AMERICA BUILDS: THE ROLE OF INNOVATION AND TECHNOLOGY IN RAIL MODERNIZATION

(119–25)

HEARING

BEFORE THE

SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS

OF THE

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JUNE 20, 2025

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Railroads, Pipelines, and Hazardous Materials
FROM: Staff, Subcommittee on Railroads, Pipelines, and Hazardous Materials
RE: Subcommittee Hearing on "*America Builds: The Role of Innovation and Technology in Rail Modernization*"

I. PURPOSE

The Subcommittee on Railroads, Pipelines, and Hazardous Materials of the Committee on Transportation and Infrastructure will meet on Tuesday, June 24, 2025, at 10:00 a.m. ET in 2167 of the Rayburn House Office Building to receive testimony at a hearing entitled, "*America Builds: The Role of Innovation and Technology in Rail Modernization*." Witnesses will discuss how technology and process improvements can contribute to safer and more efficient freight and passenger rail transportation. The hearing will also cover the regulatory and market-based environment for rail. Members will receive testimony from David Shannon, General Manager, RailPulse; Brigham McCown, Chairman of the Board, Alliance for Innovation and Infrastructure; Eric Gebhardt, Chief Technology Officer, Wabtec Corporation; and Tony Cardwell, President, Brotherhood of Maintenance of Way Employes Division—International Brotherhood of Teamsters.

II. BACKGROUND

America's freight and intercity passenger railroad networks are essential for the movement of goods and people across the country. America's freight rail network consists of almost 140,000 miles of track.[1] Six Class I freight rail carriers and approximately 600 Class II and III (short line and regional) railroads move roughly 1.6 billion tons of goods each year.[2]

Amtrak is the Nation's primary intercity passenger rail service and operates over roughly 21,000 miles of track in 46 states, serving over 500 destinations.[3] In addition, there are 30 commuter railroads in the United States, many operated by state or regional governmental authorities.[4]

[1] Ass'n of American Railroads, *State Fact Sheets, available at* https://www.aar.org/data-center/railroads-states/#:~:text=in%20Your%20State-,Freight%20Rail%20in%20Your%20State,nearly%20140%2C000%20miles%20of%20track.

[2] *Id.*

[3] AMTRAK, *Amtrak Facts, available at* https://www.amtrak.com/amtrak-facts#:~:text=With%2021%2C000%20route%20miles%20in,to%20more%20than%20500%20destinations.

[4] American Pub. Transp. Ass'n, *How many commuter railroads are in the United States, available at* https://www.apta.com/faq-items/how-many-commuter-railroads-are-in-the-united-states/.

Innovation is widely recognized within the economic sciences as a fundamental driver of long-term economic growth, prosperity, and overall societal welfare.[5] The private sector is responsible for approximately 75 percent of economy-wide research and development.[6] A return on investment in research and development serves as a necessary incentive to justify the inherent economic risk.[7]

Like other sectors of the economy, the freight rail industry and its associated sectors invest in the research and development of new technologies and processes to enhance safety, improve efficiency, and drive overall productivity. These innovations include advancements that support internal management, enhance customer service, address regulatory requirements, and optimize the use and management of system assets.[8] This memorandum provides a brief overview of these technologies and systems.

III. RAILROAD SAFETY TECHNOLOGIES

The freight railroad industry has invested in a range of technologies designed to enhance safety while also improving operational efficiencies. Some of these technologies have been mandated by statute or regulations, such as Positive Train Control, while others have been voluntarily developed and implemented by the industry, including systems for railcar bearing monitoring and defect detection systems.

POSITIVE TRAIN CONTROL

Positive Train Control (PTC) describes technologies designed to automatically stop or slow train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where maintenance activities are taking place, and movement of a train through a track switch left in the wrong position.[9] A fully functional PTC system must be able to precisely determine the location and speed of trains; warn train operators of potential problems; and act if the operator does not respond to a warning. For example, if a train operator fails to stop a train at a stop signal, the PTC system applies the brakes automatically.

The requirement that certain freight, passenger, and commuter rail lines use PTC was mandated in the Rail Safety Improvements Act of 2008.[10] Operators were initially given until December 21, 2015, to install these systems.[11] Actual implementation took longer than expected and the deadline was extended in subsequent legislation to December 31, 2020.[12] The Federal Railroad Administration (FRA) reported on December 29, 2020, that PTC was in operation on all required lines.[13]

RAILCAR WHEEL AND BEARING MONITORING AND DETECTION SYSTEMS

The railroad industry has voluntarily deployed a range of monitoring systems to detect and assess the condition of railcar wheel bearings in an effort to prevent failures that could lead to derailments. According to one analysis, defects in railcar wheels or axles are the second leading cause of derailments.[14] For example, the National Transportation Safety Board (NTSB), found that the Norfolk Southern derailment in East Palestine, Ohio, was due to an overheated wheel bearing that was not

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[5] Michael Greenstone and Adam Looney, *A Dozen Facts About Innovation*, THE HAMILTON PROJECT AT THE BROOKINGS INSTITUTION (Aug. 2011), at 1, *available at* https://www.hamiltonproject.org/publication/economic-fact/a-dozen-economic-facts-about-innovation/.

[6] NAT'L SCIENCE FOUNDATION, NAT'L CENTER FOR SCIENCE AND ENGINEERING STATISTICS, *U.S. R&D Totaled $892 Billion in 2022; Estimate for 2023 Indicates Further Increase to $940 Billion*, (Feb. 27, 2025), *available at* https://ncses.nsf.gov/pubs/nsf25327.

[7] McKinsey & Company, *What is Innovation?, available at* https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-innovation.

[8] Ass'n of American Railroads, *Freight Rail: How Decades of Technological Progress Makes Railroads Safer, available at* https://www.aar.org/issue/decades-of-tech-progress/.

[9] FRA, *Positive Train Control, available at* https://railroads.dot.gov/research-development/program-areas/train-control/ptc/positive-train-control-ptc.

[10] Rail Safety Improvement Act of 2008, Pub. L. No. 110–432, 122 Stat. 4848.

[11] *Id.*

[12] Surface Transportation Extension Act of 2015, Pub. L. 114–73, 129 Stat. 576.

[13] FRA, *Positive Train Control: Overview, available at* https://railroads.dot.gov/research-development/program-areas/train-control/ptc/positive-train-control-ptc#:~:text=On%20December%2029%2C%202020%2C%20FRA,deadline%20set%20forth%20by%20Congress.

[14] Brandon Z. Wang, et. al., *Quantitative Analysis of Changes in Freight Train Derailment Causes and Rates*, JOURNAL OF TRANSP. ENGINEERING, PART A: SYSTEMS, VOL. 146, NO. 11, (2020) [hereinafter "*Quantitative Analysis*"], *available at* https://railtec.illinois.edu/wp/wp-content/uploads/Wang-et-al-2020-Quantitative-Analysis-of-Changes-in-Freight-Train-Derailment-Causes-and-Rates.pdf.

detected in time by trackside sensors.[15] However, from 2023 to 2024, FRA safety data showed incidents attributed to overheated bearings declined by 55.5 percent.[16]

There are several types of wheel bearing monitors and detection systems. One of the most widely used is the thermal wayside detector, commonly referred to as a "Hot Box Detector"[17] which uses infrared sensors placed alongside the tracks to measure the temperature of wheel bearings as trains pass.[18] Another type employs acoustic sensors mounted trackside to detect sounds that may indicate bearing defects. There are currently no Federal regulations governing how these detectors are used or which reports are sent to monitoring centers and which are sent directly to rail crews.[19] The Association of American Railroads (AAR), however, released updated industry standards increasing the frequency of detectors along key routes, and established a new standard for stopping and inspecting trains when detector readings exceed 170 degrees, among other initiatives.[20] Other systems under development are designed to be mounted directly on railcars, enabling real-time monitoring and reporting of wheel and bearing conditions throughout a train's journey.[21]

TRACK CONDITION MONITORING TECHNOLOGIES

While defective wheel bearings are the second leading cause of derailments, the primary cause is defective track.[22] These defects can include issues with the rail itself, such as cracks, shelling, or steel flaking from the rail head, as well as problems with track geometry (e.g., misalignments, cutting failures, ballast degradation), and flaws at joints and switches, among others.[23]

Automated Track Inspection (ATI) technology, uses a suite of sensors mounted on locomotives or railcars to scan track conditions and identify defects, particularly in track geometry, at earlier stages than traditional methods.[24] While FRA regulations do not generally require freight railroads to inspect track geometry using automated track geometry measurement systems, voluntary use of this technology to prevent derailments has been increasing since its inception in the 1970s.[25] FRA has noted in proposed rulemaking that it "acknowledges the safety benefits of this technology, specifically its ability to quickly and accurately detect small changes in track geometry."[26] Advances in camera technology allow for images of track conditions to be

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[15] NTSB, *Norfolk Southern Railway Derailment and Hazardous Materials Release*, RIR–24–05, (June 25, 2024), *available at* https://www.ntsb.gov/investigations/AccidentReports/Reports/RIR2405%20CORRECTED.pdf.

[16] DEP'T OF TRANSP., *Train Accident (not at Highway-Rail Crossings) Summary, available at* https://data.transportation.gov/stories/s/2ju5-8zxb.

[17] Ass'n of American Railroads, *Freight Rail: How Decades of Technological Progress Makes Railroads Safer, available at* https://www.aar.org/issue/decades-of-tech-progress/.

[18] *Id.*

[19] *See e.g.* Rachel Premack, *There are no federal regulations on key rail sensors*, FREIGHT WAVES, (Mar. 9, 2023), *available at* https://www.freightwaves.com/news/there-are-no-federal-regulations-on-key-rail-sensors.

[20] Ass'n of American Railroads, *Railroads Addressed NTSB East Palestine Initial Findings, Await Final Report, available at* https://www.aar.org/news/railroads-addressed-ntsb-east-palestine-initial-findings-await-final-report/.

[21] U.S. DEP'T OF TRANSP., *Advanced On-Board Condition Monitoring System for Freight Railcar Applications: Abstract, available at* https://www.transportation.gov/utc/advanced-board-condition-monitoring-system-freight-railcar-applications; *see also*, Bill Stephens, *Wheel bearing expert: To prevent derailments, railroads should equip cars with sensors*, TRAINS, (Mar. 6, 2023), *available at* https://www.trains.com/trn/news-reviews/news-wire/wheel-bearing-expert-to-prevent-derailments-railroads-should-equip-freight-cars-with-sensors/#:~:text=The%20Rail%20Safety%20Act%20of,detectors%2C%20according%20to%20the%20FRA.

[22] *Quantitative Analysis, supra* note 12.

[23] FRA, *Track Inspector Rail Defect Reference Manual—July 2015 Revision 2, available at* https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/15669/Final%20FRA%20Rail%20Manual%20July%2029%202015_031716.pdf.

[24] Gary A. Carr, et. al., *Autonomous Track Inspection Systems—Today and Tomorrow*, presented to AMERICAN RAILWAY ENG'G AND MAINTENANCE-OF-WAY ASS'N, [hereinafter "*ATI Report to AREMA*"], *available at* https://drive.google.com/file/d/1tLl5SXggjI3zPMY5bxarGaadTHvmYRO/view?usp=sharing.

[25] DOT, FRA, REPORT TO CONGRESS: AUTOMATIC TRACK GEOMETRY MEASUREMENT SYSTEM TECHNOLOGY TEST PROGRAMS, *available at* https://railroads.dot.gov/sites/fra.dot.gov/files/2021-11/FRA%20Report%20to%20Congress-Track%20Inspection%20Test%20Program%2011.23.21.pdf.

[26] Track Geometry Measurement System (TGMS) Inspections, 89 Fed. Reg. 84845, 84846 (Oct. 24, 2024).

captured and analyzed by artificial intelligence (AI).[27] This predictive capability supports more informed decisions about when and where to prioritize repairs.[28]

ATI is associated with improved operational efficiency. For example, it allows for more frequent data collection without occupying valuable track time because it can be conducted during revenue service.[29] FRA noted that the industry could reasonably expect a 30 to 50 percent reduction in per-mile survey costs compared to traditional inspection methods.[30] FRA has stated that Autonomous Track Geometry Measurement System (ATGMS) technology is designed to enhance, not replace, traditional inspection methods.[31]

IV. INFORMATION TECHNOLOGY AND RAIL

The railroad industry, and its customers, have increasingly adopted information technology to enhance both safety and operational efficiency. These technologies include data analytics, Internet of Things (IoT) integration, and predictive maintenance systems.[32] While not exhaustive, the following examples illustrate several key innovations in this space.

RAILCAR TELEMATICS

Railcar telematics is an emerging technology with potential safety and efficiency implications. The term broadly describes a suite of sensors that collect and transmit real-time data on a railcar's location, condition, and performance, to car owners or operators.[33] Potential benefits to railcar owners include improved asset utilization (e.g., identifying under, or over-used railcars), enhanced scheduling and deployment, and proactive maintenance planning.[34] Testing is currently underway for telematics-equipped railcars to, in real time, detect, collect and report additional data including whether a handbrake has been applied, a door is left open or closed, whether the car is empty or loaded, or assess wear levels to inform maintenance scheduling.

THE INTERNET OF THINGS

The Internet of Things (IoT) refers to a network of embedded sensors, software, and other technologies that connect and exchange data over the internet.[35] In the rail context, IoT technologies allow operators to collect large volumes of operational data, which can be analyzed to improve efficiency, better manage logistics, and identify new business opportunities.[36]

FUEL USE

Diesel fuel use is a significant cost for railroads. Wabtec's "Trip Optimizer" is locomotive software that generates a fuel-use operating plan based on train characteristics, including weight, length, terrain, and routing data.[37] Currently, approximately 11,000 units are in use across 17 railroads. On average, the system delivers a 10

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[27] Carly Bowling, *Right on track: Researchers use new tech to improve railroad safety*, UNIVERSITY OF NEW MEXICO NEWS, (Feb. 14, 2025), *available at* https://news.unm.edu/news/right-on-track-researchers-use-new-tech-to-improve-railroad-safety#:~:text=The%20cameras%20attach%20to%20railcars,the%20FRA%20in%20the%20past.

[28] *Id.*

[29] *ATI Report to AREMA, supra* note 24.

[30] Letter from Thomas Hermann, Director, Office of Tech. Oversight, Office of Railroad Safety, to Jerry C. Boles, President, Brotherhood of Railroad Signalmen, and Freddie Simpson, President, Brotherhood of Maintenance of Way Employes Division of the IBT (Feb. 8, 2019), *available at* https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/18300/Signed%20Final%20Response%20to%20Petition%20for%20Reconsideration%20(FRA-2018-0091)%20with%20exhibits.pdf.

[31] U.S. DEP'T OF TRANSP., *Autonomous Track Geometry Measurement System*, at 4, *available at* https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/17766/Autonomous%20Track%20Geometry%20Measurement%20System_presentation.pdf.

[32] Ass'n of American Railroads, *Freight Rail: How Decades of Technological Progress Makes Railroads Safer, available at* https://www.aar.org/issue/decades-of-tech-progress/.

[33] ZTR, *Telematics for Railcars—Introduction, available at* https://www.ztr.com/blog/telematics-railcars-introduction#:~:text=In%20the%20context%20of%20railcars,this%20information%20to%20remote%20users.

[34] *Id.*

[35] Oracle, *What is IoT?, available at* https://www.oracle.com/internet-of-things/#:~:text=What%20is%20IoT?,objects%20to%20sophisticated%20industrial%20tools.

[36] *The Internet of Things: A world of opportunity for railroads*, PROGRESSIVE RAILROADING, (Mar. 2016), *available at* https://www.progressiverailroading.com/rail_industry_trends/article/The-Internet-of-Things-A-world-of-opportunity-for-railroads--47507.

[37] *Id.*

percent reduction in fuel usage, though results vary depending upon train type, terrain, and operational conditions.[38]

V. OTHER RAILROAD TECHNOLOGIES

LOWER EMISSIONS AND ALTERNATIVE FUEL LOCOMOTIVES

The railroad industry invests in locomotives to reduce emissions of harmful air pollutants and operate with alternative fuels. Certain railroads are piloting battery-electric and hydrogen fuel cell locomotives, testing hybrid consist models, and incorporating renewable fuels to further lower emissions. Some railroads have deployed zero and low-emission equipment to transload and move goods, to improve operational efficiency and reduce emissions.[39]

One such technology includes Tier 4 compliant locomotives, which are diesel-powered but engineered to significantly reduce emissions of particulate matter nitrogen oxides compared to older models.[40] These locomotives may operate solely on diesel or be designed to accommodate alternative fuels, offering greater flexibility while contributing to emissions reductions.[41] As of 2023, 6.7 percent of Class I locomotives were Tier 4 compliant.[42]

Similarly, the industry is developing and deploying battery-powered locomotives and locomotives that utilize liquid hydrogen. As part of its fiscal year (FY) 2023–2024 Consolidated Rail Infrastructure and Safety Improvements Program Selections, the FRA awarded $36.5 million to the California Air Resources Board to procure nine battery-electric locomotives and one hydrogen fuel cell locomotive to operate on the Pacific Harbor Line, an Anacostia Rail Holdings Company railroad, in and near the Ports of Los Angeles and Long Beach.[43]

AUTONOMOUS RAILCARS

Autonomous battery-electric railcars travel independent of locomotives and can couple with other cars to form up to 50-car autonomous trains.[44] Parallel Systems received approval from the FRA in January of 2025 to test its first system in partnership with Genesee & Wyoming across a 160-mile span of two Georgia railroads, which connect with the Port of Savannah.[45]

VI. CHALLENGES TO THE DEPLOYMENT OF TECHNOLOGIES IN RAIL

Railroads and their customers may face a series of challenges in utilizing and deploying new technology. These barriers can be regulatory and market-based or both, as described below.

REGULATORY CHALLENGES

The primary agency that oversees railroad safety and rail grant programs is the FRA, which exists within the Department of Transportation (DOT). The FRA has

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[38] Wabtec, Trip Optimizer, *available at* https://www.wabteccorp.com/TripOptimizer-brochure.pdf?inline.

[39] Ass'n of American Railroads, *Freight Rail: Climate Change, available at* https://www.aar.org/issue/freight-rail-climate-change/.

[40] BNSF, *Tier 4 Locomotives Pulling for a Cleaner Future*, (Apr. 22, 2024), *available at* https://www.bnsf.com/news-media/railtalk/community/tier-four.html#:~:text=Tier%204s%2C%20the%20latest%20of,its%20first%20locomotive%20emissions%20standards (Tier 4 refers to the EPA emissions standards for new and newly remanufactured locomotive engines, *see also* 40 C.F.R. Chapter 1, Subpart U, Part 1033.101.

[41] Wabtec, *Freight Rail's Bridge to a Net-Zeo Future: Wabtec's Evolution Series Tier 4 Locomotive, available at* https://www.wabteccorp.com/trains-of-thought/freight-rail-s-bridge-to-a-net-zero-future-wabtec-s-evolution-series-tier-4-locomotive#:~:text=One%20of%20the%20beauties%20of,and%20total%20cost%20of%20ownership.

[42] Email from Ass'n of American Railroads to Comm. Staff (on file with the Comm.).

[43] FRA, *FY 2023–2024 Consolidated Rail Infrastructure Improvements (CRISI) Grants Program: Project Summaries*, (Oct. 29, 2024), *available at* https://railroads.dot.gov/elibrary/fy-2023-24-crisi-program-project-summaries.

[44] Ed Garsten, *A 'Parallel' Path To Autonomous-Electric Rail Freight Travel*, FORBES, (Sept. 12, 2023), *available at* https://www.forbes.com/sites/edgarsten/2023/09/12/a-parallel-path-to-autonomous-electric-rail-freight-travel/.

[45] FRA, *Program Approval: Georgia Central Railway, L.P. and Heart of Georgia Railroad, Inc., available at* https://railroads.dot.gov/regulations/federal-register-documents/2025-02252; *see also FRA approves testing of first autonomous freight-rail system*, PROGRESSIVE RAILROADING, (Apr. 15, 2025), *available at* https://www.progressiverailroading.com/rail__industry__trends/news/FRA-approves-testing-of-first-autonomous-freight-rail-system--74325#:~:text=Parallel's%20aim%20is%20to%20deliver,with%20U.S.%20and%20Australian%20railroads.

the authority to issue regulations and orders pertaining to rail safety and to issue civil and criminal penalties to enforce those regulations and orders.[46]

The FRA's Office of Railroad Safety (ORS) promotes and regulates safety through the Nation's railroad industry.[47] Its safety and compliance program is executed through various skilled staff focused in six technical disciplines focusing on compliance and enforcement in: 1) Grade Crossings; 2) Hazardous Materials; 3) Motive Power and Equipment; 4) Operating Practices; 5) Signal and Train Control; and 6) Track.[48] These regulatory activities are carried out in Title 49, Subtitle B of Chapter II of the Code of Federal Regulations.

FRA regulations specify how railroads will achieve regulatory compliance. For example, FRA Track Safety Standards for Class I and Class II railroads requires tracks be canvassed by qualified inspectors twice every week.[49] The regulations further specify how the inspection is to be conducted, such as requiring inspections to be made on foot or by vehicle and establishes the maximum speed of a vehicle.[50] Technology may be used to supplement required visual inspections.[51]

In recognition of evolving practices and technologies, Federal law does provide FRA discretionary authority to issue non-emergency safety waivers that waive or suspend safety requirements upon a finding that doing so "is in the public interest and consistent with railroad safety." [52] Industry waiver requests can seek to implement a new practices and/or technology on discrete segments of a railroad's network that achieves an equal or greater safety outcome.

Operator safety waiver applications are submitted to, and reviewed by, FRA's Rail Safety Board. To receive a waiver, operators are required to: 1) identify the rule, regulation or standard that the petition seeks to have waived; 2) explain the nature and extent of the relief sought and identify and describe the persons, equipment, installations, and locations to be covered by the waiver; and 3) contain sufficient supporting information, including an analysis of costs and benefits of the request and relevant safety data.[53] As in Notice and Comment Rulemaking, FRA is statutorily required to notice waiver petitions and provide the opportunity for public comment.[54]

Each waiver request is considered fact specific and unique, taking into consideration the information and data the petitioner presents, public comments received, FRA's own technical analysis, and field investigation, if appropriate.[55] FRA conducts its waiver reviews concurrent with the public comment period.[56] After considering all data and relevant information, FRA authorizes the Railroad Safety Board to issue a decision on the request, either approving or denying the request.[57] Regulations specify that such a decision should be rendered not later than nine months after receipt.[58]

Railroad track inspection safety waiver applications often seek to use ATI in combination with reduced visual inspections as a means of increasing efficiency.[59] As a discretionary process, FRA has rejected previous railroad safety waiver petitions to combine the use of ATI with reduced frequency of manual inspections and/or to vary repair times. These applicants contend the waivers can produce enhanced oper-

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[46] *The Internet of Things: A world of opportunity for railroads*, PROGRESSIVE RAILROADING, (Mar. 2016), *available at* https://www.progressiverailroading.com/rail__industry__trends/article/The-Internet-of-Things-A-world-of-opportunity-for-railroads--47507.

[47] FRA, *Railroad Safety, available at* https://railroads.dot.gov/railroad-safety.

[48] *Id.*

[49] 49 C.F.R. § 213.233.

[50] *Id.* at § 2133(b).

[51] *Id.*

[52] 49 U.S.C. § 20103(d).

[53] 49 C.F.R. § 211.9.

[54] 49 U.S.C. § 20103(d)(2).

[55] FRA, *Guidance on Submitting Requests for Waivers, Block Signal Applications, and other Approval Requests to FRA*, at 1, (Dec. 2022), *available at* https://railroads.dot.gov/sites/fra.dot.gov/files/2022-12/Guidance%20on%20Submitting%20Waiver%20Special%20Approval%20Other%20Requests%20for%20Approval%20to%20FRA%20%28Dec%202022%29%20final.pdf.

[56] *Id.* at 5.

[57] *Id.* (interested parties may also petition FRA to reconsider its approval or denial of a waiver petition); *See*, 49 CFR § 211.41(f) & 211.57.

[58] 49 CFR § 211.41(a).

[59] Ass'n of American of Railroads, *Freight Rail and Automated Track Inspections, available at* https://www.aar.org/wp-content/uploads/2022/06/AAR-Automated-Track-Inspections-Fact-Sheet.pdf.

ational and economic efficiencies.[60] Some organizations have expressed concerns about these waiver petitions.[61]

MARKET CHALLENGES

As in other industries, the railroad industry seeks to attain economic benefits to justify investment in technology improvements. Railcar telematics can help railcar owners and shippers optimize and achieve greater efficiencies in the use of their railcars. According to a 2023 report, initial adoption by high-value cars, such as refrigerated cars carrying perishable goods, where information on railcar condition and health is critical would be beneficial.[62]

System interoperability and standardization may also serve as a barrier. For example, interoperability of the railroads' PTC systems contributed to implementation delays.[63] RailPulse seeks to create a common telematics technology platform that can be utilized by all stakeholders in the rail ecosystem, shippers, railroads, and railcar lessors and owners, to better ensure interoperability.[64] According to RailPulse, there are approximately 1.6 million railcars with 16,000 currently outfitted with the geographic information system location technology.[65] Among its goals is helping freight recapture and expand market share lost to trucks and improve railroads customer service.[66]

VII. WITNESSES

- Mr. David Shannon, General Manager, RailPulse
- Mr. Brigham McCown, Founder and Chairman of the Board of Directors, Alliance for Innovation and Infrastructure
- Mr. Eric Gebhardt, Executive Vice President and Chief Technology Officer, Wabtec, *on behalf of* Railway Supply Institute
- Mr. Tony Cardwell, President, Brotherhood of Maintenance of Way Employes Division, International Brotherhood of Teamsters

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[60] Ass'n of American Railroads, *Rail Industry Challenges FRA's Inaction on Waivers*, (Nov. 8, 2024), *available at* https://www.aar.org/news/rail-industry-challenges-fras-inaction-on-waivers/.

[61] *See e.g.* Policy Statement, TTD, *Transportation Labor Calls for Worker Protections Amidst the Development of Autonomous & Automated Rail Technologies*, (Nov. 21, 2024), *available at* https://ttd.org/policy/policy-statements/transportation-labor-calls-for-worker-protections-amidst-the-development-of-autonomous-automated-rail-technologies/.

[62] David Schaar, et. al., Freight Rail's Digital Future is Just Around the Bend, BOSTON CONSULTING GROUP, (January 6, 2023), *available at* https://www.bcg.com/publications/2023/benefits-of-applying-advanced-technologies-to-rail-freight-shipping.

[63] U.S. Gov't Accountability Office, Positive Train Control, As Implementation Progresses, Focus Turns to the Complexities of Achieving System Interoperability, GAO–19–693T (July 31, 2019), *available at* https://www.gao.gov/assets/gao-19-693t.pdf.

[64] RailPulse, *Improving Rails Future Competitiveness, available at* https://railpulse.com/news-updates/improving-rails-future-competitiveness/#:~:text=The%20Challenges%20of%20Today%27s%20Rail%20Telematics&text=These%20solutions%20often%20lack%20interoperability,and%20resulting%20in%20customer%20frustration.

[65] May 2025 RailPulse update to Committee Staff (on file with Comm.).

[66] RailPulse, *Improving Rails Future Competitiveness, available at* https://railpulse.com/news-updates/improving-rails-future-competitiveness/#:~:text=RailPulse%20Facilitates%20Next%20Generation%20Technology,rail%20shipping%20for%20the%20future.

AMERICA BUILDS: THE ROLE OF INNOVATION AND TECHNOLOGY IN RAIL MODERNIZATION

TUESDAY, JUNE 24, 2025

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to call, at 10 a.m. in Room 2167, Rayburn House Office Building, Hon. Daniel Webster (Chairman of the subcommittee) presiding.

Mr. WEBSTER OF FLORIDA. The Subcommittee on Railroads, Pipelines, and Hazardous Materials will come to order.

I ask unanimous consent that the chairman be authorized to declare a recess at any time.

Without objection, show that ordered.

I ask unanimous consent that Members who are not on the subcommittee be permitted to sit on the subcommittee and ask questions.

Without objection, show that ordered.

As a reminder to Members, if you wish to insert a document into the record, please also email it to DocumentsTI@mail.house.gov.

I recognize myself for the purpose of an opening statement for 5 minutes.

OPENING STATEMENT OF HON. DANIEL WEBSTER OF FLORIDA, CHAIRMAN, SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS

Mr. WEBSTER OF FLORIDA. The free enterprise system is responsible for generating the most efficient and innovative technologies of our modern world. In the global economy, technology advancements are some of our Nation's greatest competitive achievements.

Our national freight and passenger rail networks are no different from other sectors of the economy. Innovation and technology are vital to improving the rail industry's growth and safety outcomes. Ensuring that technology advancements and innovations continue to flourish will require a combination of the right policies, particularly regulatory policies, to incentivize current and future research, development, and deployment of new technology.

Unfortunately, while our other Government agencies, including those in the Department of Transportation, are embracing the promise of innovation and developing the right regulatory framework for its promotion, much of the Federal Railroad Administration's regulatory framework remains a relic of the past.

For example, most FRA regulations are prescriptive in how they require safety inspection and tasks to be conducted. They determine the frequency and means used to achieve regulatory compliance. Many of these regulations were written decades ago, at a time when technology was limited and/or sometimes nonexistent.

However, we are here to examine technology's progress. Technological progress moves on. Although the law allows railroads to apply for waivers to test new processes and technologies that can achieve safety objectives while improving efficiency, this current waiver process is less than transparent, and subject to political interference. This regulatory uncertainty hinders both innovation and the rail industry's ability to compete against other modes of freight transportation.

As Congress begins consideration of legislation reauthorizing surface transportation programs and agencies, we should look to promote policies that encourage innovation and investment in our rail system, improving both its safety and its ability to survive and thrive. This includes reforming the antiquated regulatory structure that is inhibiting innovation.

Today's witnesses will provide important insight into how technologies have the potential to revolutionize freight and passenger rail transportation. We are interested in learning their views on what Congress can do to encourage innovation and bring our railroads into the 21st century.

[Mr. Webster of Florida's prepared statement follows:]

Prepared Statement of Hon. Daniel Webster, a Representative in Congress from the State of Florida, and Chairman, Subcommittee on Railroads, Pipelines, and Hazardous Materials

The free enterprise system is responsible for generating the most efficient and innovative technologies of our modern world. In the global economy, technological advancements are some of our nation's greatest competitive advantages.

