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'He Acts Like He Has No Relatives'



I recently came across an observation from Cherokee descendant Randy Woodley I feel is quite profound. I'm sure that many of you, like me, are trying to understand what exactly is going on in our divided nation and volatile world. You all know the ugly details.

By the time you read this, the midterm elections will have concluded, and the political noise—like those annoying campaign ads from both major parties largely based on fabrications of the truth and character assassination—will have shifted gears. Yet, the volume level will still be in overdrive, and it will remain tough to press the "mute" button on our saturated brains. Enough already!

So, here's something that may help. Says Woodley: "My Keetoowah ancestors understood that every person, every being, every element of creation has a particular responsibility—a role to play in the harmony of the whole. Not everyone had the same role. Some were healers, some were warriors who protected the people, some were farmers, some were storytellers. But everyone had something that was theirs to do, and the community couldn't function without all of it. An old Native American saying puts it more bluntly: The worst thing that can be said about a person is, 'He acts like he has no relatives.'

"To act as if you have no relatives means to live as though your actions don't ripple outward. It means to treat the world as though you're the only one in it. It means to extract what you want without asking what you owe.

"Sound familiar? This is essentially the operating system of Western capitalism—the worldview that treats land as inventory, water as delivery system, people as labor units, and the sick as revenue streams. Take what you can, discard the rest and never ask who's downstream.

"My ancestors practiced the opposite. They understood that humans are the younger siblings in creation—that the plants, animals, waters and stones have been here longer and know how things work. Our job is not to dominate but to listen, learn and contribute to the wellbeing of the whole. That's not metaphor. That's a survival strategy developed over thousands of years of living in a reciprocal relationship with the land.

"The mystics have always known that the separate self is an illusion—that we are woven into one another and into creation. That what we do to the least of these, we do to the Sacred. Indigenous peoples have been practicing that truth in daily life for millennia, not as theology to be debated but as a way of being to be lived. It goes by various names, but I call it the Harmony Way.

"This is what contemplation should lead to—vulnerability. Not withdrawal from the world but deeper engagement with it. Not escape from suffering but the willingness to sit with it long enough to see clearly what is ours to do. Vulnerability requires living reflectively with yourself but also living deeply into the whole community of creation—all your relatives."

What, you may ask, does this have to do with our railway community? *Everything.* Regardless of who you are—CEO, COO, labor official, craft employee, regulator, consultant, customer, etc., etc.—try not to act like you have no relatives, OK?



WILLIAM C. VANTUONO
Editor-in-Chief

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'MORE OF THE SAME: SOLID RAIL TRAFFIC GROWTH AND ECONOMIC MOMENTUM, DESPITE OBSTACLES'

"Based on opinion polls and consumer confidence surveys, you might think the U.S. economy is in terrible shape," the AAR reported last month. "But despite real challenges that could evolve into full-fledged rises, including inflation, high energy prices, rising interest rates and global conflicts, the overall economy continues to perform much better than many expected.

"Rail traffic continues to perform well, too. August, September, and the third quarter set new intermodal records, and total carloads have grown year over year for nine straight months. Excluding coal, carloads are growing twice as fast as the overall economy.

"Importantly, carload growth is occurring across the industrial spectrum, not just in a handful of isolated sectors. The manufacturing expansion that took off at the start of the year appears increasingly durable. When coupled with resilient consumer demand, this bodes well for continued healthy rail volumes.

"Best-ever intermodal volumes: U.S. railroads originated nearly 295,000 intermodal containers and trailers per week in September, down only slightly from August's record high despite the Labor Day holiday. This made the third quarter the highest-volume quarter ever for U.S. intermodal. Record-high diesel prices, an exodus of truck drivers driven by market and regulatory factors, and generally strong railroad service levels have made intermodal an increasingly attractive option for shippers.

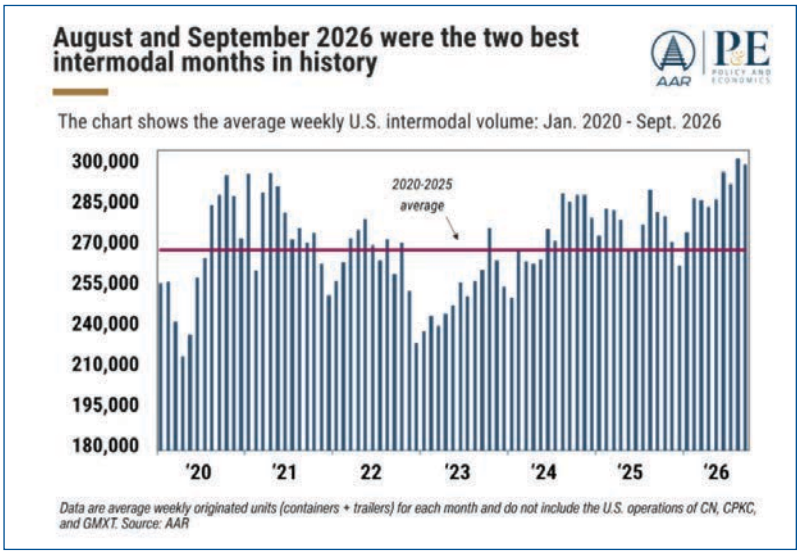
"It helps that consumers continue to spend. The most recent inflation-adjusted consumer spending figures, for August, show overall spending up 2.6% over last year and spending on goods up 2.7%. Robust consumer spending keeps goods moving through supply chains, providing a critical source of support for freight volumes.

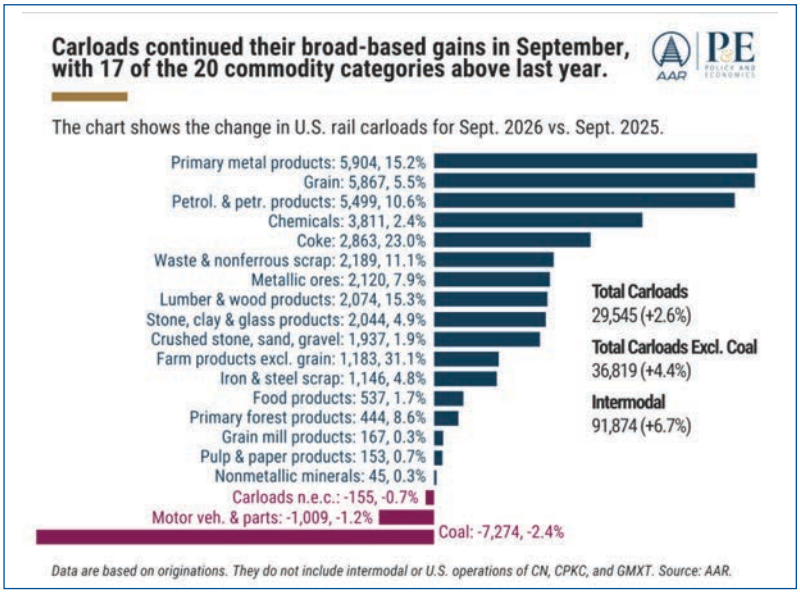
"The AAR monitors 20 carload categories that collectively reflect all major freight-producing industries. In September, 17 of the 20 had year-over-year gains, the most in five years. That breadth matters because it points to widespread industrial momentum.

"Steel had the largest absolute carload growth in September. In recent months, U.S. steel output has been the highest since 2012. Rail carloads of steel products in August and September were the most in five years. Steel is a key input for a wide range of industries, including autos, machinery, construction, energy, and appliances, and it's a prime example of a critical industry with a symbiotic relationship with railroads.

"Grain carloads rose in September for the 18th time in the past 19 months. In the third quarter of 2026, grain carloads averaged around 22,000 per week, down from around 24,600 per week in the first quarter. U.S. grain exports have dipped in recent months from early in the year.

"Petroleum products carloads, which include LPG, crude oil, asphalt, distillate and residual fuel oil and





many other products, rose 1% year-over-year in September (their 9th straight year-over-year gain) and, in absolute terms, were the most for a month since early 2020.

"Chemical carloads rose in September for the eighth time in the past nine months. They averaged nearly 33,200 per week in September, a September record. Chemical carloads are on pace to set a new annual record this year. U.S. chemical output is being spurred by manufacturing growth and by low natural gas rices relative to elsewhere in the world.

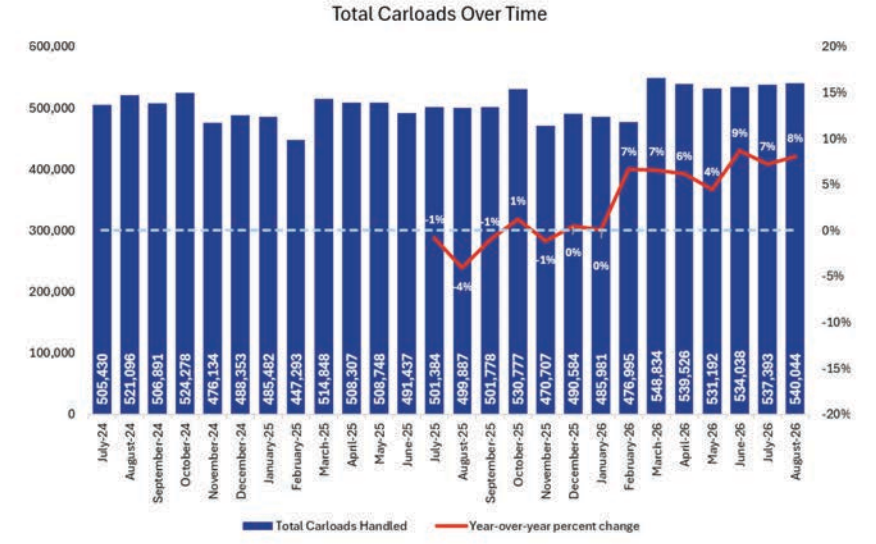
"Year-over-year coal carloads fell in September for the seventh straight month. They are less than half what they were 20 years ago, but coal still accounts for a quarter of non-intermodal U.S. rail traffic. The same low natural gas prices that are spurring higher chemical output also make electricity generated from natural gas more competitive vs. electricity generated from coal. Excluding coal, September carloads grew 4.4% over last year, significantly faster than GDP growth.

"The AAR Freight Rail Index (FRI) strips out coal and grain and seasonally adjusts the remaining traffic to create a timely gauge of economically sensitive rail volumes. In September, the FRI reached its second-highest level ever and its average for the third quarter of 2026 was a record high, pointing to continued strength across the goods-producing economy. The number of freight cars in storage fell again in September and now equals 17.7% of the North American fleet, the lowest share since April 2023. A decline in stored cars suggests rising demand for freight rail services."

ASLRRA SHORT LINE CARLOAD REPORT

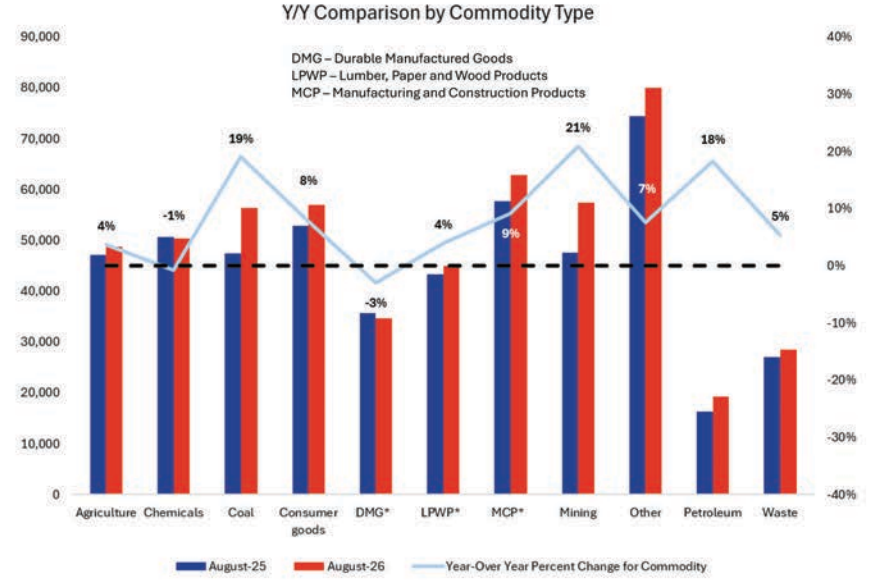
Total carloads handled calculates the total number of individual carloads that were either an origination, termination or a bridge movement, on at least one U.S. short line. This total will generally be smaller than the sum of originated, bridged and terminated movements, as some individual carloads experience more than one of these events. This short line carload data report is created by the American Short Line and Regional Railroad Association in cooperation with Railinc, based on waybill data submitted by railroads. A detailed report is published each month via ASLRRA's *Views & News*. Visit www.aslrra.org/carload to learn more.

This table presents the long-term trends of carloads handled by short lines and the respective month-over-month percent change. This data series begins with July 2024 carloads, hence there is no data for a month-to-month change in that field. As seen below, August 2026 maintained the recent trend of annual growth. August 2026 was up 8% compared to last August. This remains in line with most of 2026 being up by about 6% in annual comparisons with 2025.



All movement types saw increases compared to August 2025. Originations and terminations continued to represent the bulk of the overall increase for carloads handled. While bridge movements did experience a modest increase of about 1,000 carloads when compared to August 2025, this was a smaller change than has been seen recently during the course of 2026.

	August 2025	August 2026	Percent change
Bridged	92,340	93,441	1%
Originating	226,798	250,959	11%
Terminating	258,543	276,293	7%
Total Handled	499,887	540,044	8%



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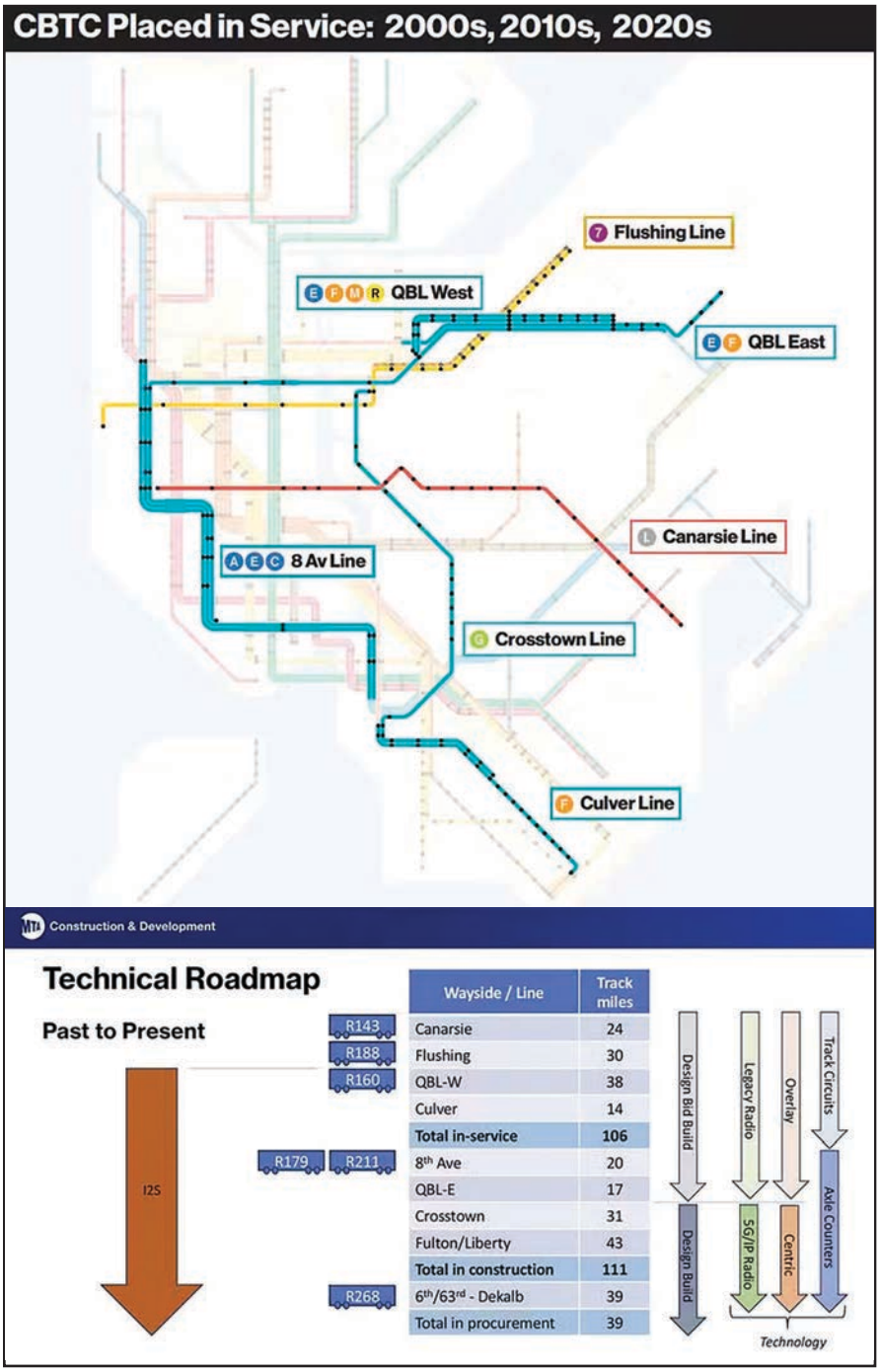


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MTA New York City Transit Launches $1.9B CBTC Project



MTA NEW YORK CITY TRANSIT (NYCT) IS BRINGING COMMUNICATIONS-BASED TRAIN CONTROL (CBTC) TO THE FULTON AND LIBERTY LINES IN BROOKLYN AND QUEENS. Work began this month on the six-year, $1.9 billion project to replace 1930s-era signaling spanning 43 track miles, from the High St A/C to Ozone Park–Lefferts Blvd A, and covering 23 stations. It is said to be the largest signal and track replacement project in MTA history.

