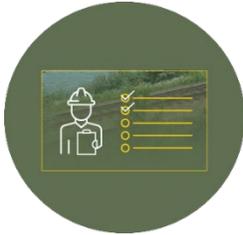


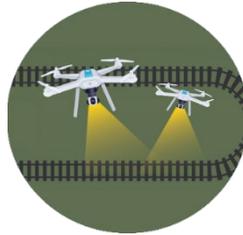
A TRAIN'S SAFETY JOURNEY NEVER ENDS

Safety is a never-ending process that is an integral part of rail operations. Empowered by technology and data insights, railroaders are dedicated to keeping the rail network safe from the beginning of a train's journey to its end and beyond.



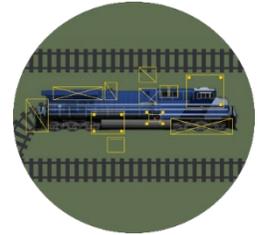
Safety Starts in Person

At a train's origin, mechanical employees and train crews thoroughly examine the train to ensure critical components meet rigorous industry safety standards.



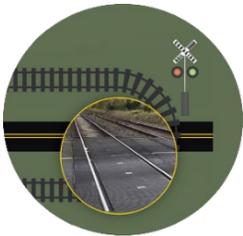
A Bird's Eye View Shows the Bigger Picture

Drones examine sections of bridges and tracks in areas that may be hard to reach, which helps keep employees and trains safe.



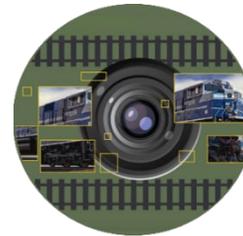
Every Locomotive is Always Thinking

Sensors throughout the locomotive continually gather data on the performance of individual components.



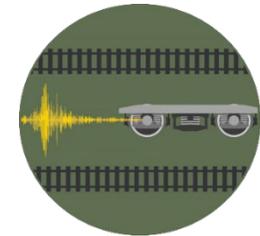
Trained Brains are Always on the Network

Tracks and grade crossings are inspected regularly by automated equipment and visually to ensure infrastructure safety.



Smart Eyes are Always Watching

Machine visioning stations capture hundreds of images per second of locomotives and railcars that pass through at speed, capturing potential issues human eyes may miss.



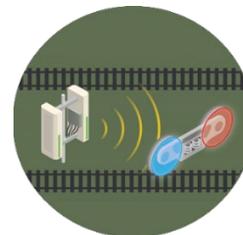
Smart Ears are Always Listening

Sensitive computers analyze the sounds of passing trains to hear if axle bearings will need to be scheduled for repair.



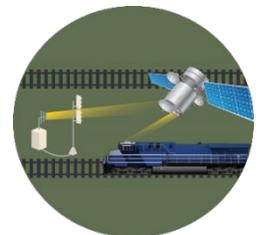
Laser-guided Safety

To be sure wheels are in a safe working condition, track-embedded lasers provide an individual profile for each wheel, often exceeding 1,000 images per train.



Network Sensors Talk to Each Other

Track-side infrared, laser and acoustical sensors share information to centralized databases where the health of locomotives and cars is tracked, and equipment can be sent to repair before it reaches a safety limit.



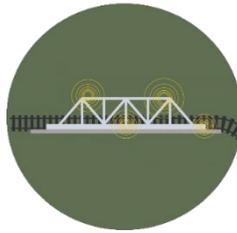
Positive Train Control Provides Confidence to Locomotive Engineers

Advanced technology prevents the most serious human-error accidents like train-to-train collisions and over-speed derailments.



Energy Management Systems Save Fuel

These on-board systems coach the engineer and can even adjust the locomotive's throttle based on the terrain and surrounding traffic.



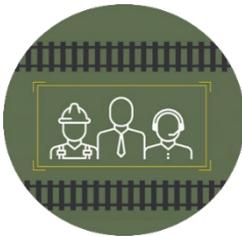
Sonar Zones in on Bridge Integrity

Sonar technology assesses the stability of bridge piers, helping ensure safe bridge crossings.



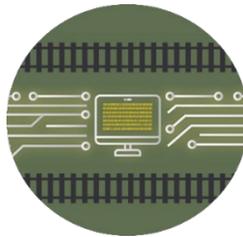
Automated Track Inspection Tech is Always on the Move

Track geometry cars, internal rail flaw detection equipment and sensors on locomotives measure rail-wear, track alignment, curve elevation and much more.



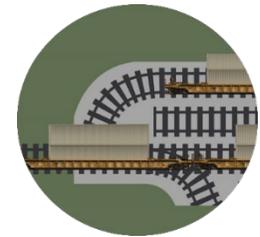
A Team Works Behind Every Locomotive Engineer

Train dispatches at rail operation centers keep locomotive engineers and other personnel along the railroad updated on route conditions.



Machine Learning, AI and Big Data Translate Information into Action

Railroads analyze the data from technologies across the network to identify and prioritize proactive maintenance, helping to keep the 140,000-mile network safe and efficient.



Safety Extends Beyond a Train's Journey

Maintenance and operational teams keep locomotives, rail cars and other equipment in top shape at yards and maintenance shops across the network.

FREIGHT RAILROADS TAKE A HOLISTIC APPROACH TO SAFETY.

From the people that power the network to the technology and data that inform their decisions, freight railroads work night and day to keep America's freight rail network the safest in the world.

Download the full infographic at [AAR.org/Train-Safety-Infographic](https://www.aar.org/Train-Safety-Infographic)