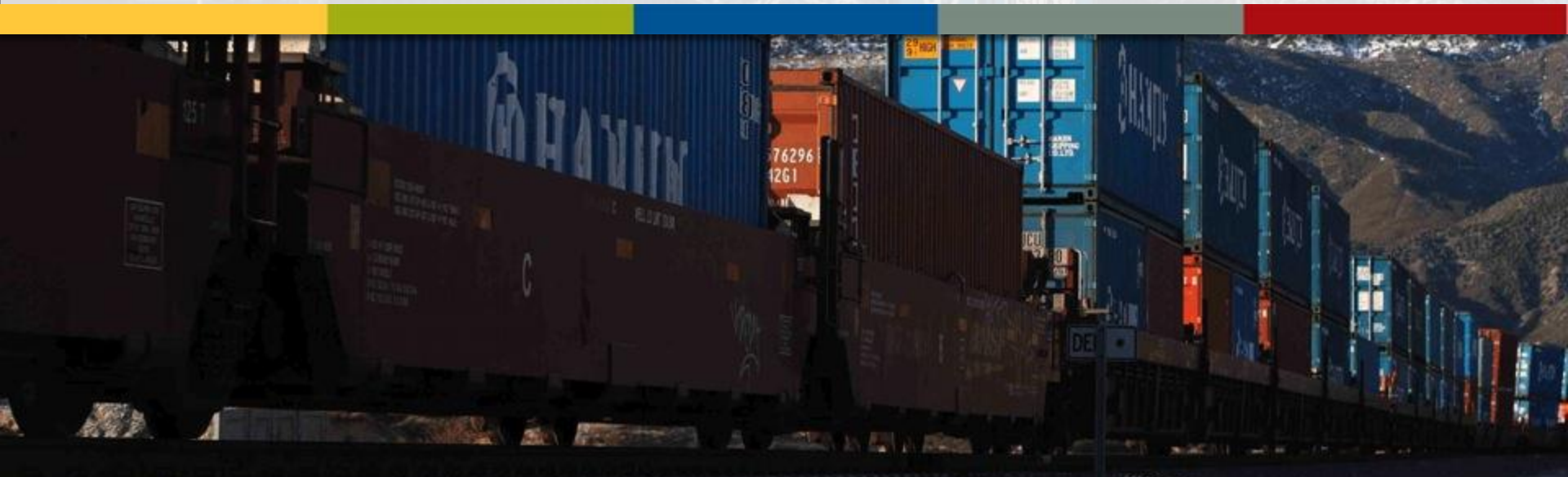
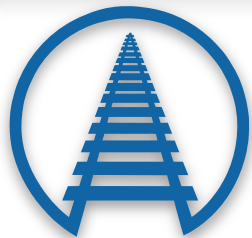




ASSOCIATION OF  
AMERICAN RAILROADS





# **Overview of the AAR A Presentation to NARMO March 2014**

**Jim Grady – AVP Technical Services**

**AAR IS**

**A Trade Association  
Based in Washington, DC**

**AAR IS NOT**

**A Government Agency**





# AAR Represents its Full Members



# AAR Also Represents

## Associates

- ▣ Suppliers
- ▣ Car owners
- ▣ Engineering firms
- ▣ Communications and signal firms

## Affiliates

- ▣ Non-Class 1 freight railroads
- ▣ Commuter railroads
- ▣ International railroads



# What does AAR do?

- Seeks to advance sound public policy that supports the freight rail industry
- Promotes the railroad industry as a safe, cost-effective, efficient and environmentally friendly transportation system, highlighting its importance to the economy and U.S. jobs
- Prepares weekly, quarterly and annual statistical reports providing comprehensive insight into the operations of North America's freight railroads
- Helps to establish safety, security and operating standards for the seamless operation of an over 140,000 mile network

