

BNSF Environmental

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DIRECTOR

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Environmental Management System



Air



Oil Handling



Waste Management



Stormwater



Waste Water

Environmental Operations- Air Emissions



Sand Towers



Fueling



Back-up Generators



Boilers



Fuel Storage



Cargo Handling Equipment

Environmental Operations- Stormwater



Fueling



Car Maintenance



Equipment Washing



Spill Response



Locomotive Maintenance



Material Storage

Environmental Operations- Oil Handling (SPCC)



Environmental Operations- Waste Management



DRAINED USED OIL FILTER

ACCUMULATION FROM: TO:

HAZARDOUS WASTE

STATE AND FEDERAL LAWS PROHIBIT IMPROPER DISPOSAL. IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY, THE U.S. ENVIRONMENTAL PROTECTION AGENCY, OR THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCE CONTROL.

GENERATOR INFORMATION:

NAME: _____ PHONE: _____

ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____

EPA ID NO.: _____ CA WASTE NO.: _____ MANIFEST NO.: _____ TRACKING NO.: _____

ACCUMULATION NO.: _____ START DATE: _____

CONTENTS, COMPOSITION:

PHYSICAL STATE: SOLID LIQUID HAZARDOUS PROPERTIES: FLAMMABLE TOXIC CORROSIVE REACTIVE OTHER _____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX _____

HANDLE WITH CARE!

UNIVERSAL WASTE

USED BATTERIES

SHIPPER: _____

ADDRESS: _____ CITY, STATE, ZIP: _____

ACCUMULATION START DATE: _____

NON-HAZARDOUS WASTE

GENERATOR INFORMATION (Optional):

SHIPPER: _____

ADDRESS: _____ CITY, STATE, ZIP: _____

CONTENTS: _____

NON-HAZARDOUS WASTE



Environmental Engineering

- **Wastewater Treatment Plants and Oil/Water separators**

- Upgrade, maintenance and operation
- Support fueling and mechanical maintenance operations

- **Other structural pollution control equipment**

- Sand towers, bag houses, storm water controls

- **Pipeline testing and design**

- **Petroleum storage tanks**

- Internal inspections and upgrade



Sustainability

Sustainability

- Meeting today's needs without compromising future needs
- Focus on "Material Issues"
 - People, Planet, Profit
- Corporate Responsibility and Sustainability Report



Material Issues

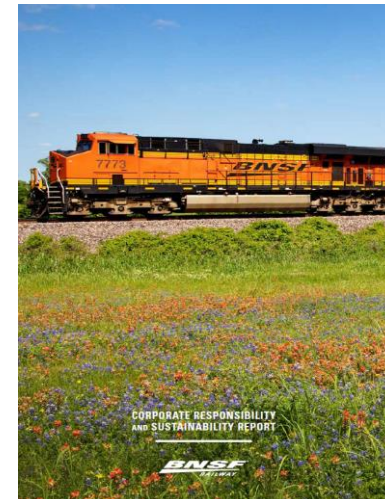
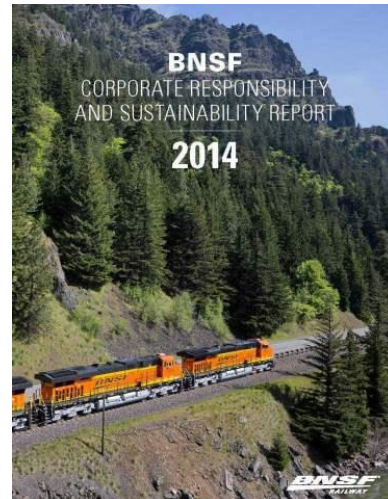
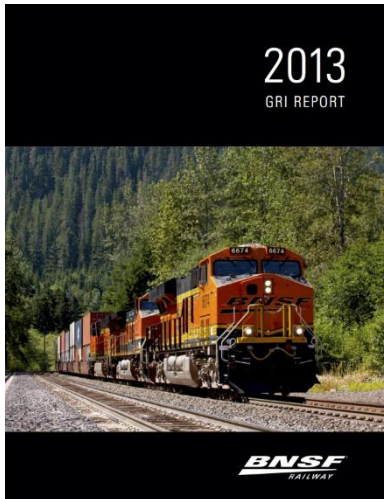


	Our Operations	Our Customers	Our Employees	Our Communities
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What's a Materiality Assessment

Materiality Assessment - An exercise that prioritizes the most significant or “material” sustainability issues through engagement with internal and/or external stakeholders.

