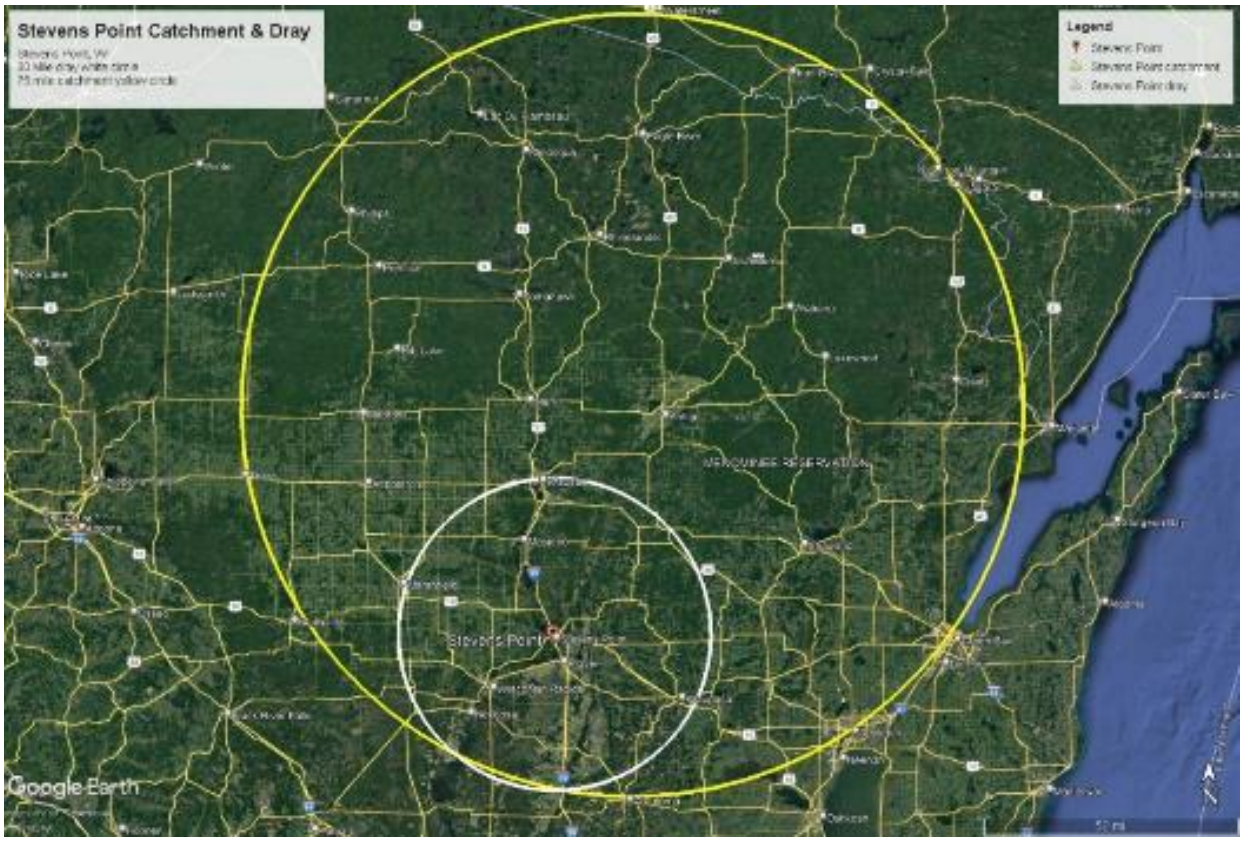


Figure 101 Stevens Point, WI Drayage 30 Mile Radius (White) Catchment Area (Yellow)

Criteria 7: Terminal support. Most of the area around the proposed location is zoned residential, light industry and or conservancy. An increase in truck traffic west of the terminal in the residential areas would likely create opposition.

Stevens Point, WI Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable Land	Criteria 3 Highway Access	Criteria 4 Drayage Distance	Criteria 5 Catchment Area	Criteria 6 Keystone Customer	Criteria 7 Terminal Support	Totals
CN	5	3 – marginal for +20,000	4 – some residential	3	3 lane imbalances	4	4	**26**

Figure 102 Stevens Point, WI Site Rankings

Wausau, WI – FOXY, CN and UP Served

Criteria 1: Class 1 Connection: Wausau is served by a 25-mile branch line that joins the main line at Junction City, WI. The Fox Valley and Lake Superior Railroad (FOXY) owns the track from Mosinee to Park Falls, WI. Researchers were unable to determine the extent of CN or UP haulage and/or trackage rights on the FOXY owned line. The FOXY line joins a CN branch line in Wausau that connects to CN's primary line another 50 miles south.

Criteria 2: Available Land: The FOXY owned property in Wausau and the immediate communities that is not currently used by the paper or other industries is not large. The FOXY Wausau Depot on Curling Road with sidings south of County Road N and west of Northwestern Ave is the largest single parcel.

This property has more than nine tracks being used. An intermodal terminal would impact the current use especially for an intermodal terminal that could handle over 20,000 annual lifts.

Figure 103 Wausau Site - WSOR

Criteria 3: Highway access: The largest property owned by FOXY is the Depot on Curling Road. It is accessed by Northwestern Ave then to County Road N to U.S. Highway 51 about a mile. Heading 4.5 miles south on the four lane Highway 51 there is a junction with WI Highway

29 and Interstate I-39 is a mile west on Highway 29. The route is mostly four lanes with intersections and minimal residential.

