

Minnesota Freight Advisory Committee
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Intermodal Service in Minnesota: Challenges and Opportunities

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Thank you!

**To the Center for Transportation Studies,
Minnesota Department of Transportation,
shippers, carriers and intermediaries who
informed the whitepaper.**

**The exceptional data provided by the
Intermodal Association of North America
(IANA).**

**This paper would not have been possible
without their expert assistance.**

Freight Transportation

- The demand for freight transportation is derived from the needs of shippers.
- Shippers define the requirements they need for their supply chain.
- Transportation services are purchased by sophisticated buyers looking to find the lowest landed cost with reliable service.
- Carriers cannot create demand but they can improve their mode's attributes to increase market share or gain new types of cargo.
- Sometimes this results in modal shifts of cargo.

Examples of Historical Modal Shifts

- **Canal to Rail** 1840s-1870
- **Rail to Plane - Mail** 1930s-1960
- **Truck to Plane - Fed Ex** 1970s-2000
- **Truck to Ship - Container** 1954-Present
- **Rail to Truck-Railway Express** 1920s-1980s
- **Truck to Rail- Double stack** 1990s-Present

Modal Shifts tend to be gradual.

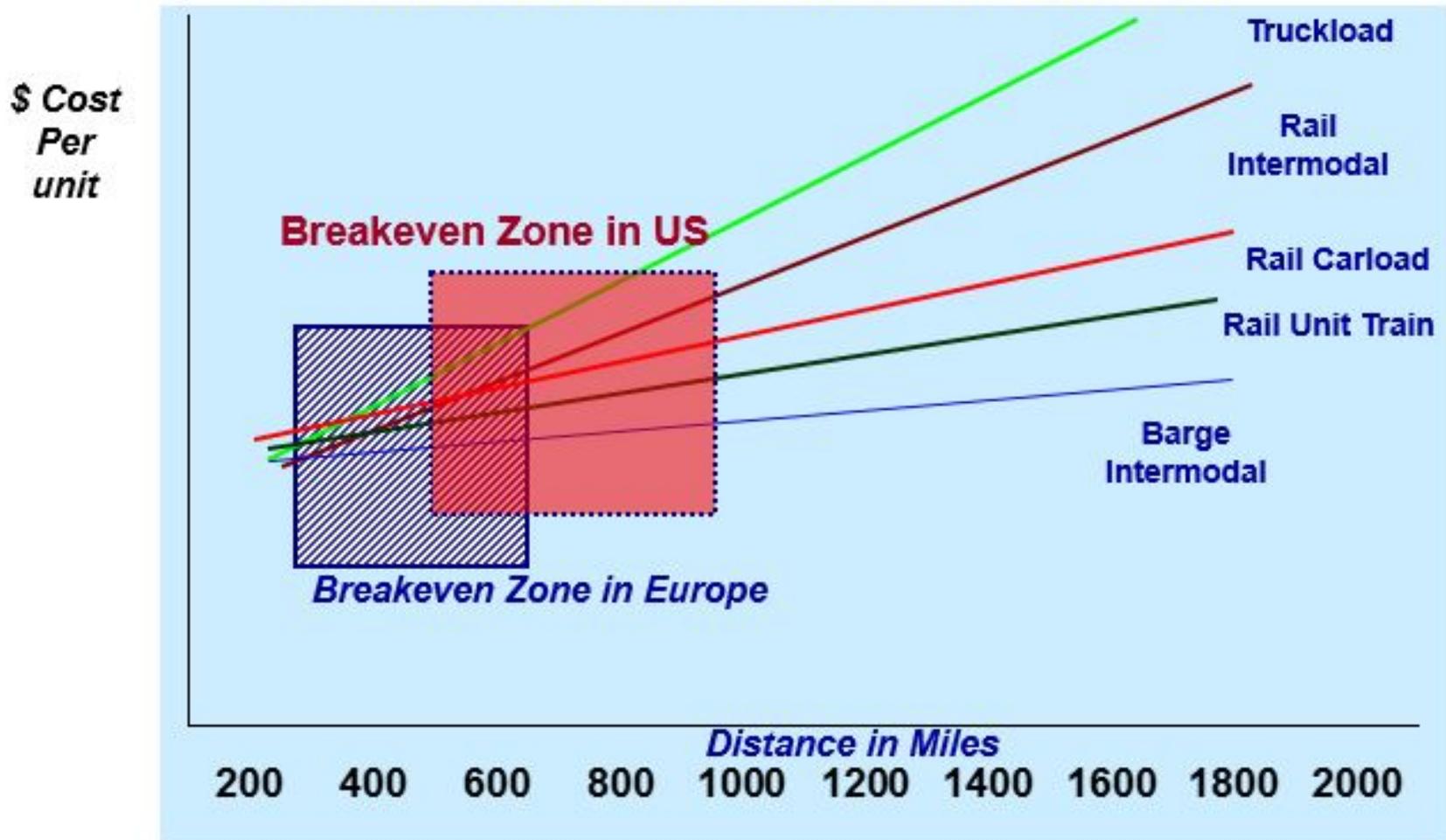
There is resistance to change due to current and future infrastructure investment