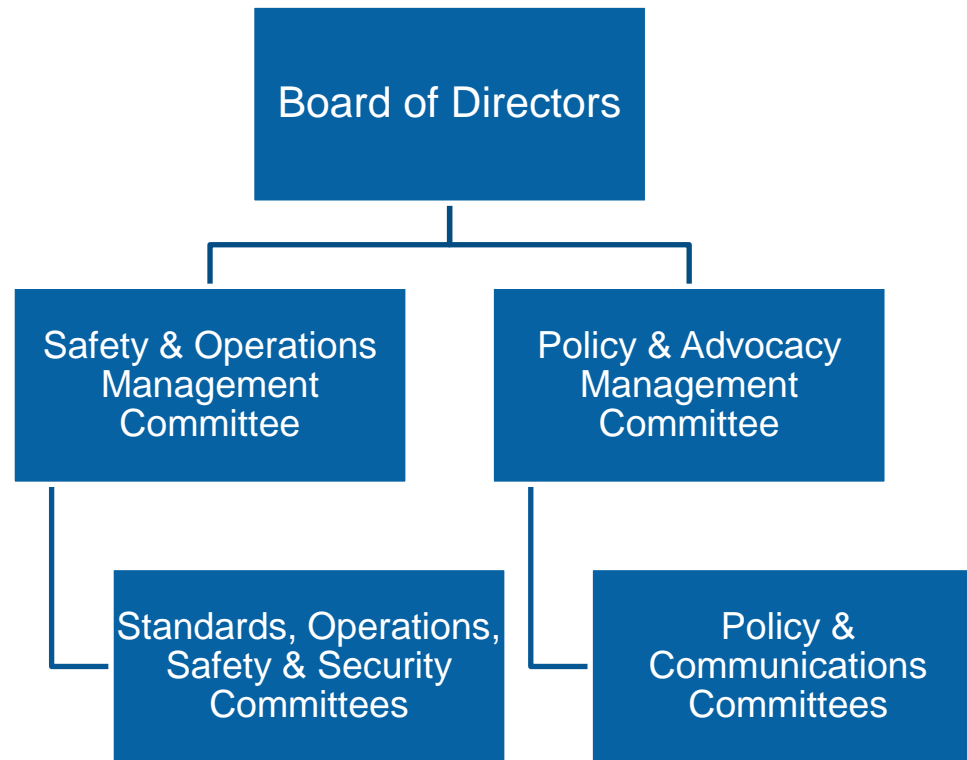


# AAR Departments

- ▣ President's Office
- ▣ Communications
- ▣ Government Affairs
- ▣ Law Department
- ▣ Policy & Economics
- ▣ Finance & Administration
- ▣ Safety & Operations



# AAR Governance



AAR staff support the work of the committees through direct committee support, communications and lobbying





# Safety & Operations

## ■ Technical Services



# Background

- In 1871 there were 20 different railroad operations that had unique track gauge.
- This prohibited interchange of cars and locomotives.
- As a result passengers and goods had to be transferred from one carrier to another in order to travel long distances.



# Background

- In those early days of our history, there were forward thinkers in the industry.
- 1867
  - Master Car Builders Association Founded
  - Developed 1<sup>st</sup> Code of Interchange Rules
- 1897
  - American Railroad Association Founded
- 1934
  - Association of American Railroads Founded



# Scope

- 1.4 Million Freight Cars in Interchange in North America
- 28,000 (+) Locomotives in service on Class 1 Railroads in North America
- Parties Involved
  - 600 Railroads
  - Private Car Owners and Lessors
  - Shipper Owners & Utilities
  - Contract Repair Facilities



# Government Agencies

- Federal Railroad Administration (FRA – DOT)
- Surface Transportation Board (STB)
- National Transportation Safety Board (NTSB)
- Federal Highway Administration (FHWA-DOT)
- Environmental Protection Agency (EPA)
- Transport Canada
- Transportation Safety Board of Canada
- Secretario de Comunicaciones y Transportes
  - (SCT – Mexico)
- Various State Agencies in US



# Two Primary Areas of Responsibility

## ■ Interchange of Equipment

- AAR Interchange Rules
  - System of Rules for Handling Repairs to Rolling Stock
  - Standards & Responsibility for Repairs
    - Field Manual & Office Manual
  - Standard and Equitable Payment Schedule
    - (Car Repair Billing Rules)





# Two Primary Areas of Responsibility

- **Standards & Recommended Practices**
  - Form Basis of Interchange Rules
  - Function to Maintain Interoperability
  - Equipment design and repair standards
    - Cover everything from Basic components and systems: e.g. Coupler & Draft Gear and Air Brake Systems
    - To Complete Car Construction
    - Locomotive Standards