Materiality Assessment helps develop core focus and theme for sustainability reporting.



Material Issues to BNSF

Material Issues



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Material Issue: Planning & Permitting

- **BNSF is typically the Applicant**
- **Sometimes an Advocate (i.e. customer projects)**
- **BNSF Stakeholders:**
 - Federal, State and Local Community Affairs
 - Engineering
 - Environmental Permitting
 - Sustainability
 - Tribal Relations
 - Economic Developer
 - Sales and Marketing
 - Leadership Team
 - Consultants

Material Issues

 People
  Planet
  Profit

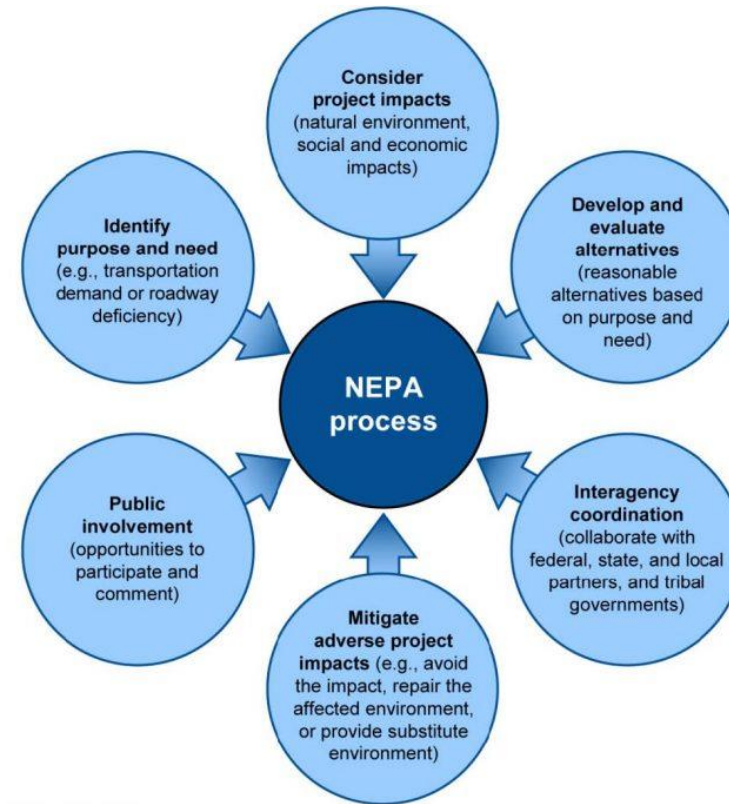
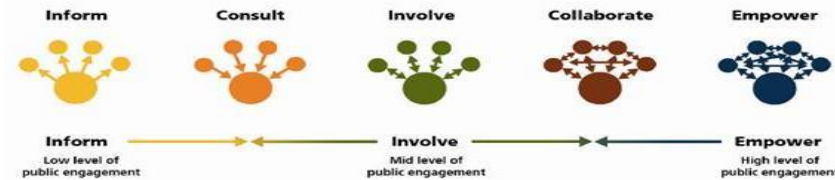
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Planning and Permitting: Agencies

- **National Environmental Policy Act**
 - Environmental Impact Statement
 - Environmental Assessment
- **Most often United States Coast Guard and Army Corps of Engineers**



**US Army Corps
of Engineers.**



Source: GAO. | GAO-15-71

Material Issue: Infrastructure Investment

- 2019 Capital Plan \$3.57 Billion
- 2019 Flooding



Material Issues

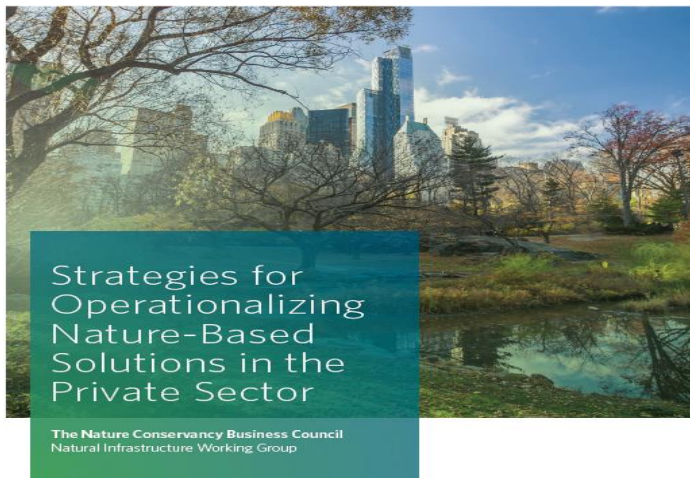
People Planet Profit

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Material Issue: New Technology / Network Efficiency & Resiliency