The project corridor serves 350,000 riders each weekday and provides connections to seven other subway lines, 36 bus routes and MTA Long Island Rail Road. The A and C serve 750,000 riders each weekday.

The first phase of work will focus on replacing aging switches and more than 250 feet of special trackwork between 104 St. and 99 St. in Queens. The project will also include infrastructure to support future mobile phone service for riders and work to keep existing infrastructure in a state of good repair.

The project contract was awarded to L.K. Comstock & RailWorks in December 2025. Siemens' CBTC System, Trainguard MT, will be used, in compliance with New York Subway Interoperability Interface Specifications (I2S). Completion is expected in 2Q 2032.

The work builds on other CBTC investments serving A and C riders along Eighth Avenue between 59 St. in Manhattan and High St. in Brooklyn. "Modernizing signals across nearly 85 miles of the subway system is made possible with funds from congestion pricing," reported New York MTA, which noted that its 2025–2029 Capital Plan provides an additional $5.4 billion to modernize signals across more than 75 miles on the Broadway N/Q/R/W, Liberty Avenue A, Rockaway A/S and Nassau Street J/Z lines.

CBTC is currently operating across the full 7 and L lines, as well as portions of the E, F, M and R routes on the Queens Boulevard and Culver line. Following signal modernization, on-time performance on the 7 line rose from 68% to 91%, according to MTA. On the E line in Queens, train speeds increased by approximately 10% following CBTC activation.

MTA said it will use a design-build contracting model for the Fulton-Liberty signal modernization project. This approach, it noted, has "been shown to reduce signal modernization costs per mile by 33% compared with the average for prior CBTC projects," as it transfers much of the project risk to contractors. MTA added that its CBTC projects now focus solely on installing the technology, foregoing the maintenance of legacy signaling during the transition.

Gregoire Sulmont, SVP, Signals and Train Controls at MTA Construction & Development, presented last month on NYCT CBTC developments at *Railway Age's* 2026 Next-Gen Rail Systems conference. He told attendees that the CBTC contract for 6th Avenue & 63rd Street (a major Manhattan trunk line, including the final section of the F) is targeted for award by the end of this year.

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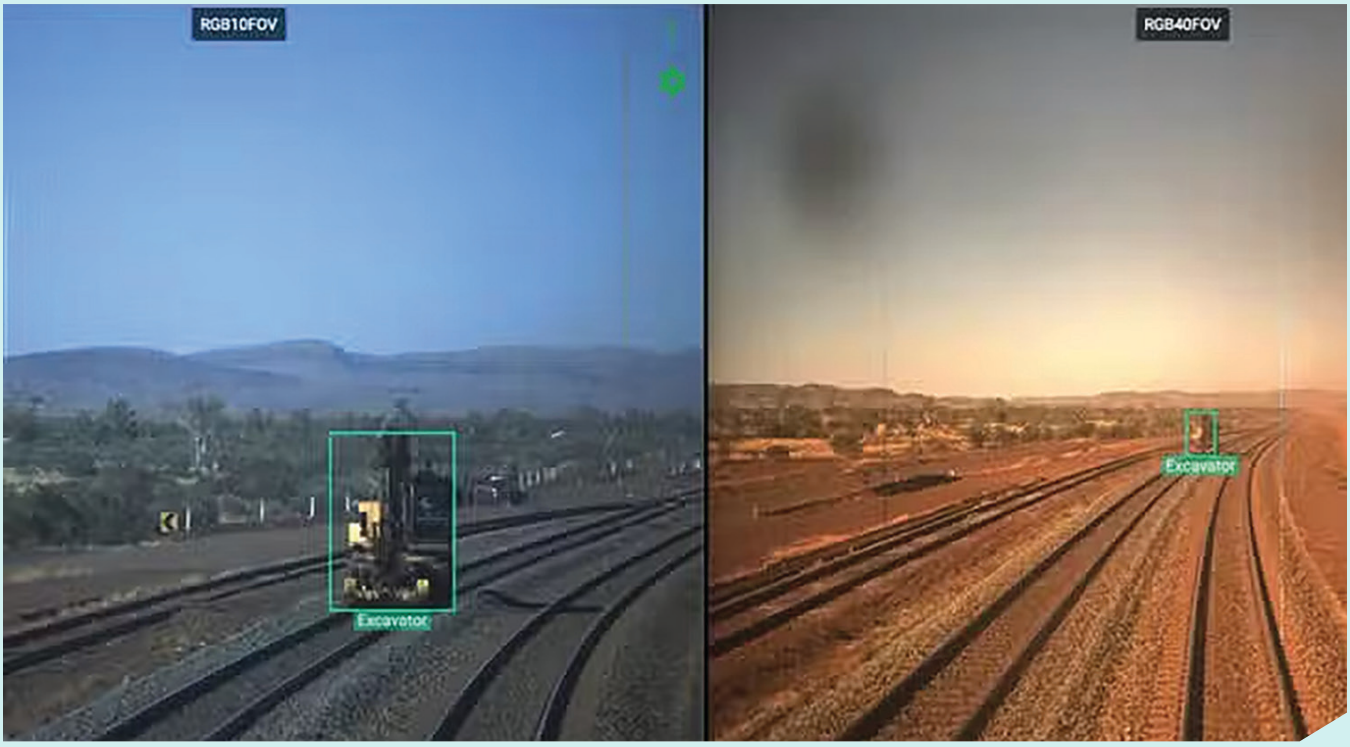
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4AI Systems Testing Onboard Sensor System at MxV Rail



The Association of American Railroads Train Control, Communications, and Operations (TCCO) Committee has selected 4AI Systems to demonstrate how its onboard sensor system, HORUS, "meets the needs of restricted speed enforcement," the company reported Oct. 19. The controlled environment pre-integration testing will be conducted next month at MxV Rail in Colorado, according to 4AI Systems, which noted that only two other suppliers have been invited to participate. The other suppliers are NIART Systems and Rail Vision Ltd.

"The upcoming testing forms part of MxV Rail's 'TCCO Technology and Automation Roadmap Program,'" 4AI Systems reported. "The objective of the Restricted Speed Enforcement increment is to identify interoperable solutions for clear path identification and to help prevent collisions with vehicles and people during restricted speed operations."

Following testing, MxV Rail will share the findings to help define industry best practice, 4AI Systems said.

According to the company, the HORUS vision perception system monitors location and speed, while "continuously scanning for objects and calculating the location for potential hazards." The action taken after detection, it noted, "is ultimately up to the operator with different levels of integration possible, ranging from advisory to enforcement, as proven with other customers."

The HORUS system has undergone "successful trials" in the United States, Australia and Europe, added 4AI Systems, which was founded in Australia and whose team "has demonstrated their ability to deploy remotely with 24/7 in-house support."

"By capturing and processing sensor data onboard in real-time, HORUS improves the situational awareness of a locomotive engineer," said Mark Wood, Chief Technology Officer at 4AI Systems, which is backed by 4Tel Pty Ltd. "Whether that be in high-risk areas, poor weather conditions or at night, we are able to support restricted speed enforcement operations with engineering controls."

FREIGHTCAR AMERICA has completed its acquisition of **TRINITY EQUIPMENT COMPANY (TEC),** an independent Michigan-based supplier of original equipment manufacturer (OEM) and replacement railcar components and fastening solutions. The deal marks FreightCar America's third acquisition in less than a year as it expands its aftermarket business. Chicago-based FreightCar America, a manufacturer and supplier of railroad freight cars, railcar parts and components, said the acquisition "broadens its product portfolio and strengthens its customer and supplier relationships across North America. TEC's product offerings and established relationships complement FreightCar America's existing aftermarket operations, providing opportunities to expand sales to new and existing customers through the company's distribution network." The transaction is expected to be immediately accretive to FreightCar America, according to Vice President and CEO Mike Riordan. "TEC's product expertise and established relationships complement our existing aftermarket operations," Riordan said. "This acquisition is consistent with our disciplined capital allocation framework and our focus on growing recurring aftermarket revenue."

4AI Systems

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We're proud to honor Lisa Blansett, Vice President of Global Supply Chain at FreightCar America, for being named a *Railway Age* 2026 Women in Rail honoree. Her leadership and excellence advance the rail industry and play a vital role in every purpose-built railcar we deliver.

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Coherent, Constant Economic Policy Unlikely

Game planning the post-midterm election environment is a challenge to even the most well-seasoned political wonk or finance professional. It is difficult to make a decision when the ability to rely on information is constantly being undermined. Think you can rely on a law passed by Congress and POTUS 47? Think again! POTUS 47 may just sign an Executive Order saying laws don't matter.

One post-election issue that will continue to rankle rail consumers will be the tariff dilemma. "Financial Edge" and *Railway Age* have written often and voluminously on the tariff topic. First, there was the potential tariff on all imports from Mexico and Canada. Then there is the fight with Canada. There are the Section 232 tariffs related to tank railcars. More fighting with Canada. Now there is the ongoing situation related to USMCA and the unsettled situation with Mexico.

Recent U.S. tweaks to the tariff agenda to support Maine's incumbent Republican U.S. Sen. Susan Collins in the midterm elections embarrassingly highlight the inconsistency with reduced tariffs on some relevant farming equipment while increasing them on consumer goods—e.g., cocoa powder, shampoo and the commerce wave driving canoes shorter than 7.5 meters.

After its six-year base term expiration, USMCA is now in an interesting lame duck period. While those north and south of the United States would be happy to renew the deal and get back to North America's business being business, the decision to renew or not to renew relies on a unanimous decision. A renewal could be as long as 16 years. Failure to agree could mean annual USMCA reviews and renewals—torture!

As Canadian Prime Minister Mark Carney works to try to maintain a strong position vs. the United States, the situation with Mexico has been fluctuating. Mexico and the United States seemed to be heading to an agreement of sorts. Enter U.S. Commerce Secretary Howard Lutnik. According to *The Wall Street Journal*, "Mexico had been zeroing in on a deal that would reduce U.S. levies on steel, aluminum and automobiles in exchange for a series of concessions from Mexico." These are



Section 232 tariffs imposed under national security concerns and are the main source of Lutnik's opposition.

The general consensus is that the current impasse is likely to hold any negotiated conclusion until after the midterms. If both houses of Congress change orientation, who knows where it goes from there?

In the grand scheme of indecisiveness, the idea that USMCA would become an annually renewed program seems like the worst of all worlds. At the Oct. 22 SEARS conference, analyst Tony Hatch noted that an annually renewable USMCA could be the worst thing for nearshoring and growth, as who would want to invest in a factory or manufacturing facility when there is an annual threat of a change in the economics of tariffs?

An unsettled tariff policy will more than likely continue to impact the railcar building in Mexico and be disruptive to an already unsettled marketplace. Cutting side deals while leaving an annually renewable USMCA in limbo is a rail consumer's worst outcome.

Current tariff policy has taught the North American rail industry that uncertainty creates doubt and hesitation—both of which weigh on the minds of consumers of and investors in rail assets. That weight is in addition to the now omnipresent Union Pacific/Norfolk Southern merger talk.

Operators and manufacturers carry that weight trying to manage increasing costs. In the past 12 months, the Producer Price Index for the Transportation and Warehousing industries has increased 12.45%. J.B. Hunt (arguably the largest U.S. consumer of rail traffic) reported the need to increase prices to offset rising costs, even as intermodal volumes are rising. On the other hand, over the past two years, the PPI for Railroad Rolling Stock Manufacturing has increased 3.4%.

Although new rail equipment may have reached a near-term peak (subject, of course, to additional adjustments in raw materials, the prices of which have also risen as much as 30% year-over-year), other logistics-related expenses continue to rise. Talk to anyone moving freight by rail and you'll find out that the struggle is real—like *really* real.

No matter the result of the election, the most likely reality in the future is that the uncertainty associated with economic policy will be the only constant. So, while freight volumes have increased year-over-year and GDP is growing at a 2.2% or 2.5% rate depending on the quarter, the surge in domestic production and growth is not offsetting concomitant price increases in COGS (Cost of Goods Sold) and not increasing profits.

Coherent and constant economic policy does not seem to be a part of anyone's current stump speech. Perhaps the 2027 gang installed in Congress will pass a law against government indecisiveness. Don't go running to Polymarket US on that one!

Got questions? Set them free at dnahass@railfin.com. //



DAVID NAHASS
President
Railroad Financial Corp.

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Railway Age proudly recognizes 27 trailblazers in the freight, passenger, government and supply sectors in 2026—the 10th anniversary of our Women in Rail Award program. These outstanding women are paving the way for others to make a career in the industry.

The annual award, established in 2017, is presented to women in the United States, Canada and/or Mexico in celebration of their excellence in leadership, vision, innovation, and accomplishments, including community service involvement.

"Congratulations to this year's distinguished group of women!" *Railway Age* Executive Editor Marybeth Luczak said. "As we celebrate 10 years of Women in Rail, *Railway Age* thanks the nearly 300 total honorees for their service, and the nominators who have shone a light on their achievements. Importantly, we are grateful to the judges who work with us each year. They include Eagle Railcar Services CEO Barbara Ward Wilson and Commuter Rail Coalition Principal Founder and CEO KellyAnne Gallagher, who helped to launch the program, and Gateway Development Commission Executive Vice President Catherine Rinaldi, who took the throttle from KellyAnne in 2025. Thank you for your dedication and support of the Women in Rail Award program and women in the industry; it has been invaluable to so many."