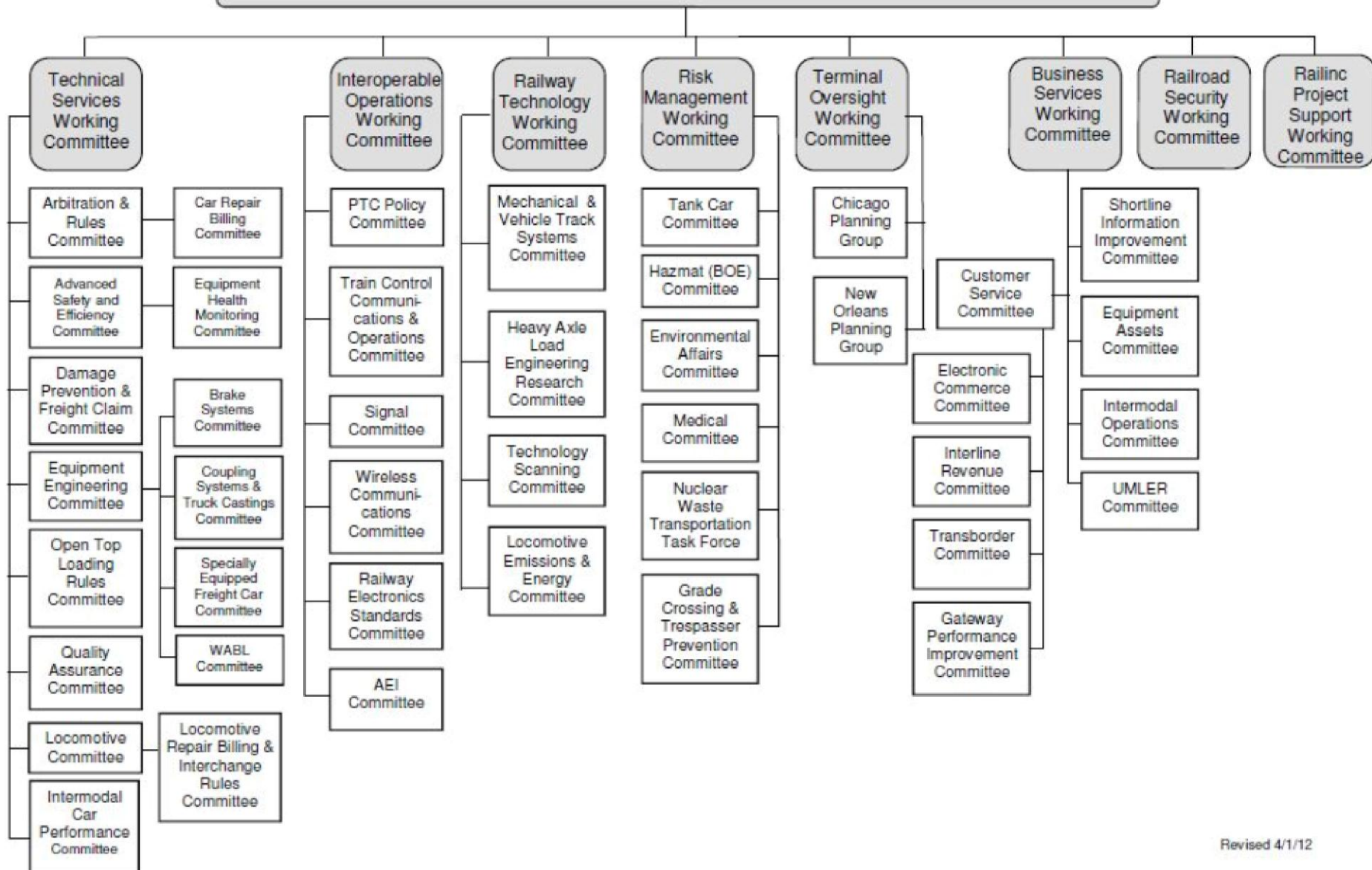
# Two Primary Areas of Responsibility

## ■ Standards & Recommended Practices

- Established & Maintained by Committees
  - Comprised of Railroad, Car Owner & Component Supplier Representatives
  - Led and supported by AAR



# SAFETY & OPERATIONS MANAGEMENT COMMITTEE



# Early Warnings & Maintenance Advisories

- Mechanism established to require corrective action by the ENTIRE Industry on freight cars or components that may pose imminent safety hazard.
- Corrective action ranges from immediate removal of the car from service to withholding an empty car from re-loading.
- Integrated with Car Tracking System to locate and advise railroad management personnel



# Enforcement

- Repairs and Billing
  - On the “honor system”.
- AAR Mechanical Inspection Department (MID)
  - In place to keep everyone honest
  - Trust but verify
- MID Audits Repair and Billing Practices
  - Through Unannounced Facility Inspections
  - Evidence of fraud can result in restitution of foreign car billing up to 18 months
- MID also conducts Facility Certifications



# AAR Regulatory Initiatives

## Locomotive 184 Periodic Inspection

### ■ Based on

- Microprocessor based control systems
  - Self Diagnostics
  - Monitor the functions
  - Record faults (particularly with respect to features relevant to the periodic inspection)
  - Major faults instantly addressed
  - Minor faults addressed through later data analysis.
  - In some cases, railroads have the capability of analyzing the data remotely,





