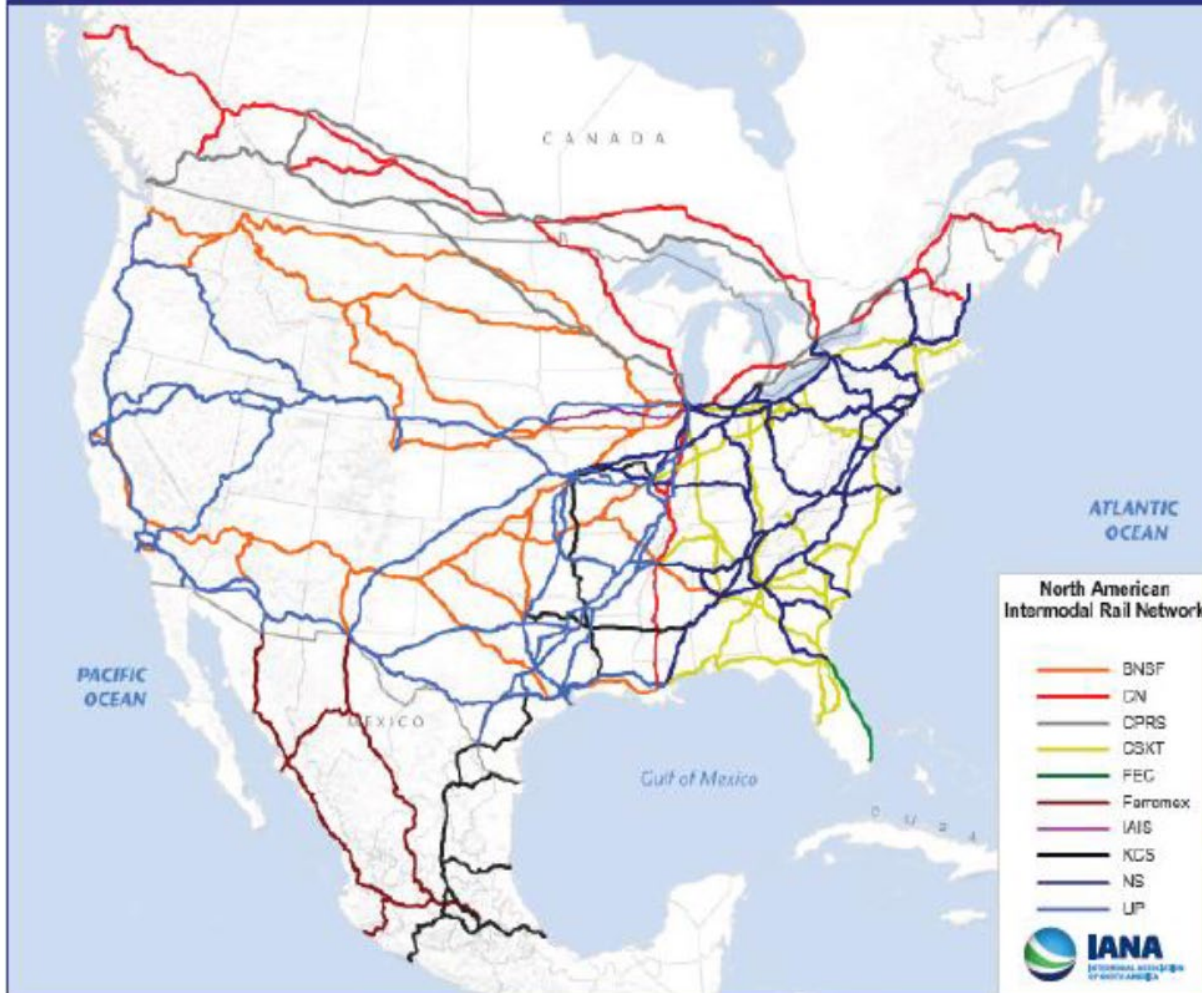


NCWRPC INTERMODAL ANALYSIS

—◆—
November 7, 2023

WisDOT Rail Meeting
Madison, Wisconsin

North American Intermodal Rail Network



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INTERMODAL By The NUMBERS

\$55 Billion Annual Industry Revenue

350 + Marine and Inland Terminals

10,000 #3PLs/\$11 Billion in Revenue

A fleet of 2 million containers/61 Providers

18 million loads moved by rail annually

531,000 Drivers/14,000 Drayage Co's