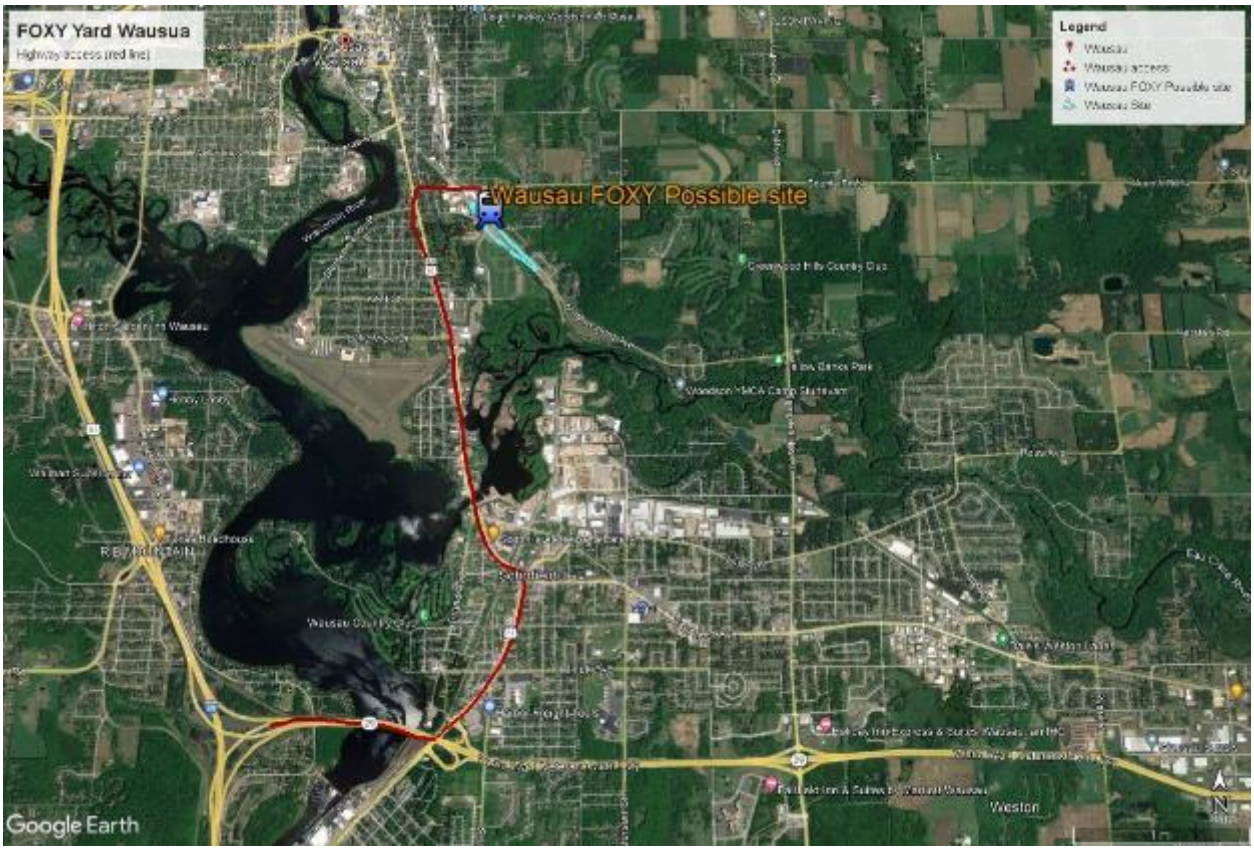


Figure 104 Wausau WI Site Access

Criteria 4: Drayage distance Wausau is 31 miles northwest of Stevens Point. Wausau is 185 miles from the MSP terminals, 280 miles from Chicago terminals, and 237 miles from CN Green Bay and other Fox River valley industry locations that are all 95 miles or more south of Wausau.

Criteria 5: Catchment area The Catchment area would spread out to the north of Wausau, east about for about 50 miles, Green Bay is 100 miles away and drayage rates may make it a toss-up in going to Chicago as trucks would be backtracking unless the cargo was bound for the Northwest gateway ports. The population base is about 1 million people.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are several industries in Wisconsin Rapids, Wausau, Mosinee, Stevens Point and Waupaca that ship out of the area. This is not a high population density area for inbound freight unless the terminal were used by Green Bay distributors.

Criteria 7: Terminal support. Most of the area around the proposed location is zoned residential, light industry and or conservancy (parks). However, the relatively long connection to an interstate highway would increase truck traffic on two lane roads with some portions of the

route residential. Without the support of WisDOT in addressing the bridge clearance issues in the Milwaukee area this site could not use double stack container cars if the connection was with UP's primary line.

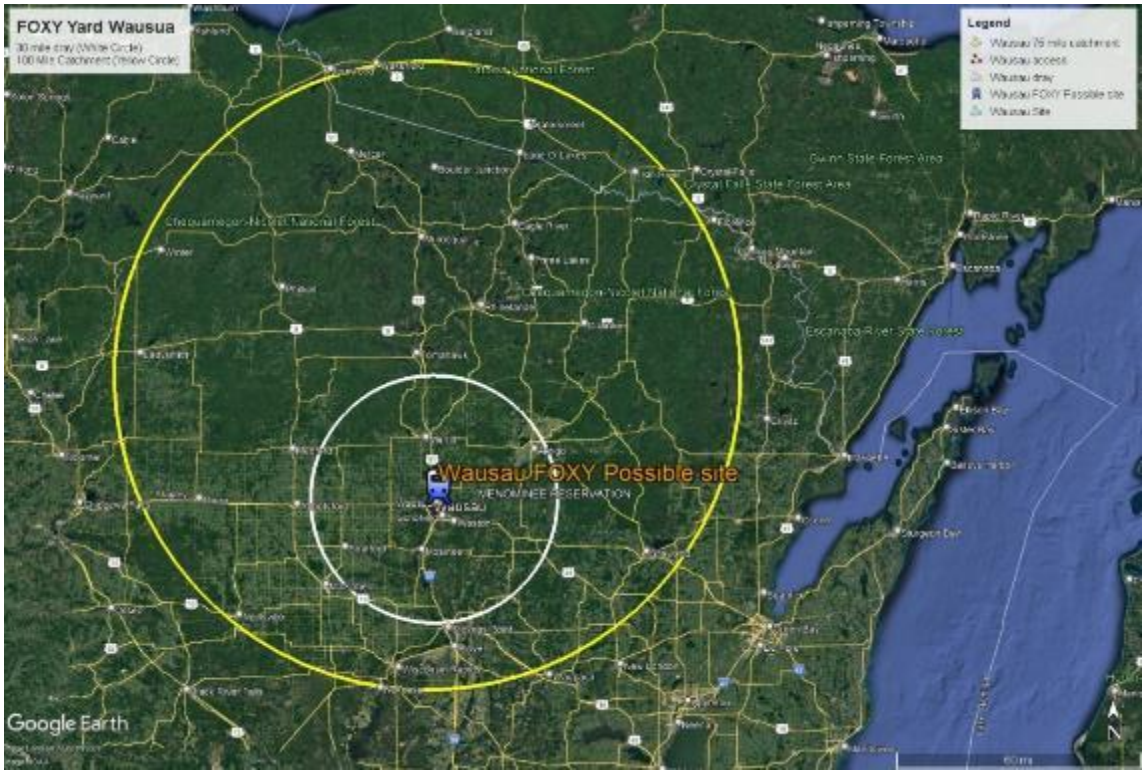


Figure 105 Wausau, WI 30 Mile Drayage (White Circle) Catchment Area (Yellow)

Wausau, WI Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable Land	Criteria 3 Highway Access	Criteria 4 Drayage Distance	Criteria 5 Catchment Area	Criteria 6 Keystone Customers	Criteria 7 Terminal Support	Totals
FOXY	3 branch line	3 may be too small for 20,000	4	3	2 low cargo volume lane imbalances	3	3	**21**

Figure 106 Wausau, WI Site Ranking

Adams, WI - UP Served

Criteria 1: Class 1 Connection: Adams is on UP's primary line connecting the Twin Cities and Milwaukee. An unresolved issue with UP is their inability to run double stack intermodal trains south from this location. Bridge clearance in south-east Wisconsin prevents the use of double stack cars.

Criteria 2: Available Land: There is a large railyard in Adams owned by UP. The 90-acre property has sidings and is elongated but there would be over 20 acres of land that may be useable.

Figure 107 Adams, WI - Union Pacific

Criteria 3: Highway access: Interstate 94 is 25 miles away by two lane WI state highways 13 and 32. Interstate 39 is about 16 miles using WI-13 and WI -21, Access to WI 13 is a 6 tenths of a mile trip on a two-lane road with residences on the north side. An alternative route to avoid the residential area is to have an entrance at May Street off Highway 13. This highway runs through the middle of Adams and is only two lanes.

