Eleven years ago, Norfolk Southern began piloting a train-handling technology dubbed LEADER, installing it on locomotives pulling coal trains over a hilly, curvy stretch of track between Roanoke, Va., and a Winston-Salem, N.C., power plant. From that small start, NS has transformed LEADER into the railroad’s flagship fuel-efficiency initiative.

In mid-2013, NS achieved a major milestone with its rollout: Every division on the network had the ability to run LEADER-equipped locomotives. By July of this year, LEADER was installed on about 70 percent of NS road locomotives, and, by year’s end, all of NS’ approximately 7,000 locomotive engineers should be trained in using the technology, said Neville Wilson, director operations and locomotive control, who directs the LEADER initiative.

“We’re making progress,” Wilson said. “We have a sufficient number of locomotives equipped and engineers trained that we’re running LEADER engines across the entire network.”

The GPS-based software that powers LEADER – an acronym for Locomotive Engineer Assist/Display Event Recorder – processes operating conditions in real time as a train moves over the track. In the locomotive cab, a LEADER monitor prompts engineers on optimum throttle speed and dynamic braking to achieve maximum fuel economy.

Fuel savings vary based on train makeup, track profile, and speed, but, on average, NS trains led by LEADER-outfitted locomotives have been consuming approximately 5 percent less fuel on road trips. The operations and locomotive group estimates that LEADER in 2013 saved NS about 10 million gallons of diesel fuel. During that year, NS trains consumed more than 479 million gallons of diesel at a cost of around $1.4 billion. Reducing the railroad’s fuel bill, one of NS’ largest operating expenses, is a primary driver of the LEADER initiative, in addition to reducing greenhouse gas emissions and the environmental impacts associated with those emissions.

LEADER’s potential to cut operating costs and lower the company’s carbon footprint, Wilson said, are reasons why employees have a stake in the technology’s success.

IN 2013, LEADER SAVED NS ABOUT 10 MILLION GALLONS OF DIESEL FUEL

“We’re making progress.
We have a sufficient number of locomotives equipped and engineers trained that we’re running LEADER engines across the entire network.”

– Neville Wilson, director operations and locomotive control
Working with vendor and LEADER manufacturer New York Air Brake, NS continues to refine and improve the technology’s capabilities. The next significant development will be adding an automatic control feature, Wilson said. When installed, LEADER will have the capability to automatically adjust an engine’s throttle speed.

“That, in my opinion, is one of the most exciting features in the pipeline for LEADER,” Wilson said. “It will allow us to realize even greater benefits.”

While running locomotives in auto control, engineers would manage train operations but allow LEADER to control the train throttle and dynamic braking. If needed, LEADER would coach engineers through air brake applications. Eventually, NS plans to seamlessly integrate LEADER into Positive Train Control, a step that would expand auto control capabilities to include signal recognition.

Wilson said NS plans to pilot the auto control feature on a couple of business lanes in August. The aim, he said, is to begin installing the upgrade on LEADER-outfitted locomotives as early as the fourth quarter of this year.
During his freshman year in college, Jonathan Collins left school to take a job inspecting and repairing railcars at Norfolk Southern’s Cincinnati, Ohio, yard. That was 22 years ago, and Collins never returned to the University of Cincinnati — he was having too much fun at NS.

From his days as an entry-level carman to his current role as manager locomotive systems and special projects, Collins has applied his natural technical aptitude to help NS address a number of business challenges involving technology.

Collins first drew notice in the mid-1990s when he helped develop a way to integrate GPS into end-of-train devices, enabling NS for the first time to track location of the air-brake pressure monitors across the system. In 2006, he won the Thoroughbred Award — the precursor to today’s Chairman’s SPIRIT Award for Excellence — after developing the first version of NS’ Track Line View program, the core feature of today’s Unified Train Control System Lite web application. Track Line enables NS users to monitor train activity across the network, including remote online access.

Collins’ most recent contribution, however, might be his greatest. Since early 2011, he has helped manage the development and deployment of LEADER, a train-handling technology that is saving NS millions of dollars in locomotive fuel costs and significantly reducing the company’s environmental impacts.

