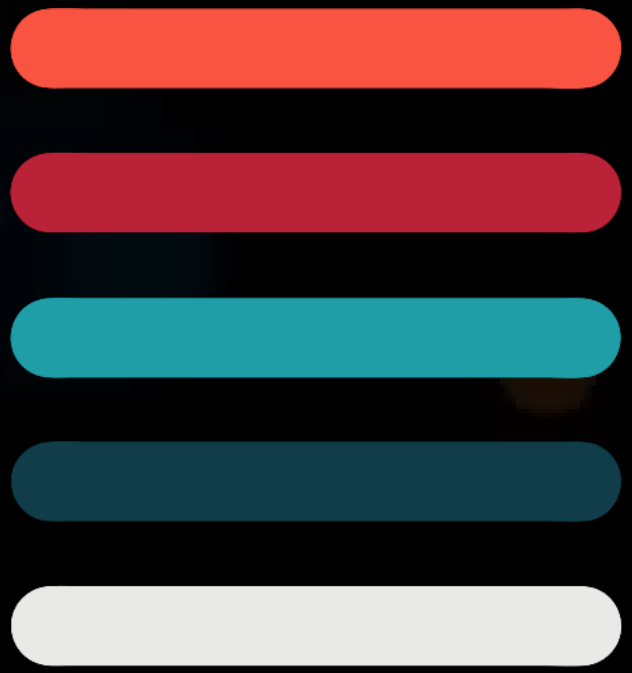
Quality Assurance Auditors & Industry Conference
February 2023 | New Orleans

MxV Rail Update

Kari Gonzales
President & CEO

MxV Rail is a subsidiary of the Association of American Railroads



MxV RAIL

MOMENTUM | INSIGHT | TEAMWORK | RIGOR | PURPOSE

Always moving forward.