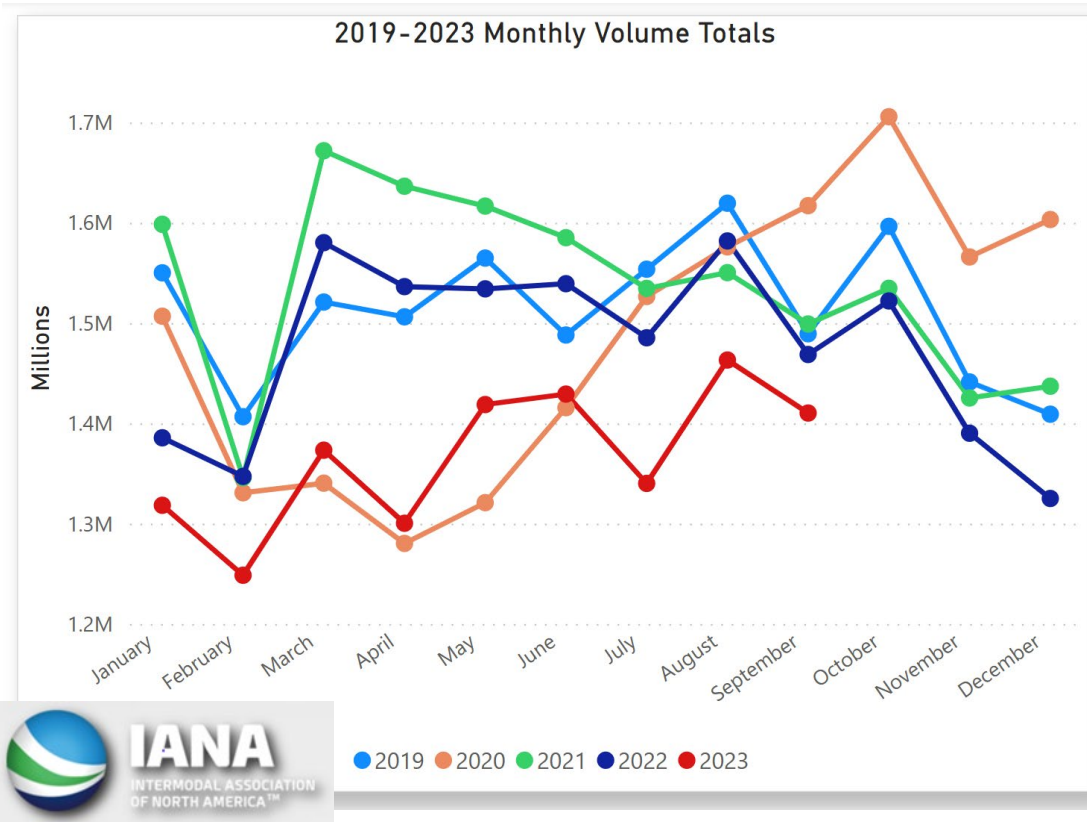
98 million drayage moves annually

\$20 Billion in annual drayage revenues

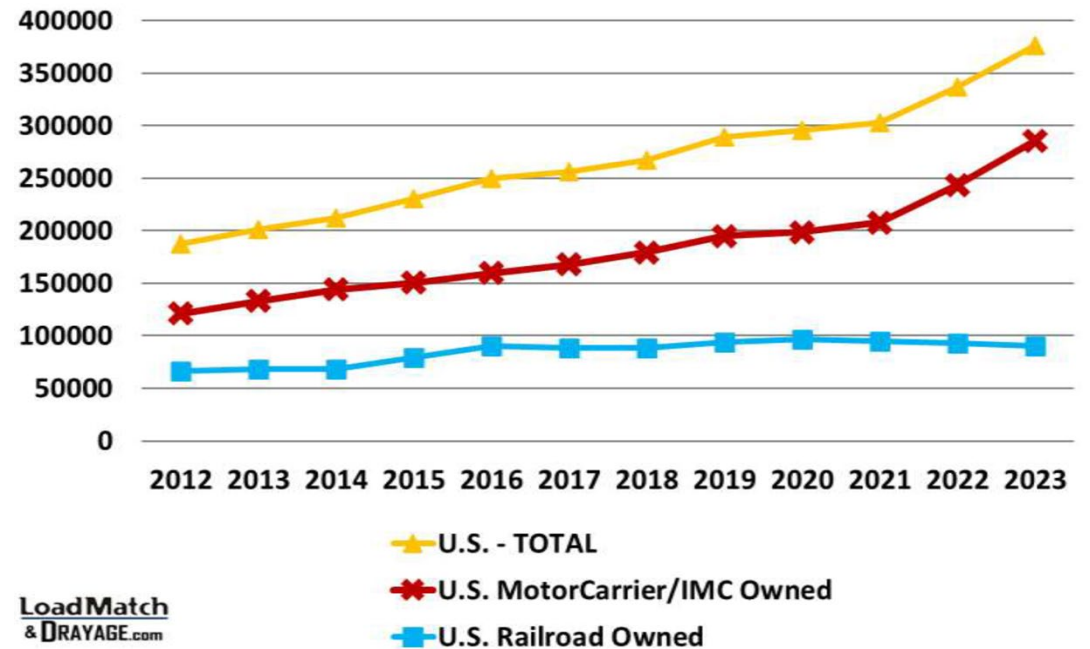
202,000 Loaded Marine TEUs/day

757,358 Chassis registered in the UIIA system

A Changing Business Model of Asset Ownership



Intermodal 53' Container Fleets - United States (dry, for railroad)



LoadMatch
& DRAYAGE.com

* in 11 years, the fleet has DOUBLED in size, in 2012 the 53' cntr fleet was 187,000 total *

Freight Recession?