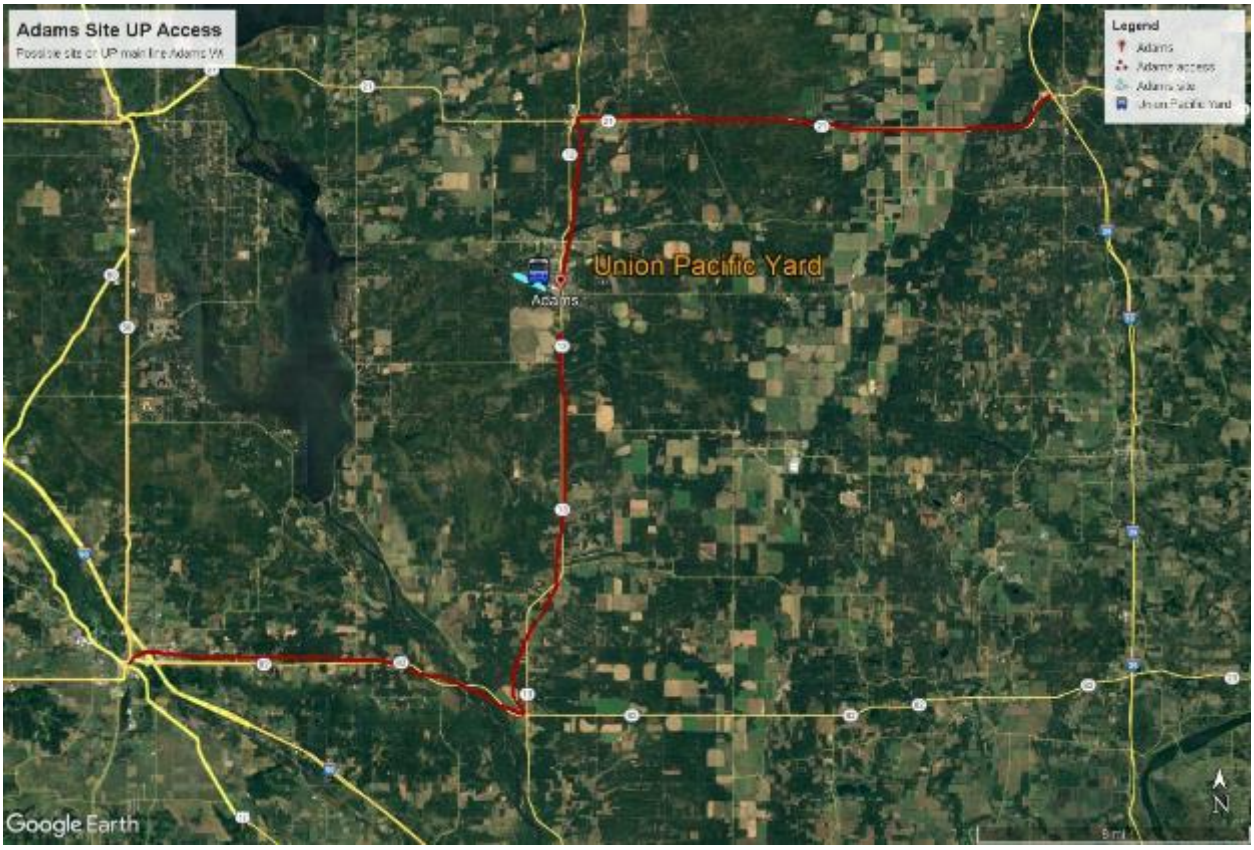


Figure 108 Adams, WI Union Pacific Access

Criteria 4: Drayage distance: Adams is 210 miles from Minneapolis and 222 miles from Chicago, 185 miles from New Richmond, WI and 73 miles from CN's Chippewa Falls intermodal terminal.

Criteria 5: Catchment area: The catchment area could spread out about 100 miles north and northeast, 40 miles northwest and roughly 35 miles south. The catchment area would have a population base of about 800,000 to 1 million people.

Criteria 6: Keystone customers Within the catchment area of this possible terminal location are industries in Stevens Points, Wisconsin Rapids, Oshkosh, Fond Du Lac, Wausau, Mosinee, and Waupaca that ship out of the area. Green Bay is 131 road miles away and would normally be outside of the catchment area but if the only other option is draying to Chicago, then this location could work depending on the intermodal lane. There are distribution centers in Tomah about 55 miles away.

Criteria 7: Terminal support. Most of the area around the proposed location is zoned industry with open land. There may be opposition to the increased truck traffic on Highway 13 through town. Without the support of WisDOT in addressing the bridge clearance issues in the Milwaukee area this site could not use double stack container cars.

Figure 109 Adams Drayage 30 Miles (White) Catchment Area (Yellow)

Adams, WI Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals
UP	1 no DBL Stack	4	3	3	2	3	3	**19**

Figure 110 Adams, WI Site Rankings

Tomah WI - CPKC Served

Criteria 1: Class 1 Connection: Tomah is on CPKC's primary line running between Milwaukee and the Twin Cities. When visiting the terminal in May 2023 a UP coal train with UP locomotives passed through. The extent of UP's trackage and/or haulage rights are unknown. A shared terminal is possible but unlikely.

Criteria 2: Available Land: CPKC owns the property at 205 N Superior Ave Tomah 54660 (Parcel 286000860000) that has approximately 33 acres north of and adjacent to CPKC's primary line. On this property there are 4 spur lines all 1000 feet or more and a small transloading facility. This property is located west of U.S. Highway 12.

CPKC also owns a 30-acre (parcel 286000460000) property north and adjacent to their tracks on the east side of U.S. Highway 12. There are several leases at this address of 111 N Superior Ave Tomah 54660. South of the primary tracks from the possible intermodal terminal is the Amtrak Tomah station. There is no siding for the station. The greenfield space for a potential terminal could handle more than 20,000 annual lifts with development. There may be leases on the property.

Figure 111 Tomah, WI CPKC Site

Criteria 3: Highway access: Interstates 90 and 94 are less than 2 miles away accessed by U.S. Highway 12. The north route to the interstates is four lanes wide and travels through primarily commercial districts.

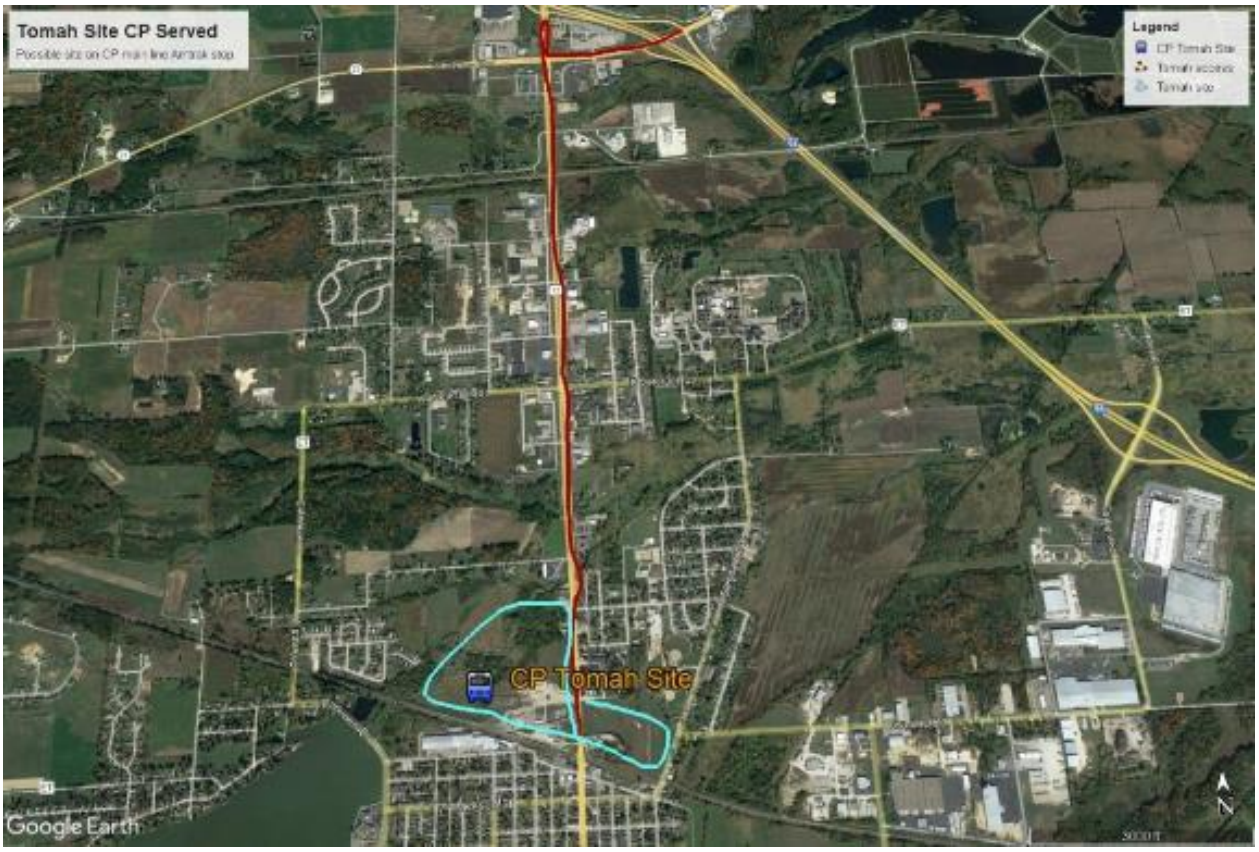


Figure 112 Tomah, WI CPKC Site Access

Criteria 4: Drayage distance: Minneapolis is 170 miles distant, CN's Chippewa Falls is 90 miles north and Chicago is 250 road miles away. The Fox River valley is 120 miles from Tomah.