Factors Influencing Modal Shifts by shippers

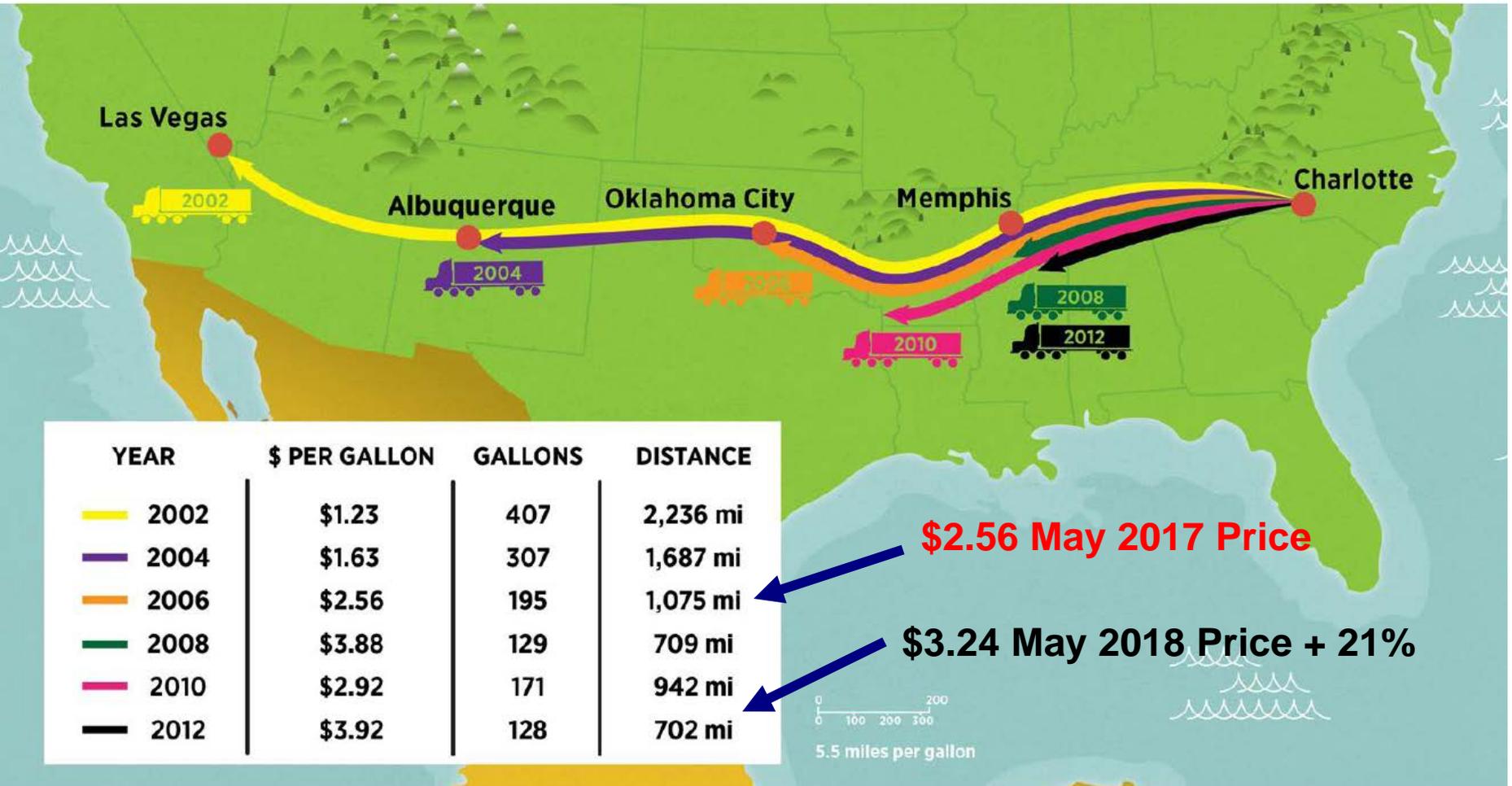
- **Velocity**
Overall time from origin to destination
- **Supply Chain Fit**
 - Partnerships, quality, accessibility and reliability
 - Lowest total cost = lowest landed cost
- **Shipper Flexibility**
Sunk and fixed costs create limitations for shippers
- **Technological Change**
 - 53' Trucks
 - ISO Containers
 - Double stack trains
- **Ease of Use**
Right attitude, easy to access, responsive to needs, reliable transmission of information, security, payment terms

INTERMODAL TRANSPORTATION

The European shipper “breakeven” mileage for intermodal versus truck is 250-600 miles this is due to high fuel costs and road congestion. In the US it is 500-1000 miles depending on road congestion, fuel cost, driver availability and rail service. Supply Chain fit may trump freight rates.



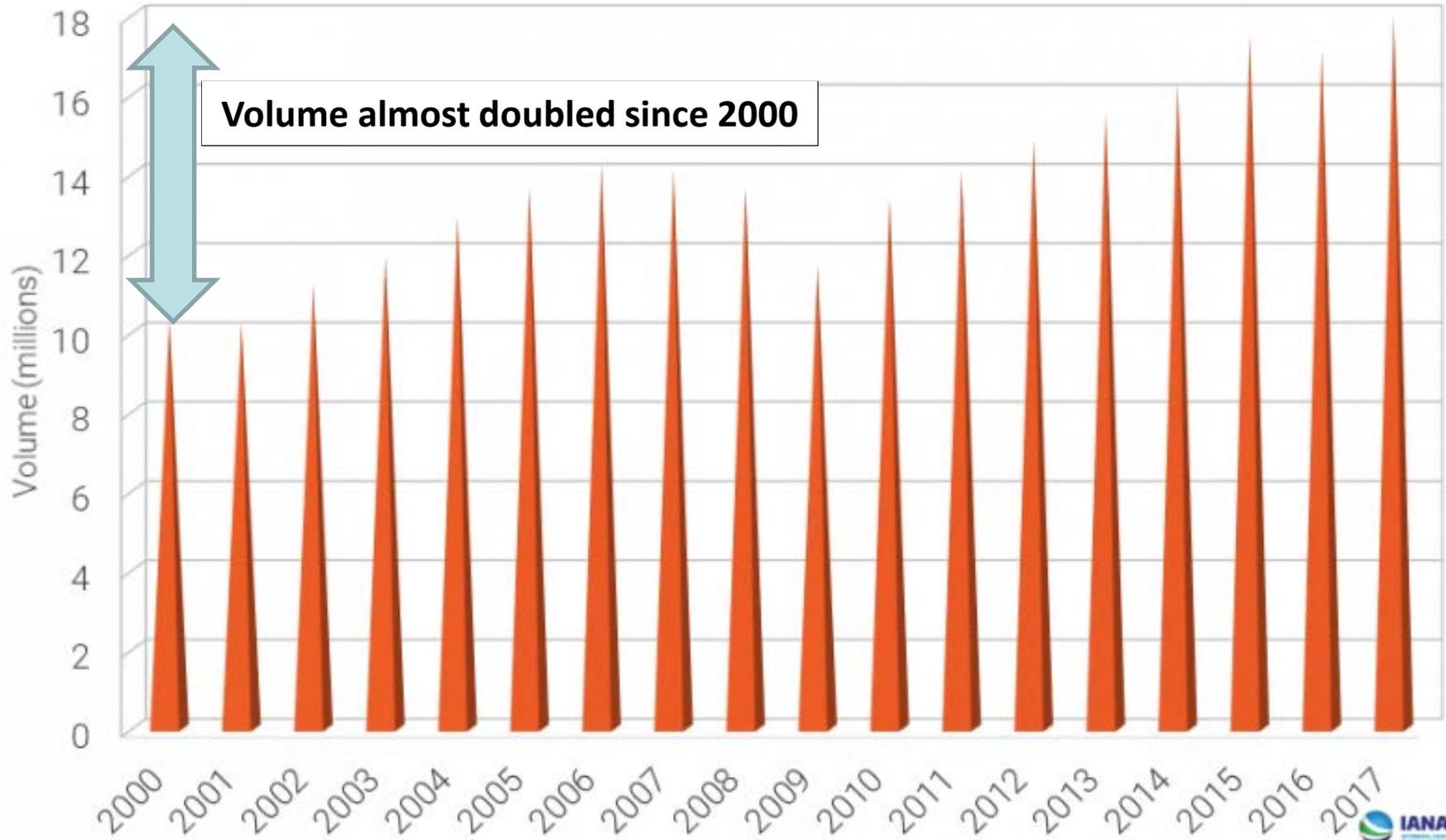
RISING FUEL COSTS (\$500 WORTH OF FUEL)



