Over the past two decades, Pan Am Railways has lost big chunks of its pulp, paper, and coal traffic. So what is the New England railroad company doing to fill its trains?

Shipping bottled water.

Since April 2016, trucks have been moving containers of water from a Poland Spring bottling plant to Pan Am's freight yard in Waterville, Maine. There, the containers are put on a train. So far, Pan Am has transported about 5,000 40-foot containers of Poland Spring water from Maine to Massachusetts, bringing new freight business onto its rail network. “It’s what we’re doing to stay relevant,” says David Fink, Pan Am’s president.

Pan Am isn’t the only railroad trying to reinvent itself. Stunned by the steep drop in shipments of coal, the industry’s largest commodity and a key pillar of the “Rail Renaissance,” railroads are looking for a new winning formula.

Major U.S. railroads are reacting to their shrinking traffic base by cutting employees, mothballing locomotives, closing freight yards, and taking routes out of service. Railroads are lengthening freight trains to save on crew and locomotive costs and continuing to raise freight rates. “They have done a tremendous job of rightsizing their operating costs, redirecting assets and redirecting their [capital expenditures], and sending out a very good image to the financial community.”

Pan Am Railways locomotives back a train of Poland Spring water across the Fore River in Portland, Maine, toward Rigby Yard in July 2016. Dan Machalaba
says Richard Flynn, principal of Northeast Logistics Systems, a railroad consulting firm in Framingham, Mass. “But there’s still a lot of uncertainty about where we are going.”

American railroading is at a crossroads. “The $64,000 question is will they be able to remake themselves?” says Robert Gallamore, economist, former railroad executive, and railroad book co-author.

Should the seven major North American railroads consolidate into a couple of giant coast-to-coast systems, potentially reducing the time-consuming handoffs of freight from one railroad to another? Can railroads become a highly automated transportation system with positive train control, driverless trains, electronically monitored freight cars, and drones inspecting the track ahead? Should railroads turn over more of their track to shortline and regional railroads, which have demonstrated an ability to pay close attention to customers and create new business? Should railroads shrink their systems to fit a declining traffic base? Or, should they pursue a growth strategy by improving their service and tapping markets they have neglected, such as short-haul freight?

This isn’t the first time American railroading has had to remake itself. One of the biggest crises was the loss of traffic to trucking after World War II. “Their hands were tied by regulation and by the requirement that they were forced to carry passengers,” says Gerard McCullough, an applied economics professor at the University of Minnesota. “They are facing challenges now, but their hands are not tied, and they are able to reallocate resources when they have to.”

Railroads are widely viewed as better for the environment than trucks in terms of efficient land use, energy consumption, and the cost of moving a ton of freight. Large capital outlays in recent years have paid for upgrading tracks and freight yards, buying new locomotives,
and removing bottlenecks. “The private rail network is in the best shape ever,” says Anthony Hatch, a New York-based independent railroad analyst, in an email. The societal benefits are so great, he says, that “rails had better play an even larger role in the economy 20 years out than now.”

HOW CAN RAILROADS GROW?

Growth opportunities are emerging. Low natural gas prices for feedstocks are driving a boom of new chemical and plastics plants on the Gulf Coast, which could expand rail traffic. Population growth, of course, would boost demand for transportation of all kinds. The U.S. needs a massive rebuilding of its aging bridges, highways, and transit systems, which could mean large quantities of steel, concrete, and gravel moving by rail. But perhaps the greatest opportunity railroads have is to play a larger role in serving the consumer economy, hauling the food, drinks, fruits, vegetables, and canned goods that now move largely by truck.

But others doubt that railroads can rebound from coal, which was one of the success stories under deregulation, allowing railroads to contract for large amounts of profitable traffic and fund the development of intermodal and the rebuilding of railroad infrastructure. Railroad coal revenues are down more than 25 percent in the past decade as utilities shutter dozens of coal-fired generating plants in response to restrictions on pollution and competition from low-price natural gas. Growing worries about global warming could sideline additional coal plants. Shipments of crude oil, which partially offset falling coal volumes, have dropped by nearly half. Even intermodal growth has slowed, at least for now.

Railroads face other threats. Shippers are promoting a plan — fiercely opposed by railroads — to open up the nation’s rail network to more rail-to-rail competition. Some Wall Street analysts are pressing railroads to curtail capital spending just when the rail industry needs to retool its system for the future. And the advent of driverless trucks sometime in the future could mean further volume losses for railroads.

“Railroads will be smaller, more tightly managed, with less frills, and more concentration on the customer base,” says former Conrail CEO Jim Hagen.