# AAR Regulatory Initiatives

## UCI Test Waiver

- Pertains to Hydraulic Cushion Unit Condition
  - Under Car
- Leaking Clearly Formed Droplets
  - FRA's Long Standing Interpretation
  - Not a Good Indicator of Condition
  - UCIs condemn at a safety factor greater than twice what is needed.
  - UCI is a Go, No-Go Gauge (approximately 70% of cushion unit removals are unnecessary)



# Proven Technology

Figure D (AAR Rule 59)



Acceptable



Unacceptable

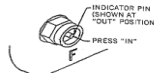
## RULE 59

12. See figures below for location of Unit Condition Indicators (UCI) and Pressure Indicator Valves. Also refer to the operation and maintenance instructions shown below for both types of indicators.

### a. Unit Condition Indicator Operation.

The UCI functions as a gage of gas pressure. The UCI can be used to inspect a unit as shipped, on the ground, or in the sill. Simply locate the UCI and attempt to press in the indicator pin. This type of pin is typically found on units identified by AHO, F/M and/or KRE.

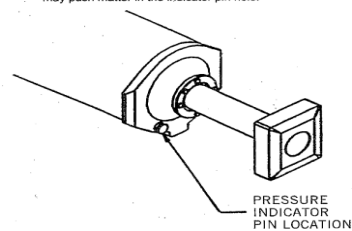
Position of the Indicator Pin	Unit Condition
Pin is extended out and is hard to push in.	Acceptable
Pin pushes in and returns out. (May not return all at once)	Acceptable
Pin pushes in and stays in.	Unacceptable**
Pin is already in.	Unacceptable**



\*\*If the unit condition is determined to be unacceptable please refer to the gas pressure check and oil level check procedures in the General Inspection and Maintenance Instructions Manual.

### b. Maintenance.

The UCI can be cleaned by removing any foreign matter on or near the indicator pin. Use a clean cloth. Avoid using compressed air which may push matter in the indicator pin hole.



UCI

Drain Plug



# AAR Regulatory Initiatives

## Wheel Temperature Detectors for Brake Inspection

- Waiver Petition for Pilot Test
  - In place of 1,000 Mile Inspection
- Union Pacific Coal Trains in Powder River Basin
- Detector measures brake effectiveness
  - “If wheels are hot, the brakes are working.”
  - Detector typically finds 4 times the defects
- Extensive Safety Assurance Plan developed.
- AAR Promises 95% cars with effective brake
- First effort at using technology for regulatory mandated inspections.





# Transportation Technology Center Pueblo, Colorado



# Transportation Technology Center, Inc. TTCI

## World-class research & testing facility

- Located in Pueblo, Colorado
- Engages in leading edge railroad research
- Behind many technological advances in our industry
- Used by freight and passenger railroads from around the world





# Rail Vehicle Test Tracks at TTC

## Railroad Test Track

- ◆ 13.5-mile loop
- ◆ 1° 15' curve and four 50' curves
- ◆ Sustained/max. speeds — 150/165 mph
- ◆ 12.5-, 25-, and 50-kV overhead catenary

## Wheel / Rail Mechanism Track

- ◆ 7.5°, 10°, and 12° curving performance tests
- ◆ Dynamic curving tests
- ◆ Spiral negotiation tests
- ◆ Lubrication studies

## Facility for Accelerated Testing

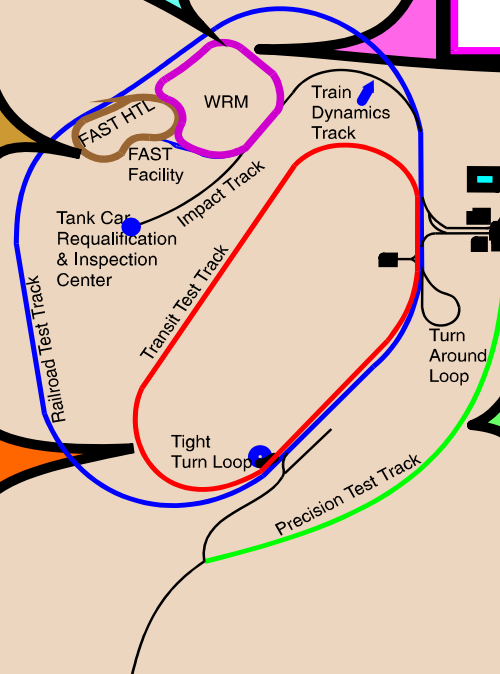
- ◆ 2.7-mile loop, three 5° curves, one 6° curve
- ◆ Main use — HAL studies
- ◆ Test bed for various premium track components
- ◆ 25 MGT/month in controlled test environment

