

BNSF Railway

Rail Capacity & Safety

Dean Wise
VP Network Strategy
BNSF Railway

July 13, 2015



*Pacific NorthWest
Economic Region*

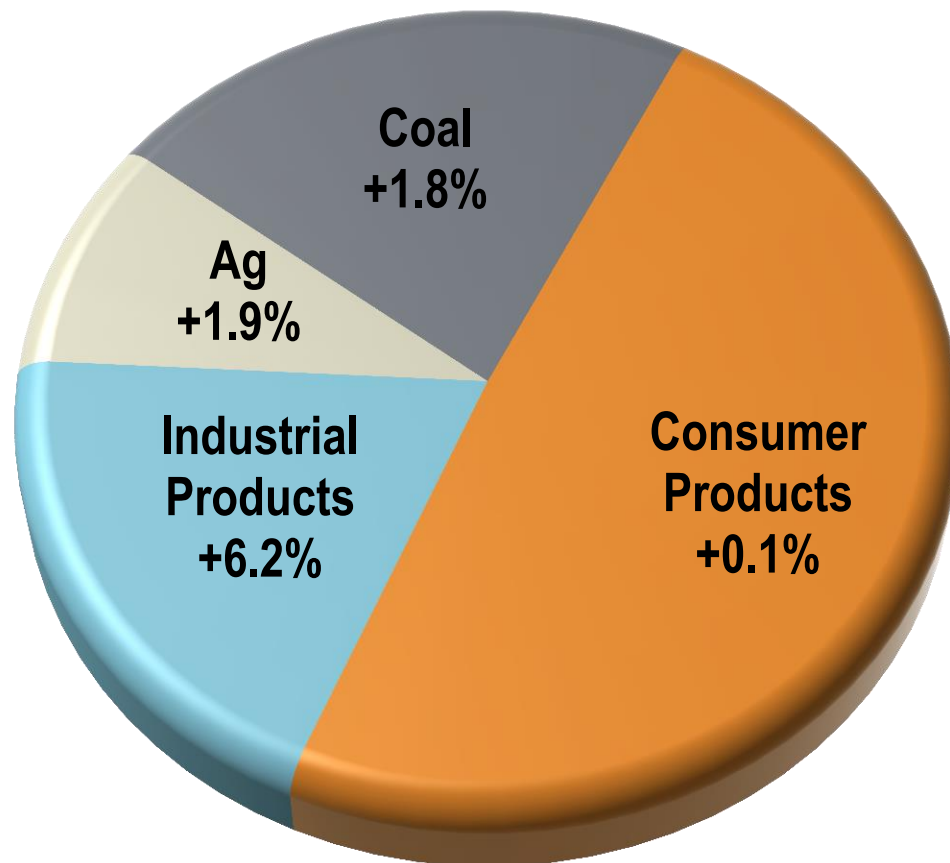
BNSF Overview

- A Berkshire Hathaway company
- 32,500 route miles with operations in 28 states and 3 Canadian provinces
- 47,000 employees
- Approximately 8,000 locomotives
- 13,000 bridges and 89 tunnels
- Moves over 1/4 of the U.S. rail freight each year
- Over 1,600 freight trains per day
- Serves over 40 ports
- Leads rail industry in technological innovation
- Unlike other forms of transportation, BNSF trains operate on an infrastructure financed almost entirely by BNSF



- Direct BNSF gateways to Canada
- Shortline gateways to Canada

BNSF Freight Business Mix



2014 Total System Volume +1.8%
% change from 2013

Industrial Products



Food & Beverage

Beer & Wine
Canned Goods
Perishables
Vegetables



Building Products

Paper, Pulp, Lumber,
Panel, Rail Equipment,
Transformers,
Generators, Roofing
Materials, Waste



Construction Products

Pipe, Sheet, Structural,
Scrap, Taconite,
Aluminum, Sand, Salt,
Clays, Crushed Stone,
Cement, Lime,
Gypsum