Criteria 5: Catchment area: The Catchment area would spread out as far northeast as Wausau, east to the Wautoma, south to the Wisconsin Dells and west to La Crosse. However, La Crosse traffic would have a toss-up to use Twin Cities terminals depending on dray rates. Businesses east of Wautoma would likely dray directly to Chicago. The population base in the catchment area is approximately 800,000 to 1,000,000.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are industries in Stevens Points, Wisconsin Rapids, La Crosse, Wausau, Mosinee, and Waupaca that ship out of the area. This is not a high population density area for inbound freight except for the La Crosse area. Walmart has a distribution center in Tomah. Of note is that in Tomah, with a population of less than 10,000 people, there are nine trucking firms with transfer facilities. These trucking firms include Old Dominion, XPO, Marten Transport, Rehrig Penn Logistics, J&R Schugel Trucking, TC Transport, Dayton Freight, Holland, and Center Transport.

Criteria 7: Terminal support. This location supports transportation, and the site is not adjacent to any residential properties. Opposition would be unlikely.

Figure 113 Tomah, WI Drayage 30-Miles (White) Catchment Area (Yellow)

Tomah, WI Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals
CPKC	4	4 may have lease	5	5	2 low volume lane imbalance	3	4	**27**

Figure 114 Tomah, WI Site Ranking

Necedah WI – UP + CN Served

Criteria 1: Class 1 Connection: Necedah is located at the Juncture of UP primary line and a CN Branch line. UP's line runs E-W and CN's branch line runs N-S. An unresolved issue with UP is their inability to run double stack intermodal trains south from this location. Bridge clearance in south-east Wisconsin prevents the use of double stack cars.

Criteria 2: Available Land: There is no railyard in Necedah. UP owns about 3 acres of vacant land abutting the south side of their rail line. Just south of Necedah city center is a circular rail spur encompassing an area of about 40 acres. The area inside the loop is owned by the city of Necedah. This loop connects to both CN and UP's rail line with both railroads owning sections of it. CN may oppose UP using their portion of the loop to serve a competing intermodal terminal less than 150 miles from CN's Chippewa Falls terminal. The city of Necedah owns about 40 acres of vacant land to the west of the loop and adjacent to the loop and UP's primary line. This would constitute a greenfield development on public land. Parts of the land are low and may be subject to wet spots and would need filling.

Figure 115 Neenah Public Site

Criteria 3: Highway access: Interstates 90 and 94 are 12 miles away by WI state highway 80 that joins the interstate in New Lisbon, WI. This is a two-lane highway used by farm vehicles.

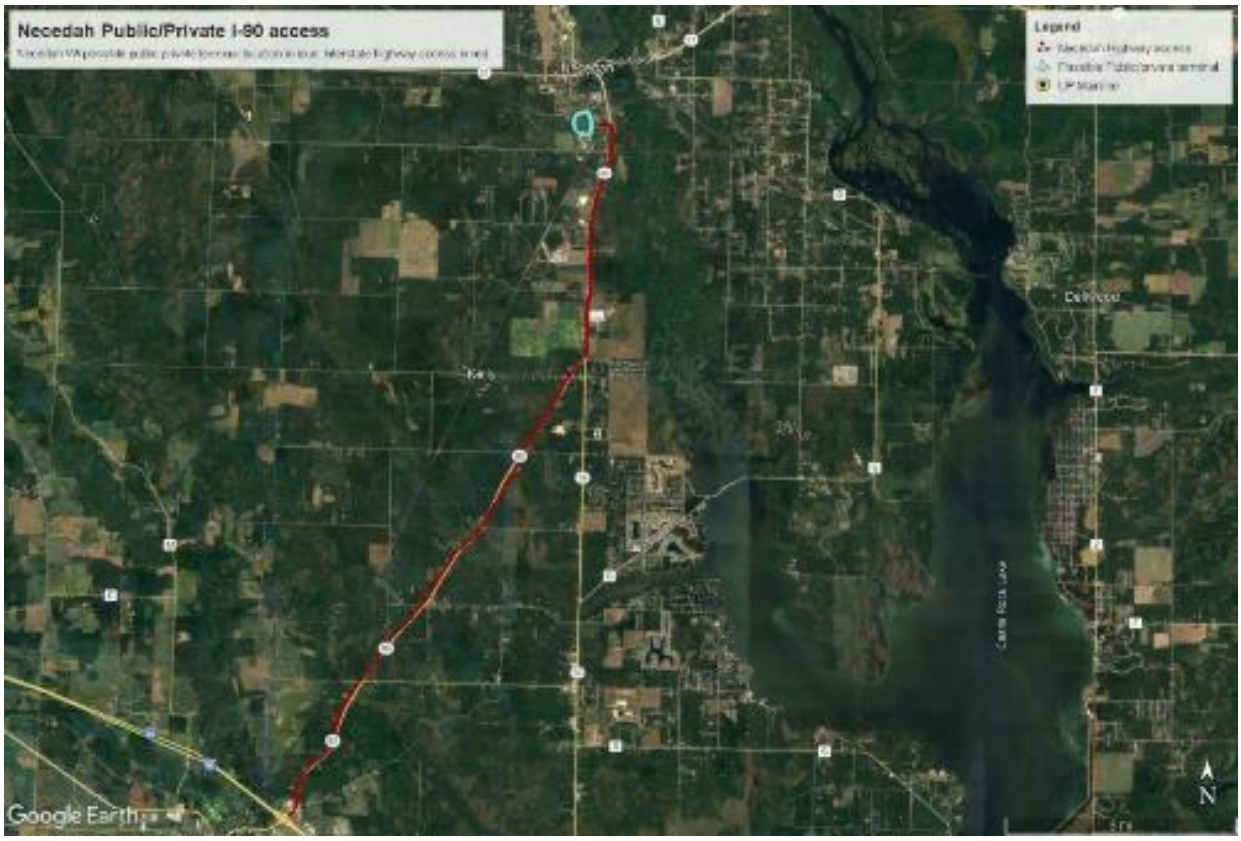


Figure 116 Necedah, WI Highway Access

Criteria 4: Drayage distance: The proposed Necedah location is 190 miles from Minneapolis and 230 miles from Chicago, 94 miles from Madison and 110 miles from CN's Chippewa Falls intermodal terminal.

Criteria 5: Catchment area: The Catchment area would spread out as far north as Wausau, east to the Wautoma, South to the Wisconsin Dells and west to La Crosse. However, La Crosse traffic would have a toss-up to use Twin Cities terminals depending on dray rates. Businesses east of Wautoma would likely dray directly to Chicago. The population base is about 900,000.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are industries in Stevens Points, Wisconsin Rapids, La Crosse, Wausau, Mosinee, and Waupaca that ship out of the area. This is not a high population density area for inbound freight except for the La Crosse area. There are distribution centers in Tomah that is about 28 miles away.

Criteria 7: Terminal Support A lot of unknowns about this potential public private site. Any progress would require the active support of the community as there is no rail infrastructure in the area. Without the support of WisDOT in addressing the bridge clearance issues in the

Milwaukee area this site could not use double stack container cars. A low ranking has been selected because of the unknowns and inability to double stack.

