

BNSF Railway

Crude by Rail Safety Overview

April 2015



Rail Transports Crude Safely

- Record crude volumes delivered safely - 99.997% of crude shipments shipped without incident
- 2012, 2013 and 2014 safest years on record, with rail volumes of all kinds increasing as economy recovers



BNSF's Safety Overview

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

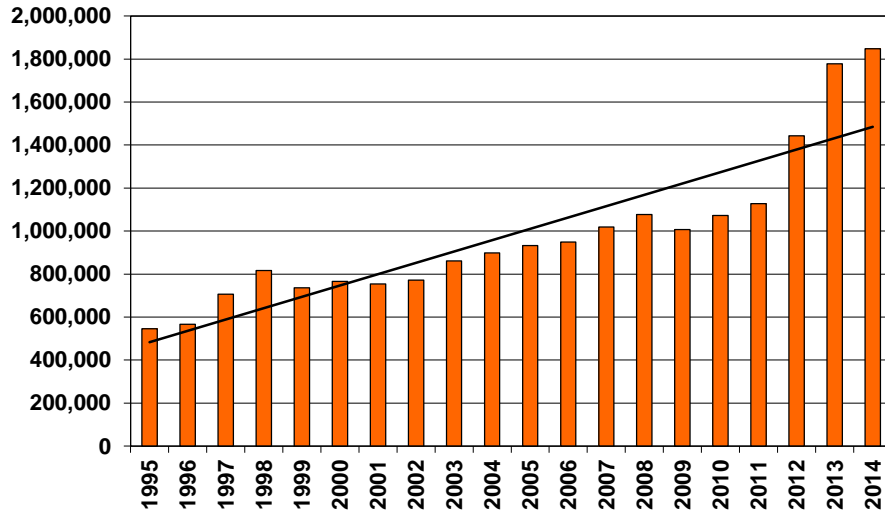


BNSF: Safety Leader for Continuous Risk Reduction

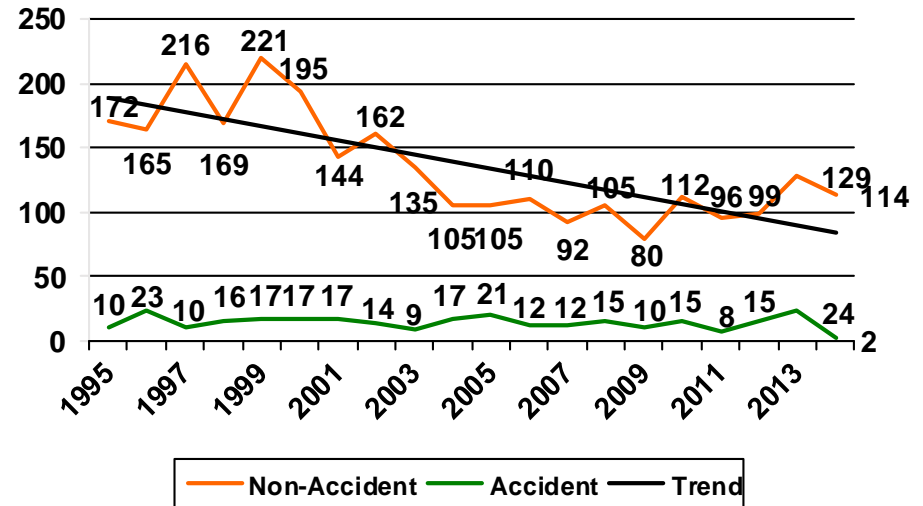
BNSF vs. Industry Reportable Rail Equipment Incident Rate (*Incidents per Million Train Miles*)



BNSF Hazardous Material Stats



BNSF Number of Hazmat Shipments



BNSF Total Hazmat Releases

- BNSF is now the largest transporter of HAZMAT in North America
- 99.997% of rail industry shipments of hazardous materials reach their destination without a release caused by a train incident.