Our national freight and passenger rail networks are no different from other sectors of the economy. Innovation and technology are vital to improving the rail industry's growth and safety outcomes. Ensuring that technological advancements and innovations continue to flourish will require a combination of the right policies, particularly regulatory policies, to incentivize current and future research, development, and deployment of new technology.

Unfortunately, while other government agencies, including those in the Department of Transportation (DOT), are embracing the promise of innovation and developing the right regulatory frameworks for its promotion, much of the Federal Railroad Administration's (FRA's) regulatory framework remains a relic of the past.

For example, most FRA regulations are prescriptive in how they require safety inspections and tasks to be conducted. They determine the frequency and means used to achieve regulatory compliance. Many of these regulations were written decades ago at a time when technology was limited or non-existent.

However, as we are here to examine, technological progress moves on. Although the law allows railroads to apply for waivers to test new processes and technologies that can achieve safety objectives while improving efficiency, this current waiver process is less than transparent and subject to political interference. This regulatory uncertainty hinders both innovation and the rail industry's ability to compete against other modes of freight.

As Congress begins consideration of legislation reauthorizing surface transportation programs and agencies, we should look to promote policies that encourage innovation and investment in our rail system, improving both its safety and its ability to survive and thrive. This includes reforming the antiquated regulatory structure that is inhibiting innovation.

Today's witnesses will provide important insight into how technologies have the potential to revolutionize freight and passenger rail transportation.

We are also interested in learning their views on what Congress can do to encourage innovation and bring our railroads into the 21st century.

Mr. WEBSTER OF FLORIDA. Now I would recognize Representative Titus, the ranking member, for 5 minutes.

OPENING STATEMENT OF HON. DINA TITUS OF NEVADA, RANKING MEMBER, SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS

Ms. TITUS. Well, thank you, Mr. Chairman. Thank you for holding this hearing and for our witnesses for testifying.

As you mentioned, we are here today to discuss rail innovation. In the United States, our innovative spirit is one of our greatest strengths, and we should be harnessing this spirit to improve our transportation networks.

Innovation has transformed both passenger and freight rail since the 19th century. This includes how locomotives are powered, as we have moved from steam to diesel to electric. And now Brightline, which is going to be in my district, running from Las Vegas to southern California, is bringing zero-emission, all-electric high-speed rail to the forefront. This will create good union jobs, it will reduce greenhouse gas emissions, and it will make it easier, more convenient, and quicker for people to travel between Las Vegas and Los Angeles. And once that is established, we think it will go far beyond.

I am interested in exploring today and hearing from the witnesses how we can use emerging technologies to combat cargo theft. This costs our economy between $15 and $30 billion each year. I held a roundtable to explore this issue earlier in the year, and co-led a bipartisan bill that would create a Federal task force to help address the issue. In addition to improving Federal enforcement, technology can help shippers track railcars and packages in real time, and that could be immensely helpful to combating this growing issue and make it safer for communities and people working on the rail lines.

And speaking of real-time tracking, I am also very interested in how innovation can make the shipping of hazardous materials safer. Hazardous material runs right through the heart of my district in Las Vegas, goes right by train right down through the heart of town. And I want to be sure that my constituents and first responders are equipped with the information they need to respond to any incidents that might occur involving hazmat.

Now, any conversation about innovation in the rail industry, like I mentioned or others that may come up, have to include discussions of rail safety. We have a duty to ensure that advancements in technology do not come at the expense of the safety of workers, passengers, and the communities that trains pass through.

That brings me to my next topic, which is track inspections. Automated track inspection, ATI—let me get all these acronyms straight—technology such as track geometry measurement systems, TGMS, can play an important role in identifying rail track defaults and in keeping passengers safe. These systems were first deployed in the 1970s, and they have been a good supplemental tool for inspecting the 140,000 miles of track we have across the

United States. There are not any regulations that prohibit any railroad from using these track geometry measurement systems or any other automated track inspection technology.

I want to say, though, that ATI should not—should not—replace visual, in-person track inspections. The National Transportation Safety Board—another acronym, NTSB—has cautioned against replacing visual track inspections with ATI. This is because ATI cannot look for 17—17—different types of track defects that a human inspector can identify. This includes broken rails, drainage issues, track obstructions, trespassers, vandalism, and washouts.

I sent a letter with Ranking Member Larsen to Secretary Duffy urging the Federal Railroad Administration to not grant a safety waiver that would allow Class I railroads to reduce visual track safety inspections from twice a week to twice a month. That is a big difference, and that is what they are asking for. The safety waiver request also asks the FRA to give the largest railroads 72 hours to address defects instead of immediately addressing them, as current regulations require.

I would also ask, Mr. Chairman, unanimous consent that a letter be included in today's record, that letter.

Mr. WEBSTER OF FLORIDA. Without objection.

[The information follows Ms. Titus' prepared statement.]

Ms. TITUS. Okay, thank you very much.

As the subcommittee works on surface transportation reauthorization, I look forward to working with you, Mr. Chairman, and the chairs of the committee on provisions that will push us into the next generation of rail with robust and dedicated investment while improving and upholding rail safety, always at the forefront.

I would now ask if we could submit a letter from the Brotherhood of Railroad Signalmen to be entered into the record that addresses some of the safety issues I brought up.

Mr. WEBSTER OF FLORIDA. Without objection.

[The information follows Ms. Titus' prepared statement.]

Ms. TITUS. Well, thank you again, Mr. Chairman, for holding the hearing, and I look forward to having those questions addressed that I have mentioned. Thank you, and I yield back.

[Ms. Titus' prepared statement follows:]

Prepared Statement of Hon. Dina Titus, a Representative in Congress from the State of Nevada, and Ranking Member, Subcommittee on Railroads, Pipelines, and Hazardous Materials

Thank you for holding this hearing, Mr. Chairman.

As you mentioned, we are here today to discuss rail innovation. In the United States, our innovative spirit is one of our greatest strengths, and we should be harnessing this spirit to improve our transportation networks.

Innovation has transformed both passenger and freight rail operations since the 19th century. This includes how locomotives are powered, as we have moved from steam to diesel to electric locomotives. Now, Brightline is bringing a zero-emission, all-electric high-speed train to my District in Las Vegas through the Brightline West project. This will create good jobs, reduce greenhouse gas emissions, and make it easier for people to travel between Las Vegas and the Los Angeles area.

I am interested in exploring today how we can use emerging technologies to combat cargo theft which costs the U.S. economy between $15 and $30 billion each year. I held a roundtable to explore this issue earlier this year and co-led a bipartisan bill that would create a federal task force to help address this issue. In addition to

improving federal enforcement, technology to help shippers track rail cars and packages in real time could be immensely helpful to combat this growing issue.

Speaking of real-time tracking, I am also very interested in how innovation can make the shipping of hazardous materials safer. Hazardous material runs through the heart of my district in Las Vegas by train. I want to be sure that my constituents and first responders are equipped with the information they need to respond to any incidents involving hazmat.

Any conversation about innovation in the rail industry must include discussions about rail safety. We have a duty to ensure that advancements in technology do not come at the expense of the safety of workers, passengers, and the communities that trains pass through.

That brings me to my next topic: track inspections. ATI technology such as Track Geometry Measurement Systems (TGMS) can play an important role in identifying rail track defaults and keeping passengers safe. These systems were first deployed in the 1970s and have been a useful supplemental tool for inspecting the 140,000 miles of track across the United States. There are not any regulations that prohibit any railroad from using track geometry measurement systems, or any other automated track inspection technology.

ATI should not, however, replace visual, in-person track inspections. The National Transportation Safety Board (NTSB) has cautioned against replacing visual track inspections with ATI. This is because ATI cannot look for 17 types of track defects that a human inspector can identify, including broken rails, drainage issues or track obstructions, trespassers, vandalism and washouts.

I sent a letter with Ranking Member Larsen to Secretary Duffy urging the Federal Railroad Administration to not grant a safety waiver request that would allow Class I railroads to reduce visual track safety inspections from twice a week to twice a month. The safety waiver request also asks the FRA to give the largest railroads 72 hours to address defects instead of immediately, as current regulations require. I ask unanimous consent that this letter be included in today's record.

As this Subcommittee works on surface transportation reauthorization, I look forward to working with Chairman Graves, Ranking Member Larsen and Subcommittee Chairman Webster on provisions that support the next generation of rail, with robust and dedicated investment, while upholding and improving rail safety.

Thank you again to Chairman Webster for holding this hearing and to our witnesses for sharing your expertise on these matters.

With that, I yield back.

Letter of June 17, 2025, from Hon. Rick Larsen, Ranking Member, Committee on Transportation and Infrastructure, and Hon. Dina Titus, Ranking Member, Subcommittee on Railroads, Pipelines, and Hazardous Materials, to Hon. Sean Duffy, Secretary, Department of Transportation, Submitted for the Record by Hon. Dina Titus

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
U.S. HOUSE OF REPRESENTATIVES,
WASHINGTON, DC 20515,
JUNE 17, 2025.

Honorable SEAN DUFFY,
Secretary,
Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590.

Re: FRA Docket # 2025–0059

DEAR SECRETARY DUFFY:

We write to express our concern with the Association of American Railroads' (AAR) request to drastically reduce the number of visual track safety inspections currently required of Class I railroads under Part 213.233, title 49 Code of Federal Regulations from twice a week, to twice a month. The request also proposes to allow railroads to address track defects up to 72 hours after finding any defects rather than immediately addressing them, as current regulation requires[1]. We urge you to deny this waiver request in the interest of rail safety.

We support the use of technology to improve rail safety and sustain railroad jobs. We do not believe that fewer visual inspections or waiting three days to address

[1] https://www.regulations.gov/document/FRA-2025-0059-0001 (last accessed May 27, 2025)

known problems is in the public interest nor is it consistent with railroad safety, as safety waivers are required to be by law.

Following the Norfolk Southern derailment in East Palestine, Ohio on February 3, 2023, that devastated the surrounding community, Class I railroads committed to joining the FRA's Confidential Close Call Reporting System (C3RS). This system allows rail workers to report unsafe events and conditions. It has been over two years since this pledge, however, and only two out of the six Class I railroads have joined C3RS on a pilot basis that covers just a subset of their employees.

There has also been bipartisan support for improving rail safety.[2] Shortly after the derailment, rail safety legislation was endorsed by then President Biden, former President Trump, and Senator Vance. The FRA also committed to improving rail safety.[3] Unfortunately, rail safety legislation has yet to be enacted.

The railroads have used Automated Track Inspection (ATI), including Track Geometry Measurement Systems (TGMS), since the 1970s. ATI is an effective measurement tool that can identify one type of track defect: anomalies in track geometry. ATI cannot look for the remaining 17 track defects that a human track inspector can identify, including broken rails, drainage issues, or washouts. There are no regulations that prevent railroads from continuing to use TGMS.

In September 2021, an Amtrak *Empire Builder* train derailed on BNSF-owned and maintained track in Joplin, Montana, that was caused by bad track conditions. That derailment killed three passengers and injured 49 other passenger and crew members. In its final report, the National Transportation Safety Board stated that "automated track inspections by geometry cars or railcar-attached devices provide detailed information on specific track parameters, but they do not capture the diverse array of unique track hazards detectable to human inspectors. They are intended to supplement an inspection program and should not be used to supplant an inspector physically examining a track."[4]

We urge you to reject the AAR's request, and we look forward to working with your Administration to raise the bar on rail safety. Thank you for your attention to this matter.

Sincerely,

RICK LARSEN,
Ranking Member, Committee on Transportation and Infrastructure.

DINA TITUS,
Ranking Member, Subcommittee on Railroads, Pipelines, and Hazardous Materials.

Letter of June 24, 2025, from Michael S. Baldwin, President, Brotherhood of Railroad Signalmen, to Hon. Sam Graves, Chairman, and Hon. Rick Larsen, Ranking Member, Committee on Transportation and Infrastructure, and Hon. Daniel Webster, Chairman, and Hon. Dina Titus, Ranking Member, Subcommittee on Railroads, Pipelines, and Hazardous Materials, Submitted for the Record by Hon. Dina Titus

JUNE 24, 2025.

DEAR CHAIRMAN GRAVES, CHAIRMAN WEBSTER, RANKING MEMBER LARSEN, AND RANKING MEMBER TITUS:

On behalf of the Brotherhood of Railroad Signalmen (BRS) and our members across the country, thank you for the opportunity to share our perspective on the Transportation and Infrastructure Committee's Subcommittee on Railroads, Pipelines, and Hazardous Materials hearing on "The Role of Innovation and Technology in a Safe and Efficient Rail System." The BRS represents the skilled men and women responsible for the installation, maintenance, testing and inspection of the signal and train control systems that are the foundation of rail safety in the United States, and we are pleased to provide our input.

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[2] See https://democrats-transportation.house.gov/news/press-releases/ranking-members-larsen-wilson-and-tandi-democrats-call-for-action-on-rail-safety-following-release-of-ntsb-report-on-east-palestine-derailment and
https://transportation.house.gov/news/documentsingle.aspx?DocumentID=407707

[3] https://www.transportation.gov/examining-state-rail-safety-aftermath-derailment-east-palestine-ohio

[4] National Transportation Safety Board Final Report of September 25, 2021 Joplin, Montana BNSF Derailment. "Derailment of Amtrak Passenger Train 7 on BNSF Railway Track". Published July 5, 2023. https://www.ntsb.gov/investigations/AccidentReports/Reports/RIR2308.pdf, page 35.

RAIL INNOVATION MUST BEGIN WITH SAFETY

As the national conversation on rail innovation advances, the BRS urges Congress to ensure that safety is not an afterthought, it must be the foundation of every technological development and deployment. Technology alone does not make railroads safer; it is the combination of a well-trained workforce and strong federal oversight that ensures technology is used in a way that advances safety. New technologies, which hold great promises, must function within the framework of existing laws and regulations that prioritize human life and public safety. Signalmen are the custodians of rail safety, as we maintain the systems that prevent accidents and ensure safe, efficient operations. If these systems are malfunctioning, trains cannot safely move to their destination because they need functioning signals to guide their movements. But innovation must do more than offer vague promises about performance; it must comply with our existing regulatory and statutory obligations that were created for a specific reason, oftentimes following preventable accidents and close calls. Each safety-critical innovation, whether in signaling, communications, or automation is subject to regulation by the Federal Railroad Administration (FRA) and is often rooted in legislation that governs labor, equipment safety, and operational standards. Innovation in the rail industry should not be able to bypass these safeguards in the name of efficiency or modernization. These laws are not obstacles; they are the guardrails that ensure innovation serves the public good instead of undermining safety. Rail innovation must never outpace its regulatory responsibilities, but too often, regulation struggles to keep up with technological advancement, creating safety gaps that oversight is meant to prevent.

HUMAN OVERSIGHT IS NOT OBSOLETE

Technological tools are only as effective as the people who implement, maintain, and monitor them. From Positive Train Control (PTC) to remote diagnostics and automated defect detection, the newest generation of safety technologies still depends on qualified Signal employees for proper installation, validation, and maintenance. Our experience clearly shows that automation cannot and must not replace human judgment. These systems fail, degrade, or misread data, sometimes without warning, even when the technology has been around for decades like PTC. When they do, it is BRS members who step in, diagnose the issue, and ensure that service and safety are restored. For example, PTC systems regularly experience communication failures and can register false occupancy, indicating a train is in a certain location when it is not, due to environmental conditions, software bugs, or hardware faults. These scenarios require a Signalman to interpret fault logs, check components on the ground, and restore operations safely. Technology does not fix itself.

These kinds of failures are not rare occurrences in our field. Our members witness them every day across our nation's rail networks, and every time a Signalman responds correctly, they prevent accidents and delays on our rail networks. Innovation has not made the signal workforce obsolete; it has made it more essential. Today's Signalmen are responsible for troubleshooting microprocessor-based equipment, analyzing digital diagnostics, and ensuring that mechanical and digital subsystems function correctly. The job now requires more skill, more training, and more technical precision than ever before. Human oversight is not outdated, it is indispensable.

Despite this reality, the rail industry is now seeking to cut back on visual inspections performed by trained Signalmen. The railroads claim that with new microprocessor-based systems, the required tests are no longer necessary. The Association of American Railroads (AAR), in their May comments to the DOT, advocated for weakening existing signal inspection requirements. They stated that: "*FRA's current inspection requirements are framed around arbitrary time-, event-, and distance-based visual inspections that were the industry norm when first promulgated more than 50 years ago*." AAR further argued that "*railroads are continuously performing unnecessary inspections that do not benefit safety*" and that "*regulation, when necessary, should be data-driven and performance-based to enable maximum safety benefits and continued safety innovation*." They also claimed that "*regulation imposes significant regulatory costs on the railroad industry that are not outweighed by public benefits*," suggesting that "*railroads have had the technological capability to employ microprocessors, which are far more reliable than visual inspections, to assess signal health for some time now*." Reducing or eliminating inspections overlooks the lived experience of Signalmen, who know firsthand that failures still occur, even in automated systems, and who are the ones who step in when technology fails. No matter how advanced the system becomes, the rail industry must not abandon the human expertise that ensures both the safety of the technology and the safety of the network itself.

WE EMBRACE INNOVATION THAT PROVIDE REDUNDANCY AND SAFETY

The BRS has clearly demonstrated our commitment to responsible innovation. Through our partnership in a federal Consolidated Rail Infrastructure and Safety Improvement (CRISI) grant alongside the University of Texas Rio Grande Valley and Hum Industrial Technologies, we are actively helping develop telematics tools that can enhance safety without displacing the workforce. This grant is a model of the labor-academia-industry partnerships that should happen as it relates to developing new technology. But we must be clear: reducing redundancy in the name of "efficiency" is a threat to safety. Railroads have a long history of removing critical safeguards as new technology is introduced. That practice must end. Redundancy is not a weakness, it is a necessary protection when technology fails, misreads, or malfunctions, which it will. Removing the human element from safety-critical systems is not innovation, it is exposure to preventable risk.

Signal systems have evolved from relay-based designs (solid state driven by electricity) to microprocessor-based control systems (computer chips). But the physical, labor-intensive component switch machines, crossing gates and lights, cantilevers, wayside signals, defect detectors, electric locks, and switch circuit controllers remain largely the same. These are the backbone of the rail network, and they still require hands-on, highly skilled testing and maintenance. FRA requires periodic, in person inspections for all these systems which signalmen do. These in-person inspections are vital to ensure that these components are working and maintained properly. The railroads are currently trying to reduce the frequency of in-person inspections for grade crossing and signal systems and just rely on diagnostic data from sensors. Rail-grade crossings are the most dangerous part of the rail system and members of the public and rail workers sadly die or get severely injured on a regular basis at grade crossings. These periodic, in-person inspections are vital to ensure that the grade crossing safety equipment, if it is installed at the crossing, is functioning to protect the public and rail workers going through the crossing. The railroads' attempt to reduce these in-person inspections is extremely unsafe, and we urge Congress to vigorously oppose those attempts.

Where a Signalman once could walk into a relay house and visually pinpoint a fault based on the physical position of a relay, today's microprocessor-based systems require interpreting diagnostic logs, analyzing digital fault data, and applying a working theory to locate and resolve the issue. This evolution has increased the technical aptitude required, not decreased the importance of Signalman. These complex systems still depend on physical integrity, electrical performance, and real-world conditions. Without a skilled workforce validating and troubleshooting them on the ground, the system is only as dependable as its last unchecked error code. This is why human oversight, and mechanical redundancy must be preserved, not removed. Innovation must augment safety, not automate workers out of the equation.

INNOVATION MUST NOT UNDERMINE LABOR STANDARDS

The BRS supports innovation. However, too often, technological progress has been used as a justification to undermine labor standards, reduce staffing, and weaken inspection frequencies which is what the Class I freight railroads are attempting to do right now. Like other crafts, the Class I railroads have cut the number of signalmen they employ since 2015 by over 30%. This has left signalmen stretched thin and in certain territories that signalmen are assigned to that stretch hundreds of miles, the railroads only have a handful of signalmen left to ensure the signal and grade crossing systems in those locations are working properly. This is not modernization, it is a shift of risk, leaving BRS members and the public more vulnerable.

A recent example is found in Sections 121 and 122 of H.R. 8996 from the 118th Congress, which would authorize federal funding for the development and deployment of telematics on railcars. While we support advancing safety technologies, these provisions omit long-standing labor protections, including the 4R Act (49 U.S.C. §22404) and related provisions (§§22905(b) & (c)) that protect rail workers negatively affected by federal grants.

Even more troubling, Sections 121 and 122 of H.R. 8996 exclude labor organizations from participating in project development or grant eligibility. These omissions are not minor technicalities; they represent a significant departure from how federally funded rail programs have traditionally operated. The 4R Act and related protections ensure that workers affected by technological change are not displaced, downgraded, or relocated without fair and equitable negotiations. They have been a core part of maintaining workforce stability and upholding public accountability in federally funded infrastructure projects. This sets a dangerous precedent. Innova-

tion that is funded by taxpayers must not come at the cost of workers' rights, safety, or job security. When Labor is left out of the process, implementation suffers. Signalmen bring practical field experience that is critical to testing and refining new systems. BRS and our members want to be involved in the development of new technology, including the next generation of telematics, given our expertise on the issue and the fact that our members will be interacting with this technology on a daily basis. Excluding the workforce leads to avoidable failures and undermines the very safety improvements the legislation intends to support. Congress must ensure that innovation is inclusive, accountable, and aligned with the values of safety, fairness, and shared responsibility.

BRS SUPPORTS INNOVATION THAT STRENGTHENS SAFETY AND JOBS

Rail innovation should strengthen the system, not strip it down. The path forward is not one of workforce reduction, but of workforce integration. Technology should empower Signalmen, not replace them. Safety outcomes consistently improve when the people who understand the system best, those who work on it every day, are involved in its evolution. We have seen this firsthand during the national rollout of Positive Train Control (PTC) which started in the mid 2000's and took over a decade and a half to complete. The PTC rollout was most successful on railroads where signal workers were part of the planning and deployment. Their field expertise helped solve real-world problems that engineers and vendors could not foresee alone. When labor is excluded, the consequences are costly: implementation delays, training gaps, and reduced safety performance. Rail innovation cannot be successful when it overlooks the very workforce that will build, maintain, and troubleshoot the systems being introduced. Innovation should also create opportunities for upskilling, trade recruitment, and safety modernization, but that only happens when labor is meaningfully involved from the start. With current workforce shortages across the rail sector, now is the time to pair innovation with investment in the people who can deliver it through training partnerships and federally supported workforce development. Innovation is not just about what is new, it is about who is included, and for it to succeed, it must include us.

CONCLUSION

The Brotherhood of Railroad Signalmen is committed to a rail network that is safer, smarter, and stronger. We believe in innovation, but it must be done with us, not around us. Signalmen are ready to help lead this next era of rail safety. We will not stand by as technology is used to sideline the very workers who make safety possible.

Thank you for your attention to these issues, and for your commitment to a safe and fair future for America's railroads.

Respectfully Submitted,

MICHAEL S. BALDWIN,
President, Brotherhood of Railroad Signalmen.

Mr. WEBSTER OF FLORIDA. I would now like to recognize and welcome our witnesses and thank them for being here.

It is good to have you today. Thank you for it. I look forward to hearing what you have to say. Let me take a moment and tell you about the lighting system. Green means go, yellow means it's time to wrap it up, red means it's time to quit. It's pretty simple.

I ask unanimous consent that the witnesses' full statements be included in the record.

Without objection, show that ordered.

I ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may be submitted in writing.

Without objection, show that ordered.

I ask unanimous consent that the record remain open for 15 days for additional comments and information submitted by Members or witnesses to be included in the record of today's hearing.

Without objection, show that ordered.

As your testimony, written testimony, has been made part of public record, the subcommittee asks you to limit your oral remarks to 5 minutes. And with that, I will call on Mr. Shannon.

You are recognized for 5 minutes for your testimony.

TESTIMONY OF DAVID L. SHANNON, GENERAL MANAGER, RAILPULSE, LLC; BRIGHAM A. McCOWN, FOUNDER AND CHAIRMAN OF THE BOARD OF DIRECTORS, ALLIANCE FOR INNOVATION AND INFRASTRUCTURE; ERIC GEBHARDT, EXECUTIVE VICE PRESIDENT AND CHIEF TECHNOLOGY OFFICER, WABTEC, ON BEHALF OF THE RAILWAY SUPPLY INSTITUTE; AND TONY CARDWELL, PRESIDENT, BROTHERHOOD OF MAINTENANCE OF WAY EMPLOYES DIVISION, INTERNATIONAL BROTHERHOOD OF TEAMSTERS

TESTIMONY OF DAVID L. SHANNON, GENERAL MANAGER, RAILPULSE, LLC

Mr. SHANNON. Good morning, Chairman Webster, Ranking Member Titus, and distinguished members of the rail subcommittee. I am David Shannon, general manager of RailPulse, LLC. And it is an honor to be here before you today on behalf of a diverse coalition of railcar owners, all united in a common purpose: to grow the use of freight rail transportation in North America through innovation.

At the heart of this innovation is telematics on railcars, the installation of GPS and smart sensors on railcars that provide real-time information about their location, condition, and health. These technologies may sound technical, but their purpose is simple: to make rail a more competitive, transparent, and reliable mode of freight transportation. And this matters because, when more freight moves by rail, the public benefits. Rail is more fuel efficient, sustainable, and safer than trucking on a per ton-mile basis. And shifting freight from road to rail reduces highway congestion, cuts infrastructure wear, and lowers transportation costs across the supply chain.

Growth in rail isn't just an industry objective, it's in the national interest. But rail cannot grow without change. Shippers have told us clearly why they choose trucks: reliable, on-time performance; shipment visibility; and equipment availability and capacity. RailPulse was created to deliver the data that can be used to address these issues not just for individual companies, but for the system as a whole.

Formed in 2021, the coalition came together out of the realization that no single company or class of companies could solve these issues. Fragmented adoption of telematics would be slow and inconsistent. But by collaborating, sharing expertise, data, investment, and equal governance, we could build something transformative. Today, reflecting the diversity of railcar ownership, RailPulse members come from all classes: Bunge North America, a shipper; GATX, Greenbrier, Trinity Rail, railcar lessors; G&W, Railroad Development Corporation, and Watco, all short line railroads; and CPKC, CSX, Norfolk Southern, and Union Pacific, all Class I railroads.

With the help of a CRISI grant, the Federal Railroad Administration, and the State of Pennsylvania, railroads launched a multiphase pilot project to test these concepts. We equipped more than

1,000 railcars of different types—tank cars, auto racks, boxcars, and more—with advanced sensors and GPS devices from multiple vendors. We proved that data could be captured, standardized, and shared securely to all authorized stakeholders, and all in real time. Following the pilot, the RailPulse platform was officially launched across North America in September 2024, and we are now seeing strong interest in adoption.

But we faced two critical challenges. The first I will call the growth-to-value paradox. While our growth has been impressive by traditional measures for a technology startup—over 17 times since the pilot ended—it is nowhere near good enough. Only when a majority of the 1.6 million railcars in North America are equipped will we see the true systemwide impact. It is only then that railroads can begin to leverage the telematics data to change their operating practices, that we can begin to contemplate new regimes for safety, and that we can implement broad-scale, predictive railcar maintenance strategies to increase the safety of the railcar fleet. But getting there requires accelerated investment. And to that end, we urge Congress to support financial incentives to help railcar owners equip faster.

The second I will call the railcar innovator's dilemma. The rail industry needs to embrace the same fail-fast ethos that has driven American technology leadership globally. But right now, even when there are internal funds available for investment, there is concern, concern that innovations early adopters invest in might be undercut by future regulation or technology specification.

We need a regulatory environment that is outcome-focused and supports—even incentivizes—experimentation and innovation, especially for monitoring technologies that don't directly affect the railcars' operation. If companies are willing to test unproven tools responsibly, they should be very actively supported.

In closing, I want to thank the committee for your time and attention today. What RailPulse is doing is historic. For the first time, a diverse set of railcar owners are working together to modernize freight rail system at a foundational level. With your partnership, the continued support of the FRA and others, and with shared commitment, we can digitize all 1.6 million railcars in North America, and we can shift the perception and reality of rail as a smart, safe, sustainable mode of freight transportation.

Thank you, and I look forward to your questions.

[Mr. Shannon's prepared statement follows:]

Prepared Statement of David L. Shannon, General Manager, RailPulse, LLC

Good morning, Chairman Webster, Ranking Member Titus, and distinguished members of the Rail Subcommittee. My name is David Shannon and I serve as General Manager of RailPulse LLC. I am appearing before the Committee today on behalf of the diverse coalition of member companies who comprise the owners of RailPulse.

WHY RAILPULSE

RailPulse, LLC was chartered in 2021 by a coalition of forward-thinking railcar owners who joined together to drive growth in the use of rail freight transportation in North America by enabling improved service and safety through the collaborative use of railcar telematics data. RailPulse believes that telematics on railcars provides

information necessary to address the critical issues that rail customers identified as causing them to prefer truck over rail leading to erosion in rail market share [1]:

1. *On-time Performance*—When telematics devices are deployed at full network scale, railroads can leverage the railcar data to improve yard operations, interline movements, and empty capacity management, resulting in greater velocity, resiliency, and predictable on-time performance.
2. *Equipment/Capacity*—At individual fleet scale, railroads and car owners can better manage railcar availability and utilization by minimizing disruptions due to unplanned railcar maintenance and by having better visibility of empty capacity on the railroads and in customer facilities allowing more optimal and timely routing of railcars to meet shipper demand.
3. *Shipment Visibility*—For any telemetry equipped railcar, shippers gain visibility to their empty or loaded movements giving them better insights into where their shipments are, what condition they are in, and should anything go wrong, the basis for a productive dialog with their serving railroad and a better customer experience.

The vision of the coalition is to create a central platform (The RailPulse Platform) providing a single source of truth for telemetry data on the location, condition, and health of all railcars in North American revenue service. Through the RailPulse Platform, the coalition aims to transform the North American freight rail industry by sharing telematics data that delivers accurate, timely insights to railcar owners and to all parties of a rail shipment, while driving railcar telematics innovation, data standards, performance requirements, and proactive sensor network management.

RailPulse's goals in creating a North American railcar telemetry platform are aligned with national policy. Ultimately RailPulse is about making rail service offerings more useful and attractive to shippers, which we believe will lead to growth in rail, an extremely safe and fuel-efficient mode of surface transportation. Specifically, on a ton-mile basis, rail is 28 times safer for both the public and workforce. It is four times more energy-efficient, which is crucial for reducing overall energy consumption and dependence. And it produces significantly less greenhouse gas emissions than trucking—trucking produces 11.5 times more while moving only 1.5 times more freight [2]. If RailPulse succeeds, we will have a safer, more energy-efficient transportation system with fewer greenhouse gas emissions and reduced highway congestion. Regardless of how you look at it, growth in rail market share is a very important public good.