## Transit Test Track

- ◆ 9.1-mile loop
- ◆ 80 mph max speed
- ◆ DC electrified third rail
  - up to 1150 Volts
  - up to 12,000 Amps

## Precision Test Track

- ◆ Multi-use track for railcar testing:
  - Pitch and bounce
  - Twist and roll
  - Yaw and sway
  - Car impact
  - Miscellaneous studies





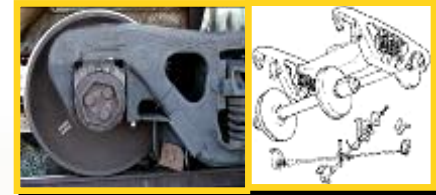
## Vehicle-Track System

- ◆ Wheel / rail asset life extension
- ◆ Vehicle track performance
- ◆ Train condition monitoring
- ◆ New Tech Implementation



## Mechanical

- ◆ Advanced train equipment
- ◆ Improved car components
- ◆ Improved car performance
- ◆ Improved braking



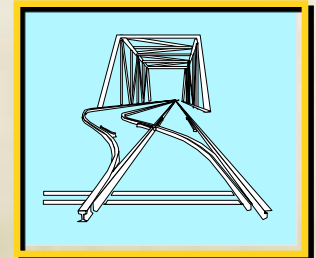
## Heavy Axle Loads

- ◆ Heavy axle load implementation
  - FAST/HAL operations
  - HAL revenue service
  - Monitoring
  - HAL Track Substructure



## Engineering

- ◆ Track integrity
- ◆ Special track work
- ◆ Bridge research
- ◆ Improved track components
- ◆ Improved performance track
- ◆ Improved signal reliability



# Strategic Research

\$12.8 Million for 2014

- 1. Wheel/Rail Asset Life Extension
- 2. Improved Car and Truck Performance
- 3. Vehicle/Track Performance
- 4. Heavy Axle Load (HAL) Implementation
- 5. Improved Braking Systems
- 6. Train Condition Monitoring
- 7. Track Integrity



# Strategic Research

\$12.8 Million for 2014

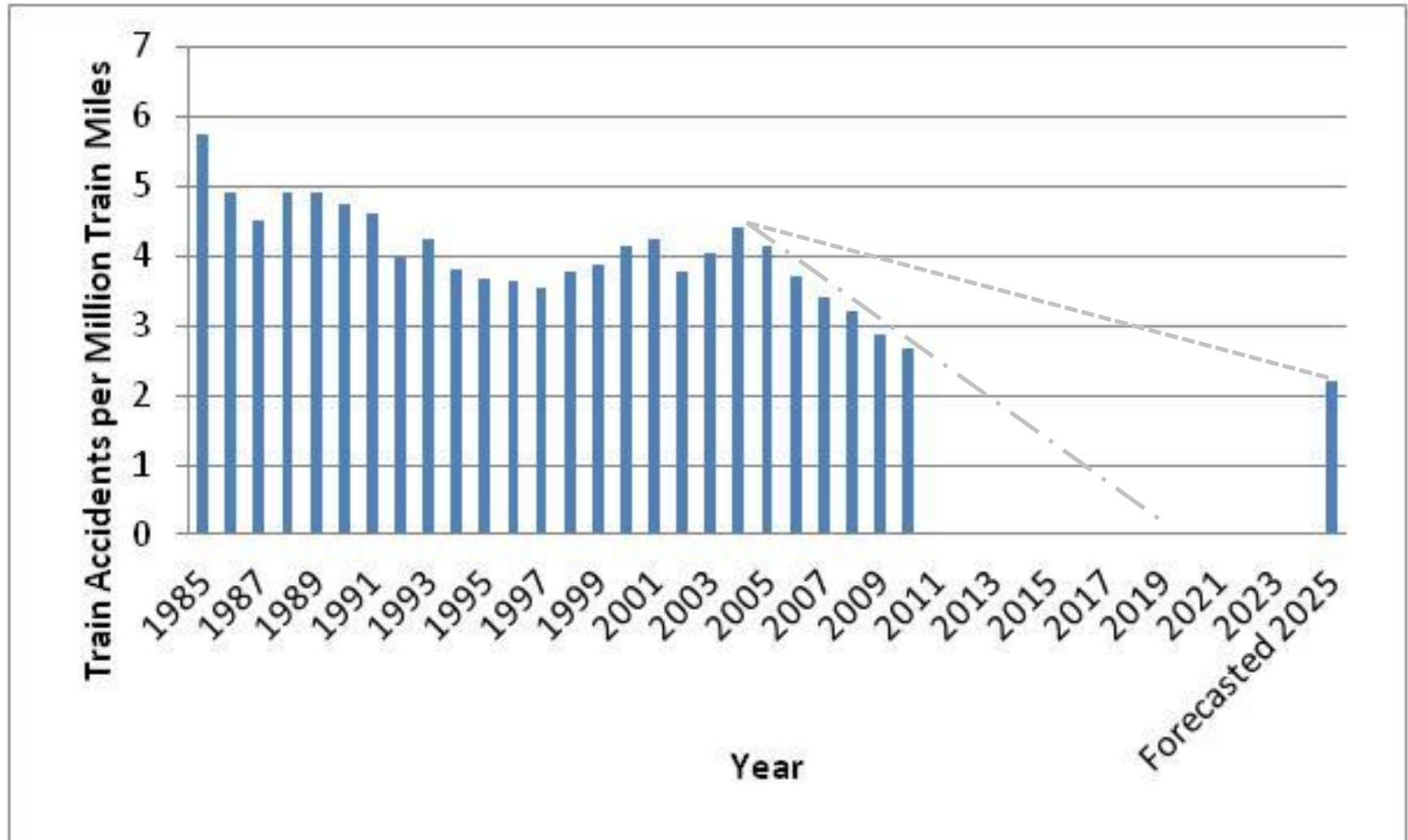
- 8. Improved Car Components and Materials
- 9. Special Track Work
- 10. Bridge Research
- 11. Improved Track Components
- 12. Improved Performance Track
- 13. New Technology Implementation
- 14. Rail Longitudinal Stress Measurement
- 15. Bridge Life Extension: revenue service evaluation of fitness for service



