

# ATTACHMENT D



# *BNSF RAIL SAFETY OVERVIEW*

MONTH XX, 2016  
CITY, STATE

EX 0113-TSS



# Rail Transports Crude Safely

**Since 1980**, railroads reduced rates for employee injuries, train accidents and grade crossing collisions by **80 percent**.

**In 2015** BNSF moved hazardous materials **99.99 percent** of the time without an accidental release.



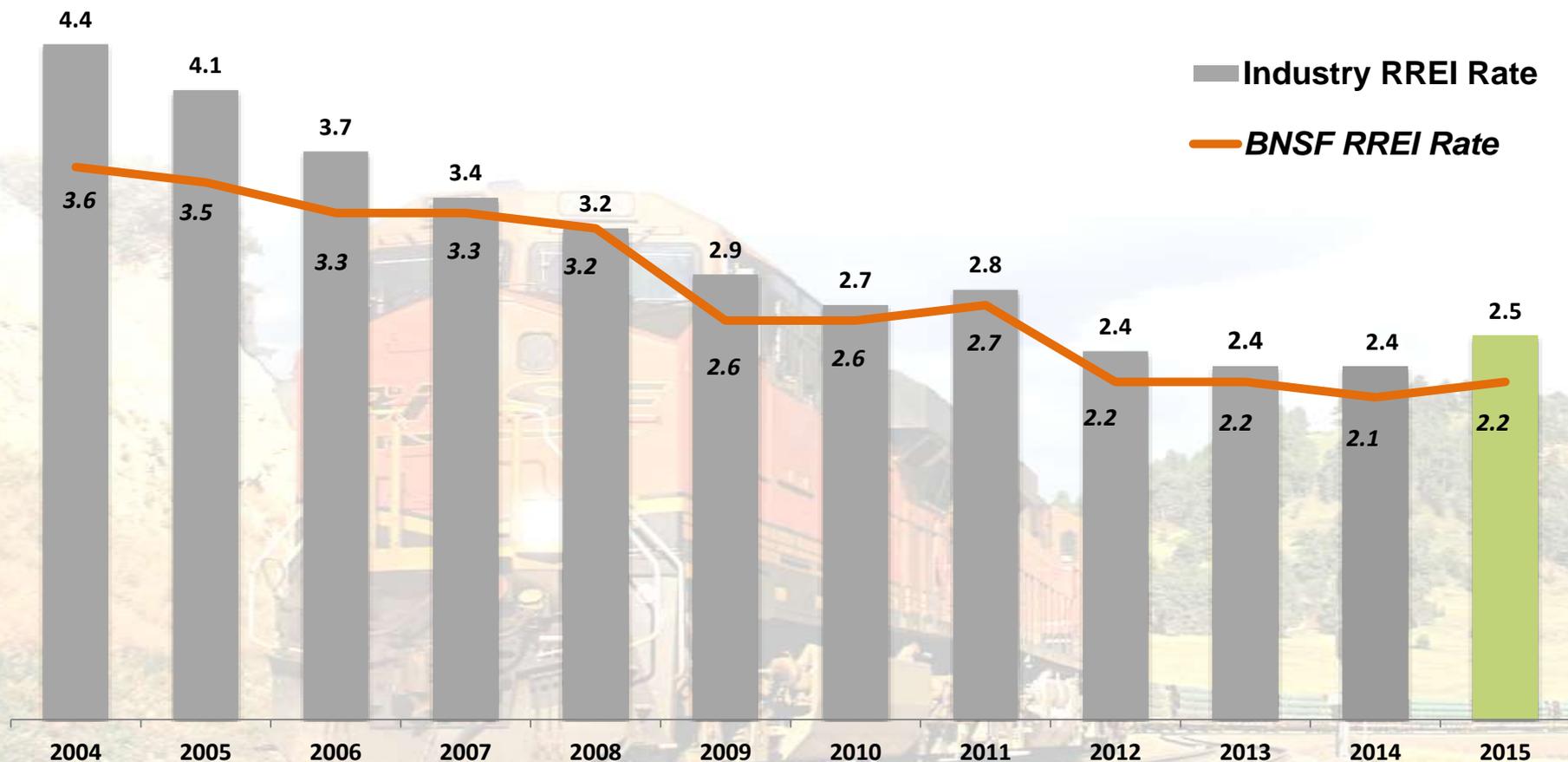
# BNSF's Safety Overview

- Rail is safest mode of land transportation.
- BNSF's safety vision is to prevent accidents in the first place.
- BNSF has a broad-based risk reduction program.