Figure 117 Necedah, WI Drayage 30-Miles (White) Catchment Area (Yellow)

Necedah Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable Land	Criteria 3 Road Access	Criteria 4 Drayage Distance	Criteria 5 Catchment Area	Criteria 6 Keystone Customers	Criteria 7 Terminal Support	Totals
UP	1 no siding & No doubles stack	3 Public	3	3	2	3	2	**17**

Figure 118 Necedah, WI Site Ranking

Central Region Summary

Terminals in the Central region of Wisconsin have a smaller population base to support inbound container traffic creating lane imbalance. The terminal locations will require significant drayage

on two lane highways to link with cargo generation locations and warehouses. These sites currently truck cargo long distances, and an intermodal terminal may provide a cost-effective alternative for shippers. UP's yard in Adams or CPKCKC's yard in Tomah have the most potential in terms of available land. UP is hampered by its inability to provide double stack service to Chicago. There would need to be enough intermodal lifts to make a reasonable ROI for the railroad.

IV. Western Area

Altoona, WI – UP Served

Criteria 1: Class 1 Connection: Altoona is on UP's primary line connecting the Twin Cities and Milwaukee. An unresolved issue with UP is their inability to run double stack intermodal trains south from this location. Bridge clearance in south-east Wisconsin prevents the use of double stack cars.

Criteria 2: Available Land: There is a large railyard in Altoona owned by UP. An increase in shipments of Frac sand resulted in upgrading both ends of the yard including new leads, longer leads, CTC signals, added capacity, and installed yard lighting.[xi] There is about 20 acres of land around the site of a former roundhouse that is either used for parking, track lay down or is vacant.

Figure 119 Altoona, WI Union Pacific Site

Criteria 3: Highway access: Interstate 94 is four miles away by four lane U.S, Highway 53. Access to U.S. 53 is a mile trip on a two-lane road with residences on the east side.

Figure 120 Altoona, WI Highway Access

Criteria 4: Drayage distance: Altoona is 96 miles from Minneapolis and 315 miles from Chicago, 72 miles from New Richmond, WI and 14 miles from CN's Chippewa Falls intermodal terminal.

Criteria 5: Catchment area: The catchment area would spread out 50 miles west, 70 miles south and east. The northern area would be limited to traffic not going to the Pacific Northwest. With another UP yard only 99 miles away the catchment area for new traffic would be limited. The population base is about 1 million people.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are industries in Stevens Points, Wisconsin Rapids, La Crosse, Wausau, Mosinee, and Waupaca that ship out of the area. This is not a high population density area for inbound freight except for the La Crosse area. There are distribution centers in Tomah that is about 28 miles away.

Criteria 7: Terminal support. Truck traffic would have to pass through several residential areas near the terminal. Without the support of WisDOT in addressing the bridge clearance issues in the Milwaukee area this site could not use double stack container cars heading towards Chicago.

Figure 121 Altoona, WI Drayage 30 Miles (White) Catchment Area (Yellow)

Altoona Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals
UP	1 No Double Stack	4	4	2 – Twin Cities CN terminal	3 Compete with Twin Cities	3	3	**20**

Figure 122 Altoona, WI Site Ranking

La Crosse, WI – BNSF and CPKC service

Criteria 1: Class 1 Connection: La Crosse has both CPKC and BNSF primary rail lines intersecting each other.

Criteria 2: Available Land: La Crosse has good-sized rail yards. The BNSF rail yard has land with minimal usage west of and adjacent to the marshalling yard that runs north south. This space is over 40 combined acres. CPKC has a marshalling yard running northeast to southwest. Most of this yard's space is taken up by track. Adjacent land to the southeast is in low lying possible wetland area. The status of haulage or trackage rights between CPKC and BNSF is unknown for this location. CPKC does not appear to have sufficient vacant land to build a terminal. BNSF could build a terminal that could handle more than 30,000 lifts annually. This location is surrounded mostly by commercial zones.

Figure 123 LaCrosse, WI Site

Criteria 3: Highway access: Access to the BNSF site if via Gillette Street to Wisconsin Highway 60 to Interstate I-90 that is about 3 miles from the yard. Access to the potential site passes through minimal residential area and the roads are four lanes for virtually the entire route.

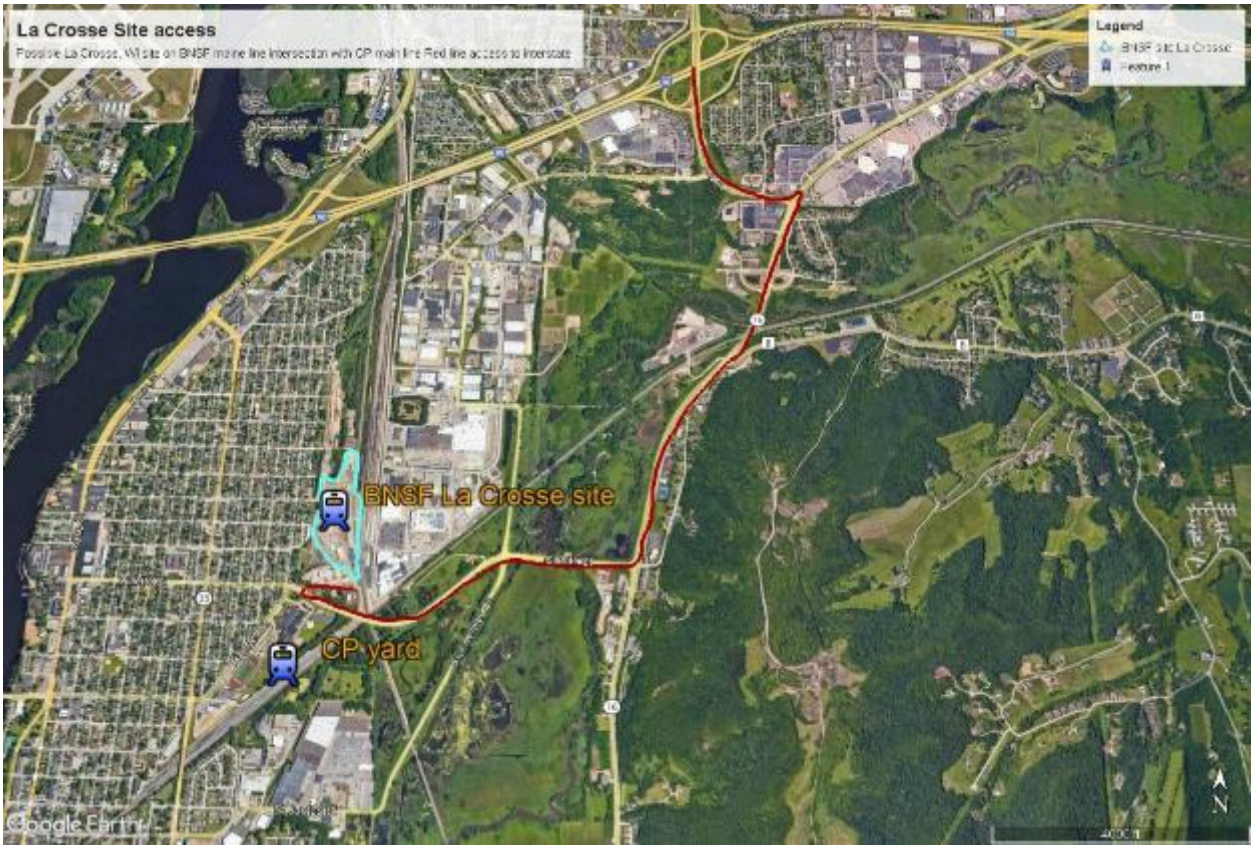


Figure 124 LaCrosse, WI Highway Access

Criteria 4: Drayage distance The BNSF and other Twin Cities terminals are 150 miles away and CN's terminal in Chippewa Falls is 100 miles north. The CN served a private intermodal terminal in Arcadia; WI is only 43 miles to the north. The UP and Iowa Northern Railway served Butler Logistics Park intermodal terminal in Shell Rock; IA is 130 miles by road. Chicago terminals are 290 miles.