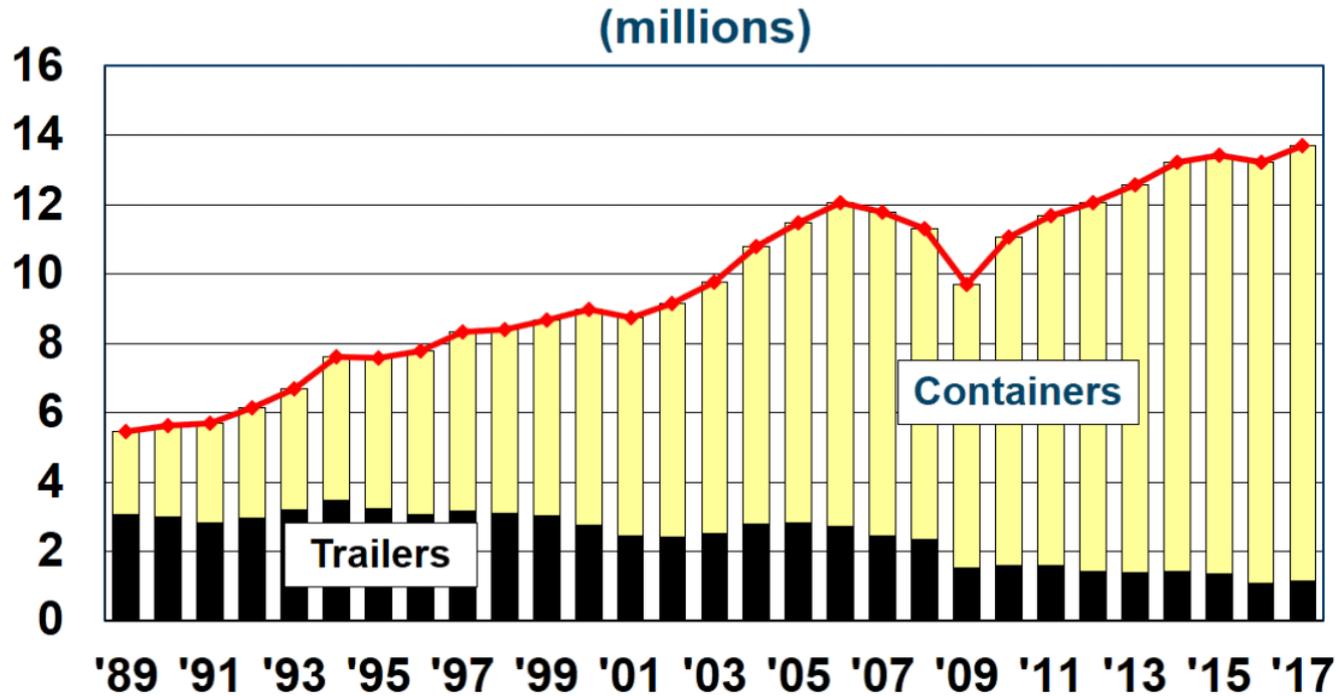
Courtesy NFS
and Hub Group



Annual Intermodal Loadings 2000-2017



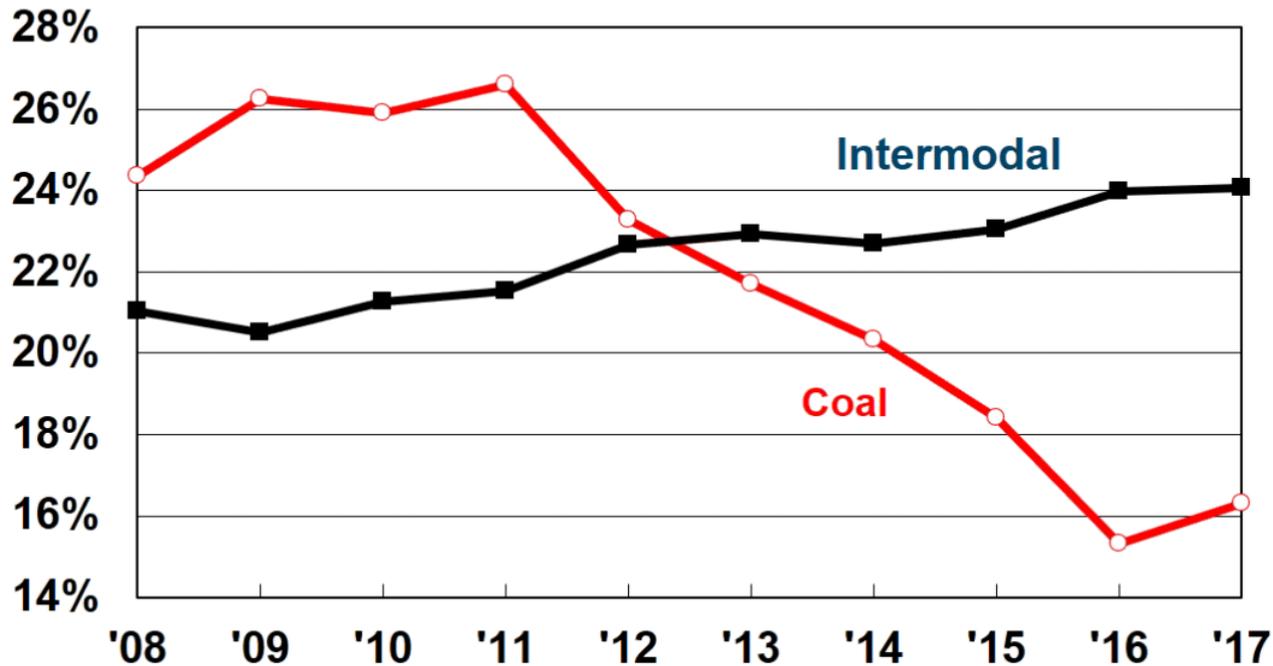
Rapid Intermodal Growth



Source: AAR Weekly Railroad Traffic

Click to save a picture to your desktop.