EFFECT OF A NEW PRESIDENT

Of course, the outlook for railroads may change under President-elect Donald Trump. During his campaign, Trump called for an ambitious national infrastructure program and a resetting of trade deals to revive manufacturing in the U.S. A trade overhaul could help the U.S. steel industry but reduce imported containers of consumer goods, Hatch says. Trump also promised to ease government regulations on business in general and on the burning of coal, in particular. Hatch says utilities have converted many power plants to natural gas, and “it’s hard to see a reversal.”

Some railroad experts are advocating nothing less than a radical overhaul of the industry’s business model. With coal declining, railroads could improve their merchandise carload business, or loose-car railroading, which still makes up a third or more of Class I rail road volumes. Railroads typically handle such carload shipments multiple times in freight yards, making transit times slow, deliveries uncertain, and service unacceptable to many shippers.

“The whole focus of the rail industry in the past 30 years has been on solid trains of bulk commodities moving long distances,” says Ed Burkhardt, president of Rail World, a railway management company. “The business that is left over, which is the single-car stuff, has to be handled many times. If it goes into a yard and gets out in 24 hours, that’s a pretty good yard,” Burkhardt says. “If you wanted to really serve the single-car

<table>
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<th>Distance band (miles)</th>
<th>PERCENT</th>
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<th>CUMULATIVE PERCENT</th>
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<td>Over 2,000</td>
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From left, Conrail manager Michael Centeno, engineer Mark Primamore and conductor Edward Risher with Conrail local train MA2 at Manville, N.J., in September 2016. Dan Machalaba
market, you would put together smallish trains, like 40 cars, or maybe even less, that would go from point to point and bypass intermediate yards."

Railroads too must reduce service variability, which Jennifer Hedrick, executive director of the National Industrial Transportation League, says forces shippers to carry additional inventory in their supply chains to lessen the risk of stock outages. In the railroad's case, it leads to shippers placing more cars on the railroad to accommodate for the variability.

Rail service crashed two years ago after a surge in crude oil and other rail traffic and severe winter weather, which resulted in crew shortages and stranded trains clogging main lines and terminals.

Erik Bohn, director logistics and customer service Americas for Omya Inc., a producer of industrial minerals, says that rail deliveries took so long that customers were afraid of running out of inventory. "We were supplying customers in the Upper Midwest from Alabama and Vermont and the transit times were anywhere from 15 to 22 days," he says. "Now, the transit times are nine to 12 days and the problem is having too many cars at customer sites."

Rod Case, global transportation practice head of Oliver Wyman, a consulting firm, says North American freight rail may need to become more like European freight rail, running higher-frequency trains. Running more frequent trains would deliver goods to customers faster and reduce carload cycle times, now averaging a month between loads. Serving a consumer-based economy will require smaller shipments and shorter hauls, he adds.

Changing how railroads operate won't be easy. "The industry is still very much in cost avoidance," Case says. Unexpected events such as locomotive failures, signal outages, and recrews affect one train in four and lead to delays. "Failure on line is sort of fun," Case says.

"There is a bravado on American railroads that engenders a certain fondness of railroads not running well."

**WHAT WILL BIG RAILROADS DO?**

Among major railroads, Norfolk Southern Railway and CSX Transportation, hit the hardest by the collapse of coal, are cutting back their coal operations and preparing for anticipated increases in intermodal and carload shipments. CSX calls its strategy "CSX of Tomorrow." "We have been in business for 190 years, and we intend to be in business for another 190 years," says Frank A. Longero, chief financial officer of CSX, which traces its roots to America's first common carrier, the Baltimore & Ohio Railroad, in 1827.

Western railroads Union Pacific Railroad and BNSF Railway have seen a drop in key commodities but have a more diversified traffic base and longer hauls. "We are moving a lot more than just coal," BNSF spokesman Mike

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**Estimated frequency of unexpected events**

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<th>U.S. Class I railroads in 2013</th>
<th>Total estimated incidents</th>
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<td>Detector activations</td>
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<tr>
<td>Detector failures</td>
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<tr>
<td>Recrews</td>
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<tr>
<td>Total</td>
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</table>

**SOURCE:** Oliver Wyman
Joseph Soto, assistant superintendent. “This is a scheduled railroad. We control our outbound trains, and we get them out on time whether it is five cars or 150 cars.” Conrail currently clocks its outbound trains at 97 percent within an hour of schedule. Historically, the railroad industry has posted lower on-time arrivals, stemming from over-the-road delays.