After Collins joined the effort, the railroad saw an exponential jump in territories capable of supporting LEADER-equipped trains, going from 2,500 track route miles in 2012 to 14,500 route miles by mid-year 2013. Accomplishing the feat was no easy matter for Collins and his team of two reports — Colby Bradley, manager advanced energy management, and Stephen Michael, manager LEADER development.
A data puzzle

As Collins explains it, LEADER essentially is a physics engine. It is powered by algorithms that calculate the most fuel-efficient way for locomotive engineers to operate a train, based on track topography and dynamic train forces.

For the GPS-based system to work, Norfolk Southern had to digitally map its rail network. Five years ago, the company deployed helicopters outfitted with infrared laser technology and camera systems to do that. This aerial “fly-mapping” generated a series of latitudinal and longitudinal points and track elevations. The mapping recorded data points every three feet, accurate to within an inch, over roughly 16,000 route miles of track, generating massive amounts of raw data.

The challenge: Collins and his team had to figure out how to efficiently convert all those data points into information that LEADER could use to prompt engineers on locomotive control settings.

“Accurate track data is the core of LEADER,” Collins said. “We needed to match the latitude and longitude data with precision to every curve, railroad crossing at grade, and turnout.”

Collins’ solution combined technology and ingenuity. It involved countless hours of feeding the fly-map data into database management systems such as ACCESS and linking them to Web-based geographical information systems and GPS-based maps, including Google Earth.

Collins also meticulously matched the data to NS timetables. These “bibles” for locomotive engineers list track speeds and mile posts that train crews use for reference while making freight deliveries. Collins worked with road foremen of engines across the network – around 110 of them – to accurately match the fly-map data to the timetables.

An extensive review followed to verify the accuracy of the work, an effort that involved NS’ railroad operations and information technology groups. Collins then worked with New York Air Brake, the LEADER vendor, to incorporate the data into the train-handling software.

Improvements continuing

“I take a lot of pride in the contributions I’ve made in furthering the technology,” Collins said. “Conserving fuel has a positive impact on the corporation’s bottom line, and it reduces our greenhouse gas emissions and environmental impacts.

“From a sustainability perspective, we need to continue looking for ways to operate more efficiently and reduce our impacts on the environment,” he added. “The more we can be self-sustaining from a fuel-conservation perspective, the better it is for us as a company, as an industry, and as a country.”

Collins and his team continue to work with New York Air Brake on improving LEADER and integrating the technology into other aspects of operations. One enhancement is a feature designed to shut off and turn on trailing engines in a consist based on power needs, further conserving fuel and reducing emissions. Another is an auto control component enabling LEADER to adjust throttle settings.

“We’ve got a very active development process,” he said. “We are trying to build symbiotic relationships between fuel conservation and train movements, to get those two things working better together. We want to deploy existing technology as rapidly as we can to gain the benefits envisioned and we want to be forward-thinking in how we do business in terms of the tools and techniques we can introduce and leverage with LEADER.”
Before using LEADER for the first time four years ago, Raiford Wilson was skeptical. The locomotive engineer has operated trains for 27 years with Norfolk Southern, and he didn’t think he needed train-handling technology to tell him how to run one.

After only a few road trips with LEADER, however, Wilson began to change his way of thinking. “I learned that it’s more of a tool to help you do your job better, rather than telling you how to do your job,” he said.

For Wilson, the most difficult thing initially was when LEADER prompted him to do things that contradicted the way he normally operated a train. As one example, Wilson said most engineers operate a locomotive in maximum throttle power when driving a train up a hill and then begin braking or notching back on throttle speed after cresting the top of the grade. LEADER typically prompts engineers to reduce speed before reaching the hilltop, letting the train’s momentum carry it over. As it turns out, LEADER knows best — that technique burns less fuel and reduces use of dynamic brakes or air brakes, which reduces wear and tear on the track.
In another example, while engineers might run their train at the maximum posted speed limit, LEADER might prompt them to notch back based on track elevation or curvature, which conserves fuel.

“LEADER shows that you can reduce the throttle at points where you really hadn’t programmed yourself to do so, and that’s where the fuel savings are,” Wilson said. “It’s trying to help you run a more conservative train and still let you make on-time performance. You have to kind of retrain your brain. After a while, it becomes almost like second nature.”

In particular, Wilson said LEADER is a good teaching tool for new engineers because “you can see what your train is doing.”

Now that he understands the benefits of LEADER, Wilson works to outsmart the technology. During road trips, he tries to adjust speed or braking before LEADER gives a flashing prompt on the cab monitor advising him to do so.