Petroleum Products

Crude Oil
LPG
Asphalt
Alcohols & Solvents

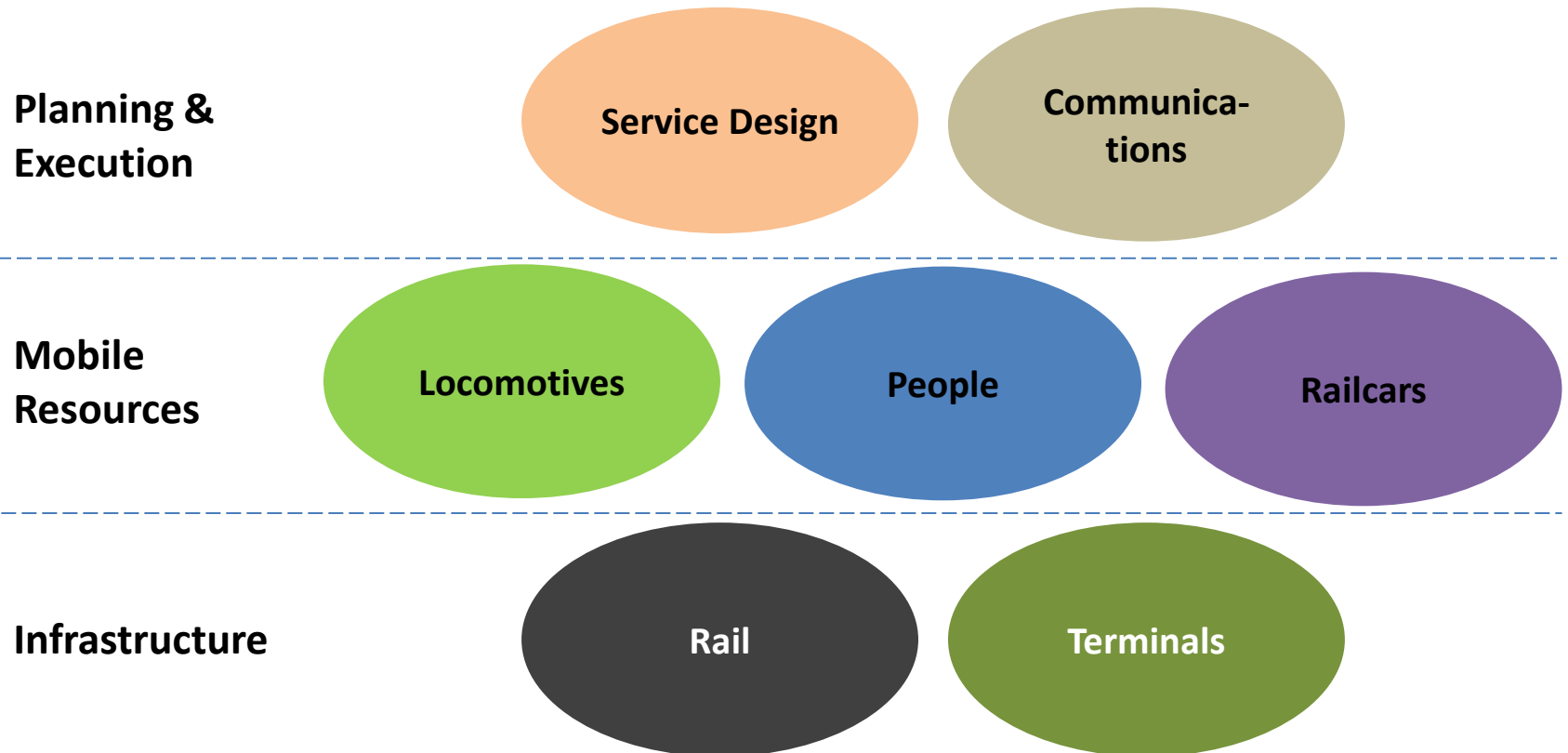


Chemicals & Plastics

Acids, Intermediates,
Caustic Soda, PVC,
Polypropylene,
Polystyrene,
Polyethylene