TESTING

CONSULTING

TRAINING

STANDARDS

RESEARCH

Moving our legacy

27K PEOPLE HOURS

TEAR DOWN & MOVE

$100M

ASSETS

MOVED

55

Weekend

TEAM MXV RAIL

Volunteers

128

SERTC PROPS

RELOCATED

Enhanced Laboratory Environment

Damage Prevention Testing

Rolling Contact Fatigue Simulator

Cold Room

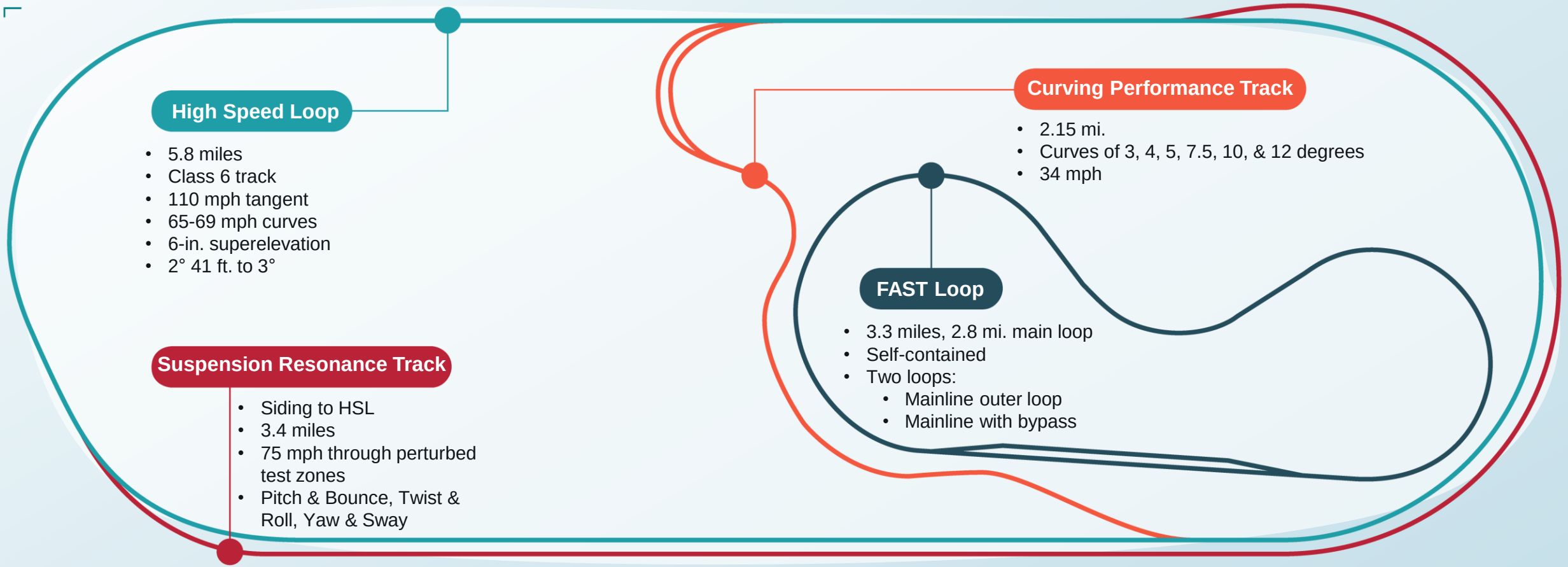
Load Cell Calibration Unit


MxV RAIL
N
SERTC
Security and Emergency Response Training Center

SERTC Training Space

SERTC Training Grounds

On-Track Testing Assets



High Speed Loop

- 5.8 miles
- Class 6 track
- 110 mph tangent
- 65-69 mph curves
- 6-in. superelevation
- 2° 41 ft. to 3°

Curving Performance Track

- 2.15 mi.
- Curves of 3, 4, 5, 7.5, 10, & 12 degrees
- 34 mph

FAST Loop

- 3.3 miles, 2.8 mi. main loop
- Self-contained
- Two loops:
  - Mainline outer loop
  - Mainline with bypass

Suspension Resonance Track

- Siding to HSL
- 3.4 miles
- 75 mph through perturbed test zones
- Pitch & Bounce, Twist & Roll, Yaw & Sway

High Speed Loop (HSL)

High Speed Loop

- Construction commenced: June 2022
- Construction completed: November 2022
- First customer testing: December 2022

AAR Strategic Research Initiative Program

Build Exemplary Teams and Facilities

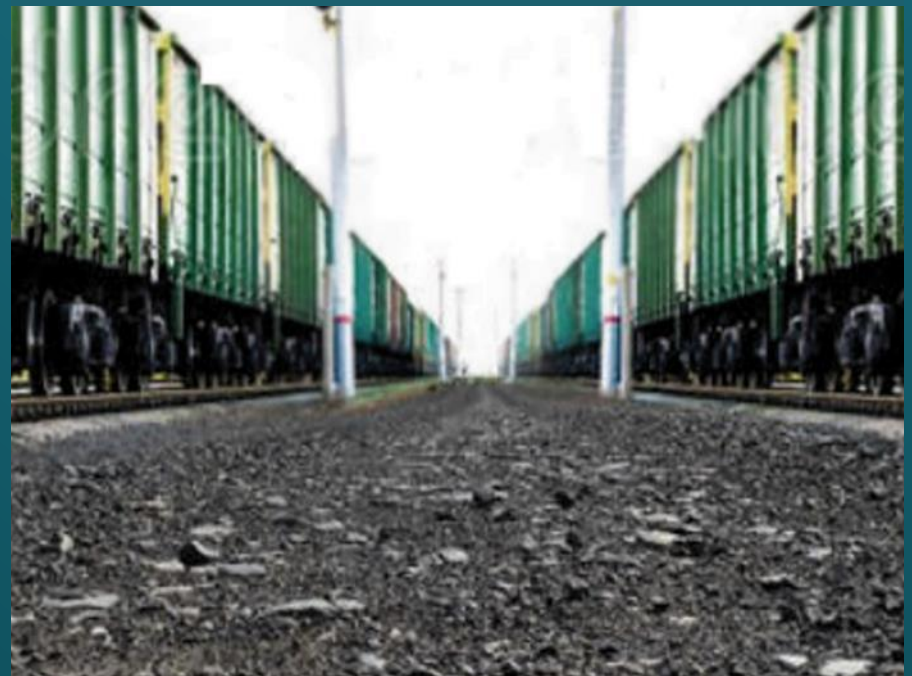
Empower Science-Based Solutions

- Identify and evaluate technologies
- Demonstrate understanding of root causes
- Support implementation
- Communicate findings