September 2023	M/M	Y/Y	YTD
International	-3.8%	-10.2%	-11.9%
<i>Private Domestic Container</i>	<i>-3.3%</i>	<i>9.8%</i>	<i>2.2%</i>
<i>Rail Domestic Container</i>	<i>-5.1%</i>	<i>-11.1%</i>	<i>-21.0%</i>
Total Domestic Container	-3.6%	5.0%	-3.5%
<i>Short Trailer</i>	<i>-7.9%</i>	<i>-36.6%</i>	<i>-20.7%</i>
<i>53' Trailer</i>	<i>1.9%</i>	<i>-15.8%</i>	<i>-25.9%</i>
Total Trailer	-0.7%	-22.0%	-24.4%
Domestic	-3.4%	2.5%	-5.7%
Grand Total	-3.6%	-4.0%	-8.7%

*** Not adjusted for working day effects**

Key Drivers for Intermodal Expansion

Long Haul Intermodal Lane Opportunities For Study Region		
Service	Market Area	Estimated Highway Miles
Single Rail Line Carrier	Central Texas	1,166
Single Rail Line Carrier	S. California	2,106
Single Rail Line Carrier	Western TN	779
Single Rail Line Carrier	Kansas Missouri	611
Interline Service	Coastal Virginia	1,165
Interline Service	Central PA	939
Interline Service	New York New Jersey	1,070
Interline Service	Georgia	1,158

Note: Major flows include domestic and international freight moving by truck on highway segments with more than 25 FAF trucks per day and between places typically more than 80 miles apart. Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework (FAF), version 5.1. Flows include 42 different commodities represented in FAF.

- National Rail Plan identifies *mode shift opportunity*
- Railroads want new business from trucks
- New conversion success driven by *asset-based carriers & Freight Visibility*
- Workforce, energy, environmental, highway maintenance cost and congestion *create public benefit*

Findings

- *Double Stack Height Restrictions* in Milwaukee are barrier to intermodal expansion for Union Pacific Railroad. Train limits on key shared corridors.
- *Contractual Barriers* such as trackage rights, and haulage rights, limit routes and potential intermodal connections
- *New Marine liner service* to Port of Duluth
- CPKC merger *Strengthening North South Freight Lanes*
- *Economic Development Interest* in Intermodal Service is Growing
- Eight long-haul routes can generate sufficient *Density for New Intermodal Service connecting Wisconsin to global and domestic markets*
- Railroads are Seeking *Growth Opportunities* in a variety of partnership models

Methodology

METHODOLOGY

- Analyzed freight data
- Developed a location scoring model
- Applied the model to potential sites
- Peer Reviewed the Methodology
- Conducted Stakeholder Interviews
- Participated in Public Engagement

ECOSYSTEM LANDSCAPE

- Rail Network Capacity and Haulage Rights Agreements are Proprietary
- Physical Barriers (Clearances)
- Land Ownership/Commercial RE
- Merger impacts
- Growth in Private Container Fleets

Warehouse Locations

(Green)