Railroad Capacity is Multi-Faceted

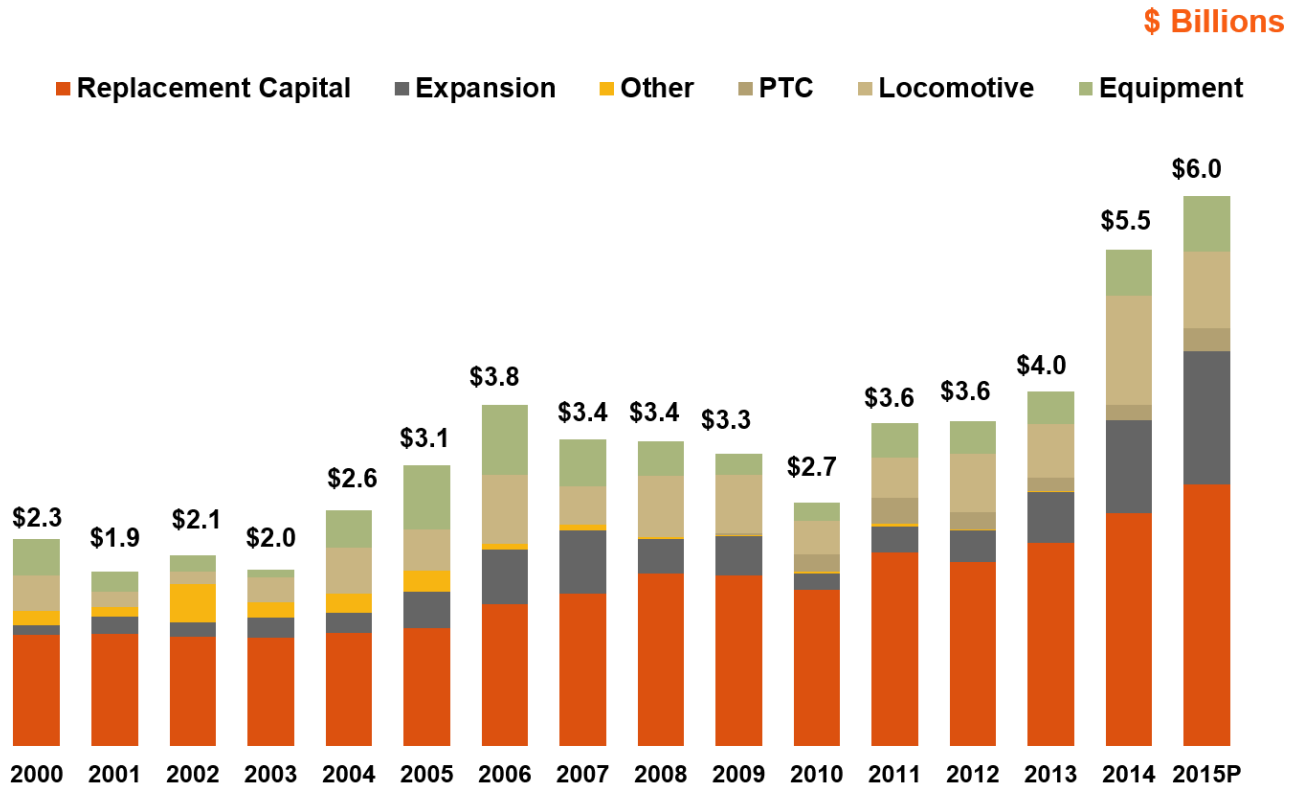
Capacity = Network Throughput (Trains per Day)



Short term focus: velocity momentum

Long term: infrastructure expansion

BNSF's Capital Commitments

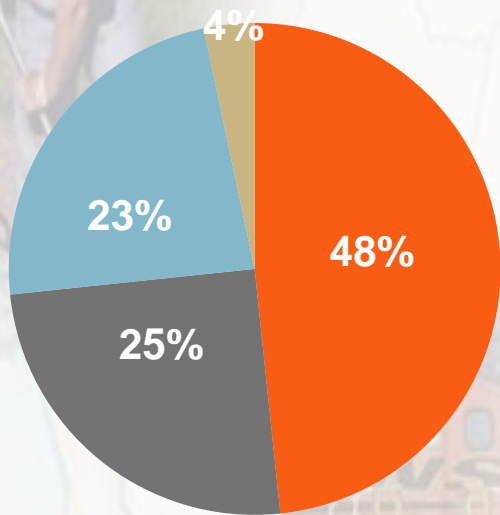


- BNSF is committed to growth by ensuring future capability and reliability
- Goal is to build capacity above customer growth