- Engineered Green Infrastructure
- TNC White Paper
- Charter/Mission & Team
- Examples: TX (Trinity River Bridge), on-site mitigation banks, others?



Material Issues

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 Planet
 Profit

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Material Issue: Energy Efficiency

Initiative: Leverage battery storage and electric power/motor technologies to reduce total cost of ownership and environmental impact

Technology Opportunities:

- Hybrid locomotive consist with a battery-electric and standard diesel locomotives
- Battery and electric trucks, cranes and other cargo handling equipment at intermodal hubs
- Onsite power and battery storage

Market Dynamics:

- Opportunity to improve efficiency, but challenging current economics
- Battery energy density improving while battery cell price dropping with increasing production volumes
- Manufacturers seeking long-term assurances to invest in technology
- Adjacency development and application opportunities

BNSF Requirements: Safety, Return on Investment, Reliability, Maintainability

8/17/2019

Material Issues

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  Planet
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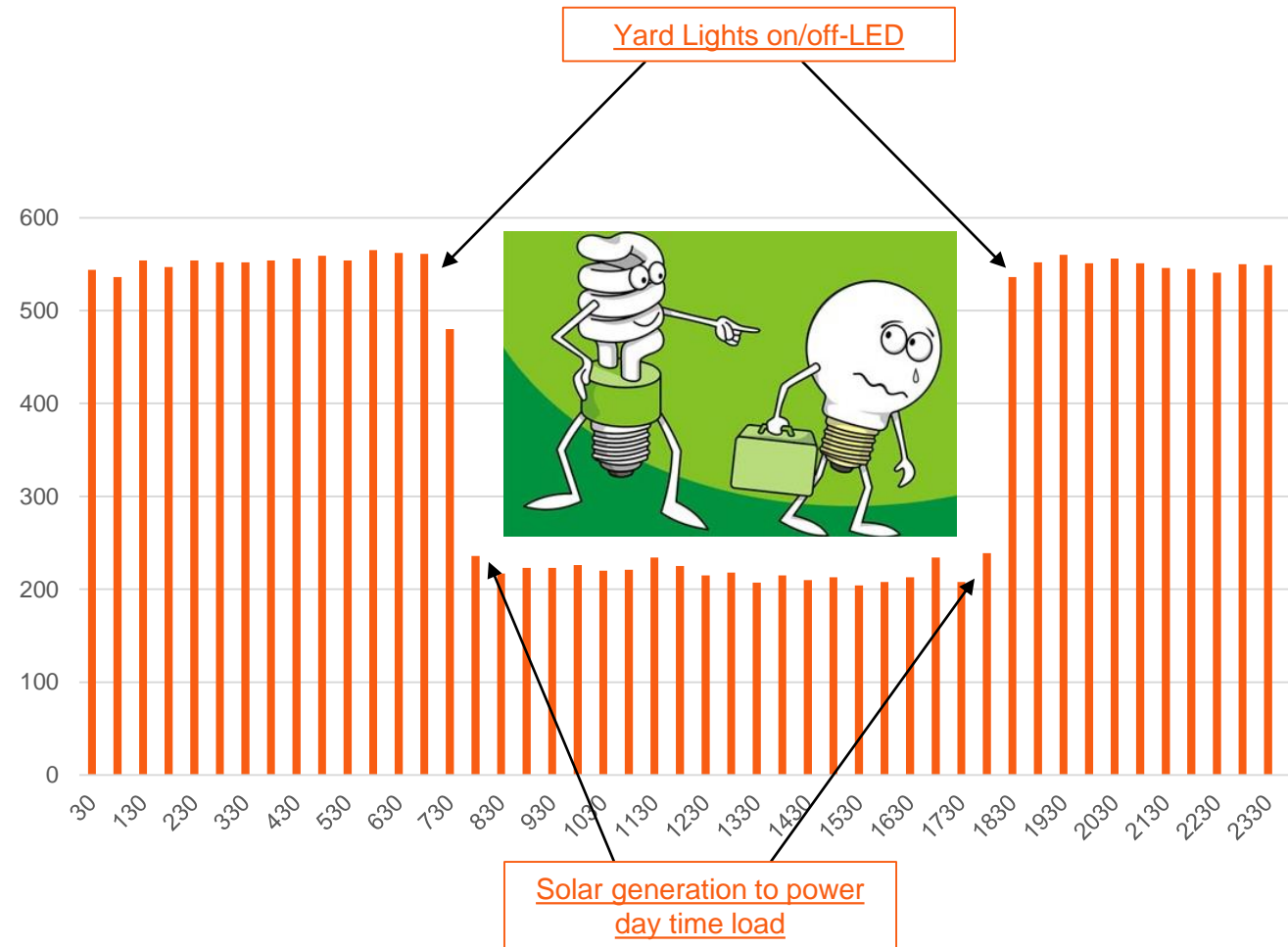
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BNSF Energy Program