Safety
Reduce track and equipment-related derailments

Reliability
Reduce/eliminate service interruptions

Efficiency
Increase productivity, reduce costs

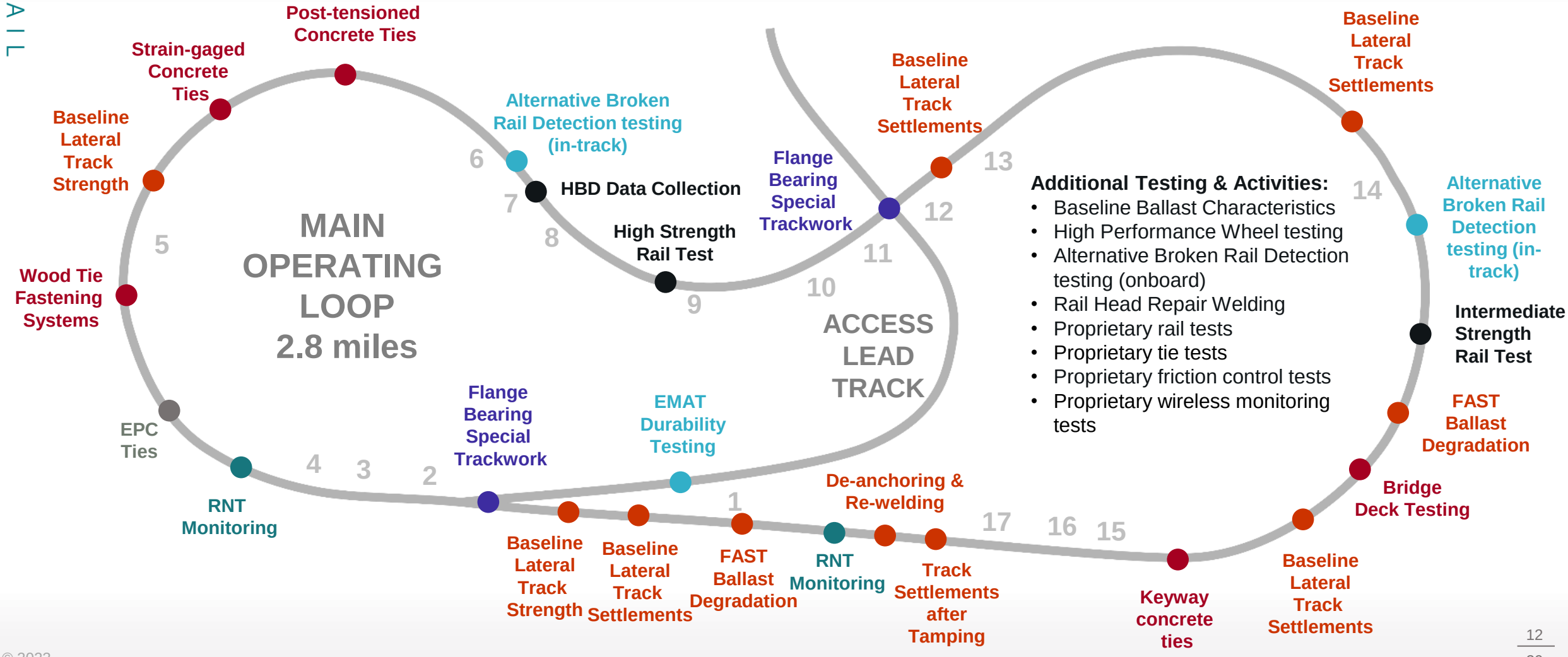


Program Design & Approval Process

- Driven by industry input
- Safety and operational trends considered
- Projects/budgets approved by:
  - AAR Research Committee
  - AAR Safety and Operations Management Committee (SOMC)
  - AAR Board of Directors

FAST Loop

- The industry's infrastructure and mechanical test bed
- Expected to be operational in late summer
- Over 28 experiments planned for 2023



Additional Testing & Activities:

- Baseline Ballast Characteristics
- High Performance Wheel testing
- Alternative Broken Rail Detection testing (onboard)
- Rail Head Repair Welding
- Proprietary rail tests
- Proprietary tie tests
- Proprietary friction control tests
- Proprietary wireless monitoring tests

RESEARCH HIGHLIGHTS:

Track Buckle Prevention

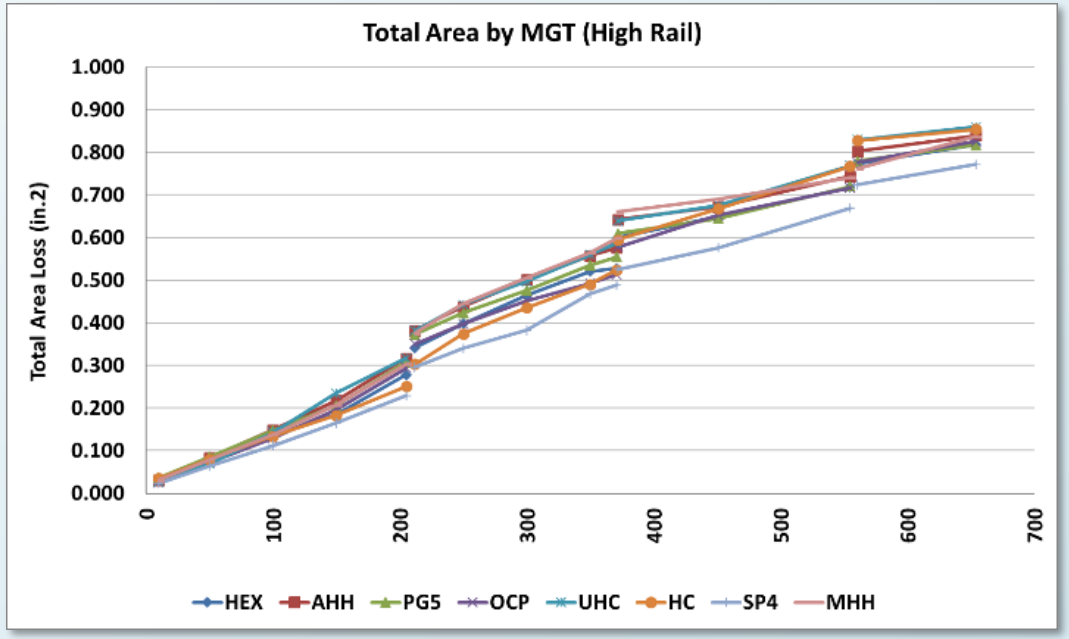
- **Lowered RNT to 40°F, skeletonized track, and induced rail running with burn ropes**
  - 1 1/4-inch buckle (1/4” initial misalignment) after rail temp reached 80 degrees above RNT
  - 30-inch buckle (1 1/4" initial misalignment) after rail temp reached 74 degrees above RNT

RESEARCH HIGHLIGHTS:

Rail Performance

Testing began in 2018, concluding after 654 MGT

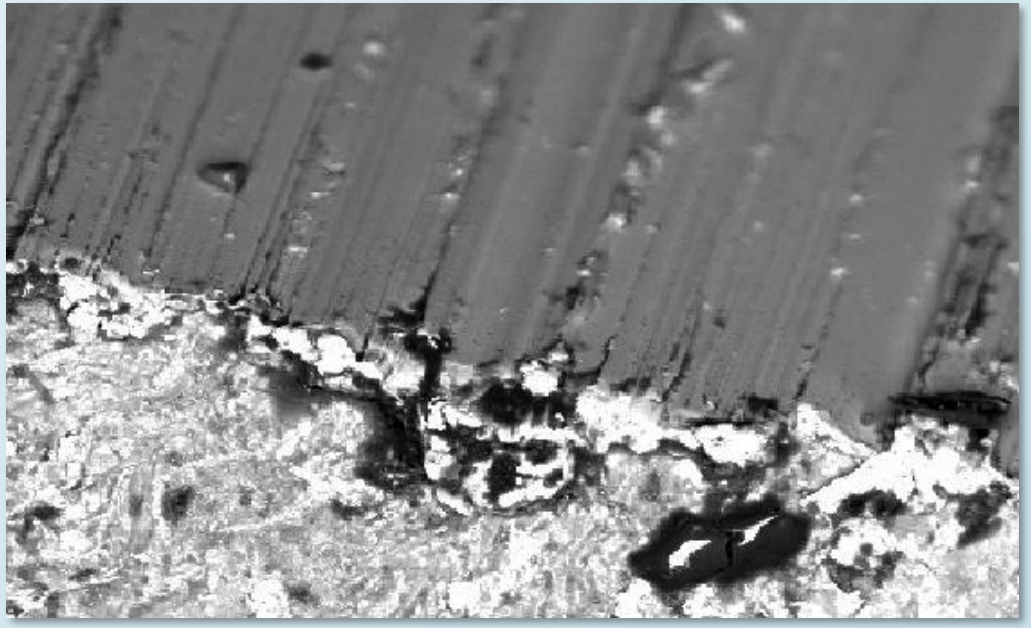
High Strength (HS) Rail Tests



No internal defects found in rails, one electric flash butt (EFB) weld failure at 210 MGT

