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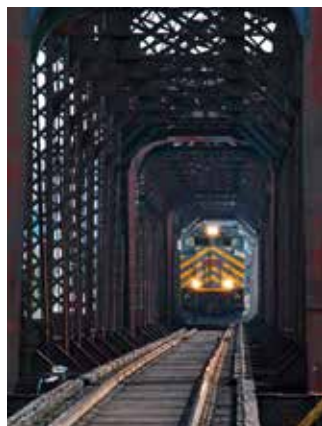
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From the Editor



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The derailment of a Norfolk Southern freight train in East Palestine, Ohio, and ensuing chemical release is drawing regulatory attention — and not all of it aimed at addressing the accident's cause.

No one was injured in the accident, thought to have been caused by the failure of an overheated wheel bearing. No one has suggested the NS crew did anything wrong.

Yet lawmakers are debating sweeping changes, including mandating the number of crew members, setting limits on train length and weight, and even regulating the amount of time trains can block grade crossings.

Both the News and Commentary sections this month are devoted to making sense of these turbulent times.

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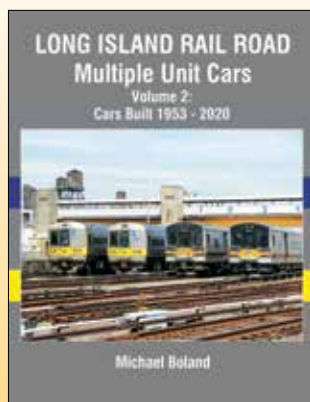
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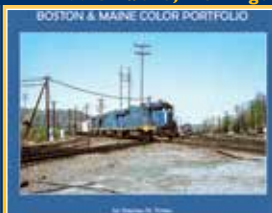
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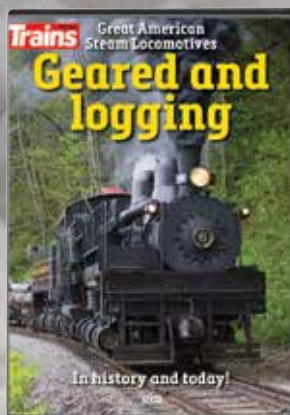
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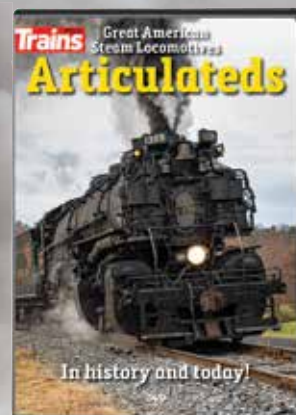
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THE TRAINS INTERVIEW

Alan Shaw

Norfolk Southern CEO discusses East Palestine, safety, and 'making it right'

▲ ES44AC No. 8092 leads south-bound train 15R as it crosses the Catawba River on Norfolk Southern's R-Line at Rock Hill, S.C., on Jan. 19, 2022. Travis Mackey

TRAINS CORRESPONDENT BILL STEPHENS spoke with Norfolk Southern CEO Alan Shaw after the railroad's quarterly earnings call on April 26. This is an abridged version of their conversation; the full version is available on Trains News Wire at [Trains.com](https://www.trains.com). Shaw's railroad and the industry in general have been under scrutiny since the Feb. 3 derailment of a Norfolk Southern train in East Palestine, Ohio, and subsequent hazardous materials release.

Q Has East Palestine changed the way the industry looks at safety? And if so, how?

A We understand the role that we play in the U.S. economy. We take safety very seriously. All my colleagues and I at the CEO level are always looking to improve. You've seen improvements in our safety performance and the industry's safety performance over time. What I will tell you is that our response to East Palestine has reconfirmed my conviction in the strategic plan we outlined last year. We said we were going to be a customer-centric, operations-driven service organization that focuses on the long term and adheres to

our core values, and focuses on the best interests of our shareholders, our customers, employees, and the communities we serve. And that's exactly what we've done in our response to East Palestine. I hope that whatever's written about this year down the road, they're going to say NS stayed true to form. We did exactly what we said we were going to do: We're going to make it right and we're going to be focused on the long term instead of the short term.

Q Union leaders say that East Palestine was the inevitable result of Precision Scheduled Railroading. How do you respond to that?

A Since we implemented PSR — and we did it the NS way — last year, our derailments were the lowest in the last two decades. We can do better. Last year our employee injury rate was the lowest it's been in the last decade. We can do better. As you know, on my first day as CEO last year — which seems like eons ago — I was out in the field on a Sunday with my craft colleagues, thanking them for what they do for NS and our

customers and the U.S. economy. That's the importance I place on our craft colleagues. Since I've become CEO we've been on a hiring spree. ... We took an industry-leading approach and we charted a new course for the industry. We're going to keep investing in our craft colleagues, investing in our network, and investing in our customers, even during economic downturns. I reached out personally to the heads of our two largest labor unions and told them I want them to be part of the solution. I didn't want to come up with the solution and then dictate it to our craft colleagues. I want their input, I want their help, and I fully intend to move forward with that.

Q Across the industry, labor has been through PSR-related downsizing over the past few years and the protracted national contract negotiations last year. How is morale among the unionized workforce at NS? And does morale have an impact on service and safety?

A We have a better relationship with our craft colleagues



than some of the other roads. ... And our local union leaders recognized that. The protracted labor negotiations, the fact that our craft colleagues worked 24/7 throughout COVID, yes, that has an impact. I understand that our craft colleagues are the foundation of our railroad, and that's why I'm investing in them. They're that important to me. I get my energy from being in front of our customers or being out in the field in front of my craft colleagues. Frankly, that's how I came up with the concept of a customer-centric, operations-driven service organization. As soon as we ended those national negotiations, it was really important to me that we pivoted to quality-of-life issues. And I wanted to do that at the local level for a couple reasons. One is I know that what's important to my craft colleagues in West Virginia or Ohio or Georgia is probably different from what's important to craft colleagues out in Oregon or California. I know we have a good relationship with our craft colleagues. And so what you saw us do in mid-December is we reached out via phone and told each one of our local union leaders that we're willing to sit down with them and talk about important quality-of-life issues. The progress we've made is tremendous. You know, labor negotiations aren't easy. Usually they're pretty protracted. That was five months ago, and we've got paid sick leave agreements with 10 of our 12 unions, and we're continuing discussions with SMART-TD and the BLET on quality-of-life issues as well. [NS and SMART-TD announced an agreement just days after this conversation.] So we've made a lot of progress.

Q Federal Railroad Administration officials have always said that safety is not a partisan issue. Yet East Palestine quickly became a political football. Were you surprised by that, and did it have an impact on NS' response to the derailment?

A I was absolutely very surprised by the misinformation that was out there, the politicization out there. And you saw that [Associated Press] story about foreign intelligence agencies getting involved on social media and really spinning this up. That was our understanding of this situation as well. Did it change the way we responded? No. The NS supervisors were there within an hour. Our family assistance center was set up within a day. I was there in the immediate aftermath and I pledged to do what's right. What's important is that I didn't go there in the immediate aftermath for a photo op. I went directly to our family assistance center and I went directly to the Red Cross shelter. I told them who I was, and who I represented, and I was talking to the impacted families and people and asked them, "Are we doing everything we can to support you?" ... I've held listening sessions with folks there, usually groups of eight to 10. I've visited folks in churches, and in schools, and in their businesses, and in their homes. Their feedback has been, as you'd imagine, emotional. It's been powerful. One of the things that I heard was that folks really wanted us to remove the impacted soil underneath the track. We already had an environmentally accepted remediation plan in place. But once I got that feedback, and I put it up against our core values and our commitment to making things right, I told my folks to take up the track. Now, that had an impact on our earnings when you go from double main line to single main line on your busiest corridor, with that single main line at restricted track speed. It's going to have an impact. But it's the right thing to do.

Q In-train forces are nothing new, they're well understood, and railroads have had train marshaling rules for a long time. Did Norfolk Southern get away

from this when it implemented the TOP 21 operating plan, which emphasizes moving traffic on fewer but longer trains?

A No, we didn't move away from this. When I became CEO I refreshed our operating leadership at a number of very key positions, starting with Chief Operating Officer Paul Duncan, who is widely recognized in the industry as one of the best and brightest of the next generation. And I said, "I want you to take a look at safety and service." And so we started broadly and we looked at how we were building trains and operating trains, and we made adjustments last year. And, candidly when that [March 4] Springfield, Ohio, derailment happened, the next morning I talked to Paul and said, "We can't afford any more. So I want you to get really, really, really conservative on our train build procedures until you can use science and physics and data to look at every train and every line segment." ... That decision is one of the things that's cost us in the short term. It's not the new rules. It's the decision to get really conservative that really created congestion on our network. ... Ultimately we'll be more productive and we'll have more capacity. But I've got to do what's right. I've got to be willing to take a short-term hit to protect our long-term future.

Q The safety advisory the FRA issued on train makeup said that distributed power reduces in train forces, but it's not a cure all. Do NS's new train marshaling rules take that into account?

A Yes. Our new rules were put in place before that FRA advisory came out. And when I saw that FRA advisory, I went to Paul [Duncan] and said, "Did they get a hold of our new rules?" be-

cause it is exactly what we put in place a week or two beforehand. We're fully aligned with the FRA and they're thinking about this exactly the right way. We're safe. Last year we had the lowest number of derailments in two decades. Most of our FRA safety metrics improved last year compared to the prior year. We've improved so far this year on derailments and accident rate as well. We're doing the right things.



Norfolk Southern CEO Alan Shaw NS



FRA advisory asks railroads to address operation of long trains

Move stops short of proposing cap on length or weight

IN ITS SECOND SAFETY ADVISORY in three weeks, the Federal Railroad Administration in April encouraged railroads to address the complexities of operating long trains.

The non-binding advisory follows three recent derailments involving trains with more than 200 cars, length of 12,250 feet or more, and weight over 17,000 tons.

The advisory said that “while research is ongoing related to operational aspects of long trains, including brake system performance, it is known that the in-train forces longer trains experience are generally stronger and more complex than those in shorter train consists.” It did not recommend a specific cap on train length or tonnage.

The April 27 train-length advisory builds on an April 6 advisory on train makeup. Among its eight recommendations to address operations of long trains are:

- A review and update of air brake and train handling rules.
- Ensuring that two-way end-of-train

devices maintain communication with the head end.

- Adopting technology or procedures to maintain radio communication between engineers and conductors.
- Reviewing and updating the locomotive engineer certification program.
- Taking steps to minimize blocked grade crossings.

The use of long trains has come under scrutiny. Rail labor contends such trains are inherently unsafe. Communities are reporting a rising number of blocked crossings. And elected officials have been critical of long trains after a string of high-profile derailments, including the Feb. 3 Norfolk Southern derailment in East Palestine, Ohio.

When issuing the train makeup advisory, officials said they noticed a trend of train makeup problems contributing to six derailments of trains having more than 125 cars.

The FRA noted that before certifying locomotive engineers, regulations require



The March 5, 2023, Norfolk Southern derailment in Springfield, Ohio, was cited by the FRA in its advisory on long trains. Sol Tucker

railroads to determine that an engineer “has demonstrated the skills necessary to safely operate trains in the most demanding class or type of service that the person will be permitted to perform.”

The safety advisory says it's one thing to operate a 100-car train and quite another to operate one with 200 cars: “A locomotive engineer cannot be expected to safely operate in a more demanding service without proper additional training that covers the unique challenges and complexities those trains present.”

Although the safety advisory lacks the teeth of regulations, industry observers expected railroads to follow the train length guidelines given the current focus on railroad safety in Washington and state legislatures. It was not immediately clear whether that would lead to operational changes or curtailed train lengths. — *Bill Stephens*

Midwest sees more Venture cars

Business-class cars debut; California wait continues

AN INCREASING NUMBER of Siemens-built Venture passenger cars — delayed by a variety of production and acceptance issues — are now in service on Amtrak state-supported routes in the Midwest. That includes the first of the business/coach class cars, which at least initially are available to riders for no additional fare.

Meanwhile, there is no firm date for introduction of California's Venture equipment, although a spokesman for the state's Department of Transportation said in April that it would come this summer.

Siemens is building 137 cars for the two state-supported operations: 88 for Chicago-based services and 49 destined for California's *San Joaquins* trains. In the Midwest, three Venture business/coach cars and 40 coaches were accepted and available for service as of the last week in March, according to Scott Speegle, Illinois Department of Transportation spokesman. Seven more cars were “in the queue to be fully accepted,” with another six en route to Chicago.

A café car continues to undergo climate testing in Canada; Speegle says IDOT “hopes to begin introducing the new café

cars in revenue service later this year.”

Siemens and the California Department of Transportation said last fall that the first seven cars in the state's order for *San Joaquins* service had been accepted by Caltrans. But the cars have yet to turn a wheel in service. Siemens said in a statement, “It is up to our customers and their operators to determine” when cars enter service, and that it has made several design improvements since the first Illinois cars entered service. It declined to elaborate.

Caltrans Senior Media Officer Edward Barrera says *San Joaquins* deployment is set for “summer 2023.” The state plans on running complete trainsets with cab cars where all equipment is semi-permanently coupled, but California cab cars aren't expected until the first quarter of 2024. Business class isn't offered on *San Joaquins* and there will be no manned cafes. “We will have vending machines and we are seeking a vending machine operator,” says Barrera.

He adds, “A number of factors go into the decision of when an operator is ready to put a railcar into service: testing, resolution of issues, ability to accept the vehicle,



A northbound *Hiawatha* departs Chicago with a four-car set of Venture cars on April 7, 2023. David Lassen

crew comfort with the vehicle operations, and maintenance agreements. Caltrans and [the Illinois Department of Transportation] have separate processes and timelines to meet our own operating needs. In California, some third-party operation/maintenance agreements need to be resolved; Venture railcars in the California fleet [also] had some open items remaining.”