# Safety Leader for Continuous Risk Reduction

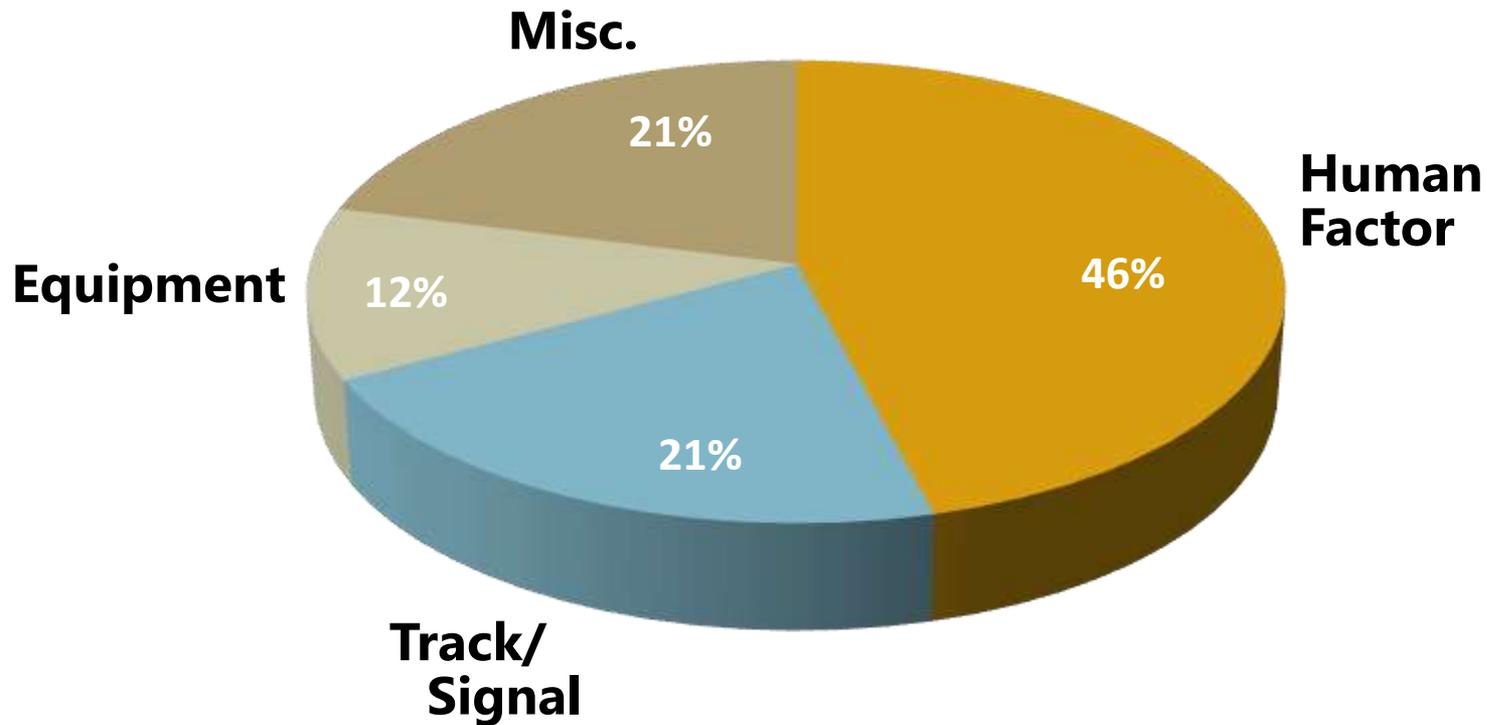
**BNSF vs. Industry Reportable Rail Equipment Incident Rate** (*Incidents per Million Train Miles*)



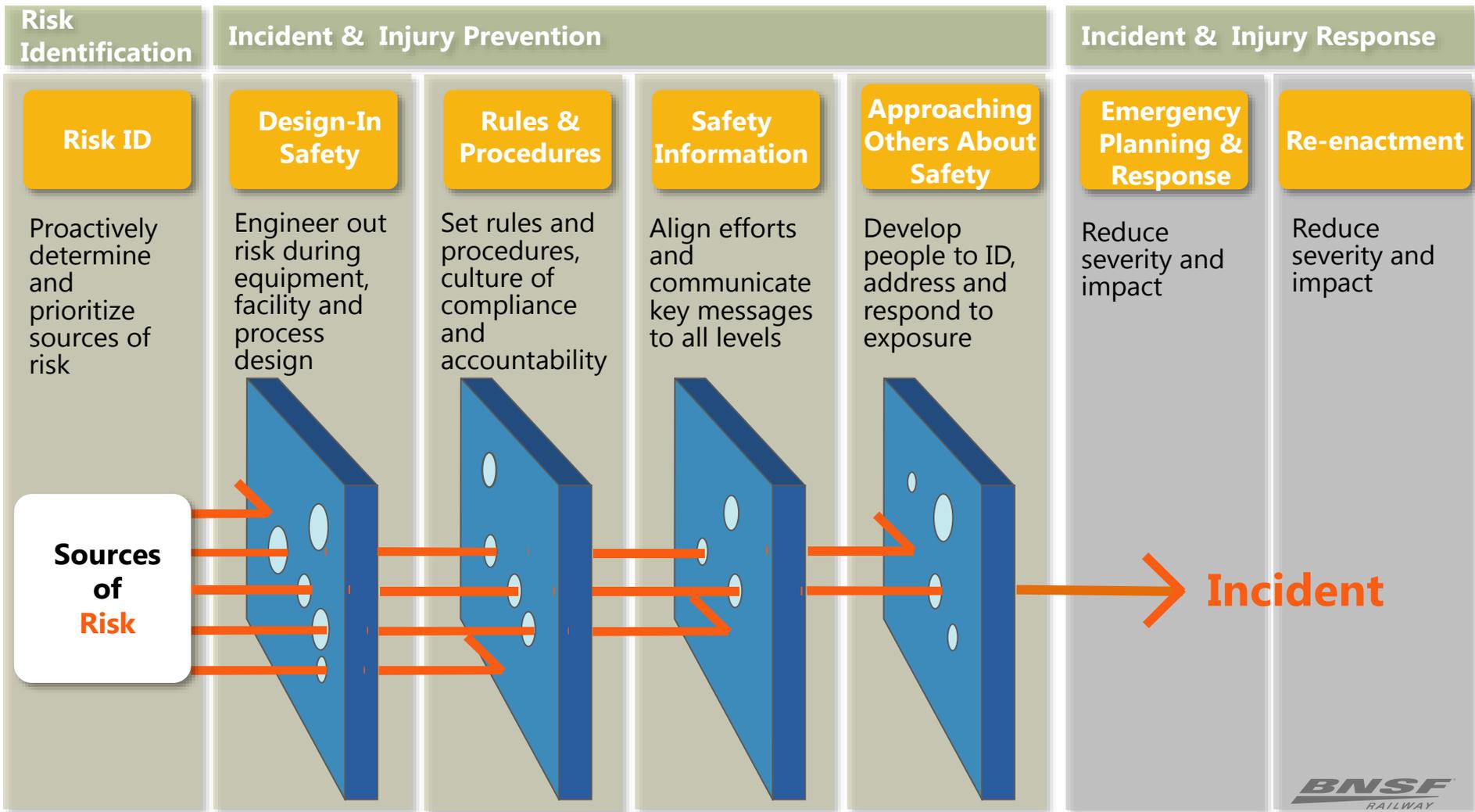
Source: FRA – Data for Calendar Year through Dec. 31, 2015