Criteria 5: Catchment area BNSFs terminal in Midway is 120 miles away. The large population base is in the Twin Cities and the area between La Crosse and the eastern suburbs of the Twin Cities is growing. This would provide some inbound boxes. This potential site could support the BNSF terminal in St. Paul by taking on customers near Winona and 50 miles south of La Crosse along the Mississippi River. The catchment area could extend north and west to within 50 miles of the Twin Cities, with a 75-mile radius circle from the Mississippi river east. The population base would be about 1.5 million people.

Criteria 6: Keystone customers Within 75 miles of this possible terminal location are numerous industries that ship out of the area. BNSF would not establish an intermodal terminal that would take customers from its St. Paul terminal. A new terminal would need to generate new traffic and not spin off traffic from existing terminals to be attractive to a railroad. When the

BNSF terminal reaches capacity, this location would offer an option to provide additional service.

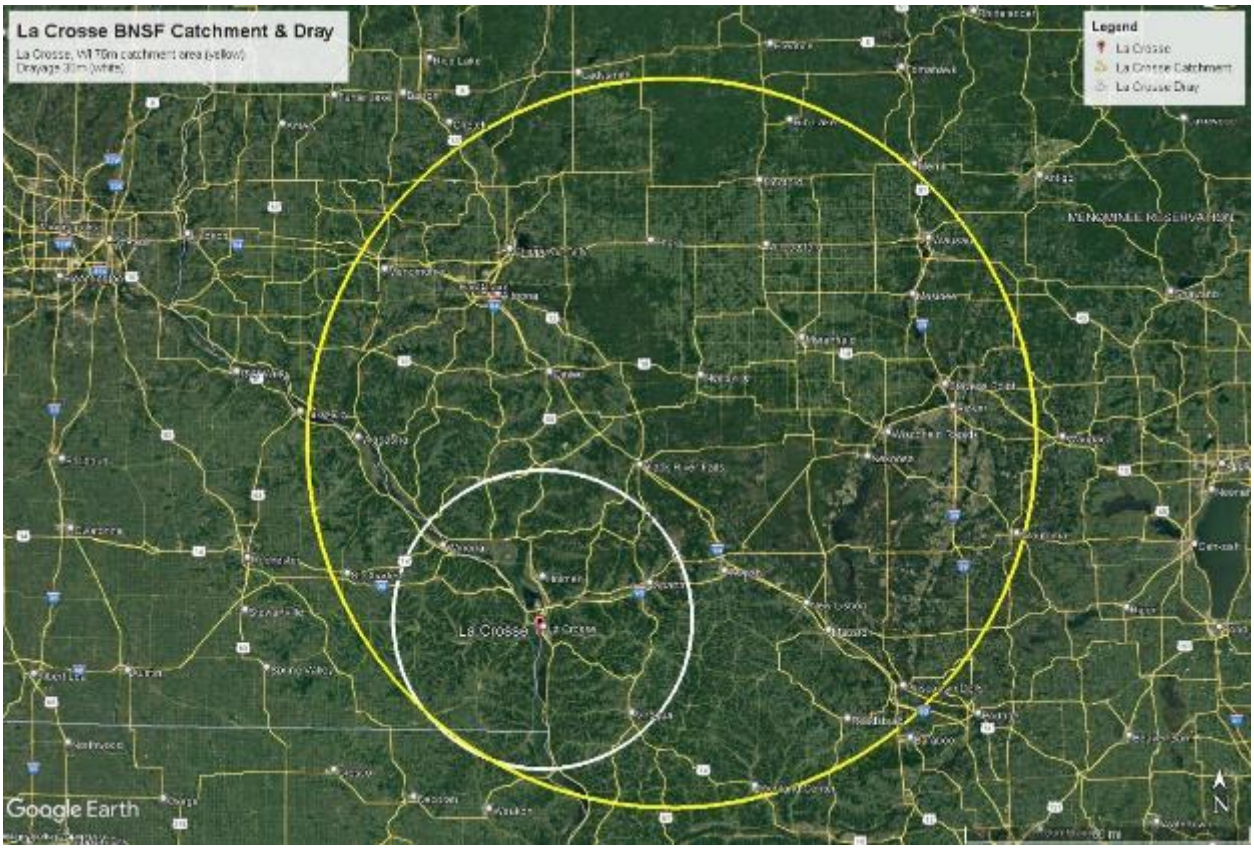


Figure 125 LaCrosse, WI Drayage 30 Miles (White) Catchment Area (Yellow)

Criteria 7: Terminal support. Most of the area around this proposed location is zoned commercial and access to the site is not through residential areas. Opposition to an intermodal terminal would be unlikely.

La Crosse, WI Possible Terminal Location	Criteria 1 Connect To Class 1	Criteria 2 Suitable land	Criteria 3 Road access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals
BNSF	5	5	5	4 Compete with Twin Cities & CN Terminals	3 Compete with Twin Cities & CN Terminals Future potential when Midway full	3	4	**29**

Figure 126 LaCrosse, WI Site Rankings

Winona, MN – CPKC Served

Criteria 1: Class 1 Connection: Winona is on a CPKC primary line. CPKC's intermodal trains running north south pass through this community. There may not be enough siding distance to stop and service an intermodal unit train.

Criteria 2: Available Land: There are several CPKC marshalling yards and spurs. The largest on a branch line north is 15.77 acres (Parcel 323208310) with virtually all the area taken up by tracks. The other yards with track Some of the spurs may be privately owned. The rail line follows the Mississippi river front allowing little if any development to the east of the line. The parcels on the primary line around the Winona Amtrak train station (Mark and Main St.) are only about 9 acres with two spurs and building. The siding is used by Amtrack. This site is surrounded by residential housing. Vacant land adjacent to either site is minimal. This location would have difficulty handling 10,000 lifts annually.