Often Consolidates
Inbound Consumer
Products Cargo

Rail Tonnage

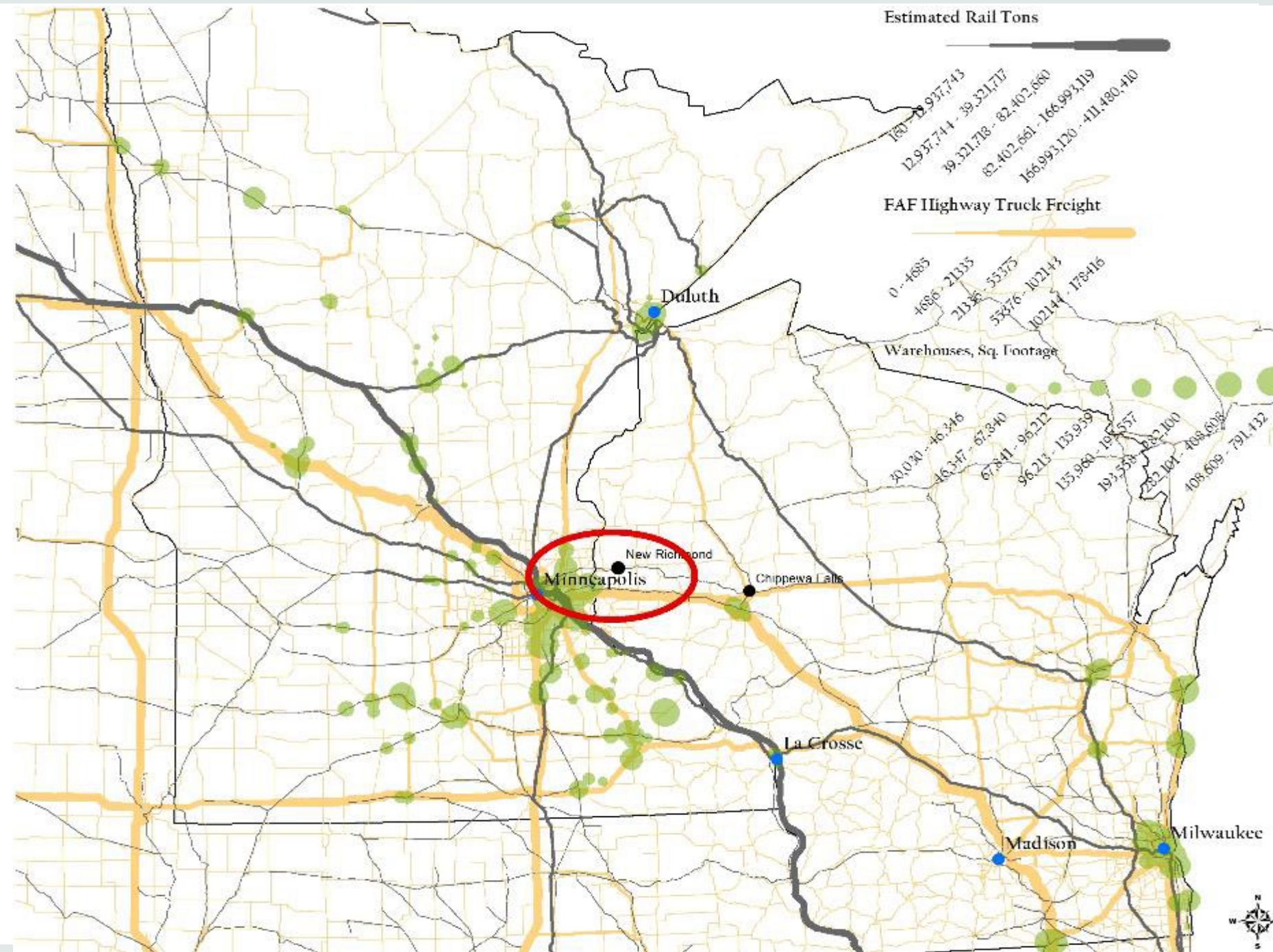
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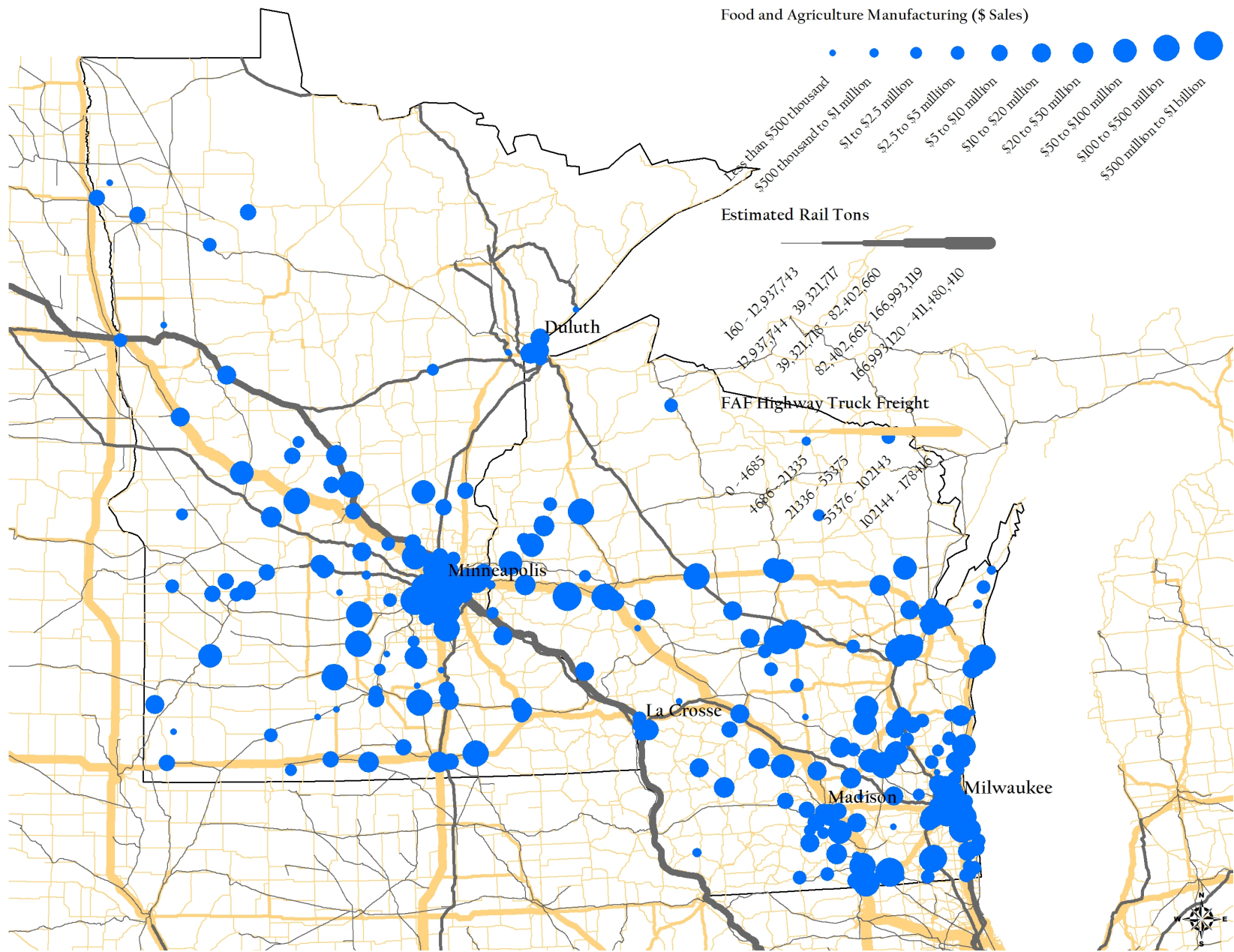
Note BNSF Dominance

Highway Tonnage

(Yellow)

Note confluence of
Highway and Rail in
Minneapolis





Food and Agriculture Shippers Ranked by Sales

500+ Locations from 2020-2021

Representative of outbound shipments

Terminal Requirements: Examples of Research Findings

- All public terminals in study region have either been *built on railroad owned land or public land*
Arcadia, WI is the exception - NOT open to the public
- Study region terminals each have *keystone customers*
- Railroads espouse a minimum of *20K annual lifts* for establishment but make exceptions in the study region
- *20K in lifts requires about 20 acres* depending upon stowage/lift system and chassis provisioning
- *Study region closure reasons:* below minimum lifts, insufficient lane balance, not meeting profitability thresholds or minimum return on investment
- Terminals may be established to serve either international, domestic or both operations.
International considered easiest and most profitable market
- All terminal have *double stack intermodal capability*
- Railroads usually, but not always *avoid opening internally competing terminals*
CN opened Acadia, Chippewa Falls, New Richmond less than 150 miles apart