“Once you’ve run a route a few times, you can figure out where you’re going to get the prompts, and it’s a challenge to try to ‘beat’ LEADER,” he said. “It’s really helping to refine everybody’s operating techniques to get the best fuel savings possible.”

Wilson operates an intermodal container train between Crewe, Va., and Norfolk International Terminals, a trip of about 135 miles each way. Wilson said he has achieved fuel savings of between 5 and 8 percent per trip with LEADER. He became such an advocate that supervisors in 2013 tapped him to help train other engineers on using the technology. He works one-on-one with engineers, using an iPad mini installed with LEADER simulations and training videos.

“I’m a big believer in peer training,” Wilson said. “I think it helps when you have somebody you work with everyday helping you advance what you’re trying to do rather than having a person from the outside coming in.”

Wilson said he takes pride helping the company save money on fuel while benefiting the environment by reducing carbon emissions.

“If you can improve the bottom line and be a green company at the same time,” he said, “I think you’ve really accomplished something.”
Challenged first by nature and then by an unexpected surge in traffic volumes, Norfolk Southern employees have proven their grit during the first half of 2014.

The excellent news for the company at midyear: Overall business volumes are near record levels in an improving economy, generating revenue and income records in the second quarter.

The challenge ahead: The surge in spring and summer traffic slowed NS’ recovery from an extremely difficult winter. Now, the company is hiring additional train and engine crews and repositioning locomotives and other resources to keep the trains moving and meeting customer demands.

A winter whammy
As summer temperatures top 90 degrees in much of Norfolk Southern’s territory, it’s easy to forget the brutal cold and snow storms that disrupted rail traffic industrywide.

“It was a record-setting winter no matter how you look at it,” said Rush Bailey, assistant vice president service management. “All North American railroads were heavily affected. We had issues with braking systems, blocked interchanges, frozen switches, and trouble getting crews to trains. We had to run shorter trains, and the whole network started to slow down.”

As the weather improved in March, NS “reset” the network flow, a tactic that involves holding already-late trains until their regularly scheduled departure times.

“When the network is running so far behind, that’s the time to reset the clock,” Bailey said. “It gets everybody refocused on operating to plan and getting everything back on schedule.”
A surge in demand

As winter turned to spring and then summer, NS’ weekly carload volumes increased to more than 150,000 as customers ramped up shipments delayed by winter storms, the economy improved, and a truck driver shortage placed more demands on rail. Climbing much higher than anticipated, volumes approached levels not seen since 2006 all-time highs, Bailey noted.

“Because it was not projected, we didn’t have the resources in place to meet that demand, and it impeded our ability to recover from winter,” he said.

NS is adding personnel and equipment to help meet the increased demand, including hiring and training around 900 train and engine employees this year, a process that takes six to eight months. To offset the lag time, NS has scheduled additional classes for new conductor trainees at the company’s training center at McDonough, Ga.

“We’ve stepped up training and have maxed out capacity at McDonough to train conductors,” Bailey said. “Some new conductor trainees should be done with training and at work by October.”

Many of the new train and engine employees might be working on new locomotives. NS purchased 25 new AC road locomotives in early 2014 and plans to buy 50 more AC road engines during the second half of the year to boost capacity. NS also has purchased 19 used locomotives this year that are being refurbished at Juniata Locomotive Shop as needed.

“With expected improvements in network velocity, we should be in good shape in terms of locomotives by the end of the year,” Bailey added.

NS field employees have accomplished a lot dealing with extreme weather and heavy volumes to keep shipments moving and the network fluid, said Jerry Hall, vice president network and service management.

“Our Operating Division employees — transportation, mechanical, and engineering — have done a phenomenal job,” Hall said. “The first and second quarters presented very difficult operating challenges, and our people, as always, rose to meet those challenges. Their efforts reflected our SPIRIT values in every way.”

Markets to watch

The spike in business has put the railroad’s resources to the test.

“Any time there’s a dramatic change in volume, it’s going to stress the network,” said Mike McClellan, vice president industrial products. “We’ve got enough railroad to handle the business. We just need resources in the right places.”

While first-quarter volumes in industrial products were stagnant, the merchandise business grew by 7 percent in the second quarter, led by a 13 percent increase in metals and construction volumes.

“Rarely do you see years where you don’t grow at all in one quarter and then have significant growth the following quarter,” McClellan said.