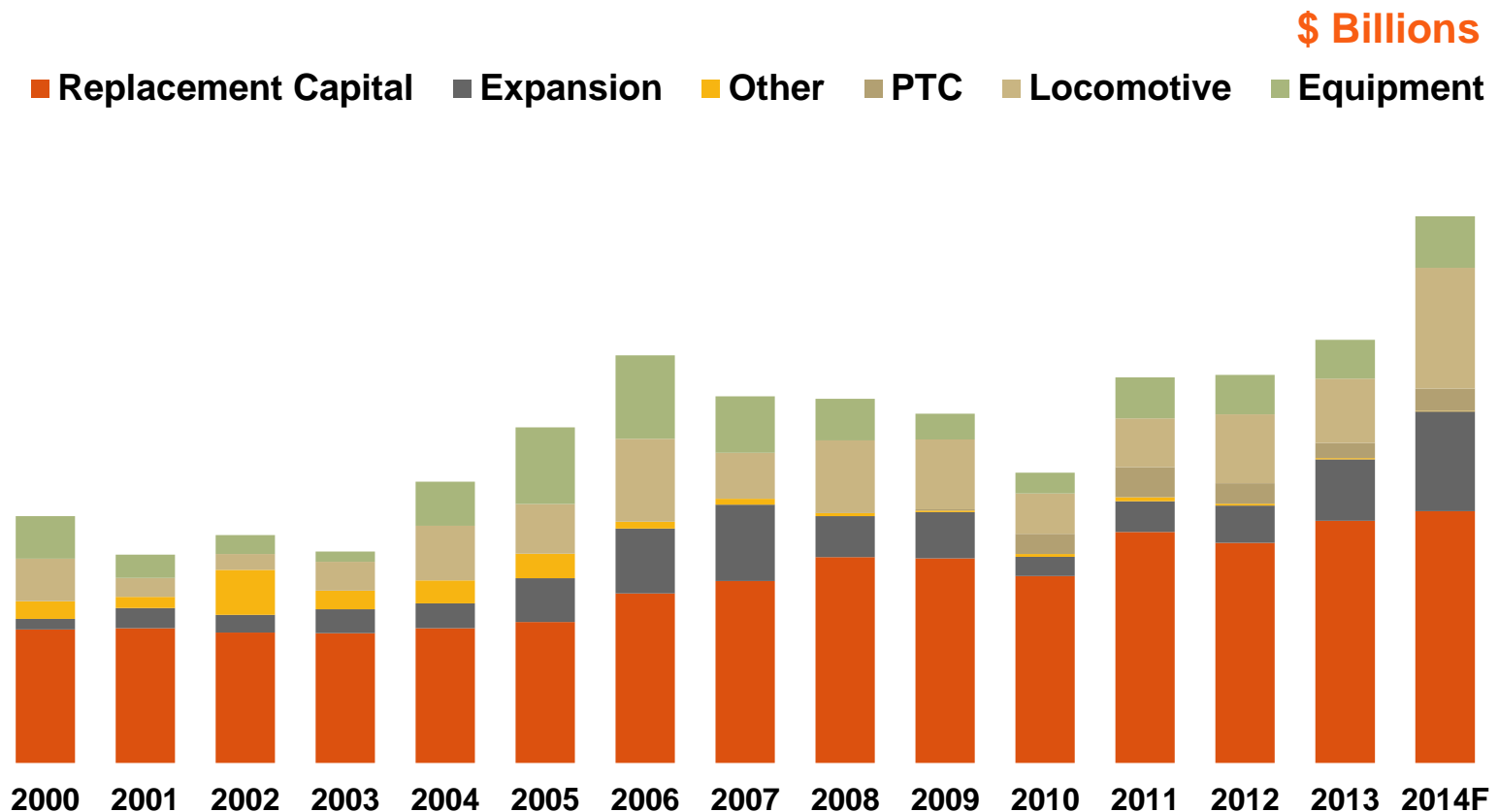
Hazmat Release Analysis

HAZMAT TRENDS	2009	2010	2011	2012	2013	2014
Accident Release (AR) Yearly Totals	10	15	8	15	24	2*
Number of Derailments with an AR	7	9	5	4	6	2
AR per 100 K Hazmat Shipments	0.99	1.40	0.71	1.04	1.35	0.11
Non Accident Release (NAR) Yearly Totals	80	112	96	99	129	114
NAR per 100K Hazmat Shipments	7.9	10.4	8.5	6.9	7.3	6.2

*6000 gal release of flammable liquid and 1,000 pounds release of flue dust

Prevention: Record Capital Spending

- BNSF will spend a record **\$6 billion** on capital projects in 2015 to support maintenance and expansion. 2014 = \$2.3 billion for network maintenance