# *Technology Goals*

- ◆ Increase asset utilization
- ◆ Reduce costs through improved productivity
- ◆ Increase fuel efficiency
- ◆ Improve customer service, as measured by individual railroads
- ◆ Improve safety
  - ◆ e.g. reduction in derailments per train mile

# Safety: Reduce Mainline Derailments / Train Mile by 50%



# Technology Driven Train Inspection

## ◆ Background

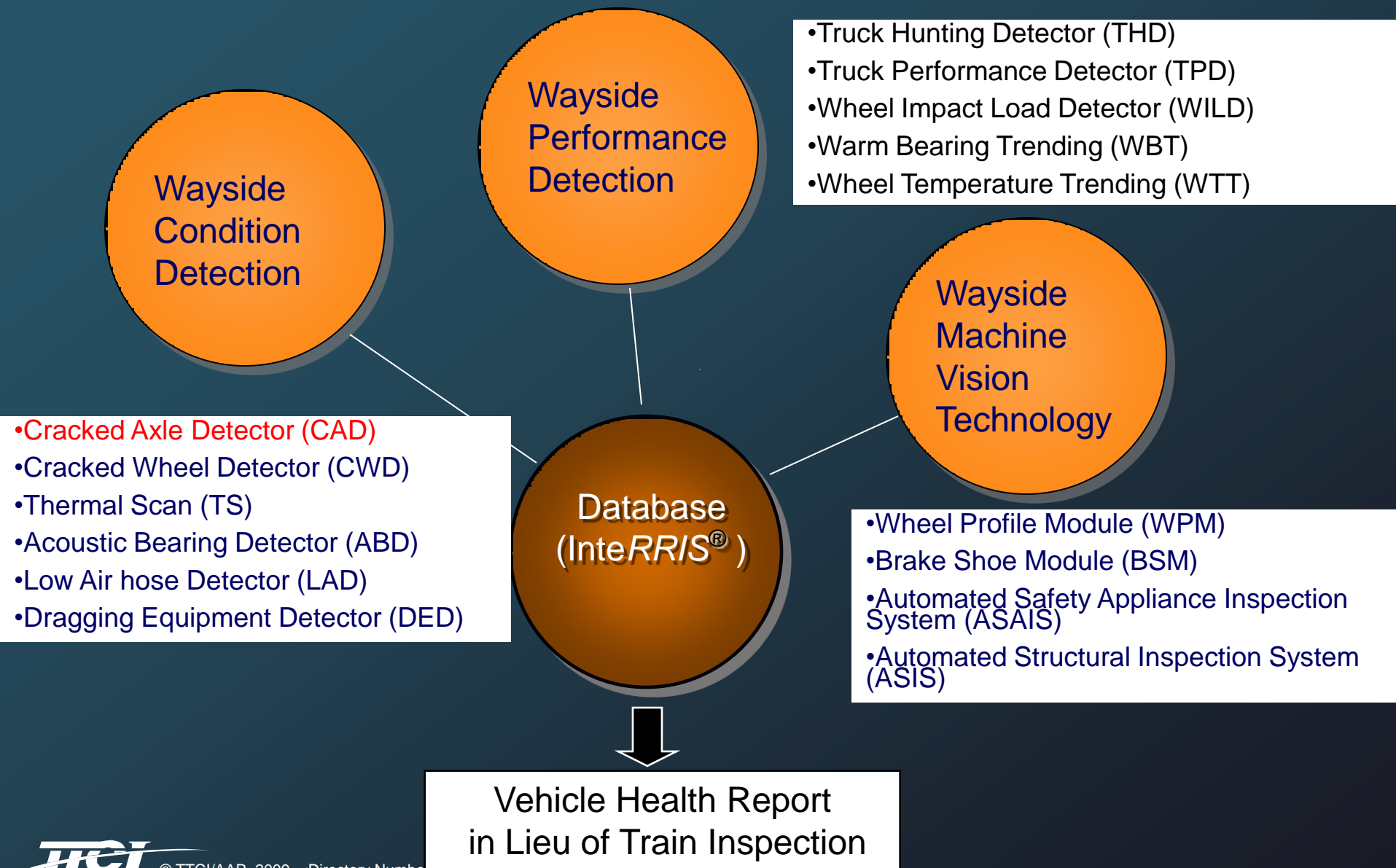
- ◆ Inspection of railcars is resource and time intensive
- ◆ Current train inspections are primarily visual and lack historic records or accessible databases.
- ◆ Utilizing advanced technologies to enhance railcar inspection process offers opportunity to lower costs and increase productivity

