

United States Department of Energy Quadrennial Energy Review

Rail's Role in Energy Infrastructure and Utilization

August 8, 2014

Overview

What we burn:

- Rail is a large energy consumer continually improving efficiency

What we haul:

- Rail is critical to the transportation of energy and energy savings

Reliability of rail:

- Rail investment to safely and efficiently meet existing and new demand

What we burn:

Rail is a large energy consumer

- BNSF uses 1.3 billion gallons of diesel per year
 - Second largest user behind U.S. Navy
- Newest locomotive fleet in industry with approximately 7600 units, improving fuel efficiency and lower emissions; in last 10 years:
 - New: Over 3,300 units
 - Remanufactured: Over 2,800 units
- Increasing use of Automated Gate technology and electric wide-span cranes at BNSF intermodal facilities
 - Reduces idling emissions and eliminates local emissions from cranes



What we burn:

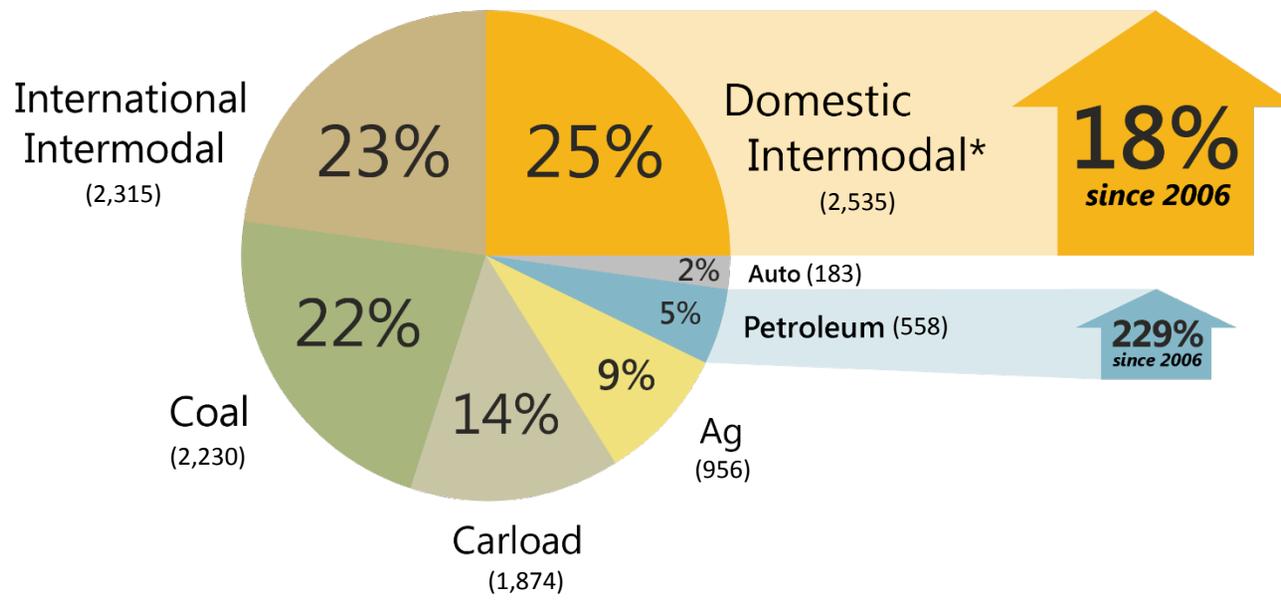
Liquefied natural gas-- BNSF pilot

- Burlington Northern successfully tested natural gas locomotives using LNG tenders in the early 1990s
- Current testing is “duel fuel” – optimizes fuel consumption and maximize operating range on parts, or all, of network
- BNSF is independently working with test locomotives from both of the primary domestic locomotive manufacturers—GE Transportation and EMD/Caterpillar
- Revenue service dynamic testing underway in Colorado and California utilizing diverse operating conditions
- Regulatory issues include siting and operating natural gas fuel infrastructure, locomotive and tender-specific regulatory issues, including Environmental Protection Agency (EPA) engine emission criteria, FRA rail operating rules, PHMSA tender design and Surface Transportation Board (STB) economic regulation
- Economic value based on diesel-LNG price spread
- Successful implementation not dependent on public incentives, and will lead surface transportation conversion