Prevention: Four Main Causes for Derailments

Action Plans to Reduce Risk

Mechanical

- Robust Detector Network
- Technology Enhancements

Operations

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

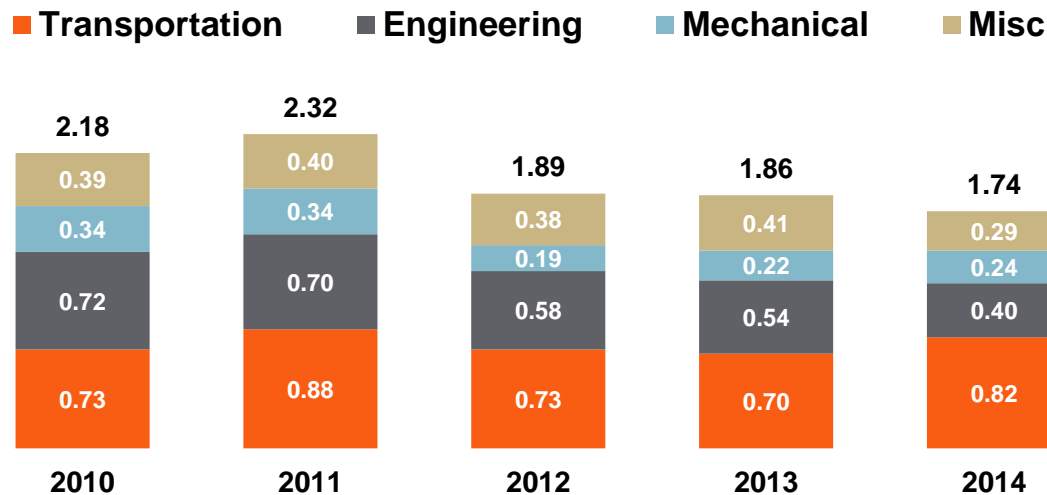
Engineering

- Inspections – Technology & Methods
- Strong capital plans
- Stronger Infrastructure

Miscellaneous

- Operating Practices/Alerts (weather-related)

Reportable Rail Equipment Incidents



Prevention: Inspection/Condition Based on Safety Approach

- **Bridge and Track Inspections**

- **BNSF inspects tracks and bridges more often than required by FRA**
 - **Most key routes on BNSF are inspected 4 times per week and the busiest main lines are inspected daily**
- **Track inspections include state-of-the-art technology to detect internal and external flaws in the rail and track structure**
- **Weather and earthquake inspections**

- **Proactive Rail Equipment Defect Detection Devices deployed across the network**

- **Wheel Impact Load Detector**
- **Warm Bearing Detection System**
- **Hot / Cold Wheel Detector**
- **Acoustic Bearing Detectors**



Prevention: Operating Practices for Key Trains

- Longstanding BNSF/Rail Industry best practices for special handling hazardous materials (“Key Trains”) now extend to crude and ethanol shipments
- Key Train Definition:
 - 1 or more loads of Toxic Inhalation/Poisonous Inhalation (TIH/PIH) materials
 - 20 or more tank loads of any hazardous materials
- Special Handling for Key Trains:
 - Special identification and tracking
 - Speed Restrictions: 50 mph max speed limit on Key Trains
 - 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
 - Key Trains will not be left unattended on main line or siding tracks, unless a detailed briefing regarding securement procedures has taken place between train crew members and the train dispatcher. Key Trains left unattended will have reverser removed and cab will be locked when equipped

Prevention: Positive Train Control Deployment Will Enhance Safety

Digital wireless communication technology

- Prevent train-to-train collisions
- Enforce speed limits
- Protect roadway workers and equipment
- Prevent movement of train through a switch left in improper position



Interoperability allows operating on other railroads

Predictive, advanced train control safety technology

Mitigation: “Next Generation Tank Car” NGTC

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.

HIGH CAPACITY PRESSURE RELIEF VALVE

Current Standard:
No requirement

Latest Rail Industry Proposal:
Requires a high capacity pressure relief device to protect against a rise in internal pressure resulting from fire. Provides for faster release of product.