# Prevention: Causes for Derailments

## BNSF Reportable Train Accident Causes - 2015



# Prevention: Risk-Reduction Efforts – Layers of Safety



# Prevention: Reducing Risk

## Human Factor

- Training
- Remote monitoring
- Positive Train Control
- Self reporting protocol

## Equipment/Mechanical

- Ultrasonic inspection
- Detector network - dragging equipment
- Technology
  - Thermal/infrared scanning for warm bearing detection

## Track/Signal

- Enhanced track inspection training
- Continued elimination of jointed rail
- Strong capital program for tie renewal
- Technology - ground penetrating radar and enhanced geometry testing

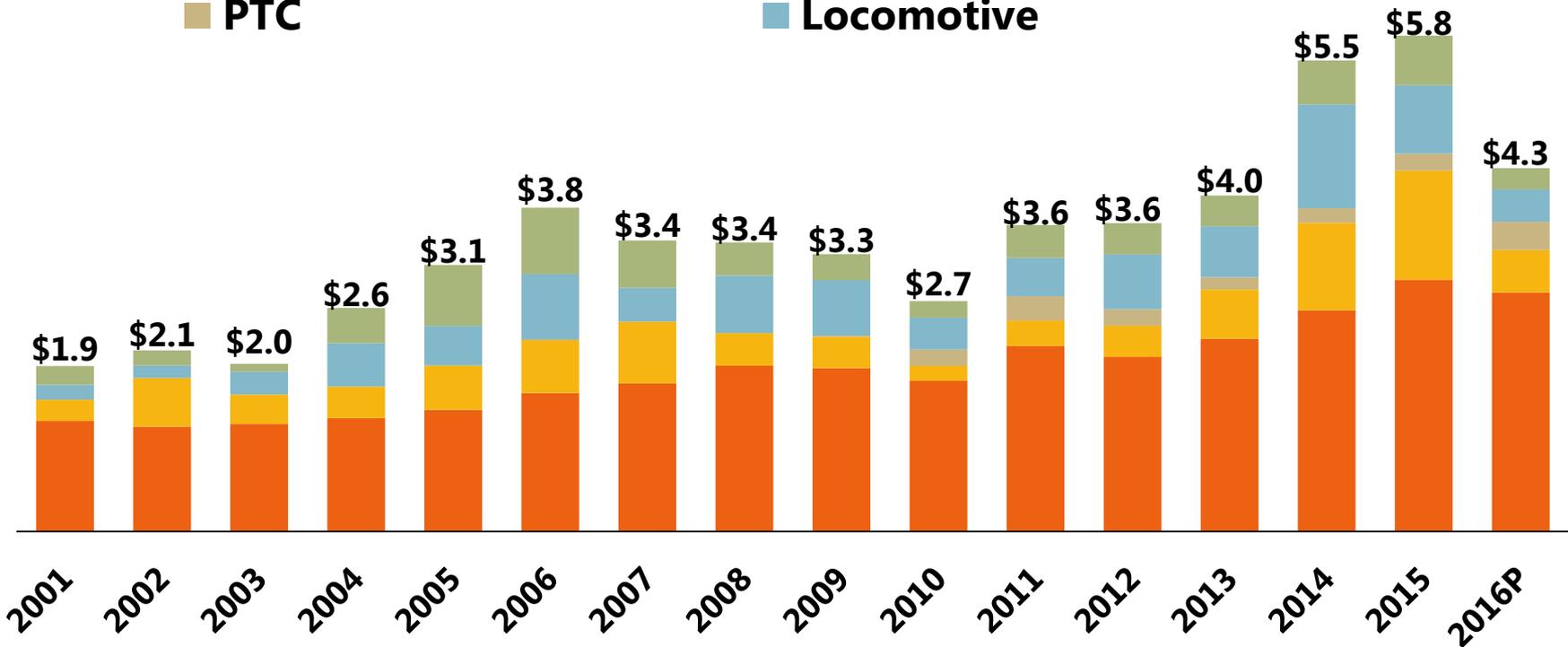


**Our ongoing focus is on instilling a culture of commitment and compliance – a culture that is sensitive to exposure and risk.**