Growth has been especially strong in “frac” sand used in drilling for natural gas and oil, as the petroleum industry ratchets up activity in the Marcellus and Utica shale regions in Pennsylvania and Ohio and additional East Coast refineries come on line.

“The crude-by-rail franchise continues to ramp up,” McClellan said. “We’ve also had big numbers in ethanol, steel, and agriculture.”

Domestic thermal coal, a wild card in NS’ business markets for the past two years, experienced an 8 percent year-over-year volume increase in the second quarter, while overall coal volumes grew 3 percent.
“Coal is the more economical source of energy right now,” said David Lawson, vice president coal. “Utilities have been buying more coal because natural gas prices are higher, and coal stockpiles have been depleted because of the harsh winter. Overall volume is up from what we forecast. That requires more resources.”

However, export coal, which typically accounts for about 20 percent of the coal NS moves annually, is facing challenges this year, including highly competitive international supplies and depressed markets for both metallurgical and thermal coal. “It’s been very cheap to buy coal from Australia and Indonesia,” Lawson said. “Their currency and quality advantages, coupled with their proximity to the Asian markets, have made it difficult for U.S. coal producers to compete in the global marketplace.”

The improving economy during the second quarter contributed to an impressive volume growth of 11 percent in overall intermodal traffic, with international volumes rising 16 percent.

“We’re running ahead of budget and hope it continues,” said Jeff Heller, vice president Intermodal. “All of our facilities are growing across the network, and business between Norfolk and Chicago is up.”

A plan for the future

About 25 percent of the nation’s freight moves through Chicago. The extreme winter weather and train backlogs prompted the Chicago Transportation Coordination Office to take action requiring member carriers to reduce traffic through the gateway. NS and other Class I railroads participating in the Chicago Region Environmental and Transportation Efficiency program, or CREATE, formed the office.

“The first and second quarters presented very difficult operating challenges, and our people, as always, rose to meet those challenges. Their efforts reflected our SPIRIT values in every way.”

— Jerry Hall, vice president network and service management

Jeff Bennett, a conductor and yard foreman at Spencer Yard in Linwood, N.C., works the pullback tracks on the yard’s north end, using remote control locomotive technology.
“All of the Class Is had daily conference calls so the railroads could coordinate to make things more efficient,” Bailey said. “Even under the best of conditions, Chicago has capacity constraints.”

The expansion of NS’ Bellevue rail yard in northern Ohio, slated for completion in December, will do a lot to alleviate congestion in Chicago and across the Northern Region, Bailey said. The $160 million project will double Bellevue’s humping capacity, making it the largest classification yard on NS’ system. The enlarged yard is expected to reduce operating costs associated with moving industrial products, especially in the Northern Region where much of the ethanol, frac sand, and crude oil traffic is concentrated.

“Bellevue will help tremendously,” Bailey said. “We will be able to build full trains at Bellevue and run them directly to Chicago and to our western interline connections without making a stop along the way. That takes a lot of pressure off Chicago, and every time we reduce handling, it takes 24 hours out of transit.”

That should please NS customers who have voiced frustration by the slowdowns experienced since the end of winter weather.

“Weather, they understand,” McClellan said. “Volume increases are confusing.” Given the adaptability and hard work of NS employees, McClellan said he is optimistic that service levels will return to normal soon.

“We will modify our operations to handle this business as we always do,” he said, “and we will get back to the high level of quality that we are known for offering — and get there quickly.”

An aerial view of Bellevue Yard taken last November shows the existing hump yard on the left and construction of a second hump yard on the right. When the expansion project is completed, the Bellevue facility will become NS’ largest classification yard.

**NS RECORDS IN 2Q 2014:**

(Exceeded) **$3 BILLION:** Railway operating revenues

(Surpassed) **$1 BILLION:** Income from railway operations

**$562 MILLION:** Net income

**$1.79:** Diluted earnings per share

**66.5%:** Railway operating ratio
A WIN-WIN FOR INTERMODAL

NS rail solution for BMW is good for business and the environment

The next time you see a BMW sport activity vehicle cruising down the road, think Norfolk Southern. Since last fall, NS double-stack intermodal container trains have been moving the parts and components that go into every SAV manufactured at the automaker's Greer, S.C., assembly plant.