TOP FITTINGS PROTECTION

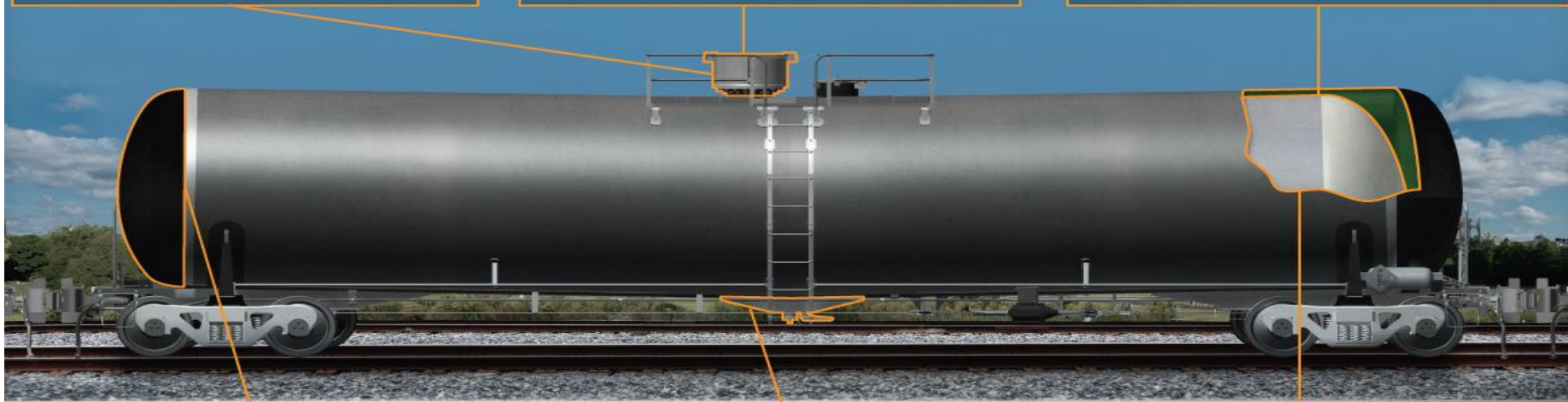
Current Standard:
Requires top fittings protection to protect the integrity of valves and fittings used to load product in the event of an accident.

Latest Rail Industry Proposal:
Contains the same requirement.

STEEL TANK

Current Standard:
Requires a minimum ½ inch thick steel tank for unjacketed cars and a minimum ¾ inch thick steel tank for jacketed cars.

Latest Rail Industry Proposal:
Requires a minimum ¾ inch thick steel tank.



HEAD SHIELDS

Current Standard:
Requires minimum ½ inch thick half height shields at both ends of the tank car to improve puncture resistance.

Latest Rail Industry Proposal:
Requires ½ inch thick full-height head shields at both ends of the tank car.

BOTTOM OUTLET HANDLES

Current Standard:
No requirement

Latest Rail Industry Proposal:
Requires bottom outlet handle reconfiguration to prevent the handle from inadvertently opening the bottom outlets in the event of an accident.

JACKET AND THERMAL PROTECTION

Current Standard:
Requires a minimum ½ inch thick steel tank OR a ¾ inch thick steel jacket.

Latest Rail Industry Proposal:
Requires the addition of both a ¾ inch thick steel jacket around the tank car and thermal protection.