# Prevention: Record Capital Spending

BNSF plans to spend **\$4.3 billion** on capital projects in 2016 to support maintenance and expansion – \$2.8 billion for network maintenance

- Replacement Capital
- Expansion
- PTC
- Locomotive



# Prevention: Approach to Inspections

## Bridge and Track Inspections

BNSF inspects tracks and bridges more often than required by FRA

- Most BNSF key routes inspected **four times weekly** and **busiest daily**
- Geometry car inspections performed **at least two times** on crude oil routes annually
- Track inspections with state-of-the-art technology to detect internal and external flaws in the rail and track structure
- Weather and earthquake inspections



## Increased Rail Detection Testing Frequencies Along Critical Waterways

Increased rail detection testing along critical waterways from the FRA frequency of twice annually to **2.5 times in April 2015**



# Prevention: Equipment Detection 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)



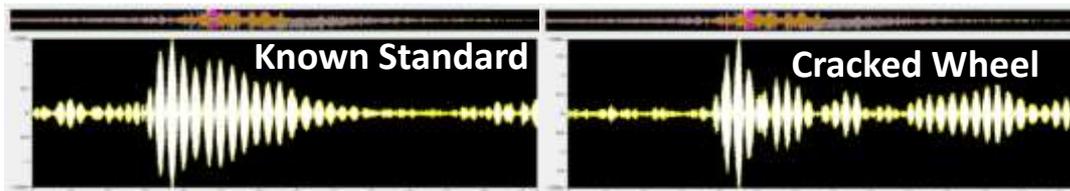
# Prevention: Rail Equipment Detector Examples



- **Acoustic Bearing Detector (ABD)** – acoustic systems used to evaluate sounds generated by specific bearing component defects



- **Hot Box Detector (HBD)** – evaluates bearing temperature history for statistical outliers; brake issues, burned off journals



- **Cracked Wheel/Axle Detector (CWAD)** – Rail mounted sensors capable of detecting the difference between tones generated by normal vs. flawed wheels and axles

# Prevention: Key Train Operations

A Key Train has one or more loads of Toxic Inhalation Hazard/Poisonous Inhalation (TIH/PIH) materials or a train with 20 or more tank loads of any hazardous materials.

## Special Handling for Key Trains

- Special identification and tracking
- Speed restrictions for crude and ethanol
  - **BNSF requires a speed of 35 mph for all shale crude trains through municipalities of 100,000 or larger as of March 2015**
  - 50 mph for all Key Trains as of July 2014
  - Municipal speed restriction of 40 mph for crude oil trains consisting of one or more DOT111 tank cars, including CPC 1232 tank cars, moving through High Treat Urban Areas issued by the Department of Transportation on July 1, 2014.
- **Risk-based Routing:** Applied PHMSA's *Rail Corridor Risk Management System* and its 27 Risk Factors, defining the "most safe and secure" routes for trains carrying TIH/PIH, to crude unit trains starting July 2014.
- **Key Train Routes:** Wayside wheel bearing detector spacing, frequency of track inspections, minimum track maintenance standards for tracks used to meet or pass Key Trains.
- **Unattended Trains:** Crude oil trains left unattended require specific job safety briefing between train crew and train dispatcher.
- **Locomotive Cab Securement:** Key Trains left unattended have reverser removed and cab doors locked.

# Prevention: Risk Reduction for Crude Trains

## Derailment Prevention – Increased Trackside Safety Technology

BNSF-SPECIFIC ACTION	INDUSTRY ACTION
<p><b>Hot Bearing Detectors</b> spacing of 10 miles on crude routes that parallel critical waterways, which is a higher standard than the industry maximum of 40 mile spacing. Key Trains stopped by Hot Bearing Detectors must set-out the indication car.</p> <p>Effective March 2015</p>	<p>Additional Hot Bearing Detectors on crude oil routes (maximum 40 mile spacing).</p> <p>Effective July 2014</p>
<p>Increase rail detection frequencies along critical waterways as BNSF went from the FRA frequency of twice a year to <b>2.5 times</b>.</p> <p>Effective April 1, 2015</p>	
<p>Key Trains with Level II Wheel Impact Load Detector (WILD) defect (120-140 Kilopound) will be handled as LEVEL I defect (immediate set-out).</p> <p>Effective March 2015</p>	