Coal vs. Intermodal as % of U.S. Rail Revenue



Data are for BNSF, CSX, KCS, NS, and UP combined. Source: company reports

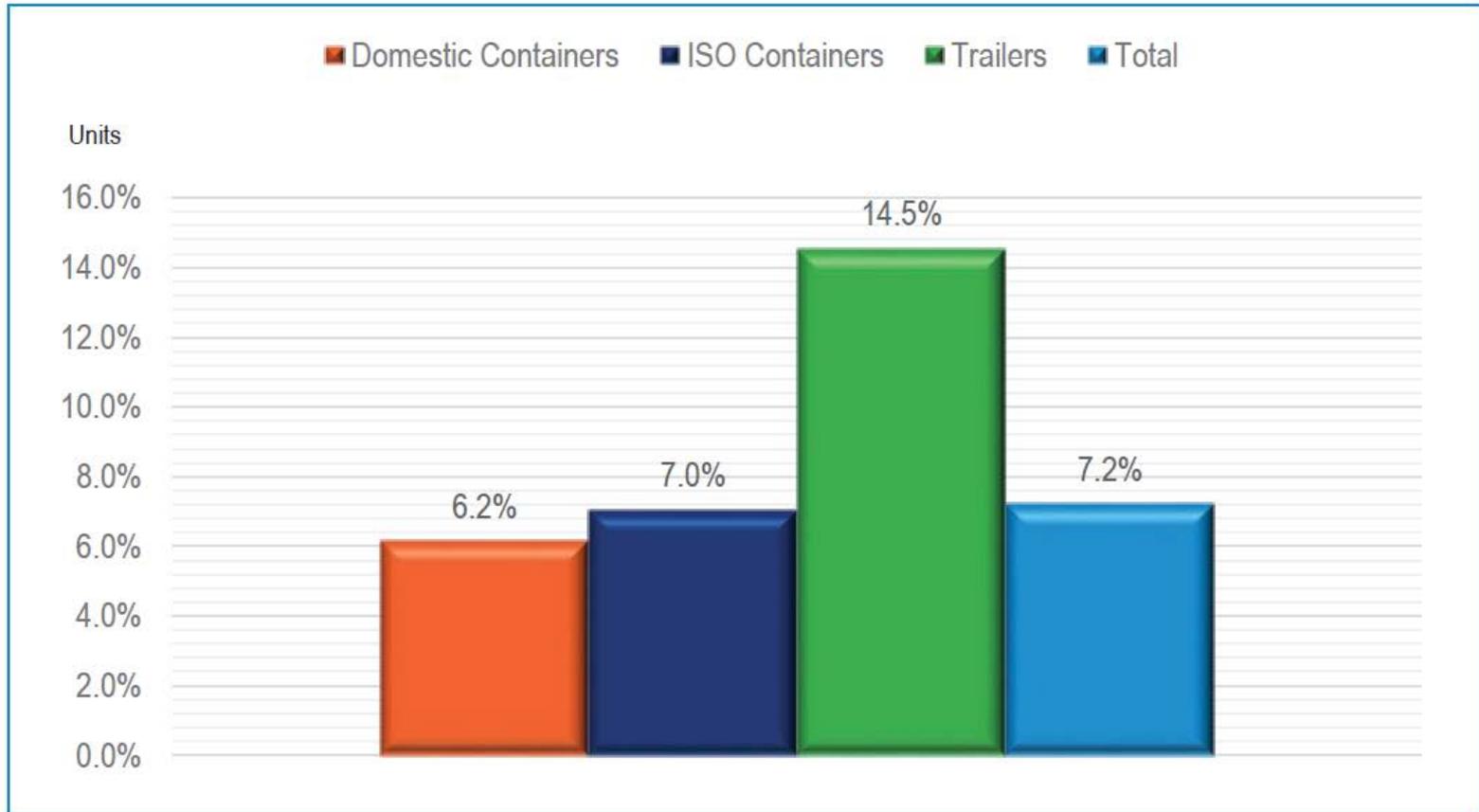
Intermodal Growth

First Quarter Equipment Loading Trends

Equipment Size/Type	1Q17	1Q18	1Q 17-18 Growth	1Q 18 Share
28' Trailers/Containers	60,463	66,567	10.1%	1.5%
40/45' Trailers	26,567	24,414	-8.1%	0.5%
48/53' Trailers	223,493	264,599	18.4%	5.8%
20/40/45' Containers	2,141,383	2,292,274	7.0%	50.4%
48/53' Containers	1,788,978	1,899,393	6.2%	41.8%
Total	4,240,884	4,547,247	7.2%	100.0%