Three phase process to onsite generation

1. Identify and remove waste
 - RR paid utility accounts that don't belong to RR
 - Bill pay for overcharges
2. Improve on energy efficient opportunities
 - LED Retrofits
 - Switch heater cabinets
 - Air Compressors
3. Design onsite renewable generation & Implement Electric vehicle opportunities

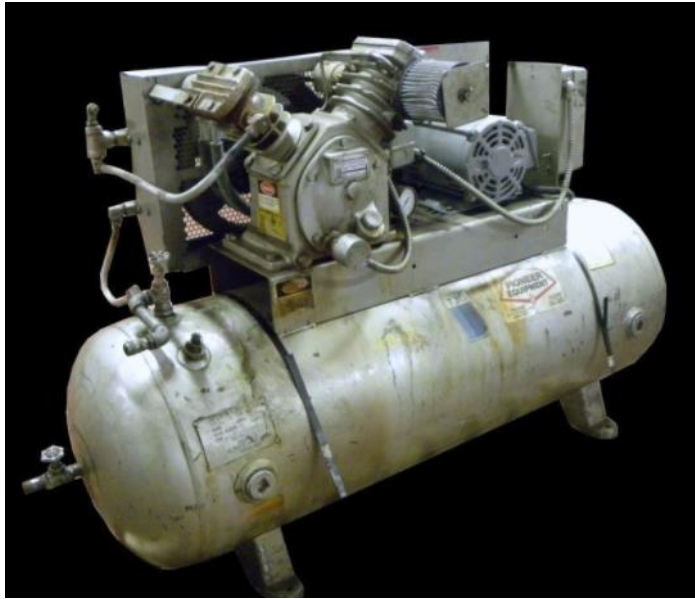
Railyard load profile



LED Retrofit (Before / After)



Air Compressors- Old versus New



Older 100hp air compressor

New 100hp air compressor



**reduction in annual
operating cost**

Solar Generation for EV Hostler Charging

Hobart Electric Hostler charging stations



Alternative energy sources

- Solar powered signals
- increase in solar panels post 2018



Intermodal Hubs

- Wide-span electric cranes
 - Stack up, rather than spread out = more productivity per acre
 - No onsite emissions
- Automated gates
 - Technologies – RailPASS mobile app for truckers, biometrics, cameras, etc.
 - Double throughput = half the emissions
 - Truckers get more turns per day with BNSF



Battery-Electric Yard Trucks

- Partners – BYD (BRK cousin company), Southern CA Edison, CA Air Resources Board
- Technologies – batteries, charging infrastructure
- Business Value
 - Subsidies available to offset higher capital cost
 - Lower operating costs
 - Electrical system efficiency better than diesel
 - Lower maintenance
 - Fewer moving parts