STRUCTURE & GOVERNANCE

From its inception, RailPulse has been structured to reflect the diversity in ownership of the roughly 1.6 million railcars in service across North America. It is designed to benefit all constituents in the rail ecosystem to drive carload growth: shippers, Class I railroads, short line railroads, and railcar operating lessors, all while enhancing the safety and security of proprietary car-owner data. Each stakeholder has an equal voice in the governance of RailPulse and its policy decisions to ensure that the coalition stays focused on what is best for the North American rail industry rather than a single stakeholder or industry class.

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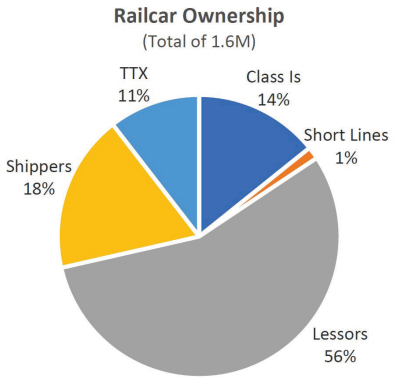
[1] Flexible Freight and the Future of Rail, 2020 North American Shipper Survey, Oliver Wyman, December 2020

[2] Growth in the Freight Rail Industry, Adriene Bailey, Railway Age, August 2024



Founded by five railcar owning companies in 2021, today RailPulse is owned by a coalition of companies representing all four railcar owning classes: Bunge NA, a shipper; GATX, Greenbrier, and Trinity Rail, railcar lessors; G&W, Railroad Development Corporation, and Watco, short line railroads; and, CPKC, CSX, Norfolk Southern, and Union Pacific, Class I railroads.

GOALS

RailPulse is focused on solving the rail industry's most pressing competitive and technological challenges associated with providing visibility into the movement of rail freight. Sharing common goals that will benefit the entire rail ecosystem is the foundation of the RailPulse coalition. The RailPulse members recognized that working independently would result in slow, incremental adoption of the latest GPS and telematics technologies and siloed access to the data. Working together as a coalition unifies our expertise and resources to take the entire rail industry forward. Rather than duplicating efforts, through RailPulse, railcar owners are now collaborating and aligning to not only speed adoption but also foster greater innovation.

The RailPulse coalition has five key goals:

1. *Create a comprehensive platform* that acts as a single source of truth for telematics data across the rail industry. By standardizing, centralizing, curating, enriching, and securing data from a variety of telematics vendors, the platform ensures that all stakeholders—ranging from shippers to railroads—can seamlessly access and utilize this information. The graphic below illustrates the role of the RailPulse Platform in the rail ecosystem.

2. *Facilitate collaboration* among shippers, carriers, and car owners, to build a unified framework that encourages synergy across all sectors of the North American freight rail system. By integrating shared telematics data and insights, RailPulse empowers stakeholders to optimize operational efficiencies,

elevate service standards, and enhance safety practices. This collaborative approach not only contributes to the growth of freight movement but also creates a resilient and interconnected ecosystem that benefits the entire rail industry.

3. *Foster transparency* into rail shipment movements and deliver advanced insights into the estimated time of arrival for both loaded and empty railcars. By providing precise and actionable data, this goal aims to enhance supply chain productivity, enable better planning, and improve shipper satisfaction across the North American rail freight ecosystem.
4. *Advance the use of telematics technology* to enhance the management and maintenance of the railcar fleet. By utilizing real-time data from cutting-edge sensors and GPS devices, the coalition aims to enable predictive maintenance practices that optimize asset utilization, extend the operational lifespan of railcars, and create a healthier, more reliable fleet. This approach not only enhances the efficiency and effectiveness of rail operations but also contributes to a safer transportation network by proactively identifying and addressing potential issues before they escalate.
5. *Drive telematics innovation* by clearly specifying the desired outcomes for monitoring the location, condition, and health of railcars—critical elements for the long-term success and growth of rail freight. RailPulse prioritizes a results-driven approach where innovations are evaluated based on their conformance to performance requirements rather than rigid design or technology specifications. This ensures that vendors retain the freedom to innovate and push the boundaries of telematics technology while delivering solutions that enhance reliability, safety, and efficiency across the rail ecosystem.

GETTING STARTED

To jump start its development, the coalition sought and was awarded a CRISI (Consolidated Rail Infrastructure and Safety Improvements) grant. The grant, alongside the support of the Federal Railroad Administration (FRA) and the State of Pennsylvania, provided seed funding for RailPulse to evaluate the state of telematics technology, to test its fitness for use across the North American rail network, and to develop and demonstrate a neutral, open-architecture telematics platform designed to provide a shared source of truth on the location, condition, and health of railcars.

The CRISI grant facilitated a multiple phased project, concluding in mid 2024, that involved over 1000 railcars equipped with modern telematics sensors, including GPS units, impact sensors, load sensors, door/hatch sensors, and handbrake sensors. Diverse types of railcars, including tank cars, boxcars, hopper cars, auto racks, and gondolas were used in the trials to ensure comprehensive data collection across different freight categories. The project engaged multiple telematics vendors specializing in sensor technology and data analytics, demonstrating interoperability within a common platform across a diverse vendor ecosystem while fostering technology innovation. These outcomes created the baseline for the RailPulse Platform, set the foundation for broader railcar telematics adoption, and highlighted the transformative potential of equipping the entire fleet with advanced telemetry.

TODAY

Today, RailPulse is transforming rail shipping by leveraging the latest technologies to gather and share real-time railcar location, health and condition information. It enables data from GPS and railcar-mounted sensors to drive improved service levels, visibility, safety, sustainability, and productivity into North American rail-based supply chains.

The RailPulse Platform was officially launched and made available to all railcar owners and stakeholders in North America in September 2024.

OPPORTUNITIES & CHALLENGES

1. Growth to Value Paradox

Since launching, RailPulse has been rapidly bringing on new subscribers who are equipping railcars and using the data. On one hand the growth in the number of installed railcars has been substantial (over 17x the initial test population) while on the other hand it has not been nearly substantial enough to deliver broad systemwide benefits that contribute to the promised public good resulting for more use of rail transport.

As with all new technology startups, companies that are engaging with RailPulse and are equipping railcars tend to be early adopters who are doing so based on the expected benefits that they can directly obtain from the technology. As such, railcar equipping tends to happen on a fleet by fleet, customer by customer basis where the needs are most acute and the benefits can be realized primarily through better individual shipment visibility, shipper-railroad collaboration and dispute resolution, and similar transactional optimizations or where individual fleet utilization improvements can be obtained. Railcar growth can continue in this way for a long time but at a very measured pace.

The paradox lies in the fact that, while when measured by traditional metrics the growth RailPulse has experienced since launching is great, it is still not good enough. This is because the public benefits can only be unlocked by achieving a critical mass of telemetry equipped railcars—beyond 50% full fleet penetration. At critical mass, railroads can begin to leverage telematics data to change railroad operating practices, new safety regimes can be contemplated and implemented, and even broadscale predictive railcar maintenance strategies can be implemented. In aggregate, these network wide actions, and their associated benefits will be transformative to the rail industry because they will lead to measurable improvements in network efficiency, service, safety and ultimately growth in the use of freight rail by shippers. With this growth the industry will deliver the public good that this technology promises.

To accelerate the adoption of telematics network wide, we need to break out of the traditional technology adoption pattern. That will require incentive for railcar owners to equip railcars faster. Ultimately, we believe that financial incentives need to be introduced that will encourage equipping railcars when the transactional benefits alone are unknown or insufficient to justify the car owner's investment. This will bring more car owners into the market and drive adoption of larger fleets faster.

The RailPulse Coalition intends to seek additional funding opportunities to incentivize rail car owners to adopt telematics technology and become subscribers to the RailPulse Platform. This adoption incentive will align itself with the goal of getting more cars online faster and getting the rail car fleet closer to the coalition's goals of the larger systemic benefits like predictive estimated time of arrival, predictive maintenance requirements, critical safety alerts, and supply chain efficiencies that reduce the cost of freight rail moves to shippers and carriers. We believe that supporting future grant funding for these benefits is in the public interest. In fact, both the European Union and India are both countries who have participated in grant funding to outfit rail telematics across their freight rail fleets.

2. Rail Telematics Innovators Dilemma

One of the key reasons the US leads the world in technology innovation is the fail-fast ethos that permeates our technology sector. This mindset encourages rapid experimentation and learning by embracing failure as a natural part of the innovation process. The rail industry needs to be incentivized to adopt a similar ethos and be strongly supported when they do.

Development of unproven technology is inherently costly and technically complex which makes investment risky. On top of that, in the rail industry, there also exists a pervasive concern that the innovation process might create liabilities for the companies that test innovative but unproven technologies or that even if their innovation is proven successful in testing, an alternative technology may be mandated by the government that makes their investment moot. Thus, we have a dilemma where there is belief in the potential of the technology but a fear of being a first mover, even where internal investment is available, due to the risk exposure of loss it might create.

We need a regulatory environment wherein the innovators don't fear being penalized when leading the charge in new technology development. The RailPulse Coalition needs to be able to experiment with new technologies and new devices to prove them out. The coalition has a mechanical committee that recommends the adoption of performance criteria that any device and the data it generates must meet before an expectation of use is created or regulated. Especially for monitoring technologies (those that don't directly control the operation/use of a railcar), the rail industry needs to be able to test innovative solutions without fear of negative ramifications. The coalition simply asks that coalition members, rail car owners, and technology vendors should be free within agreed upon parameters to innovate and test technology solutions before they are proven and when proven those technology innovations will be supported.

CONCLUSION

In closing, I again want to thank the committee for its invitation to be here today to discuss this exciting time in the freight rail industry. Working collaboratively as car owners the entire industry is making history as we utilize the latest in technologies working with our technology partners and vendors to push the limits of rail telematics for decades to come. By working together with this committee, FRA and the rail coalition we have a tremendous opportunity to convert the entire fleet of 1.6 million rail cars into smart rail cars and in the process change the way rail shippers, regulators, communities, rail employees and investors view the freight rail industry.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. McCown, you are recognized for 5 minutes for your testimony.

TESTIMONY OF BRIGHAM A. MCCOWN, FOUNDER AND CHAIRMAN OF THE BOARD OF DIRECTORS, ALLIANCE FOR INNOVATION AND INFRASTRUCTURE

Mr. MCCOWN. Thank you very much, Chairman Webster, Ranking Member Titus, members of the subcommittee. I appreciate the opportunity to appear before you today. I am here in my capacity as the chair of the Alliance for Innovation and Infrastructure. Aii is a nonpartisan, independent think tank developed over a decade ago focused on advancing pragmatic solutions to improving safety, fostering innovation, and strengthening America's infrastructure systems.

Today's hearing touches on a crucial issue. As we invest in rebuilding and expanding American infrastructure, a critical linchpin for not only our domestic economy but for our global economic competitiveness, we must ensure that our regulatory framework evolves alongside the technology shaping 21st-century transportation. The challenge before us is not partisan; it's practical. Modernization done right enhances both safety and competitiveness. We can protect American jobs while making our infrastructure smarter, more efficient, and more resilient. Technology is not the enemy of safety; it is often its greatest ally.

Aii's recent report, "Driving Regulatory Innovation for Safer Railroading," reveals significant friction between the current regulatory approach and the adoption of safety-enhancing tools. In the last 5 years, nearly 70 percent of Class I railroads have sought waivers from the Federal Railroad Administration to use technologies like automatic track inspection, yet 40 percent of those waivers took more than 6 months or longer to be approved, many with limited or no explanation. As a former Federal regulator, let me say that this isn't about shortcuts. It is about ensuring that when railroads deploy rigorously tested systems that improve defect detection and reduce risk, they should be embraced.

The concern is that if the regulatory system moves too slowly with proven technology, how can we expect it to move at all when innovation comes knocking? The regulator must be equipped to fairly and swiftly evaluate new innovations. To FRA's credit, a recent proposed rule on ATI acknowledges the need for reform, but it still leans on outdated assumptions such as mandatory visual inspections, even where automated systems have demonstrated superior performance. FRA's proposal lacks key elements of a modern

regulatory design: objective standards, structured timelines, and transparent decisionmaking.

We should move away from prescription and toward an outcome-based approach of continuous improvement like those found in safety management systems. Safety and technology go hand in hand, and continuous improvements require regulators to rethink how they regulate. By the time a regulation is written, the technology is already outdated. Because today's technology moves at the speed of light, this regulatory lag that is inherent in the system is innovation's worst detractor. We are, in many cases across Government, literally discouraging technology from being developed.

That same approach can benefit rail safety. As I have said, safety and innovation are not mutually exclusive. When regulations reward validated results, regardless of the method used, we empower both workers and innovators to contribute to a stronger system.

I do also recognize that workforce concerns are real. New technologies can be deployed in ways that enhance the ability of workers to complete their task more efficiently. Technological innovations often require more people, not less. You may recall when Americans were told that word processors, computers, and printers would make our lives a life of leisure, but that hasn't exactly turned out that way. Technology, though, improves our ability to do more. And that is important because more needs to be done.

Technology is that secret sauce to the American economy, and it can be leveraged to improve infrastructure, the companies regulated by it, and the regulator itself. Aii does not advocate for deregulation, but it supports smarter regulations that empower innovation and increase efficiency and resilience of the infrastructure while protecting communities and ensuring tax dollars are wisely spent.

Mr. Chairman and members of the subcommittee, I commend your bipartisan leadership and the work, the important work, that you all are doing. This hearing is a step toward building a regulatory framework that reflects America's capacity for innovation and responsibility. Thank you again for the opportunity to contribute, and I look forward to your questions.

[Mr. McCown's prepared statement follows:]

Prepared Statement of Brigham A. McCown, Founder and Chairman of the Board of Directors, Alliance for Innovation and Infrastructure

EXECUTIVE SUMMARY

This testimony presents both personal insights and research findings regarding the limitations of the current Federal Railroad Administration (FRA) regulatory framework and waiver process. Key points include:

- Approximately 70% of Class I railroads submitted FRA waivers in recent years involved relief from rules restricting modern safety technologies.
- Approximately 40% of those applicants experienced delays beyond 180 days.
- In *Union Pacific Railroad Co.* v. *FRA* (2023), the Fifth Circuit ruled FRA's waiver denials were "arbitrary and capricious."
- Aii identifies opportunities for Congress and FRA to modernize the framework through objective standards, increased transparency, and timeline accountability, building on the intent of the Infrastructure Investments and Jobs Act and the intent of draft Railway Safety legislation.

I. INTRODUCTION

Chairman Webster, Ranking Member Titus, and Members of the Subcommittee:

Thank you for the opportunity to appear before you today. My name is Brigham McCown, and I appear before you today in my capacity as the Chair of the Alliance for Innovation and Infrastructure (Aii). Aii is an independent, non-partisan think tank dedicated to advancing pragmatic, data-informed solutions with a goal of advancing infrastructure safety and efficiency across the United States.

Aii has written several white papers and policy briefs on innovation, safety, and regulatory reform for rail transportation in recent years and produced dozens of additional reports and resources on U.S. transportation and infrastructure systems. We create independent and objective analysis to achieve the best outcomes for public safety, infrastructure resilience, and innovation. Issues like the one before this committee today are precisely the reason I founded Aii over ten years ago.

The topic of this hearing, how America builds, raises a critical and timely point: the nation's regulatory infrastructure must evolve in parallel with our physical infrastructure. While our transportation systems have benefited from dramatic technological advances, our regulatory framework has not kept pace. Legacy rules and outdated procedures, particularly around the Federal Railroad Administration's waiver and inspection systems, may hinder rather than help efforts to improve rail safety. This hearing offers a valuable opportunity to consider how the federal government can modernize its regulatory approach to reflect today's capabilities and tomorrow's needs.

Today, I will share findings from Aii's most recent report, *Driving Regulatory Innovation for Safer Railroading*[1]. The report examines the current limitations of FRA's waiver process and regulatory structure and identifies potential reforms to support the safe integration of modern technologies, particularly Automated Track Inspection (ATI), into the national rail safety framework.

II. THE STAKES: WHY REFORM MATTERS

Rail transportation is vital to the American economy, and the safety of our network must remain at the forefront. Yet the current regulatory framework under which the FRA operates remains rooted in an era before the emergence of technologies such as sensor-based defect detection, data-driven condition monitoring, and AI-supported inspections.

Aii's analysis shows that over the past five years, approximately 70 percent of Class I railroads submitted waiver applications to FRA related to the use of advanced safety technologies. Approximately 40 percent of those experienced delays longer than 180 days, with many decisions lacking detailed technical justification.

These regulatory bottlenecks have not only slowed innovation, but they have also drawn legal scrutiny. In *Union Pacific Railroad Co*. v. *Federal Railroad Administration* (2023)[2], the U.S. Court of Appeals for the Fifth Circuit ruled that FRA's denial of ATI waivers was "arbitrary and capricious" under the Administrative Procedure Act. The Court concluded that the FRA failed to meaningfully evaluate safety data already in its possession and failed to articulate a clear rationale for preferring visual inspections over technology-based alternatives. This ruling reinforced stakeholder concerns that FRA's waiver decisions often lack transparency, analytical rigor, and data-driven reasoning.

III. FRA'S PROPOSED RULE AND OBSERVED REGULATORY GAPS

FRA's October 2024 Notice of Proposed Rulemaking on ATI reflects a formal recognition that modernization is needed[3]. Aii's review finds that while the rule introduces structured considerations for ATI, it largely preserves a prescriptive posture that may limit flexibility to deploy emerging technologies.

For example, the proposal would continue to require a baseline level of manual visual inspections, even where ATI has demonstrated greater detection performance. Data analyzed by Aii suggests ATI systems outperform manual inspections in identifying geometry defects in several test environments.

Current waiver criteria still rely heavily on broad statutory terms such as "public interest" or "consistent with rail safety." Aii's findings suggest that the use of more

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[1] https://www.aii.org/wp-content/uploads/2025/04/Driving-Regulatory-Innovation-for-Safer-Railroading.pdf

[2] https://law.justia.com/cases/federal/appellate-courts/ca8/22-3648/22-3648-2024-08-20.html

[3] https://www.federalregister.gov/documents/2024/12/23/2024-30595/track-geometry-measurement-system-tgms-inspections-extension-of-comment-period

objective evaluation standards, such as quantifiable safety outcomes, operational efficiency, and third-party validation, could improve clarity and consistency.

Transparency also remains limited. While the proposed rule provides an avenue for stakeholder input, it does not commit to publishing Railroad Safety Board member identities, voting records, or technical rationales. Aii notes that increasing transparency may build public trust and institutional accountability.

Timeliness continues to be an issue. Aii observed that approximately 40 percent of relevant Class I railroads experienced waivers with significant delays. Structured timelines, especially those aligned with validated safety data, may help ensure the timely integration of modern technologies.

These findings reflect broader provisions within the Infrastructure Investments and Jobs Act (IIJA)[4], which instructs the FRA to act within defined timeframes and reassess frequently waived regulations. Aii's analysis indicates that a structured waiver review trigger, such as three waivers granted on the same provision, could provide a pathway for proactive modernization consistent with legislative intent.[5]

IV. Lessons from Other Modal Agencies in DOT:

The FRA is not the first agency to encounter tension between safety mandates and the pace of technological change. During my federal service, I was involved in the creation of the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Integrity Management Program. That initiative moved PHMSA away from rigid compliance checklists and toward a performance-based model grounded in risk assessment and verifiable safety metrics.

The results were significant. Between 2014 and 2024, hazardous liquid pipeline incidents decreased by 36 percent, even as mileage and throughput increased. Notably, these improvements coincided with stricter incident reporting standards, ruling out underreporting as the cause. This suggests that performance-based frameworks can enable innovation while enhancing safety.

These principles, clearly defined performance goals, flexibility in achieving them, and strong oversight, may also be applicable to the rail sector. The PHMSA model demonstrates that federal regulators can embrace modernization without sacrificing their safety mission.

V. Observed Regulatory Opportunities

Based on Aii's research and policy analysis, several areas appear to offer Congress and the FRA avenues for enhancing the effectiveness of the waiver and rulemaking processes:

- The Infrastructure Investments and Jobs Act provisions on waiver timeliness could be further supported by clearer deadlines and agency accountability mechanisms.
- Evaluation of waivers may benefit from the use of quantifiable performance metrics, rather than broad or subjective terminology.
- Public transparency in waiver decisions, such as the release of voting records and technical justifications, could strengthen public confidence.
- In instances where ATI or other validated technologies consistently meet or exceed safety standards, there may be grounds to reassess the need for parallel manual inspection requirements.
- Patterns of recurring waivers could be used to signal that existing rules may no longer reflect technological or operational realities.

These findings are intended to support ongoing oversight and bipartisan efforts to modernize the regulatory framework without compromising safety or accountability.

VI. Conclusion: A Legislative Opportunity to Modernize Rail Safety

The current regulatory structure, while rooted in safety, was designed for a different era. It does not fully accommodate the tools and technologies available today. Aii's research highlights examples where validated innovations have faced delays or denial under existing procedures, despite measurable safety benefits.

Congress, through mechanisms such as the proposed Railway Safety bills and future surface transportation reauthorization, can build a regulatory framework that

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[4] See https://www.congress.gov/bill/117th-congress/house-bill/3684/text and https://railroads.dot.gov/sites/fra.dot.gov/files/2022-12/Guidance%20on%20Submitting%20Waiver%20Special%20Approval%20Other%20Requests%20for%20Approval%20to%20FRA%20%28Dec%202022%29%20final.pdf?utm__source=chatgpt.com.

[5] Aii Report Recommendation 5, p. 16.

is both rigorous and adaptable. Observed outcomes in other transportation sectors suggest that performance-based, transparent models can enhance safety, accelerate innovation, and strengthen public trust.

I thank this Subcommittee for its continued, bipartisan attention to these issues. Your leadership in oversight and modernization efforts reflects a deep commitment to improving transportation safety and resilience.

On behalf of the Alliance for Innovation and Infrastructure and the professionals who support our work, thank you for the opportunity to contribute to today's hearing. I welcome your questions and the opportunity to support further dialogue on these important issues.

Mr. WEBSTER OF FLORIDA. Thank you very much. Now, Mr. Gebhardt, you are recognized for 5 minutes for your testimony.

TESTIMONY OF ERIC GEBHARDT, EXECUTIVE VICE PRESIDENT AND CHIEF TECHNOLOGY OFFICER, WABTEC, ON BEHALF OF THE RAILWAY SUPPLY INSTITUTE

Mr. GEBHARDT. Chairman Webster, Ranking Member Titus, and members of the subcommittee, thank you for the opportunity to appear today. I am Eric Gebhardt. I am the executive vice president and chief technology officer of the Wabtec Corporation, testifying on behalf of the Railway Supply Institute.

Wabtec's commitment to innovation stretches back to George Westinghouse's 1869 invention of the automatic airbrake. And today, our 29,000-person global workforce, including 12,000 U.S. employees, helps move roughly one-fifth of the world's freight through our locomotives, braking systems, and digital platforms. RSI's more than 200 member companies support tens of thousands of American jobs and share a mission of advancing safety, innovation, and network efficiency across the rail system. For Wabtec, that mission comes to life through three pillars of modernization: accident prevention, asset health monitoring, and network utilization.

For accident prevention, Wabtec's Interoperable Electronic Train Management System and Positive Train Control continuously monitor train location and speed on more than 24,000 North American locomotives, preventing train-to-train collisions, overspeed derailments, work zone incursions, and movements through misaligned switches. Our enhanced wayside asset communications support real-time information exchange for automatic train control and early hazard warnings, creating an integrated digital safety net. This integrated approach gives railroads and regulators the tools to prevent and mitigate accidents, and exemplifies how Wabtec and the broader RSI membership are turning continuous improvements into concrete safety gains.

Wabtec and RSI have been at the forefront of deploying asset health monitoring and predictive maintenance systems. Preventing the next incident means spotting defects early. Wabtec's kinetics inspection technologies combine machine vision, laser scanning, acoustic and thermal sensing, and AI analytics to assess the condition of locomotives, freight cars, and track components. Onboard diagnostics track vibration, fuel flow, and pressure against fleet baselines to predict component fatigue, while railcar telematics turn freight cars into connected assets that broadcast mileage, impact shocks, and handbrake status. By shifting from calendar-

based to condition-based maintenance, railroads reduce failures and keep equipment in service longer.

For network utilization, Wabtec's trip optimizer and EPA-certified smart cruise control calculates an optimal speed profile and automatically manages throttle and dynamic brakes, delivering about 10 percent fuel savings and more than 400 million gallons conserved to date. Complementing trip optimizer, real-time planning solutions optimize the train network to unlock additional mainline capacity. And cloud-based yard management platforms trim idle time and the on-foot exposure that causes many yard injuries.

The Tier 4 modernized locomotives reinforce these digital tools, achieving 76 percent lower NOx, 70 percent lower particulate matter, and up to 30 percent better fuel economy than previous generations. To maintain this progress, we respectfully recommend three Federal actions.

One, sustain and grow Federal investments, particularly the CRISI program, with dedicated set-asides for digital safety and advanced inspection platforms so railroads of all sizes can accelerate deployment of these critical technologies.

Two, expand FRA research, development, demonstration, and deployment capabilities to advance AI-enabled inspections, collision avoidance systems, and alternative fuel locomotives.

And three, modernize and streamline regulatory processes so that technologies with proven risk reduction benefits can move more quickly to demonstration and widespread use.

In conclusion, modern technology has become an indispensable driver of rail safety, reliability, and efficiency. These improvements protect our communities, strengthen supply chains, and fuel economic growth. Wabtec Corporation, together with RSI and its member companies, is committed to advancing the next generation of lifesaving and efficiency-enhancing technologies. We appreciate congressional support through past initiatives, and we believe continued partnership is crucial.

On behalf of Wabtec and RSI, thank you for the opportunity to testify, and I look forward to your questions.

[Mr. Gebhardt's prepared statement follows:]

Prepared Statement of Eric Gebhardt, Executive Vice President and Chief Technology Officer, Wabtec, on behalf of the Railway Supply Institute

Chairman Webster, Ranking Member Titus, and Members of the Subcommittee, thank you for the opportunity to testify at today's hearing on rail innovation and technology. My name is Eric Gebhardt, and I serve as Executive Vice President and Chief Technology Officer of Wabtec Corporation. I appear this morning on behalf of the Railway Supply Institute (RSI), the trade association representing nearly 200 manufacturers, component suppliers, and technology companies that support America's freight and passenger railroads. Together, RSI's members have more than 725 rail supply locations in 46 states and 277 congressional districts. RSI represents an industry that has over 1.6 million railcars drawn by more than 28,000 locomotives on 140,000 miles of rail. They design, build, and maintain the equipment, digital systems, and services that advance the mission of safety, innovation, technology, and sustainability within the rail industry.

Rail is vital to our nation's economy and mobility. It is also one of the safest modes of transportation—and technology has been central to achieving that record. In my testimony today, I will discuss how modern rail technology is not only opti-

mizing operations but also saving lives and ensuring a more reliable rail network, and suggest policy steps to sustain this progress.

WABTEC'S LEGACY AND GLOBAL IMPACT

Wabtec's history is deeply rooted in rail innovation, dating back to its founding in 1869 with a breakthrough that fundamentally improved rail safety: the invention of the automatic air brake by our founder, George Westinghouse. Wabtec has built on this heritage of innovation, and today operates in over 50 countries with a workforce of over 29,000, including 12,000 in the United States. With the combined expertise of legacy Wabtec, GE Transportation, and others, the company has unmatched engineering and digital capabilities and a portfolio spanning from locomotives, braking systems, digital solutions, and propulsion technologies that enhance the performance of rail networks worldwide.

Wabtec plays a key role in advancing rail infrastructure through strategic partnerships, acquisitions, and investment in emerging technologies. Wabtec's commitment to research and development ensures that the rail industry continues to evolve to meet the needs of modern transportation. Beyond North America, Wabtec has a significant presence in Europe, Asia, Africa, South America, and Australia. This international footprint enables Wabtec to leverage global best practices and collaborate with rail operators worldwide to drive advancements in transportation systems and rail networks. Despite increasing competition from foreign manufacturers, Wabtec remains a leader in locomotive and transit solutions by investing in proprietary technology and maintaining strong partnerships with international rail authorities. In an era where global rail infrastructure is rapidly evolving, Wabtec continues to provide innovative solutions that keep it at the forefront of the industry.

REPRESENTING THE RAIL SUPPLY COMMUNITY

While my testimony highlights Wabtec capabilities, I speak for a much wider coalition of suppliers, large multinationals and specialty shops alike, whose innovations span everything from castings and fasteners to machine-vision inspection portals and cloud-based dispatching software. In 2020, the rail supply industry directly employed almost 240,000 workers, who contributed $27.7 billion of value-added economic activity across the U.S. When the direct, indirect, and induced contributions of the sector's activities are combined, the U.S. rail supply industry's total economic impact was $75.8 billion of GDP, 682,000 jobs, $49.0 billion of labor income, and $15.5 billion in taxes.

Collectively, RSI members:

- Deliver the critical hardware and software that Class I, short line, and passenger railroads rely upon to meet federal safety standards; and
- Anchor an American industrial base that faces rising foreign competition yet remains indispensable to resilient domestic supply chains.

A shared commitment to rail safety and innovation binds the entire RSI community. Wabtec approaches this critical issue through the lens of a global locomotive and digital solutions supplier charged with turning concept into deployable technology. Building on three domains: 1) accident prevention, 2) asset health awareness, and 3) network utilization, our engineers translate industry needs into scalable hardware and software that railroads can utilize today.

ACCIDENT PREVENTION

Accident prevention in today's rail network is built on a system of in-cab, train handling, and wayside technologies supplied by Wabtec and other RSI members.

Wabtec's positive train control technology (PTC), the Interoperable Electronic Train Management System (I–ETMS) is a safety overlay that continuously monitors train location and speed and will intervene to prevent accidents. This system is now installed on more than 24,000 North American locomotives across all Class I freight railroads and many commuter lines. It is specifically designed to prevent train-to-train collisions, overspeed derailments, incursions into established work zones, and movements of trains through misaligned switches.

Additionally, wayside-to-asset communication systems offer numerous new benefits to enhance efficiency, safety, and overall performance. A robust communication system enables real-time information exchange between trains and the wayside infrastructure. This allows for enhanced safety features, such as automatic train control, collision avoidance systems, and early warning mechanisms for potential hazards.