\$53.3 B in 16 years

Record Investment Continues in 2015

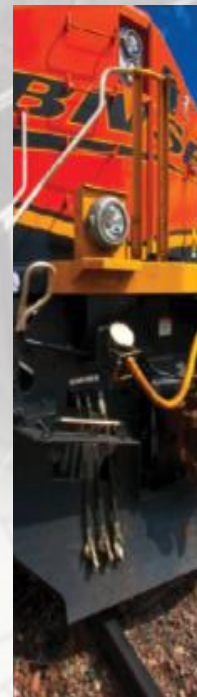
BNSF's 2015 Capital Commitment \$6B



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



\$2.9 billion
Core Network & Related Assets



\$1.4 billion
Loco, Freight Car, & Other Equip

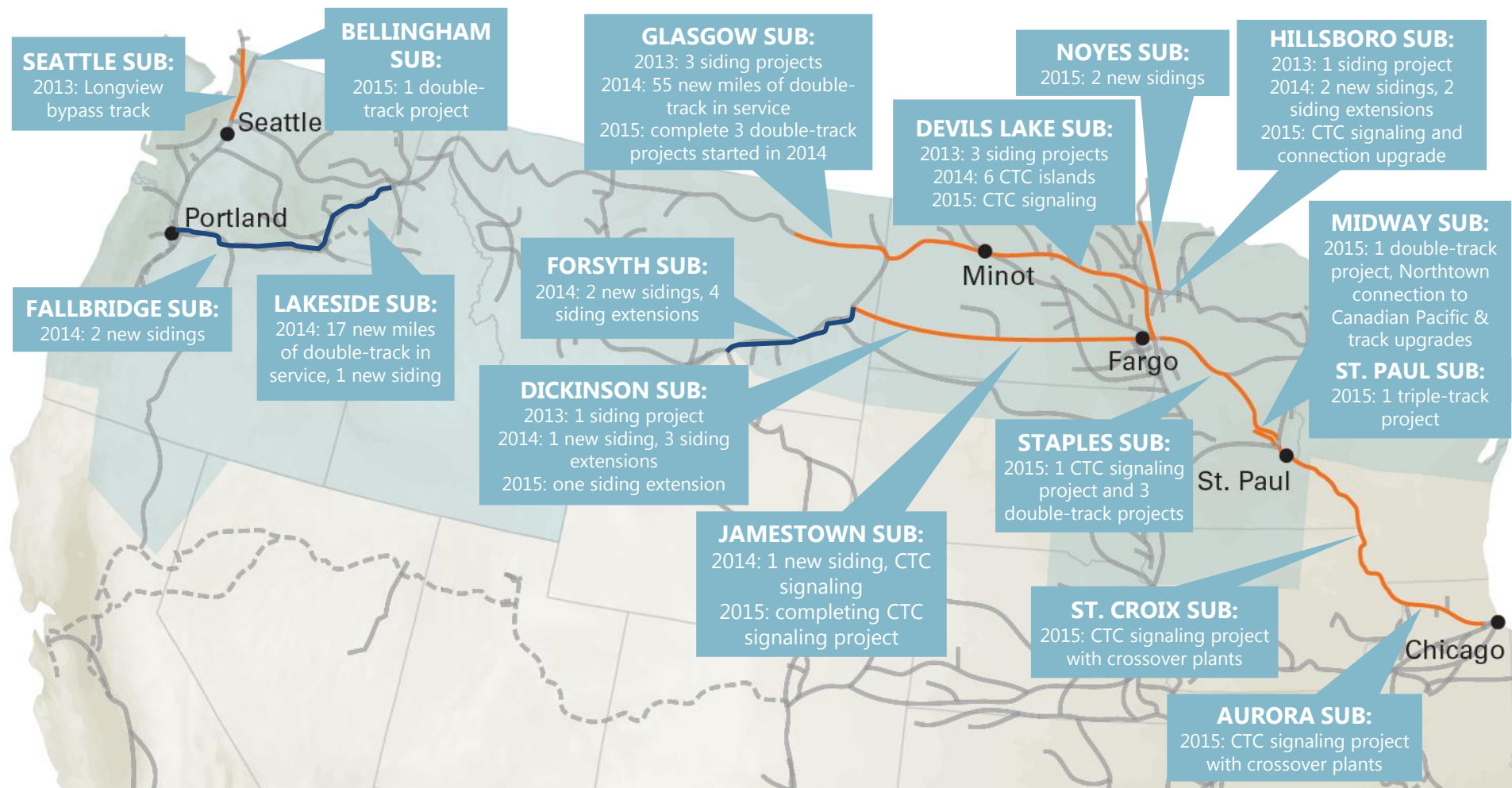


\$1.5 billion
Expansion & Efficiency



\$200 million
PTC

BNSF Northern Corridor Expansion



Great Northern Corridor Coalition

Multistate Planning and Development Study

- Montana DOT took the lead in forming a GN Corridor Coalition, which now includes 19 members and 14 supporters
- The Coalition sought and received \$928k funding for planning studies from FHWA Multistate Corridor Operations and Management Program.

*Coalition's Vision - "The Great Northern Corridor is a globally competitive **multistate freight corridor** consisting of a seamless **road and rail network** that promotes economic growth for neighboring communities and accommodates the demand for safe, efficient and environmentally sound transportation services."*

Coalition Members

- Montana DOT (Lead Agency)
- Washington DOT
- Oregon DOT
- Idaho DOT
- North Dakota DOT
- Minnesota DOT
- Wisconsin DOT
- BNSF Railway
- Ports: Everett, Seattle, Grays Harbor, Tacoma, Longview, Vancouver USA, Portland, Quincy, Pasco, Northern Montana, Washington Public Ports Association

Great Northern Corridor



Multi-State Perspective

- Shared Corridor Vision
- Highlights the important role the Corridor and its stakeholders play
- Promotes regional cooperation, planning, and shared project implementation
- Supports trade prosperity and economic development
- Strengthens relationships between federal, state and local jurisdictions