First Quarter 2018 Intermodal Growth by Market



US and Canada Rail Intermodal Network

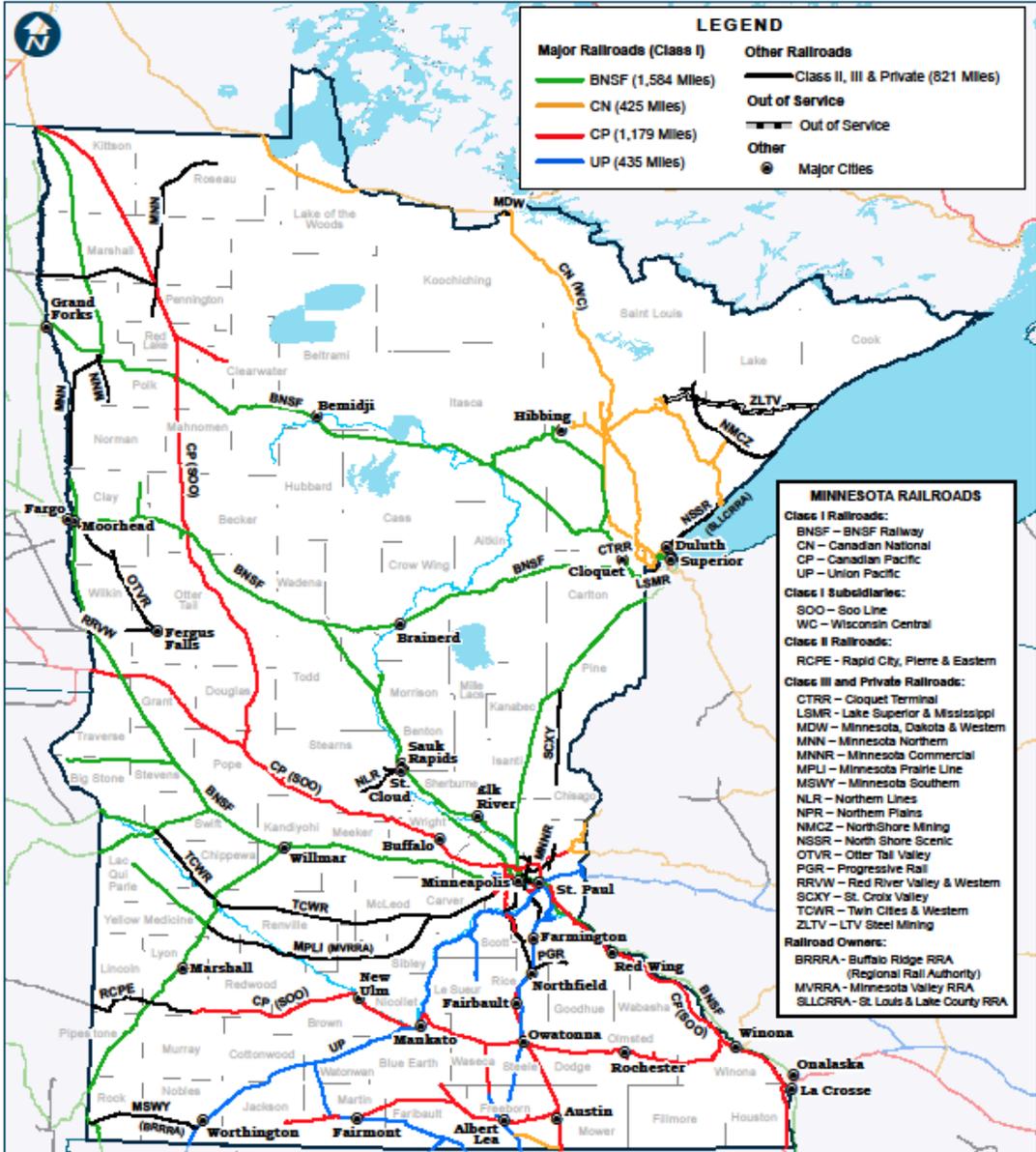




MINNESOTA FREIGHT RAILROAD MAP

Office of Freight and Commercial Vehicle Operations

September 2015

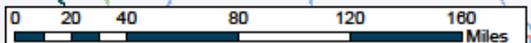


LEGEND

- | | |
|----------------------------------|-------------------------------------|
| Major Railroads (Class I) | Other Railroads |
| BNSF (1,584 Miles) | Class II, III & Private (821 Miles) |
| CN (425 Miles) | Out of Service |
| CP (1,179 Miles) | Other |
| UP (435 Miles) | Major Cities |

MINNESOTA RAILROADS

- Class I Railroads:**
 BNSF – BNSF Railway
 CN – Canadian National
 CP – Canadian Pacific
 UP – Union Pacific
- Class I Subsidiaries:**
 SOO – Soo Line
 WC – Wisconsin Central
- Class II Railroads:**
 RCPE – Rapid City, Pierre & Eastern
- Class III and Private Railroads:**
 CTRR – Cloquet Terminal
 LSMR – Lake Superior & Mississippi
 MDW – Minnesota, Dakota & Western
 MNN – Minnesota Northern
 MNNR – Minnesota Commercial
 MPLI – Minnesota Prairie Line
 MSWY – Minnesota Southern
 NLR – Northern Lines
 NPR – Northern Plains
 NMACZ – NorthShore Mining
 NSSR – North Shore Scenic
 OTVR – Otter Tail Valley
 PGR – Progressive Rail
 RRVW – Red River Valley & Western
 SCXY – St. Croix Valley
 TCWR – Twin Cities & Western
 ZLTV – LTV Steel Mining
- Railroad Owners:**
 BRRRA – Buffalo Ridge RRA
 (Regional Rail Authority)
 MVRRA – Minnesota Valley RRA
 SLLCRRRA – St. Louis & Lake County RRA



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IANA Regions

Region Map



Region	Code	States/Provinces
Eastern Canada	EC	NB, NL, NS, ON, PE, QC
Mountain Central	MC	CO, ID, MT, NE, ND, SD, UT, WY
Mexico	MX	MX
Midwest	MW	IL, IN, IA, KY, KS, MI, MN, MO, OH, WI
Northeast	NE	CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV
Northwest	NW	OR, WA
South Central	SC	AR, LA, NM, OK, TX
Southeast	SE	AL, FL, GA, MS, NC, SC, TN
Southwest	SW	AZ, CA, NV
Western Canada	WC	AB, BC, MB, NT, SK

Minnesota's Corridor Decline

First Quarter 2017–2018 Corridor Growth



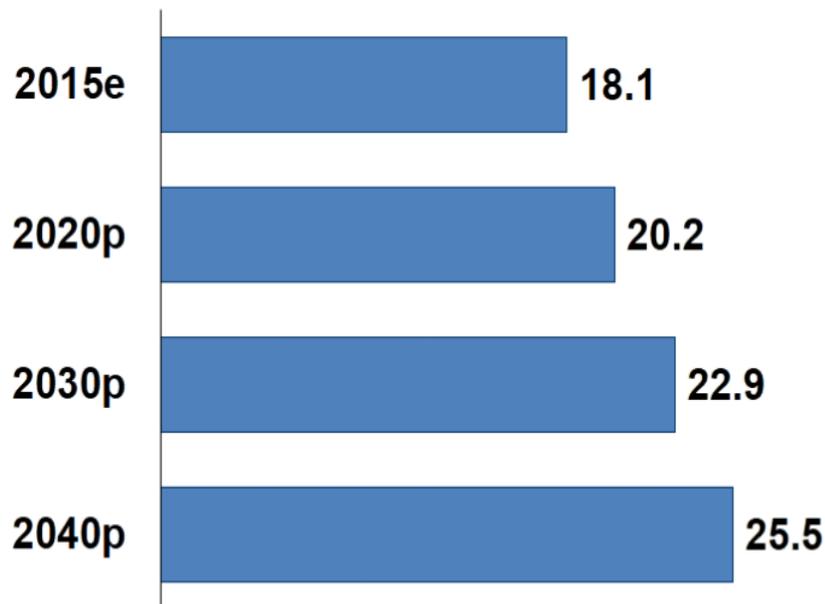
2018 1st Quarter Loadings

MAJOR INTERMODAL CORRIDORS

	January		February		March		First Quarter		Pct. Chg.
	17	18	17	18	17	18	17	18	
Midwest-Northwest	81,727	75,725	77,412	70,689	79,412	80,729	238,551	227,143	-4.8%
Trailers	5,981	7,382	5,846	7,224	6,899	9,164	18,726	23,770	26.9%
Containers	75,746	68,343	71,566	63,465	72,513	71,565	219,825	203,373	-7.5%
MW to NW	36,051	37,511	35,129	33,248	36,040	43,284	107,220	114,043	6.4%
Trailers	3,008	3,844	2,740	3,669	3,314	4,586	9,062	12,099	33.5%
Containers	33,043	33,667	32,389	29,579	32,726	38,698	98,158	101,944	3.9%
NW to MW	45,676	38,214	42,283	37,441	43,372	37,445	131,331	113,100	-13.9%
Trailers	2,973	3,538	3,106	3,555	3,585	4,578	9,664	11,671	20.8%
Containers	42,703	34,676	39,177	33,886	39,787	32,867	121,667	101,429	-16.6%
Midwest-Southwest	251,868	263,444	234,290	247,928	257,588	273,881	743,746	785,253	5.6%
Trailers	23,160	25,887	21,409	25,256	25,267	30,579	69,836	81,722	17.0%
Containers	228,708	237,557	212,881	222,672	232,321	243,302	673,910	703,531	4.4%
MW to SW	130,550	126,775	118,694	120,004	130,645	143,542	379,889	390,321	2.7%
Trailers	11,738	13,215	10,614	12,977	12,634	15,283	34,986	41,475	18.5%
Containers	118,812	113,560	108,080	107,027	118,011	128,259	344,903	348,846	1.1%
SW to MW	121,318	136,669	115,596	127,924	126,943	130,339	363,857	394,932	8.5%
Trailers	11,422	12,672	10,795	12,279	12,633	15,296	34,850	40,247	15.5%
Containers	109,896	123,997	104,801	115,645	114,310	115,043	329,007	354,685	7.8%

Long-Term Demand for Freight Transportation Will Grow

Billions of Tons of Freight Transported in the U.S.