The business/coach cars feature two-and-one seating in the business section instead of the two-and-two rows in coach. They are being operated as coaches in the Midwest since they do not yet have the accompanying café cars to offer the beverages included as a business-class amenity. — *Bob Johnston*

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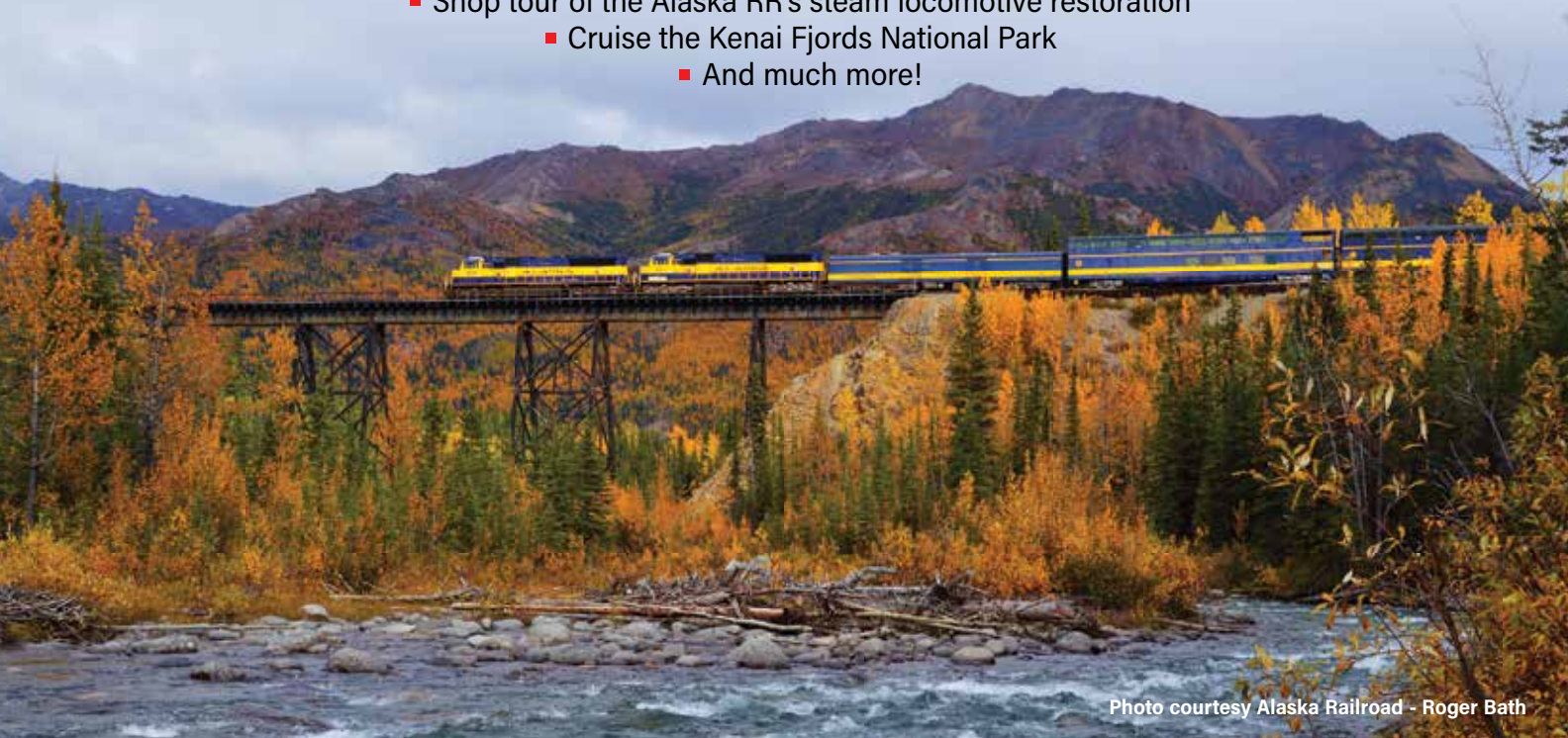


Photo courtesy Alaska Railroad - Roger Bath

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Railroads are under a cloud of suspicion

High-profile derailments put safety in the spotlight



Bill Stephens

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Analysis: Trains.com

All the positive freight railroad safety statistics in the world — like more than 99.9% of hazardous materials shipments arriving without incident — can't overcome that image of a towering column of black smoke rising from East Palestine, Ohio.

The toxic cloud from the Feb. 3 Norfolk Southern derailment did far more than upend 4,700 lives in East Palestine. It made people in trackside communities wonder: What if that happened here? And an intense media spotlight on subsequent derailments has made it seem like no one can keep their trains on the rails.

So now Washington's in a rush to introduce more stringent railroad safety regulations. Instead of following the data and waiting for National Transportation Safety Board recommendations, Congress wants to show it's doing something to make railroads safer.

High-profile railroad disasters always lead to new safety rules. What's different about East Palestine is that it has prompted a raft of proposed regulations that seem to have nothing to do with the wreck.

The NTSB said the derailment was caused by a wheel bearing failure. In its preliminary report, the board also said the train crew did nothing wrong, there's no evidence of track problems, and the hotbox detectors on the route were working as designed.

The Rail Safety Act introduced in the Senate would regulate wayside defect detectors for the first time, expand handling rules for trains carrying hazardous materials, and require railroads to provide first responders with more funding and real-time data on hazmat shipments. These are logical responses, although an argument could be made that installing wheel bearing sensors on freight cars is a better solution than adding more hotbox detectors.

The bill also is a legislative grab bag. It would require a train crew of at least two people, cap train length and weight, set minimum times for freight car inspections, outlaw blocked grade crossings, and increase fines on railroads that violate safety rules. No matter what you think about the merits of these proposals, they won't prevent wheel bearing failures.

Nonetheless, the Rail Safety Act enjoys bipartisan support and has momentum. Railroads shouldn't be

surprised that they have few friends in Washington. The industry has given itself a black eye since 2017, when railroads began a wave of massive layoffs while implementing the low-cost Precision Scheduled Railroading operating model. Since then railroads have been criticized for everything from service problems to multi-billion-dollar share buyback programs.

Because of this, East Palestine has played into two narratives.

First, it's an "I told you so" moment for rail labor. Union leaders have been warning that railroads are no longer putting safety first — and that job cutbacks would lead to disaster. East Palestine could be the start of a trend, but safety statistics have gotten better overall since 2017.

Regulators and lawmakers need the valuable insider's perspective that rail labor can provide. But unions lose credibility when they try to tie every single derailment to PSR. Labor leaders should stop overplaying their hand.

Second, politicians see railroads as modern-day robber barons who oppose safety regulations. The railroads reinforced this view by continuing to push for taking conductors out of the locomotive cab at a time when safety is under the microscope.

Lawmakers have made NS CEO Alan Shaw the industry's punching bag. NS has taken a beating over the derailment and invited criticism with its early response, which was flat-footed. Yet NS has gotten no credit for Shaw's promise to "make things right" in East Palestine or the safety steps the railroad has taken since the wreck.

Politicians ignore the fact that despite not being required to do so, railroads have invested billions in the wayside defect detector network as well as new track and train inspection technology. Also lost on the politicians: Railroads have a financial incentive to reduce derailments. A safer railroad is a more profitable railroad.

But it's clear that railroads must do better. Last year the train accident rates at NS and Union Pacific are roughly four times higher than that of industry leader Canadian Pacific. There's no reason that gap can't be closed.

East Palestine was a wake-up call for the industry. Still, the Ohio disaster has put railroads under a cloud of suspicion that's likely to linger. **I**

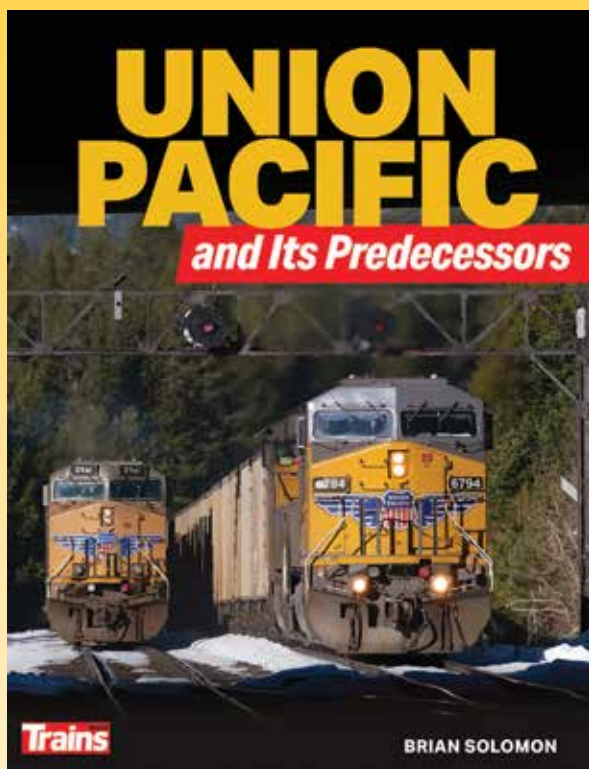


A cloud of smoke rises above East Palestine, Ohio, following the Feb. 3 derailment of a Norfolk Southern train. The incident stirred debate over rail safety. Bazetta (Ohio) Fire Department, via Facebook

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PUTTING IT TOGETHER

A trio of projects remakes the commuter rail system for New York's MTA

by David Lassen

B

ig things are happening in New York.

This is nothing new. But in this case, they involve remaking commuter rail boundaries that have existed for generations. That is definitely new.

A trio of construction projects, among the nation's largest public-works programs, are creating new options for riders and for the Metropolitan Transportation Authority. For the MTA, the options provide welcome opportunities as it explores life in a commuter rail landscape reshaped by the COVID-19 pandemic.

The projects, two of which are now complete, are:

- Long Island Rail Road's Third Track, the 9.8-mile addition to the commuter road's Main Line between Floral Park and Hicksville, N.Y. The third track, which entered service in October 2022, was a key to a schedule introduced in February that saw the LIRR increase weekday service by 41%.

- East Side Access and Grand Central Madison, the rail line and station that brings the LIRR to a new endpoint beneath Grand Central Terminal, saving time for some commuters and enabling new services. A long-delayed, well-over-budget project, it encountered one final, delaying glitch before opening Jan. 25, 2023. Full service began about a month later.

- Penn Station Access, which will bring Metro-North trains to Penn Station and introduce commuter rail service to a section of the Bronx that has been a case study for the term "transit desert." Groundbreaking for the project to rebuild Amtrak's Hell Gate Line to also handle Metro-North trains came in December 2022; completion is projected in 2027.

The projects are tightly connected. The additional capacity created by Third Track was necessary to take full advantage of the station at Grand Central. And Penn Station Access only became feasible when some LIRR trains were diverted to Grand Central Madison, opening slots at capacity-constrained Penn.

None of this comes cheaply. Big things have big prices, particularly in New York. Third Track cost \$2.5 billion; the official price tag for East Side Access is \$11.13 billion; and the current estimate for Penn Station Access is \$2.8 billion.

The projects will have measurable impacts for some commuters on a daily basis. But top MTA officials see them in much larger terms.

"The broad vision is that New York — our viability, our ability to grow — is



An inbound Long Island Rail Road train swings off the Hempstead Branch onto the Main Line at Floral Park, N.Y. Beyond the switch is the beginning of the new third track. David Lassen



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Morning rush-hour passengers disembark at Grand Central Madison, the new LIRR station deep beneath Grand Central Terminal, on the first day of full service at the new station on Feb. 27, 2023. Three photos, MTA/Marc A. Hermann

totally dependent on mass transit,” says MTA Chairman and CEO Janno Lieber. “At our density, which is nine times Houston or Phoenix, a typical Sunbelt city, and twice Boston or Chicago, it’s no secret: there’s no more room for automobiles or other internal-combustion-engine vehicles in Manhattan. There just isn’t. So we have to grow mass transit capacity, if we’re going to accommodate the growth and population.”

Jamie Torres-Springer, president of MTA Construction & Development, is responsible for building these projects. He calls the commuter expansion the MTA’s version of the Gateway Project, Amtrak’s effort to increase Northeast Corridor rail capacity with new tunnels and related infrastructure.

“We have 3 million people that live on Long Island,” Torres-Springer says. “They have, up to this point, essentially one way into Manhattan. ... These projects fit together in support of that effort to create more capacity, resiliency, redundancy for the riders from Long Island to get into the central business district.”

A fourth project, extensively remodeling Penn Station, doesn’t have an operational component — it won’t alter station capacity — but it is interwoven with the other three. A first phase, widening concourses and creating headroom in the much-reviled maze beneath Madison Square Garden, is nearing completion. A

more extensive — and more controversial — remodeling lies ahead. The goal is to get as much of that work done in the roughly four-year window between the decrease in Long Island Rail Road service to Penn and the arrival of Metro-North trains.

So how do these projects change the commuter landscape, individually and cumulatively? Here’s the overview.

THIRD TRACK

The Long Island Rail Road operates a sprawling commuter network — about 700 miles of track and 125 stations on 11 lines. Some 40% of its trains touch the 9.8-mile Main Line between Floral Park and Hicksville, which feeds the Hempstead, Oyster Bay, Port Jefferson, and Ronkonkoma branches.



Janno Lieber, MTA chair and CEO, prepares to address opening ceremonies for Grand Central Madison on Feb. 26, 2023.

With two tracks, this segment severely constrained operational flexibility. Any breakdown or emergency trackwork snarled traffic for hours. At peak periods, the railroad was essentially a one-way operation.

So, years ago, the MTA put together a plan to add a third track to increase capacity, provide the ability to recover from problems, and develop previously nonexistent reverse-commuting service.

That plan died in the face of widespread community opposition.

“When I left [LIRR for Metro-North] in 2011, there was really no prospect that this was ever going to get built,” says Catherine Rinaldi, currently serving as interim president of the Long Island as well as president of Metro-North Railroad. “The political headwinds were too difficult.”

In time, that changed. The Rauch Foundation, a Long Island-based nonprofit, led an effort championing the benefits. And the MTA redesigned the project and its approach to selling it. The original version required significant land acquisition to widen the right-of-way. The redesign fit all three tracks into the existing 66-foot-wide corridor, eliminated every grade crossing in the 9.8 miles — through closures or with underpasses — and made other quality-of-life improvement for neighbors, such as sound walls.

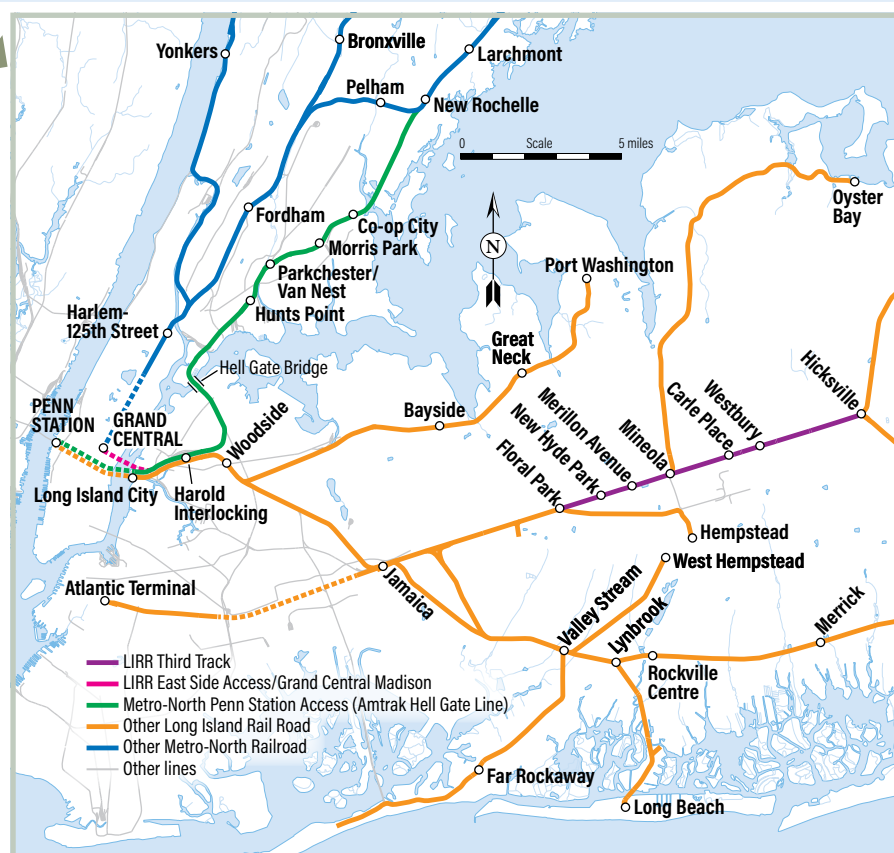
At the same time, the MTA was careful



Catherine Rinaldi, Metro-North Railroad president and Long Island Rail Road interim president, and Jamie Torres-Springer, president of MTA Construction & Development, attend groundbreaking ceremonies for Penn Station Access on Dec. 9, 2022.

to listen to the communities that were going to be affected by the four-year construction project.