NS provides overnight service to BMW, moving import and export containers over a 235-mile route between the South Carolina Inland Port in Greer and the Port of Charleston. Parts needed to build BMW's X-series sport activity vehicles are shipped on ocean carriers from Europe to Charleston, while NS moves containerized components from Greer to Charleston for export to markets such as Russia and India, where final assembly is done. NS subsidiary Thoroughbred Direct Intermodal Services manages the inland supply chain for these containers, including just-in-time delivery to the BMW plant.

As the exclusive rail provider at the new inland port, NS kept a lid on costs by adding the BMW traffic to existing trains making daily runs between Charleston and Atlanta through Greer.

The result: good business for NS and long-term economic and environmental benefits for BMW, said Chris Luebbers, group manager intermodal marketing.

“Even though it’s a very short haul, we were able to come in with a service that is competitive with truck,” Luebbers said. “BMW will not only benefit because of the future prospect of ever increasing over-the-road costs, but they’re also getting other operational and environmental benefits from using rail instead of truck.”

“This was a business case, and it supported our sustainability targets with reduced emissions that rail service provides in comparison with trucking.”

— Alfred Haas, BMW's department manager for material control and transportation control
Before the inland port opened, giving NS a way to provide intermodal rail service from Greer, BMW had used tractor-trailer trucks to ship the auto parts and components between its plant and the Charleston seaport. BMW estimates that making the switch to Norfolk Southern will remove 20,000 to 25,000 trucks annually off of Interstate 26.

As part of its corporate sustainability efforts, BMW closely monitors its supply-chain carbon footprint and has goals in place to reduce the environmental impacts from business operations. Switching to rail at Greer made economic and environmental sense, said Alfred Haas, BMW’s department manager for material control and transportation control at the automaker’s Greer facility.

“Our goal is to reduce emissions and support our sustainability targets, and rail is one way to do that if there’s a business case,” said Haas. “This was a business case, and it supported our sustainability targets with reduced emissions that rail service provides in comparison with trucking.”

**Trucks off the highway**

A Norfolk Southern analysis – using Federal Railroad Administration data that compares average emissions between double-stack intermodal rail and dry van trucks – shows that NS will help the BMW plant reduce its supply-chain CO₂ emissions by around 64 percent. The analysis shows that moving 20,000 containers by rail between Greer and Charleston generates about 3,194 metric tons of CO₂ emissions annually. That’s nearly two-thirds less than the 8,894 metric tons by truck.
In addition to reducing greenhouse gas emissions, the shift to rail is expected to ease truck traffic congestion on I-26 and make the commute safer for passenger vehicles.

Opened in 1994, the Greer BMW plant now employs about 8,000 and produces around 300,000 SAV X models annually. The plant, the automaker’s first full auto factory outside Germany, is the only one in the world today making the X3, X4, X5, and X6 models.

In the early 1990s, when BMW was searching for a U.S. site, Norfolk Southern’s industrial development group joined with South Carolina economic development officials to promote Greer as an ideal location. A Norfolk Southern rail spur at the site was a key factor in BMW’s decision to settle there, BMW officials said.

Since the plant began operations, NS has transported finished vehicles in multilevel railcars to the Port of Charleston for export to global markets. The introduction of intermodal service developed after BMW approached NS about the possibilities, Luebbers said. That proved to be a catalyst that ultimately led to construction of the inland port, which is owned and operated by the South Carolina Ports Authority. NS provided rail, signal, and other track infrastructure to support the nearly $50 million port project.

“In finding a solution, we partnered with the ports authority, which had a piece of property in a strategic location on our main line,” Luebbers said. “The market demand was right for this project to take off.”

More business opportunities

In the bigger economic development picture, upstate South Carolina is growing in population and manufacturing and holds plenty of potential for future business growth, said Brian Gwin, NS’ industrial development manager, based in Columbia, S.C. Norfolk Southern’s Crescent Corridor parallels Interstate 85 near Greer.

“The vision is that we’ll create a warehouse and distribution cluster directly tied to the port,” Gwin said. “Our intermodal traffic there will continue to grow.”

Since the inland port opened in October, NS has expanded business beyond BMW to include moving containers for a chemical company, a tire manufacturer, and an athletic apparel manufacturer. “Even before the port terminal opened,” Luebbers said, “we had received a very positive reception from the Upstate business community.”