The challenge of running a scheduled railroad is visible in Manville, N.J. Local trains clear up repeatedly for through trains. Customers sometimes have more freight cars on hand than they can load or unload. Such conditions can congest yards and cause delays, says Michael Centeno, director of customer service operations support.

On a bright, sunny summer day, Centeno joins engineer Mark Primamore and conductor Edward Risher aboard Conrail Shared Assets local freight MA2. Their GP38-2 picks up an empty covered hopper at a plastics transload and proceeds to a nearby freight customer. The rail track there is too short for the crew to easily handle all three empty hydrochloric acid tank cars at one time, requiring an extra switching move. Later that day, MA2 brings a boxcar loaded with rolls of brown paper to a company that makes bags for fast food outlets. The customer hasn’t finished unloading the released car that is occupying its single-car spot. The crew spots the load outside the plant gate for handling the next day.

“I’m so used to it,” says Primamore. “This is just part of the railroad.”

Pan Am is diversifying its traffic base. When its paper and coal businesses fell off, Pan Am took advantage of the Pennsylvania fracking boom to move propane into New York and New England. It then struck a deal to move containers of Poland Spring water.

Christopher Haynes, Northeast logistics director for Nestle Waters North America, Poland Spring’s parent company, had previously managed the Tropicana juice train. He is now turning to rail at Poland Spring to

Trevino says. “We have a diverse portfolio, so when one sector is down, there is opportunity for others to be up.”

For ideas on how they can remake themselves, railroads need look no further than some innovative shortline and regional railroads. Florida East Coast Railway, long a railroad pioneer, has turned its 350-mile main line between Miami and Jacksonville, Fla., into a busy, high-speed freight corridor with frequent train service and a high level of on-time reliability. FEC has done this despite conventional wisdom that rail needs a long haul, at least 500 miles, to overcome origin and destination terminal costs. “We have lived in this world longer than they have,” says Adam Bridges, FEC’s senior vice president marketing and strategic planning, about his railroad’s short-haul focus. “We don’t have long haul, and we are glad to share our learning.”

FEC runs long trains like the Class I railroads. But it doesn’t wait to assemble freight of only one kind. Instead, its trains carry everything from intermodal to aggregates, tank cars to automobiles, and whatever else is ready to go.

**HOW SMALL RAILROADS ROLL**

Efficiency, discipline, and consistent service is the mantra of Conrail, the third-party operator for NS and CSX in the traffic-dense state of New Jersey, metropolitan Detroit, and Philadelphia.

Its officials instruct employees to push themselves to get that one extra move completed so the railroad is ahead for the next shift. They build in extra slack instead of being complacent. “We’re supposed to do the same thing every day,” says

![Mark Primamore](Dan Machajaba)
Passengers in industry’s future?

When Amtrak took over most U.S. passenger service in 1971, railroads were relieved of not just operating losses but also the need to renew streamliner fleets rapidly approaching the end of useful lives that began in the decade following World War II.

Carriers had invested heavily in glistening rolling stock built by Pullman, St. Louis Car, or the Budd Co., and locomotives mostly from EMD and Alco, on a playing field that seemed to have a bright future, only to experience a 20-year-long downhill slide.

Incredibly, some of those cars the railroads had conveyed to Amtrak are getting a second wind in North Carolina, Indiana, and on tourist railroads. But just as starting is the fact that the Amfleet and Superliner equipment, which the national operator acquired between 1976 and 1982, is at least 35 years old.

Management must first be willing to jump this fleet investment hurdle, which has even remained especially elusive for publicly funded Amtrak. The domestic intercity carbuilding business willed when orders dried up in the 1980s, and foreign subsidiary successors stumbled spectacularly after low bidding on Amtrak’s Viewliner (CAF USA) or California-led bilevel (Nippon Sharyo) procurements. Both contracts are years behind schedule, and some industry observers predict that the bilevels may not show up until 2020, if ever.

Fortress Investment Group’s proposed Brightline service, set to debut June 2017 between Miami and West Palm Beach, with an extension to Orlando once the best financing deal can be secured, has partnered with Siemens to provide cars and locomotives (see “Rewriting the Playbook,” November 2016). But Brightline can’t be considered a pure passenger project because legacy Florida East Coast Railway real estate around South Florida stations is expected to inject serious cash flow into the total revenue mix.