This integrated approach gives railroads and regulators tools to prevent and mitigate accidents, and it exemplifies how Wabtec and the broader RSI membership are turning continuous improvement into concrete safety gains.

ASSET-HEALTH MONITORING

In addition to train control, Wabtec and RSI have been at the forefront of deploying asset health monitoring and predictive maintenance systems. Preventing the next derailment requires seeing the earliest signs of mechanical trouble. Wabtec is a pioneer in the inspection and monitoring of rail assets to improve safety through our KinetiX Inspection Technologies portfolio. These technologies focus on the rail vehicles and infrastructure themselves—using sensors, analytics, and connectivity to continuously assess the condition of locomotives, freight cars, and track components. By detecting emerging problems early, asset monitoring systems allow railroads to fix issues proactively before they lead to failures, accidents, or service delays.

Integrating machine vision, laser scanning, remote sensing with acoustic and thermal technology, load monitoring, and AI-driven analytics, the technology sets the standard for automating inspection processes, enhancing asset availability and life, significantly reducing operational costs and service disruptions. This is about being proactive rather than reactive: finding the tiny warning signs in mountains of data and acting on them, instead of waiting for something to go wrong.

Wabtec's artificial intelligence capabilities facilitate predictive maintenance, minimizing unplanned downtime and improving asset utilization. By integrating AI-driven diagnostics with real-time monitoring, we help railroads reduce mechanical failures and increase train reliability. For example, our Railcar Telematics portfolio includes state-of-the-art sensors that turn freight cars into smart connected assets that allow operators and shippers to see the GPS location of freight and better manage the safety and maintenance of the fleet.

This improved fleet reliability means higher network utilization—railroads can use their locomotives and cars more effectively and schedule trains with more confidence that each trip will go as planned. It also reduces maintenance costs over time, since repairs can be scheduled optimally and asset life is extended by fixing issues before they cause damage. In short, modern asset health monitoring is making rail operations more predictable, efficient, and safe. It exemplifies how digital technology and big data analytics are being harnessed to tackle age-old challenges of railroad maintenance and safety.

NETWORK UTILIZATION

The examples of PTC and asset health monitoring all underscore a fundamental point: modern technology is the key to taking rail safety and efficiency to the next level. These innovations prevent accidents, optimize operations, and improve asset health in ways that were not possible with traditional methods. They complement the skill and experience of railroad workers with precise automation and data-driven insight, resulting in safer and more productive railroads.

These safety gains are compounded when trains flow smoothly through the network. For example, Wabtec's Trip Optimizer is a smart cruise control system for trains certified by the U.S. EPA to deliver 10% fuel savings. Considering the terrain, train make-up, speed restrictions, and operating conditions, it calculates an optimum speed profile. It can automatically control the locomotive throttle and dynamic brakes to reduce fuel burn and provide efficient train handling onboard locomotives. The system is installed on over 11,000 locomotives globally and has saved over 400 million gallons of fuel, cutting carbon emissions by over 500,000 tons annually. Based on the typical price for No. 2 diesel fuel, Wabtec has saved customers hundreds of millions of dollars in fuel expenses.

Similarly, real-time planning solutions optimize train scheduling and improve network throughput while reducing congestion and energy use. By leveraging predictive analytics and AI-enhanced decision-making, technologies enable freight and passenger trains to operate more efficiently within existing infrastructure. Even in rail yards, cloud-based yard management platforms can integrate inventory, switch lists, and crane operations to eliminate cascading delays that often ripple onto the main line. Improved yard fluidity through automation can lead to reduced idle times and locomotive fuel consumption. In addition, fewer yard conflicts translate directly into fewer human movements between tracks, a leading cause of injuries.

HARDWARE THAT UNDERPINS SAFER, CLEANER OPERATIONS

Freight and passenger rail operators across North America rely on Wabtec locomotives to deliver safe and reliable operations for our customers. Continuing to in-

vest in new and modernized locomotives, along with the development of a portfolio of alternative fuel capabilities to meet a variety of operator needs, will be vital to the continued competitiveness of freight rail relative to other modes.

- *Freight Locomotives*: Wabtec's Tier 4 locomotives represent the most advanced diesel-electric locomotives available today. These locomotives meet the Environmental Protection Agency's (EPA) stringent Tier 4 emissions standards, which require a 76% reduction in nitrogen oxide (NOx) and a 70% reduction in particulate matter (PM) emissions, compared to previous generations. With over 1,000 Tier 4 locomotives in operation, Wabtec continues to set the standard for sustainable rail transportation. Railroads adopting these locomotives benefit from improved fuel efficiency and a reduced environmental footprint.
- *Locomotive Modernization Programs*: Wabtec modernizes aging locomotive fleets to extend their operational life while incorporating the latest efficiency and safety enhancements. These efforts have resulted in up to 30% improvement in fuel efficiency and a more than 50% increase in haulage ability.
- *Hybrid and Alternative Fuel Technologies*: Wabtec is investing in hybrid-electric and alternative fuel technologies to support a range of next-generation propulsion technologies. The development of fuel-flexible, battery-electric and hydrogen internal combustion engine locomotives represents a significant step toward implementing innovative technology solutions and increasing energy efficiency within the rail sector.

POLICY RECOMMENDATIONS

Thanks to sustained private sector and federal investment in rail technology, the industry has made great strides. We have seen the virtual elimination of certain types of collisions and derailments through PTC; we have dramatically cut fuel waste and emissions through smart automation; and we are catching maintenance issues long before they would historically have been discovered. All of this translates into a stronger rail network that can transport more goods, more safely, and at a lower cost. With freight demand expected to grow and with heightened attention on supply chain resilience, these technology-driven gains are more important than ever—they help railroads handle growth while maintaining the highest safety standards and reliability.

But continued progress is not automatic. It depends on ongoing innovation and deployment of new technologies across the industry. Railroads, suppliers, and government must work together to ensure that we fully leverage the latest advances (such as artificial intelligence for inspection, or automation for operational efficiency) and that we do so without undue delay.

To promote rail safety and efficiency through technology, we encourage Congress to:

1. Sustain and grow grant programs, particularly the Consolidated Rail Infrastructure and Safety Improvements (CRISI) program, with dedicated set-asides for digital safety and advanced inspection platforms. With the growing adoption of life-saving and efficiency-enhancing innovations by railroads of all sizes, these federal programs have been critical to accelerating the deployment of these technologies nationwide.
2. Expand research, development, demonstration, and deployment of next-generation rail technologies. Increasing the FRA's research and development budget and establishing public-private partnership programs will help drive the next wave of innovation—for example, advancements in artificial intelligence for track and equipment inspection, autonomous or remotely operated trains for certain applications, enhanced cybersecurity for rail systems, and energy-efficient technologies.
3. Modernize and streamline regulatory processes so that railroads can more readily, test, evaluate, and adopt new safety technologies. Current regulations, while well-intentioned for safety, can sometimes be inflexible or overly prescriptive, inadvertently hindering the adoption of improved technologies.

CONCLUSION

In conclusion, modern technology has become an indispensable driver of rail safety, reliability, and efficiency. These improvements benefit everyone—they protect our communities, make our supply chains more efficient, and help our economy grow. Wabtec Corporation, together with the Railway Supply Institute and its member companies, is committed to developing technologies that move the needle on safety and performance. We appreciate the support Congress has shown through

past initiatives, and we believe continued partnership is crucial. By sustaining investment in rail technology deployment, supporting research and pilots, and modernizing the regulatory framework, Congress can help the rail industry deploy the next generation of life-saving, efficiency-enhancing technologies. On behalf of Wabtec and RSI, I want to thank the Committee for the opportunity to provide this testimony. We look forward to working with you to ensure our nation's rail network remains the safest and most efficient in the world. I am happy to answer any questions you may have.

Mr. WEBSTER OF FLORIDA. Thank you very much. Now, Mr. Cardwell, you are recognized for 5 minutes for your testimony.

TESTIMONY OF TONY CARDWELL, PRESIDENT, BROTHERHOOD OF MAINTENANCE OF WAY EMPLOYES DIVISION, INTERNATIONAL BROTHERHOOD OF TEAMSTERS

Mr. CARDWELL. Chairman Webster, Ranking Member Titus, and members of the subcommittee, thank you for the opportunity to speak with you today. My name is Tony Cardwell, and I am the president of the Brotherhood of Maintenance of Way Employes Division of the International Teamsters. I was elected to lead our national union in 2022. BMWED members are the railroad workers who build and maintain the tracks, bridges, buildings, and other critical infrastructure that support both freight and passenger rail service across the United States.

I began my railroad career when I was hired by the Union Pacific Railroad, and I have 25 years of seniority on the Oregon division. Throughout my career, I have witnessed firsthand the industry's evolution, particularly in areas such as safety, technology, and innovation.

A common misconception is that the unions are antitechnology. Let me be clear: The BMWED is not antitechnology. We support innovation when it improves safety for the general public and enhances the working conditions of our members.

In BMWED's 138-year history, we have consistently embraced significant technological advancements in the rail industry, especially when those changes have made the railroad safer for the communities we serve. As president of the BMWED, I negotiate agreements with the railroads. We understand that in 50 years, railroad work will look far different.

What I will not do is trade safety for convenience or allow the railroads to do so in the name of chasing the latest piece of technology. No advancement is worth risking the safety of the constituents you serve and the communities where our members work and live. Nearly 2 years after the East Palestine disaster, the railroads' lobbyists are once again putting safety on the line. This time, they are targeting the safety-sensitive work my members perform, seeking to weaken inspection standards in order to satisfy Wall Street's short-term expectations.

BMWED's track inspectors perform FRA-mandated visual inspections of railroad track twice a week. During these inspections, they look for 27 different variations of track defects. ATI cannot find 73 percent of track defects, 73 percent. As we speak here today, the Association of American Railroads, on behalf of the Class I railroads, is asking the FRA for a safety waiver that would reduce the frequency of these inspections by 75 percent, cutting them from twice a week to just twice a month. The same waiver would allow

railroads up to 72 hours to address a defect after it is identified. Under current FRA regulations, human track inspections are required to remedy the defect immediately.

Allowing trains carrying passengers or hazardous materials to travel over compromised track for up to 3 days is an unacceptable risk. We fully support the use of ATI to supplement visual inspections, not to eliminate them. ATI cannot replace the work that track inspectors perform. It only identifies one category of defects, which is track geometry. It cannot detect 73 percent of derailment-causing defects such as broken rails, numerous switch defects, loose bolts, and many more.

If the railroads succeed in securing this waiver, rail safety will be significantly weakened. We will see more derailments, some of which could be as catastrophic as East Palestine or even worse. Imagine if an event like that were to happen in the heart of the districts you represent. That is why BMWED has launched a national campaign to oppose this waiver. We believe it would be devastating to our constituents and the safety of rail workers.

We are grateful for the support of Ranking Members Larsen and Titus and urge all Members of Congress to join us in standing against this proposal.

While a track defect did not cause the East Palestine derailment, Norfolk Southern failed to give carmen workers inspecting the train enough time to do their jobs. East Palestine was a tragic reminder of the FRA mandate inspections. Whether of track, signal systems, railcars, locomotives, or grade crossings, they are all essential. They all matter. The East Palestine derailment should have been avoided. My message to the railroads and the companies developing rail technology is simple: Partner with us to get it right.

We are not opposed to innovation or technological change. However, it must be implemented in a way that safeguards the communities across the country where our members work and live. I want to be extremely clear. BMWED will not stand by if waivers are accepted and place you and your constituents at risk. If the AAR waiver is granted, it will expose the American people to imminent danger.

At a time like this, we should be reminded of the words of the Holy Bible, Ezekiel 33:6: "But if the watchman sees the enemy coming and does not sound the alarm to warn the people, he is responsible for their death." We see the dangers coming. We are sounding the alarm. The question before you now is, Will the warning be heard?

Thank you, and I look forward to your questions.

[Mr. Cardwell's prepared statement follows:]

Prepared Statement of Tony Cardwell, President, Brotherhood of Maintenance of Way Employes Division, International Brotherhood of Teamsters

Chairman Webster, Ranking Member Titus, and Members of the Subcommittee:

Thank you for the opportunity to testify before the Subcommittee. My name is Tony Cardwell, and I am the President of the Brotherhood of Maintenance of Way Employes Division (BMWED) of the International Brotherhood of Teamsters. I became the National President of BMWED in 2022. Before I was elected President, I was a General Chairman of the Union Pacific Railroad in Oregon, where I have

25 years as a BMWED track worker and have seen up close the changes in the railroad industry over the years as it relates to safety, technology, and innovation.

BACKGROUND ABOUT BMWED

BMWED is a national union representing the workers who build and maintain the tracks, bridges, buildings, and other structures on passenger and freight railroads in the United States. BMWED represents members on all six Class I freight railroads, Amtrak, most commuter rail systems, and several unionized short lines (most short lines are not unionized).

BMWED members play critical roles in maintaining rail tracks, rail bridges, and overhead electric catenary systems that provide power to trains. BMWED members inspect track to ensure it is free of defects, maintain overhead rail catenary primarily from Washington, D.C. to New York along the Northeast Corridor, and provide protection to workers working in the railroad right of way so that they don't get killed or injured by oncoming trains, track cars, machines or motor vehicles crossing grade crossings.

BMWED is one of the oldest unions in the United States and was founded in 1887 in Demopolis, Alabama. In 2004, the BMWED merged with the Teamsters and is now part of the International Brotherhood of Teamsters.

FOR NEARLY 140 YEARS, BMWED HAS WELCOMED INNOVATIONS THAT ADVANCE SAFETY

Importantly, BMWED is not "anti-technology." On the contrary, we are advocates of responsible use of technology when it improves the working lives of our members and more so when it makes the railways safer. In BMWED's 138-year history, there have been significant technological improvements in the rail industry that BMWED has embraced, particularly when it has helped our members and/or provided a safer railroad.

Some examples include:

Mechanization and Hydraulics: When the railroads were first created in the 1800s, Maintenance of Way crews lifted heavy rails and railroad ties manually, using their brute strength, heavy steel lining bars, and teamwork to get the job done, which was slow and dangerous work—many rail workers were severely injured in the process—but it also limited how much could be accomplished in a single shift.

Initial technological advances brought heavy equipment that used pulleys and cables, alleviating some of the brute force needed for rail construction. However, ultimately, the introduction of hydraulic systems revolutionized the industry. The backhoe's introduction replaced many exhausting and injury-prone processes by bringing hydraulic lifting power and mechanical precision into the equation. Backhoes could lift, place, and move materials with far less physical strain with the right attachments. Hydraulic and specialized track equipment were built to advance and allow machines to lay rail, pull spikes, drive spikes, and pullout and insert ties. Whereas workers might have only been able to install 200 ties a day manually, they can now install up to 1000 ties daily with the new equipment. For BMWED's workforce, this meant adapting to new labor requiring equipment training, spatial awareness, and mechanical problem-solving. Indeed, for some time, the introduction of hydraulic mechanization did eliminate some jobs, but it also changed the skills our members needed and, in the process, created new jobs. BMWED members successfully adapted and today operate this equipment daily.

Track (Production) Tamper: Track ballast is the material that forms the track-bed upon which railroad ties are laid on top of. Ballast is critical to ensure tracks remain stable vertically and horizontally as trains operate over them and that water is drained correctly away from tracks so railroad ties do not rot. Ballast is usually made of stone or gravel; the material you see underneath railroad tracks. Historically, Maintenance of Way workers relied on manual labor and tools such as track jacks, lining bars, and tamping picks to compact ballast beneath the ties and adjust the track's alignment. This process was labor intensive, took time, and often yielded uneven results.

The introduction of the mechanized Production Tamper changed the rail industry by replacing the hard, manual work of hand tamping with a faster and more precise way to maintain track elevation and alignment. When the tempers came along, railroad workers could lift, line, and tamp the track all at once, making it easier to keep trains running smoothly and safely. For Maintenance of Way employees, this meant learning how to operate heavy equipment, understand hydraulic and electronic systems, and troubleshoot on the fly. Instead of pushing back against the change, they leaned into it and added a new layer of technical skill to their work. Today,

BMWED workers operate track tampers daily. Production tampers are one of the most critical developments in railroad technology and are mainly responsible for the ability to increase the type and speeds of track on a universal basis while dramatically reducing the risks of derailment. This equipment continues advancements with lasers, touch screens, advanced diagnostics, and computer systems that genuinely improve the efficiency and safety of the entire railroad system.

Continuous Welding Rail: Historically, railroad tracks were laid using what is known as jointed rail. Jointed rail, as the name implies, were 39-foot track sections bolted at various points using joint bars and bolts to form long pieces of railroad track. Jointed rails are weakest at the points where the joint bars or bolts are and are prone to cracking or loosening at those spots, causing significant sway for the train car while undermining the track's integrity.

In 1933, the first segment of Continuous Welded Rail (CWR) was laid in the United States, marking the beginning of a transformative shift in track infrastructure. CWR is rail track that has been welded together into ¼ mile pieces. And, because it has been manually welded together, CWR does not contain joints or bolts that jointed a track has. Train rides are smoother and more stable with CWR, which decreases the risk of derailment and increases the life of the rail.

The use of CWR expanded significantly in the 1950s as railroads sought smoother rides, lower maintenance costs, and the ability to manage faster and heavier trains. As jointed rail was gradually phased out, Maintenance of Way employees adapted to the evolving technology by mastering thermite welding, understanding rail stress dynamics, and ensuring proper anchoring techniques. This transition elevated their responsibilities and skillsets, transforming Maintenance of Way work into a more technical and specialized craft essential to modern rail operations. Maintenance of Way employees create and install CWR daily.

As evidenced by the above examples, BMWED and its members have adapted successfully to significant technological change in the railroad industry. There is one common thread with the technology we have come to support: demonstrable safety improvement in some form. Crucially, in these instances, workers are still doing the work, even if they use machines. Maintenance of Way workers today still install railroad tracks, ties, and ballast daily, even though they use machines to install these track components, and these components have advanced, like how Continuous Welded Rail has largely replaced jointed tracks. In addition to creating a safer and more efficient railroad system, these machines have made Maintenance of Way workers' lives easier—it is hard to imagine going back to installing rails and railroad ties manually like it was done in the 1800s, given how taxing that approach is. But we still need humans to operate these machines—there are no self-operating backhoes or track tampers, for example. And that is likely going to be the case for years to come.

BMWED has consistently embraced technology because it has empowered our members to work safer and smarter while making our railroad network safer, which is in direct contrast with the actions of the railroad industry, which has recklessly pursued cost-cutting at the expense of safety and quality of service in the past decade. The industry has drastically reduced its workforce levels by over 30 percent to unsafe levels while relying on unproven technology that cannot replace the expertise and skills of the workers the railroads let go. Additionally, the railroads have sought safety waivers to regulations that are still needed, and the Association of American Railroads recently asked the Federal Railroad Administration (FRA) to waive 80 more railroad safety regulations[1], many of which are written in the blood of previous derailments and incidents that killed people, including rail workers, and caused irreparable injuries and damages. These safety waivers are what the railroads euphemistically call "performance-based regulations"—all it means is no regulations.

BMWED AND THE FUTURE OF TECHNOLOGY

How we do railroad track or bridge inspections today will likely not be how we do it 50 years from now. BMWED wants to be a union that adapts to the changes and continues to perform all railroad construction work, including operating machines. Just as our members had to adapt by transitioning from manual labor to operating machines, the next generation of technology will likely require our members to become proficient in using artificial intelligence, analyzing multiple data sources from sensors, and operating even more sophisticated machinery, such as drones. BMWED members can make that transition if given the opportunity.

[1] https://www.regulations.gov/comment/DOT-OST-2025-0026-0829

In my role as President, I negotiate agreements between BMWED and railroads. I want to negotiate with companies about developing and/or deploying the next generation of meaningful technology so that BMWED can be partners by having our workers utilize technology, and we can ensure that our workers are being trained to have the skills needed to use the technology.

For example, drones will continue to play an increasing role in railroad track and bridge inspections, such as inspecting hard-to-reach bridges and structures and conducting heat, high water, and track washout inspections following storms. Our members currently perform these inspections, and if the railroads transition to drone-based methods, we fully expect that this work will remain BMWED work. Consistent with long-standing principles under our collective bargaining agreements, the railroads must train their workforce when new technologies are introduced. We want BMWED members to be trained and certified to operate drones, and we are prepared to work with the railroads to implement programs that acquire the necessary equipment and support our members in obtaining the FAA licenses and certifications required for safe and legal drone operation.

Adjusting to new technology involves ensuring that workers receive the training necessary to adapt to and operate said new technology. For example, BMWED has had a long-standing interest in training our members to get commercial driver's licenses (CDLs) to do more tasks on the railroads that require heavy machinery since the amount of railroad operations involving trucks is rapidly increasing. Our collective bargaining agreements with the railroads pay our members who have CDLs a higher hourly wage, so by helping them get their CDLs, we can improve their economic standing. There have been some issues with federal grant eligibility, but we would like to work with Congress to make CDL training for railroad workers an eligible expense under the Consolidated Rail Infrastructure and Safety Improvements Grant Program (CRISI), so BMWED can apply for a federal grant through CRISI to do this CDL training.

Innovation works best when railroads and companies develop new technologies and work hand in hand with their workers and unions to identify problems and develop technological solutions. Railroad workers are on the front lines, and it makes good business sense to canvass workers who are intimately familiar with the technology they are using and can help spot problems in the field. Indeed, their feedback is invaluable. After all, our members are performing the work now and have valuable input on how that technology might best be deployed to improve the quality of work.

Despite over a century of continuous track maintenance and construction work through all the ebbs and flows of technology, railroads continue to resist engaging the BMWED in meaningful discussions about how new technology can be used to improve safety. Our collective bargaining agreements contain scope rules that govern the work our members perform, and under the Railway Labor Act (RLA), those agreements remain in effect until the parties agree to amend them. This work is reserved for BMWED-represented employees through decades of customary and historical performance. That means the railroads cannot unilaterally decide to shift safety-critical work away from our members without first bargaining with the BMWED and reaching an agreement.

When railroads explore new tools for track and bridge inspections, they should be collaborating with the workers who have been doing the work for decades. Unfortunately, that is not what we are seeing. As outlined below, we have repeatedly tried to bargain over Automated Track Inspection (ATI), and the railroads have refused each time. We have also asked the Class I carriers to let our members fly drones to perform track and bridge inspections, which is work that is already core to the maintenance of way craft, just with different tools. To date, none of the carriers have agreed. This lack of engagement is a missed opportunity and a safety concern. The safest outcome will always come from combining experienced workers with emerging tools, not removing the workers entirely.

Technology should be used to make America's rail network safer and help skilled workers do their jobs more effectively. It should not be used to bypass the people who know the work or to undercut the agreements that have protected this work for generations. Railroads should work with the BMWED to deploy new technology to enhance safety, not sideline it.

Too often, we see labor unions and the workers they represent as excluded from developing and deploying new technology. It is notable to me that one of the witnesses testifying alongside me is from RailPulse. RailPulse has many stakeholders who are part of their initiative to develop a next-generation telematics platform for railcars. These partners include shippers, Class I railroads, short line railroads, and railcar operating lessors. To me, one prominent stakeholder is missing: labor. There is not a single labor union listed, and as far as I know, RailPulse has not ap-

proached any rail labor union to be part of the coalition or help develop the technology.

BMWED does not oppose RailPulse's technology, and we think better GPS technology on railcars can benefit shippers, workers, and other participants in the railroad industry. BMWED and our members may or may not be directly affected by RailPulse's technology. But I certainly would appreciate the opportunity to be part of the coalition working on the technology. And I know that several of my fellow rail unions would likewise want to be part of that coalition because RailPulse's technology will directly affect their members and their work. Some craft of railroad workers will have to ensure that those sensors on the rail cars are installed and maintained correctly, and the jobs of rail workers across different crafts are going to be affected by this technology, including the train crews that transport rail cars and the carmen that inspect rail cars for defects. They should be included in the development and deployment of this technology.

Over the last decade, the freight railroads have drastically reduced the training they provide to their workers. As mentioned above, programs like the Consolidated Rail Infrastructure and Safety Improvement (CRISI) program are invaluable because, uniquely under CRISI, rail unions are directly eligible to apply for CRISI grants. BMWED plans to apply for more CRISI grants to conduct workforce training for its members. Retaining unions' eligibility to apply for CRISI and expanding workforce development funding is one of BMWED's priorities in surface transportation reauthorization. This workforce development funding is critical to helping BMWED train our members to adapt to new technology in our industry so they are not left behind skills-wise.

We look forward to working with Congress on this issue.

NO EXISTING TECHNOLOGIES CAN REPLACE TRAINED HUMAN INSPECTORS CAPABLE OF IDENTIFYING THE FULL RANGE OF TRACK DEFECTS

Where technology and innovation can go off the rails and be dangerous is when railroads or other private companies attempt to prematurely use that technology to replace human workers even when technology cannot replicate, or come close to replicating, what a human worker can do. While technology and innovation can be a force for positive change, they cannot come at the expense of safety, and there must be regulations around the technology to ensure it functions properly. Gutting our long-standing safety regulations just because a delusive piece of new technology comes along is a recipe for disaster.

Unfortunately, BMWED is going through that exact fight with the Class I railroads now in their attempt to reduce visual track inspections by upwards of 75 percent from twice a week to twice a month and rely solely on a form of technology known as Track Geometry Measurement Systems (TGMS), which the railroads refer to as Automated Track Inspection or ATI. ATI cannot replace what a human track inspector does because it only inspects track alignment, elevation, and gauge. It does not inspect for track defects that cause a majority of track-caused derailments.

As background, the Federal Railroad Administration requires railroads to inspect their railroad tracks through visual track inspections twice a week for 23 different track defects, which is much more than the ATI can detect. Track defects are the second leading cause of rail derailments after human error, so it is essential to ensure that railroad tracks are free from defects. The worker who usually performs these visual track inspections is called a track inspector, and track inspectors are part of the BMWED union.

ATI is a technology that has been around since the 1970s. ATI is a machine run over railroad tracks that detect one type of track defect: track geometry defects. Track geometry refers to the geometric properties of the track, including how wide the track is (track gauge) and any curvature of the track. These track geometry defects account for just six of the 23 defects FRA requires railroads to inspect. ATI cannot detect defects like broken rails, rotten ties, washouts where the track has washed away, or obstructions in the right of way. ATI can only detect 26 percent of what a human track inspector can detect and, therefore, cannot replace human inspections. Moreover, ATI only detects defects, while track inspectors identify problems before they become defects.

Nothing in federal law or federal regulations also prevents the railroads from running any form of ATI, including TGMS, as much as they want. The railroads run ATI right now, and BMWED members operate some ATI machines.

Since the railroads have spread false information about this, *BMWED supports using Automated Track Inspection technology, including TGMS, because it can detect certain track geometry defects better than the human eye. However, BMWED sup-*

ports using ATI technology on top of the existing level of visual inspections, NOT as a replacement for those visual inspections.

The Association of American Railroads is seeking a safety waiver from the FRA on behalf of its Class I railroads to reduce visual inspections by 75 percent to twice a month and solely rely on ATI as a replacement for track inspections.

Last year, the FRA proposed a rule requiring railroads to run ATI a few times yearly while keeping the same level of visual track inspections (twice weekly). *BMWED supported this proposed rule, including the proposed ATI requirement*. BMWED would still like to see the FRA finalize this proposed rule.

AAR and the Short lines (ASLRRA) opposed the proposed rule, claiming that running ATI 3–4 times a year was "too onerous," even though AAR has falsely claimed for years that they could not run ATI on the railroads. From BMWED's perspective, AAR's comments in opposition to the proposed rule show that this fight is not about ATI if the railroads are opposing a requirement to run ATI at specific intervals, but rather about the railroad's attempts to reduce visual track inspections because they want to cut back on costs, no matter the cost to safety.

As Maintenance of Way workers, we take track defects extremely seriously. In AAR's requested safety waiver, the industry wants to wait up to 72 hours to take corrective action for track geometry track defects found by ATI machines for upwards of 72 hours. This delay is in comparison to the current federal requirements that a track defect found by a human track inspector must be corrected immediately, including if it is a defect that an ATI machine can also find. What AAR seeks in their safety waiver would effectively result in passenger trains carrying people or freight trains carrying hazardous materials running over defective tracks. The consequences of allowing a defect to go unaddressed for up to three days could be yet another derailment that kills or severely injures people and causes irreparable damage to communities near railroad tracks. That raises significant safety concerns.

Comments are due July 9th to the FRA about AAR's proposed safety waiver to reduce visual track inspections by 75 percent. Now is not the time to be going backward on rail safety when there are hundreds of train derailments and accidents every year, any of which could be the next East Palestine. BMWED urges Congress to oppose AAR's proposed waiver because it is unsafe and will expose workers and communities to more train derailments, more deaths and injuries, and more property damage. We are grateful to Ranking Members Larsen and Titus for their support on this issue and ask every Member of Congress for their support on this issue as well.

"Innovation" and "Deregulation" are the Industry's Buzzwords for Cutting Costs and Lowering Safety Standards

One of the other reasons we need to get innovation and technology right in the railroad industry is that safety in the railroad industry has stagnated and even gotten worse in many key safety metrics over the last decade. The Class Is' rate of total train accidents per million miles was 14.78 percent higher in 2024 than a decade ago in 2015, according to FRA data released in March of 2025. Even if you exclude highway-rail crossings, the rate of accidents was 8.25 percent higher in 2024 than in 2015. That increase in the incident rate is occurring even though Class Is ran 23 percent fewer train miles in 2024 than in 2015 (447 million vs 582 million). Using AAR's baseline, between 2005 and 2025, the railroads ran 31 percent fewer train miles. The industry's rate has increased despite running fewer trains with less frequency. So, the railroads are running way fewer trains, and safety is getting worse, not better.

Additionally, the number of employee-on-duty fatalities has remained constant over the last decade. There were seven fatalities in 2024 compared to eight in 2015, despite the number of employee hours decreasing 30.7 percent from 2015 to 2024. There are now significantly fewer employees in the industry, yet fatalities have not meaningfully improved compared to ten years ago.

More than 12,000 cities, small towns, and villages across our country have railroad tracks running through their communities. In 2024, approximately 500 cars carrying hazardous materials derailed or were damaged. Each accident risks the train workers and the communities that host railroad tracks. We expect better for an industry that has earned over $160 billion in profits over the last decade.