"We have a community relations unit here at the MTA that has grown over time," says Torres-Springer. "And for Third Track there was a deep investment in that kind of work. ... We worked with the municipal leadership up and down the line to be clear about what their needs were and how we could help to support them. And we designed the projects to create benefits locally."





An eastbound Long Island Rail Road train passes a work crew and work train with two MP15AC locomotives at Floral Park in November 2022. Addition of the third track east of Floral Park gives the LIRR much-needed operational flexibility. David Lassen



An Oct. 31, 2021, inspection trip for MTA officials provides a look inside the tunnel to Grand Central Madison. Those officials stress the importance of having a second rail tunnel to connect Long Island and Manhattan. MTA/Marc A. Hermann

The grade-crossing eliminations were a key example.

“Those crossings were often being closed 20, 30, 40 times an hour during the peak [commute],” Springer-Torres says. “So you can imagine what the impact was on local communities. When people started to understand that we were creating those benefits ... things got a lot easier.”

Not from a construction standpoint, of course. Essentially, the MTA didn’t just add a track to the Main Line. It rebuilt the two existing tracks, five stations, and related infrastructure, while continuing regular operation, except for carefully scheduled 48-hour weekend closures. [A look at how it met those challenges begins on page 17.]

Now that the third track is operational,

the LIRR can develop a reverse-commute clientele, an option it never had before.

“This is a place where the Metro-North background for me is particularly relevant,” Rinaldi says, noting that Metro-North has a fairly robust reverse-commute business. “... But Long Island never had that, really, because of the constraints of its network. Which is why the business community on Long Island was the biggest proponent of Third Track for however many years. ...

“Just the ability to have that reverse commute for the first time on Long Island, I think is a real game-changer.”

Says Lieber, “Long Island’s economy is a knowledge economy, just like the rest of the region. It’s more and more connected to what’s going on here in Manhattan, and

in the central business district, and talented professionals. ... So reverse commuting is a huge boon for Long Island’s economy.”

EAST SIDE ACCESS

If you were starting from scratch, you would probably not design a rail network delivering passengers from Long Island, east of Manhattan, to a station on the west side of the island. But that’s what happened when the Pennsylvania Railroad owned a controlling interest in the Long Island Rail Road and connected it to the Pennsy at Penn Station in 1910. For a lot of today’s passengers, that means doubling back to reach jobs on Midtown’s east side.

This is what East Side Access addresses. Or at least it’s what it was originally about.

“For a long time, it was perceived as more convenient for Dashing Dan, the gray-flannel-suited Long Island Rail Road commuter, to get to his or her office on the east side of Midtown,” says Lieber. “And that’s true. It’s going to save people a ton of time.”

The figure often used is 40 minutes a day: 20 minutes each way between Penn Station and the east side whether you walk, take a subway, or use a cab. Give a commuter back those 40 minutes, and it adds up.

But over the project’s long gestation period, other benefits gained significance. Consider that the first stab at East Side Access began in the 1970s, when part of the tunnel to Grand Central was excavated, then left unfinished because of the city’s

Continued on page 18

A THIRD TRACK WITH MANY FIRSTS

Innovative techniques, collaborative approach help deliver expansion project on time, within budget

HAD THE LONG ISLAND RAIL ROAD'S Third Track project only been what its name implies — adding a third track — it would have been complex enough.

But the work over 9.8 miles between Floral Park and Hicksville, N.Y., was much more. The two existing tracks were rebuilt, and in places relocated. Five stations were reconstructed, as were electrical substations. New underpasses eliminated grade crossings. A new signal system was put in.

For good measure, public utilities had to be relocated, because they also used the 66-foot-wide right-of-way that squeezed in the third track where there had previously been just two, along with the occasional siding.

Essentially, the railroad was completely rebuilt over four years, while still continuing to run its full commuter schedule.

"It was such a complex project logistically," says Anthony Tufano Jr., senior vice president and project executive of the LIRR mainline expansion project. "Every element of the project we've done before in our capital program. But to do it all together in one design-build [contract], which really wasn't in our wheelhouse in the railroad industry? ... I'm just amazed, and I've been here every single day of it."

While the southernmost track is generally termed the "new" track, the reality is that, to take advantage of available space or existing sidings, the third track is not always on the same side of the two previously existing mains.

Shoehorning the three tracks into the existing corridor was one change the LIRR made to win public support for the project, which previously had been shot down by public opposition when it called for substantial land acquisition. But that meant that the first couple of years of work were "relocating utilities and building retaining walls," Tufano says. "Because we had to create more property to support the third track while the trains were running."

The initial plan called for six years of construction, but "that was not acceptable," Tufano says. "It was too invasive [for communities]. So the four years was hard and fast."

Meeting that deadline required a small army. Tufano said the project involved over a thousand craftsmen from the Long Island trades council; at least 1,500 LIRR workers; and countless managers, engineers, inspectors, and other support personnel. "We probably used every tradesman on Long Island," he says. "I mean, think about it. Long Island hasn't seen a project of this scale."

"You know, try and spend \$2 billion in four years. [The final cost was about \$2.5 billion.]

It's a lot of work, it's a lot of heads, it's a lot of material, it's a lot of trucks."

One key element was the first U.S. use of a bridge technology known as "box jacking," in which prefabricated concrete boxes for an underpass could be pushed under the LIRR tracks in the course of a weekend. Only one company, the Italian firm Petrucco, currently performs box jacking.

"We shut the road down and have six months to move the utilities, put in temporary shoring, and keep the track running," Tufano says, pointing to a photo of the process in his office. "They cast this [box] in place, they build a bridge on top of it, flood it with ballast, and they jack. The jacks just push the box and slide it into place."

"Our last grade elimination project prior to Third Track was Roslyn Road [in Mineola, in 2009]. It took three years, because you had to find an alternate location for the road, buy property, and knock down buildings to keep the roadway [open] while they were building [an underpass] traditionally, in a big open pit."

After the first use of box jacking, he says, "I couldn't believe how simple it was, once you have buy-in and everyone's marching to the same drum."

To best understand what's involved in box jacking, watch this time-lapse video of an example at Covert Avenue in New Hyde Park: www.youtube.com/watch?v=pM5LaPRtoUk. Florida passenger operator Brightline has subsequently used the technology on its route to Orlando International Airport.

The grade-crossing separation projects were not the only beat-the-clock jobs tackled in 48-hour weekend shutdowns. There were also bridge replacements, beginning at Cherry Lane in Carle Place. [Watch that at www.youtube.com/watch?v=glQomF2IRU4&t=27s.]

At least part of the challenge with such jobs is managing the vast amount of people and equipment working in close quarters. That Cherry Lane bridge barely met its Monday morning deadline. The next bridge replacement was completed with four or five hours to spare.

"You have the railroad construction forces [and] the contractors' construction forces," Tufano says. "Logistically, you're in tight areas, and who handles what, orchestrating that dance, becomes something that each time, we got better and better at. It was a very risky proposition early in the project, and then toward the end it was almost like clockwork. ... We were sitting there sometimes saying, 'This is getting boring.'"

In truth, nothing about this project was

Continued on page 19



Hicksville, at the east end of the Third Track project, is one location where the "new" main track makes use of a previously existing track. This view looks west. David Lassen



An aerial view shows the concrete box and bridge for the School Street underpass, completed and ready to be moved into place via box jacking, on Oct. 4, 2020. MTA

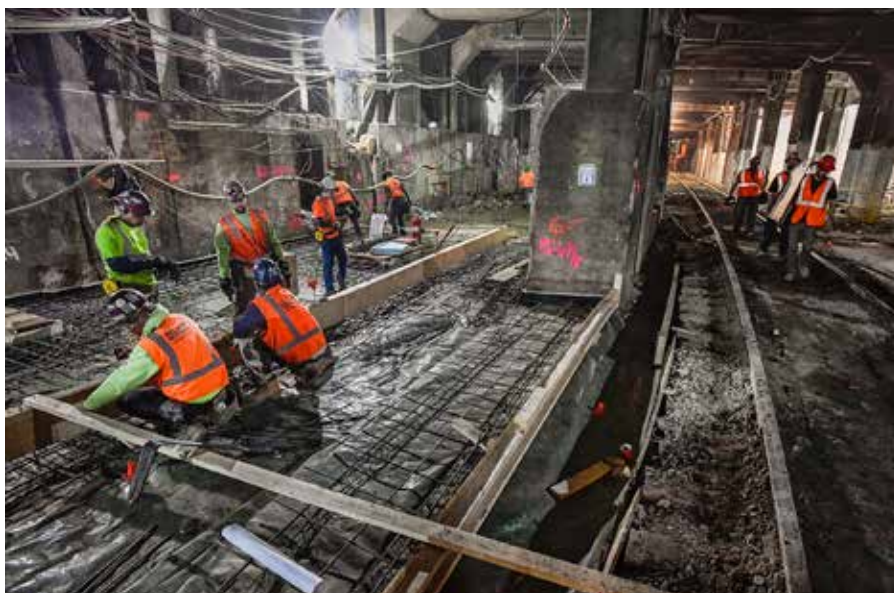


The Covert Avenue underpass in New Hyde Park, N.Y., is jacked into place on Aug. 24, 2019. The jacks are at the edge of the concrete box in the foreground. MTA





At the Queens end of East Side Access, the MTA had to work around Amtrak's Sunnyside Yard and Harold Interlocking, the nation's busiest. In a 2014 photo, a new bridge at 43rd Street also goes over Amtrak loop tracks. Two photos, MTA/Patrick Cashin



Work is in progress to convert the former Madison Yard space at Grand Central Terminal into the Grand Central Madison concourse on Nov. 22, 2016.

From page 16

financial situation. It was revived in earnest with funding in 1998.

Since then, New York has experienced 9/11. It has been hit by Hurricane Sandy. Each left its own scars, and pointed out the liability of having just one rail route between New York and Long Island. East Side Access changes that.

"It delivers us another route in and out of the central business district in Manhattan, in the event of emergencies of whatever variety — whether they're climate-related, or God forbid, something intentional," Lieber says. "It creates resiliency in that respect."

Rinaldi points to the transformational possibilities that come from having Metro-North and the Long Island serve the same

terminal, with transfer a walk and escalator ride away.

"The connectivity between the railroads, I don't think that's something that people talked about when the project was initially launched," Rinaldi says. "But especially as we're in this kind of post-COVID place, as we're looking to bring more people to the system, I think that interconnectivity is really important. ...

"People who live at Fordham now potentially could take a job in Queens, or people who live in Queens could take a job in White Plains. ... It will knit the region together in a sort of economic way that I think will be enormously advantageous. That certainly wasn't one of the drivers when the project was initially funded, but I think it is a really important feature."

(Acknowledging these new possibilities, the MTA launched a combo fare for those transferring between its two commuter railroads. Anyone starting on one system can go anywhere on the other system for an additional \$8.)

Of course, the fact that the project's perceived benefits have changed also reflects a gestation that has spanned generations. The first Long Island Rail Road train pulled into Grand Central Madison 14 years after the initial projected opening date for a project that, back in 1998, was supposed to cost about \$3 billion.

Explaining the delay would require an article of its own, if not an entire book; for a good overview, seek out a *City Journal* story from Autumn 2015, "Fifteen Stories Under: Why New York's East Side Access railroad project has taken so long and cost so much."

But current management says it learned from the delays, and has changed how the agency does business. It's no accident that before becoming MTA CEO, Lieber headed up MTA Construction & Development. Prior to that, his background was delivering construction mega-projects, like rebuilding at the World Trade Center site.

"What we brought to East Side Access," Lieber says, "is a couple of things. One is a determination not to continue the pattern of pushing the schedule back. ... Two was diagnosing what was wrong within [and] attacking those issues, which we did, which was fundamentally project-management type issues."

Torres-Springer took over MTA Construction & Development in 2018 — fairly late in the saga — but explains how project management has changed. He calls East Side Access "a remnant from another age."

"It was designed 20 years ago," he says. "It was a design-bid-build project, having to fully design every component 20 years ago, to be delivered over time, to be given to the lowest bidder to deliver. [There were] multiple tens and dozens of contracts, leading to contractors that were falling over each other, and in some cases ... to point to each other and place blame or avoid responsibility."

"These are not the ingredients of a successful mega-project. What we've moved to as a model is design-build, which allows us to more appropriately share risk with our contractors, reducing the number of contracts, and significantly taking much more aggressive project-management leadership."

The first major project completed under that model was LIRR's Third Track. It came in on time and under budget.

Meanwhile, for all the tribulations of East Side Access — including a final ventilation-fan issue that prevented opening in late 2022, as MTA had long promised —

From page 17

simple. Consider that to accommodate those underpasses for the grade-crossing separations, there were places the existing right-of-way had to be raised as much as 5 feet. This is clearly not achievable in the course of a single 48-hour shutdown.

"We raised the track in a series of passes over time," Tufano says, "and just kept on raising, dumping stone, raising, dumping stone We had to raise it up in different lifts. You can't have one track higher than the other, because you'll be spilling ballast over into the gauge of the track. So it was a complex, delicate dance; it was like open-heart surgery on a patient that was awake. And when you raise, you've got to raise all your stations; you've got to raise everything."

This sort of work was going on whenever there was a scheduled 48-hour shutdown anywhere on the Main Line.

"On any weekend we were replacing a bridge, we were probably doing 50 other things," Tufano says. " ... It was all hands on deck. We were working everyone. If we're going to shut the railroad down, we're going to piggyback, including the railroad's state-of-good-repair work."

How much was going on during those weekend shutdowns? Well, consider that Tufano had people whose sole job was to coordinate the equipment moves.

"We had so many pieces of equipment moving around Nassau County at any given time," he says, "fleets of hi-rail vehicles and road vehicles on a weekend."

Even placing the new track into service was more complex than on a usual project. A straightforward final step for most trackwork, on the LIRR it has the additional complication of an electrified third rail involved — as well as the five stations in the 9.8-mile construction zone. At each of those, temporary platforms were placed over the not-yet-in-service third track, which had to be removed for regular service to begin.

Ultimately, this is why the new track was opened in three phases, on Aug. 15, Aug. 30, and Oct. 4.

"You can't do it over a weekend," Tufano says. "You have two stations in the first block, two stations in block three, Mineola [a station and junction] in block two. ... It was just such a delicate dance to keep everyone able to move while we were doing this phased approach at construction."

The Third Track project was the first test for the Metropolitan Transportation Authority's shift to design-build projects, in which the contractor has far more say, rather than the previous approach of bidding on a fully designed project. "We let them design the path forward to be successful or not, and they were very successful," Tufano says. "We helped them along the way tremendously, but it really was true design-build. There was very little design when we went into this project."



To expedite the process, the LIRR project management, engineering, consulting, and design groups were moved into one Long Island office building, along with managers for contractor 3rd Track Constructors, a consortium of four companies: John P. Picone, Inc.; Dragados USA; Halmar International, and CCA Civil.

"Nothing went back to headquarters," Tufano says. "We managed the job totally from this office, and that was really different for us as an agency." This meant that, when there was a question or a problem, the people to decide a resolution were just down the hall.

Rest assured, such questions or problems arose daily.

"Things look great on paper, but the real world is there's an active railroad that's been

there for a hundred years," Tufano says.