## ◆ Issues

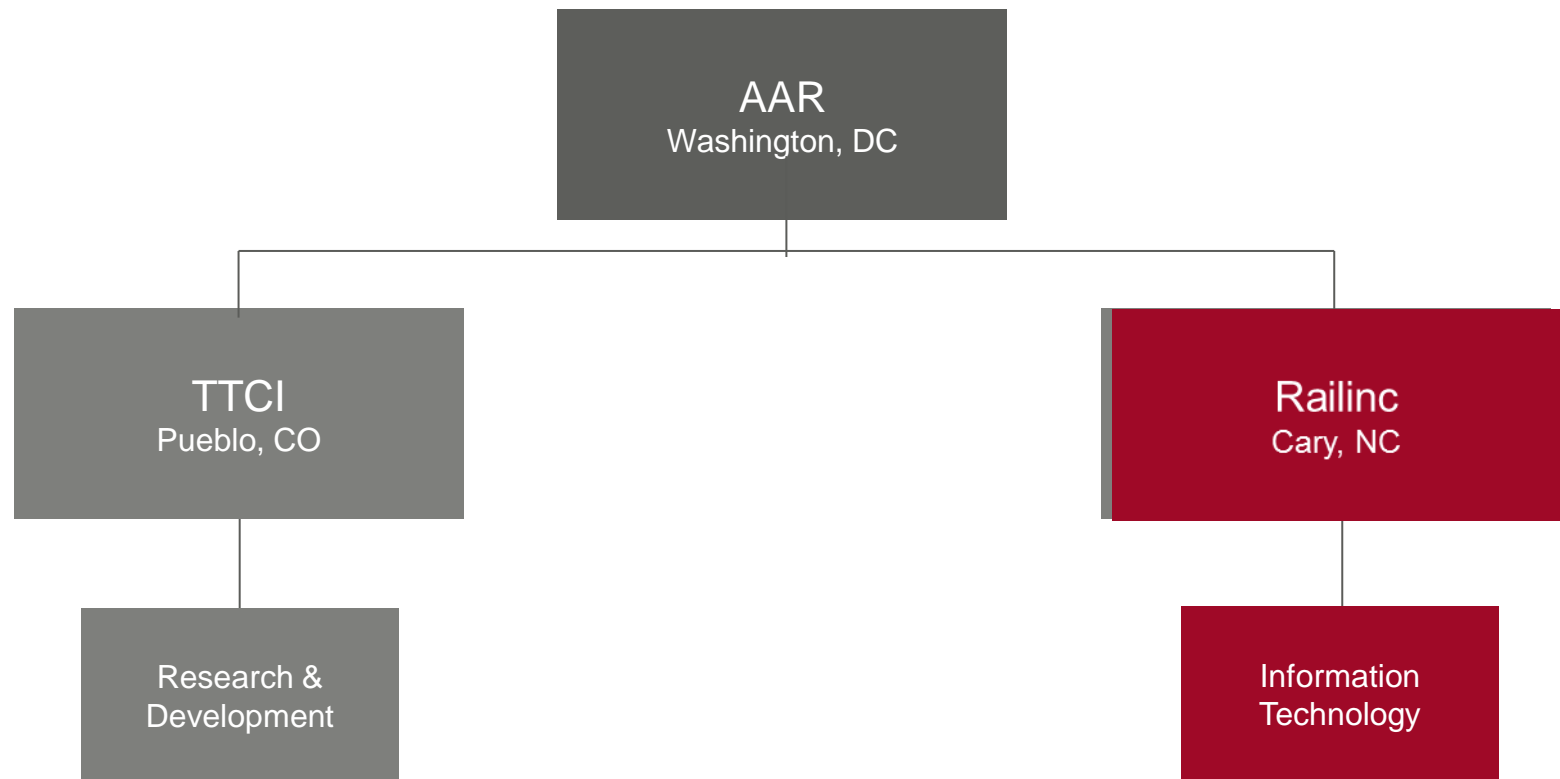
- ◆ Inspection efficiency is affected by experience, training, competency and fatigue
- ◆ Human exposure to yard hazards
- ◆ Yard capacity limited by current inefficient inspection process