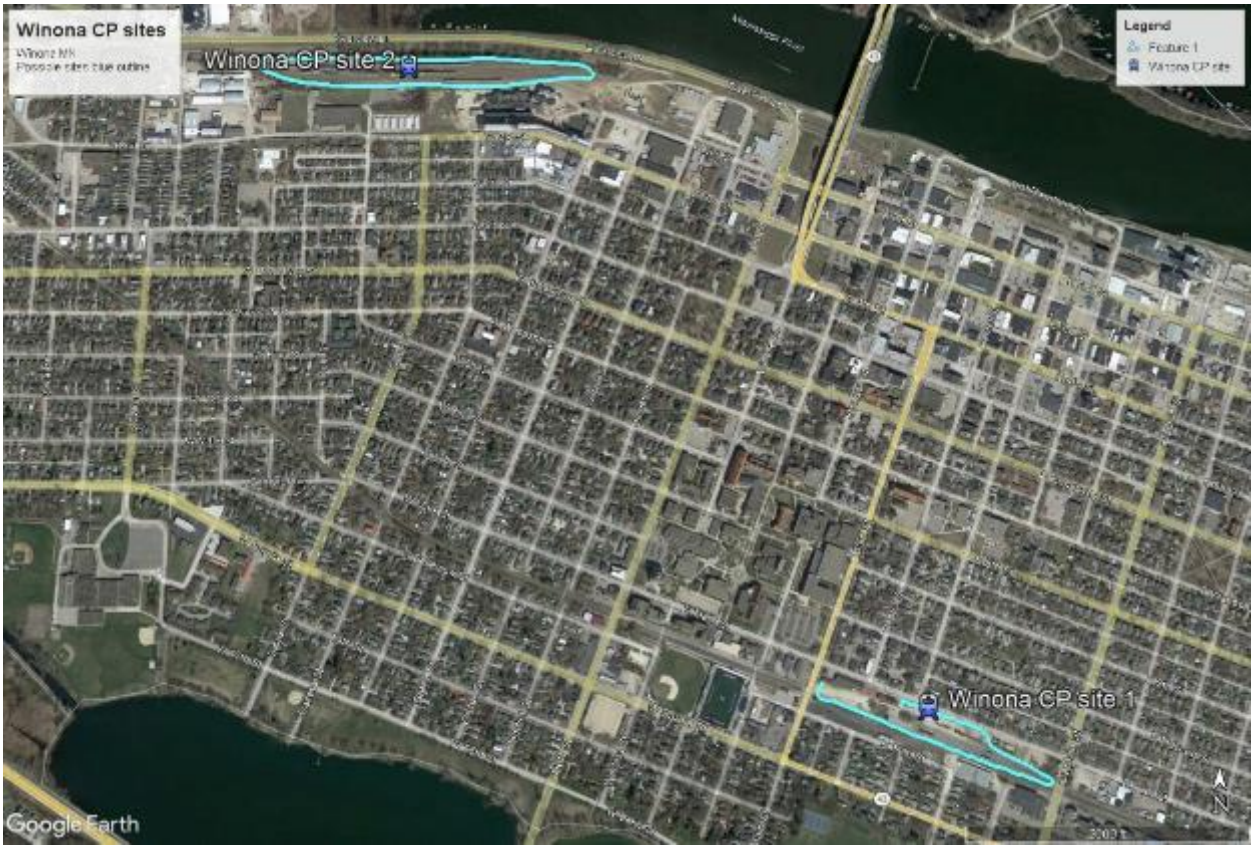


Figure 127 Winona, MN CPKC Sites

Criteria 3: Highway access: US Highway 14 is 2- 4 miles from the possible sites. Access to either potential site would require that trucks pass through residential and light commercial areas on city streets.

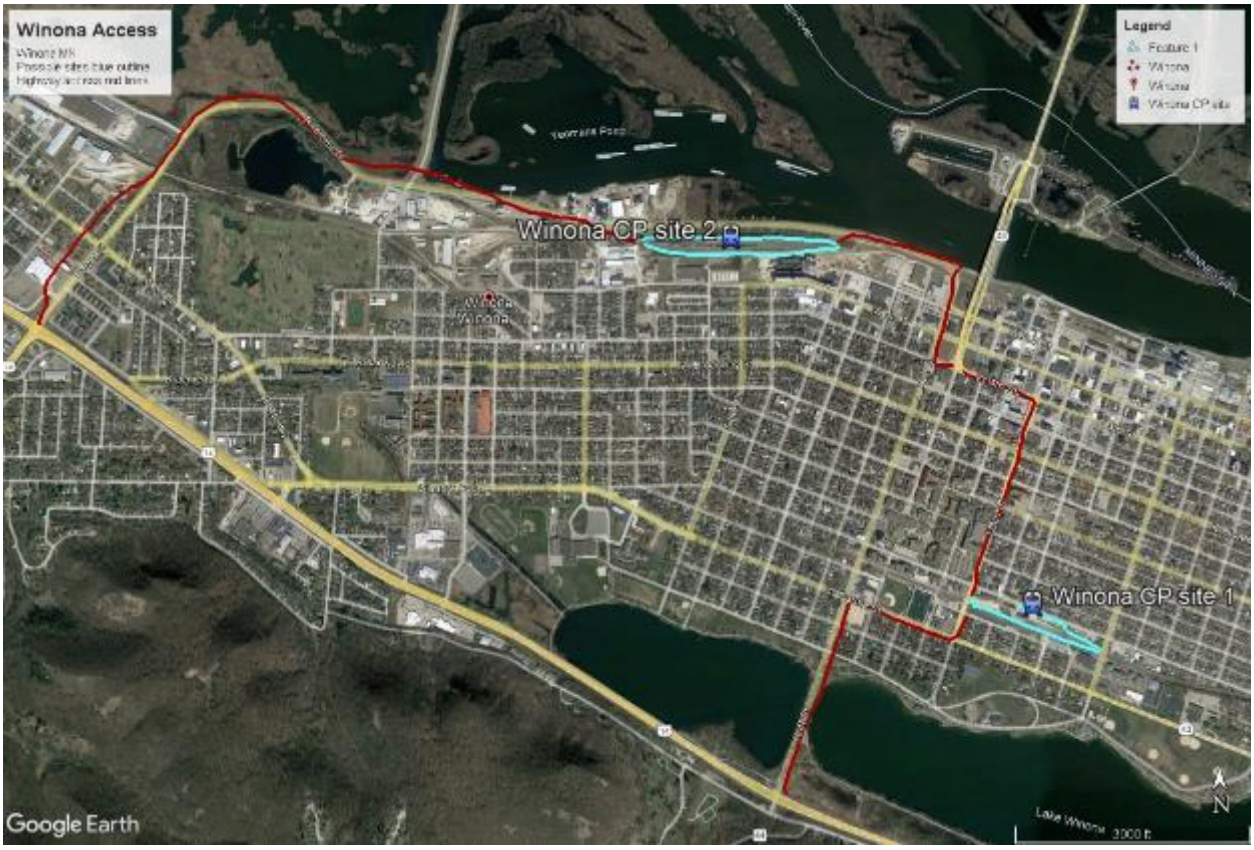


Figure 128 Winona, MN Site Access

Criteria 4: Drayage distance Interstate I-94 is 81 miles away and I-35 is 57 miles from Winona. This location is 200 road miles from southern Chicago terminals, 187 miles from Chippewa Falls and 124 miles from CPKC's Minneapolis Terminals. CN's Chippewa Falls and Arcadia terminals are 80- and 26-miles Northeast respectively.

Criteria 5: Catchment area This community is on CPKC's primary line but only 124 miles from Twin Cities intermodal terminals including CPKC's. The UP and Iowa Northern Railway served Butler Logistics Park intermodal terminal in Shell Rock; IA is 151 miles by road. The Catchment area would spread out about 20 miles north, 100 east, 50 west, and about 70 miles south. There is also the potential for container barge operations. While river container movement is popular in other parts of the world it has never gained traction in the U.S. River container movement would probably be viewed as rail competitive rather than collaborative. The population base would be between 800,000 and 1 million. The large population base is in the Twin Cities. The probable low number of inbound boxes to this possible site would be an issue.

Criteria 6: Keystone customers Within 100 miles of this possible terminal location are numerous industries that ship out of the area. CPKC would be unlikely to establish an intermodal terminal that would take customers from its St. Paul terminal. A new terminal would need to generate new traffic and not spin off traffic from existing terminals to be attractive to a railroad.

Criteria 7: Terminal support. Most of the area around this proposed location is zoned residential or light commercial and is quite built up. The increased noise and truck traffic would change the character of the area and opposition would be likely.