The following pages highlight the 2026 honorees, plus four earning honorable mention.

THE JUDGING COMMITTEE, WITH INPUT FROM *RAILWAY AGE*:



BARBARA WILSON
CEO
Eagle Railcar Services

Ward Wilson heads Eagle Railcar Services, an EQT Infrastructure-backed railcar repair and maintenance platform with 13 U.S. shops. A 30-year rail finance, leasing, and operations executive, she was previously CEO of Wells Fargo Rail, Chief Financial Officer of Helm Financial, and President and CEO of RailUSA. She serves on the Sierra Railroad and Remprex boards and has judged Women in Rail since its inception.



CATHERINE RINALDI
EVP
Gateway Development Commission (GDC)

Rinaldi oversees all essential administrative functions, while developing and tracking metrics to ensure that strategic objectives are achieved at GDC, the bi-state authority charged with delivering the Hudson Tunnel Project. She was previously President of MTA Metro-North Railroad, the first woman to hold that position. From February 2022-October 2023, she simultaneously served as Interim President of MTA Long Island Rail Road. Rinaldi is a summa cum laude graduate of Yale College and a graduate of the University of Virginia School of Law.



TAMMY ALLEGRETTI
Director Human Resources
Genesee & Wyoming Railroad Services, Inc.

Throughout her G&W career, Allegretti has provided HR leadership and guidance across multiple states. She navigates complex employee relations matters while effectively managing organizational risk. She has also spearheaded employee retentions initiatives, working with operational leaders to identify the underlying causes of turnover and develop and implement targeted plans. Her ability to build relationships and translate HR strategies into practical actions has contributed to measurable improvements. Delivering results under challenging circumstances is a strong example of Allegretti's leadership. She successfully led the relocation of a 20-employee department from the Northeast to the South, while the employees were in the process of unionizing. She collaborated across multiple departments to coordinate relocation support and address the unique needs of the employees. The relocation was completed in less than a year.



JANA AUSTERMAN
Director of Sales Support
Watco

Austerman's work to modernize and streamline processes makes life easier for customers and Watco team members alike. She led the company's adoption of Microsoft's reporting tool Power BI and contract management software OpenText, and helped spearhead the integration of both into the CRM system, providing a centralized place for customer information, reporting, and contract details. Operations and safety leaders at Watco's 48 railroads and 75 terminals rely on Power BI to gain visibility into operations and progress toward revenue goals. Austerman also overhauled Watco's siloed process for securing clearances to move high-wide shipments, plus streamlined new-customer onboarding. Outside of work, she volunteers for the Special Olympics and Heart and Hammers.



LAUREN BERRY
Assistant Vice President,
Business Development &
TRANSFLO
CSX

Berry repeatedly leads work requiring coordination across Commercial, Operations, Technology, Accounting, Finance, HR, Legal and Transportation. Her ability to translate analytical insight into coordinated action has supported not only acquisitions and integrations but also product launches and operating improvements.

As a member of CSX's Strategy organization, Berry drove financial modeling for the acquisitions of Pan Am Railways and Quality Carriers. She also led the Quality Carriers commercial integration team, coordinating across departments to onboard the organization and to offer new transloading and ISOtank solutions for chemical shippers.

More recently, Berry supported the opening of the Petersburg, Va., terminal—the third new TRANSFLO terminal launched in two years.

While navigating revenue and volume headwinds, Berry has implemented a more disciplined sales operating model built on account segmentation and a structured cadence tailored to transactional and growth accounts. She also advanced Salesforce adoption and pipeline governance. Year to date, the team has submitted 236 new opportunities and secured 72 wins—a 31% win rate—while building a forward-looking pipeline of 111 pending opportunities representing about $12.7 million in potential revenue.





LISA BLANSETT

Vice President, Global Supply Chain
FreightCar America

Blansett consistently aligns people, processes, and priorities to achieve outstanding operational and financial outcomes—most notably delivering critical materials ahead of lead time and under budget, a rare achievement in today's supply chain climate, according to her Women in Rail Award nominator. Blansett leads an organization of approximately 500 employees across Supply Chain, Material Management, Logistics and Fabrication, and she has cultivated a high-performing culture grounded in accountability, collaboration, and continuous improvement.

Blansett has been the driving force behind FreightCar America's vertical integration of fabrications, which her nominator called "a transformative initiative that has fundamentally reshaped our operational agility and cost structure." Under her leadership, the team successfully in-sourced approximately 40% of fabrication work, reducing the reliance on external suppliers, as well as strengthening quality control. This transition, her nominator noted, not only compressed lead times but also delivered significant annual cost savings, improved throughput, reduced rework, and enhanced process stability.



SUAYDY CANALES

Director, Capital Construction
Amtrak

Canales's 16-year career has included work on the Purple Line Light Rail Project in Maryland, where she supported workforce development, diversity initiatives, contractor participation, and compliance programs. Over the past two years, she has led capital construction oversight for Amtrak's largest



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Megan McIntyre
Project Director

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infrastructure project under the Infrastructure Investment & Jobs Act (IIJA), the $6 billion Baltimore and Potomac Tunnel Replacement, which will modernize a critical segment of the Northeast Corridor through the construction of new high-capacity rail tunnels, replacement bridges, upgraded rail systems, and a new ADA-accessible West Baltimore MARC station. Canales serves as the Construction Oversight Area Lead and the primary third-party stakeholder management coordinator between Amtrak, Baltimore City agencies, Maryland Department of the Environment, EOR design teams, and CMAR contractors. She has successfully led complex permitting, regulatory, and stakeholder coordination efforts that are essential to advancing construction and maintaining schedule certainty. Through proactive risk management, collaborative leadership, and strategic problem-solving, Canales has helped remove barriers that impact project delivery while ensuring alignment between transportation infrastructure goals and community interests.



HANNA CHOUEST

Deputy General Counsel, Markets and Regulations
Norfolk Southern (NS)

Chouest began advising NS and other rail clients as outside counsel in 2009 and joined the Class I railroad in 2020. Today, she serves as NS's lead economic regulatory attorney, guiding matters before the Surface Transportation Board and supporting major commercial teams. Chouest has supported the railroad's $1.6 billion acquisition of the Cincinnati, New Orleans & Texas Pacific and represented the company in the Canadian Pacific–Kansas City Southern merger proceeding.

One of the most significant challenges of Chouest's career has been guiding NS through the legal and regulatory demands of its merger work with Union Pacific. Over the past year, the volume of information, pace of decisions, and breadth of cross-functional questions have required her to serve as a central filter and trusted advisor across the organization. Chouest helped prepare the STB application, supported the company through ongoing discovery, participated in integration planning, and advised employees on antitrust requirements. She leads outside counsel supporting the merger work, coordinating two law firms on the regulatory side and keeping the teams aligned.





TESSA COLLINS
Deputy Staff Director–
Hazardous Materials
Federal Railroad Administration (FRA)

Collins began her railroad career as a conductor at BNSF Railway and rose to Division Safety Coordinator, managing 40 safety leaders in eight terminals. The Class I railroad also recognized her with Distinguished Service Awards and Safety Employee of the Year Awards. With some 20 years of railroad safety experience, Collins now leads the FRA's efforts to strengthen federal safety oversight, improve risk management, and advance regulatory effectiveness across the railroad industry.

Collins has led the development of a Safety Management System that incorporates data-driven, risk-based inspections to identify hazards, to prioritize resources, and to provide consistent regulatory oversight.

She excels at communication, building consensus, fostering collaboration, and bringing a diverse team together to develop effective systems and foster a proactive safety culture, according to her nominator. Additionally, her leadership reflects a forward-thinking approach to safety, emphasizing proactive hazard identification, informed decision-making and continuous improvement.

"The diversity of experience among this year's Women in Rail honorees reflects the tremendous breadth of talent in our industry. The stories of these accomplished women are a powerful reminder that there is no single path to leadership in railroading. It was a privilege to participate in recognizing their contributions."

—***Catherine Rinaldi,*** *EVP of Gateway Development Commission and Women in Rail Award Judge*

AECOM

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Diane Cowin
Senior Vice President, Global Transit Clients Director

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APRIL CORMAN COLYER

Chairperson, Board of Trustees
R. J. Corman Railroad Group, LLC

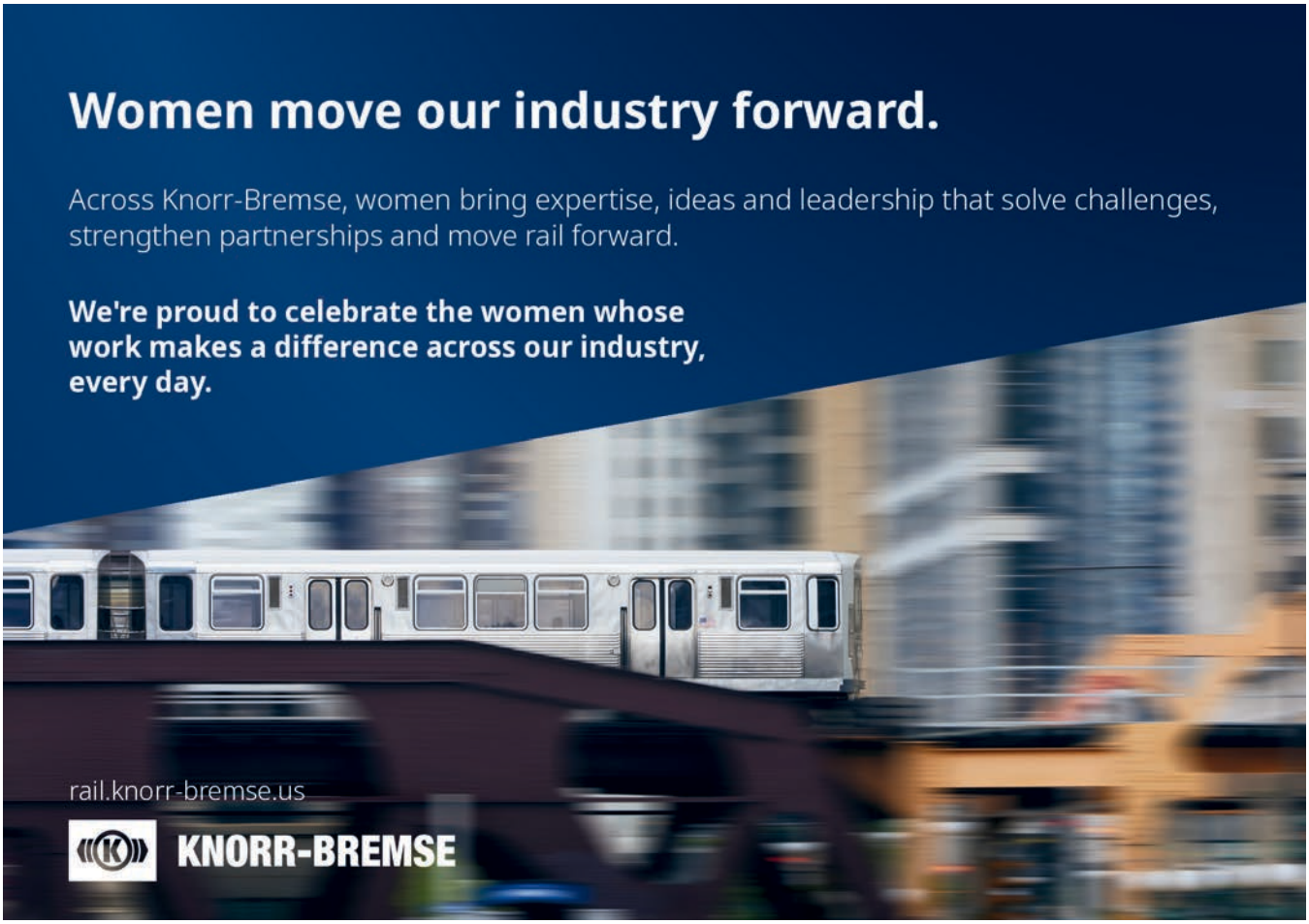
Corman Colyer represents the next generation of leadership at one of North America's most recognized family-owned railroad companies. While she is a member of the company's "founding family," she made a conscious decision early in her career to gain firsthand experience throughout the business, serving in roles including Dispatcher, Project Manager, Director of Public Relations, and Commercial Development Manager before assuming her current governance responsibilities. Her willingness to engage directly in the day-to-day business helped provide continuity following the passing of Rick Corman. As ownership transitioned to a multi-generational trust structure, Corman Colyer became a vital connection between the company's founding principles and its future direction. "Her ability to effectively communicate the importance of rail transportation has helped elevate the understanding of the vital role short line railroads play in freight mobility, economic growth and supply chain resilience," her nominator wrote. "Whether representing our company during infrastructure investment announcements, engaging with public officials, or promoting the value of rail to customers and communities, April has become a trusted voice for the industry and an effective ambassador for the future of short line railroading." Corman Colyer also serves as President of the Jessamine County Chamber of Commerce Board in Kentucky.



DEVICA DAS-COLLADO

Engineer–Structures
MTA Long Island Rail Road

Das-Collado has consistently excelled in the Engineering Department, demonstrating both mastery of her discipline and leadership. Beginning as a Junior Engineer, she completed a rigorous rotation across all operating departments, and as a construction inspector, she safeguarded critical



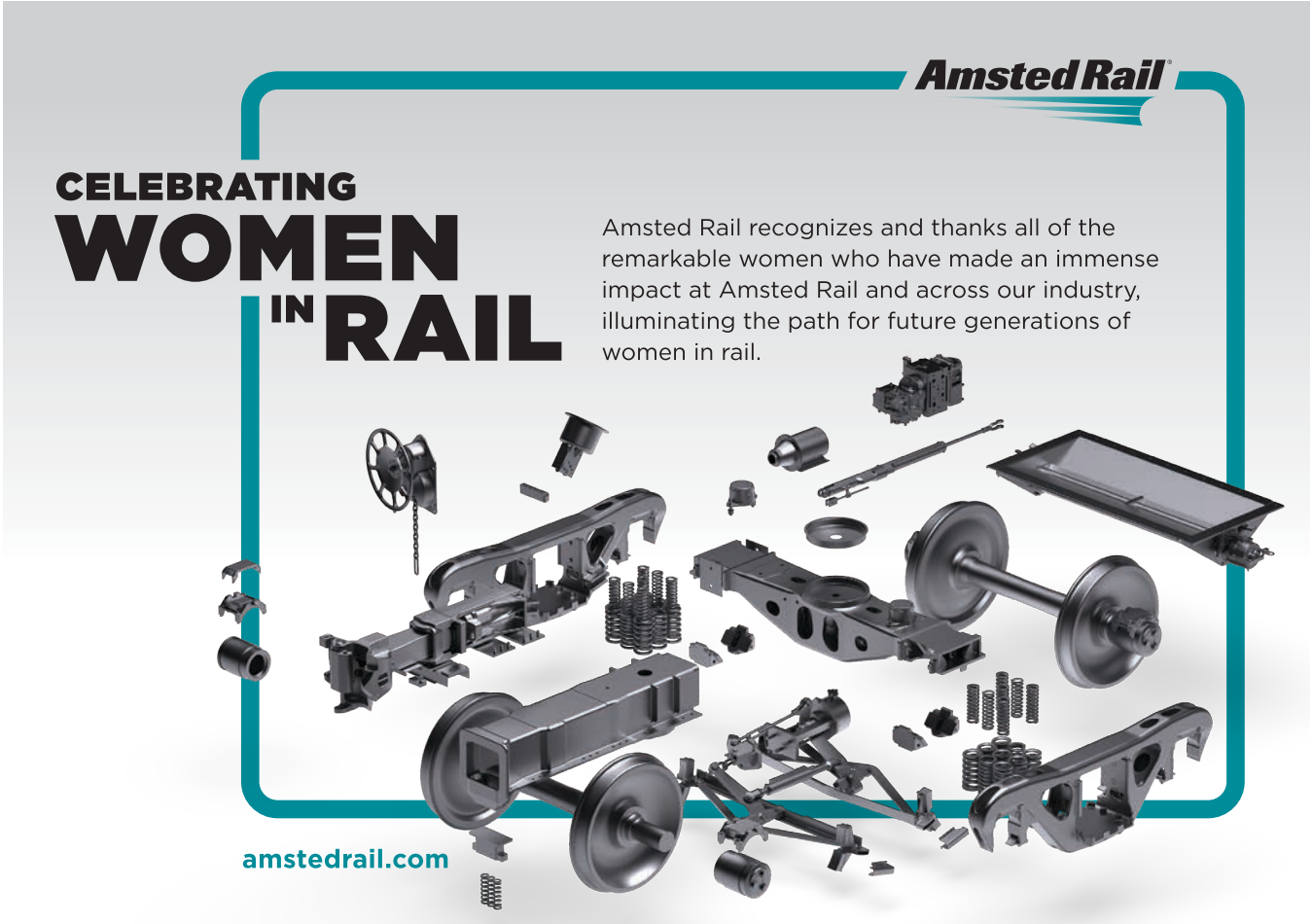
railroad assets, ensuring structural integrity and operational safety for employees and the surrounding communities. Advancing into project and program roles, Das-Collado contributed to state of good repair initiatives, such as station rehabilitations and bridge maintenance, and championed a preventative maintenance approach. In her current role, she ensures her teams are well prepared, well equipped, and aligned through clear communication and structured guidance, and fosters a culture in which safety is a shared value. Das-Collado was the first female supervisor in the Engineering Structures department—a well-deserved promotion that came with challenges. "Devica's technical expertise and physical capabilities were routinely questioned," her nominator wrote. "Through patience, professionalism, and unwavering commitment, Devica earned the trust and respect of her team. She demonstrated her capabilities and went on to be promoted to Engineer of Projects. Today, Devica leads all Project Supervisors within the Engineering Structures department."