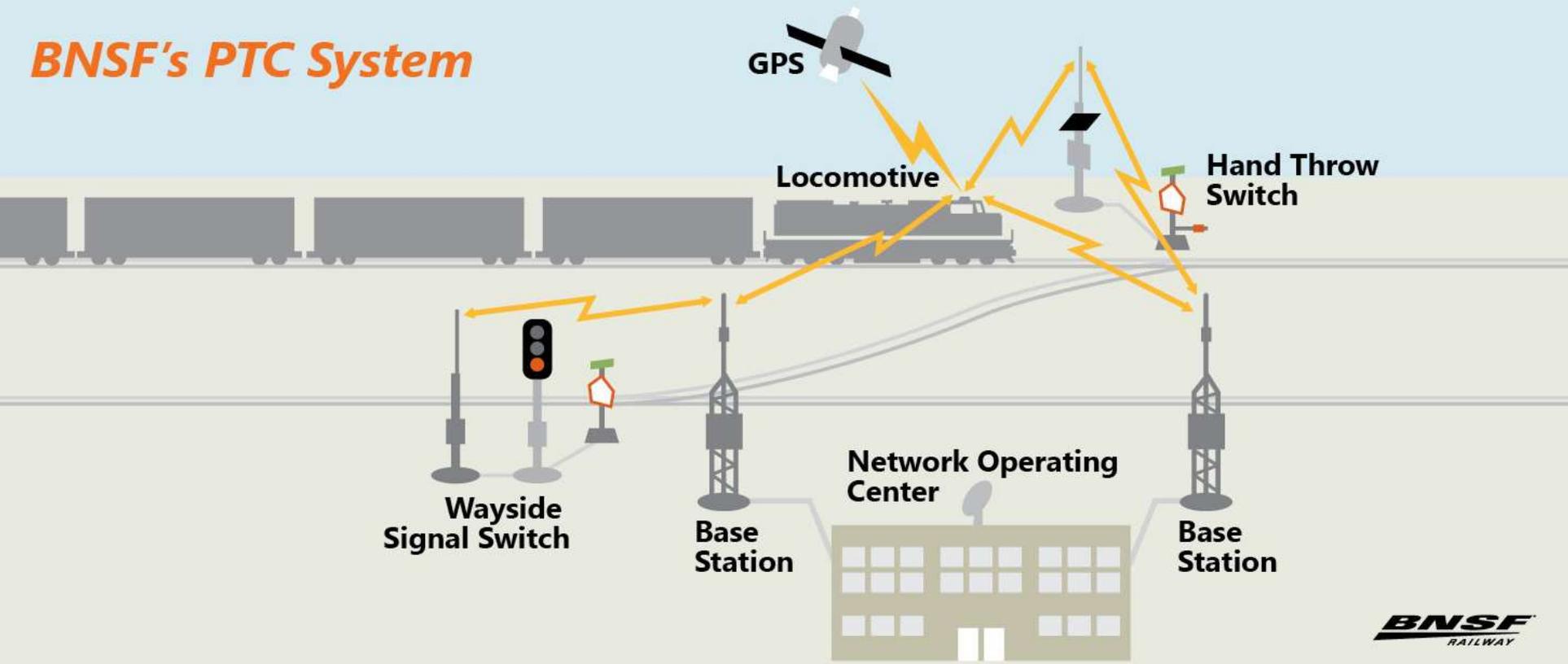
# Prevention: Positive Train Control (PTC) Deployment Will Enhance Safety

PTC is a digital wireless communication technology



*The Future*

## *BNSF's PTC System*



# Mitigation: U.S. DOT Final Rule

## Final Rule Issued May 2015 and Effective July 7, 2015

*(various aspects of the new rule are currently being challenged in court and with the U.S. DOT)*

### New Braking Standards

- Requires End-of-Train (EOT) device or Distributive Power (DP) braking
- Electronically Controlled Pneumatic (ECP) braking system for High Hazard Flammable Unit Trains (HHFUT) (70+ cars) by Jan. 1, 2021 or 30mph speed limit – Crude Oil
- ECP braking for High Hazard Flammable Trains by May 2023 or 30 mph speed limit – All Other HHFUT

**Note:** The FAST Act requires an independent evaluation of the electronic brakes standard, which may result in the repeal of the electronic brakes mandate.

### New Operational Standards

- Reduced operating speeds - **BNSF-specific standards exceed**
- Routing requirements
- Notification information for government agencies

### New Classification Requirements

Document sampling and testing program

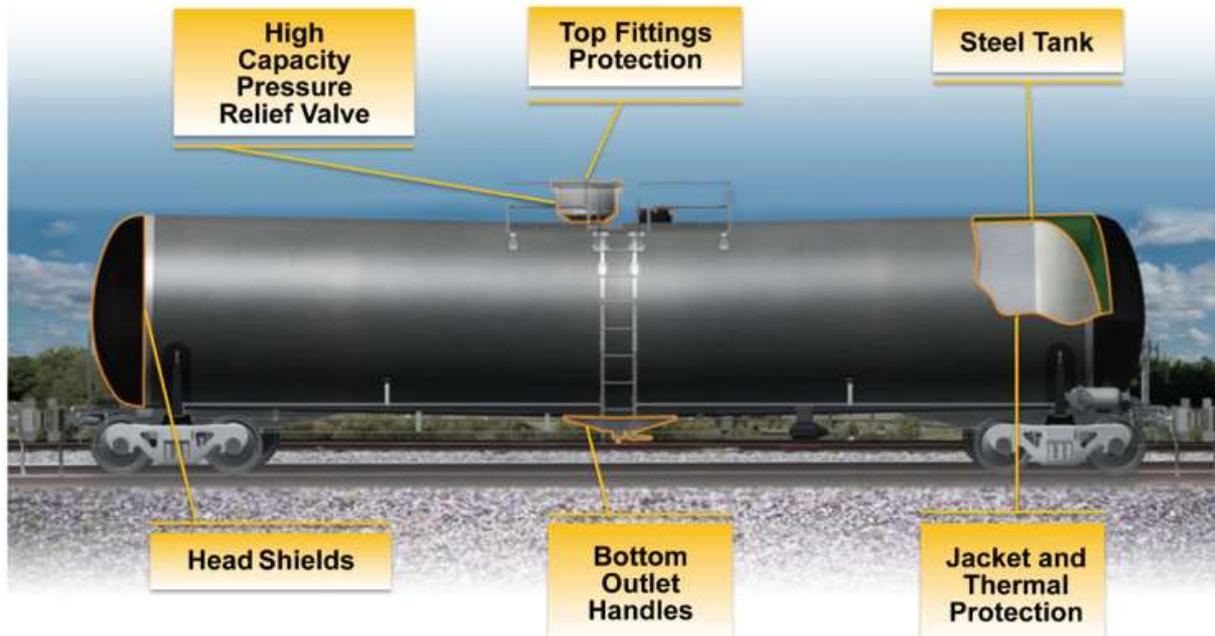
Ruling applies to HHFT (High-hazard flammable trains) =  $\geq 20$  loaded tank cars in a continuous block or  $\geq 35$  or more loaded tank cars dispersed through a train