What we haul: Traffic mix has changed 2006-2013

Volume in Thousands

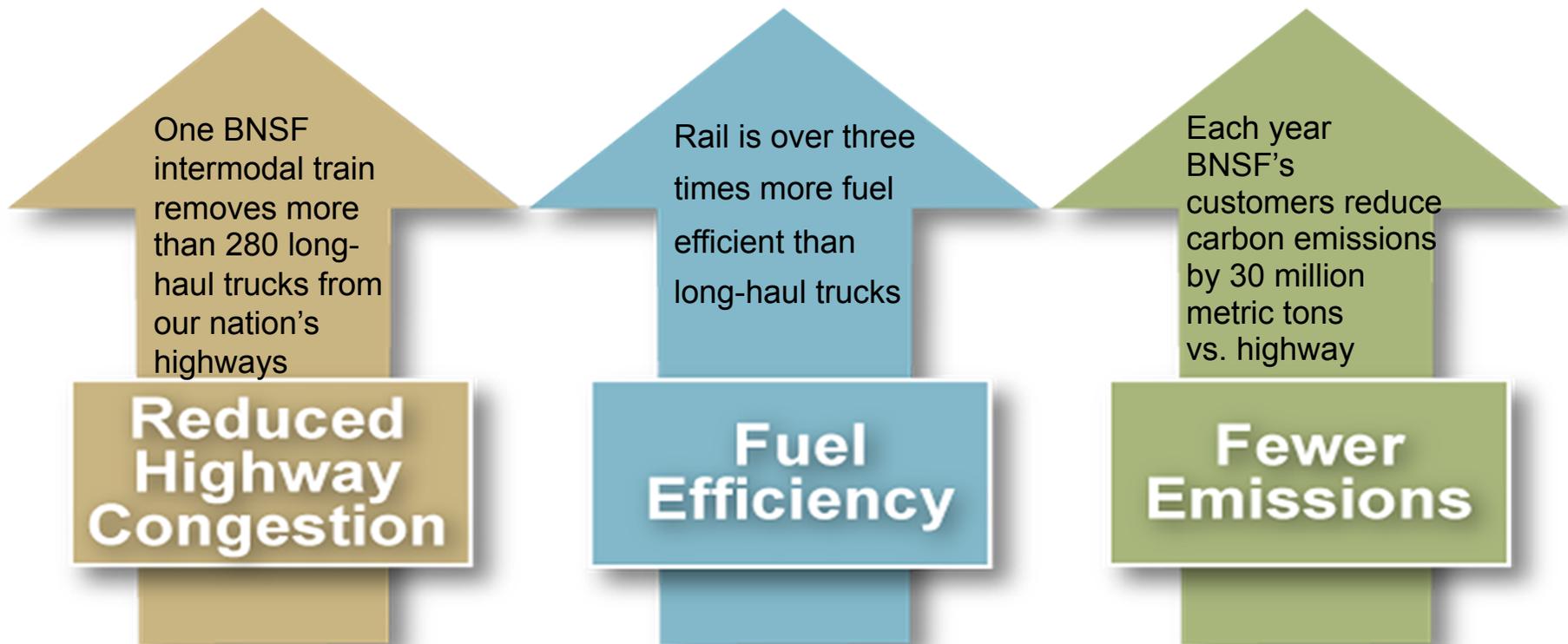


Domestic Intermodal represents largest number of units and growing rapidly.

2006 Volumes = 10,637
2013 Volumes = 10,093

2013 Units

What we haul: Intermodal fuel efficiency



From an environmental, economic, congestion and safety perspective, rail is the best way to move goods – today and in the future

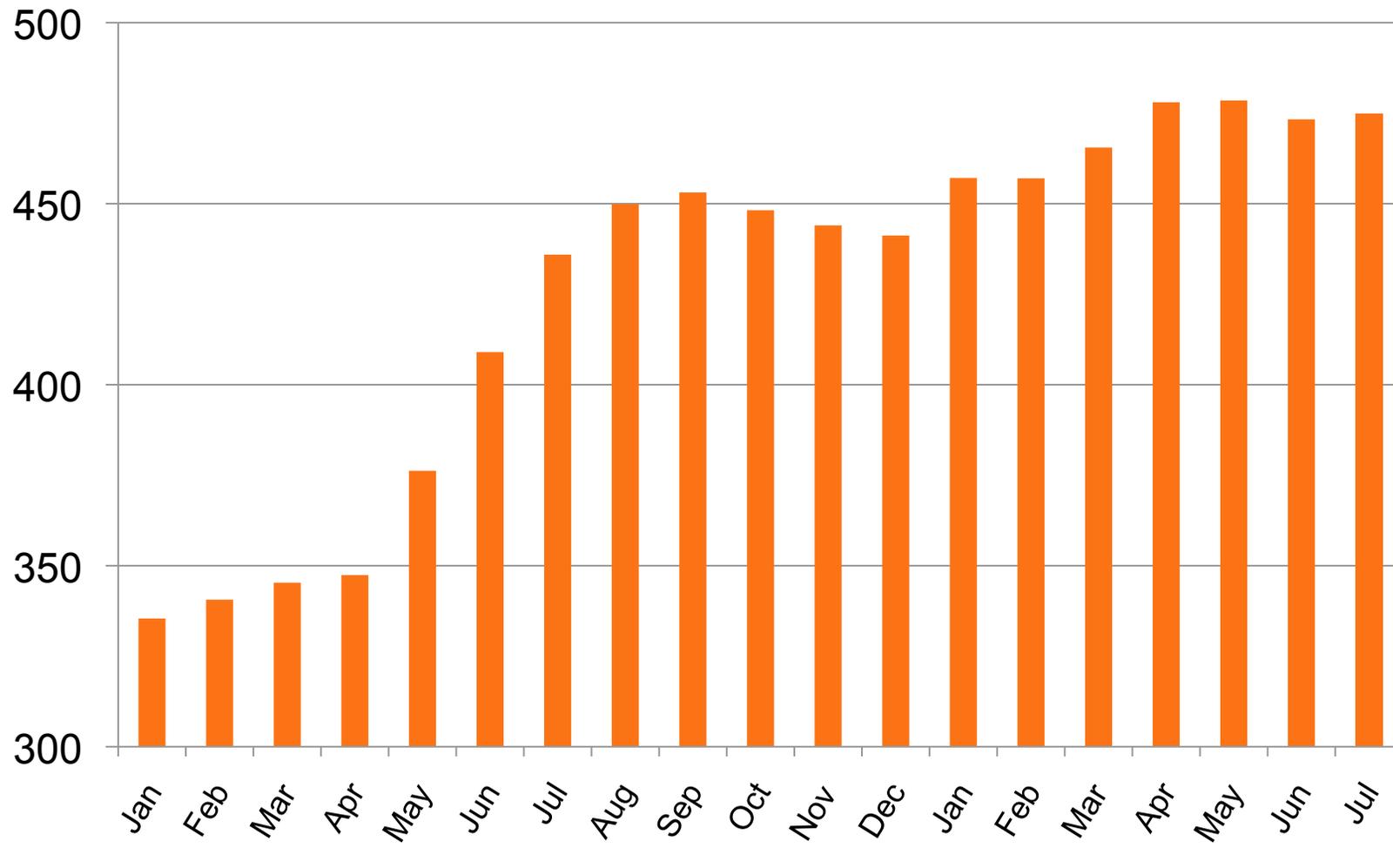
What we haul: Growing coal demand



- US coal demand strong- Western coal pricing, natural gas pricing and economic demand up
- Coal generation up almost 7% year-over-year through May.
- BNSF has invested to ensure resilient and efficient coal network: **\$3.5 billion** since 1996 to ensure reliability of coal network.
- Historic \$9 billion capital plan (2013-14) provides capacity on key coal routes.