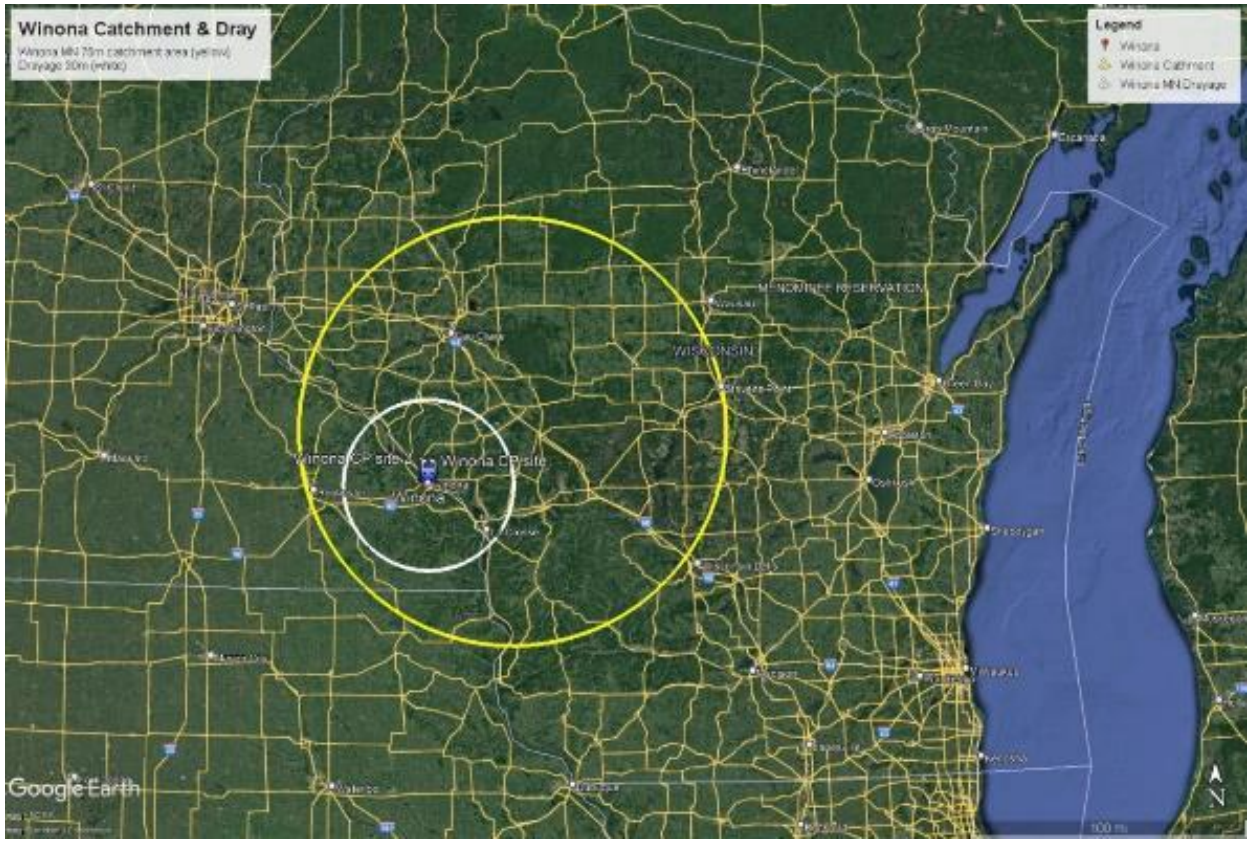


Figure 129 Winona, MN Drayage 30 Miles (White) Catchment Area (Yellow)

Winona, MN Possible Terminal Location	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Road access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone Customers	Criteria 7 Terminal Support	Total
CPKC	4	2	3	2 Competes with CPKC Twin Cities & CN Terminals	2 Competes with Twin Cities CPKC & CN Terminals	2	3	**18**

Figure 130 Winona, MN Site Rankings

Western Region Summary

Altoona has significant terminal options but is close to UP's intermodal termina in the Twin Cities. This location could be an option for another domestic lane but the barrier to double stacking is and issues. BNSF will run out of space in the Twin Cities in the future and the La Crosse location may provide an option for expansion. Winona has very limited open terminal space and is within 150 miles of CPCK's Twin Cities terminal. Highway access to Winona for Wisconsin non-agricultural produces is a problem.

4.0 Recommendations and Significant Findings

Intermodal rail investment reduces highway congestion, saves taxpayer dollars spent on highway maintenance and is the most environmentally responsible way to ship freight by land. The development of intermodal service has long been considered an economic development tool. Wherever double-stack height restrictions exist it is in the economic and public interest of both the State and the carrier(s) to eliminate those barriers to commerce. Elimination of rail clearance limits will provide freight shippers access to lower cost transportation networks and can extend the market reach of the State's producers and consumers.

Double-stack clearance projects have been completed with federal funding for decades. Two of the most notable multi-state projects included the NS Heartland Corridor which was awarded $83 million in federal funds in 2011 and the CSX National Gateway Corridor which was awarded $98 million in 2010. The State of Pennsylvania supported double-stack clearances for Conrail to connect the Port of Philadelphia to destinations in the Midwest. These public/private initiatives require willing partners to address the cost of infrastructure and service design.

1. A **CHAMPION** needs to be identified to advocate, coordinate and promote interest at the local level. Once user interest is confirmed, an understanding of service requirements and lanes for service is essential. Intermodal service requires coordination of the freight shippers, receivers, transportation service providers and equipment owners. For the service to be sustainable each party must be profitable.
2. The **STATE HAS SIGNIFICANT INFLUENCE** in project permitting, development of highway corridors and freight networks. In studies exploring terminal development, railroad companies are accustomed to working directly with State agencies on large transportation projects, because the state control transportation networks and have policy-making and taxing authorities. State backing is essential for undertaking an intermodal development.
3. **FEDERAL GRANT FUNDING** is more available now than at any time in recent history. To obtain funding, the calculated public benefit must be greater than the cost of the proposed infrastructure improvements. This will require local level support and

cooperation. If the clearance restrictions are to be addressed in Milwaukee it will take the joint efforts of passenger and freight advocates to mobilize public support.

4. The **STATE FREIGHT AND RAIL PLANNING DOCUMENTS** must include infrastructure-related restrictions and identify the public need for them to be remediated.
5. This report identifies a number of rail sites that may benefit from further development and or investment in multimodal freight solutions. Some sites represent opportunities for transload operations if intermodal service is not viable. **THESE SITES SHOULD BE IDENTIFIED AND SHARED WITH WISCONSIN ECONOMIC DEVELOPMENT LEADERS TO PROMOTE RAIL ACCESS IN THE STATE.**
6. The **STATE SHOULD ACTIVELY ENGAGE THE CLASS 1 RAILROADS** to address Class 1 rail investments in corridors and terminals that improve freight and passenger mobility utilization?.
7. Quantified data of interstate truck movements originating and terminating at the Chicago Intermodal terminals does not exist and therefore the justification of intermodal volumes which originate or terminate in neighboring states cannot be captured. **WISCONSIN SHOULD WORK WITH ILLINOIS TO IDENTIFY SOLUTIONS TO THIS DATA DEFICIENCY.**
8. **LOCAL AND REGIONAL GOVERNMENTS PLAY A KEY ROLE** in identifying freight stakeholder transportation needs and developing visionary solutions to strengthen the existing network to meet those needs. Specialized assistance will be needed to help these organizations obtain the public ing needed to develop rail projects.

The figure below depicts forecasted total U.S. freight movements out to the year 2040, per the US Department of Transportation. Based on population and economic growth, the need for freight handling facilities will continue to increase. It can take years to design, plan, permit and build new facilities or address infrastructure limitations.

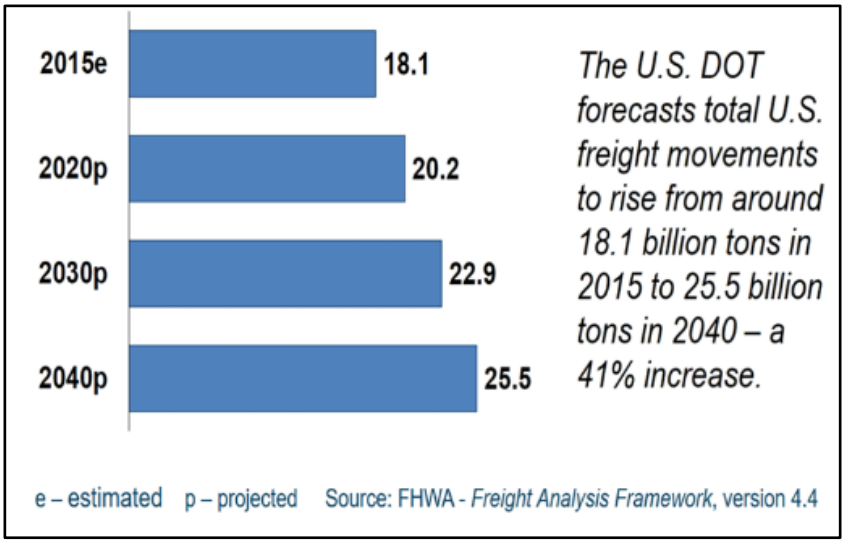


Figure 131 Freight Movement Forecast