"We were out in the field with designers constantly, making changes on the fly. ... But having everyone here was the way we were able to continue construction as the job was evolving."

That co-location, and the demonstrated ability to work together, will be a lasting legacy of Third Track.

"I would never take a major project without putting everyone in one location," Tufano says, praising "the relationships that are built. ... We're together every step of the way. We all own the schedule. It wasn't the contractor's schedule, it wasn't the owner's schedule. It was our schedule. We all kept our eyes on the prize." — David Lassen

TO TICKETING AND CUSTOMER SERVICES



"The Presence," a glass-tile mosaic, is one of several works by artist Kiki Smith featured at Grand Central Madison and part of the station's collection of major art installations.

the agency is proud of the final product.

"Everybody who comes to New York passes through Grand Central," says Rinaldi. "... It's just so exciting for the venue and for the neighborhood to have this additional transportation capacity tucked in beneath this historic space. I think it's going to just revolutionize the neighborhood, certainly revolutionize the MTA."

Says Torres-Springer, "It's a 700,000-square-foot concourse and it's underneath the busiest and most valuable real estate in North America. So it's an extraordinary space, but it's also part of a 3½-mile-long infrastructure project out to Queens."

GRAND CENTRAL MADISON

So, about that station.

Trains looked at the project when excavation was complete but service was still years away [see "The \$10.8 Billion Bore," March 2015]. Even then, it was clear that, whatever the delivery problems, the final result would be impressive.

That was even more true during a visit in November 2022. There was still plenty to

be done — escalators were blocked off; message boards were under wraps; countless fixtures were not yet in place. Some unfinished features will remain so for some time: while the concourse level has 25,000 square feet for shops and restaurants, none is expected to open this year.

On the other hand, the actual station portion of Grand Central Madison — the platforms and eight tracks — was essentially ready to go.

One thing that is almost impossible to appreciate without visiting is how large Grand Central Madison is, particularly the main concourse. That concourse was created from the space that used to be Madison Yard, a lower-level layover facility for Grand Central Terminal passenger equipment. It stretches roughly a quarter mile, from East 43rd to East 48th streets. Street access is at 43rd, 44th, 47th, and 48th streets. (Eventually, there will also be an entrance at 45th Street.)

The station's relationship to the buildings above it is illustrated by the section of concourse between 47th and 48th streets,

Grand Central Terminal's former Madison Yard has been remade as the quarter-mile-long concourse of Grand Central Madison.

Three photos, MTA/Marc A. Hermann

torn up and rebuilt in mid-project to allow JP Morgan Chase to add a million square feet to what is now planned as a 60-story, 1,388-foot-tall structure overhead at 270 Park Avenue. That required stronger foundations through the space occupied by the Grand Central Madison project, so — at Chase's expense — already-completed work was torn out, the new foundation was added, and the concourse was rebuilt.

"Without any impact to our budget or our schedule, they have caught up to us," said Paige Biancamano, MTA's director of communications and community outreach for East Side Access, as she led a tour of the unfinished station. "So keep in mind, this portion of the concourse" — she gestured back to the section from 43rd to 47th streets — "is early 2000s design. This portion of the concourse — 2020 design." The most visible difference for those passing through will be a full digital wall, the terminal's only such display.

Art will be a defining characteristic of the concourse. During our tour, the only area where photos were prohibited was at a spectacular 120-foot-long mosaic by artist Yayoi Kusama. Other artworks remained under wraps or had not yet been installed.

"There's some absolutely beautiful artwork down there, as befits this new space and this new location," Rinaldi says. "I would ask people to take a look out for the art while you're down there, and I don't think you'll be disappointed."

The time that passed between the station's design and its opening is reflected in the area between 46th and 47th streets,



The ticketing area at Grand Central Madison, as it looked prior to the station's opening. With technology reducing the need for ticket windows, much of this area has been repurposed.

which features a long, curving row of ticket windows. Such windows, of course, have become increasingly obsolete in an era of smartphone apps and ticketing machines, so the majority have been repurposed. They'll serve as tourist information locations, lost-and-found windows, and other customer-service points.

"The look of the ticket window will remain," Biancamano says, "because as a tourist or a lost child, you know that's where the helpers are." This area remains the station's "main congregating point," she adds. In addition to the ticket/information windows, it will eventually feature the main restaurant and bar, a waiting room for ticketed passengers, and the primary display of train information — though that information is displayed throughout the facility.

To catch a train, passengers will access the station's mezzanine level from stairs and escalators at one-block intervals between 45th and 48th streets. It's a long way down to the mezzanines; a ride on the escalators, the longest in the MTA system, takes almost two minutes.

Once on the mezzanine, passengers have access to eight LIRR tracks — four above and four below the mezzanine, in two sets of tunnels. "We are the meat in a track sandwich," Biancamano says.

While the concourse repurposed existing space, the 350,000 square feet of the mezzanine and platform areas were created through the use of tunnel boring machines and blasting. At the mezzanine level, passengers are about 90 feet below the concourse; at the lowest level of tracks, they are about 140 feet below Park Avenue.

The MTA put much design work into what it calls "passive wayfinding." Each of the connections between the concourse and mezzanine is color coded, with the number of the street above inlaid in the terrazzo flooring.

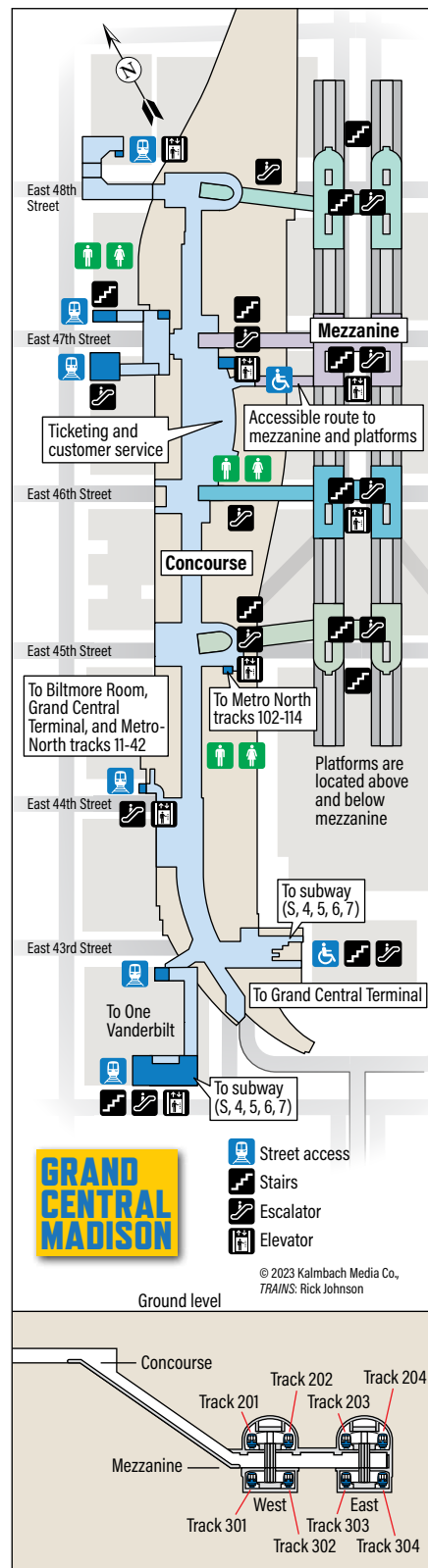
The combination of the Third Track project and the opening of Grand Central Madison allowed the LIRR to boost its weekday trains by 269 per day — a 41% increase. Service to Manhattan was split 55%-45% between Penn Station and the new facility. In the first weeks after the schedule was introduced in February, however, unofficial estimates suggested about 70% of riders continued to go to Penn Station, leading to some overcrowding issues (and vocally unhappy passengers).

But as the LIRR adjusted its schedules and lengthened some train consists, and passengers became familiar with the new service patterns, the problems and complaints faded quickly. And, on April 7, just 40 days after full service began to Grand Central Madison, the station handled its millionth customer.

PENN STATION ACCESS

The shift of some LIRR traffic to Grand Central Madison opens the door for the project that will bring some Metro-North New Haven Line trains to Penn Station.

Currently, those trains stay on Metro-North trackage at New Rochelle, eventually joining the Harlem Line into Grand Central. Under Penn Station Access, MTA will add one or two tracks, as well as four stations, along Amtrak's Hell Gate Line west of New Rochelle, continuing on the Amtrak route into Penn Station.



"We're learning from the idea of squeezing more service out of the infrastructure that you have," says Lieber. "That's the core idea of the Penn Access project and the Third Track project, two really exciting projects that are transformational."

Much as East Side Access allows commuters who used to arrive at Penn Station

A MIGHTIER PENN

First steps to improve Penn Station are welcome, but larger plan has critics

IF, AS A VISITOR TO NEW YORK, you've blundered through the corridors of Penn Station, you know it to be as confusing as it is vital. So imagine how locals feel.

Actually, you don't have to imagine. They're quick to tell you, starting with Gov. Kathy Hochul, who has called Penn Station a "hellhole." NJ Transit and Long Island Rail Road passengers view the adjacent Moynihan Train Hall — bright, airy, and largely for Amtrak customers — with envy.

"We all acknowledge that since the demolition of the original station, which was a tragic event in the history of this city, the station is completely inadequate for the purposes for which it serves," says Jamie Torres-Springer, president of MTA Construction & Development.

The MTA is working to improve Penn: building a new Seventh Avenue entrance (which Torres-Springer says "addresses the problem that everyone points to, that no one can really tell where Penn Station is"), widening corridors and increasing ceiling heights. Air circulation, power connections, and retail space are being updated.

But that work only touches 20% of the station. A revamp of the other 80% would turn the current two-level facility into a single-level station with a main hall featuring a 450-foot-long skylight, 18 new entrances and larger underground passageways.

A joint venture of FXCollaborate Architects and WSP USA Inc. received the design contract, with British architect John McAslan + Partners collaborating. McAslan + Partners redesigned London's King's Cross station in a heralded 2012 project.

At one point, the project was to also add tracks to expand train capacity, which will be



The architect of London's Kings Cross Station, redesigned in 2012, is involved in the Penn Station project. Keith Fender

necessary when the long-discussed Gateway Tunnel project is built. That aspect, a \$13 billion "south hall," has been pushed back; the current plan, estimated to cost \$7 billion, will accommodate the eventual next step.

To fund the revamp, the state's economic development agency approved a plan calling for 10 new office and residential towers around the station. The *New York Times* reports the massive redevelopment would involve 18 million square feet of mostly office space, along with retail space, 1,800 residential units, and a hotel.

This is where local enthusiasm turns to skepticism, or worse. Some question whether the development will in fact pay for the station; others are vehemently opposed to leveling so many existing buildings, including rent-regulated apartments and historic architecture. The list of objections is long; lawsuits have been filed.

It is safe to say no one is against improving Penn Station, and that the initial improvements are welcome. The question is whether the planned next step is the best way to proceed. — David Lassen

A rendering for the proposed remodeling of Penn Station, which would feature a 450-foot skylight and convert the structure into a single-level facility. Office of New York Gov. Kathy Hochul



to choose to go to Grand Central, Penn Station Access will give the reverse option to New Haven Line passengers who currently go to Grand Central but might have a final destination closer to Penn.

But its biggest impact will be for those near four new stations in the Bronx — at Hunts Point, Parkchester/Van Nest, Morris Park, and Co-op City, in order of distance from Manhattan. Those communities will gain a commuter rail option in an area where public transit is surprisingly lacking. The MTA estimates that a commuter from Co-op City would save 50 minutes on a trip to Penn Station over current public transit options and 73 minutes on a trip east to Stamford, Conn. Those numbers are stunning when you consider the straight-line distance from Co-op City to Penn Station is 12 miles and Stamford is 19 miles.

"You'd think you could walk that fast, right?" says Rinaldi. "I mean, it's just not that far. That's sort of the exciting thing about these projects — the public transportation network is catching up to the way that people live their lives, and providing them with opportunities that currently don't exist."

Penn Station Access involves building or rebuilding 19 miles of track, along with four new interlockings, one rebuilt interlocking, and rebuilds of bridges, electrical substations, and other infrastructure. The MTA will draw heavily on lessons from the Third Track project — to the point that Tom McGuinness, one of the leaders of Third Track, will be the Penn Access project executive.

This time, the MTA will not have the same degree of total control it did on Third Track, where the trains involved were also run by MTA. On the Hell Gate Line, construction will have to work around operations of Amtrak and CSX Transportation. MTA reports on the East Side Access issues make it clear that coordination problems with Amtrak during construction at Harold Interlocking, the nation's busiest, contributed to significant delays.

"This is one place," says Torres-Springer, "where we have to robustly apply the lessons we learned about managing railroad forces to make sure that we have outages, make sure that we have flagging and track protection. Amtrak and CSX need to work with us to do that in the same way that the Long Island Rail Road worked with us. And I'm very hopeful that they are able to do that."

That effort did not start well. In January, barely a month after groundbreaking, Torres-Springer told an MTA committee meeting the project was already seven months behind schedule because of problems gaining access from Amtrak. But in March, Amtrak announced an agreement to allow single-tracking of the Hell Gate Line for several months to create work time for the



MTA CEO Janno Lieber and New York Gov. Kathy Hochul (in blue coat) take part in groundbreaking for the Penn Station Access project on Dec. 9, 2022. MTA/Marc A. Hermann

MTA. It's possible the project schedule could recover as a result.

CONNECTING ALL THE PIECES

All three of these projects have been discussed, in some form, for decades. Taking the long view — not just of MTA history, which dates to 1965, but of New York City commuting in general — they'll reach fruition in a fairly short period.

As originally envisioned, they were intended to save time for specific groups of commuters. But as they come on line, the MTA sees much larger benefits across its commuter rail network: for reverse-commute to Long Island; for trips between Metro-North stations and Long Island Rail Road locations; or — with the Metro-North and LIRR systems connected — for commuter rail travel within New York City itself.



An Acela test train heads east across the viaduct leading to Hell Gate Bridge while an N Line subway train stops at the Ditmars Boulevard station on Sept. 28, 2020. The Penn Station Access project will add Metro-North trains to those of Amtrak on the Hell Gate line. Jose Garrido Alonzo

"We're doing promotional pricing, what they call City Ticket, from in-city destinations to other in-city destinations," Lieber says. "All of a sudden, you're making the commuter railroads much more valuable to New York City people, with a tremendous equity benefit for less-advantaged communities and people of more limited means."

The changes also come as the MTA, like virtually every transit agency, is considering its mission in a post-COVID landscape,

when the focus may no longer be on the traditional 9-to-5 commuter into the central city. In that respect, the ability to offer new services, and seek creative new options, couldn't come at a better time.