The East Palestine, Ohio derailment in 2023 showed the importance of human inspections in preventing derailments before they happen. Routine inspections of the different elements of the railroad system, including track, brake, rail car, and locomotives, are vital to ensuring there are no defects in any of those aspects of the rail system that could cause a derailment. The NTSB investigation found that the

East Palestine derailment was caused by a wheel bearing on a rail car that overheated and was not caught in time. In a post-incident inspection, the FRA found that one out of four railcars in the East Palestine derailment had defects. The defects would have been identified and addressed if trained workers had thoroughly and physically inspected the railcars.

That inspection did not happen because Norfolk Southern (NS) and other Class I railroads are cutting back on the number of qualified Carmen, the craft that does these rail car inspections, by 40 percent since 2015. Additionally, NS and other Class I in recent years have limited the time that Carmen must inspect rail cars to 30 seconds per side of each rail car, and a train can hundreds of rail cars to inspect at one time. That time pressure prevents qualified and skilled workers from being able to do their jobs.

Even though NS had installed some technology called defect detectors that are supposed to detect defects before they happen, NS did not install enough defect detectors on the route that the East Palestine train was traveling on, so they were spaced too far about, and some of them were not working properly. Hence, the technology failed to do what it was supposed to do, which is another example of how technology cannot replace qualified workers in terms of safety.

Had NS had the proper level of Carmen and given them the time to do their job and inspect the East Palestine train when it was combined from different trains outside of St. Louis, Missouri, the odds are high that the defective wheel bearing on that train would have been caught and fixed and East Palestine would never have happened. The East Palestine derailment was entirely preventable with the proper workforce levels, regulations, and safety procedures in place. Instead, a community and its residents are traumatized for a lifetime. That fact is unacceptable and should infuriate everyone.

While East Palestine was not a track derailment, if the railroads successfully get this waiver and reduce visual track inspections by upwards of 75 percent, there will be many more track missed defects and potentially many more derailments along the scale of East Palestine.

In its investigation of a September 2021 Amtrak Empire Train derailment on BNSF track in Joplin, Montana, caused by bad track conditions that killed three passengers and injured 49 other passenger and crew members, the National Transportation Safety Board (NTSB) found that ATI *should be used as a supplement* to human track inspections, and *should not replace humans* (emphasis added): For example, automated track inspections by geometry cars or railcar-attached devices provide detailed information on specific track parameters, but they do not capture the diverse array of unique track hazards detectable to human inspectors. They are intended to supplement an inspection program and should not be used to supplant an inspector physically examining a track (Page 35).[2]

Safety will decline dramatically if we do not fix the current problems with how railroads do inspections across the board, including protecting the visual track inspections that the railroads actively seek to reduce by 75 percent. More preventable derailments like the one in East Palestine will happen because of increased defects. Congress must prevent these derailments by adopting common-sense safety regulations, especially around inspections.

CONCLUSION

BMWED has navigated 138 years of technological change in the railroad industry and plans to navigate the next 138 years. We must survive as a union. While there is no way to predict what the future looks like, it will be different from today, and part of charting a path for the upcoming changes will involve successfully adapting to and embracing innovation and technological advancement. At the same time, these innovations should enhance the safety of workers and our rail system and make workers' lives easier. Too often, railroads and private companies first think about innovation and how to justify reducing their workforce, even when technology cannot fully replace human beings, which would decrease safety and put the public at risk. Labor unions and workers push back against unproven technology because companies misuse it for the wrong reasons.

My message to companies and railroads is simple: partner with the BMWED on technology so we can get it right. The BMWED is not scared of innovation or techno-

[2] National Transportation Safety Board Final Report of September 2025, 2021, Joplin, Montana BNSF Derailment. "Derailment of Amtrak Passenger Train 7 on BNSF Railway Track." Published July 5, 2023. Accessible at https://www.ntsb.gov/investigations/AccidentReports/Reports/RIR2308.pdf

logical change but does want to ensure it is done correctly for the safety of our members and communities across our great country.

Mr. WEBSTER OF FLORIDA. Thank you all for your testimony. We will now turn to questions from the panel. I will recognize myself for 5 minutes.

So, Mr. McCown, your organization recently issued a report highlighting how, under the Biden administration, the waiver process broke down. How do politics such as this conflict with the Federal Railroad Administration's stated mission of enabling the safe, reliable, and efficient moving of people and goods?

Mr. MCCOWN. Mr. Chairman, thank you for the question.

The report focuses on the fact that technology continues to evolve, and the regulatory framework hasn't kept pace. And you are referring to limiting political whiplash, which is one of the five recommendations. And in technical safety decisions, we need to ensure that regulatory outcomes are based on data, and that they are consistent with standards, not shifting political priorities.

When you don't know what the rules of the game are from the regulator, it's hard to comply, number one. And number two, it's impossible to deploy capital.

Mr. WEBSTER OF FLORIDA. So, can you describe the importance of, kind of, a transparent regulatory process to achieve FRA's mission?

Mr. MCCOWN. I'm sorry. Was that to me, sir?

Mr. WEBSTER OF FLORIDA. Yes.

Mr. MCCOWN. Yes. Yes, it's critical. It's impossible to comply with the rules if you don't know what the rules are. And it's impossible to plan when decisions appear haphazard or decisions change. This should be nonpartisan, not something where the rules change depending on who's in the White House.

Mr. WEBSTER OF FLORIDA. Okay, so when railroads ask for an automated track inspection manual inspection—seek a waiver there, these waivers are about using technologies to proactively and strategically address potential track safety issues, not simply eliminate manual inspections. Is that right?

Mr. MCCOWN. Yes.

Mr. WEBSTER OF FLORIDA. Okay. So let me just get this straight, okay? There is technology, and some of it is pretty advanced, makes some great things done. Does it have 100 percent reliability?

Anybody?

Mr. MCCOWN. I will answer. You need people to interpret the data, that's clear. But the technology in many cases is more accurate than the people. The technology is better than my eyeball. That's just fact. If that weren't the case, we wouldn't take x rays when we go to the doctor's office.

Mr. WEBSTER OF FLORIDA. But on the other hand, there is a manual inspection that takes a person. What do they do? What do they look for?

Anybody can answer that question. Tell me about a manual inspection.

Mr. CARDWELL. The manual inspections are the visual inspections that are done. They are able to catch a lot of defects that can't be caught by the track geometry machines, which is ATI. And

so the visual inspections can catch all kinds of defects and preventative defects in advance of the defects becoming worse. But there are numerous defects that the ATI track geometry can't catch, such as just as simple as a broken rail. The track geometry machines do not pick up a broken rail, and that is just a basic track defect. It happens all the time, every night across the country.

Mr. WEBSTER OF FLORIDA. So there is also an automated track inspection, and so, is that quicker? Does it look at less things than a manual inspection does? What's the difference?

Mr. CARDWELL. Is that a question for me?

Mr. WEBSTER OF FLORIDA. Anybody.

Mr. CARDWELL. The ATI machine does catch track geometry defects, and it is efficient at catching track geometry defects. We love the work that the ATI does on the tracks. Our track inspectors appreciate the track geometry machines that come through and catch those defects. But what they don't catch is what the visual eye can catch, and that is a lot of the basic defects that are out there. It catches about six. There are 23 codes in the FRA, and it catches about 6 of those defects, and they are all track geometry, the measurements of the track, track surface, track gauge, things of that nature.

Mr. WEBSTER OF FLORIDA. So, is it better, the same, faster? What's the difference?

Mr. CARDWELL. For track geometry, I would argue that it does a better job for track geometry, but it doesn't catch a large percentage of the defects that are out there. It only catches about 26 or 27 percent of the defects on the track.

Mr. WEBSTER OF FLORIDA. So, is it checking the track or the vehicle's mechanical parts, or both?

Mr. CARDWELL. I'm sorry, what was the question?

Mr. WEBSTER OF FLORIDA. Is it checking the track itself or the mechanical parts on the car itself? Wheels, axles, things like that. What does——

Mr. MCCOWN [interrupting]. I believe you are referring to—the geometry tool detects the track. That's a different technology from, say, hot bearings or other aspects on the cars themselves.

Mr. WEBSTER OF FLORIDA. So, okay, so there is the hot bearing. Does that show up in a manual inspection, or does it take a rolling automated inspection?

Mr. CARDWELL. What was the question?

[Pause.]

Mr. CARDWELL. Yes, on the hot bearing detectors, they are different. We represent the track inspectors that do the work, but I would say that hot bearing detectors, the best thing that can be done to detect those is a strong visual inspection, and that was what was said by the STB, as well, after the East Palestine derailment. There is technology that catches it, but the technology doesn't relay the information as quickly as it should, obviously, as seen, and the technology isn't as prevalent out there as it should be.

The detectors were too far apart in the East Palestine derailment is what was decided by the STB. There should be more of them out there. There wasn't enough, and that was the determination from the STB report.

Mr. WEBSTER OF FLORIDA. Okay, I am way over, sorry about that, but thank you for your answers. I appreciate that.

So Ms. Titus, you are recognized.

Ms. TITUS. Thank you. Well, I would like to continue this conversation, because I said in my opening remarks, I think there were 17 defects that couldn't be found by this geometry technology that needs the eye to see them.

And, Mr. McCown, I think you need a different analogy from the eye and the x-ray machine, because every time you have an x ray, then you have to have a person come in and read that x ray. It doesn't read itself and find the problem and take care of it.

So, maybe we can go back to you, Mr. Cardwell. Talk again about some of these defects that a person can see if they are out there inspecting that this technology can't find. And tell us how many of these you might find in a week or a month. How prevalent are they? And how trained do you have to be to find these things? I mean, it's not just somebody walking down the track. These are experts who are looking for these kinds of things just in case, because they are such safety problems.

Mr. CARDWELL. Thank you for the question, Congresswoman Titus.

It takes an immense amount of time to become a track inspector, and a lot of studies and research and testing that is done before you can become a qualified track inspector. So, yes, they are very skilled workers, and they are able to find defects that no technology can find.

And they are also able to rationally deal with the defects as they come. For example, when you run into a track defect, it is not always just a defect that is caused by some random thing. It is usually a multitude of issues that are causing that defect. So, for example, there could be water issues in the area that are causing a surface level issue. The ATI machines are unable to determine that there is a water problem. The visual inspections, you are able to see that there is a water problem, where there is a drainage issue, where there is a lot of mud or issue in that track which is causing a surface issue which causes the railcars to tip off the rail and cause derailment.

When we come up to those defects as a visual track inspection is being done, we can look at the different—the environment that we are in, and we can make determinations on what can fix the issue. And we can also prevent the track defect, which is most important. There is no preventative maintenance being done by ATI. The human inspections are what do preventative maintenance before the defect is caused.

Remember, we want to find defects before——

Ms. TITUS [interrupting]. Accidents.

Mr. CARDWELL [continuing]. It happens, not after, because defects are what cause derailments.

Ms. TITUS. Under the current regulations, if you find one of these defects, don't you have to report it and have it addressed immediately, or else there are some kind of fines or issues that arise if you don't?

Mr. CARDWELL. I am sorry. What was the question, again?

Ms. TITUS. Don't you have to report this and have it addressed immediately, or else there are some fines imposed on the railroad if that doesn't happen, or on the inspector?

Mr. CARDWELL. Yes. The waiver is asking for a 72-hour—3 days before the defect has to be corrected.

Ms. TITUS. I want to ask about that, too. I think Mr. McCown.

In the waiver, even though it's 72 hours, if you don't inspect it, there is no fine or anything, any consequences. Isn't that a part of the waiver, too?

Mr. MCCOWN. There is no fine, but I think you have to put this in context, that if——

Ms. TITUS [interrupting]. Well, that seems to be a pretty big context, if you are not—if you are taking away the fine, if you are not going to address the problem.

Mr. MCCOWN. Well, is it a problem? This is so specific, it finds——

Ms. TITUS [interrupting]. We don't know, with your technology, if we don't have a person out there looking at it.

Mr. MCCOWN. Well, just like in other modes, this technology finds things that are so minimal they may be a "wait and see." They may not need to be addressed right away. If BNSF's testing says you find 200 times more defects with this tool than a visual inspection, it is depicting very minute issues that may not require immediate action. And so, I think it has to be ranked according to safety.

And the Congress can—you all can decide what timeline is appropriate, but not everything is an overnight problem.

Ms. TITUS. Well, who determines that "wait and see"? I am not sure I want to be on a train on a track that is a "wait and see." Who makes that decision if it is too minute to address immediately?

Mr. MCCOWN. It's a safety risk management decision that operators make every single day of the week in every mode of transportation. That's what we do. We are professional risk mitigation experts.

Ms. TITUS. Bean counters?

Mr. MCCOWN. I'm sorry?

Ms. TITUS. I just said bean counters.

That's all right. Thank you, Mr. Chairman, I'll yield back.

Mr. WEBSTER OF FLORIDA. Mr. Rouzer, you are recognized for 5 minutes.

Mr. ROUZER. Thank you, Mr. Chairman. I appreciate each of you being here today to share your wisdom and testimony.

Mr. Gebhardt, I am going to start with you. When a rail infrastructure project is undertaken, whether it is upgrading a corridor, modernizing a yard, or deploying new technologies, is it just the businesses and communities in the immediate vicinity that see the benefit, or do these projects tend to generate broader regional or even national economic impact?

Mr. GEBHARDT. Well, I think, as any of these projects would be done, there is broader impact that would come——

Mr. ROUZER [interrupting]. Can you bring that microphone a little closer to you?

Mr. GEBHARDT. Yes.

Mr. ROUZER. Thank you.

Mr. GEBHARDT. There is broader impact that would come from this.

If we think about—if there is new railway equipment that has to be utilized there, there is a broad network across the country with RSI—or Wabtec in particular here—that may provide that equipment there. It could also open up opportunities to move more freight by rail, which is the safest and cleanest way to move a ton-mile, which could also open up some of the interstates and such there from what would have been truck traffic along those ways there. So there are a lot of benefits that come from this.

Mr. ROUZER. So another strong interest of the committee is how Federal grant programs can help drive innovation. Specifically, the CRISI program is first and foremost shaped to improve rail infrastructure safety and performance. But you noted much of the industry, from short lines to suppliers, have looked to use these grants as a way to deploy and scale promising technologies.

Has Wabtec directly utilized CRISI funding to advance or deploy new technologies?

Mr. GEBHARDT. So Wabtec tends to work with others for some of these grants here, where someone else may be the prime recipient of it, and we'll work with them or could also provide the technologies.

One of the keys is that we have been working very, very diligently on both Tier 4 technology, which reduces NOx by 76 percent and particulate matter by 70 percent, and also been working on modernizations where we take older technology, we upgrade them, take them from DC to AC technology, and really bring new life to them. And by doing that, we can improve efficiency by 30 percent and improve haulage ability, how much you can actually pull, tractive effort, by 50 percent. And now, with the IIJA Act, it opened up these opportunities to the short lines, where they could utilize those fundings to upgrade to Tier 4 technology and also modernize their locomotives. So it has been very beneficial.

Mr. ROUZER. So would you rate the CRISI program an essential program or nonessential program?

Mr. GEBHARDT. Oh, I would say we would recommend keeping it at its current levels that are in the IIJA. And then we would even think of even increasing the amount of grants for FRA to do more R&D, because we really do need to be developing this future technology that is out there a little bit further.

Mr. ROUZER. Mr. Shannon, I am going to come to you next. Federal regulations and implementation always seem to lag behind the pace of technological innovation, making it difficult to create the most efficient system possible in many cases.

So we have freight railroads that deploy increasingly advanced diagnostics and real-time data tools to help monitor car and track conditions, yet many of the ways we evaluate rail safety operations and equipment date back decades, some even to the steam locomotive era. Mr. Shannon, if Congress were to mandate the use of thermal wayside detectors, what impact would that have on you and the efforts of your customers to invest in railcar telematics and similar monitoring technologies?

Mr. SHANNON. I think the concern that that comes to for us is that the outcome is what we would like to see focused on, which is identifying hot bearings, failing bearings, wheel defects, et cetera, before they become emergency conditions. If we regulate a specific solution—say, more wayside detectors—that is going to sort of remove the motivation for both the car owners and the technology developers to invest their time and energy to create the technologies for the railcars themselves that you put on the railcars themselves that show the promise and have done in other industries extremely effectively of giving early detection before this becomes a critical failure mode so that the car owner has the opportunity to replace wheels, to do the maintenance activities ahead of failure, where wayside detectors tend to be more closer to time of failure when they detect the ultimate issue.

Mr. ROUZER. Yes. Well, as they say, prevention is always the best cure, no matter what we are talking about.

I yield back.

Mr. WEBSTER OF FLORIDA. Mr. Moulton, you are recognized for 5 minutes for your questions.

Mr. MOULTON. Thank you very much, Mr. Chairman. I would like to actually pick up where my colleague, Mr. Rouzer, just left off.

I agree, Mr. Rouzer, that prevention is better. But I would add that, if you have telematics that can be simultaneously or constantly monitored by the engineer, then you would also know the instant that a hot bearing is detected on a car, regardless of whether you are near a hot bearing detector. Am I right, Mr. Shannon?

Mr. SHANNON. That would be correct. Telematics on the railcar is going to give whoever is the recipient of the data the most immediate insights as to the condition of the wheel.

But again, I think the thing that we need to consider is the best use of this technology is to prevent the railcar from reaching the point where the bearing does——

Mr. MOULTON [interrupting]. Well, maybe that is the case——

Mr. SHANNON [continuing]. Get so hot it is going to fail.

Mr. MOULTON [continuing]. But if it improves safety to also have it——

Mr. SHANNON [interposing]. Absolutely.

Mr. MOULTON [continuing]. Available, I mean, why would we not do that, as well?

And my point is the same as Mr. Rouzer's, which is that if we have modern technology that can bring the accident rate down to zero, then that is what we should be using, not installing more 1960s technology which is the hot bearing detectors that the railroads have.

I mean, I assume you care about transportation and you are not buying an awful lot of fax machines because that was the communications technology in the 1960s, right?

Mr. SHANNON. Yes, I think I agree with——

Mr. MOULTON [interrupting]. You are hesitating on that, which makes me——

Mr. SHANNON [interrupting]. I had to make sure I understand——

Mr. MOULTON [continuing]. Worried that you are still in the market for fax machines.

Mr. SHANNON. No, I don't want more fax machines. Definitely not.

Mr. MOULTON. Okay, well, that's the point.

Mr. SHANNON. More technology on railcars.

Mr. MOULTON. So there is a lot of agreement here that we have got to get into the 21st century.

Mr. SHANNON. Absolutely.

Mr. MOULTON. And we have technology available today.

I mean, the fact that I can order something for $1.99 on Amazon and know exactly where that package is on the way to my house, and yet I can spend $15,000 or $20,000 to ship a railcar across the United States and have no idea where it is, no idea when it will arrive, is a little absurd.

Mr. SHANNON. That is a great concern, and it is one of the key reasons RailPulse exists is to provide a single source of truth for the location, condition, and health of the railcars using advanced telematics technologies on the railcars themselves.

Mr. MOULTON. Right. So there are improvements in customer service because you know where your car is.

Mr. SHANNON. Absolutely.

Mr. MOULTON. And there are, obviously, improvements in safety that we have detailed.

And you also made the point that the more freight that we get off of trucks and onto rail is good for the national interest. Those are your words. In 2023, there were 22,543 hazardous material incidents on highways compared to 297 freight rail hazmat incidents. It is a pretty stark statistic. Railroads have approximately 10 percent of the hazmat accidents trucks have, despite roughly equal hazmat ton-mileage, 10 percent. So we would be saving a lot of lives, a lot of money if more hazmat—just to take hazmat as an example, let alone broader freight—were transported by rail instead of truck. From 2012 to 2023, there were 82 fatalities on highways due to hazmat accidents; zero railway deaths.

But Mr. Cardwell made a very good point, which is that the railroads, especially in the last 10 or so years, have a history of taking every cost-saving measure and not putting it into expanding their traffic to actually getting more trucks off the highways. They put it into cutting service, cutting employees, and just improving profits for Wall Street. So how do we square this circle, where we want rail traffic to increase, we want technology to help us get there, but we don't want the companies to just give all the profits to Wall Street and none of the benefits to the American people?

Mr. Cardwell, please.

Mr. CARDWELL. I would say that we are more than willing to have the ATI machinery operated, and technology. We actually have pushed for more of it. We believe that they should use the ATI regularly.

The last proposal that was given from the FRA was for three times a year, and the railroad spoke against ATI, and now they are saying they want to do it 12 times a year and get rid of all the visual—75 percent of the visual inspections.

Mr. MOULTON. So here is my point.

Mr. CARDWELL. We think they should work in tandem together.

Mr. MOULTON. Look, I have only got 20 seconds left, but here is my point. I agree with what you are saying.

Mr. Shannon, I agree with what you are saying. Why can't we get on the same page here? Why won't you invite the rail unions into discussion, into the coalition? You don't even have all the Class I's yet. Let's involve some of the rail unions in this debate.

Mr. SHANNON. The answer to that question is fairly simple. RailPulse is chartered and owned by railcar owners. And it would be—we don't own the data that is in RailPulse, and so how the data is used within the railroads when they get access to it is really—is a railroad thing.

Mr. MOULTON. That has nothing to do with inviting the likes of Mr. Cardwell to the table. We all should share the same goals, which is increasing traffic by rail. You are part of the solution. But his workers are part of the solution, too, and they have a pretty good perspective. So I just hope you can work more together in the future.

VOICE. We would agree with that.

Mr. MOULTON. Thank you, Mr. Chair. I yield back.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. LaMalfa, you are recognized for 5 minutes.

Mr. LAMALFA. Thank you, Mr. Chairman. Well, it is interesting the debate going here seems to boil down to, does advancing technology mean we have less workers? And I don't necessarily think that that is what needs to happen, having less workers or also standing in the way of improved technology.

So, I guess, Mr. Cardwell, let me ask you quickly. Do you see that what is advancing here on the bottom line means that there will be less workers on the rail because it will be replaced by technology and it will be replaced by self-regulation, et cetera?

Mr. CARDWELL. We have seen a mass reduction, 30 percent—up to 30 percent reduction since 2016 in our workforce.

Mr. LAMALFA. Because of technology?

Mr. CARDWELL. As expected with some technology, yes. We understand that technology is going to eliminate some jobs. In fact, from 138 years ago, we have seen thousands of railroading jobs lost because of technology.

Mr. LAMALFA. Yes, I have read your outline on that. Tampers and all the way through, that labor saving made it easier on the workers, but has resulted in less workers.

But I guess what you are looking at here, do you believe what we are talking about here with this advanced telemetry and such, if that is implemented, does that mean less workers?

Mr. CARDWELL. I am sorry, what was the question one more time?

Mr. LAMALFA. With this additional telemetry and more advanced technology, does that mean less workers to you?

Mr. CARDWELL. I can't hear.

[Pause.]

Mr. CARDWELL. Yes, the waiver is asking for a 75-percent reduction in human inspection, visual inspection.

Mr. LAMALFA. Okay, let me throw it to Mr. McCown or Mr. Shannon on that.

Is that your goal here, is that you will have actually less online workers because the technology makes that possible?

Mr. MCCOWN. Well, I think, from the think tank's perspective, we are agnostic on that solution. But I think what it does is the people who are the finders are also the fixers. It allows you to redeploy your assets to where they are needed most.

As I mentioned during my opening, technology often makes more work to be done, not less work. And I think we are getting stuck between this either/or, and it's not.

Mr. LAMALFA. That's what I am wondering.

Mr. Shannon.

Mr. SHANNON. Yes, I would agree with what Mr. McCown said. The technology is not designed to eliminate work. It is actually designed to make the work more effective, more productive by highlighting and identifying issues. And those issues then need to be worked on by somebody. They need to be evaluated and verified, and then, as appropriate, any repairs and other actions need to be taken. There is nothing at what RailPulse is advocating for to eliminate jobs.

Mr. LAMALFA. All right. Mr. McCown, a bit earlier there was a discussion about the technology at a more microlevel, confined, maybe more flaws. Maybe you are talking about a piece of rail where you can find a very microcrack or something, for example, that maybe a visual inspection would easily pass over. So now we know about that microcrack, and you are talking about like, well, does it rise to the level of repair right now?

I mean, if my pickup has a dent in it, it doesn't keep me from going out in my fields. But if I have a bent frame or a leaking axle or something, then that does. So can you comment a little bit more on the action level of what your technology finds as to—you kind of talked about a risk tradeoff. Like, a slight crack in a rail that visually wouldn't be seen wouldn't even be known about. Does that mean you have got to repair the rail, that type of thinking?

Mr. MCCOWN. Thank you for the question, sir. That is a very good point.

And if you think about it, we have preventive tests. It's to make a holistic assessment of the infrastructure asset over its entire lifetime. If you can find things early, you can watch them to see if it's getting worse, if a defect is propagating or it's not. It's crucial for the risk management, and it's integral in an SMS type of approach, which is about continually raising the bar. But not every defect requires immediate action. That's the analysis part that takes people.

Mr. LAMALFA. Okay. Mr. Shannon, is the FRA standing in the way of the advancing technology? My notes are saying there seems to be some holdup, that FRA wants to just stick with the old technology and is kind of not embracing the ability to integrate new in its regulation.

Mr. SHANNON. To date, FRA has been supportive of what we are trying to do at RailPulse, so I don't know that they are necessarily standing in the way. However, if they advocate for specific technologies and sort of shut down innovation in the process, that would stand in the way.

Mr. LAMALFA. They may be seeking to lock in technologies is what I am kind of hearing. But are they open enough to look at what we are talking about here to let it be approved?

Mr. SHANNON. I would say they have been open to RailPulse——

Mr. LAMALFA [interposing]. All right.

Mr. SHANNON [continuing]. For sure.

Mr. LAMALFA. Mr. Chairman, I will yield back.

Mr. SHANNON. They have been supportive of what we are trying to do.

Mr. LAMALFA. Thank you. Thank you.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mrs. Sykes.

Mrs. SYKES. I am down here. Thank you so much, Chairman. And thank you, Ranking Member Titus, for holding this hearing today. To our guests and witnesses, thank you for being here, as well.

I have many times in this committee raised the issue of rail safety, and I think today's hearing on how our Nation can modernize our rail system is a perfect place to address it again.

As you all know, and as we have discussed today, on February 3, 2023, a Norfolk Southern train carrying hazardous chemicals derailed in East Palestine, Ohio, which is right next door to my district in northeast Ohio, causing many issues and long-term issues for folks in not only Ohio, but our neighboring State of Pennsylvania.

Certainly, no one should have to deal with the horror and fallout of what occurred from this disastrous derailment. But what is even more upsetting is that this entire derailment originated from a wheel bearing that failed and a wayside detector that failed to identify the issue in time. Because these detectors are placed over 20 miles apart, this overheated bearing was only noticed after any effective action could be taken to save the bearing and prevent the catastrophe that we saw that day.

In my time as a State legislator, I have kept with me this advice from our public safety director, who reminded us that if something is predictable, it is preventable. And it is maddening, because this incident was predictable and preventable. And because neither of those things happened, an entire community has been upended, with little done to rectify their safety and their concerns.

So to ensure that this kind of disaster doesn't happen again, I introduced the RAIL Act. It is a bipartisan, commonsense piece of legislation. Among other things, it includes policies that specifically address the issues of failing wayside detectors. If the RAIL Act were signed into law, wayside detectors and hot boxes would be required every 10 miles of track, rather than 20. Were this policy back in place in February of 2023, this tragedy could have been prevented altogether, and we would not be worrying about the long-term health effects of a controlled burn in eastern Ohio.

But during the investigation of the disaster, it was also reported that railcars were being dispatched after giving an inspector only 30 seconds to inspect each side of the railcar. Thirty seconds is hardly enough time to get around and walk around the railcar, let alone check one to confirm that it is safe to transport potentially hazardous cargo. And some of these trains, as you know, are double

stacked and miles long. So I am happy to report that, after working with various labor groups, the RAIL Act also required the Department of Transportation to update railcar inspection regulations and audit related inspection programs. And this will prevent limiting the time for employees to do these complete railcar and locomotive checks.

So Mr. Cardwell, if you could please speak to the importance of ensuring that these safety inspections, whether for tracks or railcars, aren't rushed. Because one thing I have noticed in this conversation—and other colleagues have mentioned—technology and the rail workers should go hand in hand and be complementary to one another. But if you are shortchanged with even your ability to do the work, then what good is the technology?

Mr. CARDWELL. The answer is "Yes." All of us, all the crafts are fine with the technology that is coming in, and we want to work with them to develop this technology and make sure that it works well. So we do want to work in tandem with these different technologies.

I will remind you and the rest of the committee that the railroads have the ability to use this technology as much as they want to. The key factor is they are trying to eliminate the human factor, the human inspections to cut cost and then bring this technology in when it is simply unproven and can't catch the defects the way the human inspections can.

So on the railcar issues, I am not a carman and I don't represent the carmen, but I can tell you and assure you that they do want more thorough inspections done of cars. And we also want an adoption of the technology that helps catch some of these other defects that the human eye can't catch. So yes, we can work together and achieve a much safer railroad if we are willing to do that.

Mrs. SYKES. Thank you, Mr. Cardwell.

And Mr. Shannon, I know one of my colleagues talked to you about bringing labor to the table. I have about 30 seconds left, and so this is about the amount of time someone would have to inspect one of these train railcars. But in the time remaining, maybe you can give a full answer to my question about how and what are some of the best ways to include labor in these conversations so that employees are able to help you institute technology and make sure our communities are safe?

Mr. SHANNON. From a RailPulse perspective, I would say our members would bring labor in as appropriate into the discussions about how to use the data that comes out of RailPulse. Our goal as RailPulse is to ensure that data is made available, that it is timely, it is secure, and that all of the right people that need to have access to it get access to it. But since we don't have a direct relationship with the labor, I would say that would be through our member companies that do use the data, including the railroads.

Mrs. SYKES. Thank you, Mr. Chair. I am over time by 30 seconds, and it just goes to show he couldn't even answer the question in the amount of time it takes for folks who are given that time to inspect brakes in railcars. I yield back.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. Stauber, you are recognized for 5 minutes.

Mr. STAUBER. Thank you, Mr. Chair.

We are witnessing a technology boom in the rail industry that is poised to make freight and passenger rail safer and more efficient than ever before. During my time as a law enforcement officer, I saw similar technology advance. At first we officers sometimes met these changes with resistance. However, we often came to realize the great benefits that the technology provided us, whether it helped track down a criminal or improve our response time to a concerned citizen or kept us safe.

Importantly, we were brought into the conversation. We were brought into the conversation. I think it is equally important that our rail workers are brought into the conversation about rail technology, as my colleague just mentioned.