# Mitigation: New Tank Car Standards

## Tank Cars for High-Hazard Flammable Trains (HHFT)

New tank cars built after Oct. 1, 2015, must meet enhanced DOT 117 design or performance criteria for HHFT:

- Increased thickness from 7/16 inch to 9/16 inch steel
- Thermal protection required
- Jacketing with minimum 11-gauge steel and weather-tight
- Full-height Head Shield - 1/2-inch thick



# Mitigation: New Tank Car Standards

Car specification /Service	U.S. Retrofit Timeline	Car specification /Service	Canadian Retrofit Timeline
DOT111 (NJ)/PGI	January 1, 2017* January 1, 2018	DOT111 (NJ)/Crude Oil	May 1, 2017
DOT111 (J)/PGI	March 1, 2018	DOT111 (J)/Crude Oil	March 1, 2018
CPC-1232 (NJ)/PGI	April 1, 2020	CPC-1232 (NJ)/Crude Oil	April 1, 2020
DOT111 (NJ)/PGII	May 1, 2023	DOT111 (NJ)/Ethanol	May 1, 2023
DOT111 (J)/PGII	May 1, 2023	DOT111 (J)/Ethanol	May 1, 2023
CPC-1232 (NJ)/PGII	July 1, 2023	CPC-1232 (NJ)/Ethanol	July 1, 2023
CPC-1232 (J)/PGI and II and all remaining cars in PGIII	May 1, 2025	CPC-1232 (J)/PGI and II all remaining cars in other flammable liquid service	May 1, 2025

# Response: First Responder Coordination

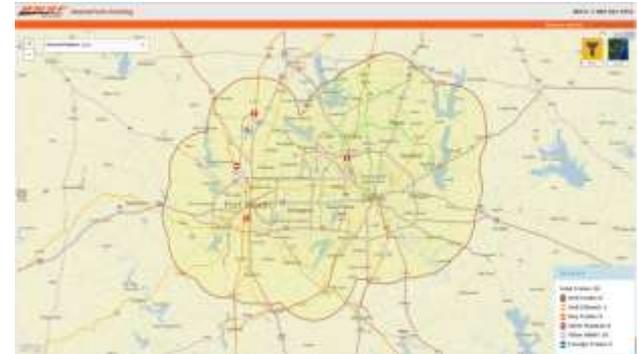
- **Shipment information access** by first responders
- **Training** first responders, employees and customer employees
- **Mobilizing** in the event of an incident

# Response: First Responder Access to Information

Historically, BNSF has provided local first responders information about hazmat shipments upon request.

*Today we go even further*

- Since July 2014, BNSF provides **State Emergency Response Commissions with Bakken crude traffic train counts** on transport of 1 million+ gallons.
- BNSF **offers SECURETRAK** website, a real-time Geographic Information System tracking program, to state and/or regional fusion centers.
- Industry **launched AskRail app** to provide first responders with car-specific data for hazmat contents and railroad contacts during incident.
- BNSF **developed national inventory of resources** for first responders, staging of emergency response equipment and community notification contacts.
- BNSF launched [www.BNSFHAZMAT.com](http://www.BNSFHAZMAT.com) website to provide information such as training and emergency response plans to first responders.



SECURETRAK Website



AskRail App

# Response: First Responder Training

BNSF and the railroad industry train first responders in their communities under a longstanding program called “TRANSCAER” (*Transportation Community Awareness and Emergency Response*)

- Hands-on equipment in field – Instructor lead
- Train list / shipping papers
- Placards
- Equipment
- Incident Assessment



- BNSF trained **more than 10,000** local emergency responders in 2015.
- More than **80,000 emergency responders** trained by BNSF since 1996.