"These are historic capital investments that we've been waiting for," says Rinaldi, "for what feels like forever. And for them to come in while I'm in this role — oh, my God. What a thrill for a transportation person to actually be here when this is all coming to pass. It's just a real thrill." **I**

An LIRR train approaches New Hyde Park. Expanded Main Line capacity means the railroad can now pursue reverse-commute traffic. David Lassen



PRAIRIE STATE



70 years on, America's largest railway museum is focused on the future

by Frank Hicks

A signature piece in the Illinois Railway Museum collection, the Chicago, Burlington & Quincy *Nebraska Zephyr* — the “Train of the Goddesses” — rolls on museum track behind EMD E5A No. 9911A *Silver Pilot* on May 24, 2009. IRM acquired the *Zephyr* in 1968. Mitch Goldman

PRESERVATION





Situated in the country near Union, Ill., IRM's footprint rivals the size of its rolling stock collection. Including a wide farmland buffer, the museum owns 500 acres of land on which sit 11 equipment barns holding 329 pieces of railroad equipment. Illinois Railway Museum

An hour northwest of Chicago O'Hare International Airport, on the edge of bucolic Union, Ill. (2019 population: 580), amidst a sea of cornfields, is a train enthusiast's paradise. It's a sprawling 110-acre property packed with railroad yards, giant storage barns, historic structures, and railway equipment of every description. On a busy day, you may be able to ride more than half a dozen different trains pulled by steam locomotives, diesels, or electric power. You're as likely to see a 1904 Chicago streetcar as a 1988 GE Dash 8.

The Illinois Railway Museum, or IRM, isn't

your typical museum with a switcher pulling a coach and a couple of cabooses. It proudly proclaims itself to be America's largest railway museum, and if you use the size of the rolling stock collection as your primary measurement, it is. By this standard, it may be the largest railway museum in the world. There are more than 500 pieces of transportation equipment at the museum, including a few dozen buses and trolley buses. Around one-third are electric — streetcars, interurbans, "L" cars, even an ancient horsecar — with the remaining two-thirds comprising the mainline railroad collection.

WELCOME TO THE MUSEUM

All this equipment is located on a huge campus alongside the Union Pacific's Belvidere Subdivision. This was originally the Galena & Chicago Union (G&CU), which, back in 1848, was the first railroad built west out of Chicago. As you drive into the parking lot, you're immediately presented with an eclectic selection of railroad history. To your left, alongside the museum's own main line, is a two-story, wood-frame interlocking tower. Straight ahead is a huge, 75-foot-long, lit-up sign reading "Santa Fe" that once sat atop a Michigan Avenue building in downtown Chicago. To its right is a 1910 ground-level rapid transit (the "L" as it's called in Chicago) station from Cicero, Ill. On a busy day, these architectural relics are all likely to be in use.

► **Saturday, June 18, 2022 — It's Chicago Day at the Illinois Railway Museum. The last Chicago streetcar operated 64 years ago. IRM marked the occasion by offering rides on streetcars, 'L' trains, interurbans, and commuter trains that served Chicago.** Bob Weder

Park and walk into the museum entrance, which is located along the "Main Street" historic streetscape, and it won't take long before you're struck by the extent of the museum's infrastructure. The facility has several miles of storage and yard tracks on its main campus, with a 1-mile streetcar loop ringing most of the exhibit areas. At the north end of the campus is the original 1851 depot from Marengo, Ill., the next town to the west, which was moved to this location in 1967. There you can board a

train for a ride on the museum's 5-mile-long demonstration railroad. With all this track, and all these buildings, a common question for IRM visitors is: how did it all get here?

THE FIRST \$1,000

The museum was founded in 1953 by electric interurban enthusiast Howard Odinius. He and nine other men each put in \$100 towards purchasing Indiana Railroad No. 65, a 22-year-old electric interur-





ban car. They created a nonprofit, the Illinois Electric Railway Museum, renamed eight years later, removing “Electric.” The growing collection of rolling stock was stored in the cramped back lot of a foundry in North Chicago, about 30 miles north of Chicago proper.

By the early 1960s, the collection had grown to 40 pieces and had started to include mainline railroad equipment. More space was needed. Several sites were considered, but the one chosen was a stretch of abandoned right-of-way from a little-known interurban called the Elgin & Belvidere Electric Railroad (E&B). IRM purchased the right-of-way by paying the back taxes, and in 1964 the museum picked up and moved to Union, 50 miles northwest of Chicago. Volunteers started building track and stringing wire in 1965.

By the following year, a bus engine driving a generator was set up, and a single switch — located near where the interlocking tower is today — was installed on the single length of track. In July 1966, the first car ever to operate at IRM, Illinois Terminal No. 415, made its maiden voyage in preservation. One year later the depot from nearby Marengo was moved to the museum site; that same year the first steam

engine, a Shay, operated at IRM. The 26 acres of land purchased in 1964 ballooned to 112 acres by 1986, and the empty farm fields started to be filled first by storage yards and later by wood-frame, steel-sheathed storage barns.

YES, THE DEPOT IS OPEN

Visit IRM today and the old 1851 Marengo depot is still the focal point of activity on most weekends. On busy days, a train departs from the depot every 15 minutes, usually alternating between an electric M.U. train and a mainline train hauled by either a steam or diesel locomotive. An out-and-back trip to the east end of the line, a spot poetically dubbed Kishwaukee Grove, takes roughly 40 minutes. The view out the window is almost exactly the same as it was 100 years ago, with farm fields on all sides and the mainline railroad — today the Union Pacific — paralleling the entire way. Visitors are sometimes treated to a meet, either with another IRM train or with a passing UP freight.

Instead of being the museum’s center, as it was in 1967, the depot is now at the northern periphery of an expansive property. Among IRM’s keys to success are a pair of hallowed priorities that have served

Among the museum’s 155 pieces of electric equipment are Chicago, Aurora & Elgin Nos. 409 and 460. No. 409 is a 1923 Pullman product. No. 460 dates to 1945 and came from the St. Louis Car Co. At IRM you can ride these restored interurban coaches. David Crosby

for over half a century as a unifying and driving force: land and barns. Today it’s increasingly taken as gospel that for long-term stability, railway museums must own their land. IRM occupied leased land during its first decade. The challenges experienced motivated it to move to a site it owned in an area where land was plentiful and relatively cheap. At first, the museum purchased land along its right-of-way to expand facilities and accommodate additional yards and sidings. By the 1990s, with the Chicago suburbs creeping inexorably closer toward Union, IRM began acquiring “buffer” land — farmland ringing the campus that wasn’t necessarily convenient for expansion, but whose acquisition would prevent home building adjacent to the museum. This land was leased for farming, providing a moderate, yet steady, revenue stream.

The other priority was barns. It became clear early in the museum’s existence that the only sure way to preserve its collection

**THE ILLINOIS RAILWAY MUSEUM’S FIRST PIECE: INDIANA RAILROAD NO. 65,
AN ELECTRIC INTERURBAN CAR, PURCHASED FOR \$1,000.**



The track and walkways are laid first. What was once open ground has become a “yard” to house part of IRM’s rolling stock collection. When funds are raised, the “yard” is covered with a building and it becomes a “barn.” IRM has 11 “barns” for its collection. James Kolanowski

of rolling stock against the vagaries of the weather was indoor storage. The solution was to construct huge carbarns quickly and cheaply, to get as much railway equipment out of the weather as possible. The first carbarn, named Barn 4 because it was erected over Yard 4, was a steel-skinned, wood-frame pole barn constructed in 1972. By the end of the decade, four more barns had gone up, including one designated for trolley bus storage and a small one for use as a steam shop.

The huge storage barns are perhaps the most defining feature of the IRM campus. Approaching the museum from the south — along Olson Road — it looks like a sea of storage buildings, all of them white with red roofs and green doors. IRM has 11 storage barns holding railway equipment, and that doesn’t include two bus garages, a parts storage building, a maintenance building, and the steam shop. Overall, there are more than 3 miles of track under roof at the museum, housing and protecting more historic railway equipment than any other railway museum in the country.

Most of the barns are categorized, if loosely, by type of railway equipment. Barn 3 holds passenger and freight cars. Barns 6, 7, and 8 contain most of the electric streetcars, interurbans, and rapid transit cars. Barn 9 holds much of the steam locomotive collection, as well as the Chicago, Burlington & Quincy *Nebraska Zephyr*. Some of the closed barns contain restoration shops: Barn 2 is the diesel shop, Barn 4 the electric car shop, Barn 10 the passenger and freight car shop. Other barns, including the two newest — a pair of four-track, 512-foot-

long behemoths constructed concurrently in 2015 — mostly contain a mixture of restored mainline railroad equipment and unrestored pieces awaiting future attention.

A NEW FOCUS AND CHANGE

By the end of the 1970s, IRM was among the country’s largest railway museums, one of the few places one could go to see electric cars and steam engines pre-

served side by side. In 1981, the 1-mile streetcar loop ringing the campus opened, and in 1985 the length of the main line doubled from 1½ to 3 miles. The museum changed its fee structure from traditional ride tickets to a “park” system, with visitors paying an admission fee that included unlimited rides during their visit.

Starting in the 1980s, the museum site’s physical appearance — its presentation to the public — was transformed by an aggressive program of infrastructure improvement. Today, every public building has paved walkways and all the major roads and pathways around the museum grounds are paved and wheelchair accessible. A major program was undertaken to clean up the central campus and give it a more professional, better-kept appearance. Trees were planted, landscaping done, and attractive signage installed.

In 2003, the year IRM turned 50 years old, the museum’s first brick building was constructed: a cafeteria and restroom facility to replace the aging refreshment stand with a professional, climate-controlled building at the museum’s center. The Central Diner, with a historic road-side diner built into one side, was the beginning of a new focus on improving



► This scene could have taken place in the 1950s on the Chicago South Shore & South Bend, but it’s Sept. 20, 2015, at IRM. No. 803 is an operational GE 5,100-hp electric locomotive, one of 20 built for the Soviet Union, but never delivered because of Cold War tensions.

► IRM has miles of operating track — a mile-long streetcar loop and a 5-mile-plus main line. You will see a variety of equipment operating, like this lineup on Aug. 31, 2019 — Frisco 2-10-0 No. 1630 and J. Neils Lumber Co. three-truck Shay No. 5. Two photos, Jeffrey Terry

facilities for the public. The museum also started to install historic signage around the campus. Improvements took place off-site as well: In 2002 IRM purchased the Strahorn Library, a few miles west in Marengo, to house books, photos, and other historical documents.

IT'S ALL IN THE INFRASTRUCTURE

IRM is known for the huge size of its rolling stock collection, but infrastructure is arguably where the museum truly excels. Electric trains on the main line are cleared to run 40 mph, with steam and diesel trains operating at 30 mph, thanks to track maintained at Class 3 standards by volunteers and the occasional visit from a track contractor. The entire main line, the streetcar loop, and numerous yards have overhead trolley wire that are maintained by volunteers, too. And to top it off, IRM has a more extensive signal system than perhaps any other volunteer-run museum.



The main line and streetcar line are both automatic block signal-equipped and there is a restored relay-driven CTC machine on the second floor of the interlocking tower from which the dispatcher can control several of the more commonly used switches and signal indications used by

trains in public operation. There are even working crossing gates, wig-wags, or Griswold crossing signals at many of the pedestrian crossings on the museum campus.

Then, of course, there are the buildings. There are about 30 buildings at the museum, ranging from diminutive crossing shanties to cavernous storage barns. Several of the buildings are historic: besides the 1851 depot, said to be the oldest railroad station west of Pittsburgh in regular use, there's the 1910 "L" station from Chicago; the two-story interlocking tower from Spaulding, Ill.; a rehabbed mercantile store from nearby Union; and a smattering of waiting shelters and railroad outbuildings, some restored and some not.

There are also the signs: a variety of restored neon signs dot the museum campus, most of which are lit up during evening special events. They're interspersed with low stone walls that exhibit aged concrete entablatures displaying the names or initials of long-gone railroad companies.

This didn't all happen by accident. It was the result of another priority that emerged in the 1980s and 1990s: physical property improvement. The museum's board of directors made the decision to set aside money from each ticket sold for a Public Improvement Fund that would pay for enhancements and upkeep of the museum's physical property. Over the decades, this PIF money has funded projects from paving to building maintenance, from installing a sewer and stormwater runoff network to upgrading interior lighting and installing educational signage.

These investments have been made both to maintain the museum's infrastructure and to enhance visitor amenities. Visitors rarely visit specifically to see the results of such projects. As each public improve-





Volunteer power in action: IRM has only three year-round, paid employees and 250 to 300 regular volunteers working in 20 departments. They tackle everything from ticket sales to restoration work, like re-trucking the Chicago North Shore & Milwaukee *Electroliner*. Carina Borst

ment project is completed, however, the museum is improved for those visiting.

VOLUNTEERS

Like most railway museums, IRM depends heavily on volunteers. In fact, given the scale of the museum's collection, infrastructure, and operations, it depends on volunteers to a surprising extent. The museum has three year-round, paid employees. Museum leadership, including the board of directors, executive director, treasurer, and two general managers, is made up exclusively of volunteers. Governance has remained essentially unchanged for some 50 years, even as the museum's volunteer base has grown, and the organization has diversified its exhibits and holdings. It's estimated that the museum has between 250 and 300 regular volunteers, with most weekends seeing dozens of volunteers present on the grounds.

The organization of the museum is based around its departments. There are some 20 departments, including equipment departments like steam, diesel, and electric car; infrastructure departments like track, signal, and buildings and grounds; the Operating Department; and others such as libraries, exhibits, and *Rail & Wire* — the museum's magazine. Each is

managed by a curator, all of them volunteers. The largest is the Operating Department, which manages train operations and oversees safety and training. Volunteers typically choose a department (or two or three) to work in based on their interests. On any given weekend during the summer, there may be anywhere from a half dozen to 40 people involved in train operations — all of them volunteers.

It's not just IRM's organization that's decentralized; the property is physically more spread out than most museums due to the large collection. The diesel shop is at one end of the property, the passenger and freight car shop at the other end, and the steam shop and electric shop are in between. Unlike many museums, IRM doesn't employ any paid staff in its shop areas; all work on railway equipment, except for occasional specialty work that is contracted out, is completed by volunteers. A surprising number of these volunteers are under the age of 30, and it's not unusual to see crews of volunteers representing a wide range of ages, from college-age to retiree, working together. In a hobby sometimes perceived to be at a disadvantage compared with smartphones and computers, how does IRM do it?

At the center of IRM's appeal to volunteers is a welcoming atmosphere. Cliques



are few and there is always an eagerness for more help. IRM has long excelled at preserving and passing along institutional memory: there are still active volunteers who joined the museum in the 1960s and 1970s, who learned directly from men who maintained steam engines and streetcars during their careers. It's these older volunteers who teach the younger ones.

There is also a strong sweat-equity ethic at IRM that rewards volunteers who contribute time, no matter their age. Much of the museum's leadership is made of people who have volunteered for years or decades, but younger volunteers — or retirees who joined in recent years — are well represented. Three of the museum's seven directors

IRM BY THE NUMBERS: 3.2 MILES OF TRACK UNDER ROOF; 502 PIECES OF ROLLING STOCK, INCLUDING 58 DIESEL AND 27 STEAM LOCOMOTIVES.



are under age 35, and two of the these are under 30. Newer volunteers can have just as much influence as older volunteers. What matters is their devotion and the application of their talents to benefit the greater cause of the institution and its mission.

CELEBRATING YEAR 70

As it enters its 70th year, the Illinois Railway Museum continues to grow and improve. Site development work has concentrated on what the museum calls its Main Street: a historic street scene built in the middle of the cornfields that someday — perhaps soon — will see streetcars running through a streetscape flanked by historic and historically-styled buildings. The first building on this street, an old mercantile store from Union that IRM fixed up as its gift shop, opened in 2019. The second, a

newly constructed building housing a popular model railroad exhibit, the Pullman Library collection of drawings and documents, and a Milwaukee Road museum and archives space occupied by the Milwaukee Road Historical Association, opened in 2022. Today, a third building is nearing completion. It has been constructed in cooperation with the Chicago & North Western Historical Society to house that organization's historical collection.