Phase I - Findings & Conclusions

- Critical first step to identify and analyze the Corridor in a local, regional and national context
- Demonstrates the benefits the Corridor provides – nearly 25% of the GNC states' economies are influenced by the Corridor
- Strategically positions the GNC Coalition to pursue critical actions, steps and initiatives
- Lays the foundation for productive near-term and long-term future for the Corridor
- Positions the Corridor for future funding opportunities

BNSF's Safety Vision

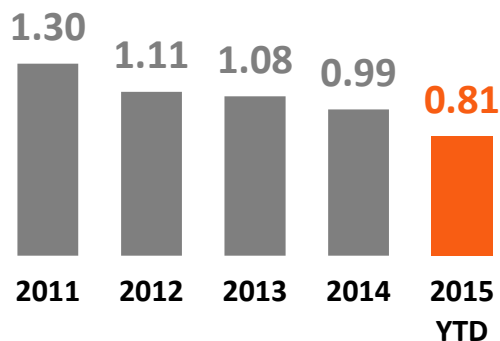


- **BNSF believes that every accident and injury is preventable**
- **BNSF's safety vision is focused on preventing accidents in the first place**
- **BNSF partners with employees to create a culture that reinforces safety as the highest priority**
- **BNSF's risk reduction program is designed to enable all commodities to be handled safely and arrive damage- and incident-free**