Terminal Requirement Assessment Methodology

Step 1. Analyze Current Terminals & Identify Successful Attributes

- Terminal locations: Chippewa Falls-CN, Arcadia-CN, New Richmond-CN, Duluth-CN, Shoreham-CP, Midway-BNF, UP-Minneapolis

Step 2. Analyze Closed Terminals in region for Closure Rationale

- Terminal locations: Green Bay, Neenah, Stevens Point, Portage, Milwaukee

Step 3. Research Industry Heuristics for Establishing Terminals

- Length of haul, Acreage, Land suitability, Drayage, Lane balance, Catchment areas

Step 4. Develop criteria needed for terminal success and consider providing weighting scale for terminal variations

Step 5. Apply criteria to two existing regional terminals for beta testing

Step 6. Apply criteria to potential new locations in study region

Score Card Criteria	Defining Attributes
1. Connection to a Class 1 Railroad	Either located on Class 1 track or trackage/haulage rights to a Class 1 without double stack height restrictions. (Evaluation data – Railroad Maps/FRA Data)
2. Available Terminal Land	Land must be available and suitable for an intermodal terminal with 20K annual gate throughput. (Evaluation data – County Land Records)
3. Highway Access	Highway and bridge access to the terminal and to major highways needs to be suitable for loaded containers/trailers. (State Maps)
4. Drayage Distance	Drayage distance to the terminal from cargo generators is cost effective when compared to draying to other terminals. (Map Distances)
5. Catchment Area.	Population base that will generate sufficient containerizable cargo to justify an intermodal terminal. Internal competing terminals need to be 150 miles away. Ideally the catchment area will have inbound and outbound cargo approaching lane balance. Catchment area can vary by commodity and carrier.
6. Keystone Customers	The catchment area needs to have inbound and outbound cargo opportunities. Warehouses, distribution centers, production facilities and trucking firms as well as population density are indicators of a potential customer base.
7. Terminal Support	A new intermodal terminal is supported by private and governmental entities with incentives and public support. (public funding, zoning, outreach)

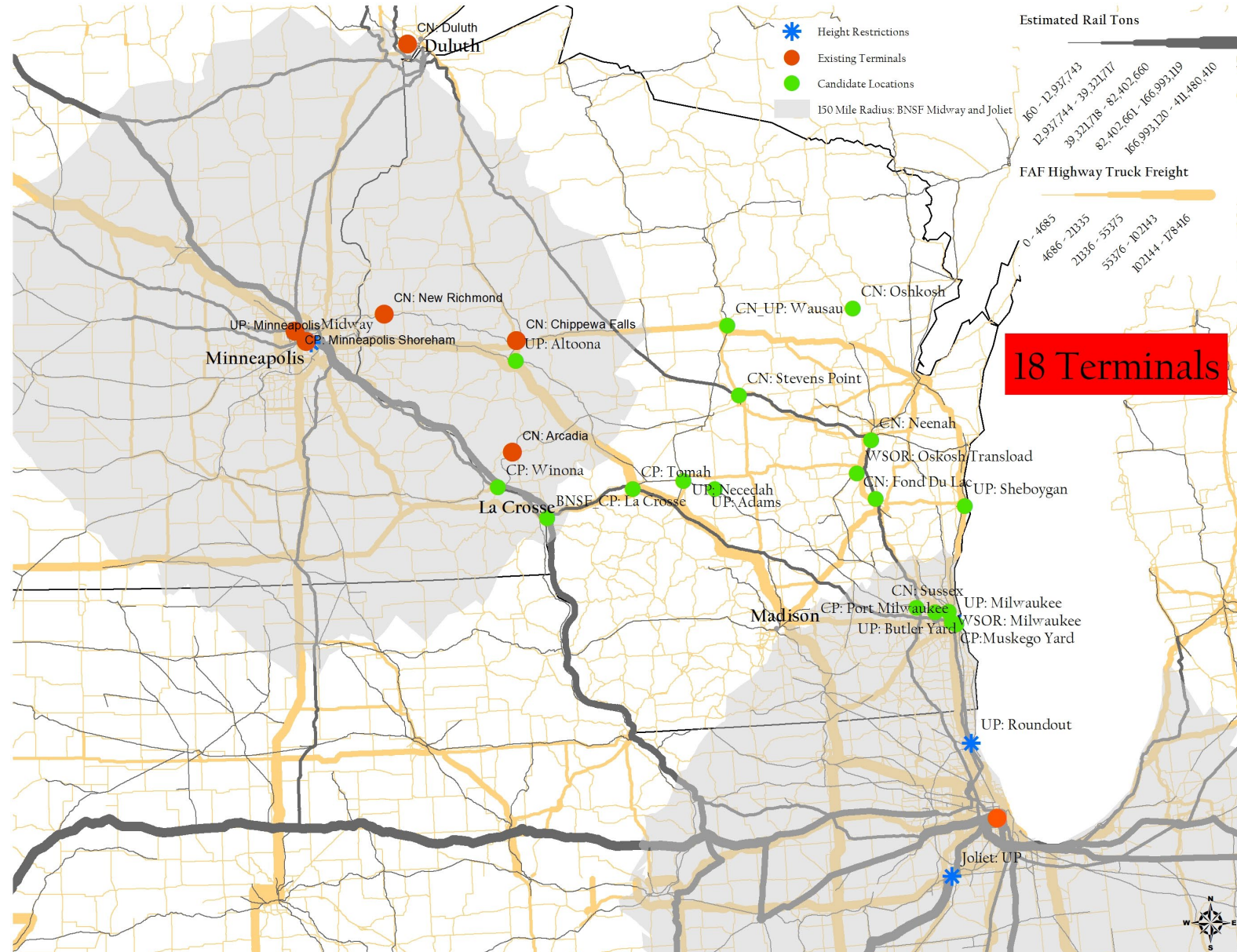
Criteria Applied to Existing Terminals in Study Region