# Response: Training First Responders at National Facilities



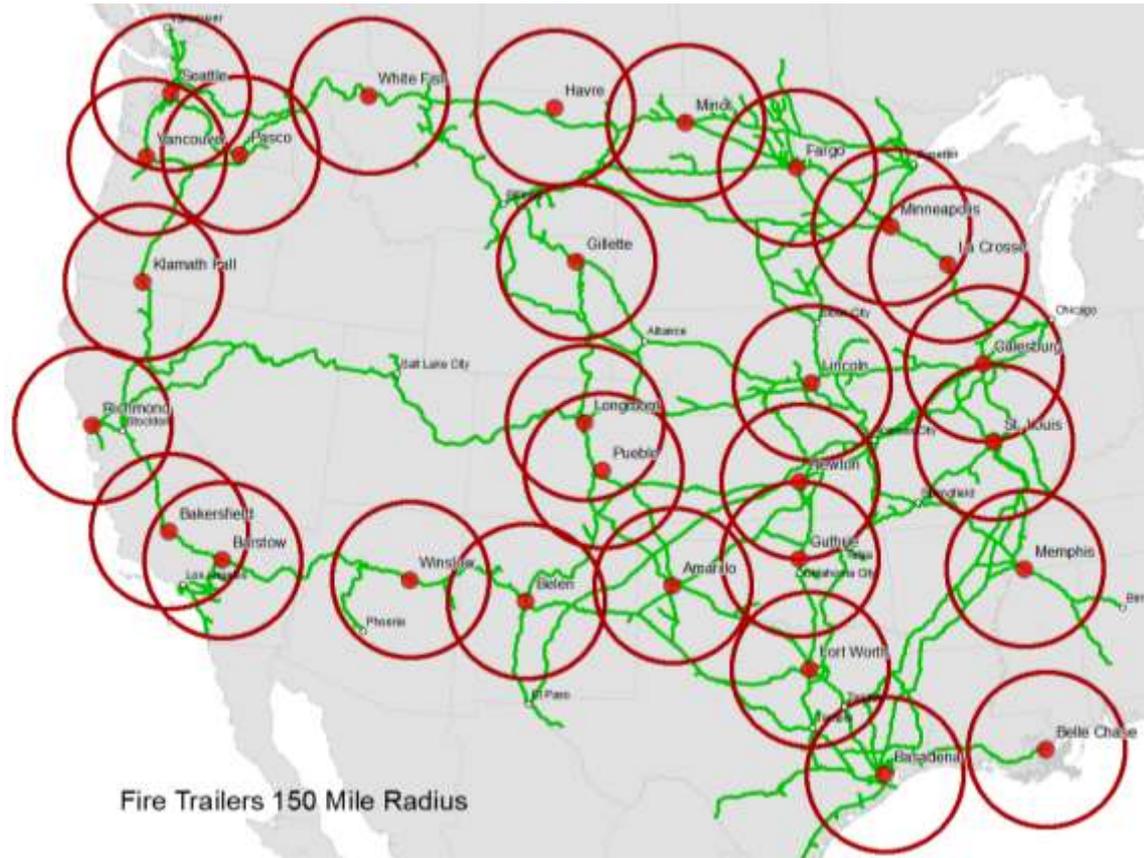
- Security and Emergency Response Training Center (SERTC) at national railroad research/training facility
- First responders learn crude incident techniques in three-day class with 24 hours of training
- In 2015, industry trained 1,700 first responders. In 2014 and 2015, BNSF sponsored more than 1,200 local emergency responders; In 2016, BNSF is sponsoring 360 responders to attend SERTC and Texas A&M
- BNSF believes first responders must be properly trained to respond safely

# Response: Incident Mobilization

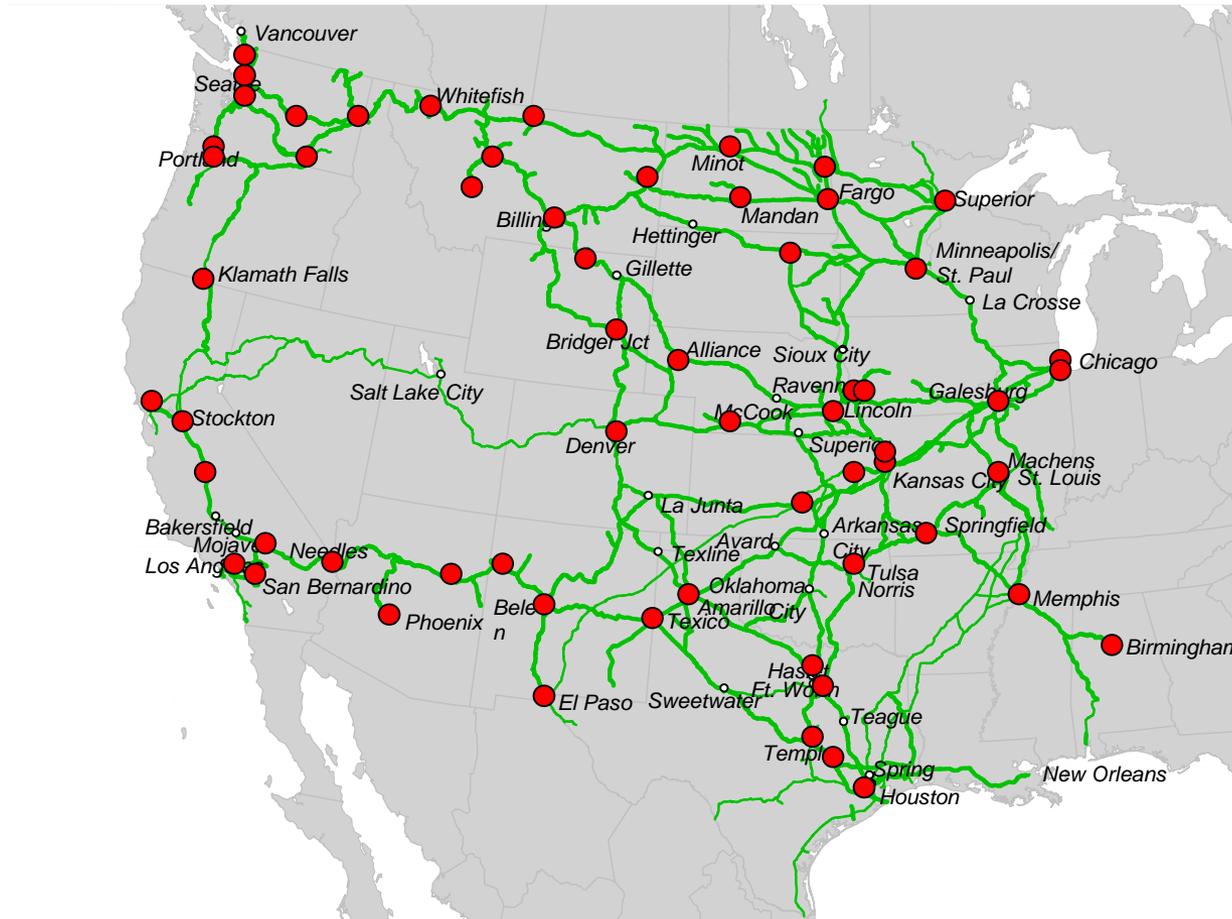
## BNSF pre-positions equipment across its network