Another area of focus has been on educational displays, including a new set of exhibits in Barn 3. Elevated walkways allow visitors to peer through the windows of historic passenger cars. A few of the cars are typically open for visitors to walk through. One of the barn's four tracks holds a freight train. Visitors are invited into the cars here, as well. A walk through

With 58 diesel locomotives, IRM holds the largest such collection in the U.S. Outside Barn 2, the diesel shop, a trio of EMD products is on display — No. 504, a 1959 CB&Q SD24; No. 7525, a 1971 Wisconsin Central SD45; and No. 92, a 1967 Santa Fe FP45. David Crosby

an Illinois Central side-door caboose describes the role of the caboose. Step inside a Santa Fe stock car and you'll learn about the Union Stockyards. Inside a wooden Fruit Grower's Express reefer is an exhibit on ice harvesting and the role railroads played in refrigerated transport of meat and produce.

Over time, IRM has focused its operations more and more on special events. The museum is home to one of the country's largest Day Out With Thomas events, drawing some 25,000 to 30,000 people over two summer weekends. In the winter, an-



Numerous pieces in the IRM collection went from regular service directly to the museum. Chicago North Shore & Milwaukee No. 749, a 1928 Pullman interurban coach, is one example. In 1963 IRM acquired the car, which remains operational today. Three photos, David Crosby

other 18,000 to 20,000 people ride the Happy Holiday Railway trains around Christmas. Other family-oriented events are held near Easter and Halloween. Most of the special events at IRM, though, still focus on railroad history. Diesel Days is among the most popular; starting in 2019, IRM began using a “gala” model inspired by UK heritage railways for this event, leading to a surge in attendance and interest. Other well-attended events include an antique vehicle show, after-dark train operations on Labor Day Weekend, and Museum Showcase Weekend in September.

To celebrate its 70th anniversary, IRM is offering additional special events. The year started with a well-attended commemoration marking the conclusion of service on the North Shore interurban line in January. An event celebrating 50 years since the last trolley bus operated in Chicago was scheduled for March — fitting, as IRM is the only museum in the U.S. with public trolley bus operation. On July 1, the museum plans to operate 70 pieces of equipment from its traction collection for the annual Trolley Pageant, the largest assemblage of historic electric railway cars in operation anywhere. On Diesel Days weekend, slated for August 11-13, the Diesel Department volunteers are planning to fire up locomotives totaling 70,000 hp. On Museum Showcase Weekend in September, IRM will run trains nonstop throughout the weekend, including all-night train operations, a first for the museum.

BEYOND YEAR 70

As throughout its history, IRM has big improvements in the works. The museum has never been shy about following American architect Daniel Burnham’s directive to make no small plans. New barns are being drawn up and built, new storage yards are being laid out, and less obvious improvements to the museum’s infrastructure are happening largely out of sight. To provide an entry point for visitors, an interpretive center and entrance building is planned for Main Street. More structures are anticipated, too, creating a full urban streetscape reminiscent of the 1950s. A lengthy extension of the current 1-mile streetcar line is under way, as is work on two new storage yards.

On the equipment side, new acquisitions always pop up. The Museum has many superlatives — 3.2 miles of track under roof, more than 500 acres of land owned, the Strahorn Library housing the Pullman and Budd collections tallying over 1 million drawings, and several miles of paved walkways — but the collection still continues to be its *raison d’être*. Its sheer size — 502 pieces — is matched by its diversity: 58 diesel locomotives (largest collection in the U.S.), 27 steam locomotives (including three mainline 4-8-4s), 105 freight cars, 81 passenger and baggage cars, 155 electric streetcars, interurbans, rapid transit, locomotives, and box motors. Also included are 23 trolley coaches, 12 motor coaches, 22 pieces of railroad work equipment including steam cranes, and a rotary snowplow. The smallest



collection pieces — seven units from the infamous 2-foot-gauge Chicago Tunnel Co., including a locomotive and cars. All these in one place is what draws volunteers and visitors alike to this prairie powerhouse.

Stand at the corner of Central Avenue and Depot Street today, with steam whistles in the distance, streetcars clattering past, and equipment storage barns in every direction, and it’s difficult to imagine the beginning of it all: a handful of interurban cars on borrowed industrial land in the 1950s. It’s taken 70 years for those early seeds to grow into the “Museum in Motion” that IRM is today. It begs the question: what will the next 70 years hold for this remarkable place? **I**

For additional information about the Illinois Railway Museum please visit irm.org.



IRM is a showcase of American railroading, offering unparalleled access to both operating and static equipment. The opportunities to photograph, study, and ride U.S. railroad history are virtually limitless. This is a museum where you just can't see it all in one day.

◀ Over 70 years and with such a large collection, you'd expect that some IRM piece would have made it into a movie. CB&Q SD24 No. 504, painted in BN green, was the locomotive that appeared in *Groundhog Day*, the 1993 Columbia Pictures film starring Bill Murray.



KEYSTONES OF MASSACHUSETTS

Arch bridges are enduring masterpieces of railroad engineering

Story and photos by
Connor Dietrich



CSX ES44AH No. 3058 glides gracefully across the line's double-arch keystone bridge with autorack freight M264 in tow. This bridge is easily visible from the start of the Keystone Arch Bridge Trail.



Having just crossed the line's double-arch stone bridge, CSX No. 5287, an ES40DC, leads intermodal freight No. 1022 east as it descends the Berkshire Mountains in Massachusetts. The mile marker of the bridge, QB 129, is visible to the right of the train on the bridge.

Still in use more than 180 years after they were built, the keystone arch bridges of western Massachusetts stand as enduring monuments to the skill of their creators.

AN ECONOMIC CRISIS

Boston had a problem in the late 1830s. The newly completed Erie Canal was drawing more and more trade to the ports of New York and New Jersey, where easy canal access made shipping to the growing interior United States much cheaper. The businessmen of Boston had to do something or their city would continue to lose trade and economic development, and Boston would dwindle. With the Berkshire Mountains standing between Boston and the rest of the U.S., a canal wasn't an option. This led to consideration of another possibility: a railroad.

At the time, railroads were not seen as a long-range transportation solution. While many railroads were well established by the mid-to-late 1830s, most didn't cover very long distances. For example, the Boston & Providence Railroad, the first section of which was completed in 1835, operated over a route of 31 miles. A railroad from Boston to Albany, connecting to the Erie Canal, would have to cover almost 200 miles. There was also another major obstacle in the way — the Berkshire mountain range. While not as daunting as the Sierras or Rockies, the Berkshires presented a significant engineering challenge. At the time no railroad had ever crossed a mountain range. This new project would clearly require an experienced railroad engineer, so Major George Washington Whistler was hired to survey and build the railroad.

Whistler was a graduate of the U.S. Military Academy at West Point, the only engi-

neering school in the U.S. at the time. He also had experience with railway engineering, having worked on the construction of several early railroads including the Baltimore & Ohio.

Whistler and his team surveyed a route through the Berkshires that mostly followed the Westfield River to help reduce grades. Following the winding and twisting river meant several crossings would be required, which is how the keystone arch bridges came to be.

BUILDING THE BRIDGES

Unlike mountain railroads, bridge engineering was well established at the time of the construction of the railway across the Berkshires. The famous Carrollton Viaduct — the oldest railway bridge in the U.S. still

in use — had opened on the Baltimore & Ohio in 1829. Whistler had also worked on the construction of that bridge, and he incorporated elements of its design into his keystone arch bridges. Both the Carrollton Viaduct and the Massachusetts keystone arches used stone for increased strength and reduced maintenance requirements — an important consideration in the remoteness of Western Massachusetts.

Both used the familiar keystone design to create stone arches that supported the tracks. What made Whistler's keystone arches especially noteworthy was their use as part of an over-mountain route, rather than a single crossing of a river. In total, Whistler's route would require the construction of 10 bridges.

For materials and building expertise, Whistler turned to Scottish stonemason Alexander Birnie. Stone was brought in by teams of horses and oxen leased from local farmers. Birnie and his crew of mostly Scottish and Irish immigrants braved dangerous and remote working conditions to build the 10 bridges, along with other stone structures required for completing the route along the river.

Each bridge began with the construction of stone support pillars at each end of the future bridge. Next, a wooden frame was built in the shape of the arch between the stone pillars, upon which the stones forming the arch were laid, finishing with the famous "keystone" in the middle. Now capable of supporting itself with the finished arch, the construction of the side walls supporting the tracks could begin. Starting with a wooden frame to place the track at the proper level, stone walls and fill were added to finish the bridge.



CSX ES44AH No. 3243 grinds up the start of the Washington Hill grade towards the summit of the Berkshires. The grade is named after Major George Washington Whistler, the pioneering railroad civil engineer who surveyed the route.



Viewed from below, an abandoned bridge towers over the Westfield River. Seven of the original 10 stone bridges remain, five of which are still used by trains. Hikers can stand on this bridge and view the scenic river and mountains.

All 10 bridges were built to have the capacity for two tracks, despite predictions the traffic levels would never require more than one. This proved to be a wise decision, as the route added a second track less than 10 years later.

The tallest bridge stood 70 feet above the Westfield River. The bridges were so popular and novel that they appeared in postcards and drawings. People would frequently hike and trespass to get a view of the famous bridges.

Upon completion of the bridges and the route in 1841, the Western Railroad was born. What one skeptic had derisively called “a railroad to the moon” was now carrying freight over the Berkshires. Boston had its answer to the Erie Canal and was saved from economic stagnation. The impacts turned out to be far greater than that, however. This project proved to the U.S. and to the world that the railroad was the best way to move freight over land. Soon, canal projects were abandoned in favor of railroads. Whistler himself was summoned to Russia to begin work on a rail line from Moscow to Saint Petersburg. As the U.S. expanded west, the railroad went with it, soon reaching all the way to the Pacific coast. The keystone arch bridges have proven to be a bit of a “keystone” them-

selves. All the great railways we know today would not have been possible without the work of Whistler and his team laying the foundation for the science of railroad engineering — and Whistler’s Western Railroad would not have been possible without Alexander Birnie’s 10 arched bridges.

THE BRIDGES TODAY

Over time, the keystone arch bridges have passed ownership between the Western Railroad, the Boston & Albany Railroad, New York Central, Penn Central, Conrail, and finally, CSX Transportation. Today, seven of the original 10 arch bridges remain standing. Three were destroyed in a catastrophic flood in 1927 that required 11

days of work by New York Central crews to re-open the line. Two arches were abandoned in favor of a 1912 reroute of the tracks that eased the curvature of the line. The remaining five bridges are still carrying trains to this day.

Designed in a time when locomotives weighed about 45,000 pounds, the five arch bridges in service today effortlessly support modern 432,000-pound Wabtec ET44AH behemoths, while the bypassed bridges have stood for 111 years without any additional maintenance since their abandonment, and today are popular attractions on the Keystone Arch Bridges Trail.

Maintained by the Friends of the Keystone Arches, the trail is an approximately 5-mile walk out and back following the Westfield River through the wooded mountains. The start of the trail allows easy views of the only “double arch” stone bridge still in use. There are also several locations where the tracks are visible from the trail, which crosses both abandoned arches. While they may no longer carry heavy freight trains, the bridges still provide an opportunity for hikers and railfans to enjoy the scenery of the Berkshire Mountains and see some of the most important and influential pieces of railway history standing today. **I**

Directions to the trail

Take U.S. Route 20 to the town of Chester, Mass. From the center of town, take Middlefield Road and drive north about 2½ miles, mostly within sight of CSX tracks. The information sign for the arches is easily seen on your left at the entrance to Hebert Cross Road. This is the parking area for the trail.

Trains

THE MAGAZINE OF RAILROADING

APRIL 1959 • 50c

**Who
shot the
passenger
train?**

REVISITED

Reflecting on DPM's total examination of an American Institution

by Bob Johnston

Countdown to
1000
ISSUES

AS WE APPROACH the 1,000th issue of *Trains* Magazine in 2024, this is the next salute to a key article, this time from the 200th to 299th issues. After examining magazines from June 1957 to September 1965, the vote was unanimous. Chosen for its significance to *Trains'* history, and setting a premise for years to come, is "Who shot the passenger train?" by editor David P. Morgan, or DPM. The original 36-page exposé, as revolutionary as it was at the time, predicted many things to come. The all-passenger-themed April 1959 issue was dressed with a unique, dramatic cover, one of the magazine's best known. — *Nastassia Putz*

David P. Morgan's "Railroad News and Editorial Comment" in every issue of *Trains* was always a highly anticipated monthly treat during the editor's tenure (1953 to 1987).

With its jarring orange cover blasted by a bullet hole, the April 1959 issue took DPM's insightful point-of-view commentary and colorful prose to a whole new level. It provided a

wealth of facts and astute observations that weren't only visionary in the short term but are still incredibly relevant today.

At least that's the way it seems 64 years later, more than five decades after railroads were relieved of their obligation to run intercity passenger service when Amtrak was formed. As DPM hoped, financial responsibility for running commuter

trains had transitioned away from the carriers in the early 1980s. That was when legislation permitted publicly funded local rail authorities — but not intercity rail — to get a slice of federal gas tax money that previously had only flowed to highways.

Railroads were expected to fund commuter service, which is one of the things that contributed to the bankruptcy of Penn Central. The renamed "transportation trust fund" allowed newly created operators like New Jersey Transit to take over.

Exposing weakness

Trains' accurately billed "total examination of an American institution" appeared at a time when highly regulated North American railroads featured shiny streamliners, most less than 10 years old, on routes that had crisscrossed the country for more than 100 years.

A fleet of 22 Vista-Dome sleeping cars and coaches graced Northern Pacific's long-distance *North Coast Limited* between Chicago and the Pacific Northwest in 1954. Buckbee-Mears Co.



Case in point



In 1956, city taxes of \$412,641 were paid on Cincinnati Union Terminal (\$42,575,649 investment). Wallace W. Abbey

In addition to examples peppering his commentary, DPM makes liberal use of vertical text and photo sidebars (like this) running parallel to the narrative. Writers generally use one or two of these in feature articles to isolate topics that would otherwise interrupt the main story's flow. Here, this brilliant journalistic "case in point" device, continuously employed throughout, further illustrates nearly every argument while adding entry points in each section to entice readers.

"RAIL VS. AIR IN TOLEDO," for instance, reveals how New York Central "spent \$5 million to erect Central Union Terminal in 1950" and was charged \$42,745 in 1956 property taxes, while public money built a nearly \$4 million airport with tax-free municipal bonds and city funds that runs an operating deficit of almost \$200,000 per year (back then).

The numbers are far different today, but the comparative funding arrangements are still valid. Amtrak, not the railroads, now bears the operating cost burden at many stations and is charged with making them accessible to comply with the 1990s Americans with Disabilities Act provisions. — Bob Johnston

The fact that transportation options were changing rapidly was masked by outward appearances, reinforced by the front-of-the-magazine ad touting "Fun-filled vacations in the Union Pacific West."

DPM chooses to burst this outwardly optimistic bubble by first listing two myths: "Passenger trains don't really lose so much money" and, the UP ad notwithstanding, "They're doing fine in the West, aren't they?"

After discussing how the Interstate Commerce Commission dictates the method by which passenger trains' costs are allocated and reported, he zeroes in on high labor expense, unfunded obligations to provide service enforced by the ICC and state regulators, plus government-subsidized air and highway competition that was beginning to clean the railroads' clock.