Railroads might be tempted to run passenger trains if someone else takes the revenue risk. In fall 2016, the Federal Railroad Administration sought comments on establishing guidelines for outsourcing up to three Amtrak long-distance routes in a “Competitive Passenger Service Rail Pilot Program” mandated by the Fixing America’s Surface Transportation Act of 2015. Many unresolved issues await the FRA’s final ruling (expected in 2017), but current Amtrak hosts would likely sign off on any agreement with a third-party operator only if they were assured the partnership didn’t jingle the “open access” bell.

Integrating overnighters with freight operations on the same tracks would allow railroads to establish priorities without inviting nitpicking from Amtrak or the Surface Transportation Board on decisions dispatchers make. The model isn’t self-evident, however, on multiple-frequency, higher speed corridors, which are far less compatible. They require precisely the kind of expanded physical plant and signaling railroads got rid of decades ago and now demand that public funds pay for. As right-of-way owners, the carriers have been able to exact improvements as a condition of their participation that many critics claim amount to “gold plating” under the guise of hard-to-justify future freight capacity needs.

Though it has struggled with shortcomings, Amtrak converted a disparate, Balkanized collection of passenger operating practices into a unified network by investing in safety training, reservation systems, maintenance expertise, and institutional knowledge, which any prospective entrant must purchase or replicate.

Good luck with that. — Bob Johnston

reduce the company’s dependence on trucks and meet growing demand for its bottled water.

“Our business is growing, and Pan Am recognizes this as an opportunity to grow with us and in a new way,” Haynes says, pointing to rail’s environmental benefits. “Hopefully people will see that we are a progressive company and respect for the environment is a core value for us.”

Will more people mean more demand for freight transportation? Or will a green, sustainable economy mean reduced consumption?

Accountants, IT specialists, marketing firms, lawyers, dry cleaners, all parts of the nation’s expanding service economy, require less transportation than the railroads’ traditional manufacturing customers. The millennial generation, whose conservative spending habits were shaped during the Great Recession, isn’t buying big houses or big cars. People look at the railroad as a nuisance. As population has grown, nobody wants a railroad in their backyard.

Another question hanging over the railroad industry is how likely the federal government is to open the railroads to reciprocal switching. Some shipper groups are lobbying for an open access system, which they say would give shippers more power to choose the most efficient routes and price options. John Friedmann, vice president strategic planning for NS, says railroads now have flexibility to respond to a changing economy. “But just when railroads need that

Iowa Pacific Hoosier State heritage equipment deadheads north at the rear of Amtrak’s Amfleet-equipped Cardinal north of Chalmers, Ind., on Aug. 29, 2016. Two photos, Bob Johnston

The daily Florida East Coast Railway Port of Miami transfer job heads south through Miami April 26, 2015. Scott Harris

The first Brightline locomotive debuts June 7, 2016.
Two sidewinders lift a CSX yard engine while X139 rolls by (far right) and Q156 prepares to leave the North Baltimore, Ohio, yard. KC8-powered Q107 shoves back onto its train of Schneider boxes. Michael D. Harding

flexibility to make the biggest change to their business model in 35 years,” Friedmann says in an email, “that flexibility is threatened, ironically by creeping government re-regulation — the opposite of how the railroads won their freedom in the last quarter of the 20th century.”

What happens in trucking will have a big effect on the rail industry. The supply of truck drivers is expected to tighten in the next few years, which is good for railroads. New federal regulations will require truck drivers to use electronic log books to monitor their rest periods and time spent behind the wheel. Highways are growing older and more crowded, leading to increased truck delays. On the other hand, driverless trucks are on the horizon, which threaten to siphon business from the rails. Even as the world is moving closer to driverless trucks, the Federal Railroad Administration is trying to mandate two-person crews aboard locomotives.

**TAKING ACTION**

Railroad executives, too, are constantly looking over their shoulders at Wall Street. Analysts are urging railroads to reduce their capital expenditures in line with their lower traffic levels and use the cash for dividends and stock buy backs.

“Wall Street wants to crucify anyone when they raise [capital expenditures],” says Rob Krebs, retired BNSF chief executive. “They want to run you out of town on a rail.” Some shippers complain that railroads focus more on lowering their operating ratio (an efficiency measure of expenses as a percentage of railroad revenue) than serving customers. “One of the biggest public relations issues the railroads have is their constant drive for lowering operating ratios,” Bohn says. “It tends to create the atmosphere for more hostile relationships than positive, constructive relationships.”

Tom Finkbiner, chief executive of Tiger Cool Express, a refrigerated intermodal company, says railroads could raise their share of the refrigerated market, now controlled more than 90 percent by trucks, if they offered more expedited intermodal trains. Curt Warfel, logistics manager for a chemical company, says that local train crews frequently run out of time and fail to switch customers, delaying freight cars by days. He wants railroads to offer a premium, expedited service for carload shipments, figuring that the potential savings in car hire and inventory costs could outweigh higher freight rates. One railroad executive called his idea too complex and unworkable.