Source: Association of American Railroads, February 2014

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

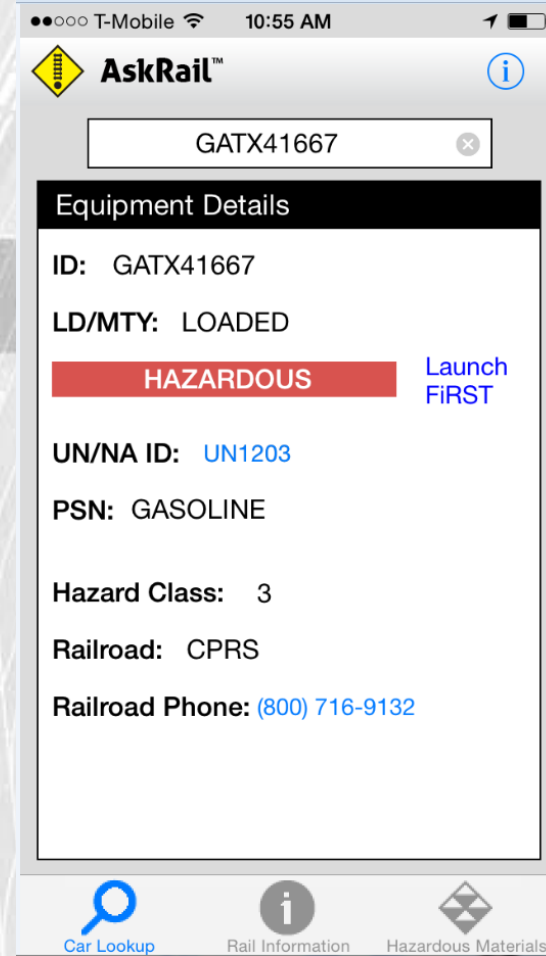
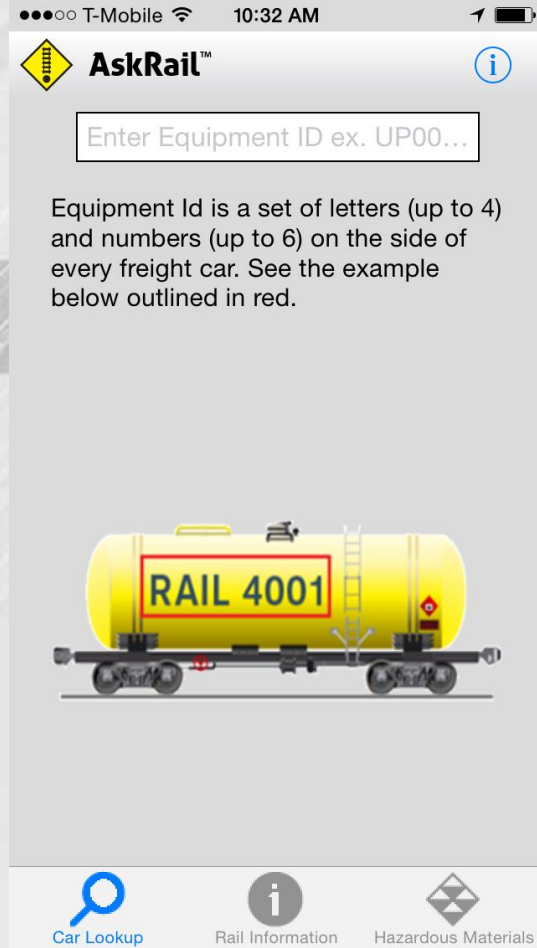
BNSF already provides local first responders information about shipments upon request

However, by July 2014, per agreement with USDOT

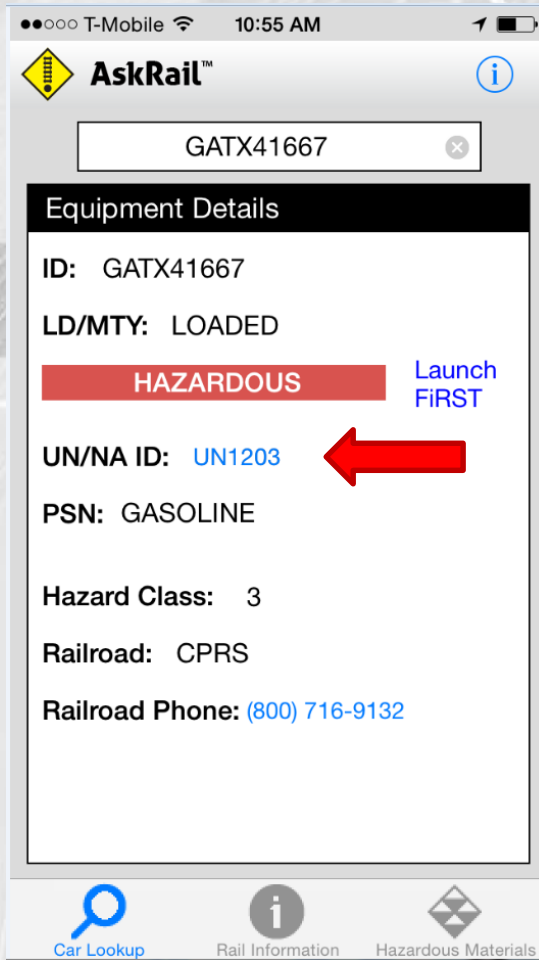
- **Railroads will develop a nationwide inventory of resources for “Key Route” emergency responders**
- **Locations for staging emergency response equipment**
- **Contacts for community notification**
- **Provide to U.S. DOT and available to appropriate emergency responders**

As of June 7, 2014 Executive Order from US DOT also requires railroads to immediately notify State Emergency Response Commissions about the operation of trains carrying more than 1,000,000 gallons of Bakken crude oil through their states

Single Car Lookup



View Response Guide



Response: BNSF/First Responder Local 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 trains an average of 4,000 local emergency responders each year in communities across network.
Over 8,000 trained in 2014