If those straightjackets aren't enough, DPM adds, railroads are saddled with the millstone of heavy taxes on improvements they decide to make. His opinionated tirade blasting the status quo under which railroads operate doesn't stop there.

It dissects elements of what DPM defined as the "Passenger Business," commuters, mail and express, and coaches versus Pullman — "sitters versus sleepers" — which today we might categorize as "short distance" versus "long haul."

He shows how the era's railroads are discriminated against by public policy "givens" in each segment.



The California Zephyr pauses at Glenwood Springs, Colo., on June 5, 2016. Two photos, Bob Johnston

Passenger only?

He wonders, however, if the carriers themselves might be at fault. Particularly perceptive is a section questioning, "Has passenger service been mismanaged?" with a subhead titled, "How not to run passenger trains." It chides roads for running what amounts to a wholesale transportation operation when they should be more concerned with marketing and hospitality aimed directly at the traveling public.

"Freight and passengers mix like Scotch and ginger ale," DPM observes.

If instead, railroads practiced a customer-focused retail approach, then a carrier's consumer marketers wouldn't allow a new station to be located in a grimy rail yard, and oper-

ating strategists would protect travelers' interests.

It is in this section that he urges railroads to establish a separate passenger operation — not just a department.

"Failure to make passenger carriage a business in its own right has produced severe repercussions," he notes, adding, "When a state regulatory agency tells a railroad, 'passenger trains can't be operated at a profit,' the clear implication is to make up the difference out of freight earnings."

The venerable editor was still pounding his typewriter keys when Amtrak (in 1971)

Once-busy Central Union Terminal in Toledo is a ghost of its former self as the westbound *Lake Shore Limited*, with three P42 locomotives leading, stops on Dec. 14, 2016.





Bound for LaCrosse, Wis., Amtrak's TurboTrain made a stop at Minneapolis' Burlington Northern Depot on behalf of the Department of Transportation on Sept. 1, 1971. Kent Kobersteen

and VIA Rail Canada (in 1978) began testing his hypothesis. As a railfan, however, DPM never heartily embraced the eventual homogenization that erased individual railroads' passenger identities.

But he had clairvoyantly surmised in "Who Shot the Passenger Train?" that the weight of regulation, increased costs, and declining patronage would eventually suffocate passenger service. That service had, in any case, become a distraction from the railroads' pri-

mary money-making enterprise: hauling freight.

As it turned out, the catalyst for the separation DPM sought was the bankruptcy of a merged Pennsylvania Railroad-New York Central, in which uncompensated passenger losses and commuter obligations played an outsized role. Yet Amtrak's creation, and the revision in tax laws a decade later to publicly fund commuter rail operating authorities, were equally driven by the political need to preserve passenger trains. The new na-

tionwide entity brought relief from regulation and taxation burdens. But another five decades have passed without any change from DPM's cocktail-referenced characterization of how well freight and passenger trains can coexist.

Prophetic proposals

Not satisfied to simply wring hands over why passen-

ger trains had been wounded, he also offered possible "Here's what can be done" innovations. "Concept ... for a train to please both passengers and accountants" (pages 36-39) presents drawings of an articulated, double-ended lightweight "motor train" provided by Alan R. Cripe, who had been Chesa-



Car in point



DPM touted the low-level boarding and downstairs luggage storage of Santa Fe's Hi-Levels. They would become the design inspiration for Amtrak's Superliner fleet. Santa Fe Railway

Through many "car in point" photos, DPM depicts rolling-stock examples that would eventually become ubiquitous on the passenger rail scene: a Chicago & North Western push-pull commuter bi-level cab car (the first of these was then on order from Pullman Standard), and a pair of Santa Fe Hi-Level coaches (built by the Budd Company in 1956). He praises the operating economies of bidirectional equipment not needing to be turned at terminals, as well as the Atchison, Topeka & Santa Fe Railway fleet's pounds-per-seat savings and capacity advantage over single-level cars.

Decades later, push-pull bi-level commuter trains would proliferate: M.U. electric NJ Transit and Long Island Rail Road double-deckers now pass through clearance-restricted eastern tunnels.

Amtrak officials would be sufficiently enamored with the Hi-level concept to extend it to dining, lounge, and sleeping car Superliners built by Pullman Standard 20 years later.

California Cars constructed by Morrison Knudsen in the 1990s and Alstom's *Pacific Surfliners* several years later married the push-pull and bi-level concepts DPM favored in 1959. — *Bob Johnston*



NJ Transit commuter cars feature two levels despite restrictive tunnel clearances. This equipment was modified for an express service to Atlantic City, N.J., in 2009.



Amtrak's Amfleet coaches, built by Budd, featured stainless steel shells originally created for Pennsylvania Railroad's high-speed electric Metroliners. Here, long-distance Amfleet II versions on the southbound *Silver Star* cross CSX's St. Lucie Canal drawbridge south of Okeechobee, Fla., on Feb. 9, 2023.

peake and Ohio's director of design. Efficiencies of "Tomorrow's dayliner," are compared utilizing pull-out captioning with a standard locomotive-hauled coach streamliner. The C&O design features engineer compartments at both ends with wrap-around windows for one-person operation.

A diesel-powered trainset exactly like this was never built. But less than a decade later, with the help of money from the High Speed Ground Transportation Act of 1965 and adapting C&O's patents, United Aircraft unveiled gas-turbine-powered TurboTrains whose elevated

cabs bore a striking resemblance to the magazine's "dayliner." They would soldier on for Amtrak and Canadian National (and later VIA Rail Canada) into the 1970s and 1980s.

Subsequent incarnations of the permanently coupled trainset concept included imported French and U.S.-built Turboliners, three Talgo versions for Pacific Northwest *Cascades*, and Acela Express. An Illinois Central M.U. electric heavyweight commuter coach, one of DPM's "car in point" examples illustrating how "specialized equipment for passenger service produces dividends," was a grandfather to lightweight Budd-built Metroliners. They were produced in the late-1960s with federal funds for the Pennsylvania Railroad.

Quad gates at highway crossings permit 110-mph speeds through central Illinois on Amtrak's Chicago-St. Louis route, but the service still hosts only five daily round trips. The fast trains also often endure freight congestion delays. Bob Johnston





DPM would approve of the bidirectional trainset heading to MiamiCentral on the day Brightline revenue service began to downtown Miami. Photo taken May 11, 2018. Four photos, Bob Johnston

Amtrak eventually replaced these speedy bidirectional electrics with Acelas built by a Bombardier-Alstom consortium, but not before their tubular stainless steel shell design formed the basis of Amfleet, the truly lightweight passenger car DPM sought that became the company's 50-year workhorse. Now Alstom is constructing the next generation of Acela trainsets.

Advice taken. Or was it?

DPM suggested in his "Passenger Service for Tomorrow" section that this new equipment would be ideal for 100-to-500-mile journeys, and overnight trains could cater to 500-to-1,000-mile travelers. Trips over those distances could be sold

only as "getting there is half the fun" rail cruises with enhanced amenities, he writes, "otherwise jet speed constitutes an impossible hurdle."

Amtrak's fast and frequent Northeast service has certainly filled DPM's "speed-frequency-comfort" short-distance prescription, enhanced immeasurably by the company's decision to electrify tracks in 1999 between Boston and New Haven, Conn. Another shining example today is privately operated Brightline, offering sizzling marketing that promotes hourly departures into and out of Miami with bidirectional trainsets. Trains will soon be extended past West Palm Beach to Orlando on track that has

been sufficiently upgraded for speed and capacity to handle both passengers and freight, equitably dispatched.

Elsewhere, not so much. Even recently upgraded Midwest corridors in Illinois and Michigan with track capable of hosting trains at 110-mph speeds have only a handful of daily frequencies because that's all state funding can afford. Both are plagued with freight train interference sections that torpedo on-time performance and reliability.

Therein lies the rub.

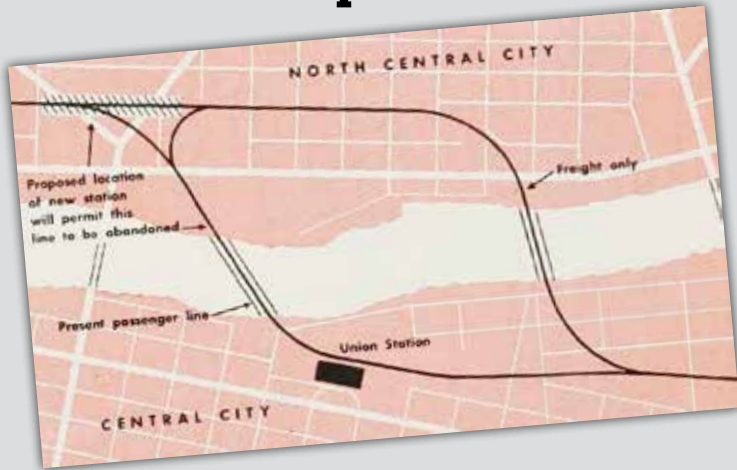
Although DPM touts a sep-

arate passenger-focused organization, he assumes it would be symbiotic like Brightline and Florida East Coast rather than adversarial like Amtrak and its freight railroad hosts.

Other suggestions haven't panned out, either. DPM advocates producing standardized passenger car designs to slash customization costs. That was the goal of the Next Generation Equipment Committee, created by 2008's Passenger Rail Investment and Improvement Act to "help minimize costs and in-



Station in point



This original drawing created by Kalmbach's art department illustrates a passenger-only line that was abandoned, and a new station located on an existing freight bypass.

"A new look at Union Station" (pages 45-47) depicts a station built adjacent to an existing freight line replacing an expensive-to-maintain legacy facility. The hypothetical situation, created by Kalmbach Media's art department personnel, bears an uncanny resemblance to what happened a decade later when Penn Central shuttered Albany, New York's Union Station in 1969.

Constructing a facility across the Hudson River on what was then a freight bypass required fewer tracks to host a dwindling number of departures. Making the switch thus allowed the sale of valuable downtown real estate

and abandoning a bridge used only by passenger trains.

New York State and federal funds later helped upgrade the station, Albany-Rensselaer, into the functional complex Amtrak's *Lake Shore Limited* and Empire Corridor trains call at today.

What's different from the drawing? The (Hudson) river runs vertically between "Union Station" and the "freight-only" line — not horizontally — and the new station (Albany-Rensselaer) is situated along the north-south segment at right instead of at the top junction where the former passenger-only route joins the freight line. — *Bob Johnston*



Pacific Surfliner equipment built by Alstom, seen at Burbank Airport, Calif., in 2008, features full-length level boarding without the need for a conductor at every open door, a drawback of passengers cars running in 1959 that DPM pointed out.

crease efficiencies." So far, so good. But what happened? The Committee came up with a new bi-level design rather than adopt Alstom's *Pacific Surfliner* solution. Nippon Sharyo underbid Alstom but lacked the engineering and production expertise to build 130 cars for the Midwest states and California. Meanwhile, although privately financed Brightline tapped Siemens to design a trainset that conforms to the single-level NGEN specifications, the states insisted on separate interior configurations in each region for their single-level Venture car substitutes.

Today, Brightline has 10 trainsets in operation with 20 more coaches on order, while the states' Siemens fleet has been mired in production and deployment delays for three years.

Unfulfilled solutions

Notably absent in DPM's analysis is any discussion of a separate high-speed right-of-way for U.S. passenger trains. There was, however, a brief item leading William K. Vickman's "Beyond the Pacific" column on page 10 that Japanese National Railways would begin construction on April 5, 1959, of a separate standard-gauge "Bullet Railway" between Tokyo and Osaka.

We all know what happened after that innocuous mention: Japan never looked back and the high-speed contagion and accompanying passenger rail technological advances spread to Western Europe and China,

while North America continued to be awash in publicly subsidized ground and air competition. The auto-air industrial complex fueling political contributions to maintain the status quo is as strong as ever, as evidenced by high-speed rail construction and funding difficulties encountered in California and Texas.

Then there is today's Amtrak. DPM assumes the railroads themselves should fashion an "exclusively passenger corporation" as a "separate entity which is accorded responsibility and authority over revenues and costs." Doing so, he argues, "would repeal this lamentable drift away from the science of salesmanship" perceived at the time. To be sure, Amtrak has periodically checked some of his boxes over the years:

- **Simplified ticketing:** As soon as it could harness then-primitive computer technology in the 1970s, Amtrak eliminated the cumbersome need to "wire for space" or purchase separate Pullman coupons, the standard ticketing practice that didn't change from 1959 to the 1960s. The company introduced E-ticketing in 2011 and a smartphone app soon thereafter,



An Amtrak conductor scans passengers' *Lake Shore Limited* boarding passes at Albany-Rensselaer station in 2015.

Three photos, Bob Johnston



Short consists plague Amtrak customers today with sold-out trains and high fares, as evidenced by this three-car eastbound *Capitol Limited* train passing through Germantown, Md., on Feb. 23, 2023. With one coach, one sleeper, and one diner-lounge car, is the passenger train under fire again?

which has steadily improved. But the www.amtrak.com website continues to be too confusing compared to airline sites and lacks critical information that prospective travelers need.

Easy-to-access comparative timetables and route guides, formerly provided, have either been eliminated or converted to nearly inscrutable “on demand” versions requiring users to know what to ask for.

• **Advertising, “a huge latent force that could be tapped”:** At one time, Amtrak embraced nationwide “Getting into Training” campaigns, National Train Day promotions, grass-roots consumer marketing, and even route-specific initiatives during the company’s product-line era of the late 1990s. All that ended when current management dismissed its regional marketing staff as a cost-cutting move in 2018 in favor of mostly digital placements and emails to

existing customers. Now, the best promotion and traveler engagement rests with regional operating authorities in Maine, North Carolina, and California as Amtrak abdicated its role.

• **Personalized retail-type operation:** For many years and despite funding challenges, Amtrak parlayed its separate existence to promote rail; now those efforts to connect with clientele have reverted to the Northeast Corridor service, *Auto Train*, and little else.

What DPM didn’t adequately cover in his treatise was tactics railroads would use to kill their own trains. Downgrading amenities such as food service and sleeping cars, and getting public service commissions to discontinue portions of routes so the railroad could go to a recalcitrant adjoining state and say, “See! No one is riding!” hadn’t become pervasive in 1959. Southern Pacific was still operating a fully equipped *Sun-*

set Limited; substituting an “Automatic Buffet Car” for a diner on a coaches-only train would come later.

With Amtrak, its tenuous annual funding dependence resulted in regrettable business decisions like the discontinuance of long-distance trains such as the *National Limited* across Ohio, the *Desert Wind* through Las Vegas, Nev., and the *Floridian* out of the Midwest.

More recently, a Northeast Corridor-oriented board of directors approved a corporate bonus system that rewards cost-cutting and installed a series of CEOs with airline backgrounds that never thoroughly embraced the hospitality possibilities of a train that DPM took for granted.

With the board’s blessing and acquiescence, management over the last three years has made the conscious decision to disinvest in national network

equipment and personnel resources. The results have been inconsistent with the customer-focused passenger operation DPM envisioned: a lack of dining facilities available to all, sidelining revenue-generating Superliners to precipitate sell-outs, and the creation of exorbitantly high fares that choke off demand.