“Railroads say this is what we have, and if you want it, this is my number. It goes back eons. That is part of the railroad culture,” says Roy Blanchard, a Philadelphia-based railroad consultant. “Big moves of fungible bulk commodities that are not time sensitive fit the railroad batch process model and didn’t take very creative leadership.” Others say railroad sales forces have been thinned, so that many customers rarely see a railroad sales representative. Just getting a rate quote from a big railroad can take days, if not weeks. Mike Smith, president of the Finger Lakes Railway in Geneva, N.Y., has had trouble even getting freight train schedules. “Shippers can’t use what they don’t know about,” he says.
Rail experts offer advice on reducing rail shipment variability. Bohn says railroads are too quick to lay off crews when business declines. It takes a year or more to hire and train new crews when business picks up, leading to crew shortages, service failures, and a lag time in handling new traffic. Flynn urges railroads to become more integrated in their customers’ supply chains so they can better predict what volume will be on their networks day to day. “The airlines can plan weeks and months in advance,” he says. “The railroads wait for the volume of cars to show up to see if they are going to run a train or not.”

Despite recent infrastructure investment, needs for infrastructure spending still exist. Finkbiner says Union Pacific expanded its Portland, Ore., intermodal yard. “They expanded it to where it should have been in 2005, and it is still crowded,” he says. “It is in a bad place and the topography makes it difficult to get 800 acres in one place where you can put one of these giant facilities.” But he acknowledges that some facilities, in particular a proposed BNSF intermodal terminal near the ports of Los Angeles and Long Beach, have been blocked by community opposition. Finkbiner says there isn’t a good single intermodal facility anywhere in New England, and facilities in New Jersey are old and land bound.

Chicago remains the industry’s biggest bottleneck despite ongoing efforts to put in new track, connections, and flyovers to improve the flow of freight and passenger trains. One investor group is pursuing a plan to build a high-capacity rail route bypassing the city entirely. Finkbiner doesn’t see how the industry will take out shipment delays in Chicago until just a couple of railroads control shipments between East and West. Until then, rail management is “stuck in the mindset” of protecting their own interests even at the expense of service nationally, he says.

Meanwhile, railroads say they are accelerating efforts to improve their networks and service. Longo says CSX is reshaping its network into a high-capacity core system, called the Outer Triangle, connecting New York, Chicago, and Jacksonville, Fla. CSX is clearing more of its tracks to accommodate double-stack trains. Longo says the company’s intermodal strategy “unique,” because it combines dense corridors among major cities with a hub-and-spoke system to serve small- and medium-size markets. CSX has built a sprawling new intermodal hub in Northwest Ohio and is now planning the Carolina Connector, a Northwest-Ohio-type terminal in North Carolina.

NS has doubled the size of its Bellevue, Ohio, classification yard, which is halfway between New York and Chicago. The 650-acre facility is now large enough to handle freight that has been processed at other yards. Freight moving from Philadelphia to Chicago, for example, had been handled at four yards. With more capacity at Bellevue, NS can bypass its Conway, Pa., and Elkhart, Ind., yards, reducing handling by half and shaving two days of transit time off customers’ freight.

Some railroaders believe that technology will play an increasing role. “Technology will bring opportunities to our doorstep,” says Ronald L. Batory, Conrail president and chief operating officer. “The question is how, when, and at what speed will we seize them.”

**RAILROAD EVOLUTION**

Conrail removed the hump from its Pavenia Yard in Camden, N.J., and turned it into a flat switching yard. One person with a remote-control belt pack now operates a switch engine, doing the work once performed by three people. Conrail turned to managers Adam Baginski, 27 years old, and Steve Hart, 36, to outfit the yard with cameras, sensors, and a global positioning satellite. The sensors tell which way switches are aligned and how often they are used. The railroad uses GPS on remote-controlled locomotives and employee radios. Photo analytics will identify undesirable conditions. A project design caveat: the equipment must be developed “outside the box” and not necessarily from the railway supply industry shelf.

Batory says railroading will undergo an evolutionary process as the success of one railroad breeds the success of others. Railroads used to have a lot of parochial people working for them, he says, but young, technologically savvy employees such as Baginski and Hart are the industry’s future. “People today are much more open-minded and a lot different than those of the past regulated environment,” Batory adds. “We have a more educated, enthusiastic, and energetic workforce than ever before.”