What we haul:

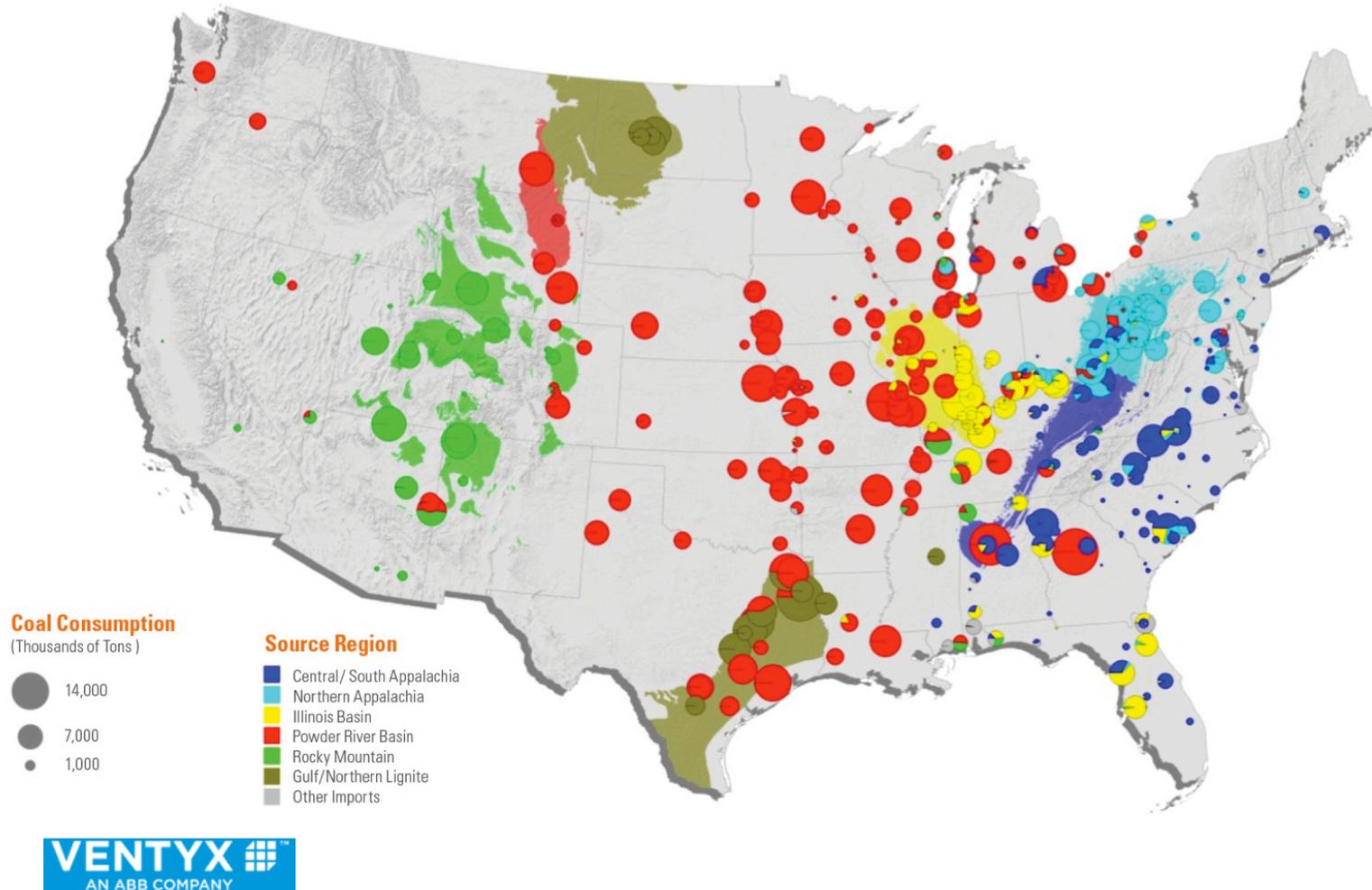
Coal sets in service begin rise in mid-2013



Source: Internal BNSF data



What we haul: Efficient transportation enables PRB coal use



Source: Ventyx

BNSF
RAILWAY

What we haul:

BNSF Ethanol Destination Franchise

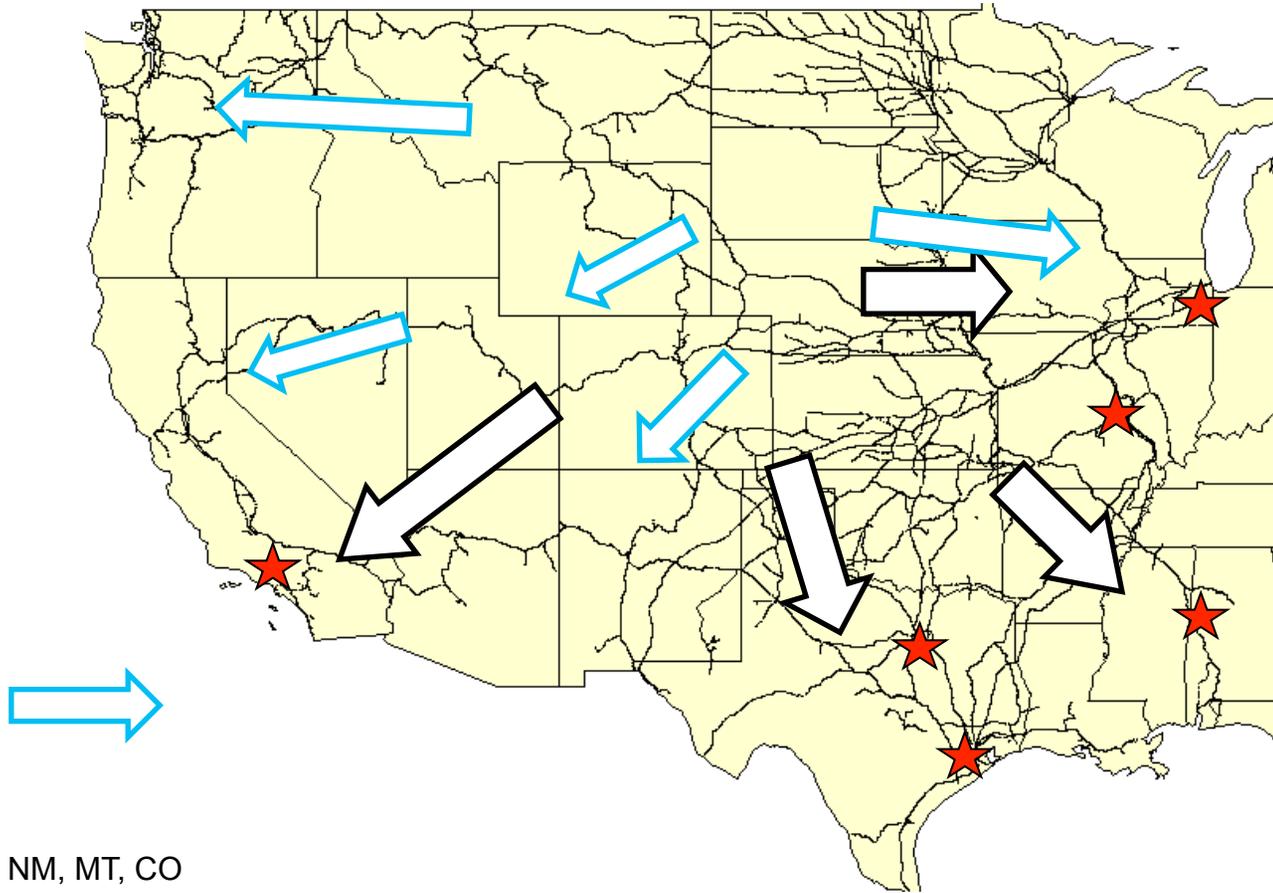
Unit Train ★ Destinations

Existing

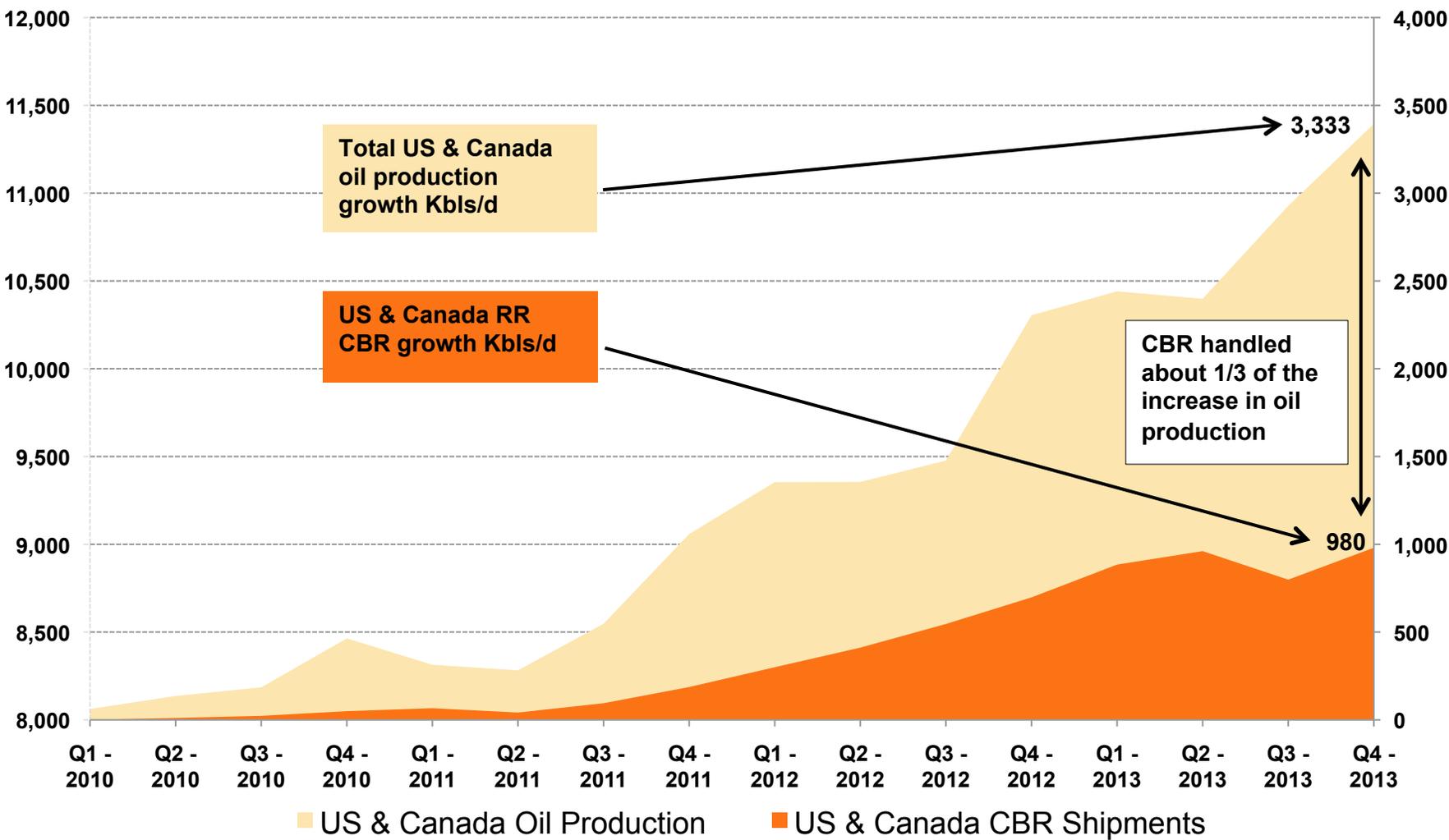
- Watson, CA
- Birmingham, AL
- East Coast – via Chicago
- Texas - Ft Worth & Texas Gulf