Rail workers are the first and last line of defense for safety in the rail industry. But technology can supplement their efforts and enhance their processes, and we should take advantage of American ingenuity. Mr. Cardwell, in your testimony, you mentioned that you want to work with the railroads and private companies to develop the next generation of technology. What are some of the technologies that you and your members are excited about?

Mr. CARDWELL. I have recently done a couple of agreements with the railroads that have allowed snow removal with these amazing machines that they are using in the high parts of California, and they are doing snow removal much faster, eliminating quite a few snow removal jobs, for example, and we negotiate those agreements. We are excited about them. Our guys do operate them, but it did take away a lot of jobs in the snow removal area of the work that we do. We have negotiated agreements for car plate—where they lay the plates on the rail, where it is a very safety-sensitive job, and they use a plate machine now, and it eliminated two or three jobs on each gang.

So we have negotiated technology and are excited for technology that doesn't eliminate safety. In this case, we wish they would use the technology every day of the week on the railroad tracks. We wish ATI would run regularly, at least once a week. It would be great. It is a good supplement to the work that our track inspectors do. We are not opposed to it, and I want to emphasize that over and over again. We simply don't think there should be a reduction of 75 percent in the human inspections. It is unsafe.

Mr. STAUBER. So how can rail technology companies collaborate with unions such as BMWED to achieve the goal of safety?

Mr. CARDWELL. What was the question again?

Mr. STAUBER. How can rail technology companies collaborate with the unions to achieve the goal of safety?

Mr. CARDWELL. Well, we have the professionals that know this work. They understand it, and they are the best people to come in with the technological groups and talk to them about how these machines could operate, or what would be better, or better refine them. And we are more than willing to take that time to sit with them as a union, and even bringing in members from the field, the professionals, the people that do this work, to help explain and work with these technological groups to figure out what is the best way to do it, the safest way to do it. That is the important thing, is safety. So we are more than willing and have spent time and money doing that.

Mr. STAUBER. Thank you.

Mr. Shannon, can you highlight how the current regulatory process at FRA has stifled innovation?

Mr. SHANNON. I would say the concerns that we might have would be where any kind of regulatory process specified a solution and sort of shut down the motivation for our car owner-members and the technology companies we work with to innovate to chase an outcome, as opposed to build something that has been prespecified.

It is important that we focus on the outcomes and the performance we want out of the system, and use the innovation engine that is embodied in the North American technology sector to come up with the best solutions to address those challenges, as opposed to having the solution mandated for us.

Mr. STAUBER. Mr. Gebhardt, same question: Can you highlight how the current regulatory process at FRA has stifled innovation?

Mr. GEBHARDT. We work within the frameworks that the FRA has. On some of these, if we had more outcome-based metrics for success to go ahead and move forward so that we can move forward on the waiver process and then move forward into actual adoption, that could help the process overall.

Mr. STAUBER. So outcome-based, not mandating.

Mr. GEBHARDT. Well, outcome-based, meaning we state what the outcome would be for this technology to be accepted. So it might have to have 98 percent accuracy, or it might have to last a certain amount of time. Being more outcome-based on that could help us through the process.

Mr. STAUBER. Okay. Thank you very much.

Mr. Chair, I am out of time, and I yield back.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. Deluzio, you are recognized for 5 minutes.

Mr. DELUZIO. Thank you, Mr. Chairman. Welcome, everyone. I am particularly glad to see a western Pennsylvania company, Wabtec, represented here.

Mr. Gebhardt, I will start with you. I know the company is doing quite a bit of innovation around locomotive and rail technologies, making lots of products for Amtrak and others across the rail industry.

I will note the Bipartisan Infrastructure Law, I think, was a really important investment that helped support the development of those technologies for Amtrak in particular and others, but I think there is ripple effect, right, helping other manufacturers and workers.

Tell me about some of the work you guys are doing on locomotive technology. What are the opportunities and some alternative energies? What can the Congress be doing? What should we be thinking about to help stimulate some of that development?

Mr. GEBHARDT. Yes, thank you, Congressman, for the question.

When I look at the technologies we are really working on, we are working a lot with our Tier 4 locomotives.

Mr. DELUZIO. You lost your mic, Mr. Gebhardt.

Mr. GEBHARDT. Yes. Okay, with our Tier 4 locomotives and also with our modernizations. We are taking, with the Tier 4, 78 percent reduction in NOx, 70 percent reduction in particulate matter,

with our modernizations taking older locomotives and bringing them up to modern standards when we do that. The IIJA really helps with that because it opens this up to the short lines, allows them to step into this, and really helps with the funding of that.

On the development side, some of the R&D grants that are coming through are helping with the alternative fuels that you had mentioned there. We are working with biofuels, renewable fuels to make sure that those are capable technologies there. We have also been working with LNG. We have a number of liquid natural gas units that are operating right now as an alternative fuel, and these were a lot of things that were developed under some grants that were done.

So we are very supportive of continuing with these types of grants to really bring this technology forward.

Mr. DELUZIO. Well, it seems to me there is a business benefit if you can get your fuel and energy costs down. I think there is an air quality benefit for all of us. And so I think this is a good opportunity that Congress should pay attention to here, as well.

Mr. Cardwell, I want to come to you, as well. I picked up on some of the discussion about automated track inspections and your point is a good one to me, as I hear it, that you and your members are all about better technology, helping the railroads implement this stuff, but you need humans in the mix, you need humans involved. Tell me what this looks like to one of your members. How this technology—how they use it, how you see this being implemented in a way that is safest and that brings to bear the expertise your members have.

Mr. CARDWELL. Let's just take the ATI machines, for example, the one that was the primary discussion today concerning track inspections. Our track inspectors are happy when the ATI machine comes through the territory because it catches certain defects that the human eye can't. And so they are glad to see it come through the territory because it catches geometry measurements that the human eye can't catch, and that is always helpful. So they like when that comes through.

But there are many things that these machines can't catch that the human eye can. There is a whole list, in fact. The large majority, 73 percent of the track defects, can only be caught by the human eye. And so they like working with that technology, they are glad when it comes to their region or territory. There are many others.

The machinery that is being used today on the railroad is much more technologically advanced, and they love operating that equipment. It has cut jobs, but we are happy with the machinery because it is more efficient and safer.

Mr. DELUZIO. And some of the things that you just mentioned, a big percentage—I think 70 or so percent, you are saying—that the human eye can only capture, give me some examples of what that might be.

Mr. CARDWELL. Sure. So for example, just a broken rail cannot be caught by the ATI machinery. The rail, what happens when it heats up and it cools, it expands and contracts. And so that rail breaks, and it happens all the time. There are literally probably

several hundred broken rails a day across the railroads, and those broken rails can cause derailment, for obvious reasons.

Mr. DELUZIO. Is that the number-one cause of derailment, track issues like that?

Mr. CARDWELL. Track issues are the number-one cause of derailment. I think 50-plus percent of track derailments are caused by rail defects and, most importantly, in switches. And this ATI machinery does not pick up most of the defects inside of a switch. Most derailments are caused within a switch when one train goes to another track, it goes from one track to another. And in that switch, there is a lot of defects that cannot be detected by any technology right now.

Mr. DELUZIO. Very good, Mr. Cardwell. My time is up. Thank you both.

Mr. Chairman, I yield back.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. Nehls, you are recognized for 5 minutes.

Mr. NEHLS. Thank you, Mr. Chairman. And as we talk about this ATI, you talk about 73 percent, I am just going to make a comment.

I believe that, East Palestine a couple of years ago, a little over 2 years ago, February of 2023, I think ATI is a good thing. I think it really, really is. That technology is available today, and I believe it improves safety. I don't believe the Class I's really want to go out there and have derailments. I mean, it just doesn't make sense. So they are spending an enormous amount of money with this ATI because they want to continue to have what I would say is a very good record on moving goods and services across our country, and doing it very safely. I applaud them for that.

I don't believe ATI was really ever created to completely eliminate visual inspections. I don't think that was the intent here. I believe it is an augment. They will augment the visual inspections. Now, whether the FRA is saying 75 percent, whatever, I don't know about that. But I do not believe—when the Class I's are investing in this technology, it is costing money. I have been around, I have seen these machines that travel to and fro, and it is costing them an enormous amount of money. I believe it is all in the name of safety, and they are deploying these things along the network.

And at some point in time, this technology may justify reducing the workforce. I mean, it just makes sense. You mentioned 73 percent. With this evolving technology, let's say ATI identifies six, or whatever the number is. Everybody is going to have a number of these flaws, these deficiencies. What happens when the technology is so good it can identify all of it that we don't—maybe don't need any of you to do it? Would you support that, then, or would you say, well, I just don't believe that that's—no.

Mr. CARDWELL. If the data safety—if the—first of all, Congressman Nehls, we thank you for your leadership——

Mr. NEHLS [interposing]. Sure.

Mr. CARDWELL [continuing]. And your work for us.

I would say that if the technology proves safer, then the unions have to adapt to it.

Mr. NEHLS. Yes.

Mr. CARDWELL. And we have.

Mr. NEHLS. Yes.

Mr. CARDWELL. Historically, across all levels of machinery, we have been more than willing to allow that technology in as it is proven safe. In this case——

Mr. NEHLS [interrupting]. I guess I just want to—I got a couple of minutes, I want to talk about, really, the modernization act. But the point I am trying to make is management and labor, you have got to get together to talk about—we are all concerned about safety. When I was the chairman of this subcommittee, we had all the unions in there, we were trying to get some good legislation in on improving safety. But let's understand that I don't believe the Class I's are out there and they want to see derailments today.

And I have to say, for the last couple of years, it has been pretty good. We haven't any mushroom clouds over any of our communities in the past 2-plus years, and thank goodness we haven't. So I applaud the Class I's and everybody else that is working hard to keep our rail as safe as possible.

I am sure you all may be familiar with the bipartisan bill. It is the H.R. 2515, the American Tank Car Modernization Act. That's my bill, and I led it with Seth Moulton, Congressman Moulton. This bill will provide Department of Transportation grants through the FRA directly to railcar owners for the purchase and installation of telematics devices, with the achievable goal of greatly speeding up the adoption of telematics on the 1.6 million railcars.

I mean, this is just common sense. This is the heartbeat of the car. Why wouldn't we do this if the technology is there? Having telematics on an increasing number of freight railcars will significantly provide upgraded supply chain visibility, safety enhancements, create maintenance efficiencies, and enable comprehensive telematics solutions for the shippers and the stakeholders in the rail system. That is just common sense, you guys, it is common sense.

For far too long, we have talked about increasing the use of freight rail and bringing the rail system into the modern ages when the solution, it's right in front of us and has been effectively used by trucking—it has been used by the trucking industry for decades. We just don't use it in the rail.

Mr. Shannon, please illustrate the position of RailPulse on H.R. 2515, and how the legislation would impact the entire rail industry.

Mr. SHANNON. First, we are very supportive. Thank you very much.

How it would influence the industry, I think, is it changes the economics. That——

Mr. NEHLS [interposing]. Sure.

Mr. SHANNON. Our biggest challenge right now, with the adoption of telematics on railcars, is the justification of the initial expense of equipping a railcar.

Mr. NEHLS. Sure.

Mr. SHANNON. And through the lens today of a car owner, they need to do an ROI equation for themselves based on the direct benefits. Those direct benefits may or may not be equal to——

Mr. NEHLS [interrupting]. Thank you.

Mr. Gebhardt, how do you feel? How is Wabtec? Good deal?

Mr. GEBHARDT. We are very supportive——

Mr. NEHLS [interrupting]. Yes, thank you.

Mr. GEBHARDT [continuing]. Of telematics.

Mr. NEHLS. I've got 10 seconds. I am going to finish here.

We have talked to hundreds of people in the rail industry over the past few years. Commonsense themes of using freight rail keep coming up. Using rail is complex, it is inconsistent, and could be more costly than other modes. And I want freight rail to be used more. We want it to be used more, not less, and it is a safe way to transport the goods that America needs to thrive and grow. The entire operational system needs to be averse to the modern solutions we give shippers more of a reason to use it [sic].

So let's get this done. It's bipartisan. I am looking forward to working with industry and labor on how we can make rail the safest possible mode of transportation in the country.

Thank you. I yield.

Mr. WEBSTER OF FLORIDA. Thank you very much. Mrs. Foushee, you are recognized for 5 minutes.

Mrs. FOUSHEE. Thank you, Chairman Webster and Ranking Member Titus, for holding this hearing. And thank you to the witnesses for being here today.

Mr. Cardwell, under current regulations, if a track inspector finds a track defect, they are required to immediately do one of two things: either take the track out of service or place a speed restriction on the track until the defect is fixed.

Alternatively, under AAR's recently submitted waiver, if a railroad is using automated track inspection technology, or ATI, they would have 72 hours to send out an inspector to check the defect, but there aren't currently any requirements to take the track out of service or reduce train speeds until the defect is fixed.

As we are all acutely aware, safety regulations often have to play catchup as new technologies like ATI are developed or deployed. And it seems obvious to me that this is an area that needs to be seriously looked at by the DOT. Can you speak a little about the way in which this loophole in Federal regulation can lead to increased risks in rail safety, and why it is important for automated track inspection technology to be subject to the same safety protocols as human inspectors?

Mr. CARDWELL. It is pretty hard to understand why they would ask for such an exception. It is a serious safety concern that we have, a 72-hour delay of putting a remedy on a defect.

Just for a quick explanation, when a track inspector finds a defect, he stops or slows down that track. He can slow the speed down so it is safer to travel across. He can stop any trains from going over it. He may fix the defect itself, but there is a remedy immediately taken. And in this case, they are asking for 72 hours. I don't know that anyone wants to be around a railroad track where a defect is on that track for up to 72 hours without being corrected. I know I wouldn't go anywhere near it, and it is a danger. It is an extreme danger. I think the waiver is extreme.

Mrs. FOUSHEE. Thank you for sharing that perspective.

I think we all recognize the potential that developing technologies like automated track inspection and AI have to help improve rail safety outcomes and protect our communities from accident. That said, I also firmly believe that it is of paramount impor-

tance that these new and exciting technologies are used in conjunction with and under the supervision of human inspectors and other trained rail safety workers, not as a substitute for them.

Mr. Cardwell, I am curious, from your experience, how you have seen new technologies assist the critical role that human inspectors play in interpreting this influx of tech-generated data, and why you think it is important to have humans, not computers, making rail safety decisions.

[Pause.]

Mr. CARDWELL. The question—we can work together—makes it better is because our people that do the work know it best. They do the work. We have an average of, I think, 29 years of seniority in the rail industry. Those folks know this work inside and out, and they can work with the people that do this work in conjunction with them, and help them make a safer railroad.

We believe that we can take the derailment, which—the derailments that are happening right now per million rail-miles traveled are as high as they have ever been. We did measurements clear back to 2015, and we still have the same amount of derailments today as we did in 2015 per rail-mile traveled. We think working together we can lower that derailment, those derailments in America by using this technology, but also working with the human inspectors and human workers that do this work—and they are professionals—and work in conjunction with them, and we can build a better railroad.

Mrs. FOUSHEE. And one final question. It is critically important that innovations in railcar inspection technology are used to support and supplement in-person inspections performed by qualified mechanical inspectors. So how can automated track inspection technology be used to support the vital safety work that our BMWED members perform every day?

[Pause.]

Mr. CARDWELL. The ATI machinery catches measurements, it measures the track constantly. And in doing so, a human inspector can't do that so it works well for what it does. And we believe that they should continue to use it. In fact, we proposed they should use it more often, not less, because it does catch those measurements that the human eye can't. It works well. In the areas that it has been used it works well. We are not opposed to it at all.

We just—the current FRA proposal that we had from a year ago is still sitting on the table that can be picked up and used, and it proposes that we use it more often, not less often. And we support that bill.

Mrs. FOUSHEE. Thank you for that.

I yield back, Mr. Chair.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. Mann, you are recognized for 5 minutes.

Mr. MANN. Thank you, Mr. Chairman. Thank you for having this hearing, and thank you all for being here this morning.

I represent the Big First district of Kansas, which is roughly two-thirds of the State, most of the western and some of the eastern part, as well. Kansas, my State, is served by more than 4,600 miles of active rail, owned and operated by 14 individual freight railroads that connect our manufacturers, farmers, producers, and natural

resources to domestic and foreign customers. These railroads move nearly 40 million tons of freight across Kansas annually, and serve as a huge economic driver for the economy.

Our freight railroad operations must focus on keeping our communities, consumers, and workforce safe while ensuring our Nation's supply chains remain efficient. Overburdensome rules and regulations can greatly hinder these efforts to move goods and people across the network, and I look forward to hearing from you all today on how Congress can help alleviate some of these burdens.

A handful of questions. First for you, Mr. Gebhardt, what are some of the challenges that businesses like yours face when Government rules and regulations are inconsistently applied?

Mr. GEBHARDT. Well, consistency, of course, is important there, and making sure that they can be applied, because we don't want to have a locomotive for every State in order to meet requirements.

Also, we don't want to have different varying degrees there, so we try to have consistency. We would like to try to build [inaudible] as much as possible. Our Tier 4 locomotive, we like to build those. We like them to have constant standards for that.

Mr. MANN. Can you elaborate on how a more comprehensive regulatory reform such as moving to a performance-based framework could provide greater certainty to railroads and to rail suppliers?

Mr. GEBHARDT. Yes, and this is something that is important to us also. So we have been monitoring our locomotives for a long time now. We talk about telematics. Since 1998, we have been pulling data back on our locomotives. And right now, we have 18,000 locomotives that we pull the data back on. We get 10 million data messages a day. We can analyze all of that to understand how can we extend intervals, how do we work differently, how do we make sure that we improve the product so that it can be a condition-based maintenance, condition-based inspections, and condition-based intervals.

Mr. MANN. It is important, in my view. Last question, and again for you, Mr. Gebhardt. We often associate regulations with safety, but ignore the positive role that deregulation may have in promoting the exact same outcomes. In the railroad industry, how important have past deregulations been in improving safety outcomes?

Mr. GEBHARDT. I would say—I will talk more generally about what we do around safety on this. Safety is paramount to all that we do, and we focus very tightly on that. We think about Positive Train Control and such around this. Positive Train Control, we do—1 million miles a day of data we get back. And so we understand exactly how the trains are operating such there. We then put our TO, our trip optimizer, which is the adaptive cruise control, to help the engineers and conductors operate the trains through the terrain to drive down the fuel usage on that, but also drive up the safety, the train handling as part of what it does there.

We gather all this data, we learn from the data, we make it better. And I think that is what—a lot of this big data that people are talking about, we have been doing it now for 30 years, almost 30 years now, pulling all this data back. We learn a lot from it. We are starting to apply AI, but most of what we do is deterministic

right now. And whenever we do use AI, we put a human in the loop just to make sure that the right answers are going back on that.

Mr. MANN. Great. Well, thank you all for being here. Thanks for your time.

And, Mr. Chairman, I yield back.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. García, you are recognized for 5 minutes.

Mr. GARCÍA OF ILLINOIS. Thank you, Mr. Chairman, Ranking Member, and to all the witnesses here today.

Mr. Gebhardt, your company develops and maintains software used by train dispatchers. For instance, train dispatchers employed by a major commuter railroad continue to experience issues with their dispatching system developed and maintained by Wabtec. These issues include the system glitching and incorrectly showing train locations. The only solution Wabtec has offered to these train dispatchers is to turn off and restart their computers.

While the computers were turned off, no backup system was in place, and the train dispatcher had no way of knowing the location of trains or monitoring on-track worker safety. In other words, the train dispatcher was completely in the dark until the computer restarted. Dispatchers had to restart their computers several times a day, and the issue persisted for years.

Mr. Chair, I would like to request unanimous consent to submit a letter for the record from the American Train Dispatchers Association dated March 27, 2024, to the FRA, outlining dangerous flaws where the dispatch system provided inaccurate information and failed to display the position of the power-operated switches controlled by the train dispatcher. This issue occurred at BNSF, which also uses a dispatch system developed and maintained by Wabtec.

[The information follows:]

Letter of March 27, 2024, from L. Ed Dowell, President, American Train Dispatchers Association, to Hon. Amit Bose, Administrator, Federal Railroad Administration, Submitted for the Record by Hon. Jesús G. "Chuy" García

MARCH 27, 2024.

The Honorable AMIT BOSE,
Administrator,
Federal Railroad Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590.

Via email

Re: March 26, 2024 BNSF Train Dispatcher Software Taken Out of Service Due To Safety Concerns

DEAR ADMINISTRATOR BOSE:

Please consider this letter as a formal complaint and a request for a complete investigation and audit of the BNSF's "Auto Router", "Movement Planner" and "Train Management Dispatch System" (TMDS). On March 26, 2024, BNSF Manager Dispatching Practice and Rules issued BNSF Railway Control System Notice No. 75 stating, "*A TMDS defect was discovered where incorrect data is being communicated from TMDS to Movement Planner. As a result of the TMDS data defect, effective March 26, 2024, the Auto Router function is being temporarily disabled. It will be disabled at the system level on CTC territory. This will allow time for Wabtec to develop and test an enhanced TMDS version that addresses the TMDS data defect.*"

When Auto Router is on, TMDS has a defect that Auto Router triggers. Basically, TMDS pulls a past switch position from archived data and subsequently throws the switch in the field and *does not properly display the position of the switch in TMDS to the dispatcher*. This was first reported to BNSF last year. Fall of 2023 a BNSF Train Dispatcher reported a potential safety defect to BNSF Safety Hotline (the dispatcher has all supporting data). After a short investigation BNSF stated that they were unable to replicate the defect and advised the train dispatchers on that desk to take Auto Router offline at that location only. A few months later, the same defect occurred on a different desk. Now on March 26, 2024, the BNSF has taken Auto Router down on their entire system. This significant action should demonstrate the seriousness of this defect. Even more concerning, is that at least one other Class-1 Railroad uses Auto Router.

ATDA believes strongly that all software used by train dispatchers that affects the safe movement of trains and on-track equipment should be required to be tested and certified safe by the FRA. The current practice by railroads to implement and utilize these safety critical technologies without being thoroughly vetted is unacceptable. We cannot continue to allow the safety of our communities to be left in the hands of railroads.

The primary ATDA contact on the property is:

Kevin Porter, Vice President
porter@atda.org
(817) 733–7664

We look forward to working with you to investigate and resolve this serious safety issue.

Respectfully submitted,

L. ED DOWELL,
President, American Train Dispatchers Association.

Enclosure: BNSF Railway Control System Notice No. 75

cc: Karl Alexy, Associate Administrator & Chief Safety Officer, FRA
Andrea Wohleber, Senior Advisor, FRA
Kevin Porter, Vice President, ATDA
Eddie Hall, President, BLE/T
Tony Cardwell, President, BMWED
Mike Baldwin, President, BRS
Jeremy Ferguson, President, SMART–TD

Mr. GARCÍA OF ILLINOIS. Mr. Gebhardt, I am very concerned about the flaws reported by the ATDA and the workers on the ground. What is the average time that it takes for your company to resolve safety concerns that are reported by workers such as train dispatchers?

Mr. GEBHARDT. Well, I am not aware of the specific issue that you brought up there, but we are more than happy to get back to you on that.

For safety issues, we take those very seriously. In fact, we typically get back within hours, rather than within days. So I would like to learn more about the case that you brought up there, and make sure that I can understand it better and take whatever actions are necessary on that.

Mr. GARCÍA OF ILLINOIS. And to my question?

Mr. GEBHARDT. How long——

Mr. GARCÍA OF ILLINOIS [interrupting]. The time that it takes to resolve safety concerns that are reported by workers such as train dispatchers.

Mr. GEBHARDT. Yes, so once a safety case comes into Wabtec, we immediately start taking action there. We try to work through a triage process, where we decide what the severity of the safety issue is, and then decide what the short-term containment plan would be, and then what the long-term corrective action is.

Mr. GARCÍA OF ILLINOIS. Is there an average time on those reports?

Mr. GEBHARDT. I don't have that available.

Mr. GARCÍA OF ILLINOIS. And what steps do you commit to take to ensure that technology used by train dispatchers is fixed?

Mr. GEBHARDT. I missed the last word.

Mr. GARCÍA OF ILLINOIS. What commitments will you take to ensure that technology used by train dispatchers is fixed?

Mr. GEBHARDT. So we have a rigorous safety process internal. We also work with the FRA, the TSA, and others to make sure we meet all the applicable safety standards. And typically, our internal safety standards are higher.

Mr. GARCÍA OF ILLINOIS. Thank you.

Mr. GEBHARDT. So I——

Mr. GARCÍA OF ILLINOIS [interrupting]. Mr. Cardwell, I understand the flaws with the dispatcher software can pose severe safety risks to workers on the train tracks and the general public. Should new technologies such as dispatch systems be overseen by the Federal Railroad Administration?

Mr. CARDWELL. Thank you for the question. The answer is "Yes."

When we have workers out on the tracks and the dispatchers are watching our back, they are the ones that keep the trains from coming in on our work groups. And if there is a glitch or there are problems, that puts our workers in peril. And I would argue that it should be regulated. If it is not, and there is an incident or there is a glitch like that, it would be devastating. So the answer is "Yes."

Mr. GARCÍA OF ILLINOIS. Well, thank you, Mr. Cardwell. And of course, thank you and all the witnesses for being here today.

I yield back.

Mr. WEBSTER OF FLORIDA. Thank you so much.

Mr. Westerman, you are recognized for 5 minutes.

Mr. WESTERMAN. Thank you, Mr. Chairman, and thank you to the witnesses for being here today.

As we talk about innovation and construction and all the things we would like to see not only in our rail system but, really, in the infrastructure across our country, an issue that comes up often is permitting and permitting reform.

And as you are aware, in a recent 8-to-0 Supreme Court ruling that involved the railroad in the Uinta Basin out in Utah, the Supreme Court said something that we have been saying for a long time, that NEPA is a process to review permitting, it is not something that produces an outcome. But I think this is a major decision by the court. And as Justice Kavanaugh said, Congress did not design NEPA for judges to hamstring new infrastructure and construction projects. So I would just like to maybe start with Mr. Shannon, and go down the dais or the table and tell me how important permitting reform is in your area.

Mr. SHANNON. I will confess, permitting reform is out of scope, really, for RailPulse. We are the car owners, so we don't get involved in permitting for railroad, new track or anything like that. So I would have to——

Mr. WESTERMAN [interrupting]. So building more rails wouldn't help your business?

Mr. SHANNON. It certainly could, but it is outside of the scope of what we do. It would be more of our members' focus.

Mr. MCCOWN. Congressman Westerman, thank you for the question.

Permitting reform is crucial. We used to be an America of builders. We built things. It is next to impossible to get anything built. And whether you are on the left or you are on the right, these permitting regulations affect us all. And NEPA was never meant to be a bedrock environmental law. It is a process law. And as you know, at the end of NEPA, you can go ahead and build it, even if it says there are going to be significant adverse consequences.

We have to reform it because it is being used by the loser to hold up projects. Our infrastructure is deteriorating, and it has got to be fixed.

Mr. WESTERMAN. Mr. Gebhardt.

Mr. GEBHARDT. We are not directly involved in the permitting process, as a technology company. But anything that helps move more freight by rail and allows more infrastructure to be built would be positive for the industry.

Mr. WESTERMAN. See, I would argue that you are impacted by NEPA because you can't implement your technology if people can't get a permit to——

Mr. GEBHARDT [interposing]. Correct.

Mr. WESTERMAN [continuing]. Build new infrastructure. And I think that is one of the disconnects that we have, that we don't realize just how impactful the permitting process is in the way it has been weaponized to stop things from happening. It is also easy to stop something from happening. The difficult work is in actually building something and making things happen.

Mr. Cardwell.

Mr. CARDWELL. Yes, we support the NEPA reforms on Brightline and a lot of the railroad that is coming. We think it is important.

Mr. WESTERMAN. All right, Mr. Chairman, I yield back.

Mr. WEBSTER OF FLORIDA. Thank you very much.

Mr. Nadler, you are recognized for 5 minutes.

Mr. NADLER. Thank you, Mr. Chairman.

Mr. Cardwell, by law, safety waivers may only be granted if they are in the public interest and enhance safety. Both the National Transportation Safety Board and the Federal Railroad Administration have stated that automated track geometry systems should supplement, not replace, visual inspections. In your view, what rationale have the railroads provided for continuing to pursue the safety waiver, and how does that align with the existing safety guidance?

Mr. CARDWELL. Obviously, I think they are cost-cutting measures. I am not entirely sure, because they are not safe, that is for sure. I believe they are cost-cutting measures. I believe they are job elimination attempts.

Mr. NADLER. You believe what?

Mr. CARDWELL. Because we were——

Mr. NADLER [interrupting]. I couldn't hear you. You believe the cost-cutting measures——

Mr. CARDWELL [interrupting]. I am sorry.

Mr. NADLER. Finish your statement. I couldn't hear you. You believe the cost-cutting measures——

Mr. CARDWELL [interrupting]. Yes, that is why we are——

Mr. NADLER [continuing]. You believe the cost-cutting measures what? I didn't—I couldn't hear you.

[Pause.]

Mr. CARDWELL. Oh, I apologize. We believe that they are cost-cutting measures. That's it. They are definitely not providing a safer railroad, so we believe the attempts are just cost-cutting measures.

Mr. NADLER. Okay, thank you. As you know, automated track inspection systems can detect only one category of track defect: geometry. But inspectors are trained to identify 17 additional types of defects that ATI cannot detect. Why is it so important to search for all potential hazards, not just those related to track geometry?

[Pause.]

Mr. CARDWELL. There are 23 defect codes under the FRA, and there are subsets of those defect codes. And it only finds six. So ATI technology can only find 6 of the 23 different defects. That is extremely dangerous. That means a large percentage of the defects won't be detected by the ATI. So if we reduce the human inspection, visual inspection, then those defects won't be able to be found. That is a dangerous, dangerous situation.

Mr. NADLER. Okay. And what would be the safety impact of reducing inspection frequency for those 17 other types of defects from twice weekly to just twice monthly?

Mr. CARDWELL. That means that we would be going approximately 14 to 15 days between inspections on those tracks. That is dangerous. If there is a track defect down on that track that can't be found by ATI and it sits there for 14 days with millions of pounds of chemicals and passengers going over those rails, I think that is just unacceptable. It is dangerous.

Mr. NADLER. And can you share how recent technological innovations have helped track inspectors do their jobs better?