	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	26
BNSF - Midway	5 – on main line	4 – no more room for expansion	5 – 3 m to Interstate	5 – >10 m mod congestion	5 – no BNSF competing terminals	5 – Hub & JB Hunt	4 – Residents want less truck traffic	33

This metric is a **comparative indicator of a terminal’s potential**. It is subject to changes for example in trade lanes, customer base, politics and economics. The **intermodal terminal must be financially viable for all parties** as an ongoing operation. These criteria will be applied to the study region’s potential locations.

Inventory of Potential Sites & Existing Terminals

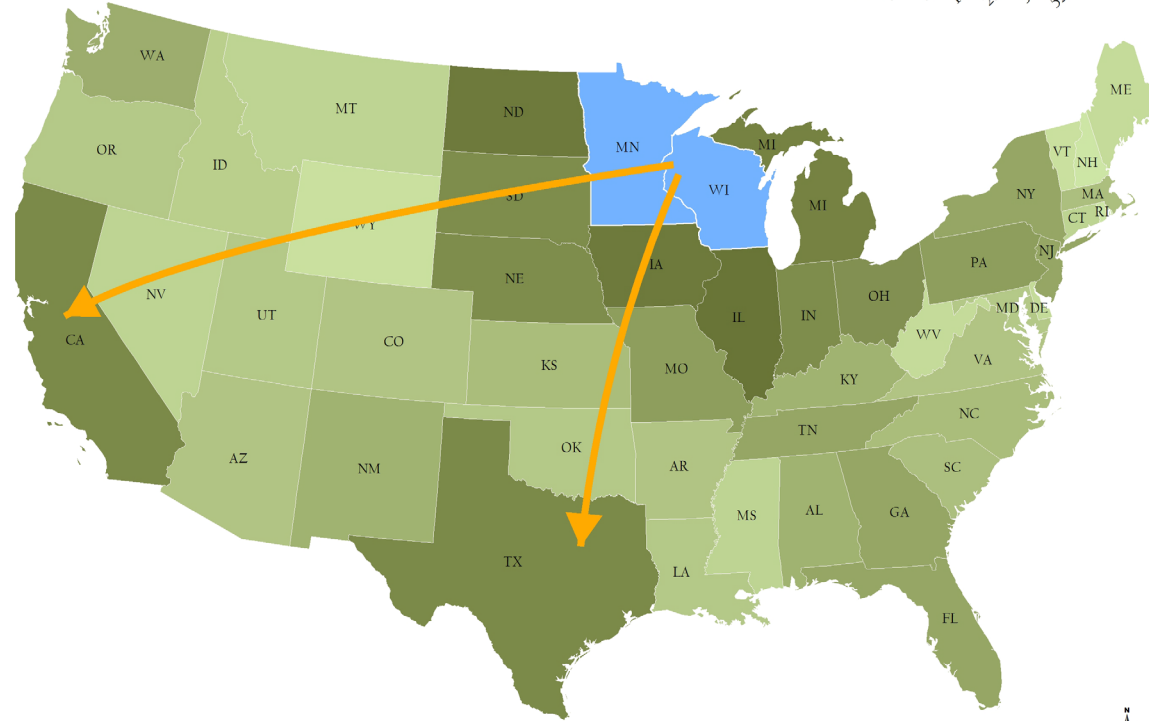
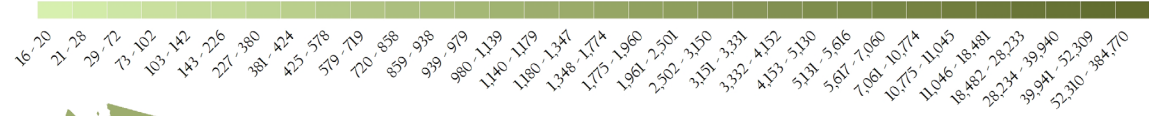
- Clearance Restrictions
- Rail Density
- Highway Freight Tonnage
- Catchment