MARTINE FAILLE-DAOUST

Vancouver Rolling Stock Project Director
Alstom

Faille-Daoust is a mechanical engineer and business leader with 23 years of experience across the aerospace and rail sectors. As Project Director for the Vancouver SkyTrain Rolling Stock Program, she provides strategic direction for the procurement, manufacturing, testing, and commissioning of 295 railcars produced across two manufacturing facilities, while leading a team of 190-plus professionals. When she took on the role, the project was facing customer dissatisfaction driven by delays. "Martine led a comprehensive change-management effort focused on rebuilding trust, strengthening accountability, and fostering collaboration across functions," her nominator wrote. "She successfully shifted the organization from a site-based culture to a unified team approach centered on customer needs, passenger safety, service reliability, and quality. She also implemented performance-driven KPIs and governance mechanisms that provided greater visibility into delivery performance, software readiness, and issue resolution. As a result, the project established a stable train delivery cadence fully meeting customer commitments." Previously, Faille-Daoust was Alstom's Head of Parts, Component Repair, and Overhaul for North America, where she grew the business by more than 40% within three years. She also gives back, mentoring eight employees at Alstom.





HELEN GENOWAY

Senior Director, Supply Chain Operations
CN

With more than 30 years of transportation industry experience, Genoway served the trucking industry as a bilingual dispatcher (French) for five years before joining CN in 2000 as an intermodal dispatcher. Throughout her career, she has chosen growth and reinvention over familiarity, moving through Customer Service, Sales, Marketing, HR, Automotive, Transportation and Supply Chain Operations at the railroad. While working in Sales and Marketing, Genoway built an onboarding and career progression model that followed employees from recruitment through development and promotion; that work led HR to invite her to become Senior Manager of Onboarding for the entire company. In her current role, she leads some 1,200 employees across a portfolio that includes docks, transload operations, automotive operations, vessels, and CN subsidiaries Autoport Limited and IBS/Stellar. In 2021, she led a 22% reduction in purchased services costs and improved minutes per vehicle. She has also championed remote security monitoring; robotics partnerships in automotive logistics; and sustainability-focused planning to support the integration of hybrid and electric vehicles into fleet operations. "Great leadership is not about having all the answers," Genoway says. "It is about having the courage to learn, the confidence to act, and the ability to bring people together to achieve results."



JILL HAMPTON

Vice President, Turnkey Systems
Hitachi Rail

Hampton began her professional journey as a lawyer in private practice, rising to partner before entering the rail industry. Her early involvement in the Public Enquiry following the Ladbroke Grove Rail Disaster in London, England, exposed her to one of the rail industry's most significant safety events, contributing



to an experience that shaped her commitment to accountability, risk management, and long-term industry improvement. Hampton has successfully transitioned from legal leadership into broader executive management roles. She has worked on the Hazel McCallion LRT Contract Transition in Canada, leading Hitachi Rail's transition of the C$4 billion project from a traditional P3 to an Alliance delivery model. Hampton also led the legal team for the C$4.35 billion New Generation Rolling Stock P3, Australia project, delivering 75 six-car EMUs for the South East Queensland rail network. And she led the pursuit of the GO Expansion program in Canada as part of the ONxpress Transportation Partners consortium; her guidance helped to secure the multi-billion-dollar contract to modernize the Greater Toronto Area's commuter rail network through network-wide re-signaling and electrification. Hampton also serves on the Board of the Connect 6ix Project Company, which is responsible for delivering the C$9 billion Rolling Stock, Systems, Operations and Maintenance contract for the Ontario Line.



KENDALL HENDERSON
Director
Intermodal Innovation
BNSF Railway

Henderson has built a career at the intersection of railroad operations, technology and innovation. She started at BNSF Railway as an Engineering intern and then progressed through frontline and operational leadership roles, including Assistant Roadmaster, Roadmaster, Trainmaster, and Manager of Operations Service Excellence before transitioning to technology.

According to Henderson's nominator, one example of her strength and resilience came in 2025, when the Class I railroad's new technology organization, bnsf-tech, was evolving. Henderson and her team remained responsible for executing planned work and providing production support. When dedicated Project Management support was no longer available, Henderson stepped in to fill the gap.

Henderson's commitment to developing others extends beyond her immediate team through BNSF Railway's Mentor Circle. Additionally, she continues to expand her industry knowledge through the Intermodal Association of North America and that organization's Future Leaders of Intermodal Program.

Henderson was recognized as one of *Railway Age*'s 25 "Fast Trackers" Under 40 in 2025.





SHARON M. HIRST
Director,
Accounting & Pensions
Conrail

Hirst has made significant contributions to the success of Conrail (pre-split date) and today's Conrail Shared Assets, according to her nominator. Her work has spanned Internal Audit, Corporate Accounting, HR, and Employee Benefits, and she has contributed to the implementation of a new payroll system, onboarding of new employees, and oversight of all employee benefit plans. Additionally, Hirst has played a role in the railroad company's financial planning and reporting.

One example of Hirst overcoming a challenge came during the rollout of a new payroll system at Conrail, according to her nominator. This required Hirst to not only learn new software but also train employees and work with multiple groups to customize the system. The project was a success, and the system is currently used by 400 employees.

Hirst's leadership is demonstrated daily through her strong work ethic, integrity, consistency and professionalism. She serves as a mentor to those within the finance department, and she is constantly training and working with newer company employees.



KARI KIRCHHOEFER
SVP Marketing & Sales–Premium
Union Pacific

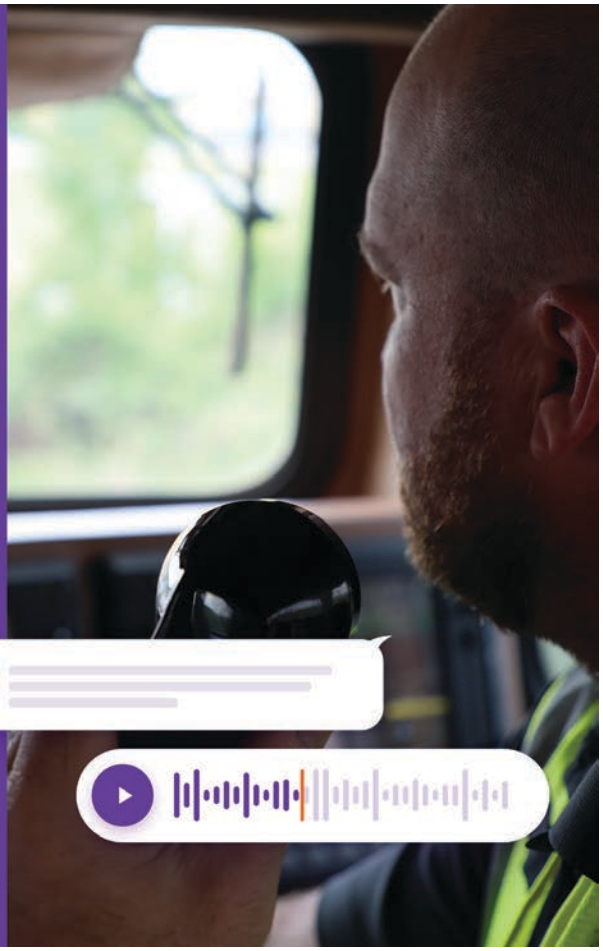
At UP, Kirchhoefer has helped shape strategy across multiple business segments, including agricultural products, industrial products, chemicals, logistics and premium transportation services. She has served as President of the railroad's Streamline subsidiary, Vice President and General

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Manager of Chemicals, and Vice President of Loup Logistics, and she is currently a Senior Vice President of Premium. She combines commercial expertise with operational understanding to help customers optimize supply chains and improve transportation efficiency. UP has introduced several new intermodal products and services under Kirchhoefer's leadership, including the Inland Empire Intermodal Terminal, Kansas City Intermodal Terminal, the Phoenix pop-up service, and Falcon Premium. The success of these initiatives has contributed to strong growth in UP's domestic intermodal franchise, which is achieving record volume levels this year, according to Kirchhoefer's nominator. From her beginnings in marketing and sales to her current role, she has demonstrated that leadership is not defined by title, but by vision, results, and the courage to lead. She is Executive Sponsor of the railroad's Council of Native American Heritage, and serves on the IANA Board and the Salvation Army Advisory Board.



AMIEE MARTELLE

President/CEO/CFO

Riverport Railroad LLC

Martelle's leadership is reflected in the growth and improvement of Riverport Railroad throughout her career. As she took on greater responsibilities, moving from an administrative role to her current position, she has continually looked for ways to improve operations, maintenance practices, internal processes, and working conditions for employees. She takes a hands-on approach with customers, going out of her way to understand their operations and identify ways the railroad can improve logistics and better support their needs. "Amiee leads by being involved, listening to those around her, and continually looking for ways to improve the railroad for its employees, customers, and community," reported her nominator. She is Treasurer of Northwest Illinois Economic Development (NWILED), for the Savanna Chamber of Commerce, and for the West Carroll Sports Boosters; and she is Treasurer and Den Leader for Cub Scout Pack 48 and President and Treasurer for the West Carroll 314 PTO. In 2012, she received BNSF Special Recognition for a short line railroad; in 2021, earned NWILED Board Member of the Year; and in 2022, was recognized with the NWILED Collaboration Award and Business of the Year.





Congratulations to Tammy Allegretti, HR Director and one of this year's Women in Rail!

Tammy's extensive HR knowledge and approachability help to foster a culture of safety, service and growth for employees every day.

GENESEE G&W WYOMING

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RENÉE MAXEY

Assistant Legal Counsel
Patriot Rail

Since joining Patriot Rail in 2023, Maxey has become a trusted legal and strategic advisor helping to advance major freight infrastructure, economic development, and regulatory initiatives that extend beyond the company itself. One of her most significant contributions was helping to challenge an inequitable regulatory process before the Surface Transportation Board that affected how certain freight rail projects are reviewed. Maxey's team advocated for a more consistent, efficient, and predictable process for rail construction projects that support freight infrastructure and economic development while maintaining appropriate environmental protections. Subsequently, the STB published its new proposed rule changes addressing some of these concerns, creating the potential for industry-wide benefits, such as reduced duplication, faster project timelines, lower costs, and a more streamlined regulatory framework.

Maxey has also been instrumental in Patriot Rail's growth strategy following the acquisition of the Salt Lake, Garfield & Western, and successfully negotiated and finalized the acquisition of strategically located property that became the site of a new BNSF intermodal terminal.



MEGAN MCINTYRE

Project Director
HNTB Corporation

McIntyre has spent more than 24 years leading complex freight, passenger rail, and public infrastructure programs throughout the Western U.S. and Canada. She has served as Engineering Project Manager for BNSF's WSDOT ARRA-funded rail improvement program, which



delivered approximately $450 million in rail infrastructure improvements across Washington State and was one of the first FRA stimulus-funded programs in the U.S.; the project earned the 2017 Dr. William W. Hay Award for Excellence and the 2016 WSDOT Environmental Excellence Award. As Chief of Staff for Sound Transit Operations, she helped advance operational readiness planning and organizational alignment; supported approximately 240 employees; and established the first Women's Network within the department, creating professional development opportunities, peer support and networking for women. McIntyre currently leads HNTB's Washington Rail and Transit practice. She is an active member of AREMA and its education and training committee, and through the Women in Transportation Seminar Puget Sound Chapter, she has connected transportation professionals with local high school students to explore careers in transportation, engineering and construction.



KAY O'NEIL

Chief Network Strategy & Partnering

Keolis Commuter Services

O'Neil's 40-plus-year career has taken her from the Boston & Maine and the Massachusetts Bay Transportation Authority, to founding her own consulting firm, and most recently to her leadership at Keolis, which operates MBTA Commuter Rail. She has demonstrated her leadership in many ways, including spearheading the "Reimagining and Transforming Rail" Initiative. She headed this cross-departmental effort to identify innovations and capital improvement projects for Keolis to propose to MBTA; they included initiatives to remove bottlenecks, improve service resiliency, operate additional service, and improve travel times, and several have become elements of MBTA's Capital Improvement Plan. O'Neil is also a contributor to the Battery-Electric Train Service Steering Committee supporting MBTA's work to introduce these trains to the Fairmount Line, with the goals of increasing service frequency, improving environmental performance, and reducing carbon emissions. One of O'Neil's most notable career achievements was the development of the Train Resource Management System, which collects and correlates disparate data on rolling stock, crews, infrastructure, and reliability to provide an integrated database of train performance information.

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IDA POSNER

Vice President & Chief Operating Officer
Railroad Development Corporation (RDC)

A fourth-generation railroader, Posner joined RDC in 2017. She was elevated to Vice President, Strategic Planning in 2020 and to Chief Operating Officer in 2025. Posner oversees RDC's internal operations and supports its portfolio of businesses in the United States, Europe and Latin America. She also heads strategic planning and business development for the firm and serves as a director of Iowa Interstate (*Railway Age*'s 2025 Regional of the Year), RDC-Deutschland (Germany), Eurorail, and RailPulse, where she is Vice Chair.

Posner is passionate about food systems and transportation, and the intersection of the two. She the founder and Managing Partner of Hawthorne Food Ventures, a venture capital fund that invests in startups reducing food waste. She is also a trustee of the Posner Foundation of Pittsburgh and a Board member of ReFED, a U.S. nonprofit solving food loss and waste.