Mr. CARDWELL. Yes, there are all kinds of technological advances that help us do our jobs better. There is new technology coming regularly in the industry, new machinery that helps—the physical labor that our workers do is being enhanced by the machinery that is coming in. And I say it keeps—it helps—it keeps the injuries down, it keeps potential death down because the machinery has new technology in it that avoids collisions and things of that nature. So there is great technology out there that is doing great things for our members and keeping them safer. We are willing to adopt those.

And we are willing to work with ATI technology, as well. We have asked for the data, the information. We have insisted on wanting to know and speak with the people that developed this technology and the people that are overseeing this technology to understand how it works and what it does, and we continue to be kept away from the technology from the railroads.

Mr. NADLER. Okay, thank you. And a moment ago, I asked for the—what would be the safety impact of reducing inspection frequency for those 17 other types of defects from twice weekly to twice monthly. You answered the question. My last question is,

what are the railroads doing? Are they, in fact, reducing inspection from twice weekly to twice monthly?

Mr. CARDWELL. Yes, they are not only asking for a reduction in inspections, they are asking for a 72-hour period, up to 72 hours, before they correct the defects.

Mr. NADLER. And I assume you think that either the National Transportation Safety Board or Congress should remedy that.

Mr. CARDWELL. Yes. That is just so dangerous. Remedying the defect after 72 hours is completely—if any railroader that has done railroad work were in this room, we would just laugh at it.

Mr. NADLER. Thank you. My time is expired, I yield back.

Mr. BEGICH [presiding]. The gentleman yields back. I recognize Representative Taylor for 5 minutes for questions.

Mr. TAYLOR. Thank you, Chairman and Ranking Member Titus, for holding this hearing today, and thank you to all of our witnesses for your testimony and insight and the sacrifices I am sure you all made to be here.

Ohio has 44 operating railroads and over 5,000 miles of track, making Ohio the third largest rail infrastructure State in the Nation. With Ohio's presence in the rail industry, adopting and implementing new technologies could result in huge growth for southern Ohio.

Mr. McCown, in your testimony, you highlighted how the United States regulatory process has hindered technological growth in the rail industry. I am proud that the first bill I introduced in Congress, the Regulation Decimation Act, would remove burdensome, unnecessary, and counterproductive regulations that prevent innovation and growth.

Mr. McCown, as this committee works on drafting the upcoming surface transportation reauthorization bill, what regulations and/or processes within the Federal Railroad Administration should we be examining to remove regulatory bottlenecks?

Mr. MCCOWN. Mr. Taylor, thank you for the question. And as a native Ohioan, I appreciate your comments there, as well.

We need to move from prescription to performance-based policies to make sure that, A, nobody can take advantage of shortcuts, no one is going to be self-regulated, but we are hitting performance metrics. We need to be outcome-based instead of prescriptive. The goal is transparency and incentivizing innovation. Let's be agnostic on the technology that is used to meet and exceed its target.

The goal of continuous improvement is to constantly drive down the number of incidents, to make them less severe, to occur less often. By doing this, we are unleashing innovation, and we will see cottage industries further develop and innovate in this area. But by telling somebody, you have to do it this way, we are already losing.

Mr. TAYLOR. Thank you. The implementation of new technologies in our rail industry could help make our track safer, reduce delays, and improve product delivery. It is imperative that the development of new technologies and American innovation is encouraged.

As one example, Mr. Shannon, I was glad to hear that RailPulse is being utilized throughout Ohio, keeping our communities safe. However, as a small business owner, I understand the difficulties that smaller companies may have in adopting new technologies.

Mr. Shannon, from an industry perspective, what can be done to help encourage the adoption of new technologies?

Mr. SHANNON. I think that is a great observation. The technology that we are talking about on railcars is not horribly expensive. But at the same time, for small businesses, small railcar owners, we are talking about a significant investment. And so one thing that can be done and should be done would be providing incentives to encourage the adoption of this technology, financial incentives through CRISI grant or similar public-private kind of incentives.

Mr. TAYLOR. I heard at one point that it is sort of cheaper to get it on a new car than it is to put onto an existing car. Is that true?

Mr. SHANNON. It can be cheaper to put it on a new car. The core technology is very similar, regardless of whether it is a new car or an existing car. But capturing a car in service and getting to that car, locking it down, if you will, so that you can safely install the equipment can cost more, for sure. So——

Mr. TAYLOR [interrupting]. Would you say it is a bigger challenge for, like, short line railroads or smaller operations?

Mr. SHANNON. It would be a bigger challenge for short line railroads, it can be a bigger challenge for private car-owning shippers.

Mr. TAYLOR. Thank you.

The benefit that new technologies can provide in preventing accidents should be one of Congress' top priorities. With the East Palestine derailment in my home State of Ohio, we are keenly aware of how important it is to prevent tragedies before they happen.

Mr. Gebhardt, your company, Wabtec, produces a couple of different products that seek to prevent accidents. Can you go into more detail about these two technologies that can detect potential accidents and seek to prevent them?

Mr. GEBHARDT. Well, we do a number of technologies that are specifically focused on safety. We have a kinetics inspection technologies platform that uses acoustic technology, thermal technology, visual technology to look for defects, potential issues that are going to be coming along there.

We also have technology for incoming inspection into yards, and now we are developing technology that actually will go under the trains to go ahead and inspect for the outgoing inspections to augment the work that the yard workers are already doing there.

So we are working to try to make rail safer, we are working with the locomotives, of course, but then we are also working with the railcars.

Mr. TAYLOR. Real quickly, is there anything big on the horizon that we haven't heard about that is coming out as far as this kind of safety technology?

Mr. GEBHARDT. Yes, I would say probably the most exciting one that we have is what we call our RailGhost. It is actually something that is going to go under the trains, inside the yards or in sidings, and can do a lot of the inspections there. We are working on the visual inspections now. We will put different measurands on there over time, but it is a very exciting technology, and it will augment what the yard workers are already doing.

Mr. TAYLOR. Thank you, and thank you all very much.

Chairman, I yield back.

Mr. BEGICH. The gentleman yields back. I now recognize Mr. DeSaulnier for 5 minutes for questions.

Mr. DESAULNIER. Very nice pronunciation. It's like you took French, high school French or something.

Well, I want to thank you and the ranking member for this hearing. It is fascinating. I represent a district in the East Bay of the bay area. I have dealt with innovators and the innovation economy for a long time because I am old. And a long time ago, I was admonished by somebody in that field, "Do not let the technology seduce you." So we want to take the value of all this wonderful technology, but make sure it also works in the real world.

So, Mr. Cardwell, I will start with you. As a former Teamster member, I have my withdrawal card from many years ago from Local 170 in Worcester, Massachusetts, where I worked for trucking companies, starting as a warehouseman and then later working as a dispatcher. So I know something about—a long time ago—logistics from those two perspectives, working graveyard shifts when I was going to college.

So, to your point, I think sometimes us who are in the labor field—and I am a senior member of the Education and Labor Committee—we get accused of being modern-day Luddites and we are against innovation. But my experience is we have evolved to where we see the value, but we want to make sure that the human part of it is connected. And we deal with this on the Aviation Subcommittee, of which some of us are on—is when the technology and the procurement process gets ahead of the human beings, then we have disasters or mistakes which affect everybody and, I would argue, sets innovation back.

So, trying to get that right balance, how are we doing that, particularly in goods movement? All this benefit, which—and I love your comments, Mr. McCown, about performance-based and outcome-based driven. This should be an example, I think, in goods movement and how we move product. But we have to have humans involved in that.

So, could you speak to that? How do you engage with management not just to protect your workers, which I want to be part of, but do it in a way that is thoughtful, that—and I know you do this already. If humans aren't involved, there is nobody to check, as you have already said, to make sure that the technology is working properly. And if the humans don't understand the technology, and we haven't provided the infrastructure in workforce development the way other industrialized countries like the Germans do, it doesn't work. And it just becomes this battle over profit motive and where the money goes to.

So, how do we fit that balance, and how have you engaged to make sure that you are part of that?

Mr. CARDWELL. Sure, we want a partner with us, and we are excited about the CRISI grants. We ourselves are going to apply for a bunch of them, and have, so we can train our members with this new technology, as well. And that funding that comes in is helpful. We want to partner with anybody who is willing, including the gentlemen here, to work on these issues to make sure that our workers are part of this change and evolution in technology. We are more

than willing to do that. But what we cannot do and will not do is compromise the safety aspect of it.

The technology is not proven. And where it is proven, it works well. And we are willing to adopt those technological changes for safety alone. What we cannot do is accept this technology if it is not proven to be safe, and if it doesn't catch certain things.

It was testified to in the Senate hearings that 90 percent more defects are found by ATI, which is not true. It can only find up to 6 out of the 23 defect codes within the FRA. So there is no way that it has increased that much. If there were that much increase in defect finds from this technology, then there would be a huge workload increase, as well. And that workload hasn't gone up. It has maintained the same.

I would argue that we are for this technology and want to continue working with these different groups.

Mr. DESAULNIER. Mr. McCown, I want to ask you—thank you for that—a question in the short time I have left.

Representing an area that is the fifth wealthiest district in the country, but also having a lot of goods movement in there, it is this urban-industrial interface in the bay area. We have got four refineries, hazardous material, and then we have got the Port of Oakland. So trying to manage that has always been a struggle. We have had some pretty good success when the industrial partners have worked with us. But unfortunately, there are some people in the private sector who drive to lots of short-term investment returns. So shortly, how do we balance all of this in an area like that?

Mr. MCCOWN. Yes, thank you so much, sir. Yes, I first came to Washington, DC, working for a South Bay gentleman whose portrait hangs to your left, and so I understand that very much.

Mr. DESAULNIER. I am aware of him.

Mr. MCCOWN. It's a balancing process. And oftentimes, the truth is in the middle.

Mr. BEGICH. The gentleman yields back. I now recognize Mr. Fong for 5 minutes for questions.

Mr. FONG. Thank you, Mr. Chair. Certainly, I echo the comments made that there is certainly value to technology innovation. It is transforming the transportation industry. But we need to see that it moves forward in the rail space.

Mr. Gebhardt, the research that Wabtec has been doing sounds very promising when it comes to supply chain improvements. I wanted to get your take on how the Federal Government can better support the development and commercial deployment of innovative railroad telematics?

Mr. GEBHARDT. Yes, this is an important topic, and I would break it down into a couple of areas, the first being helping with the development phase with some R&D funding, public-private partnerships around that because some of these technologies might be 8, 10 years away. Making investments on that, on a moving target, is something that some Government encouragement can definitely help with that.

And then providing waivers so we can actually get some of the technology out on the track to go ahead and test it.

And of course, a safe manner. We always want to make sure we are doing everything in a safe manner there.

And then making sure that there is outcome-based approvals for things. I will give one quick example on this. Zero-to-zero is one of our technologies. We have had trip optimizer in operations since 2009, but it kicks in at about 9 miles an hour on the way up and about 12 miles an hour on the way back down again. We have worked technology to go from start to finish, from zero to zero on the other side there, and this is an adaptive cruise control. It helps with having better fuel, better train handling and such around this technology. And that is something where some help in moving that forward would be demonstrated. We have proven that it is safe; now we just need to get some test time on that one.

Mr. FONG. I appreciate that. I think, if we have learned anything from 2020 and the pandemic, we need to be investing more in supply chain to ensure that we reduce delays and ensure that essential goods are moving to the market.

To Mr. Shannon, I wanted to ask, how are small, the regional railroads, short line railroads, how are they being brought into the modernization effort? Are there integration barriers that we need to be cognizant of, cost barriers?

Mr. SHANNON. Well, first I would say the small, regional railroads we are actively working with as much as possible, including within our ownership. The short line railroads are represented as a class of owners within RailPulse so that we get their insights and opinions in terms of driving RailPulse forward.

I would also add that I think the small, regional railroads are very important to driving the adoption of this technology, because they have such a tight affinity working with the shippers and their customers, and helping them get the benefits out of this technology.

That being said, a comment that was made earlier about they are small, they are not as cash rich, and those that have fleets of railcars that they would like to see instrumented, any help that can be done to help accelerate the adoption of the technology on their behalf or for them would be valuable.

Mr. FONG. Sure. Well, certainly, from someone who represents the Central Valley of California, rail is very important for us in moving our products, whether it's agriculture or manufacturing or energy, oil and natural gas, too, to where it needs to go.

Building off of your answer, what are the biggest policy or bureaucratic obstacles? What are they to deploying sensor-based monitoring and automated track inspection?

Mr. SHANNON. Did you say track inspection?

Mr. FONG. Automated—well, ATI, yes.

Mr. SHANNON. Yes. Well, RailPulse is not involved in track inspection, so we are telematics on railcars. That information can be used to improve the safety, the health of the railcars. The—and it is sort of—in answer to your question, I will comment on——

Mr. FONG [interrupting]. Maybe Mr. McCown can——

Mr. SHANNON [continuing]. Focusing on outcomes——

Mr. FONG [interposing]. Yes.

Mr. SHANNON [continuing]. Is probably the single biggest thing, performance metrics, so that we stay—we don't hamstring the innovation in the industry.

Mr. FONG. Thank you.

Maybe that question was better addressed to you, Mr. McCown, in terms of how——

Mr. MCCOWN [interrupting]. Sure, so——

Mr. FONG [continuing]. What are the biggest obstacles to employing new technologies?

Mr. MCCOWN. Yes, thank you so much for the question.

The truth is that it's not one size fits all. And a rail track over here is not the same as a rail track over there, yet we are treating them all the same. What we need to be able to do is manage the risk appropriately and then deploy assets, human and technology, to where they are needed.

But right now, the FRA is set up where everything is monolithic, it is all the same. And that is just not the best way to evaluate risk. And so, these performance-based metrics allow operators to concentrate where the risks are. And they are held accountable if they don't do that.

Mr. FONG. I appreciate that. I have run out of time.

I yield back.

Mr. BEGICH. The gentleman yields back. I now recognize Mr. Burlison for 5 minutes for questions.

Mr. BURLISON. Thank you, Mr. Chairman.

Mr. Gebhardt, artificial intelligence has the potential to revolutionize the world, but also the rail industry, as well. From predictive maintenance to infrastructure for optimizing train operations, AI has the capability to not only enhance efficiency, but reliability and safety. And I think that is important to note. Can you shed light on how AI is going to impact the rail industry in a positive way?

Mr. GEBHARDT. Yes, we have been working very closely with AI and developing that, but we are pacing it based on the real capabilities. We are making sure it is being tested.

As I had mentioned earlier, we pull in about 10 million data messages a day from our locomotives around the world, and we process all of that. We have really been working over the last several years, the last decade or so, with deterministic rules that are if-then type statements, let's put it that way. Now we are starting to do more and more with AI. But as we understand AI, we always have a human in the loop as that goes back. So we have automated rules that are deterministic. The AI, there is a human in the loop on that.

When we look at condition-based maintenance and those types of things, we are using the AI to really pull forward that data so we know where can we extend intervals, where do we need to shorten intervals. And then, even within the engineering side, how do we improve the components to make sure we can continue to extend that and focus on safety? We make sure we focus very much on how do we make our products safer and safer.

But AI is a fantastic tool at this point. We are really doing a lot of things with a human in the loop. The only place that we are doing full AI is really around visual tools, where we have a new rail spiker that we are doing, where we can actually use AI in order to shoot the spikes in automatically, those types of things

that are nonsafety-related and things that really take a lot of the visual technology. That is where we are using a lot of AI.

Mr. BURLISON. Thank you. You had mentioned earlier about RailGhosts. Is that right?

Mr. GEBHARDT. Yes.

Mr. BURLISON. Can you describe that? So, this is a robotic device?

Mr. GEBHARDT. Yes, this is a robotic device. And the goal is that longer term, it will be robotics and visual AI. So, it has about 16, 18 wheels on the sides there, and it actually flows under the train. And each of the wheels snaps back as it goes under the train. And what we are doing now is, we are putting cameras, thermal guns, other things on this platform, and therefore, we will be able to augment the inspections as it goes through. And we are very excited about it. And we can move it at about 12 miles an hour, so it can move very quickly through there, be able to put the data right in the hands of the yard workers to go ahead and see exactly what is going on there, maybe follow up with an inspection afterwards on those types of things.

And then what is also pretty cool about it is how we put it in what is called turtle mode, where it can actually drop down inside the rails, and then the train can just pull right over it and just go right out on the outgoing side of things. So we are really excited about the technology, working with a couple of the Class I's on this at this point to make sure that we can meet all their needs that they are looking for.

Mr. BURLISON. And Mr. Gebhardt, is there anything that is holding you back in that regard? Are there any regulations or laws that we need to evaluate that are going to hold your industry back from innovating here?

Mr. GEBHARDT. Yes, so on that particular case of RailGhosts, there is not much holding us back on that one.

I had mentioned the zero-to-zero, trying to get the waivers for zero-to-zero to go ahead and move forward with that, which is the extension of our trip optimizer, adaptive cruise control product. That's one that we are working to try to move that one along.

Mr. BURLISON. Okay, thank you.

Thank you. I yield back.

Mr. BEGICH. The gentleman yields back. I now recognize myself for 5 minutes of questions.

My first question, Mr. Cardwell, you mentioned that the average employee in the industry has been active for 29 years, in earlier testimony. A good blend of youth and experience helps to foster responsible innovation adoption. Do you have any concerns about an aging workforce in your industry?

And if so, what needs to happen, in your opinion, in order for this to be addressed?

Mr. CARDWELL. I have no concerns about the age. The average time that they spend in seniority in the classification is 29 years. We have a lot of young employees right now, too. It's a good job, it's a good-paying job, and it's a career. These guys love what they do, so they stay for a long time. They typically don't go out into other jobs. They are interested in the technology, and they want to participate in it, as all the young people are these days. And they

want to participate and operate this new machinery and technology, as well. They are excited about it.

We believe there is a good relationship that can be formed there, but we can't compromise safety when we do it.

Mr. BEGICH. Thank you.

Next question, Mr. McCown, in your role as former president of Alyeska Pipeline, you oversaw critical infrastructure operations in some of the harshest and most remote conditions in the United States. How do you assess the applicability of advanced safety and inspection technologies such as automated track inspection or acoustic monitoring in similarly rugged and isolated environments like the Alaska Railroad?

Mr. MCCOWN. Chairman Begich, thank you very much for your question. I thoroughly enjoyed my time in Alaska, and my wife would still like to move back there permanently.

Pipeline safety regulations have evolved over the years into more performance-based. We also use different tools to measure different aspects of the pipeline. And in the pipeline industry, that has changed dramatically over the last 30-plus years. Your pipeline is almost 50 years old now, with an enviable safety record.

So it can be done. It is a combination of deploying technology, also people, and determining where your risks are. If you take that holistic system, there is no reason why we should be up here trying to drag rail into the 21st century. We need these tools and the pace of technology. And what is available today is different than it was just a couple of years ago.

Mr. BEGICH. And to follow up on that, from your experience, what Federal policies or regulatory flexibilities would best support the deployment of remote sensing and predictive maintenance systems in frontier State infrastructure?

Mr. MCCOWN. Yes. Well, as I mentioned earlier, no two sets of track are alike, different operating conditions. And fortunately or unfortunately, regulations are set up for a one size fits all, which is again why I would like to see more performance-based.

But at the same time, when a waiver gets held up—and I hate that term "waiver." It is an equivalency. We are not waiving anything. We are meeting the standard a different way. That is what encourages innovation. And so at the Department, not just in FRA, these get held up for far too long. And in some cases, the standard they want you to meet is actually higher than the regulations. And the well-meaning DOT career folks pile things on. We need more flexibility, not less. And once you have a waiver that is being done over and over again, it is time to change the regulation.

And for Alaska, Alaska is a different operating environment, and people need to understand that and, quite frankly, defer to folks who know best.

Mr. BEGICH. I so appreciate that you mentioned that, Mr. McCown. You understand better than perhaps anyone in this room just how different Alaska can be as an operating environment, and we do need to make sure our regulations are flexible with respect to the environments in which they apply.

One question. I am going to open this up for any of the witnesses here. One of the challenges that we have in rail is the deployment cost of new rail. A lot of the conversation today focused on oper-

ations and innovations within the existing operating infrastructure. What technologies or opportunities for new technologies are on the horizon that can lower the cost for new rail deployments?

Mr. MCCOWN. I will go ahead and take a quick stab at it. Regulatory certainty is required to deploy capital. Where you have risk, right, in any business, you are not going to invest into something. So, we need a stable regulatory environment where the rules aren't going to change depending on who is in the White House or what bureaucrat is in charge 2 years from now.

So, by laying those rules down and by removing rules that no longer make sense, we can lessen the cost to build new things, to build new rail tracks, to build new highways that are safer and better than the existing ones that are out there.

Mr. BEGICH. I appreciate that, and I would just encourage the industry generally, as we are looking at innovations across the industry, let's also be sure we are looking at innovations that will drive down the cost and accelerate the deployment of new rail.

Certainly, in my home State of Alaska, we have had a longstanding dream to connect to the lower 48 States through Canada to Alaska. We would like to do that in a capital-efficient manner, and we would like to do that in an expeditious manner. And I think innovation is going to be one of the ways that we actually make that dream achievable.

With that, my time has expired. I would like to thank the witnesses and ask if there are any further questions from any members of the subcommittee who have not been recognized.

Seeing none, that concludes our hearing for today. Thank you again to the witnesses for your testimony. The subcommittee stands adjourned.

[Whereupon, at 12:12 p.m., the subcommittee was adjourned.]

SUBMISSIONS FOR THE RECORD

Statement of Ian Jefferies, President and Chief Executive Officer, Association of American Railroads, Submitted for the Record by Hon. Daniel Webster

INTRODUCTION

On behalf of the members of the Association of American Railroads, thank you for the opportunity to submit this statement for the record. AAR freight railroad members account for the vast majority of railroad mileage, employees, and freight traffic in Canada, Mexico, and the United States. In addition, AAR maintains two wholly-owned subsidiaries on the cutting edge of rail technology. MxV Rail in Pueblo, Colorado, is the industry's research, testing, and training epicenter, developing science-based solutions to make North America's rail network safer, more efficient, and more reliable. Railinc in Cary, North Carolina, is the industry's digital backbone, providing essential data, tracking, maintenance, and messaging services to power safe and efficient rail service around the country.

At first glance, today's freight railroads may appear unchanged: locomotives pulling a string of rail cars across steel rails and wooden ties. But beneath that familiar exterior lies a remarkable technological evolution. Billions of dollars in reinvestment by the railroads have transformed the systems that support, operate, and optimize freight railroads over the last few decades, and advances in digital technologies, automation, data analytics, and safety systems have revolutionized the industry. As a result, railroads are safer, more reliable, and more cost-effective than ever before, and the industry is continuing to develop and deploy new technology to continue that trajectory. Safety has always been, and will continue to be, at the forefront of everything the railroads do, and the industry will continue to invest in new technology that improves the safety of rail operations for our employees, customers, and communities. Railroads have identified a path to take the industry into the future that combines the power of innovative technology with the grit and expertise of our workers. That path will only come to fruition in a regulatory environment that supports innovation.

FREIGHT CARS AND DEFECT DETECTION

Over the last 50 years, railroads have invested billions of dollars in developing and deploying technology to help identify potential problems with railcars before they cause safety concerns like derailments. Research, data, and years of experience show safety outcomes improve with a layered approach combining visual inspections with technology that identifies problems invisible to the naked eye.

For example, several decades ago, railroads began voluntarily deploying detectors along tracks to identify defects on passing rail cars before structural failure. These trackside systems measure the temperature or the "acoustic signatures" of freight car wheel bearings as they pass, identifying bearings that are nearing failure and alerting train crews to respond when necessary. Over time, the industry has worked together to improve the performance of these detectors and conduct trend analysis to identify at-risk bearings sooner.

While wayside detection has dramatically improved safety on the mainline, railroads are continuing to invest in new, more advanced technologies for identifying problems faster and more consistently. That investment includes onboard condition monitoring systems that continuously collect and report data on wheel bearing health to identify problems and alert train crews earlier than ever. Norfolk Southern has also deployed specialized detection portals to generate detailed three-dimensional images of each locomotive and railcar as it moves through the portal. Using artificial intelligence (AI), ultra-high-resolution cameras, laser scanning, and digitized imaging, railroads can now identify potential issues—including misaligned

components and structural defects—and pull cars for repairs before safety concerns arise.

Track and Other Infrastructure

Railroads are continuing to improve the safety of their track, bridges, signals, and other infrastructure through new technology that inspects, maintains, and predicts issues with more accuracy and efficiency than ever before. These tools reduce the risk of derailments and service disruptions, lower maintenance costs, and improve the overall resilience of the rail network.

Defect detector vehicles are a key component of these systems. Advanced track geometry cars use sophisticated electronic and optical instruments to inspect track alignment, gauge, curvature, and other track conditions. On-board computer systems provide sophisticated analyses of track geometry and predict the response of freight cars to track deviations to help railroads determine when tracks need maintenance. New methods for detecting rail flaws are constantly under review. Recently, MxV Rail developed and tested a prototype of the world's first laser-based rail inspection system. A new in-motion ultrasonic rail joint inspection system, also developed by MxV Rail, has undergone real-world tests on a major railroad.

Several railroads have adopted LiDAR and AI-driven technologies to enhance track inspection and asset management.[1] Norfolk Southern, for example, uses railcar-mounted LiDAR and sophisticated AI models to create intricate three-dimensional maps of its network, complete with the location and dimensions of switches, crossings, and other assets. This precise, up-to-date digital map streamlines route planning and maintenance, helping to proactively prevent collisions, derailments, and other safety risks. BNSF has integrated LiDAR technology into its operations by deploying hi-rail vehicles—specialized trucks equipped with rail wheels—that use advanced sensors to collect three-dimensional data for precise measurements of track geometry, bridge clearances, and other critical infrastructure. CSX owns and operates several LiDAR systems that continuously scan the railroad's entire 21,000+ mile network, collecting detailed 3D data to support safety protocols and infrastructure planning.

In addition, ground-penetrating radar and terrain conductivity sensors have been developed that identify problems underground—such as excessive water penetration and deteriorated ballast—that make track less stable. Similarly, railroads inspect bridges for stability using sonar technology to detect underwater erosion and structural weaknesses. To improve employee safety and ensure safe operations, railroads also use drones across the network to conduct aerial inspections of tracks, bridges, and rail yards, providing real time data and reducing the need for employees to enter dangerous areas.

Locomotives

Numerous railroads are testing alternative fuel locomotives to reduce emissions and improve fuel efficiency, enhance performance and sustainability, and support safer operations. While these locomotives are not commercially viable for broad deployment on the vast rail network, they hold significant promise for railroads to continue providing safe, low-emission, and cost-effective service in the future. For example, BNSF and Wabtec, a locomotive manufacturer, demonstrated a 10 percent reduction in fuel consumption and greenhouse gas emissions through a demonstration project that combined a prototype battery-electric locomotive with two traditionally powered locomotives on a single train. Union Pacific, in partnership with rail technology company ZTR, completed testing and proof-of-concept work on hybrid battery-electric locomotives expected to reduce fuel consumption by up to 80 percent and is moving towards field testing the locomotives in active rail yard operations. Several railroads, including CSX and CPKC, are undertaking pilot programs for hydrogen fuel cell locomotives, a potentially promising zero-emission solution for yard switching, short-haul, and line-haul operations.

This technology is still in the early stages of testing and deployment, and these pilot programs are helping railroads assess feasibility, safety, performance, and infrastructure requirements. Considerable research and development, much of it funded through the Department of Energy, is imperative to determine if non-diesel locomotives can ultimately become a safe, reliable, and efficient alternative to diesel.

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[1] LiDAR stands for Light Detection and Ranging, a remote sensing technology that uses laser light to measure distances and create highly detailed, three-dimensional representations of the environment.

RAIL OPERATIONS

Railroads today rely on sophisticated technology to manage the flow of traffic across vast networks, optimize train routing and scheduling, and help ensure efficiency and safety. Many of these technologies have been around for several years, including the Rail Corridor Risk Management System (RCRMS), which identifies the most secure routes for trains carrying hazardous materials, and Positive Train Control (PTC), which automatically stops or slows trains before certain accidents can occur using GPS, wireless radio, and onboard computer systems. These systems use sophisticated algorithms and constant data collection to prevent devastating accidents before they can occur, and railroads are continually looking for ways to leverage this data to continue increasing safety and improving operations along the network.

All major railroads also rely on advanced network optimization systems to improve efficiency, reduce delays, and conserve fuel. These systems calculate the most fuel-efficient speeds over specific routes; determine optimal train spacing and timing; and minimize meet-and-pass conflicts. Using real-time data, they provide dispatchers and rail personnel with dynamic runtime forecasts and decision-support tools that enable faster, more accurate adjustments to network conditions. At Norfolk Southern, for example, the operating team uses its Operating Plan Developer (OPD) to develop detailed operating plans and manage assets in a virtual, data-rich environment. OPD helps coordinate hundreds of train movements each day while enhancing safety, reliability, and service quality—goals shared by the many other railroads that deploy similar technologies.

Railroads have also developed advanced applications that help trucks get in and out of yards quickly at intermodal terminals, which reduces fuel consumption and emissions and improves supply chain fluidity. BNSF is implementing its Automated Yard Check (AYC) system, a cutting-edge solution that combines drones with advanced algorithms to collect real-time data on container locations and significantly streamline terminal operations and inventory accuracy. Railroads have also deployed mobile apps, like CPKC's CP Fast Pass, to help trucking partners with ingate, outgate, on-terminal, and pre-gate procedures, reducing wait times and improving overall efficiency. Many intermodal yards also have biometric scanners that recognize truck drivers' thumbprints; video portals that automatically read truck ID numbers; and automatic receipts and digital paperwork as part of automated gate systems.

COMPUTERS AND COMMUNICATION SYSTEMS

Railroads were among the first industries to use mainframe computers. Today the legacy of using sophisticated communication systems and computer-based tools continues to help coordinate operations and communications across the nationwide rail network. For example, CN uses an innovative virtual reality system to take potential employees on a virtual tour of a rail yard and illustrate the intricate operations and diverse jobs available on a railroad. The technology is expected to be used at career fairs and recruitment events across CN's network. Railroads also use augmented and virtual reality training that allows workers to practice safety procedures, train handling, and emergency responses in simulated environments. Union Pacific is using 3D printing in its training programs to create realistic models of key rail components with which trainees can practice before entering an active rail yard. 3D printing life-size knuckles and drawbars allows for hands-on training to help new hires understand the switching process and practice with replicas to build confidence and expertise from the start.