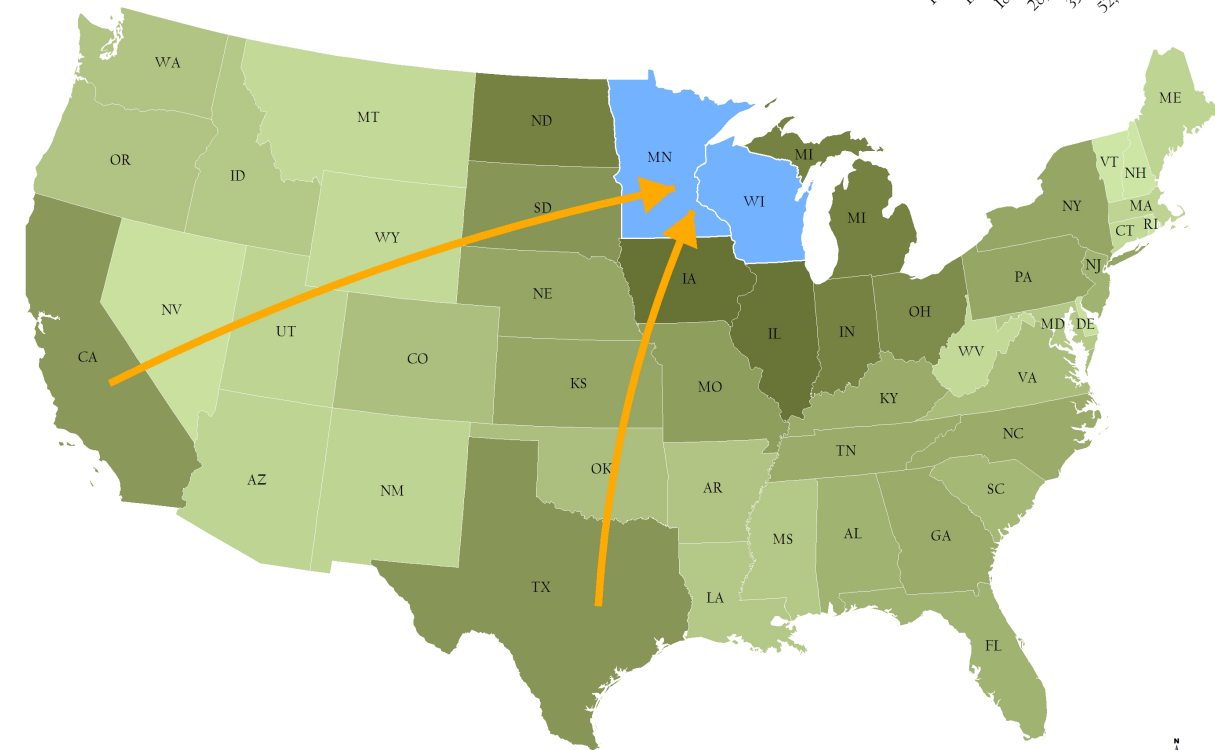
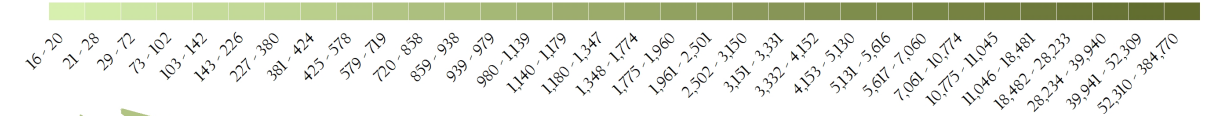
18 Possible Terminal Locations and rail service	Criteria 1 Connection To Class 1	Criteria 2 Suitable land	Criteria 3 Highway access	Criteria 4 Drayage distance	Criteria 5 Catchment area	Criteria 6 Keystone customers	Criteria 7 Terminal Support	Totals With Barrier gone
Milwaukee, WI – UP Butler	1	5	5	5	5	5	3	29 35
Milwaukee, WI – UP Jackson	1	5	5	5	5	5	3	29 35
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 29
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 –FOXXY, CN & UP	3	2	4	3	2	3	3	20
Adams, WI - UP	1	4	3	3	2	3	2	18 25
Tomah, WI - CPKC	4	4	5	5	2	3	4	27
Necedah, WI - UP	1	3	3	3	2	3	2	17 21
Altoona, WI - UP	1	4	4	2	3	3	3	20 25
La Crosse, WI - BNSF	5	5	5	4	3	3	4	29
Winona, MN - CPKC	4	2	3	2	2	2	3	18

Domestic Truck Freight: Tons

Truck Freight Originating in MN & WI (2023 Tons)



Truck Freight Destined into MN & WI (2023 Tons)