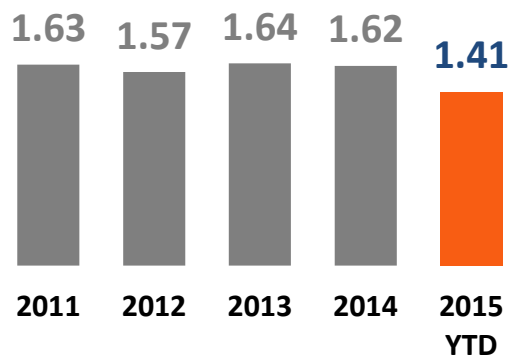
BNSF – A Safety Leader

ACHIEVED BEST-EVER SAFETY AND DERAILMENT PERFORMANCE IN 2014

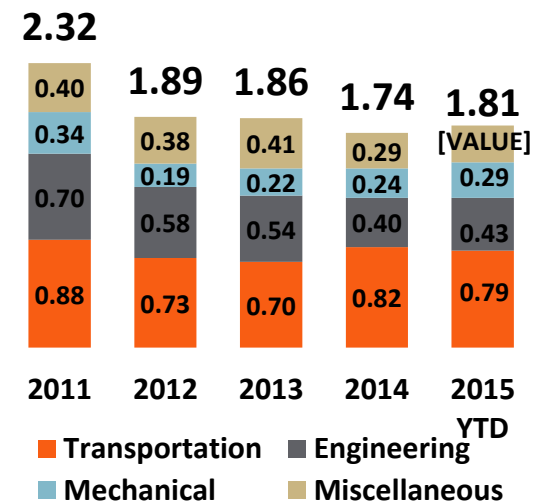
EMPLOYEE
REPORTABLE PERSONAL INJURY INCIDENTS PER
200,000 EMPLOYEE HOURS



PUBLIC
CROSSING ACCIDENTS
PER MILLION TRAIN MILES



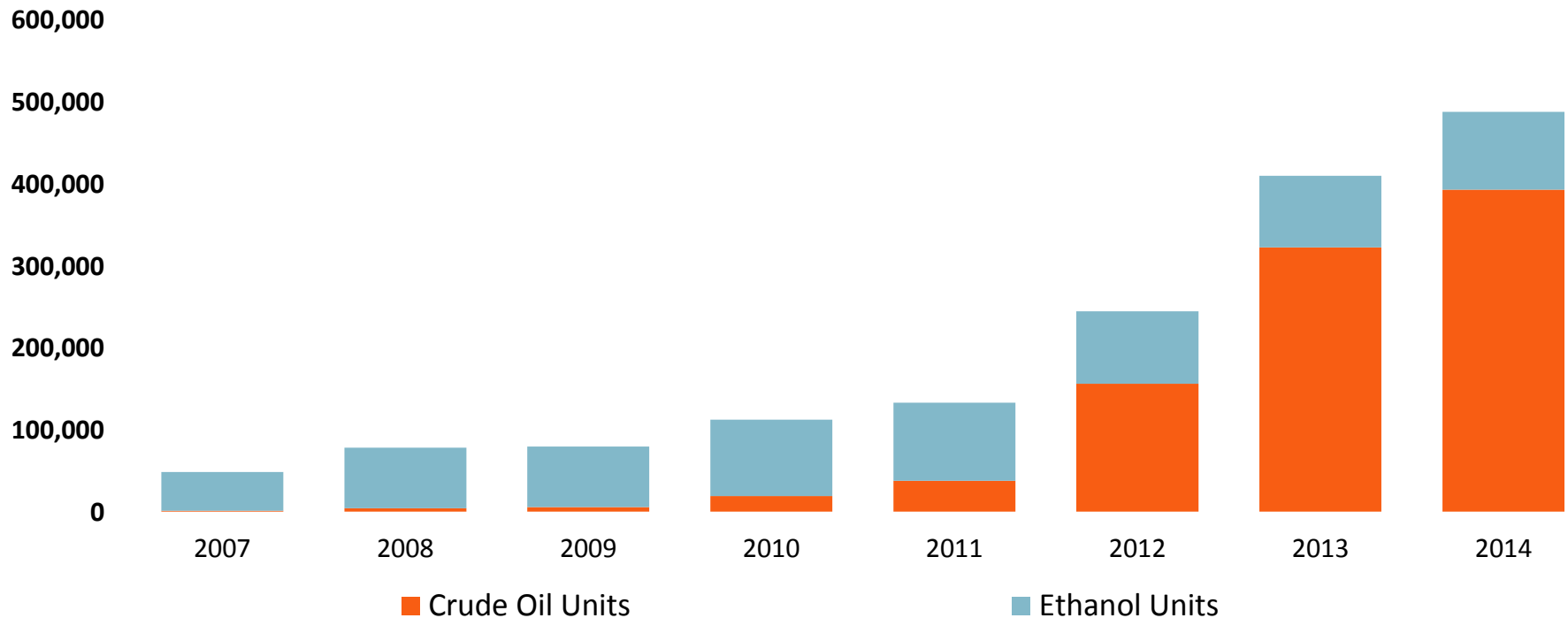
RAIL EQUIPMENT
REPORTABLE DERAILMENT INCIDENTS PER
MILLION TRAIN MILES



Source: BNSF internal data through April 30, 2015

Ethanol & Crude Oil Traffic Has Increased . . .

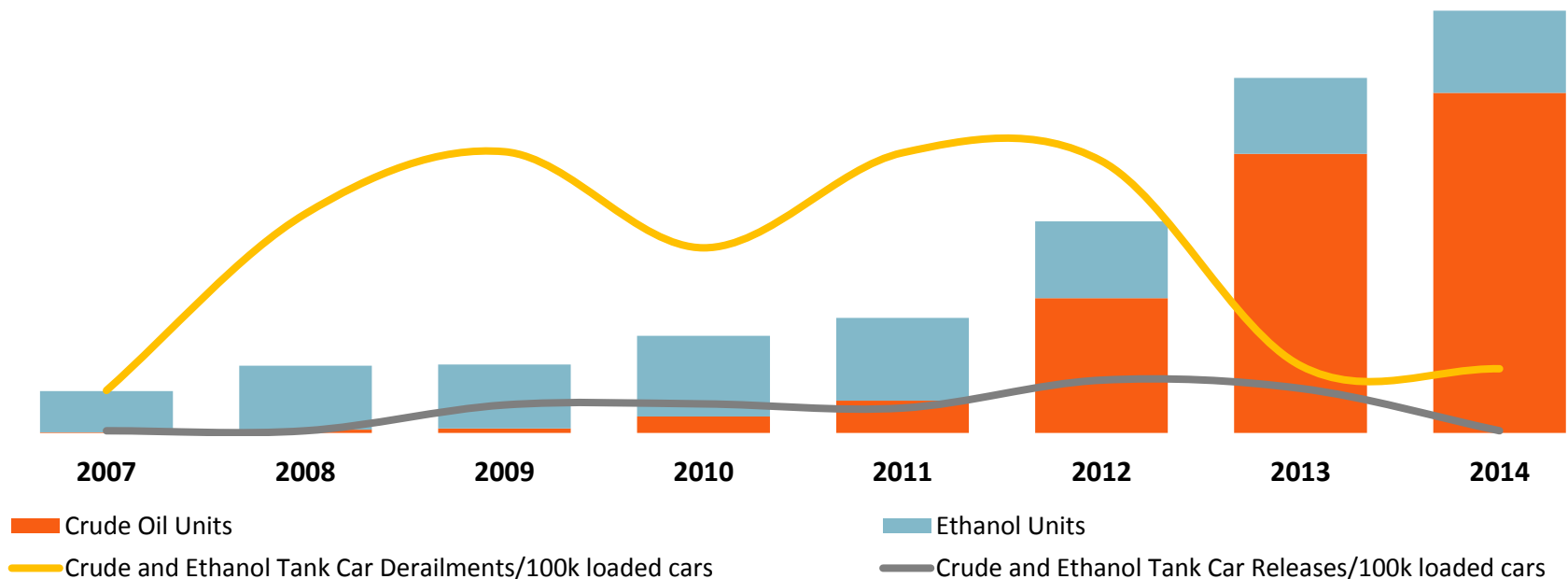
By 2014, ethanol and crude oil traffic increased to almost 10 times the level in 2007