Testing began in 2021, 283 MGT accumulated
Moving to new FAST loop in 2023

Intermediate Strength (IS) Rail Tests



One base break in low rail at 228 MGT and one EFB weld developed a web defect

RESEARCH HIGHLIGHTS:

Draft & Coupling Systems

- EOC Energy Management Task Force on potential standard development
- Conduct slack action tests to evaluate in-train performance
- Impact tests with Damage Prevention and Loading Services Group

RESEARCH HIGHLIGHTS:

Communications & Train Control

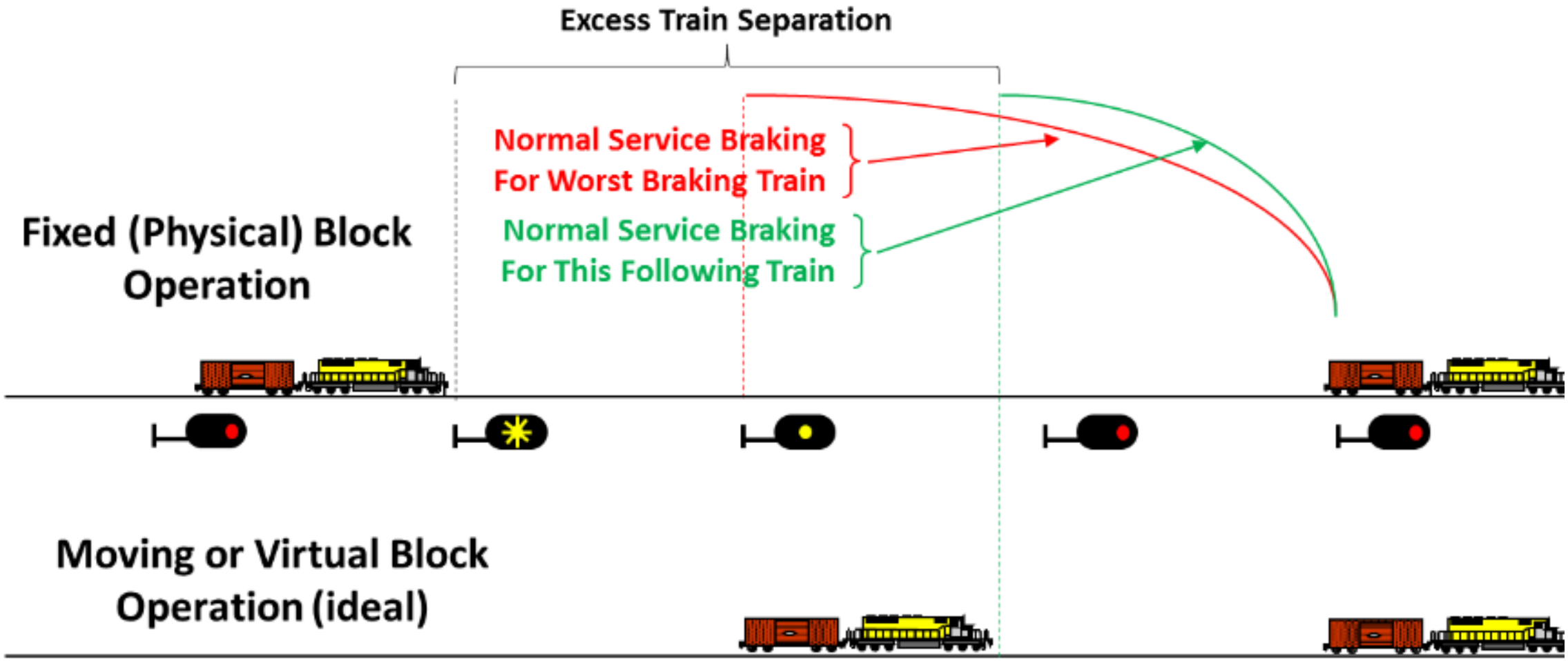
MxV Rail Core Functions

- INDUSTRY RESEARCH
- INDUSTRY TECHNICAL SUPPORT
- COMMERCIAL SUPPORT

Industry Focus Areas

- Address Operational Issues Resulting from PTC
- Address Train Control Technology Lifecycle Implications
- Leverage Technology for Advanced Operations

Higher Reliability & Capacity Train Control



Save the date

28th Annual Association of American Railroads

RESEARCH REVIEW

June 26-28 | Pueblo, CO

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Thank you

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