Posner holds a BSE from Princeton University and an MBA from Columbia Business School and serves on the Princeton CEE Advisory Council. Additionally, she was recognized as one of *Railway Age*'s 25 "Fast Trackers" Under 40 in 2025.



ISABEL RAMESAR

Senior Director of Administration
MTA Long Island Rail Road

Ramesar started her 15-year LIRR career as an intern and has gone on to manage budgets exceeding $550 million, direct multimillion-dollar projects, and lead initiatives affecting thousands of employees. According to her nominator, one of her most notable strengths is her ability





to identify complex operational challenges and develop practical, technology-driven solutions that improve efficiency and accountability. She spearheaded a process re-engineering initiative that streamlined communication across 10 departments and reduced paperwork by approximately 85%. She also created several tools that have strengthened administrative and compliance functions across the organization. But what makes her stand out is her strong commitment to developing others. When Ramesar joined LIRR's Training Department, one of her primary responsibilities was building a new team to support critical functions, including budgeting, timekeeping and safety-sensitive record-keeping. In addition to selecting the members, she mentored three women—two went on to receive promotions and the other completed her college degree. Ramesar has also partnered with the City University of New York's Emerging Talent Program to provide students with meaningful exposure to careers in public transportation.



KALEIGH REYES
Key Account Manager
Wabtec

Reyes demonstrates exceptional resilience and adaptability in the face of uncertainty and change. One of the most significant examples of this has been her leadership as the key account executive supporting Norfolk Southern during a period marked by continuous organizational shifts, evolving strategic priorities, activist investor pressures, and the complexities surrounding a highly publicized merger effort, according to her nominator. Reyes has maintained strong executive relationships, proactively aligned Wabtec's resources to emerging customer needs, and ensured that both organizations remained focused despite the uncertainty. Reyes consistently uses her platform to create meaningful and lasting impact for the communities she serves. At Wabtec, Reyes is the Global Chair of the PRIDE Forum Employee Resource Group and a member of the steering committee of the Women of Wabtec–Commercial pillar, with an emphasis on developing the next generation of women working in the rail industry. Also, this year Reyes completed the Boston Marathon, raising more than $10,000 for 261 Fearless, a global nonprofit that empowers women through running, education and community-building.







STEPHANIE ROEDIGER

Senior Director Sales–U.S. Grain, Potash & Coal

Canadian Pacific Kansas City (CPKC)

Over the past seven years, Roediger has led multiple grain elevator projects in Canada and the U.S., helping expand CPKC's grain origination network to the 8,500-foot train model. By coordinating teams across Finance, Business Development, Engineering, Industrial Development and Operations, she has helped strengthen collaboration while also mentoring others and broadening their understanding of the rail business. These efforts have transformed CPKC's grain network, according to her nominator, allowing customers to move 44% more grain per train from country origins to ports and processing facilities. Roediger has consistently demonstrated strong leadership by supporting her teams, building alignment across the organization, and leading through complex, high-impact business situations. For example, in 2025 when a destination in Mexico City needed Canadian wheat within nine days but had not yet purchased it, Roediger worked to connect them with a seller. She partnered with stakeholders, and from start to finish, the train was sold, loaded at an elevator in Canada, moved more than 2,400 miles, and was ready for unloading before deadline. Roediger also represents CPKC as a Board member on the STB's National Grain Car Council and as a member of the National Grain and Feed Association's Rail Arbitration Rule Committee.



KATHLEEN (KATIE) SACKETT

Senior Director of Sales & Marketing, Louisville & Indiana Railroad (LIRC)/ Northern Lines Railway

Anacostia Rail Holdings

Sackett is a customer-focused leader who is dedicated to growing business, according to her nominator. She began her railroad career with the Southern

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Sharon Hirst

Director Accounting and Pensions

on being named one of Railway Age's
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Congratulations to Jayme Gonzalez, Director of Instructional Design, for receiving honorable mention in this year's Women in Rail awards! Through her innovation, Jayme is shaping the future of rail safety and industry education.

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Pacific Lines and later worked at BNSF Railway before taking a 10-year hiatus to raise her two sons. She subsequently returned to the industry on the short line side, joining Wisconsin & Southern Railroad, a Watco company, before coming to LIRC in 2017 as Director of Sales & Marketing. Sackett was promoted to her current role in 2020, where she leads sales and marketing for both the LIRC and Northern Lines Railway in Minnesota.

Sackett is active in economic development and community service across Indiana. She serves on the boards associated with Jackson County, Greater Columbus, and Aspire Economic Development/Chamber Alliance; and is a Midwest Association of Rail Shippers member and volunteer and a certified Operation Lifesaver volunteer, supporting railroad safety education.

Sackett holds a Bachelor of Science degree in business from Arizona State University.



MEREDITH SLESINGER
Rail and Transit Administrator
Massachusetts Department of Transportation (MassDOT)
(*Railway Age* Women in Rail 2022, Honorable Mention)

Slesinger oversees Massachusetts' passenger and freight rail programs and its 15 Regional Transit Authorities. Under her leadership, the Rail & Transit Division launched Compass Rail, a long-term vision for expanding intercity passenger service, including future west–east service between Boston and Albany, and MassDOT has secured more $280 million in federal funding to advance key rail initiatives. Her collaboration with Amtrak and CSX led to a $108 million Federal Railroad Administration grant to expand service along the Inland Route, adding new daily roundtrips between Boston; Springfield, Mass.; and New Haven, Conn., beginning in 2030. This effort was recognized with WTS-Boston's 2024 Innovative Transportation Solutions Award. According to her nominator, one of Slesinger's greatest strengths is maintaining focus on long-term public benefit while navigating difficult policy and operational challenges. Before joining MassDOT in 2020, she held senior leadership roles at Amtrak, the Northeast Corridor Commission, and the American Public Transportation Association.

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RIYA VARUGHESE

Senior Electrical Engineer
MTA Metro-North Railroad, Maintenance of Equipment Engineering Department

Varughese contributes to the success of MTA Metro-North Railroad's Maintenance of Equipment Engineering Department not only by leading projects but also by serving as a mentor. She takes part in a range of initiatives—from leading the rolling stock cant deficiency project in support of the railroad's company-wide speed study, to participating in new vehicle procurement design reviews and supporting vehicle electrical system projects, such as Positive Train Control, door systems, and trainlines. Her responsibilities include managing the general engineering consultant contract, designing and fabricating specialized test equipment, and authoring technical documentation.

Varughese is dedicated to developing future talent. She mentors early-career engineers, providing technical guidance to help them grow professionally, and she is actively involved in her church community, serving as a youth leader, mentor and choir teacher.

She holds a Master of Science in electrical engineering from NYU Tandon School of Engineering and is a graduate of Metro-North's Associate Engineer Program.



CATHERINE (CATE) WHIDDON

SVP and Railroad Practice Leader
Westchester, a CHUBB Company

Whiddon has served the insurance and risk management needs of the railroad industry for more than 30 years and is currently SVP and Railroad Practice Leader at Westchester, the excess and surplus specialty insurance group within Chubb, a publicly traded property and

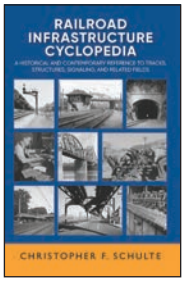
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casualty insurer. Whiddon and Westchester saw the need for specialized excess and surplus lines insurance coverage for the short line and regional railroad industry, according to her nominator. Recognized as a subject-matter expert in railroad protective liability and railroad liability, Whiddon has taught classes for the Insurance Risk Management Institute and the Railroad Insurance Managers Association. She is a founding member of Westchester's Women's Advisory Council and takes part in CHUBB's Coaching Circles, mentoring and coaching early-career leaders. She is also involved with Operation Lifesaver in Dallas/Fort Worth.

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*—**Barbara Ward Wilson**, CEO of Eagle Railcar Services and Women in Rail Award Judge*

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KEEPING BALLAST IN TOP CONDITION

Railway suppliers advance maintenance technologies and best practices to extend ballast life, improve drainage and support track performance.

BY CAROLINA WORRELL, SENIOR EDITOR

High-production, computer-controlled track machinery and inspection vehicles play a critical role in maintenance-of-way (M/W) operations, helping railroads maintain ballast condition and preserve track geometry. Ballast provides the stable track structure needed for smooth train operations, while supporting drainage, distributing loads and maintaining track alignment.

Proper ballast maintenance involves a series of operations, including dumping, spreading, tamping, profiling and cleaning. Of these functions, drainage is among the most important, as fouled or poorly draining ballast can compromise track stability and accelerate deterioration.

For railroad civil engineers and maintenance teams, extending ballast life and maintaining performance depend on effective maintenance practices and the technologies used to execute them. The following roundup examines products, innovations and best practices from suppliers responding to *Railway Age*'s inquiries about advances in ballast maintenance.

Brandt

The Brandt Industries RTB100 Hi-Rail Backhoe "is changing how crews handle ballast maintenance and inspection," the company says. "The RTB100 was built on real-world feedback from rail operators and contractors who indicated

Loram



And its 24.9 mph travel speed and three-minute road-to-rail conversion "make the most of maintenance crews' time both on and between job sites."

Loram

"Effective ballast maintenance increasingly starts with understanding conditions below the surface," Loram explains. "We combine inspection technologies with maintenance capabilities to help railroads identify developing issues, prioritize work and direct resources where they can provide the greatest benefit."

Ground Penetrating Radar (GPR) is central to this approach. Loram's three-channel GPR system collects subsurface information at the track center and tie ends, providing insight into ballast fouling, moisture and underlying track structure. Analysis of this data can help railroads identify where ballast is approaching the end of its useful life and better target shoulder ballast cleaning, undercutting and other maintenance activities.

Loram notes it can integrate GPR with LiDAR, track imagery and track geometry data to provide a more comprehensive assessment of surface and subsurface conditions. LiDAR can identify ballast-profile deficiencies and support ballast-volume calculations, while GPR provides information about ballast thickness and conditions beneath the track.

A 2026 project demonstrated this integrated approach across 193 miles (310.8 kilometers) of track. Loram combined GPR, LiDAR and track imagery to assess renewed ballast thickness and calculate ballast volume, delivering location-specific information at 32.8-foot (10-meter) intervals to support quality control and verification. The goal is to turn inspection data into actionable maintenance decisions. Once conditions are identified, Loram's broader ballast and grade capabilities include shoulder ballast cleaning, undercutting, vacuum excavation, ditching, track lifting and material handling.

"By connecting inspection, analysis, maintenance and verification, Loram helps railroads take a more targeted approach to ballast management and address the underlying conditions affecting track performance," the company says.

Miner Enterprises

Miner Enterprises' AggreGate® ballast outlet gates for railcars have been utilized in M/W operations for more than 40 years. The standalone solar-powered AggreGate® enables independent operation of individual cars anywhere within the ballast train. "This boosts M/W agility and efficiency by eliminating the need for grouping manual and automatic cars," the company says. Optional remote wireless control systems enable specific car and gate selections for up to 1,000 cars. Optional car-mounted work lights for nighttime ballasting are also available.

AggreGate outlet gates from Miner feature large guillotine door openings "designed to stop ballast flow with minimum effort. Single- and double-door controls provide precise ballast shutoff capabilities at switches, crossovers and

they wanted a solution that's safer, more efficient, and dependable. And they got it. The machine's rear hi-rails include an accumulator system that self-adjusts hydraulic pressures for track variances. This means constant rail contact when going over switches and uneven tracks, added safety when working around bridges, culverts, and high banks, which increases operator confidence and comfort. The hi-rail backhoe is also extremely versatile, transitioning easily between on and off track and working effectively in both environments."

Built on a John Deere 320P chassis, the RTB100 combines Brandt's hi-rail gear with Deere's proven reliability. It can be paired with a ballast tamper, undercutter, tie changer, and other railway-specific attachments from Dymax Rail to become a track tool multitasker.



Built on a John Deere 320P chassis, the RTB100 combines Brandt's hi-rail gear with Deere's proven reliability.



RCE says that over the past year it has focused on product innovation and the integration of advanced safety technologies.

bridges. The AggreGate can effectively dump ballast inside, outside or on both sides of a rail simultaneously. Standard electric, air-powered and manual gate models are also available. All are suitable for both retrofit and new railcar systems."

The solar-powered Miner Lighting System includes four energy efficient LED lights mounted on the railcar's undercarriage. Each stand-alone system supports low-visibility and night-time ballast operations. The photovoltaic system includes a solar array, batteries, two switches and a lighting controller with a temperature compensation feature "designed to ensure the system is properly charged in hot and cold environments." The Miner Lighting System is available as an option with all models of Miner ballast/MOW outlet gates and rapid discharge systems.

Pavemetrics

"The rail inspection market is increasingly focused on automation, digitalization and predictive maintenance as railway operators and infrastructure owners seek to improve inspection efficiency, enhance safety, reduce costs and minimize service disruptions," Pavemetrics tells *Railway Age*. Eddyfi Technologies' Automated Vision Systems (Railmetrics®) has established a global presence in automated inspection, with more than 500 systems deployed worldwide and technology in use in more than 50 countries.

"Reflecting the demand for faster, more reliable and data-driven inspection," Railmetrics® introduced its Turnout Inspection Module at Asia Pacific Rail 2026, held May 6-7 in Bangkok, Thailand. The module combines the company's established LCMS sensor technology with AI-driven defect detection to inspect critical turnout components at speeds of up to 75 mph (120 kph) "without disrupting normal rail operations. The system automates the inspection of switches, crossings and other critical turnout components, identifying defects and measuring key parameters while collecting geo-referenced data to support defect tracking and maintenance planning. Its ability to operate both day and night provides additional flexibility and inspection coverage. By enabling inspections at track speed, the technology eliminates the need for dedicated slow-speed inspection passes."

"These capabilities address several priorities for railway customers, including reducing manual trackside inspections and worker exposure to operational hazards, improving measurement consistency, and lowering inspection costs," Pavemetrics notes. "Automated defect detection and precise location data also support more informed maintenance decisions, helping infrastructure owners identify problem areas, monitor track conditions and prioritize maintenance activities. As railroads continue to adopt digital inspection technologies, solutions that combine operational efficiency, safety and actionable data are becoming increasingly important to infrastructure management."

Plasser American

"With railroad maintenance windows becoming increasingly limited, railroads need reliable, high-capacity solutions that maximize productivity while maintaining track quality and availability," Plasser American says. "We offer a comprehensive fleet of ballast cleaning, shoulder cleaning, and surfacing equipment

RCE

engineered to help railroads get more done in less time. As railroads continue to balance infrastructure demands, workforce constraints and limited track access, effective ballast maintenance remains critical to long-term network performance. By combining high-production ballast cleaning equipment with advanced surfacing technology, we help railroads improve productivity, reduce lifecycle costs, extend infrastructure life, and return track to service efficiently."

Undercutting and shoulder cleaning "remain essential to restoring ballast condition, improving drainage and extending track life," Plasser American notes. "Our RM802, the largest undercutter in the U.S., delivers production rates of up to 2,000 feet per hour when working with pre-dumped ballast. The RM80-800 combines high-speed performance with the ability to operate in challenging conditions, including fouled and muddy ballast. Integrated track lifting and lining devices also help the machine navigate trackside obstacles, supporting efficient operation in demanding work environments."