REGULATORY ENVIRONMENTS THAT FOSTER INNOVATION IMPROVE SAFETY

Railroads have invested billions of dollars in developing, testing, and deploying new technology. When combined with the expertise of the railroad workforce, this innovation has the potential to improve the safety of railroad operations for employees, customers, and communities around the country. To take the next great leap forward in safety, federal regulators must move beyond a prescriptive regulatory framework that stifles innovation and too often gets sidetracked by other political issues. Railroads support a regulatory framework that supports the effective systems in place today while encouraging and supporting investments for the future.

Prior administrations have sidetracked the Federal Railroad Administration's (FRA) waiver process by focusing on achieving unrelated political goals. Refocusing that process on safety is one way to build a more technology-focused regulatory environment. A clear example of the need for updates to the waiver process is FRA's treatment of Automated Track Inspection (ATI). One Class I railroad secured a

waiver from FRA to test ATI in conjunction with visual track inspections. Based on clear safety improvements from these tests, the railroad applied for a waiver to expand the use of ATI, and additional Class I railroads applied to use similar technology on their tracks. In 2021 and 2022, the FRA, the agency whose core mission is preserving and improving the safety of the railroad industry, denied these waiver requests despite the demonstrated safety improvements. Eventually a court found that FRA's decision was arbitrary and capricious and directed the agency to grant the waiver. In 2024, FRA allowed expanded use of ATI under a new regulatory framework that allows the use of ATI without changes to existing visual inspection rules.

FRA's decision seemed to be linked to concerns from railroad workers about the impact of technology on jobs. Railroads have been clear that the best safety outcomes occur when our highly skilled workforce operates in tandem with our advanced technology. BNSF recognized that FRA was concerned about the impact of these waivers on railroading jobs and worked directly with its local Brotherhood of Railway Carmen (BRC) to develop and test a new Brake Health Effectiveness (BHE) system. Not only did they see demonstratable safety improvements, the BRC members reported *additional* work as BHE helped to identify *more brake issues for them to remediate*. With the public support of its local BRC, BNSF applied for a waiver to expand the use of BHE. FRA sat on the request for nearly two years, and BNSF was unable to expand the use of safety-improving technology and create additional jobs for its highly compensated, highly skilled union workforce.

FRA should act on waivers in a timely manner consistent with statute; make decisions only based on transparent criteria and clear science-based data demonstrating improved safety outcomes; consistently renew or expand waivers as additional data becomes available; and create clear expectations and pathways for adoption of new technology and processes by the broader industry when the safety record is established.

Railroads will continue to develop and implement new technologies to improve safety and performance. Achieving the maximum benefits from this technology will require a regulatory framework that supports innovation and provides flexibility for achieving safety goals. Technology mandates locking in specific tools or processes create disincentives for railroads to invest in new technology. Relying on sound science, clear data, and an articulated need will give railroads discretion to innovate and create new ways to incorporate technology that improves safety while maintaining strong FRA oversight.

CONCLUSION

By investing billions in infrastructure and innovation, railroads are constantly modernizing operations to improve safety while meeting rigorous global supply chain demands. Railroads look forward to working with members of this committee and other policymakers to ensure that these new technologies complement the expertise and ingenuity of the rail workforce in making our workers, customers, and communities safe while serving as the engine of America's economy.

Letter of June 24, 2025, from John Schmitter, Co-Founder, Chief Commercial Officer, RailState LLC, to Hon. Sam Graves, Chairman, and Hon. Rick Larsen, Ranking Member, Committee on Transportation and Infrastructure, and Hon. Daniel Webster, Chairman, and Hon. Dina Titus, Ranking Member, Subcommittee on Railroads, Pipelines, and Hazardous Materials, Submitted for the Record by Hon. Daniel Webster

JUNE 24, 2025.

The Honorable SAM GRAVES, Chair,
House Transportation and Infrastructure Committee,
2167 Rayburn House Office Building, Washington, DC 20515.

The Honorable DANIEL WEBSTER, Chair,
Railroads, Pipelines, and Hazardous Materials Sub.,
House Transportation and Infrastructure Committee, 2251 Rayburn House Office Building, Washington, DC 20515.

The Honorable RICK LARSEN, Ranking Member,
House Transportation and Infrastructure Committee,
2164 Rayburn House Office Building, Washington, DC 20515.

The Honorable DINA TITUS, Ranking Member,
Railroads, Pipelines, and Hazardous Materials Sub.,
House Transportation and Infrastructure Committee, 589 Ford House Office Building, Washington, DC 20515.

Via email

DEAR CHAIRS GRAVES AND WEBSTER, AND RANKING MEMBERS LARSEN AND TITUS—

RailState thanks you for holding today's Railroads, Pipelines, and Hazardous Materials Subcommittee Hearing, "*America Builds: The Role of Innovation and Technology in Rail Modernization*."

As a part of this hearing, RailState asks that you submit this letter for inclusion in the hearing record for use by the Committee as it considers how to modernize our nation's rail transportation network to enhance safety while facilitating more effective passenger and freight movements resulting in increased capacity.

RailState's Rail Network Intelligence is the first data platform providing in real-time comprehensive, unbiased data and powerful tools for complete visibility into rail network operations. In an easy-to-understand dashboard, subscribers including public stakeholders, logistics teams and planners are provided previously hidden and outdated data and insights fostering smarter decisions resulting in lower costs, more accurate planning, mitigating challenges ahead of time, and responding to issues faster.

Proprietary sensors, developed and assembled by RailState in Quincy, Massachusetts, capture images of moving trains from outside the railroad's right of way. The sensors use high resolution cameras, lidar, infrared illumination and other hardware to capture information about each car and locomotive on each train passing the sensor. RailState software uses AI to interpret visible information on the side of each car, compiles it into actionable data and makes that data available to users through a web application and API less than 30 minutes after the train passes the sensor.

RailState has been providing this service for various public sector entities for over five years with 250 sensors located throughout North America. These sensors operate in all climate conditions from the Canadian tundra to Death Valley. To date, they have tracked thousands of trains each day identifying the fluidity of the network, providing mobility trends, capturing rail movements at our nation's ports and borders, showing train lengths and consists, and spotting cargo fraud and railcar vandalism. Establishing and funding a *Rail System Performance Data Program* would greatly assist the Federal government in helping to modernize our nation's freight and passenger rail network, thus, improving safety and not just improving but growing passenger and freight rail capacity.

I am more than happy to answer any questions you might have.

Thank you for your continued leadership and consideration of this most important effort.

Sincerely,

JOHN SCHMITTER,
Co-Founder, Chief Commercial Officer, RailState LLC.

APPENDIX

QUESTIONS FROM HON. DANIEL WEBSTER TO BRIGHAM A. MCCOWN, FOUNDER AND CHAIRMAN OF THE BOARD OF DIRECTORS, ALLIANCE FOR INNOVATION AND INFRASTRUCTURE

Question 1. Please elaborate on how railroads would determine the prioritization of repairs to track determined to be noncritical or dangerous.

ANSWER. Railroads should consistently adopt a structured, risk-based approach to establishing repair priorities. Conditions posing an immediate threat, such as defects that could lead to derailments, must be addressed and mitigated promptly. This protocol aligns with FRA regulations. Defects not requiring immediate repair should be prioritized based on severity. These considerations should, at minimum, encompass the type of cargo, train tonnage on the segment, speed, population density, and environmental factors. Furthermore, Automated Track Inspection (ATI) data and predictive analytics increasingly enhance repair prioritization through a likelihood/consequence safety analysis, conforming to recognized risk-management standards.

Recommendation to Congress: Authorize and encourage the USDOT and the FRA to pilot decision-support tools that integrate tonnage exposure, defect type, and predictive modeling to enhance national repair prioritization standards. Urge the USDOT to utilize existing programs within other modal administrations to foster intermodal collaboration.

Question 2. In his testimony, Mr. Cardwell claimed that the American Railroad Waiver Request—FRA Docket #2025–0059—will "significantly weaken" railroad safety by reducing the frequency of manual inspections and allow railroads "up to 72 hours to address" track defects exposing "the American people to imminent danger." Is this your understanding of the waiver request? How would the waiver request, if granted, operate in practice?

ANSWER. My understanding of the matter is entirely different. It is appropriate to assert that safety protocols and procedures should incorporate science, technology, and data; otherwise, safety could be compromised if decisions are influenced by subjective factors such as workforce size. Such decisions are most appropriately managed through collective bargaining between the railroads and unions. In practice, waivers, such as the one referenced, would facilitate ATI serving as the primary inspection instrument.

Manual follow-up inspections for anomalies would still need to be conducted within the requested 72-hour response period. The proposed 72-hour window itself is part of a waiver petition for ATI implementation filed by the AAR in May and has not yet received FRA feedback or approval. This provision does not permit neglect; instead, it formalizes a precise, data-driven process for verification and remediation. ATI systems collect vast amounts of freight rail operational data that must be processed into usable information and analyzed—a task that takes time but yields insights far beyond what human inspectors could achieve. The 72-hour window is a reasonable timeframe for this process to be feasible, enabling railroads to detect far more, and far smaller, defects sooner than traditional inspection methods. Railroads would remain accountable for their decisions, and in many instances, manual inspections would be conducted more promptly than the maximum allowable time. Continuous ATI monitoring allows earlier detection of issues and greater frequency compared to periodic manual inspections, thereby enabling timely interventions.

As a former regulator myself, I recognize that such arbitrary deadlines can be problematic, which is why my recommendation would only include a final agency action. That said, in many cases, there is simply no reason other than a lack of will within an agency as to why the waiver review process cannot be completed within a reasonable period, such as 90 days. Acting upon applications from regulated enti-

ties is indeed a systemic issue across many parts of the Department of Transportation. Congress should also ensure the Department of Transportation avoids a belt-and-suspenders approach. By this, I mean that for a waiver, special permit, or other parts of DOT, applicants are often required to go far beyond the existing regulatory framework to secure approval. This is not only counterintuitive; it undermines innovation and only reinforces the outdated nature of many federal regulations.

Recommendation to Congress: Establish statutory timelines (shot clock) that cannot be stopped for the FRA waiver reviews, and require that any waiver approval include measurable safety performance metrics for oversight.

Question 3. Federal Railroad Administration (FRA) waivers share common elements with performance-based regulations. How does the waiver process differ from a performance-based regulatory framework? Are waivers a substitute for performance-based regulatory framework?

ANSWER. The waiver process offers temporary, case-specific exemptions from prescriptive regulations when an applicant demonstrates that an alternative approach meets or surpasses safety standards. Conversely, a performance-based framework establishes defined safety outcomes—such as detection rates or maximum repair times—and provides regulated entities with flexibility in achieving these outcomes. While waivers are reactive measures, performance-based regulation is proactive and sustainable. Ideally, regulatory agencies should progressively revise their regulations to shift away from prescriptive measures in favor of performance-oriented approaches. This transition would eliminate the regulatory delays associated with the current rulemaking procedures and would promote more rapid investment in innovative solutions by companies and inventors. Moreover, the agency should prioritize waivers granted to specific entities and consider regional or industry-wide waivers wherever feasible. These waivers could subsequently serve as the foundation for a new performance space framework, where applicable.

I believe there is a strong bipartisan consensus in favor of a risk-based approach to regulations, as the standards often set are so stringent that they function both as economic deterrents and dissuade companies from investing in their assets. This is, of course, not to suggest that regulation should be eliminated or that regulated entities should be exempt from oversight. On the contrary, more effective regulations serve to bring us closer to our objective of zero accidents and zero incidents.

Recommendation to Congress: Require FRA to review and consider permanent rule changes whenever three or more waivers are granted for the same provision within five years, ensuring recurring operational realities are reflected in regulation.

Question 4. Your organization's recent report, "*Driving Regulatory Innovation for Safer Railroading*," highlighted some very egregious examples of the Biden Administration's manipulation of the FRA's waiver process, most notably the United States Court of Appeals for the Fifth Circuit ruling against FRA's rejection of a BNSF waiver.

Question 4.a. What are the implications of an agency acting in an "arbitrary and capricious" manner for innovations that improve railroad safety and innovation?

ANSWER. The Fifth Circuit's ruling in *BNSF Railroad* Co. v. *FRA* characterized the Federal Railroad Administration's (FRA) denial of waivers as "arbitrary and capricious" due to its failure to consider relevant safety data and the absence of a clear rationale for prioritizing manual inspections. It is essential to recognize that such a standard sets a relatively high threshold; agencies that act reasonably—despite expert disagreements—or that are generally upheld often meet this criterion. Nonetheless, when an agency considers alternative measures to be more suitable, it likely exceeds its statutory authority and extends its powers beyond those granted by Congress. Cases of this nature are particularly regrettable, as they are unnecessary. Frequently, governmental legal representatives are aware of more appropriate options but are constrained by policy directives or, in certain instances, by political decision-making processes.

Unfortunately, such conduct erodes confidence by fostering uncertainty, which discourages investment in both emerging and established safety technologies. Ultimately, this is harmful to the public, as it sacrifices the advantages of improved efficiency and enhanced safety.

Question 4.b. Were FRA's actions during the Biden Administration contrary to the agency's mission to "enable the safe, reliable, and efficient movement of people and goods?"

ANSWER. Rejecting data-supported innovations without a clear justification contradicts the FRA's mission "to enable the safe, reliable, and efficient movement of people and goods." The primary concern, if I may, in this context, pertains to em-

ployment, which is entirely understandable. As briefly mentioned during the hearing, employment considerations are always significant, and sound public policy should duly account for this. An effective safety policy should not hinder employment. Existing mechanisms are in place through which the workforce and the railroads can negotiate compensation packages, pensions, and overall security. As I have briefly indicated, history shows that employment is not necessarily diminished due to technological advancements. Instead, in this context, the workforce responsible for locating and repairing defects remains essentially the same.

It is reasonable to assume that if significantly more defects can be identified using more automated technologies than the traditional methods, such as the "Mark 1 Mod 0 Eyeball" as we would refer to it in the military out of pure jest, it would constitute an improvement.

Recommendation to Congress: Require FRA to publish, in the Federal Register, objective and data-driven rationales for waiver denials, including any comparative safety analysis between proposed and existing methods.

Question 5. In his testimony during the hearing, Mr. Cardwell claimed that technologies like ATI are only 26–27 percent effective at identifying defects. Could you explain why this figure may not be accurate in describing how ATI works in conjunction with manual track inspections?

ANSWER. I do not believe that the cited 26–27% figure accurately represents ATI's capabilities. To clarify further, the allegation is that ATI is specifically using Track Geometry Measurement Systems, which can only identify six of the 23 defect types the FRA requires railroads to check for during visual inspections—roughly 26 percent of the total categories—meaning this figure reflects the targeted scope of defect types ATI measures, not its accuracy within that range.

For its accuracy, both the FRA and MxV Rail pilot programs showed that ATI reduced defects per 100 miles by 92.2% (from 3.08 to 0.24)[1] and lowered derailments on monitored corridors by 72.7%.[2] ATI shifts manual inspection focus on defect types it cannot yet detect, such as specific turnout issues, which account for 60–80% of non-geometry defects.[3] ATI also reduces worker exposure to on-track hazards and expands inspection coverage without increasing track time.

Recommendation to Congress: Direct FRA to integrate validated ATI performance data into its rulemaking and consider expanding its authorized use for mainline inspections, paired with targeted manual follow-ups.

Question 6. The hearing mostly focused on the benefits of performance-based regulations on regulated entities. As a former regulator at the Department of Transportation (DOT), what benefits are the benefits of performance-based standards to Federal regulators?

ANSWER. For regulators, performance-based standards provide:

- *Flexibility* to approve innovative solutions without the necessity of frequent rule rewrites.
- *Clarity of Outcomes* with measurable safety metrics;
- *Efficient Oversight* by focusing on results rather than method compliance; and
- *Continuous Improvement* through feedback from performance data.

The PHMSA Integrity Management Program, developed during my tenure in federal service, has contributed to a reduction in hazardous liquid pipeline incidents, which have decreased by 36% between 2014 and 2024, despite an expansion in mileage and increased volumes transported. This demonstrates that well-designed performance frameworks can enhance safety while fostering innovation.[4]

Recommendation to Congress: Authorize FRA to implement a phased, metrics-driven performance-based program—initially as voluntary pilots—with periodic evaluation and potential codification if safety improvements are verified.

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[1] Association of American Railroads. (2025, April 24). *TGMS Waiver Petition to FRA (FRA–2025–0059), attachment detailing pilot-program defect ratios* [PDF letter]. https://www.trains.com/wpcontent/uploads/2025/05/FRA-2025-0059-0001_attachment_1.pdf

[2] Federal Railroad Administration. (2021, November 23). *Track Inspection Test Programs: Report to Congress* [PDF]. U.S. Department of Transportation. https://railroads.dot.gov/sites/fra.dot.gov/files/2021-11/FRA%20Report%20to%20Congress-Track%20Inspection%20Test%20Program%2011.23.21.pdf

[3] Eruvuru, S. (2023). Railroad Wireless Communications Research and Testing. Association of American Railroads. MxV Rail. Retrieved from https://www.mxvrail.com/wp-content/uploads/2023/10/28th-Annual-AAR-Research-Review-2023-All-Slides-1.pdf

[4] Pipeline and Hazardous Materials Safety Administration. (2024). *Annual report: Hazardous liquid pipeline performance measures, 2010–2024*. U.S. Department of Transportation. Retrieved from https://www.phmsa.dot.gov/data-and-statistics/pipeline/hazardous-liquid-annual-data

QUESTIONS FROM HON. DANIEL WEBSTER TO ERIC GEBHARDT, EXECUTIVE VICE PRESIDENT AND CHIEF TECHNOLOGY OFFICER, WABTEC, ON BEHALF OF THE RAILWAY SUPPLY INSTITUTE

Question 1. The technologies you are developing seek to leverage vast amounts of data and data analysis to shift the paradigm of railroad safety from a reactive approach to a proactive approach. In your testimony, you also said it will take rail safety "to the next level."

Question 1.a. How important is a consistent and transparent regulatory process to enabling this paradigm shift?

Question 1.b. Would you agree that the goal of regulations should be to achieve a safety outcome, rather than mandate a specific process to achieve that outcome?

Question 1.c. How is data collected from ATI analyzed and utilized?

Question 1.d. How do railroads use this information to determine and prioritize track maintenance and repair?

ANSWER to 1.a., 1.b., 1.c., & 1.d. A consistent and transparent regulatory process is essential to the successful development, demonstration, and adoption of rail safety technologies. When industry can anticipate how data-driven solutions will be evaluated, it reduces uncertainty and supports broader investment in safety-enhancing technologies.

Wabtec agrees that the primary goal of regulation by the Federal Railroad Administration should be to achieve measurable safety outcomes. Prescriptive rules, while well intentioned, can constrain the deployment of advanced technologies that may exceed legacy safety benchmarks. A performance-based regulatory approach, focused on outcomes, including defect detection and predictive maintenance efficacy, can provide the flexibility needed for the industry to continuously improve while maintaining rigorous safety standards.

Automated Track Inspection (ATI) systems collect geometry and high-resolution imagery on critical safety components. The data is immediately uploaded to secure servers. In near real-time, these tools identify anomalies, trends, and potential defects, assigning a severity rating and generating actionable alerts for rail operators. Historical and trend-based analyses are also performed to detect degradation patterns over time—enabling predictive maintenance and asset lifecycle management.

Capturing and analyzing vast amounts of data allows railroads to continuously monitor the state of the equipment and infrastructure, spot degradation trends and catch failures before they occur. Many failures will have early indications that degradations are in progress. With these capabilities, railroads have the ability to catch and address these before catastrophic failures occur.

Question 2. Some claim railroads use innovation solely as a means of eliminating jobs or otherwise avoid safety regulations.

Question 2.a. How do technologies like ATI create new opportunities for rail workers?

Question 2.b. In your opinion, does rail innovation necessarily result in fewer rail worker jobs, or does it shift the composition of the rail workforce?

Question 2.c. Can you describe other benefits technology can bring to workers?

ANSWER to 2.a., 2.b., & 2.c. Our experience demonstrates that technology, when deployed thoughtfully, can enhance both safety and opportunity for rail workers. For example, inspection technologies shift the focus of rail safety personnel from repetitive, manual, and sometimes dangerous tasks to higher-value roles in data interpretation, diagnostics, and preventative maintenance planning. The talented railroad workforce is increasingly being trained to operate and maintain advanced diagnostic tools, expanding their technical skill sets and improving long-term career prospects in a modernized rail industry.

We have, in the US, a very valuable rail infrastructure of over 140,000 miles of track handed down to us by earlier generations. Unfortunately, this very desirable historical asset is under-utilized. Advanced Technologies have the ability for us to significantly increase traffic volume while improving safety. This would have the effect of not only relieving pressure on our roads and highways, but for the rail worker, it would mean more work to operate and maintain the increased quantity of equipment and assets needed to move the increased volume of freight.

Question 3. Should regulatory safety standards be solely based on measurable and objective technical and engineering criteria? Can you describe the negative consequences of introducing subjective factors to evaluate regulations and what this means for innovators?

ANSWER. Regulatory safety standards should be grounded in measurable, objective technical and engineering criteria. Objective standards ensure that safety outcomes

are consistent and rooted in sound science. They also create a clear and level playing field for industry participants, enabling investment, innovation, and continuous improvement in rail safety technologies.

When subjective factors influence decision-making, similar technologies may be treated differently across regions or time periods, undermining confidence in the regulatory process. Ultimately, safety should never be compromised. But when evaluation criteria are objective, transparent, and measurable, the rail industry is better positioned to bring forward innovative tools that can meaningfully improve safety and performance.

Question 4. How do technologies like ATI facilitate a process that promotes continual improvement in railroad safety management efforts?

ANSWER. Technologies, like ATI, transform railroad safety from a static, compliance-based model, to a dynamic, data-driven process of continual improvement. Rather than relying solely on periodic manual inspections, inspection systems generate continuous streams of high-resolution data on critical components such as wheels, bearings, and brake systems, even while trains are operating at track speed. These inspection technologies also reduce the potential for human error and ensure more consistent safety objectives.

When these technologies leverage state of the art Machine Learning or other Artificial Intelligence advancements, their models improve over time and become more capable and precise. In the same manner as humans learn, inspection models are trained and then as models are used in the field, they gain observations based on exposure to new situations. With this new knowledge, models are continually retrained based on experience. This new knowledge now becomes a permanent part of the model, which continuously improves over time. However, unlike humans, this knowledge base is consistent across each inspection.

Question 5. Would you agree that the best outcome for railroads, their workers, their customers and the public is to allow the adoption of new technologies to occur in a competitive market and avoid having the government choose winners and losers? Can you briefly describe the benefits of a competitive market for your industry?

ANSWER. The most effective and sustainable outcomes for railroads, workers, customers, and the public are achieved when technology adoption is guided by a competitive, innovation-driven marketplace. At the same time, we support continued federal investments in rail technology research, development, and deployment, such as the Consolidated Rail Infrastructure and Safety Improvements grant program. These investments play a critical role in de-risking early-stage innovation, advancing foundational research and development, and accelerating the adoption of next-generation technologies that enhance safety and operational efficiency.

Looking ahead to the 2026 Surface Transportation Reauthorization, Wabtec supports a suite of market-oriented initiatives that preserve competition while speeding safe deployment. We recommend establishing a SuperRail program at the Department of Transportation, in partnership with the Department of Energy, to competitively fund next-generation rail technologies across energy efficiency, network optimization, advanced materials, and cybersecurity. We also support an FRA research, development, and demonstration pilot focused on automated inspection and a rail technology and innovation fast-track program to streamline testing, evaluation, and approvals. None of these proposals choose winners: they set clear outcomes and let rail technology providers compete to meet them, while giving railroads practical pathways to adopt what works at-scale.

QUESTIONS FROM HON. RICK LARSEN TO ERIC GEBHARDT, EXECUTIVE VICE PRESIDENT AND CHIEF TECHNOLOGY OFFICER, WABTEC, ON BEHALF OF THE RAILWAY SUPPLY INSTITUTE

Question 1. Have Railway Supply Institute members seen a benefit from the robust and dedicated rail funding in the Bipartisan Infrastructure Law?

ANSWER. The Infrastructure Investment and Jobs Act provided five years of predictable, rail-specific funding for critical industry supporting programs, including the Consolidated Rail Infrastructure & Safety Improvements (CRISI) program. As a result of this five-year Surface Transportation Reauthorization, rail suppliers and operators have greater certainty to invest in manufacturing facilities, product development, and their workforce.

These programs, including but not limited to CRISI, have accelerated the deployment of advanced safety and efficiency technologies developed by RSI member companies, including Positive Train Control, railcar telematics, and new and upgraded

locomotives. Each federal investment triggers follow-on orders for further equipment and technology produced by RSI firms and suppliers.

Question 2. Why did Wabtec develop a Tier 4 locomotive? Why aren't more railroads replacing their older locomotives with these cleaner locomotives?

ANSWER. Wabtec invested over $250 million to develop the Tier 4 locomotive and comply with the U.S. Environmental Protection Agency (EPA) Tier 4 emissions standards, which were first promulgated in 2008 and became effective in 2015. Wabtec's Tier 4 locomotive was designed to meet these stringent emissions standards without aftertreatment, offering a fuel-efficient, lower-emissions alternative to legacy locomotives, while maintaining the high-performance demands of freight operations. More than 1,100 Wabtec Tier 4 locomotives are in operation today.

Widespread replacement of older locomotives with Tier 4 units has been limited due to significant upfront investment, fleet utilization strategies, and operational considerations. Additionally, many Class I railroads have opted to modernize existing fleets of line-haul locomotives due to their long life of up to 40 years. While not achieving Tier 4 compliance, locomotive modernizations still drive substantial fuel savings, improve reliability, and reduce emissions at a lower cost.

QUESTIONS FROM HON. RICK LARSEN TO TONY CARDWELL, PRESIDENT, BROTHERHOOD OF MAINTENANCE OF WAY EMPLOYES DIVISION, INTERNATIONAL BROTHERHOOD OF TEAMSTERS

Question 1. Do you support railroads using better technology?

ANSWER. Yes. BMWED supports the use of any technology that improves safety, helps identify defects earlier, or gives track inspectors better information in the field. Automated inspection tools, drones, sensors, and geometry systems all have value when they supplement, not replace, the judgment and experience of qualified track inspectors.

Since 2018, BMWED has vigorously attempted to work with the freight railroads to find a responsible and safe pathway for integrating new technologies while preserving the level of visual oversight required to keep the track structure safe. Those efforts have consistently emphasized that technology should strengthen inspection programs, not weaken them. These attempts were rejected, at every level.

Technology can enhance safety, but it cannot replicate the full range of conditions inspectors evaluate, such as track components, ballast conditions, drainage issues, ties, fasteners, switches, and subgrade movement. Our position is simple: technology should make the job safer, not serve as a justification for reducing human oversight that FRA regulations still require.

Question 2. Does railroad management share information from their track geometry measurement systems with track inspectors?

ANSWER. Not consistently. On some railroads, inspectors receive partial or delayed TGMS information, or only limited categories of exceptions. In many cases, inspectors report that they do not receive full exception lists, historical trend data, GPS aligned records, or the underlying strip charts that would allow them to fully verify or understand an automated exception. Workers have also reported that railroad managers sometimes discard or disregard TGMS runs that show less favorable conditions, which prevents inspectors from seeing the full picture of track health.

BMWED has repeatedly raised concerns when railroads use automated data to justify reducing visual inspections while not providing inspectors with the full set of information needed to properly verify defects and protect track safety.

Question 3. Why have freight railroads cut their track inspection staff over the last ten years? Are they operating over fewer miles of track?

ANSWER. Freight railroads have reduced track inspection staffing for reasons that have nothing to do with reductions in track miles. In fact, many carriers still operate roughly the same mileage they did a decade ago, and traffic density has increased on key corridors.

The staffing cuts occurred primarily because of cost reduction strategies tied to Precision Scheduled Railroading. Railroads consolidated territories, increased the geographic size of inspector assignments, eliminated redundant positions, and allowed attrition to shrink the workforce. These decisions were financial, not safety driven. Over the same period, Class I carriers have reduced their overall workforce by roughly 30 percent. This includes safety related craft positions such as track inspectors and reflects a systemic staffing issue, not a targeted or safety driven adjustment.

Despite maintaining similar mileage and in many cases higher tonnage, railroads today have fewer inspectors per mile of track. BMWED continues to warn that reducing human inspection capacity while increasing reliance on automated systems creates gaps, diminishes local expertise, and increases safety risk to both workers and the public.

QUESTION FROM HON. DINA TITUS TO TONY CARDWELL, PRESIDENT, BROTHERHOOD OF MAINTENANCE OF WAY EMPLOYES DIVISION, INTERNATIONAL BROTHERHOOD OF TEAMSTERS

Question 1. Can you describe the cooperation between your members and the Federal Railroad Administration's 371 safety inspectors? Would increasing the number of FRA safety inspectors and modernizing pay to retain skilled FRA safety inspectors improve safety for communities, passengers, and operations? If so, could you explain how?

ANSWER. Thank you for the question. BMWED members work closely with FRA's safety inspectors and view them as essential partners in protecting workers, communities, and the traveling public. Our members interact with FRA inspectors during routine field inspections, joint investigations, incident reviews, and compliance audits. These interactions are professional, collaborative, and grounded in a shared commitment to ensuring that the national rail network meets the requirements of federal Track Safety Standards.

FRA's 371 inspectors are responsible for oversight of more than 140 thousand miles of track, thousands of bridges, and all freight and passenger railroads in the country. Their ability to independently verify conditions, follow up on reported hazards, and hold carriers accountable is critical. However, the ratio of federal inspectors to the size and complexity of the national rail system limits how often FRA can visit properties and how deeply they can audit track conditions, inspection records, and maintenance programs.

Increasing the number of FRA safety inspectors, and modernizing pay so the agency can recruit and retain individuals with real field experience, would improve safety in several ways. It would allow FRA to conduct more frequent onsite inspections, verify automated inspection data with independent measurements, and follow up more rapidly on defects, slow orders, and derailment precursors. It would also strengthen oversight of carrier compliance with Part 213 and ensure that reductions in visual inspections do not occur without strong evidence of safety.

Additional FRA capacity would reinforce the work of BMWED inspectors on the ground. When FRA is present more often and able to independently confirm conditions, it reduces pressure on railroad employees to meet unrealistic productivity goals and helps ensure that safety decisions are based on conditions, not company targets. That improves safety for communities along rail corridors, for train crews and maintenance employees, and for passengers who rely on safe track infrastructure.

BMWED strongly supports increased staffing, improved pay, and modernized hiring authorities for FRA's safety inspector corps.

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