Manifest Lanes

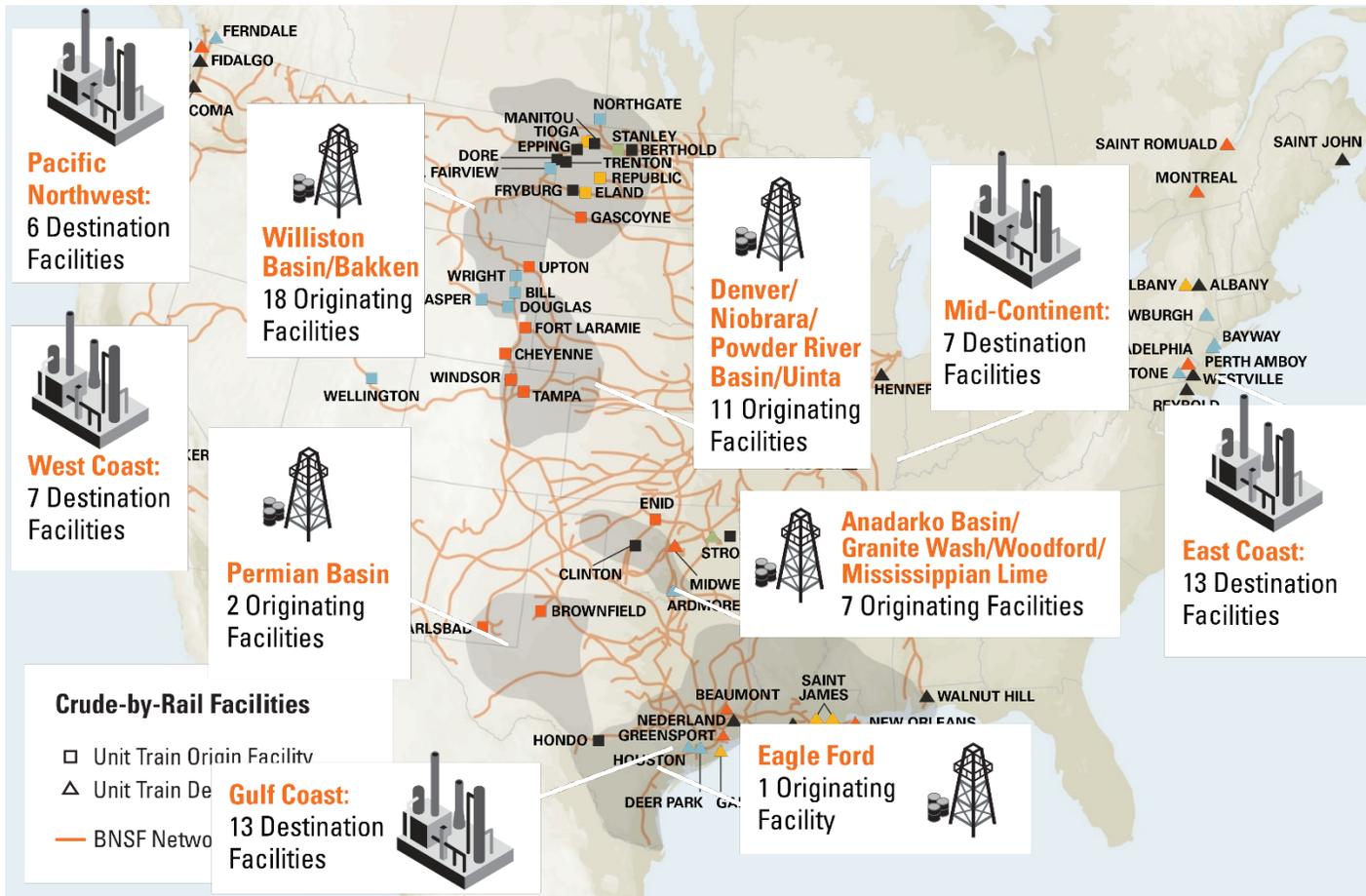
- Northern California
- Pacific Northwest
- Mountain Zone – UT, NM, MT, CO
- IL / MO – Chicago, St Louis