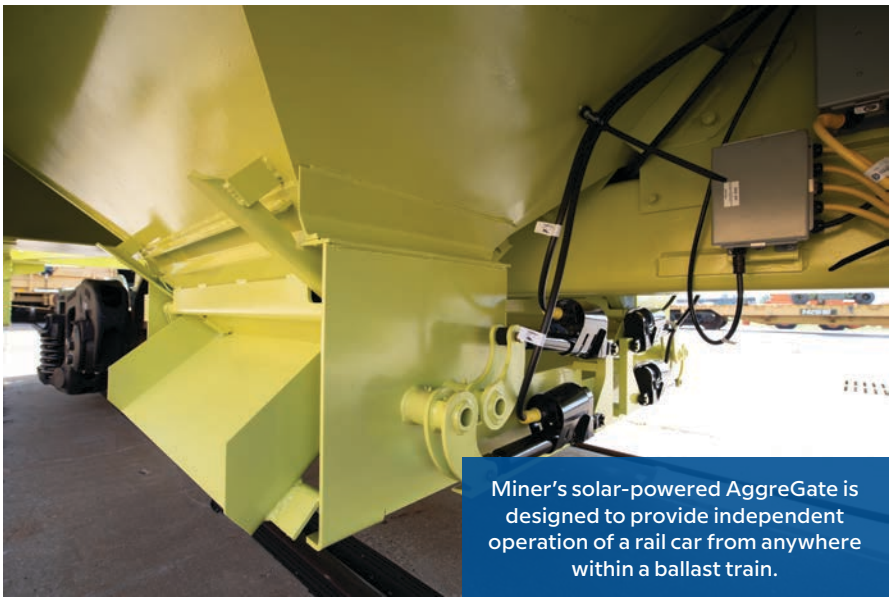
Plasser American offers a comprehensive fleet of ballast cleaning, shoulder cleaning, and surfacing equipment.

For shoulder ballast cleaning, Plasser American offers the FRM85 and FRM802, designed to clean the full shoulder width and depth in a single pass. Available with single- or double-shaker box configurations, these machines "provide flexible solutions to meet varying production requirements. By removing fouled ballast and restoring proper shoulder profiles, they help improve drainage, preserve track structure, and reduce the need for more

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Miner's solar-powered AggreGate is designed to provide independent operation of a rail car from anywhere within a ballast train.

frequent maintenance."

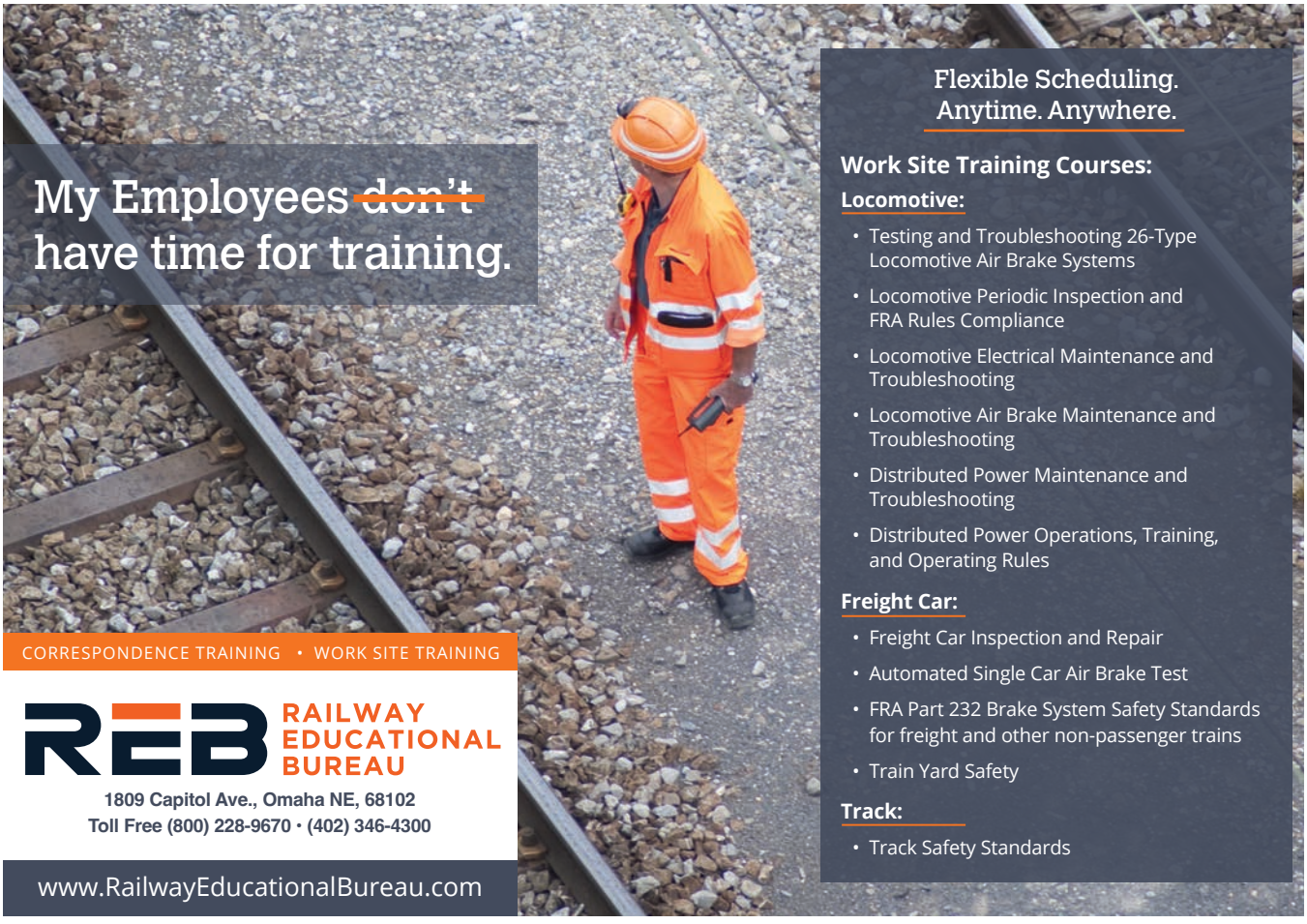
Productivity gains "extend beyond ballast cleaning to the surfacing operation," Plasser American says. "The GRM4000, part of our high-production GRM line, features a two-tie tamping unit designed to increase output while maintaining precise track geometry. Its optimized weight distribution accommodates transportation by road truck or flatcar, providing greater logistical flexibility."

RCE

"New orders at RCE have been flat to slightly down year to date, reflecting broader challenges in the construction equipment market. Higher interest rates, tariffs, economic uncertainty and elevated fuel costs have constrained capital investment, prompting some customers to defer purchases. Used equipment demand has remained steady, while rental demand has increased as customers seek to manage costs and maintain flexibility."

Over the past year, RCE has focused on product innovation and advanced safety technologies, including object detection and enhanced operator awareness systems. "With demand for rental equipment increasing, customers are placing greater emphasis on immediate availability and flexible rental and leasing options that allow them to meet project requirements without major capital expenditures."

RCE is building more equipment for stock to shorten lead times. "As economic uncertainty continues to influence purchasing decisions, equipment availability, financing flexibility and safety enhancements remain important considerations for rail construction customers."



Miner Enterprises



Metra SD70MACH, a re-purposed freight locomotive.

Wikimedia Commons/Guo Rui Pei

CHICAGOLAND, HUB OF THE MIDWEST

A new governance structure guides the Windy City's complex passenger rail and transit systems.

BY DAVID PETER ALAN, CONTRIBUTING EDITOR

Four years ago, in the September 2022 issue of *Railway Age*, we ran a feature article about trains in Chicagoland and local rail transit on the Chicago Transit Authority (CTA) system. Like most transit providers in the United States and Canada at the time, Metra (which oversees or runs regional rail service in the region), the Northern Indiana Commuter Transportation District (NICTD, which runs the South Shore Line), as well as the CTA were recovering from the COVID-19 pandemic, which caused severe declines in service, ridership, and revenue. Metra and the South Shore Line were hit relatively hard, the CTA less so. Bus service suffered, too, but that's beyond our purview.

At the time, *Railway Age* Editor-in-Chief William C. Vantuono supplied the lead paragraph for the article: "Chicagoland is the nation's freight rail hub, a status that also holds true for passenger rail. Amtrak, Metra, NICTD and the CTA have a symbiotic relationship in a complex network of lines and services that provides mobility to hundreds of thousands of people every day. Emanating from Chicago are intercity corridor services to Midwest points such as St. Louis, Detroit and Milwaukee, and long-distance trains to and from New York, New Orleans, Seattle, San Francisco and Los Angeles. Commuter rail lines stretch north, west and south (east is Lake Michigan, can't go there!) throughout the region. NICTD, known to locals as the South Shore, connects Chicago with South Bend, Ind. And the CTA, with its famous elevated Loop, serves the inner city as well as both major airports, O'Hare and Midway."

My introductory paragraph still holds true, as well, for the most part: "For this overview of rail in the Windy City, I could not have thought of a better lead-in to describe the variety of trains and rail transit in the Hub of the Midwest. With the Chicago Transit Authority (CTA) and its eight-line local rail system, Metra trains throughout Chicagoland, the Northern Indiana Commuter Transportation District South Shore Line to Indiana, and more than a dozen Amtrak corridor-length and long-distance routes, Chicago and the region present a variety of rail experiences and useful mobility for residents and visitors alike." Now it's time for an update.

The transit map for Chicago and vicinity has not changed in the past

four years, but some things are different when it comes to mobility on rails in and near the Windy City, and we will focus on those changes. The eight CTA rail lines, the Metra system that reaches out from downtown on three sides, and the dramatic view of classic skyscrapers from "L" trains on the famous Loop have not changed, but other aspects of Chicago mobility are different or will be different soon. We will concentrate on those.

The CTA celebrated its 75th anniversary on Oct. 1, 2022, shortly after the previous article ran. It was a fun-filled event, and it included a rare opportunity to ride on a pair of preserved 1923-vintage cars. Today, the CTA map looks the same as it has for decades, and service has recovered to its pre-COVID level. Changes are coming to transit governance now, and we'll get to them later in this article.

There is a major construction project under way. It's the Red Line Extension, part of the "Red Ahead" program. The line runs in the median of the Dan Ryan Expressway and will be extended on the South Side from its current terminal at 95th Street to 130th Street. The estimated cost of the 5.6-mile extension is now $5.7 billion. Construction began on April 24, 2026, and is expected to be completed in 2030.

Service on Metra had been reduced on account of the COVID-19 pandemic in 2020, and it had not recovered to pre-COVID level as of four years ago. Today it essentially has, and there have been some further improvements. Three of Metra's 11 lines run on weekdays only, with a strong emphasis on commuter trains. The Heritage Corridor on UP, part of the historic Alton Railroad that hosts Amtrak's *Texas Eagle* and *Lincoln Service* trains to St. Louis, runs only three trains from Joliet to Chicago in the morning and back out in the late afternoon. At the other end of the system, the UP Northwest Line has three commuter runs that serve McHenry, which is located on a branch. The North Central Service to Antioch on the Wisconsin Central and Southwest Service on the historic Wabash, now part of Norfolk Southern, run a small amount of "off-peak" service, but far short of a full-service schedule. The Blue Island Branch of Metra Electric, historically the IC Electric on the Illinois Central and now part of CN, also runs limited service. The same is true at the ends of some lines: beyond Libertyville on the Milwaukee District North Line, beyond Crystal Lake on the UP Northwest Line, and beyond Waukegan on the UP North Line. All three UP lines run on the historic Chicago & North Western (C&NW) and Metra's northernmost station on the North Line is Kenosha, Wis., the railroad's only stop outside Illinois.



Stadler FLIRT Akku battery-electric trainset on display at LaSalle Street Station, Chicago.

Aside from those few commuter-oriented lines, the other eight lines in the system run a full span of service, and some schedules have improved over the past four years. The standard for service on Metra has historically been hourly service on weekdays, sometimes with longer gaps, and every two hours on weekends. Four years ago, the Big Noise from Winnetka had been an experiment with running half-hourly midday trains on weekdays between that stop and Chicago. That experiment has now ended. There are differences in the schedules on all the lines, and some end the service day earlier in the evening than others. Still, the service patterns are basically similar.

Saturday and Sunday schedules are different, and some lines run only every two hours throughout the weekend. Others run hourly trains for part of the day, especially on Saturdays. There has been one notable improvement in weekend service. It's on the BNSF line to Aurora, historically part of the Burlington Route. Trains now run hourly for most of the day in both directions, on both Saturdays and Sundays. There has not been a similar improvement on any other line, although some lines have a few more trains than ran four years ago.

Metra has an expansion project under way, too. Service will be extended to Rockford on UP, west of Elgin on the Milwaukee District West Line, according to the website www.chicagoroackfordrail.org. The new service will mark the first time that Rockford has had a train since the state-supported *Black Hawk* was discontinued in 1981. The cost is now estimated at $275 million, including a new track between the Metra and UP lines west of Elgin. Plans call for two round trips per day to start running at the end of 2027, with a station in downtown Rockford and intermediate stops at Elgin and Belvidere.

On the Indiana side, NICTD's South Shore Line completed an eight-mile extension from Hammond to Munster, Ind.: the Monon Corridor (named after the historic railroad that ran there),

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Amtrak St. Louis-bound *Lincoln Service* train passes the CTA's 35th/Archer station.

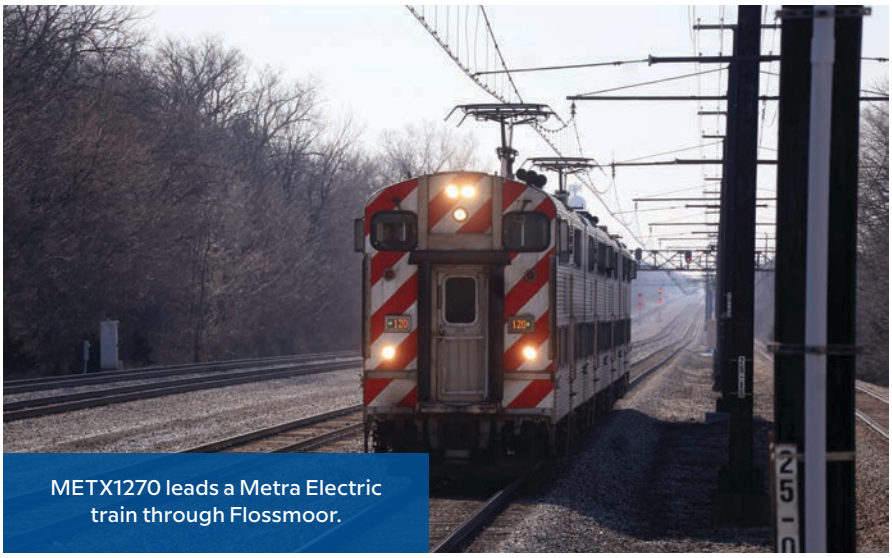
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and known as the West Lake Corridor. Service began on March 31, 2026, and includes through-running trains only at peak-commuter hours: five in the prevailing direction and one in the reverse direction.

There are also trains at other times, seven days per week, but connections to or from Chicago are poor, with scheduled waiting times of at least 14 minutes for the cross-platform transfer, and many trains requiring longer waiting times or having no connection at all. The line bypasses downtown Hammond, but there are plans to build an infill station to serve the city. The recent double-tracking project on the South Shore Line's main has improved schedules by adding service, but only slightly.