Source: BNSF internal data through Dec. 31, 2014

Ethanol & Crude Oil Incidents Have Decreased

*As crude oil and ethanol shipments have increased, the number of derailments have decreased by 78% **



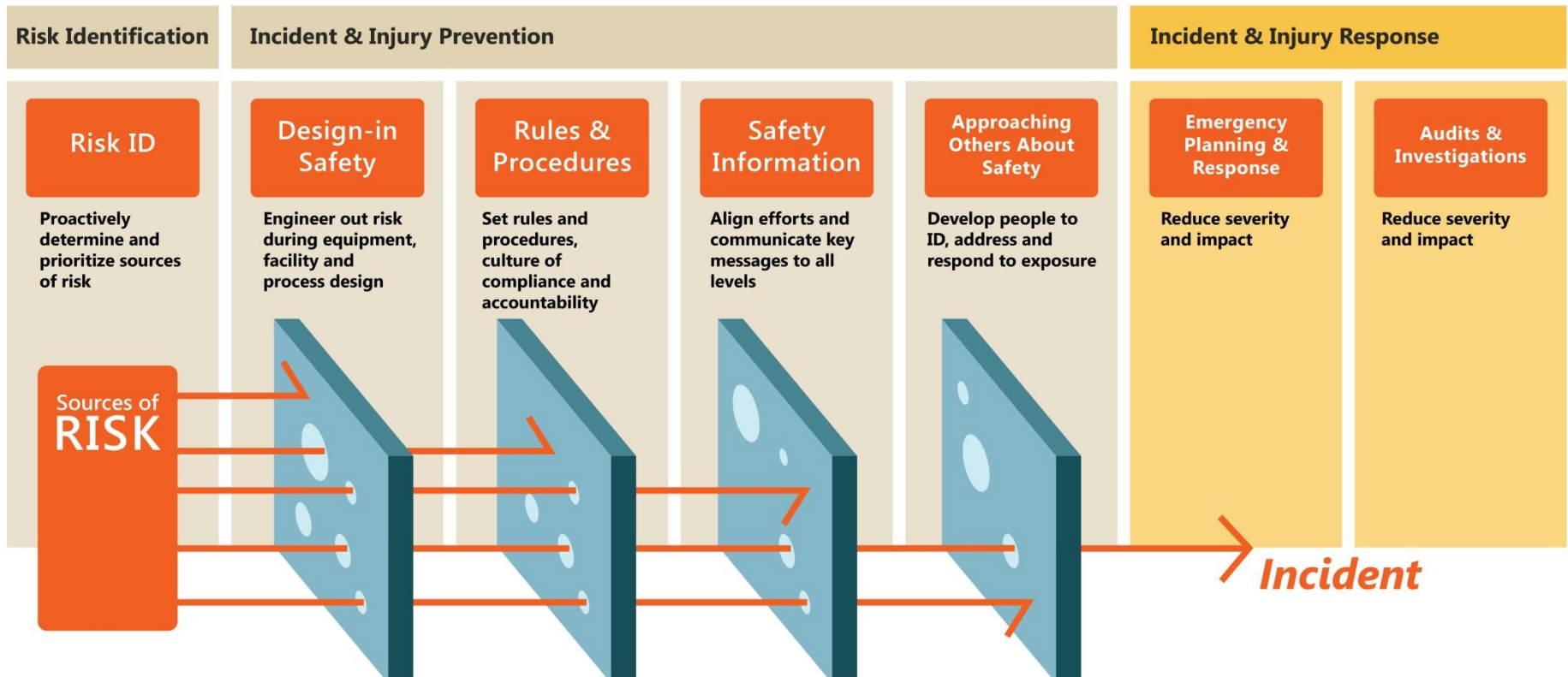
Source: BNSF internal data through Dec. 31, 2014 *Decrease in crude and ethanol loaded cars from 2011-2014

