ASSOCIATION OF AMERICAN RAILROADS

ENHANCING RAIL SAFETY THROUGH AUTOMATED TRACK INSPECTIONS

The U.S. rail industry is seeking approval from the Federal Railroad Administration (FRA) to implement a blended inspection approach that integrates Automated Track Inspection (ATI), also known as Track Geometry Measurement Systems (TGMS), with existing manual (visual) inspections. This initiative is designed to enhance rail safety, improve inspection efficiency, reduce risk to workers, and ensure reliable freight service across the national rail network.

What is track geometry?

Track geometry refers to the precise three-dimensional configuration of railroad track, encompassing key elements such as gauge (distance between rails), alignment, elevation (cross-level), and curvature. Maintaining correct track geometry is essential for ensuring the safety and efficiency of rail operations. Even minor deviations can impact train performance, increase wear on equipment, and pose safety risks if left unaddressed.

ATI is proven to enhance safety

Using lasers and cameras mounted to locomotives or rail cars, ATI inspects track at speed as trains move across the network. This enables railroads to:

- Identify defects invisible to the human eye.
- Assess track structural performance under the load of a train, which manual inspections cannot replicate.
- Gather data that can be analyzed for patterns or warning signs to develop a more predictive model for addressing track maintenance.

With decades of operations, ATI technology has continued to advance and consistently provides a more accurate, and comprehensive method of detecting emerging track geometry defects compared to traditional visual inspections.

Defects affecting ballast, ties, and spikes typically also manifest themselves through track geometry defects, which are reliably detected using ATI. By identifying issues earlier and more reliably, ATI enhances preventative maintenance and helps railroads proactively manage safety risks.

Pilot Programs Results Show Strong Safety Enhancements: *One test showed ATI identified 200 times more defects than visual inspections.*

How visual inspections complement AI

Carriers aim to integrate ATI with manual inspections in a way that puts inspectors and technology where they're most effective. While ATI excels at evaluating geometry deviations and overall track health, certain defects such as vegetation and track elements like frogs and turnouts are most effectively evaluated through human visual inspections.

The rail industry is urging the Federal Railroad Administration (FRA) to support a modern, data-driven inspection framework—one that reflects today's advanced capabilities rather than relying on regulatory requirements that have remained largely unchanged since 1971.

AAR's ATI petition is a path forward

In April, the Association of American Railroads petitioned FRA to implement a blended approach to ATI systems and visual inspections. This request aims to enhance early detection and effective track defect remediation. Once the petition is approved, railroads will be required to meet certain predetermined monthly track safety performance thresholds in order to use (or continue to use) the waiver.

Contrary to claims by some entities, the waiver does not eliminate visual inspections. Rather, the waiver seeks limited relief—reduction in the frequency of one type of periodic visual inspection—contingent upon meeting rigorous, predefined safety metrics. If the waiver is granted, all other FRA required track inspections would remain in place.

The waiver does not alter railroad's requirement to meet—or exceed—the safety requirements required by FRA's track safety regulations. It simply proposes an alternative method to achieve the same safety outcomes, grounded in data and oversight.

If granted, the waiver would support:

- **Speeding up and expanding safety inspections:** By attaching ATI systems to locomotives or boxcars, railroads can inspect hundreds of thousands of track miles per year offering greater inspection accuracy and consistency while also enabling more timely maintenance and effective capital planning.

- **Enhanced worker safety:** ATI technology reduces inspectors' exposure to risk along railroad right-of-way. Visual inspections are done by walking on and around the track or by hi-rail vehicles. FRA data show that slip and fall incidents are the highest source of employee injury. Hi-rail vehicles operations, particularly near highway-rail grade crossings, also pose significant hazards. Integrating ATI into train movements enables railroads to meet inspection mandates while also lowering risk to inspectors.

- **Greater efficiency and network capacity:** Blended use of ATI with visual inspections reduces the need to halt or slow down train traffic to fulfill frequent visual inspections keeping freight, the motoring public, and our economy moving.

Remedial Action

Significant rail defects such as a broken rail must be remediated immediately under the current FRA visual inspection regulations. This remains unchanged using ATI under the proposed waiver.

For lower-class defects immediate remedial action is not required when ATI identifies a defect on higher-speed passenger track. Instead, the regulations provide that railroads have "two days" to analyze the data collected, field verify any potential defects, and implement a remedial action such as a slow order for less serious defects to ensure safety and prevent further infrastructure damage until repairs can be made.

AAR has proposed a more stringent approach for multi-class defects than FRA's existing regulations for high-speed track used in passenger operations by proposing to require that these serious defects be remediated within 48 hours of detection.

This would accelerate the response timeline for addressing the most serious defects compared to the existing regulation in place for high-speed passenger train operations. For instance, if a defect is detected on a Monday morning, the current rules allow remediation by midnight Wednesday. In contrast, AAR's proposal would move the deadline to Wednesday morning—effectively shortening the window by several hours.

It is also important to note that when the FRA conducts inspections using its own track geometry vehicles, the delay between defect detection and railroad notification can exceed the two-day window currently allowed for remediation for high-speed passenger operations.

Shared Goals & Responsibility

Railroads and policymakers all want the same thing: reduced risk and safer tracks. ATI is a tested, proven tool that builds on our commitment to improve safety outcomes. By granting AAR's waiver request, FRA can take another step forward in protecting employees and rail-served communities.