New Regional Governance

As we have reported, the loss of federal funding for transit operations that had been part of the COVID-19 relief statutes in 2020 and 2021 has placed many transit providers at the precipice of a "fiscal cliff," and Chicago's agencies are no exception. Chicagoans and their suburban neighbors faced threats of severe service cuts. Last December, the legislature passed and Gov. J.B. Pritzker signed a bill that dedicated enough new funding to the local providers to save the service, while part of the deal was that the Regional Transportation Authority (RTA) would be replaced by a new agency, the Northern Illinois Transit Authority. NITA is now in operation, having had its official start on Sept. 1. The new regional agency's website, www.nita.illinois.gov, said on opening day: "Starting Sept. 1, NITA is now your regional transit agency, coordinating affordable, reliable, safe transit for riders. NITA today officially begins operations as the nation's second largest transit authority by passenger miles driven by the system's operators—the Chicago Transit Authority (CTA), Metra and Pace, launching a new regional approach to how public transit is funded and coordinated across the Chicago region." The existing providers will retain separate boards, which will concentrate on matters that pertain to each provider, while NITA will concentrate on regional matters, such as fare integration and planning. NITA will have a 20-member Board, all appointed by elected officials: five each by the



METX1270 leads a Metra Electric train through Flossmoor.

governor, Cook County, and the mayor of Chicago. There will also be one member from each of the "collar counties" in the suburban areas served by Metra trains and Pace buses. *Railway Age* has reported that the change was coming, and we will continue to report on the results that the new governance structure will bring.

The Amtrak Side

When we reported to you four years ago, Amtrak's Chicago service had not recovered to pre-COVID levels. Shortly thereafter, the *City of New Orleans* returned to daily service. Service on the state-supported Chicago-hub corridors has also returned to pre-COVID levels. There is a new train, the *Borealis* between Chicago and St. Paul, which began service on May 21, 2024. It leaves Chicago about four hours ahead of Train 7, the *Empire Builder*, and leaves St. Paul approximately 3-1/2 hours behind Train 8, its sibling train. Ridership has been high, and the train has generally been considered successful.

Equipment has been a problem on Amtrak's corridors outside the Northeast lately, due in large part to the removal from service of the Horizon cars, built in the late 1980s, on account of structural problems. New equipment has been arriving on the scene: Siemens Venture cars are in use, and Airo cars are coming soon. On the long-distance side, the new *Floridian* pieced together from the *Capitol Limited* and the segment of the *Silver Star* running south from Washington, D.C. (not to be confused

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with the 1970s train of the same name that served such cities as Nashville and Birmingham) might be temporary, as Amtrak had originally indicated. An Amtrak manager told a conference sponsored by the Rail Users' Network (RUN) that the two trains would resume separate operations and the *Silver Star* would again serve New York and intermediate points in the Northeast in fall 2027.

As we reported four years ago, the rail scene in Chicago is not as interesting as it was in the pre-Amtrak past, but the CTA, Metra, the South Shore Line, and Amtrak are still providing about the same levels of service as they did before the COVID-19 virus hit in 2020. The CTA still serves the City of Chicago and a few neighboring towns. Metra trains still reach many suburban communities, and hourly service on weekdays has become the standard pattern on its full-service lines. Weekend service will seem sparse to anyone used to the hourly service generally offered in the New York and Philadelphia areas, but the BNSF line is now running hourly on weekends, so there might be some reason to hope for improvement in the future.



A CTA Brown Line train of 3200 Series cars.

Chicago is still an interesting place to visit, with its historic neighborhoods, museums and other attractions. There are still plenty of trains to take you there, and transit in the region has a new governance structure. We will keep an eye on it and let you know how it performs as time goes by.

Wikimedia Commons/Laurence's Pictures





FIGURING OUT WINTER WHEEL FRACTURES

BY GARY T. FRY, PH.D., P.E., CONTRIBUTING EDITOR

Winter is approaching in the northern hemisphere, and this is the time of year I often get asked two questions. First, "Is there something we can do to reduce broken wheel derailments in winter?" and second, "Why do more wheels break in winter than other times of year?" Railway industry professionals want to learn more about this technology topic.

Let's consider the first question. With vanishingly rare exception, broken freight railcar wheel rims I have examined over the past 30 years have triggered from a subsurface fatigue crack defect that was not visible on any exterior surface of the wheel. Usually, the triggering fatigue defect has been larger than one inch in its minimum dimension. In many cases, multiple very large fatigue crack defects (each more than four inches, or more) were involved in the wheel failure—a so-called multiple site damage (MSD) scenario. In terms of broken freight railcar wheels, none of the dozens that I have examined presented with manufacturing defects of any form. Rather, the fatigue defects that were present developed after the steel material experienced long-term cyclic loading under routine heavy-axle-load freight railroad operations.

Such fatigue crack defects are a natural consequence of metallic fatigue. Metallic fatigue has been recognized internationally for more than 150 years as a safety-critical engineering concept. It features prominently in the design, manufacture, operation, inspection, evaluation, and maintenance of structural metal components—including steel railway wheels.

Yes, we can absolutely reduce broken wheel derailments in winter. We need simply to reduce the number of defective wheels that we allow to be used in service. To that end we need to perform routine, non-destructive testing (NDT), specifically ultrasonic inspections, of wheel treads to find subsurface fatigue defects—a known and predominant root cause of broken wheels. If a fatigue defect is found, replace the wheelset. This is a common practice for many railroad operations around the world but not common in North America.

No further research is needed. On railway systems that perform these inspections, substantially fewer broken wheel derailments occur compared to systems that do not inspect wheel rims for the presence of subsurface fatigue defects. There are no effective means of repairing a fatigue defect in a defective wheel, and the fatigue defects only grow larger—never smaller—with continued use of the defective wheel. Affordable, off-the-shelf, portable, handheld equipment designed for the task is available from nearly two dozen global brands. Training is available for existing railroad employees to use the equipment. Alternatively, there are hundreds of NDT contractors in North America with certified technicians available to reliably perform the work.

Whatever approach might be selected to perform the inspections, there are considerable safety gains to be realized and risks to be mitigated, especially considering their low cost, ease to perform, and reliability. I have heard arguments against implementing such inspections because it will likely cause increased wheelset replacements compared to current practices. As a result, there would be increased costs to some industry stakeholders. This might prove true in the near term, immediately after implementation. In short order, however, the bulk of defective wheels would be removed from service, and the subsequent rate of wheelset replacements would decrease substantially along with the occurrence of broken wheel derailments. No one should accept broken wheel derailments as a "cost of doing business."

The second question requires some general technical background on the fracture behavior of structural steel. Structural fracture in a steel component can occur

Transportation Safety Board of Canada

even when the component is subjected only to the routine service loading that it was designed to withstand, usually by a significant margin of safety. In fact, the component may have supported millions of applications of the loading for many years before the fracture suddenly occurred.

For example, consider a railcar wheel. Each revolution under a loaded car represents a single fatigue cycle of load. Assuming a 33-inch diameter wheel tread, 500,000 miles of loaded railcar travel is equivalent to 305,577,491 fatigue load cycles for a railcar wheel. Now consider a case where a wheel rim breaks 8 feet after traveling 500,000 miles—that is, just before completing 305,577,492 revolutions.

A question begs to be asked! What was special about that last revolution of the wheel that caused the rim to break? The simple answer is, probably nothing special at all. Another perspective: The last revolution of the wheel did not cause the broken rim; rather it was the broken rim that caused the last revolution of the wheel.

Let's consider generally what comprises a fracture event using a broadly familiar object: a pistachio. Figure 1 contains a sequence of four photographs of pistachio shells: intact, slightly cracked, very cracked and fractured. This sequence is representative of how steel components might fail in fatigue. They start off intact and defect free. After many loaded cycles of use, they develop small fatigue crack defects that grow into larger fatigue crack defects. Left in service, they eventually suffer a fracture triggered by one of the fatigue crack defects.

There are fascinating microscopic things happening inside solid material at the tip of a fatigue crack just prior to a fracture event. These things comprise the fracture process and are best represented mathematically as a tipping point in a complex balance among three energies. In the context of opening the pistachio shell, these energies are: 1) the energy created as the forces in our fingers spread apart; 2) the strain energy inside the solid shell caused by our fingers prying the shell open; and 3) the energy required to extend the length of the crack within the solid shell material.

That third energy, the energy required to extend the crack, involves a material property that we call Toughness, (also referred to as critical strain energy release rate). It has units of energy per unit area of crack formed. All solid materials have toughness. The toughness of metals usually varies with temperature: generally lower at cold temperatures and higher at warm temperatures.

Here are some toughness values of a few materials at room temperature: For our pistachio shells, it is around 10,000 Joules per square meter. For glass, it is very low: around 10 Joules per square meter. For copper, it is very high: around 1 million Joules per square meter. For the low-carbon steels used in bridges and buildings, it is around 100,000 Joules per square meter. For the hard, wear-resistant pearlitic steels used in railcar wheels, the toughness is around 10,000 Joules per square meter—surprisingly similar to pistachio shells!

Material Toughness, fatigue crack size, and load level are independent variables. This gives three scenarios for us to consider. First, for a given value of material toughness and some level of applied load, there is a critical-sized fatigue crack that will trigger a brittle fracture. Second, for a given value of material toughness and a fatigue crack of some size, there is a critical level of applied load that will trigger a brittle fracture. Third, for a given fatigue crack of some size and an applied load of some level, there is a critical value of material toughness that will result in a brittle fracture. Figure 2 is a diagram that represents these essential considerations (material toughness, defect, and load) imagined as a fracture safety triangle.

Quantitative understanding of the fracture of steel comes from laboratory tests using fatigue-cracked specimens. Data sets recorded during these tests are used to calculate a quantity called Fracture Toughness, which quantifies, as a single value, the balance that exists among Material Toughness, fatigue crack size, and applied load intensity near the crack tip at the instant of fracture.

During my career, I have heard many misconceptions regarding Fracture Toughness in steel and what it represents. Here are four practical facts of Fracture Toughness. 1) In simple terms, Fracture Toughness is a strength parameter for defective material—specifically, a material that contains crack-like defects. 2) Fracture Toughness has no meaning in the absence of a crack defect. (In fact, Fracture Toughness is not defined in the absence of a crack defect.) 3) Fracture toughness has no reliable bearing on the resistance of a steel to developing fatigue crack defects in service. 4) Fracture Toughness has no reliable bearing on the growth rate of fatigue defects after they form in service.

Reliably and pragmatically, Fracture Toughness quantifies only a single feature of a steel alloy. The larger the value of Fracture Toughness, the larger the fatigue crack

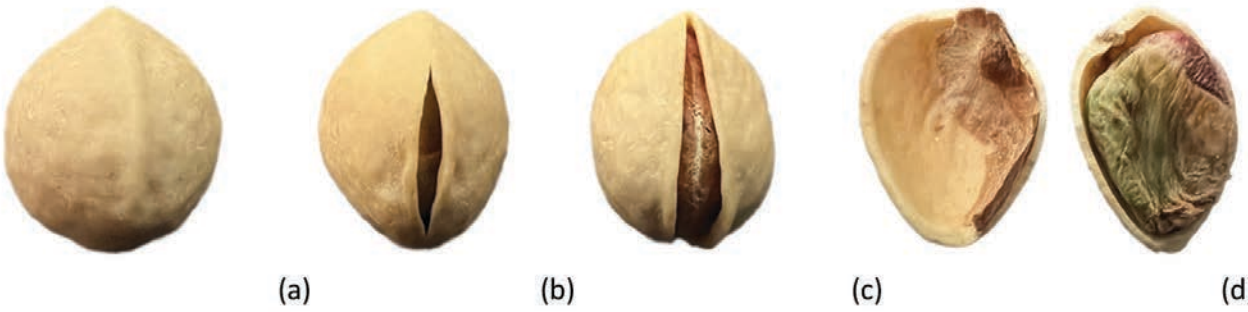


Figure 1: Progressive crack growth and final fracture of a pistachio shell: (a) intact; (b) small crack; (c) large crack; (d) fractured. *(Courtesy of Gary T. Fry.)*

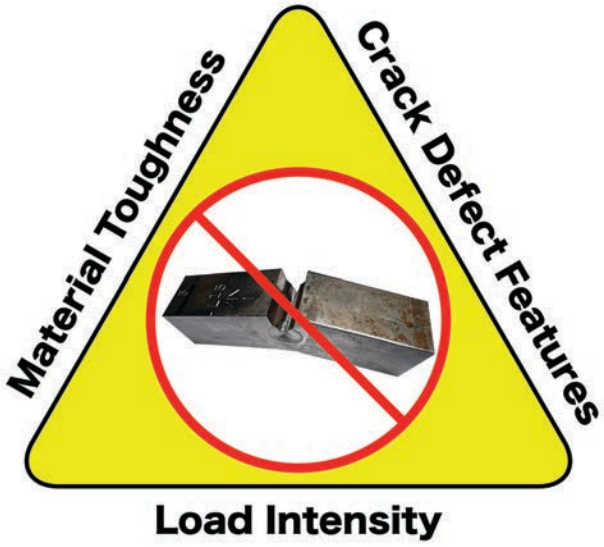


Figure 2: A "Fracture Safety Triangle" listing the essential elements that must be quantified and controlled to prevent sudden fractures of steel components *(Courtesy of Gary T. Fry).*

defect that can be tolerated in the steel before triggering a fracture under load. In essence, Fracture Toughness helps us predict how an initially intact, defect-free steel will perform in a demanding fatigue environment after fatigue cracks develop. We would surely like a chance to find those fatigue cracks, before the steel suddenly fractures under load and stakeholders have suffered the consequences!

This is the guarantee that we are aiming for when we specify a minimum value for Fracture Toughness in a steel—a guarantee that is only valid in the presence of an effective fatigue crack defect inspection program. If we aren't looking for the fatigue defects, and replacing the components when defects are found, the defects just keep growing until a fracture occurs. In this non-inspection scenario, steel with a high Fracture Toughness fails nearly the same as steel with a low Fracture Toughness. The only difference is that the triggering fatigue defects are larger for tougher steels. If we don't inspect for fatigue defects, the risk of component failure and associated consequences are completely independent of Fracture Toughness.

If we do have an inspection program, then the minimum value of Fracture Toughness that we should specify depends on the details of our inspection program. For example, suppose that a routine inspection program of wheel rims can only reliably identify subsurface cracks that are larger than 0.25 inch; that is, defects smaller than 0.25 inch are missed more often than they are found. In this case, we need to assume after an inspection is complete, that our wheels might well contain 0.25-inch cracks when we return them to service. We also need to assume that these cracks will grow larger as the defective wheels accumulate more loaded miles in service. With a high degree of reliability, those defective wheels need to be able to perform safely under load at least until the next inspection when we get another chance to find the growing cracks.

To achieve the required level of reliability, we need to specify a required minimum value for Fracture Toughness. Specifically, this value must be determined using the calculus of statistics based on the expected variability in Fracture Toughness values and their positive correlation with temperature, the expected variability in wheel temperature during service, the expected variability in size, shape, location, and orientation of fatigue cracks in the rims, and the expected variability in load intensity spectra applied to those fatigue cracks in service. Any other means of selecting a minimum Fracture Toughness value is essentially arbitrary.

Currently in North America, we do not routinely inspect for subsurface fatigue defects that develop in wheel rims during service. This is the non-inspection scenario described above. We do specify a minimum value for Fracture Toughness in wheel steels, and it is periodically updated—usually increased. Given the lack of an ongoing fatigue crack inspection program, however, the basis for these required Fracture Toughness values, and their periodic updates, is not evident. Regardless of the reasoning, without an associated fatigue crack inspection program, the risks of broken wheels are not mitigated. All that we observe from tougher wheels are larger fatigue defects when we perform our broken wheel failure investigations.

Now we are ready to answer the second question: "Why do more wheels break in winter than other times of year?" We don't routinely inspect for subsurface fatigue defects in wheel rims and replace the defective wheels. Consequently, actively growing fatigue defects are allowed to remain in a wheel rim where they will continue to grow

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during all seasons of operation: summer, fall, winter, and spring. At the instant that the fatigue defect becomes a critical size with respect to the railcar load and the wheel's current Fracture Toughness, which decreases with decreasing wheel temperature, a single additional wheel revolution could trigger a fracture. Therefore, we can reasonably expect to see clusters of these fractures with the arrivals of the coldest days of winter when wheels are coldest and their Fracture Toughness is lowest.