Response: Training First Responders at Pueblo, CO National Facility

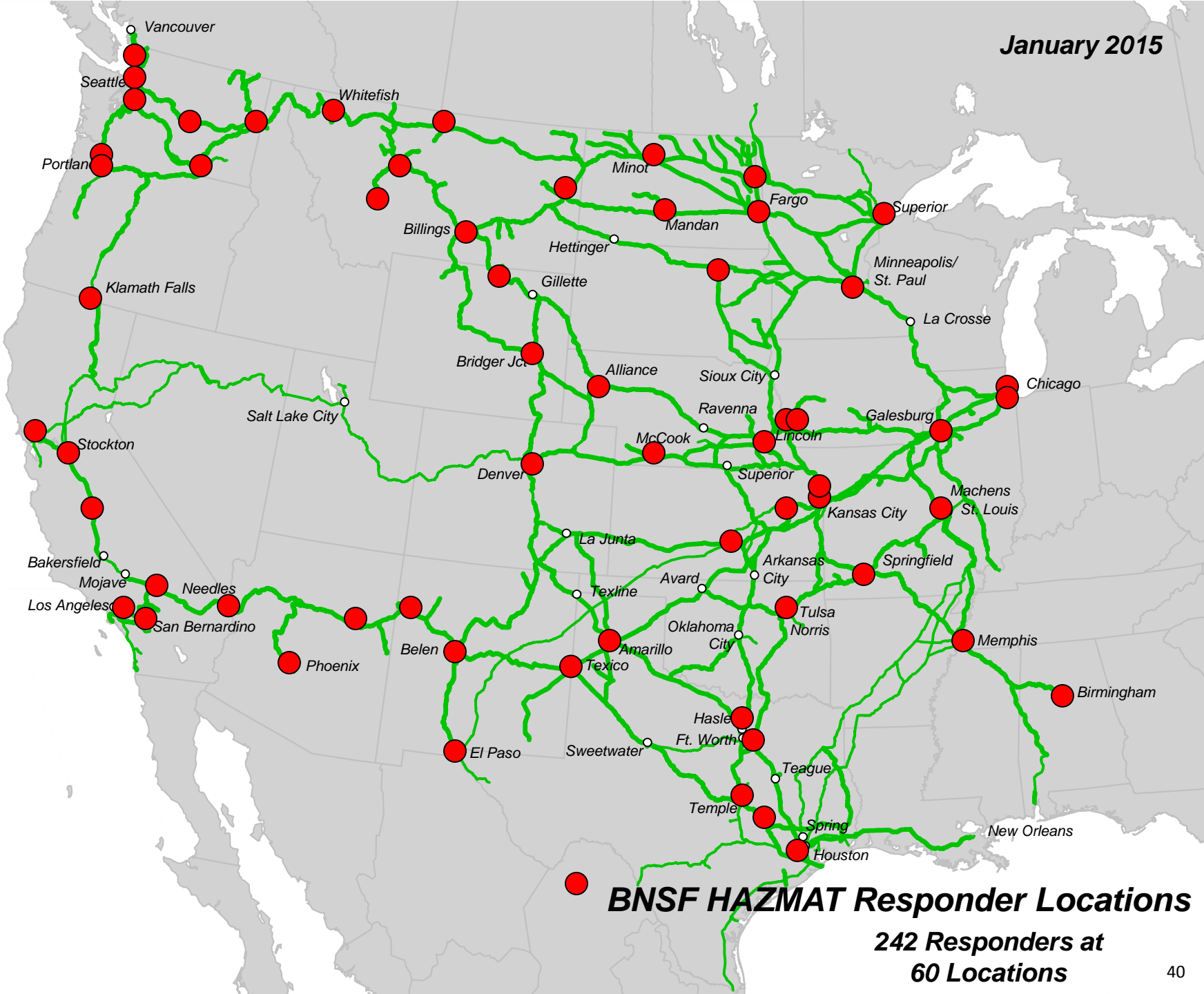
- **Security and Emergency Response Training Center (SERTC) at Pueblo, Colorado national railroad research/training facility (TTCI)**
- **In-depth hazmat emergency response training to more than 30,000 emergency responders and railroad and chemical industry employees.**
- **\$5 million industry commitment to train additional first responders on crude oil routes**
- **BNSF will sponsor (tuition and travel) emergency responders**
 - **2014 = 714**
 - **2015 = 500**