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

Increasing freight transportation costs

IMC Market Trends — 1st Qtr. 2018 vs.. 2017

	1st Quarter 2017	1st Quarter 2018	Pct. Change
Intermodal Loads	410,242	423,911	3.3%
Highway Loads	544,864	634,519	16.5%
Total Loads	955,106	1,058,430	10.8%
Intermodal Revenue	\$ 1,068,427,893	\$ 1,200,897,434	12.4%
Highway Revenue	\$ 769,402,536	\$ 1,134,896,619	47.5%
Total Revenue	\$ 1,837,830,428	\$ 2,335,794,053	27.1%
Average per Intermodal Load	\$ 2,604	\$ 2,833	8.8%
Average per Highway Load	\$ 1,412	\$ 1,789	26.7%

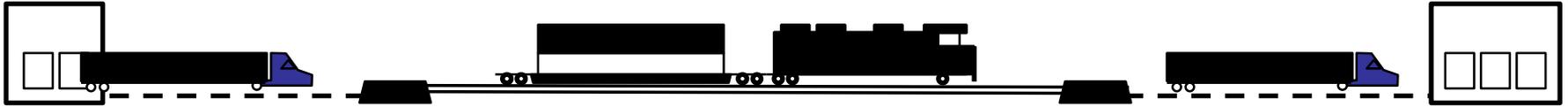


IANA
 INTERMODAL ASSOCIATION
 OF NORTH AMERICA

Factors that shift from all-Truck to Rail Intermodal

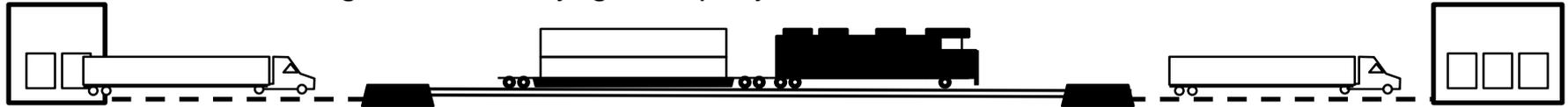
- Truck Driver Shortage
- Electronic Logs allow enforcement of regulations of Hours of Service
- Congestion
- Fuel cost increases
- Increased tolls
- Highway conditions
- Shippers delaying trucks

NSF Intermodal's Channel Partners (2012)



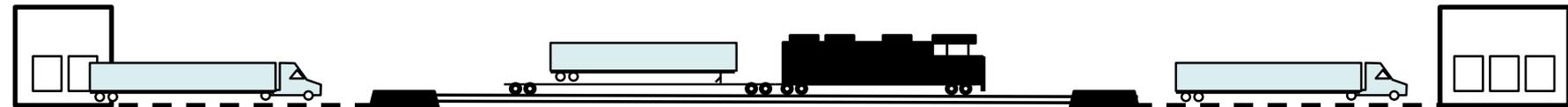
IMC (26%)

Intermodal Marketing Companies leverage Norfolk Southern's shared container fleet. From our intermodal terminal, IMCs deliver "the final mile" using their own truck fleet, or may contract each leg to a local drayage company.



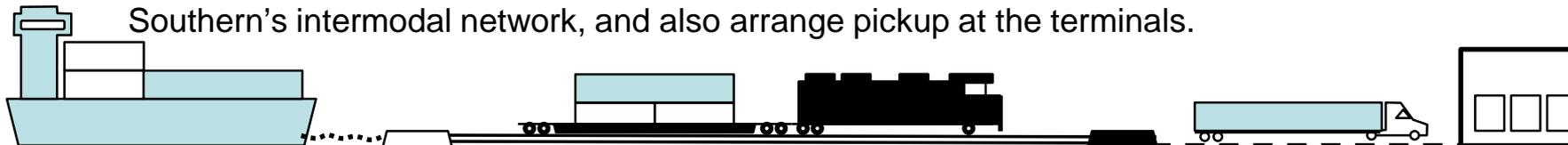
Truckload (25%)

Trucking lines move their own container fleets on Norfolk Southern's rail network to remove over-the-road miles. Instead of one long-haul truck move, these companies move freight locally to and from each market's intermodal terminal.



Premium (9%) -

Due to special service and equipment needs, handlers of premium freight like refrigerated or parcel goods use their own trailers and containers on Norfolk Southern's intermodal network, and also arrange pickup at the terminals.



International (40%)

Steamship lines each have their own inventory of 20' and 40' containers. Over the road, ocean carriers contract directly with local trucking companies.

Short (under 400 miles) Intermodal Routes

NFS Railroad

ATL-Greensborough NC

- 331 miles
- Astell GA – Charleston SC
 - 315 miles
- Charleston SC – Charlotte, NC
 - 208 Miles