The fractures are triggered by subsurface fatigue crack defects that were allowed to remain in the wheel rims after surviving the coldest hours of the previous winter, though perhaps barely so. Those cracks continued to grow under load through the subsequent warmer months but managed to remain subcritical in size. It is now winter again, and the fatigue defects are bigger this time around and are still growing during loaded revolutions of their wheels. When the wheels get cold enough, some of these actively growing defects will have become too big for the available toughness in the wheel and the load in the railcar. During one more loaded revolution of the wheel, they will trigger a fracture.

Key takeaways: In terms of basic material properties and manufacturing quality, modern freight railcar wheels are reliable, and long lasting, but they are not everlasting because they are not fatigue-proof, and they never will be. Instead, railcar wheels are no different from other steel components in a demanding cyclic load environment; that is, they have a calculable likelihood to develop fatigue defects. In the case of railcar wheels, the fatigue defects nucleate and grow subsurface within the rim and are invisible to the eye. To reliably find and remove these defective wheels before they break, an NDT technique such as ultrasonic inspection is required. We have roughly 13 million freight railcar wheels to inspect in North America. With available inspection technology, and a reasonable allocation of resources, all of them can be inspected within three years' time. The result would be a substantial and lasting decrease in broken wheel accidents in service.



Dr. Fry is Vice President of Fry Technical Services, Inc. (https://www.frytechservices.com/). He has more than 35 years of experience in research and consulting on the fatigue and fracture behavior of structural metals and weldments. His research results have been incorporated into international codes of practice used in the design of structural components and systems, including structural welds, railway and highway bridges and high-rise commercial buildings in seismic risk zones. He has extensive experience performing in situ testing of railway bridges under live loading of trains, including high-speed passenger trains and heavy-axle-load freight trains. His research, publications and consulting have advanced the state of the art in structural health monitoring and structural impairment detection.

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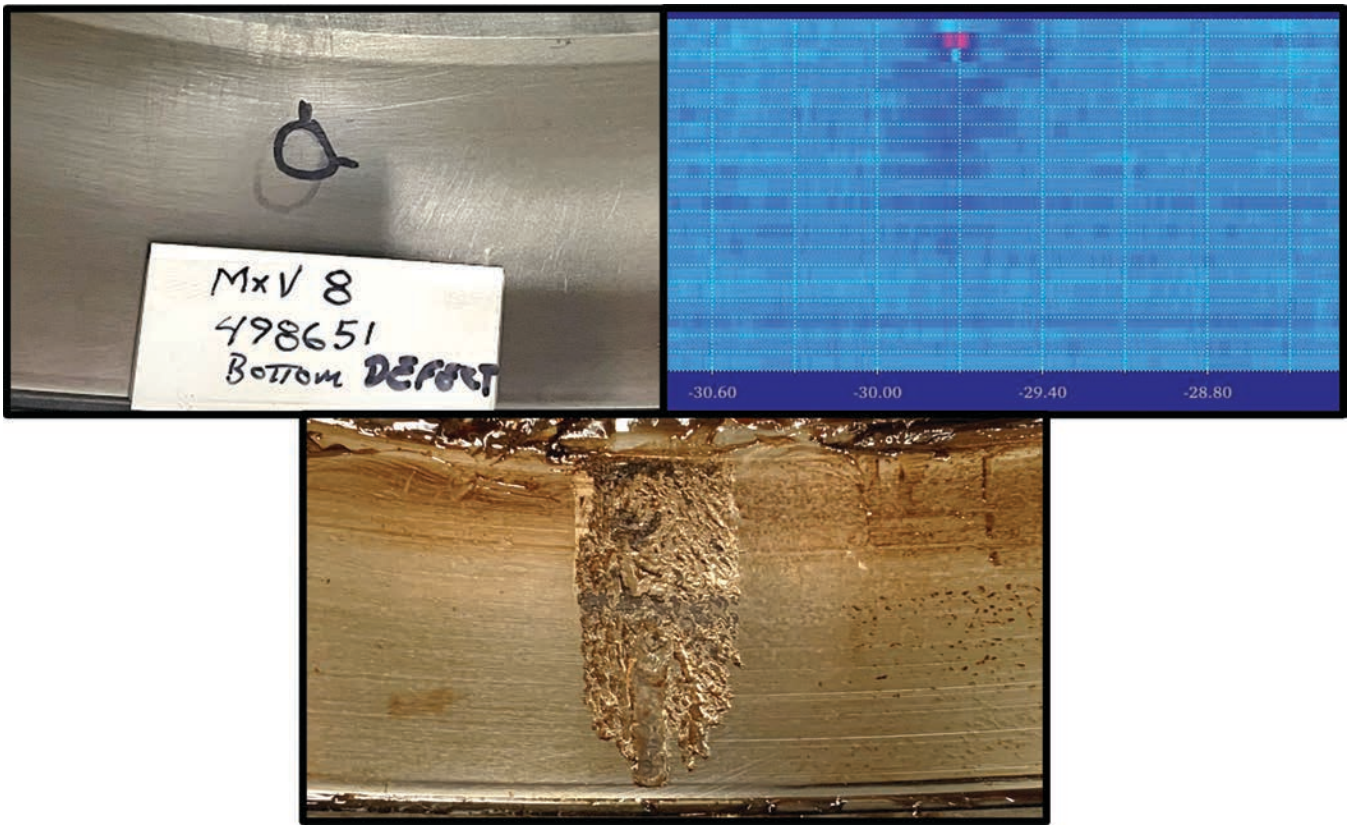


Figure 1. Bearing cup raceway before testing *(top left)*, ECA scan showing small defect indication *(top right)*, and spalling at the same location after 41,200 miles of rig testing *(bottom)*.

USING EDDY CURRENT TO IMPROVE BEARING RECONDITIONING

BY MATT WENGER, SENIOR ENGINEER III; AND ANISH POUDEL, PH.D, SCIENTIST, MXV RAIL

MxV Rail recently completed Phase 4 of a multi-year study that evaluated eddy current array (ECA) nondestructive evaluation (NDE) technology as a tool to improve bearing cup inspections during reconditioning.[1] Earlier phases investigated the behavior of repaired bearing cups and the ability of ECA technology to find bearing cup raceway defects that could lead to premature spalling. Phase 3 results demonstrated significant improvements in detection accuracy and prompted a final study focused on validating the technology's repeatability and lower detection size limits.

Roller bearings removed from railcar wheelsets must undergo reconditioning at an approved facility before they can be reused. The reconditioning process includes bearing disassembly, component cleaning and inspection, repair of eligible defects, and reassembly. According to data through 2025, approximately 65% of North American freight bearings have been reconditioned at least once during their service life.

During reconditioning, bearing cup raceways are visually inspected for defects, such as pinhead and incipient spalls (among other flaws). If left unrepaired, these spalls will grow in service, resulting in vibration, damage to other rolling surfaces and shortened bearing life. While visual inspection remains the industry standard, some defects may be too small or subtle to detect with the naked eye.

ECA inspections can sense surface and near-surface material discontinuities by measuring changes in the flow of eddy currents induced within the test specimen. An array probe can quickly scan the raceway surface and highlight locations where cracks or spalls impede the normal flow of eddy currents. ECA systems can quickly output a two-dimensional color gradient plot of an entire cup raceway in real time. Any

MxV Rail

suspected defect indications can then be pinpointed and verified using a single-coil, handheld "pencil" probe.

During Phase 4, MxV Rail scanned 252 newly reconditioned Class F bearing cups. Of those, eight cups contained very small ECA indications that were not identified during the visual inspection process. These eight cups, along with eight cups showing no ECA indications, were selected for accelerated service life testing.

The test bearings were assembled and evaluated on a four-bearing laboratory test rig at the University of Texas Rio Grande Valley. The test conditions were designed to simulate freight service while accelerating fatigue development. Bearings were run at the equivalent of 85 mph under a radial force representing a fully loaded 110-ton railcar. Test mileage extended to as much as 120,000 miles while vibration and temperature were monitored continuously to track bearing health and identify the onset of spalling.

The results demonstrated a clear correlation between ECA indications and premature spalling. All eight bearing cups containing ECA indications developed spalls during testing, producing a 100% true-positive rate. Of the eight cups without ECA indications, seven completed testing without spalling for an 88% true-negative rate. Overall, the presence or absence of ECA indications correctly predicted test outcomes in 15 of 16 cases (94% accuracy).

Notably, the defects evaluated during Phase 4 were extremely small compared to those in previous phases. Several indications measured only 0.005 square inch in area, which is near the lower detection limit of the ECA system used. Figure 1 shows an ECA indication and the resulting spalling after 41,200 miles of rig testing.

To date, Phase 4 provides the strongest evidence that ECA inspections can identify service-life-shortening bearing cup defects that may otherwise be overlooked during visual inspections. MxV Rail is providing technical guidance to the Association of American Railroads (AAR) Wheels, Axles, Bearings, and Lubrication (WABL) Committee regarding the potential implementation of eddy current technology into the manual for bearing reconditioning.[2]

The *Technology Digest* upon which this article is based can be found in our eLibrary along with more than 1,000 other publications describing the railway research, testing and analysis from AAR-funded research. The MxV Rail team has the software, laboratories, and test tracks to meet the railway industry's needs for both publicly accessible research and contractual tests for individual customers. We invite you to learn more at www.mxvrail.com.

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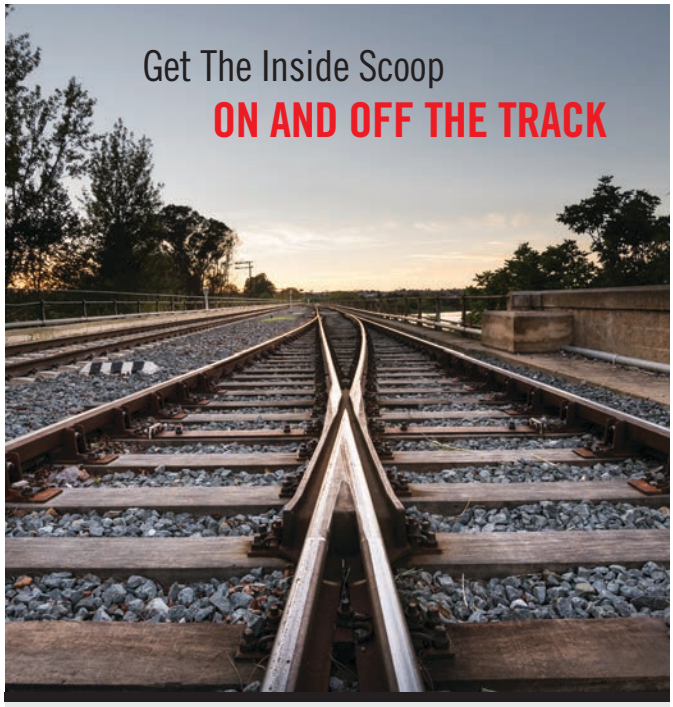
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Understanding the AI/Railroad Comparison

Experts, journalists and commentators make casual mention of the explosive growth of the railroad industry in the 19th century. It stands in as a precedent, or at least a referent, for the seemingly sudden emergence of Artificial Intelligence.

Always it is a brief mention, as if we intuitively grasp the significance or similarities. My initial impression is two-fold. It is evidence of how deeply embedded railroad history is in the national consciousness, and how shallow and unhelpful the casual comparison really is.

Railroad mobility was as disruptive and game-changing in the 1820s and 1830s as AI is today. But merely citing railroading as a pattern or precedent for various AI technologies today is intellectually lazy. It glosses over the stark parallels between both, and the ways we mere humans deal with such profoundly powerful change. It also ignores lessons we might find useful.

This could be a conversation useful to both our understanding of railroad history, and how to manage the immense power of AI to alter the future. In a blindingly brief span of time 200 years ago, railroad mobility altered the ways we traveled, did business, understood the economy, and the very nature of American culture and daily life.

Modern railroading (as opposed to crude tramways, which had been around for a very long time) was the single-most consequential technological advance of the 19th century—not in universally good ways, and often with unintended consequences. But railroad mobility profoundly changed the course of national development, and the ways we understand reality. Sound familiar?

It did so in many ways, which is why economists, politicians, writers and so many others reflexively mention it. Three broad characteristics suggest what made the "Railroad Revolution" so powerful.

First, it was incremental and synthetic. It is possible to trace the many small advances and occasional flashes of vision that individually may seem significant, but when assembled effectively, multiplied potential outcomes. The rate of change then suddenly accelerates.

A dozen disparate trajectories were swirling around in the 1820s. They ranged from metallurgy, physics, and development of coal as a resource to seismic shifts in international trade, westward U.S. expansion, and evolution of U.S. democracy. Railroad mobility figured in all.



The Honeywell DATAmatic 1000 electronic data processing system installed by the Baltimore & Ohio Railroad in 1958 was a first-generation mainframe computer.

They interacted in unpredictable ways, informed by external forces and human nature. I can, and have, made a direct connection between the Haitian Slave Revolution of the 1790s and the founding of the Baltimore & Ohio Railroad in 1827. Mostly people scoff—until I explain further. Without that successful slave revolt, Napoleon would not have sold France's American holdings to Thomas Jefferson in 1803 at a bargain price.

The same may be said for AI. It is an incremental and synthetic technology with many small advances leading to sudden breakthroughs as to what is possible. The modern electronic computing industry emerged from the Second World War, and railroads (along with insurance companies) were some of the first industries in the 1950s to adopt mainframe computing. Railroading could always be described as a data processing industry that also happens to run trains.

Second, railroading was what I call an "enabling technology," but on a scale and with power never before seen. Mathematics, language and culture are also enabling technologies, but of a different nature. Railroad mobility was physical, kinetic, and sprawling, and delivered immediately tangible benefits.

Today we take for granted how relatively easy it is to move about the country and ship goods and commodities at predictable cost. It is difficult to describe the many ways that railroad mobility opened possibilities, removed barriers and accelerated progress in its first 50 years.

That represents something of a paradox. Railroad mobility is perishable. It can be fragile. It doesn't, in and of itself, "produce" anything. It requires immense investment, close oversight and constant upgrading to remain useful. It can be hard to accurately locate in the unprecedented developments of the past 250 years.

Finally—and this represents something of a frontier in how we understand railroading—railroad mobility figuratively and literally required us to think differently, behave differently and construct a world view according to different parameters. And those parameters were simultaneously enticing, exhilarating and threatening.

Railroad mobility required us to completely re-imagine geography, economy and behavior. In many ways, people understood railroading as the first time mankind had exerted control over nature itself. Within the space of a few years, a journey that previously took a day required only an hour. What once required a week took only a day. Forty years after the dawn of the "Railway Age" in the 1830s, you could cross the entire continent in a week. That was utterly unthinkable in 1803.

That is what AI is also requiring us to do in ways that electricity, air travel or even world wars did not. It will take a while to unpack and process a more useful comparison between the Railway Revolution and the AI Revolution. I think it would be useful.

I have long been fascinated by how the railroad industry embraced innovation and integrated evolving technologies. AI is no different, but we've had this conversation before. Railroad mobility changed society in almost every way imaginable. Exploring how, and what we can learn, wouldn't be nostalgia. It would offer wisdom in dealing with looming AI challenges. //



JOHN HANKEY
Contributing Editor; curator, railroad historian and railroad preservation project consultant

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