Response: Incident Mobilization

**BNSF pre-positions
212 first responders
and equipment at 60 locations
across the network.**

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





BNSF HAZMAT Responder Locations

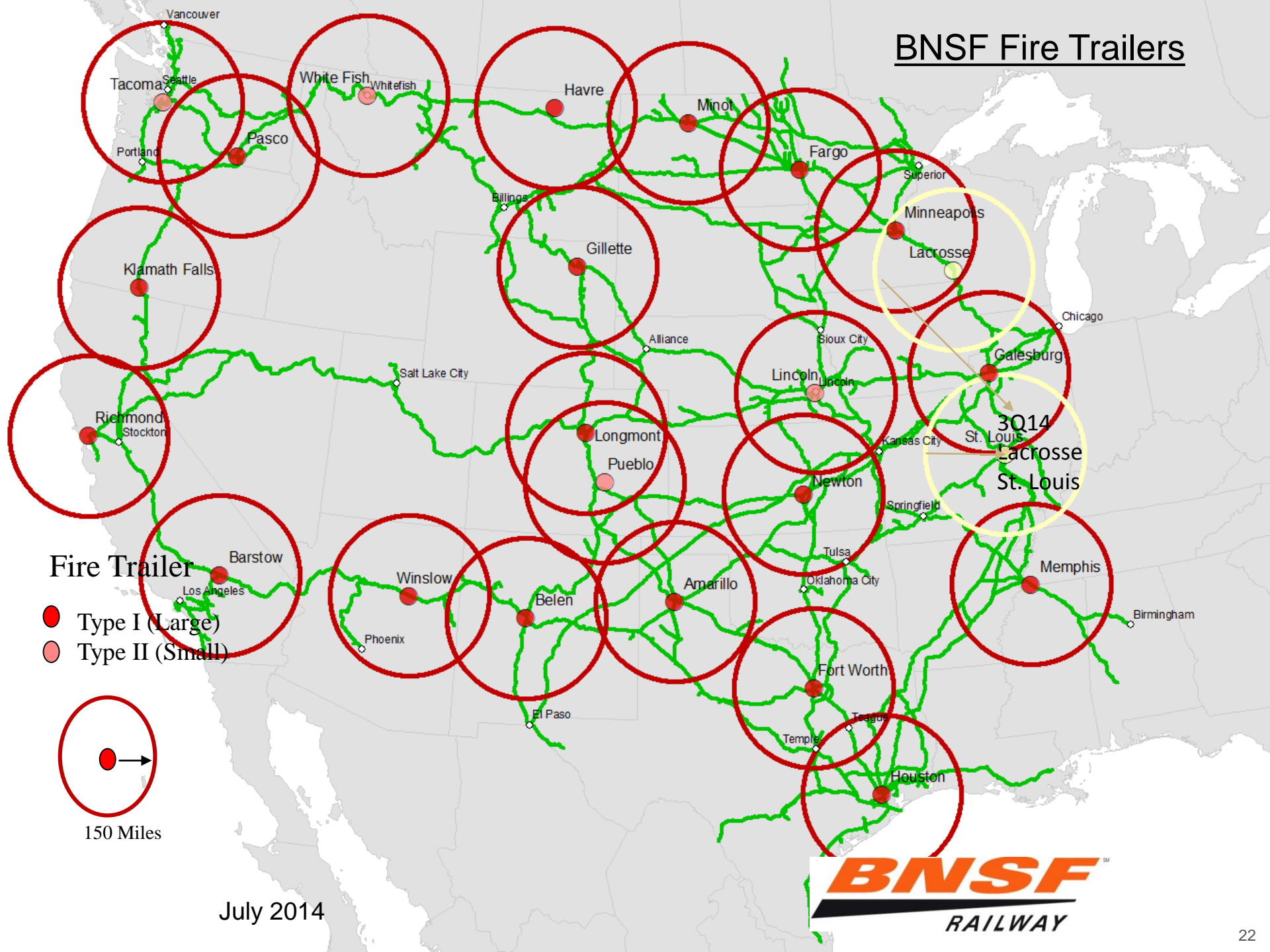
**242 Responders at
60 Locations**

AR-AFFF Fire Trailer Program

1. Designed to address the surge in Ethanol and Crude Oil shipments.
 2. Provide equipment, supplies and contract Firefighters in response to polar solvent and fire incidents
- Currently 20 trailers throughout system location based on HM. 3 under construction