Sustainability 101

“...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

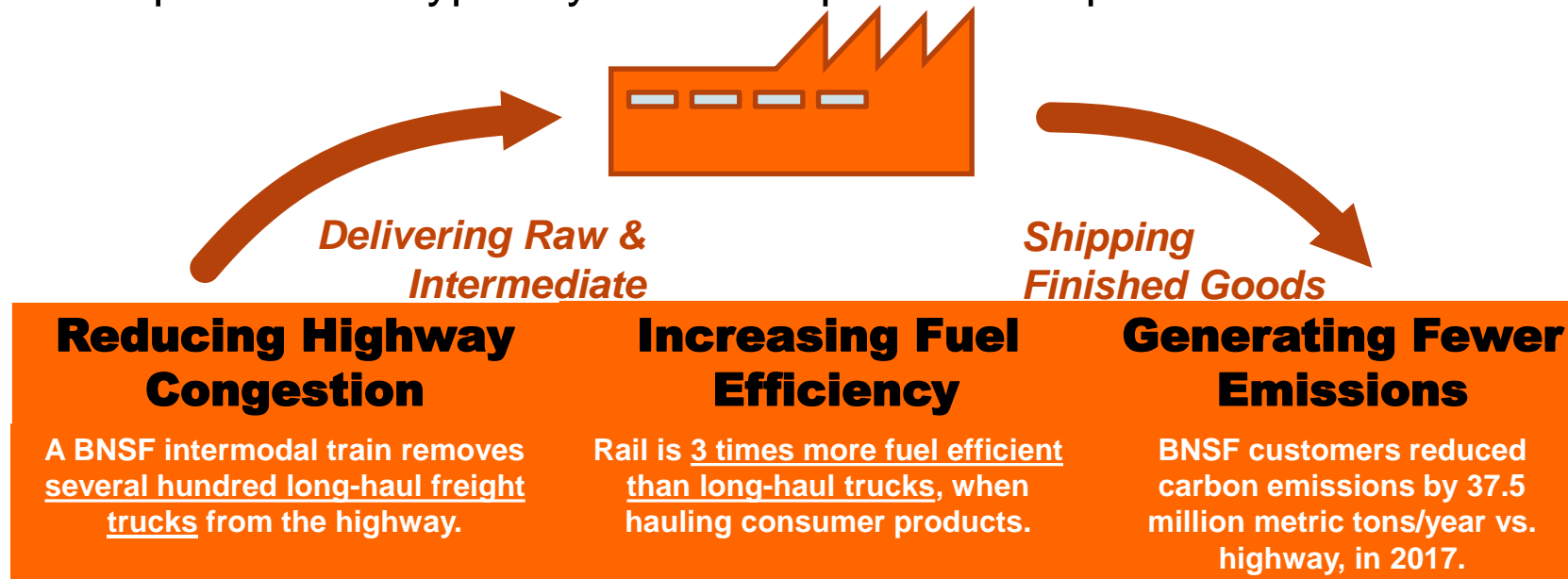
The Brundtland Commission, “Our Common Future,” 1987

**Sustainable businesses balance and enhance long-term environmental, economic and social value
- the Triple Bottom Line**

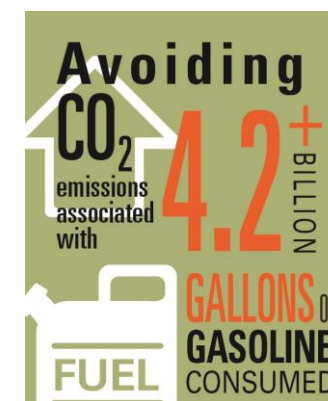
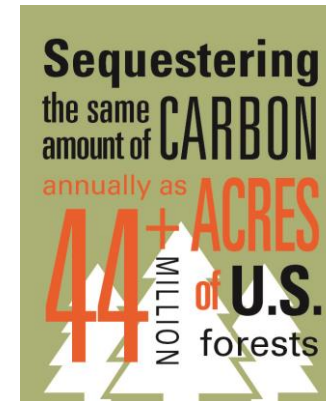
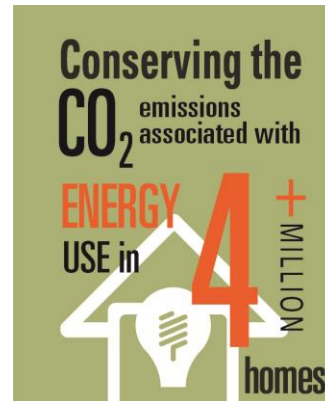


Why Transportation Matters to Customer Sustainability

Transportation is typically 5-20% of product footprints



That's Equal to Our Customers:

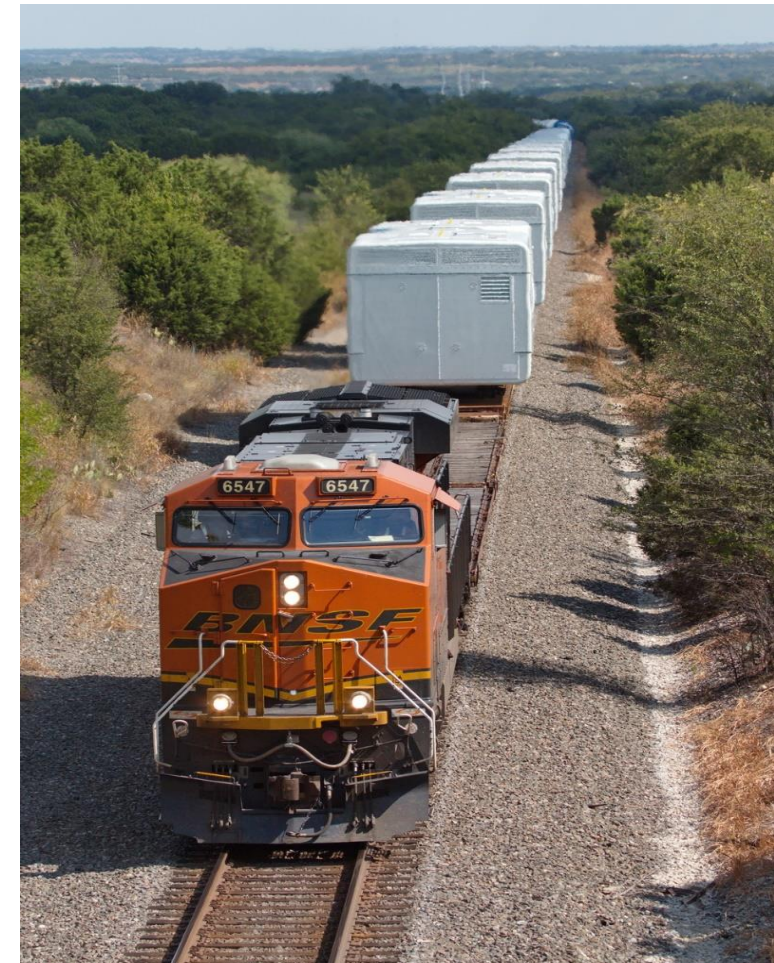


Sustainable Freight Leadership



BNSF Sustainable Solutions Examples

- Sustainable sourcing & supply chain
- Locomotives
- Green infrastructure - landscapes, lighting and renewable energy
- Intermodal – electric cranes and trucks
- What's next?
 - Electrified hubs
 - Battery-electric/hybrid locomotives



Sustainable Sourcing & Supply Chain

Sustainable Purchasing Leadership Council

Furniture, from Linear to Circular Economy

- Old system
 - BNSF paid to dispose old furniture, creating waste
- New system
 - Davies Furniture (WBE) takes furniture for reuse/remanufacture
 - BNSF gets credits towards furniture purchase
 - Eliminates BNSF warehousing/disposal costs



Category Rationalization

- Reduced chemical products in supply chain
 - Minimize waste
 - Leveraging spend
- Reduced number of products