Departing thoughts

What would DPM think? That’s one very important reason “Who Shot the Passenger Train?” in so many ways is still a valuable reference today. **I**





Living railroad history in the Berkshire Hills

A visit to the Berkshire Scenic Railway Museum

▲ After departing North Adams on the ex-B&A North Adams branch, RDC1 No. 6126 is about to pass under Pan Am Southern freight 11R seen en route from East Deerfield, Mass., on the former Boston & Maine Fitchburg Route. Two photos, Brian Solomon

WELCOME to the first of my monthly travel investigations, where I'll explore a great railroad journey, a special destination, or a historic experience. I plan to visit some of the most interesting railroads operating today, while also leading *Trains* readers down less-traveled paths to seek out the hidden gems of railroading.

PLACES TO GO

Due to its importance to me, I begin with the Berkshire Scenic Railway Museum because it has preserved rural

New England railroading and historic equipment representative of my early interest. It's also where I have friends who have worked to make this a fun place to visit.

Founded in 1984, Berkshire Scenic abides by its motto — "We are not just preserving history, we're making it!" — and aims to preserve the rural railroading of the Berkshire Hills in western Massachusetts. The museum has an unusual arrangement that features two related but geographically separate operations. Its original location

is the Lenox Station Museum on Willow Creek Road in Lenox, Mass. Since 2015, it has developed the Hoosac Valley Train Ride based in Adams, 25 miles to the north.

The Lenox Station building was built by the New Haven Railroad in 1903 to replace an earlier structure destroyed by fire, and is central to the museum's railroad interpretation.

THINGS TO SEE & DO

Among the displays is a recreation of a classic New Haven Railroad block station

complete with vintage telegraph equipment and the tools used by operators to deliver train orders. Short train rides are offered from the station to the yard, where a variety of classic mid-20th century rolling stock is on display. Among the prizes of the collection is former New Haven Railroad Budd RDC1 No. 42, which is representative of the equipment that served this line during the 1950s, 1960s, and early 1970s. Classic diesels include former Maine Central No. 954, an Alco S1 built in 1945.

General Electric accepted this as a trade in the mid-1970s on an order of U18Bs, and rather than scrap it, repurposed the S1 to its Pittsfield, Mass., plant. In 1988, GE donated the engine to the museum.

Another Alco at Lenox is a type of locomotive that stirred my interest as a youngster: former Birmingham Southern RS3 No. 151 may seem like an outlander, but in its later career served a variety of industries culminating with work yarding coal trains at Holcim's former Alpha Portland Industries cement plant in upstate New York. Berkshire Scenic acquired this a rare operational example of an RS3 (with the 244H prime mover) in 2011 and has painted it to represent a former New Haven Railroad unit lettered as Penn Central No. 5599.

My favorite Berkshire Scenic component is its Hoosac Valley ride that shares trackage with Pan Am Southern on the north end of the former Boston & Albany North Adams Branch.

On Columbus Day weekend in 2015, my father and I were on hand for the opening day excursions with Berkshire Scenic's former New York Central SW8 No. 8619 leading ex-Budd RDC1 No. 6126 from Renfrew Station to North Adams and back. In 2018, the railroad opened a mile-long extension southward to the center of Adams that is now its primary excursion station. To the south, this B&A alignment hosts the Ashu-willticook Rail Trail.

Excursions are operated on select weekends on the 10-mile round trip to North Adams. This scenic journey runs through its namesake valley that is most popular during peak autumn foliage in early October. However, for me the best time to visit is during the shoulder seasons in June and July, when the RDC works solo, under its own power.

This a rare opportunity to experience a pure Budd RDC in action. In busier times, the RDC is part of consist that includes a pair of former Lackawanna M.U. trailers operated push-pull style with the SW8 diesel.

Toward the northern end of the line, the ex-B&A branch crosses beneath Pan Am Southern's former Boston & Maine Fitchburg route main line — jointly



On a beautiful day in May 2016, Berkshire Scenic's former Boston & Maine RDC1 No. 6126 departs North Adams. New England had the largest fleets of RDCs and these self-propelled cars remain an important part of the region's rail heritage.

owned by CSX and Norfolk Southern — that is famous for its 4.75-mile passage through the nearby Hoosac Tunnel. (Hoosac's east portal can be viewed from public property off River Road in Florida, Mass., about a 20-minute drive east of North Adams.) Berkshire Scenic stores additional historic equipment at its Ash-track Yard in North Adams including former Boston & Maine SW1 No. 1113, a former Canadian National MLW-built S4 that later served Claremont & Concord,

and a former Pennsylvania Railroad baggage car. Limited tours of the yard are planned in June and July.

HOURS & OPERATIONS

The Lenox Station Museum is only open Memorial Day weekend through Labor Day weekend on Saturdays from 10 a.m. to 2 p.m.

For the Hoosac Valley train schedules, events, and equipment descriptions, visit berkshiretrains.org. — *Brian Solomon*

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What happens when 'ask Google' doesn't know the answer?

The Nevada Northern Railway Museum still does things the old-fashioned way

▲ The best way to restore a steam locomotive is the way that gets the job done. NNRy Shop Foreman Lennox Purinton (left) and Master Mechanic John Henry McDonnell use past knowledge and some experimenting to get it right as they restore locomotive No. 40. Steve Crise

PRESERVATION BRIEFS

Big Big Project

UNION PACIFIC BIG BOY NO. 4006, in the **NATIONAL MUSEUM OF TRANSPORTATION**, St. Louis, is slated to receive a cosmetic restoration, including 80 gallons of new paint. The cost stands at \$32,500.

Restoration of **ALASKA RAILROAD NO. 557**, the railroad's last steam locomotive, has reached another milestone. The **ENGINE 557 RESTORATION CO.** has installed the flues in the locomotive boiler. Next year is the scheduled completion date for the 2-8-0.

THERE IS A RICH TRADITION being carried out inside the 1907 enginehouse at the Nevada Northern Railway Museum in Ely, Nev. Here mechanics work to restore No. 40, a 1910 Baldwin 4-6-0. The engine is a National Historic Landmark and the official Nevada state locomotive. Just how that is done is not information that you can simply find by asking Google or Alexa. It comes from shared knowledge passed down through the generations.

"There are books out there about this kind of stuff, but the problem is they usually tell you how it's supposed to work. They don't tell you how to make it work," says Master Mechanic John Henry McDonnell. "I was pretty fortunate because I was here when we restored locomotive No. 81 [a 1917 Baldwin 2-8-0]. The fellow that did it was Gary North, and he said, 'This is the last one I'm doing, so you have to learn how to do it so you can do the next one.'"

That was 2016. McDonnell, 23, had worked at the Nevada Northern for almost 10 years. He participated in the museum's Rail Camp as a high school student, then applied to become a 17-year-old intern. Fast forward to 2022. McDonnell becomes

master mechanic; the current shop foreman is 19-year-old Lennox Purinton, who has been working at the railway since he was old enough to do so.

"When I was a kid, my grandpa started coming down to volunteer and I really wanted to go with him, but they couldn't have me do a whole lot 'cause I was about 7," says Purinton. "So, I ended up pulling weeds in the summertime. Then I figured out how to annoy all the shop guys, so they started giving me the dirty work, but they couldn't get me to go away ... so they hired me when I was 14 to work in the gift shop." Since then, Purinton has worked his way up from brakeman to shop foreman.

Nevada Northern ordered No. 40 in 1910. It has been operating there since — just a little bit longer than your typical cell phone. When No. 40 came in for its 15-year boiler inspection, it was decided to restore the running gear, which has issues dating to 1924. The axles are stamped "4-12-24." After 98 years, they're worn out.

So how do you restore a steam engine anyway? The best way to do it is the way that gets the job done, plain and simple. Of course, coming up with the

right answer isn't always easy. "I've been here for 11 years now, and I've seen a lot of different things, but there's still things that come up that I've never seen before," says McDonnell. "You know, sometimes it's trial and error, unfortunately, but usually if you can use a little bit of critical thinking, you can figure out how to fix it best or how to make it work."

McDonnell says there was a time when many people knew how to restore steam engines. But no one wrote anything down because they didn't think they needed to. They were constantly passing it down to the next generation. When diesels arrived, a vast amount of that knowledge disappeared.

"Down here we do everything. We're electricians some days, we're boilermakers, we're pipefitters or machinists or welders, we're blacksmiths. Am I missing any?" McDonnell asked Purinton.

No. 40's restoration should take another year or so.

"It's a big puzzle of trying to make everything fit the way it should," says McDonnell. "... you just figure it out. You do a little bit at a time and eventually, you get there, and you get it done." — Will Apotheker, NNRy



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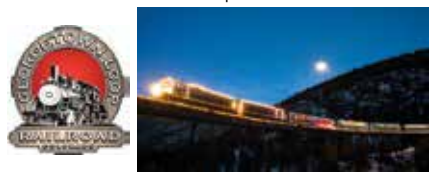


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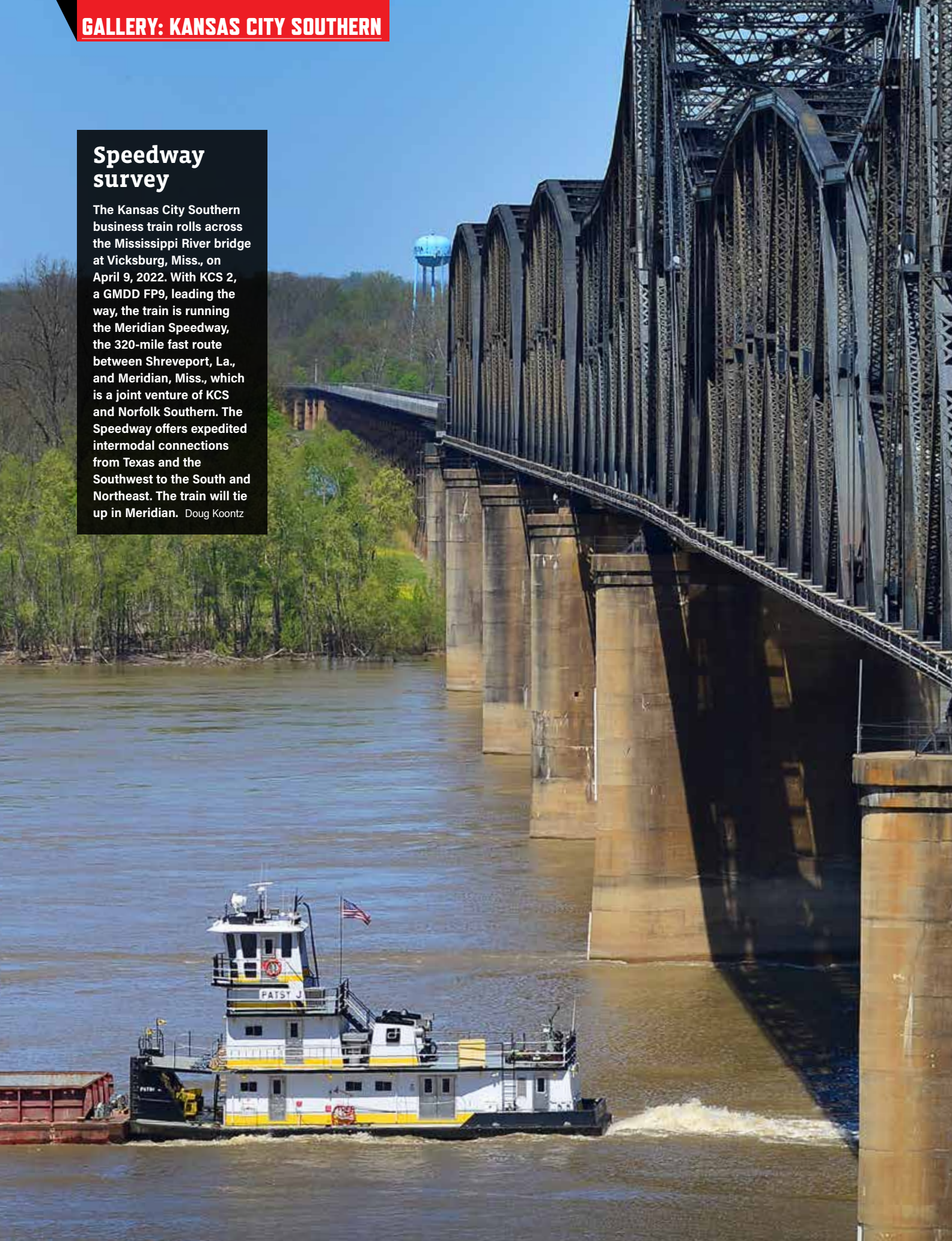
South Dakota in focus

Beyond the great spaces and great faces, South Dakota has been **RAILROADING FOR 150 YEARS**. In the 1980s, the Staggers Act and the Milwaukee Road retrenchment **CHANGED THE FACE OF SOUTH DAKOTA** railroading. **ON THE EDGE**, the ebb and flow of life in Edgemont, a railroad town. Capturing the Rushmore State's varied railroad action on film and digital in **VHS MEMORIES**. Plus News, Travel, Gallery, Preservation, and more!

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Speedway survey

The Kansas City Southern business train rolls across the Mississippi River bridge at Vicksburg, Miss., on April 9, 2022. With KCS 2, a GMDD FP9, leading the way, the train is running the Meridian Speedway, the 320-mile fast route between Shreveport, La., and Meridian, Miss., which is a joint venture of KCS and Norfolk Southern. The Speedway offers expedited intermodal connections from Texas and the Southwest to the South and Northeast. The train will tie up in Meridian. Doug Koontz





The *Southern Belle*

A relative latecomer to the streamlined era of passenger trains, the *Southern Belle*, Kansas City Southern's flagship, presented passengers with everything one would expect of Southern hospitality. Seen here in the early 1950s at Butler's Bluff near Noel, Mo., the train ran between Kansas City, Mo., and New Orleans from 1940 until 1969. *Trains* collection





As straight as the crow flies

Before the *Southern Belle*, *The Flying Crow* was the KCS flagship, starting in 1928. The route from Kansas City to Port Arthur, Texas, was promoted as fast and straight — just like the flight of a crow. *The Flying Crow* also offered KCS passengers the first opportunity to take their meals in a dining car, which was operated by Pullman. Here *The Flying Crow* glides along near McElhaney, Mo., on April 13, 1934. Louis A. Marre collection



Pulling hard

Bearing the railroad's white-with-red-lettering paint scheme, four Kansas City Southern SD40s lean into a curve north of Neosho, Mo., on June 5, 1976. Scott A. Hartley



Run for the border

With GE ES44AC No. 4848 up front and an EMD DPU on the rear, a southbound manifest train cruises along the Laredo Subdivision near Realitos, Texas, Nov. 16, 2017. Several strategic moves in the mid-1990s opened the Mexican border for KCS and swelled its traffic in the Lone Star State. Bill Stephens

The cold of a winter's night

Kansas City Southern ES44AC No. 4860 idles under a cloudy winter sky. We are in Meridian, Miss., on Dec. 26, 2021. Our train awaits a Norfolk Southern crew that will guide it to Irondale, Ala., a suburb of Birmingham. The low temperature this night: 60 degrees. That's winter in the South. Dylan Jones



The rambling Red

On its ramble across Louisiana, the Red River passes Bossier City and Shreveport. These two cities, located across the river from each other, are joined by a number of bridges, including the five-section, through-truss structure erected by Kansas City Southern in 1916. In August 2006, a KCS freight, led by EMD SD70ACe No. 4008, makes its way south from Bossier City into Shreveport.

Steve Schmollinger



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