FEC Railroad

JAX – Miami

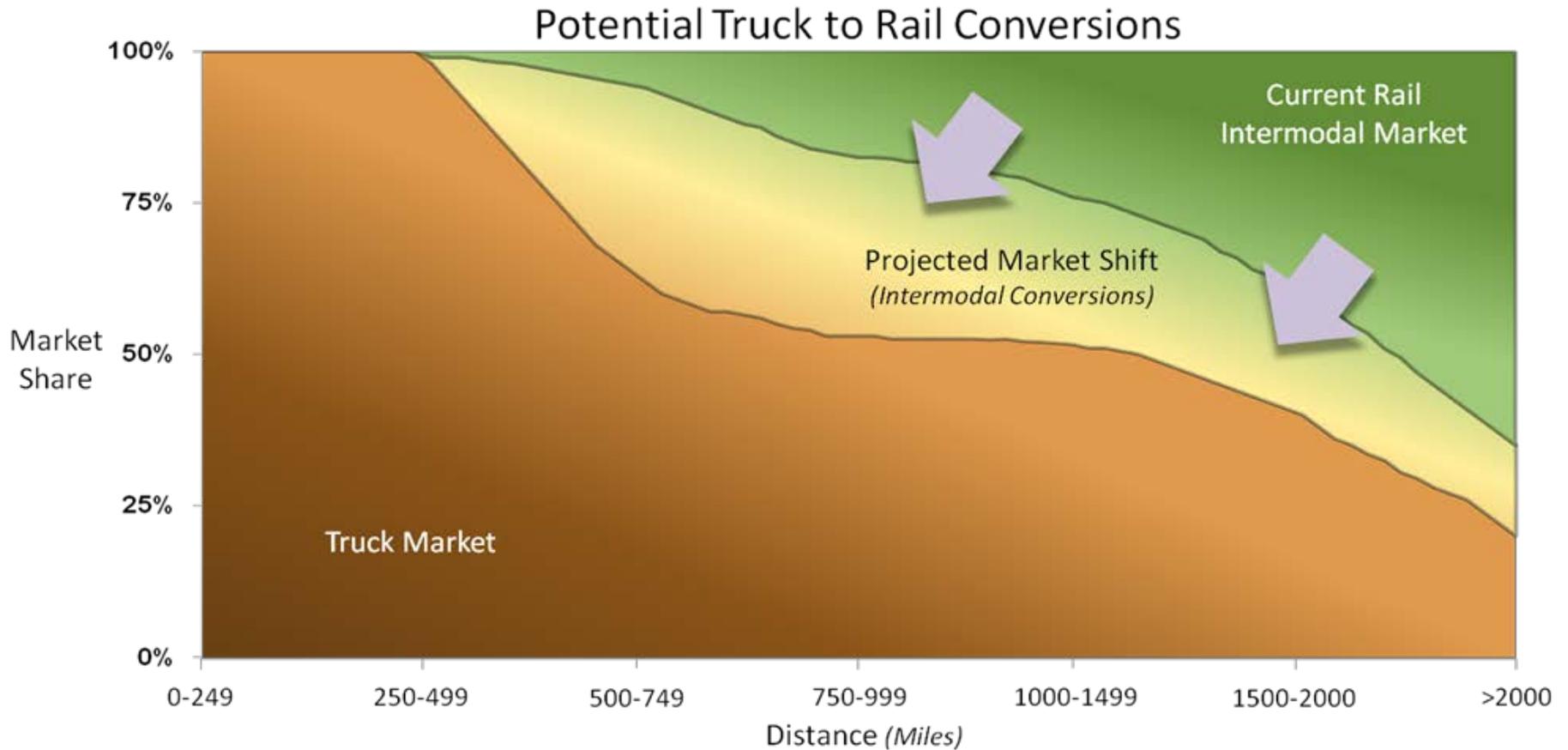
350 miles

CSX Railroad

- ATL-JAX and ATL- Savannah
 - 347 miles – 300 miles
- JAX-Tampa
 - 200 miles



Future Modal Shift



U.S. Department of Transportation, Federal Railway Administration, 2010

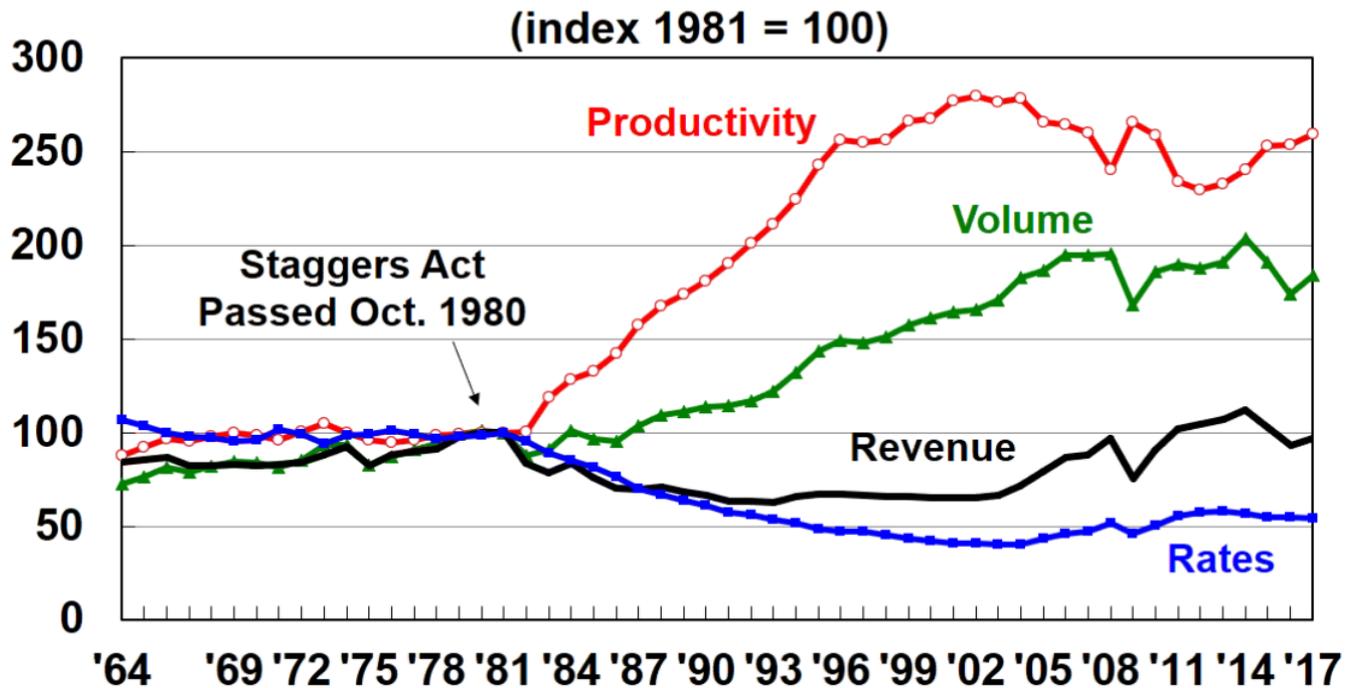
Intermodal will continue to grow

- **Intermodal will continue to grow because**
 - **Rail service has improved**
 - **Long haul trucking may lack adequate capacity**
 - **Highway congestion will increase**
 - **Environmental concerns will increasingly shape transportation decisions and rail intermodal is more environmentally friendly than all-truck transportation**
 - **Communications have improved resulting in better coordination of transportation assets.**

Discussions

- **How do we improve existing intermodal terminals/service in Minnesota?**
 - Truck Access
 - Container Pools
 - Physical improvements in the terminals
- **Is there sufficient volume and lane balance to have domestic/Canadian intermodal service to and from Duluth on CN's line? Memphis? Montreal? Toronto?**
- **Could a viable intermodal terminal be built on UP's lines serving Minnesota to set up a corridor to Southern California?**
 - Volume
 - Lane balance
 - Rail Network fit
 - Cost sharing