What we haul: North American oil production



What we haul: Crude-by-rail origins & destinations



2009

- 1 Origin Facility
- ▲ 1 Destination Facility

2011

- 3 Origin Facilities
- ▲ 5 Destination Facilities

2012

- 9 Origin Facilities
- ▲ 15 Destination Facilities

2013

- 10 Origin Facilities
- ▲ 10 Destination Facilities

2014

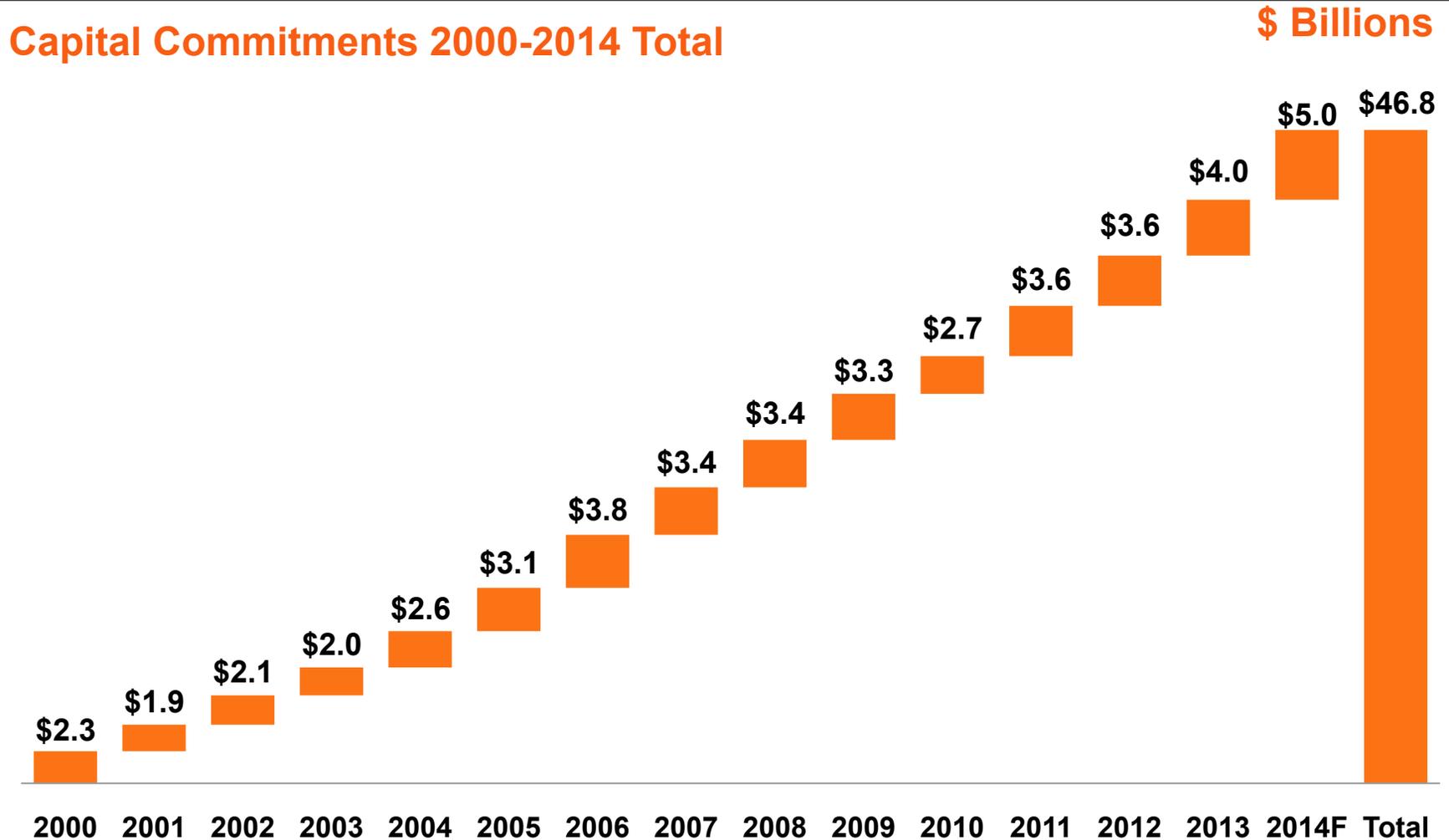
- 7 Origin Facilities
- ▲ 10 Destination Facilities

Reliability of rail: Rail is providing unique value

- **Market Distribution Flexibility** allows producers to ship in multiple constructs and to refineries throughout the U.S.
- Investments in infrastructure, people and process ensures **Reliable Transportation Services** for producers.
- Decades-long commitment to **Safe Operating Practices** helps prevent accidents in the first place.

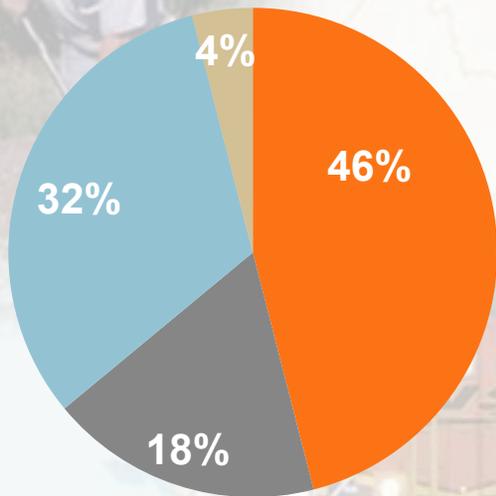


Reliability of rail: Investing in infrastructure to support demand



Reliability of rail: Ensures Capability and Dependability

BNSF's 2014 Capital Commitment \$5 Billion

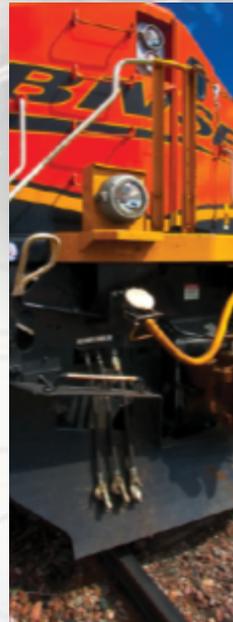


- Core Network and Related Assets
- Expansion and Efficiency
- Locomotive, Freight Car, and Other Equip
- PTC