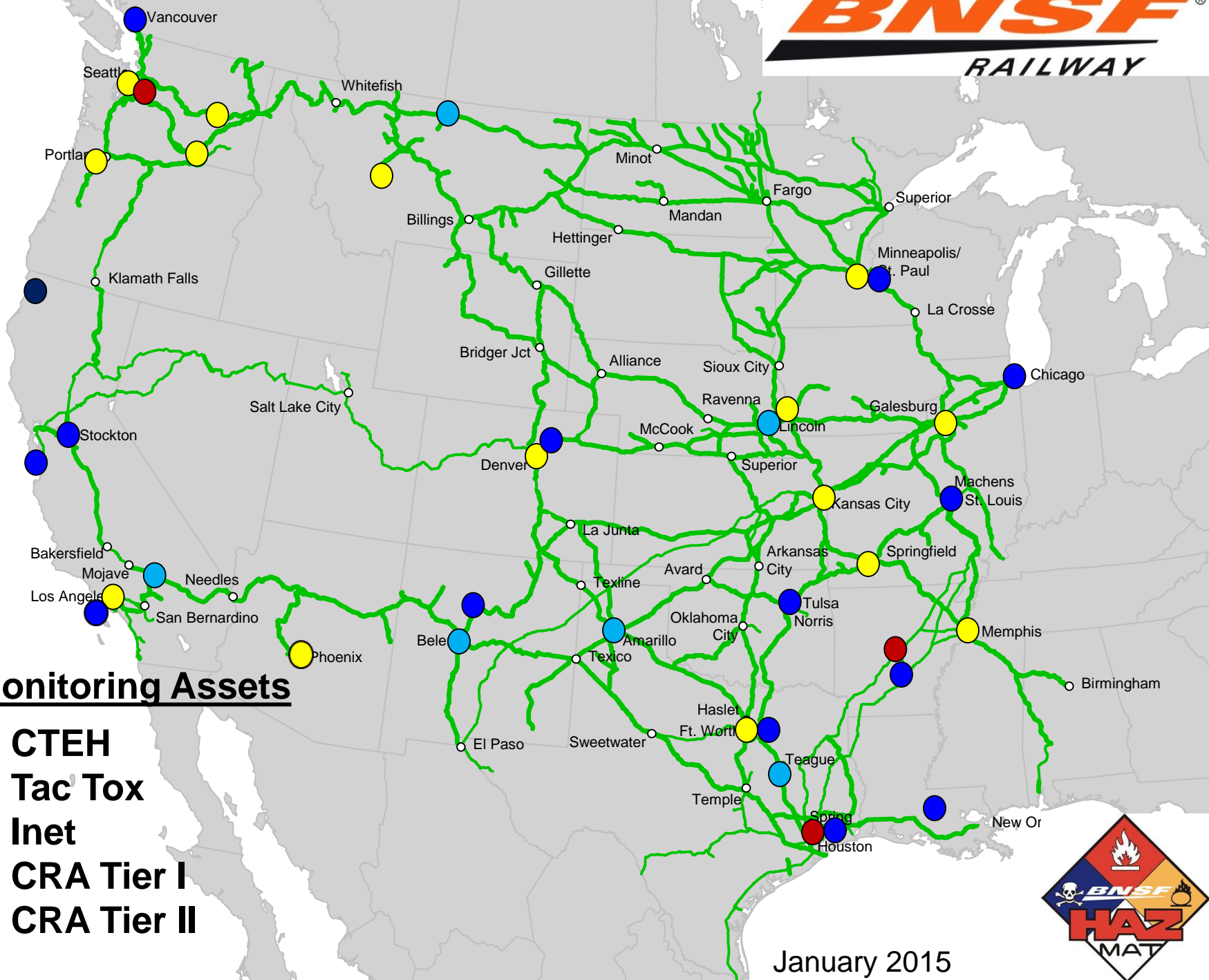
BNSF Fire Trailers



Air Monitoring Assets

- Centers for Toxicology and Environmental Health
- Tactical Toxicology (Tac-Tox)
- INet
- CRA





Air Monitoring Assets

- CTEH
- Tac Tox
- Inet
- CRA Tier I
- CRA Tier II



January 2015

Remediation

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**

The image features a blurred train moving from left to right across the frame, set against a sunset sky with orange and blue tones. In the foreground, there is a dark gravel area. On the left side, a railway signal post with two lights (one green, one red) is visible. 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, italicized, white sans-serif font below it. A thick white horizontal bar is positioned behind the 'RAILWAY' text.

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