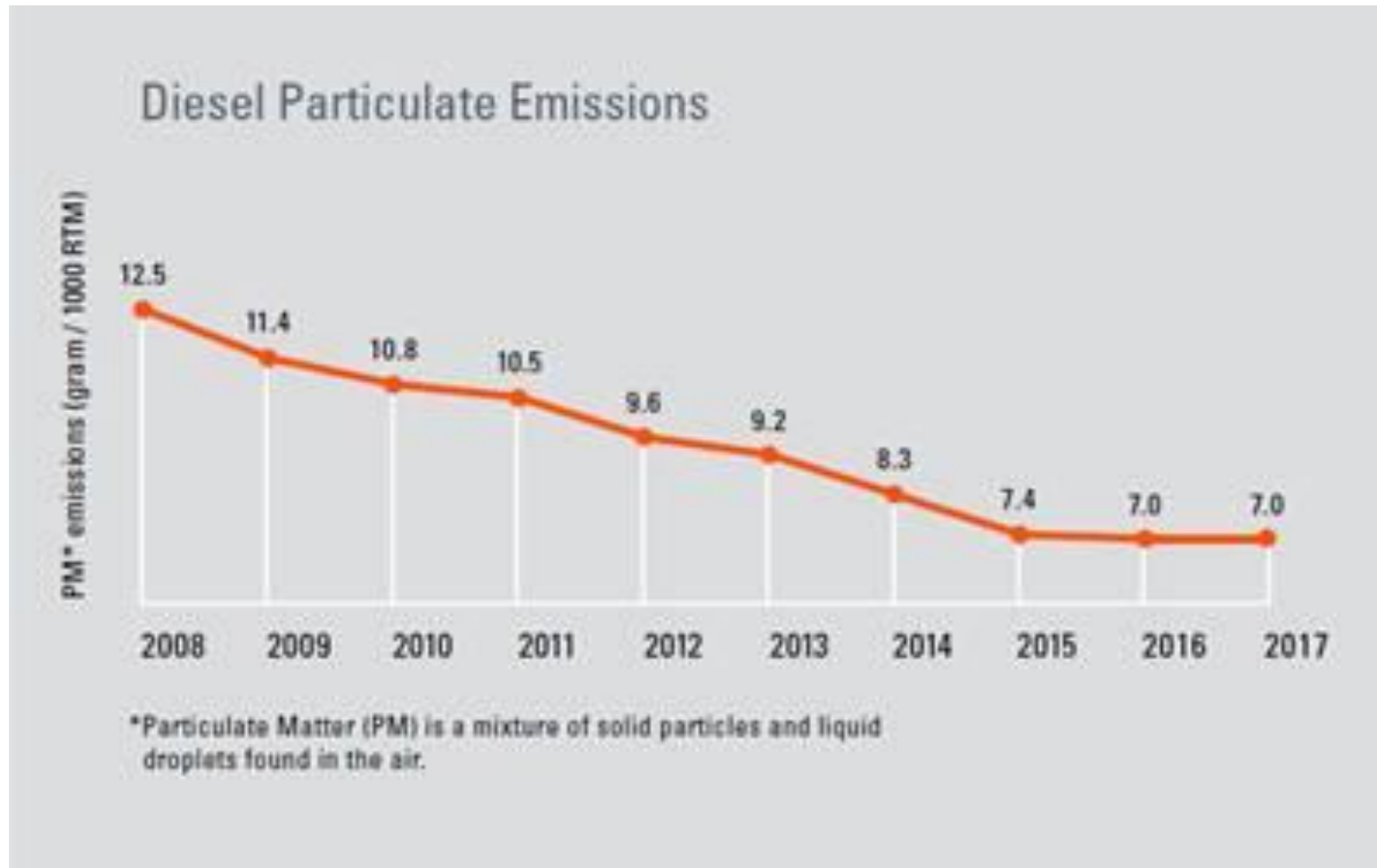


Locomotive Investments

- Newest fleet in North America
- 30- to 40-year assets are remanufactured every 6-8 years (circular economy example)
 - Less metal/resources used
 - Lower operating costs
 - Fewer emissions
- Fuel efficiency efforts
 - Energy management systems
 - Idle control
 - Top of rail lubrication
 - Right-size horsepower per trailing ton



Results – Significant Reduction of Particulate Matter Emissions



Sustainable Landscaping

- Simulated short grass prairie at HQ
- Sustainability Benefits
 - Improve and modernize aesthetics
 - Lower water and pesticide use
 - Lower maintenance costs



Natural Stormwater Treatment Everett, WA



- BNSF activities: fueling, railcar maintenance, material storage
- Naturally vegetated ditch = 28 quarters of successful pollutant removal
- *The Nature Conservancy's* Business Council
 - BNSF among corporate partners
 - Developing corporate green infrastructure guidance
 - Yale is academic partner

Vegetation for Erosion Control

Orin Line, WY



- Permanent erosion and sediment control measures at 4 bridge locations
- Native grasses, wildflowers, rock reinforcement, down drains and drainage tees.



Sustainable Solutions Provide Competitive Advantage to BNSF

- Rail is the most sustainable mode of long-distance land freight transport
- BNSF's is an industry leader
 - Cleanest fleet
 - Innovation opportunities
- BNSF sustainability investments provide economic & business win-wins that benefit BNSF and its stakeholders



Discussion/Questions