\$2.3 billion

Core Network and Related Assets



\$1.6 billion

Loco, Freight Car & Other Equip



\$900 million

Expansion & Efficiency



\$200 million

PTC

Reliability of rail: North Dakota- expanding capacity to meet demand

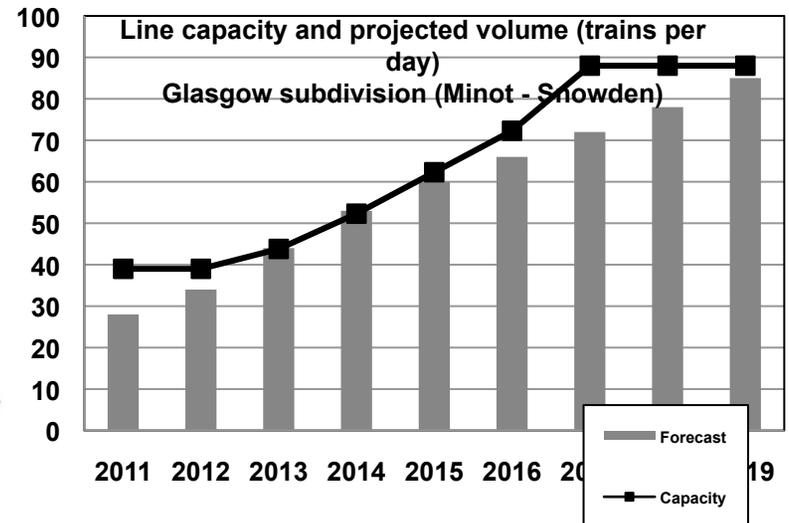
Over \$600 million in infrastructure investment (2013-2014)

115 miles of new track

4 new sidings

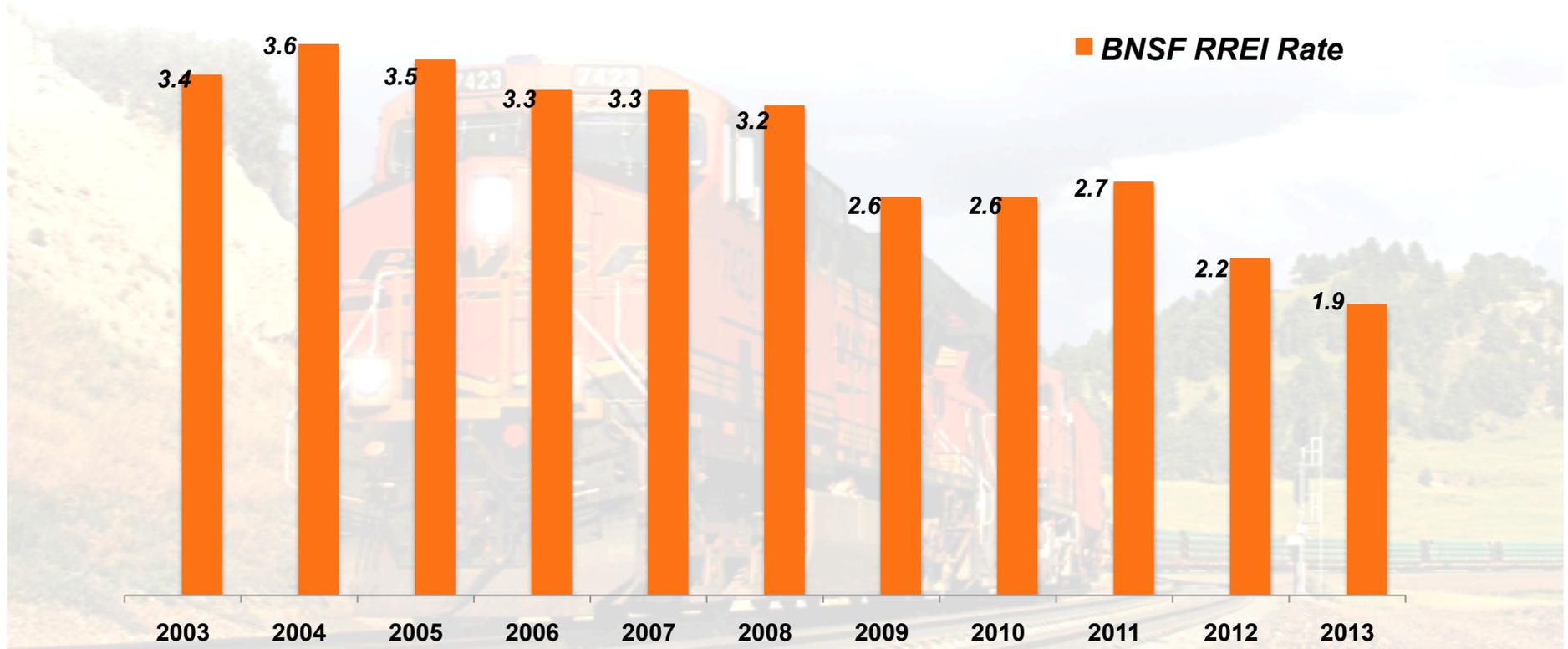


- BNSF
- Handling Carrier
- Other Rail Systems
- Canadian Pacific



Reliability of rail: Continuous risk reduction

BNSF vs. Industry Reportable Rail Equipment Incident Rate (*Incidents per Million Train Miles*)