Long Lane Options

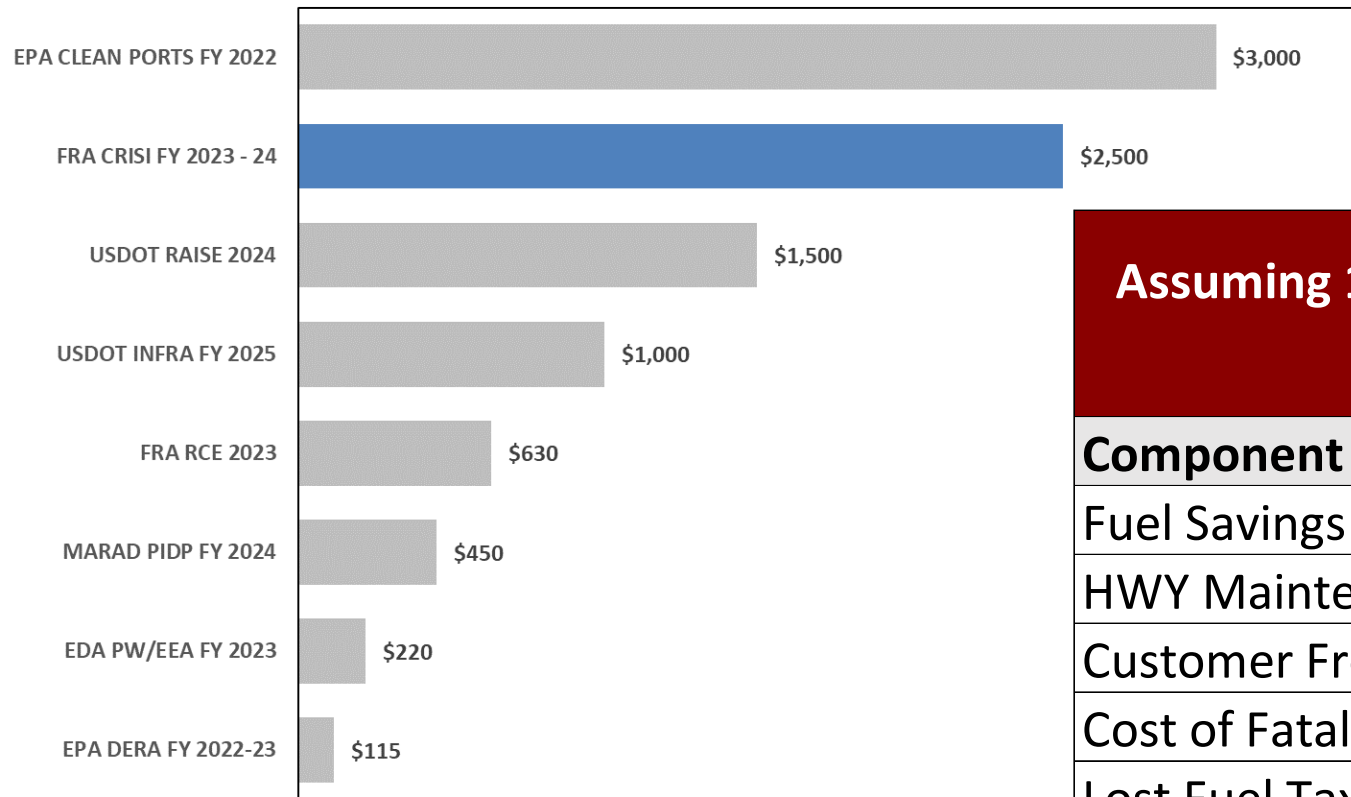
Long Haul Intermodal Lanes in Study Region Worth Exploration

- Domestic and International *Options Exist*
- Balance is critical to profitability & equipment
- Transit, Network Fit and *Reliability Considerations*
- Double Stack Impediments must be addressed

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

Public Benefits and Costs – Potential Grant Programs

FORECAST NEXT GRANT CYCLES AMOUNTS, MILLIONS



Assuming 11% Intermodal Conversion - TEXAS CORRIDOR

Component	Annual Public Benefit
Fuel Savings	\$278,556,282
HWY Maintenance Savings	\$2,123,631
Customer Freight Savings	\$23,539,968
Cost of Fatalities	\$65,234,000
Lost Fuel Tax	\$1,335,763

Assumptions

6 miles per gallon of fuel

\$.05 savings between Intermodal and Truck Rates

\$.867 cents in state and federal fuel cost per gallon

\$.41 maintenance cost per truck mile

1 Class 8 fatality per 100 Million Miles

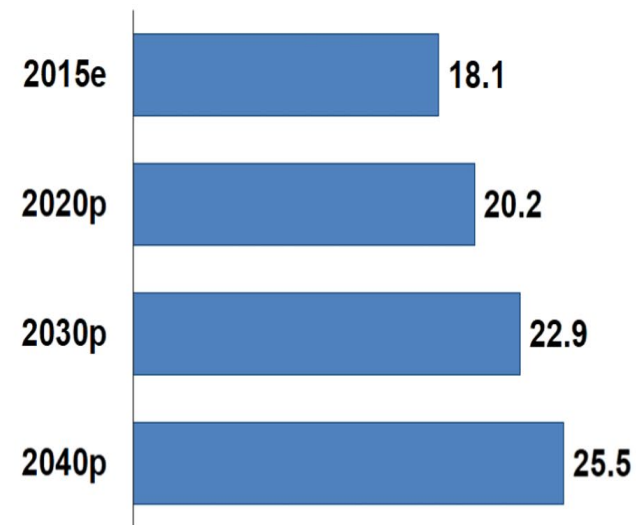
\$3.55 per gallon of diesel 4/24/23

Long-Term Demand for Freight Transportation Will Grow

INTERMODAL WILL CONTINUE TO GROW

- Rail service has improved for intermodal
- Long haul trucking may lack adequate capacity
- Highway congestion will increase
- Environmental concerns will increasingly shape transportation decisions
- Rail intermodal is more environmentally friendly than all-truck transportation
- Freight Visibility has improved resulting in better coordination of transportation assets.

ALL FREIGHT WILL CONTINUE TO GROW



The U.S. DOT forecasts total U.S. freight movements to rise from around 18.1 billion tons in 2015 to 25.5 billion tons in 2040 – a 41% increase.

e – estimated p – projected Source: FHWA - Freight Analysis Framework, version 4.4

Recommendations

- Take advantage of the States' significant influence to address infrastructure deficiencies such as clearances
- Encourage State Agencies and NGOs to work in unison to develop transportation systems
- Leverage Grant Resources and state matching funds for rail development
- An emphasis on intermodal development should be included in the States' freight and rail plans, including the identification of infrastructure barriers
- Leverage utilization of 18+ potential terminal locations in the region
- *Engage with Class 1 Railroads, Intermediaries and Shippers to explore terminal options and new intermodal single and interline corridors*



QUESTIONS