BNSF Has a Broad-Based Risk Reduction Program

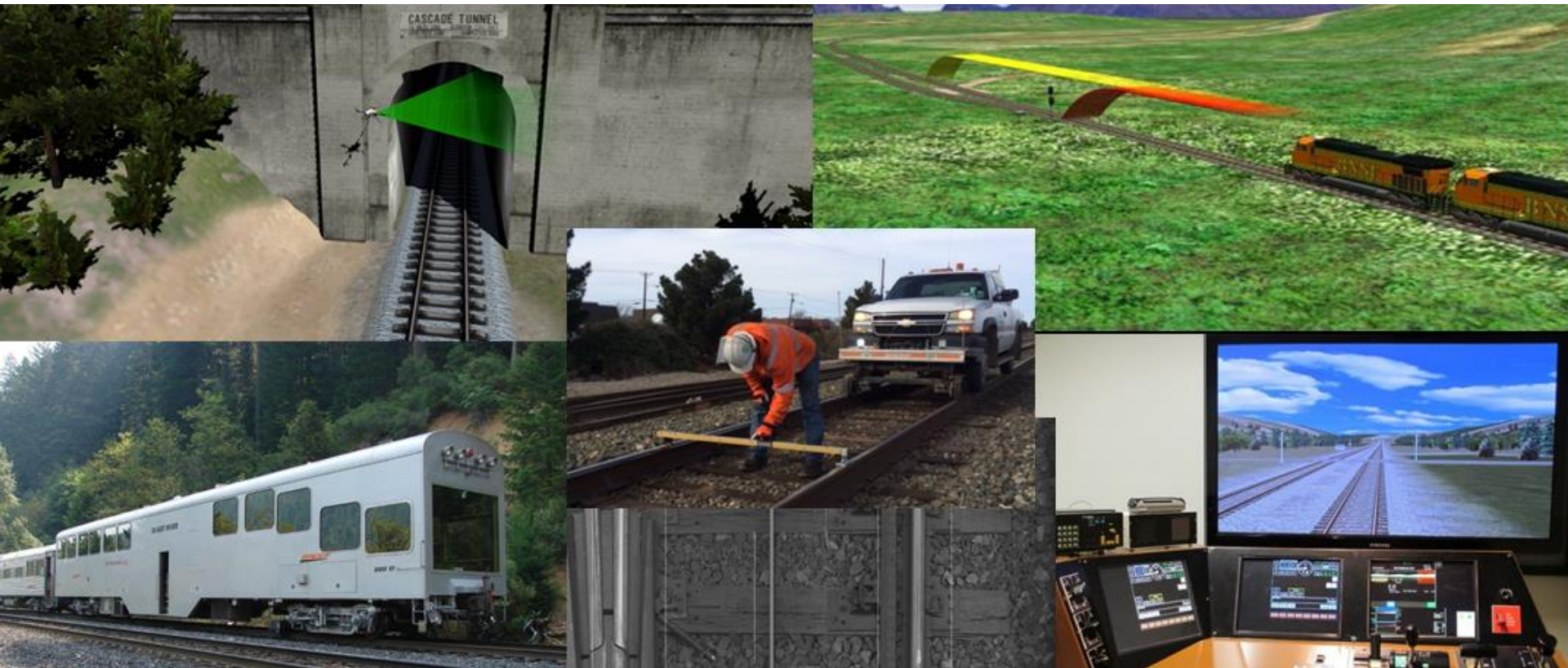


- *Preventing rail equipment incidents*
- *Reducing the impact and consequences of an incident*
- *Strengthening emergency response capabilities*

Layers of Safety Risk Reduction



Leveraging Technology to Reduce Risk



Track Measurement and Analytics

BNSF's Track Measurement Fleet:

- More than 150,000 miles tested per year
- Rail-Bound Geometry Cars
- Hi-Rail Geometry Vehicles
- Holland STAR Cars
- Ground-Penetrating Radar Vehicles
- Aurora Tie Inspection Vehicles
- Ensco Joint Bar Inspection System
- Sasser Optical Inspection System
- Unmanned Geometry Test Car Pilot



Equipment Detection Technology

Prevention Technology

- More than 2,000 trackside detectors
- Hot Box Detector (HBD)
- Wheel Load Impact Detector (WILD)
- Trackside Acoustical Detector (TADS)
- Sonic Cracked Wheel/Axle Detector (CWAD)
- Machine Vision Systems
- Magnetic Particle Inspection
- Warm Bearing Detection System (WBDS)
- Hot Wheel Detectors (HWD)
- Truck Performance Detectors (TPD)



Positive Train Control (PTC)



Challenges:

- System of systems reliability
- Interoperability
- Further technology integration

BNSF Positive Train Control (PTC) Implementation



Data Analytics Help Proactively Identify Rail Equipment Issues



Unmanned Aerial Systems (UAS)

Supplemental track and structure inspection

- Small multi-rotor aircraft
- Operations governed by FAA Section 333 Exemption
- Will enable service interruption support



Track integrity flights for key train operation

- Larger fixed wing aircraft
- Initially governed by FAA Research Agreement (CRDA)



Rail Technology