# Technology Driven Train Inspection Technologies



# Railinc is the IT subsidiary of the AAR



# Railinc's Business

## Software as a Service

- Information Technology for freight rail in North America

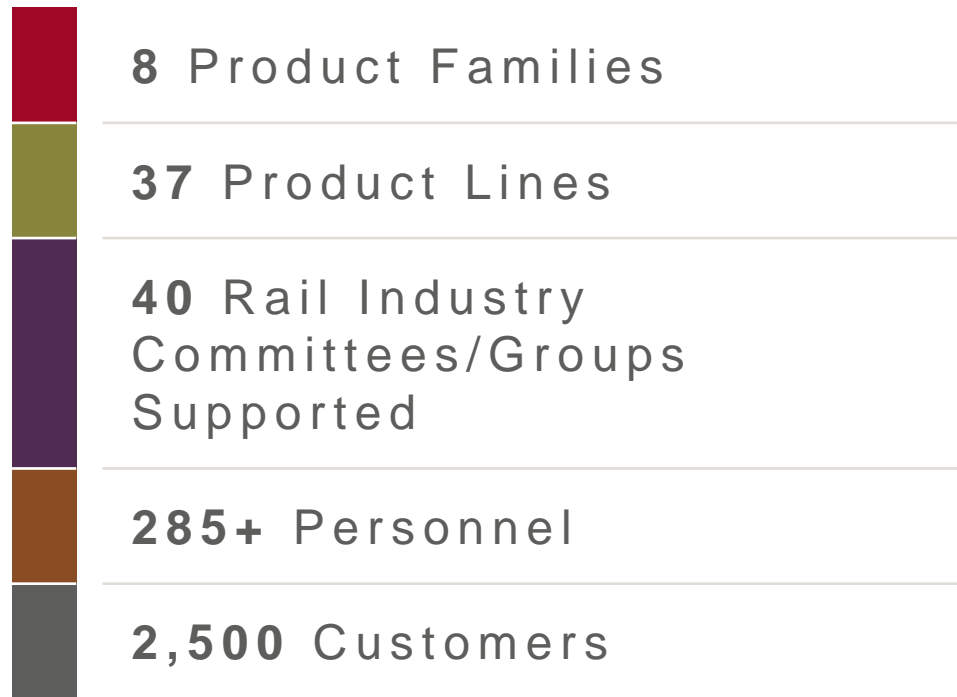
## Value Added Network

- Central Hub to Store, Process, Package and Distribute data

### Single Industry Source for Network Freight Rail Information


Interline Operating Waybill Exchange	Equipment Characteristics	Interline Revenue Settlement	Car Location Information	Car Repair Billing	Asset Health Alerts	Reference Info for BOL and Waybill Creation
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# Railinc by the Numbers



# Our Customers

<b>Class 1 Railroads</b>	US operating railroads with \$452.7 Million or more of revenue
<b>Private Car Owners</b>	Owners of railroad equipment who are not railroads
<b>Third Party Logistics</b>	Entities involved in the transportation of goods but not the transportation provider or shipper/receiver
<b>Other Railroads</b>	Smaller railroad holding companies, Class II, or Class III railroads
<b>Others (Shipper, US Gov't)</b>	Other customers not in the categories above

A close-up photograph of railroad tracks, showing the metal rails and wooden ties. A thick red horizontal bar is overlaid across the middle of the image, partially obscuring the tracks.

*Railinc's mission is to create valued solutions for rail industry problems using our people, processes and technologies.*

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MISSION STATEMENT