Reliability of rail: Crude by rail safety

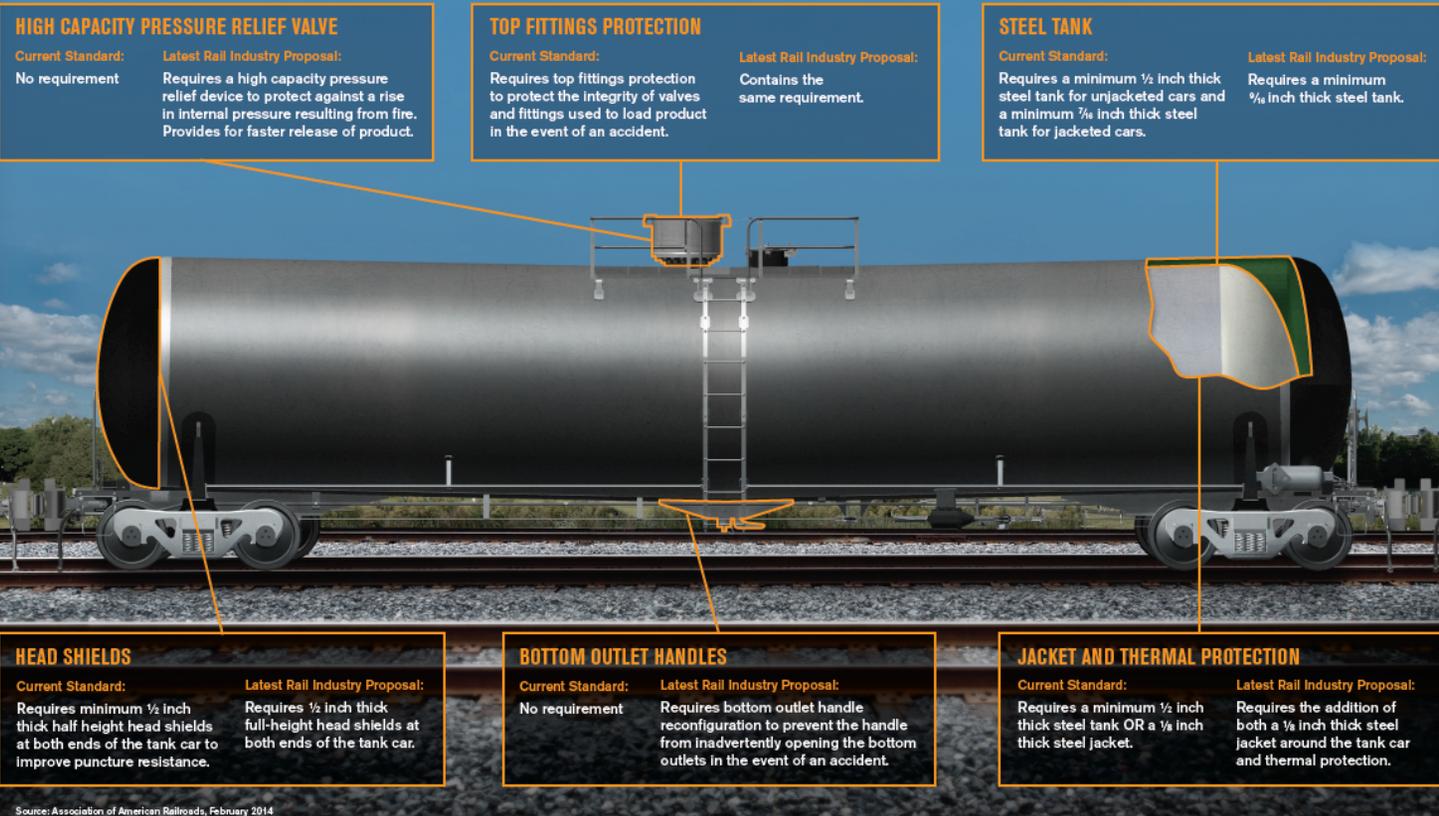


- 2013 and 2012 safest years on record, with record volumes
- Growing crude volumes delivered safely (99.997% shipped without incident)
-
- Over 65,000 first responders trained in their BNSF communities since 1996; 1,500 oil incident trainers trained by rail industry in 2014

Reliability of Rail: Industry leadership and careful regulation

EVOLUTION OF RAIL INDUSTRY TANK CAR STANDARDS FOR CRUDE OIL

The railroad industry is proposing to increase the federal tank car design and construction standards for new tank cars used to transport crude oil. This proposal comes after a previous upgrade proposal which the industry voluntarily adopted and has been observing since October 2011. This graphic shows the additional tank car components included in the latest rail industry proposal.



- Reasonable train speeds are essential to commerce
- Feasible and effective DP braking systems
- Crude fleet transition first priority

What will ensure reliability?

What's needed to fully capture the potential that rail holds for energy reliability:

- ✓ Tank car regulations that can be implemented creating certainty in the marketplace;
- ✓ Reasonable speed restrictions that enhance safety, but do not encumber 95% of the freight traffic on America's freight rail network;
- ✓ Regulatory agencies to cooperatively work with us to facilitate the conversion to LNG.

The image features a blurred train moving from right to left across the frame, set against a sunset sky with orange and blue tones. A signal tower with two lights is visible on the left side of the tracks. The BNSF Railway logo is prominently displayed in the center, consisting of the letters 'BNSF' in a large, bold, white sans-serif font with a registered trademark symbol, and the word 'RAILWAY' in a smaller, white, italicized sans-serif font below it. A thick white horizontal bar is positioned behind the 'BNSF' text.

BNSF[®]
RAILWAY

A thick white horizontal bar spans the width of the page, with the BNSF Railway logo positioned on the right side. The logo consists of the letters 'BNSF' in a bold, orange sans-serif font with a registered trademark symbol, and the word 'RAILWAY' in a smaller, black, italicized sans-serif font below it.

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