- Industrial fire-fighting foam trailers
- Emergency breathing air trailers
- Chlorine kits
- Midland kits
- Air monitoring assets



# Response: Mobilization of Prepositioned Hazmat Responders



**More than 250 responders at 60 locations**

# Restoration of sites

## BNSF will restore the site



Cameron, Texas, post derailment

- BNSF is responsible for mitigation of the spill and any restoration tasks
- BNSF contracts with pre-approved consultants and contractors to perform the remediation and restoration
- State agencies oversee the work and BNSF must obtain their concurrence before a site is acceptably closed

# Future Technology Plays a Key Role in Driving Safety Improvements



# Unmanned Aerial Vehicles

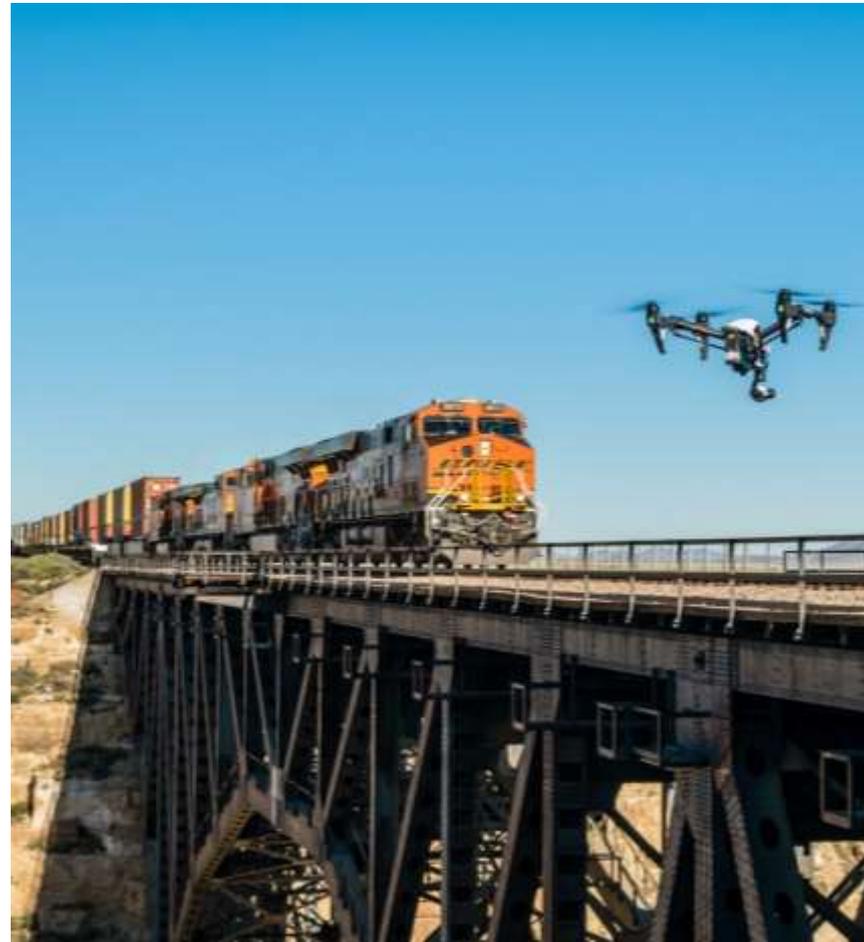
**BNSF is one of only a few companies in the United States – and the first railroad – to take the lead in the use of Unmanned Aerial Vehicles (UAVs)**

## **Supplemental track and structure inspection**

- Small multi-rotor aircraft
- Operations governed by FAA Section 333 Exemption

## **Track integrity flights for key train operation**

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



The image features a BNSF Railway logo centered over a background of a train. The train is a long freight train with multiple locomotives and several flatcars. The entire scene is overlaid with a semi-transparent orange filter. The logo consists of the letters "BNSF" in a large, bold, italicized sans-serif font, with a registered trademark symbol (®) to the upper right. Below "BNSF" is a thick white horizontal bar that tapers at both ends. Underneath the bar, the word "RAILWAY" is written in a smaller, italicized sans-serif font.

**BNSF**<sup>®</sup>  
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