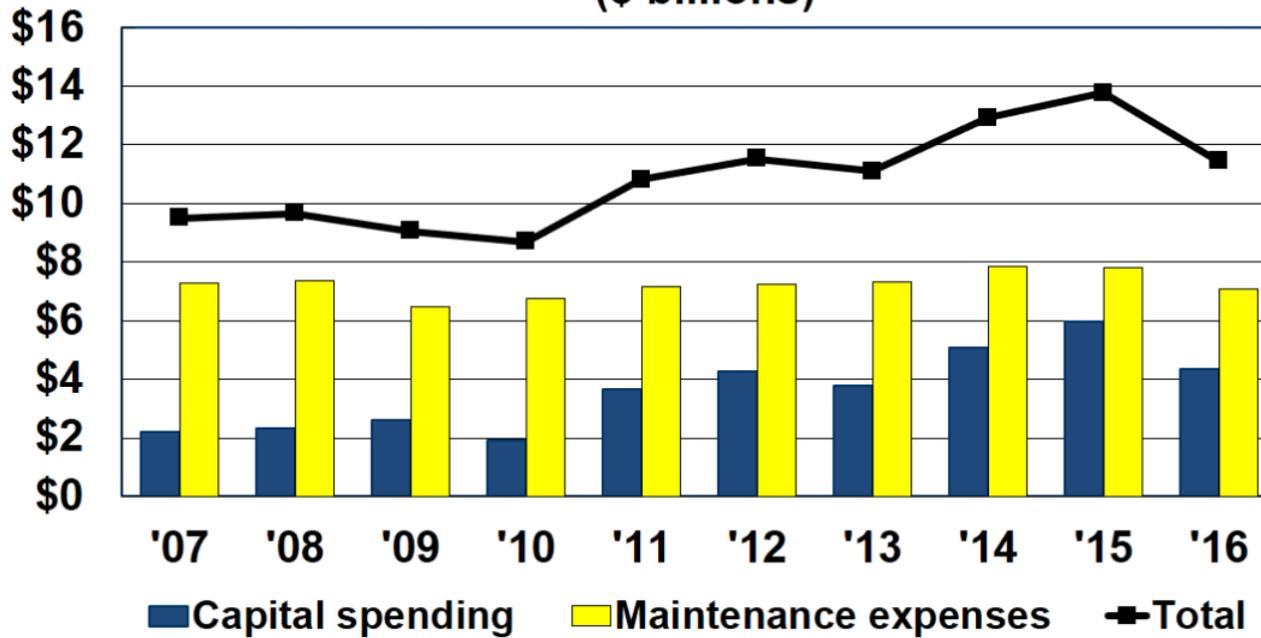
The U.S. Freight Railroad Industry in One Chart



Source: AAR

Railroad Spending on Equipment

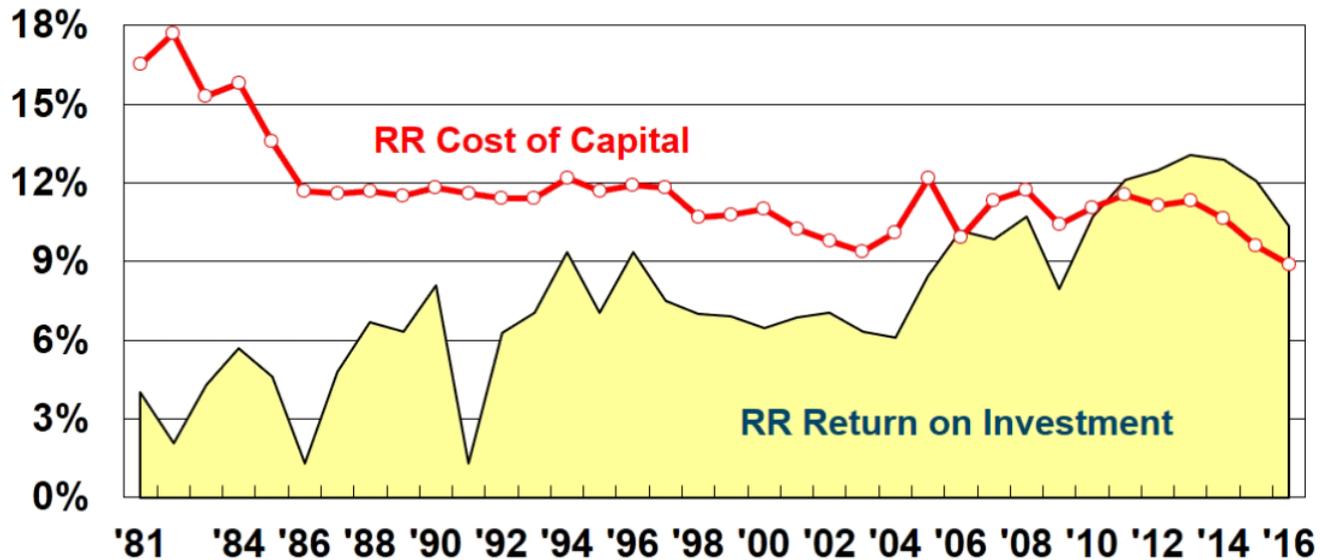
(\$ billions)



Data are for Class I railroads. 2016 is preliminary. Source: AAR

Railroads Have Only in Recent Years Earned Their Cost of Capital

Class I RR Cost of Capital vs. Return on Investment



Note: In 2006, the Surface Transportation Board significantly changed the method by which it calculates the rail industry cost of capital. Source: STB

A successful intermodal terminal will need:

- **A value added rail transportation network between intermodal terminals. The system must be financially viable for all parties as an ongoing operation**
- **Class 1 Rail participation early on is vital.**
- **A sufficient volume for frequent service on a regular basis, ideally lane/load balance. A Class 1 may support small terminal to assess future market potential.**
- **Dedicated shippers using the facility**
- **Catchment areas for the intermodal terminals that provide inbound and outbound cargo with minimal drayage**

Discussions

- **What will be the impact of Transloading on Minnesota terminals?**
 - According to TTX transloading grew by 6% in 2017.
- **Can the Duluth Value Added Intermodal Terminal Model (Container Freight Station) be exported to other terminals?**
- **Are there opportunities for overweight containerized cargo?**
 - Increase truck GVW weight limits
 - Overweight highway corridors
 - Streamlined permitting

Expanding Intermodal Links

- **Take a systems approach when growing intermodal markets.**
 - **Partners make better supply chains**
- **Reliability can be more critical than price.**
 - **Quality requires planning and adherence.**
- **Informed shippers are open to multi-modal supply chain solutions.**

Questions?