The BMW business is a prime example of how NS has been making strategic inroads into short-haul markets. Typically, trains have had a tough time competing with trucks on cost for moves of less than 500 miles. However, that balance is changing, Luebbers said, as higher fuel and insurance costs, a tight driver market, and new government regulations on truck drivers’ hours of service and safety performance are pushing up trucking costs. Tighter truck capacity due to increased cargo volume at East Coast ports and a shift to rail by environmentally conscious shippers are adding to rail’s competitiveness.

As NS has improved operating efficiencies and service times, the railroad’s intermodal marketing groups have crafted innovative business partnerships to win short-haul container business in several key consumer markets. They include: Charleston, S.C., and Savannah, Ga., to and from Atlanta; Charleston and Savannah to and from Charlotte, N.C.; Norfolk to and from Greensboro, N.C.; and the Port of New York/New Jersey to and from Pittsburgh, Pa.

In those lanes, Luebbers said NS used existing terminal and train capacity to add new business, reducing the railroad’s cost structure while increasing revenue.

“We’ve made headway in that arena by finding ways to build volume density,” Luebbers said, “which helps offset the shorter miles.”

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BizNS
NS solution keeps Ford riding tall on rail

Norfolk Southern works with customers to develop innovative solutions to business challenges. Creative thinking by employees in NS’ equipment planning and automotive marketing groups has provided Ford Motor Company, a major automotive customer, with an economical, sustainable solution for shipping new-generation Transit vans by rail.

Ford’s all-new Transit made its U.S. debut in June, replacing the venerable E-series. The Transit, manufactured for North American markets at Ford’s Kansas City Assembly Plant, is available in low, medium, and high roof heights.

Two years ago, as Ford prepared to introduce the vehicle to U.S. markets, it became apparent that only Transits with low roofs would fit in the bi-level railcars the industry uses to move automobiles. The new medium- and high-roof Transits, at up to 110 inches high, were too tall. NS, which has the largest U.S. rail market share for Transit vans, stepped up with a solution.

“Norfolk Southern developed an idea to modify articulated bi-level railcars for Ford, and we helped garner support from Union Pacific, Canadian National, and TTX,” said Joseph Skinner, NS group manager for Ford. UP and CN work with NS in moving the Transits to West Coast and Canadian markets, while TTX is an industry-owned railcar pooling company.

“The rail industry partners, TTX, and Ford had working sessions to identify items that needed to be modified and concerns that needed to be addressed, which we handled in a very collaborative way,” Skinner said.

NS led the team in a six-month project. The primary modification involved raising the middle deck of the railcars. This enabled Ford to ship high- and medium-roof vans in the lower level, while moving standard-size vehicles, such as the Mustang, Focus, Fusion, and Fiesta, in the top section.

Initially, NS developed a prototype using an articulated bi-level railcar and worked with Ford on test loads at NS’ automobile mixing center facility in Melvindale, Mich., near the automaker’s Detroit headquarters. The articulated bi-levels are about 50 feet longer than a conventional bi-level, allowing NS to maximize the number of vehicles transported, said Mike Rimer, NS manager automotive fleet planning.
“We did test loads to determine what the exact specifications needed to be,” Rimer said. “Because of the varied lengths of the Ford Transit product and the need to maximize the load factor on the lower deck, the longer articulated car became a natural choice.”

Ultimately, TTX, which owns the articulated bi-level cars, paid for the modifications, contracting with an outside facility that works with the rail industry on railcar repairs and upgrades, Rimer said. Raising the railcar’s middle deck involved removing deck bolts, brackets, and supports and then reinstalling them at a higher level.

**Lori Shinney**, NS director automotive sales, noted that the automotive business is very dynamic as automakers design and build vehicles to meet customer demands for size and shape. NS, in turn, works with customers to ensure that the ever-changing vehicles remain on rail.

“We strive to come up with innovative and creative solutions to assist our customers,” she said. “We try not to take ‘no’ as an option and provide alternatives to resolve their challenges.”

Ford Transits are shipped to North American markets from NS’ Kansas City Automotive Distribution Center, which handles nearly 300,000 vehicles annually. Ford filmed a promotional video at NS’ distribution center highlighting the Transit transportation solution. In the video, **Sean Grant** of Ford’s North American Vehicle Logistics noted that delivering vehicles long distance by rail is more economical than moving them by trucks over the highway.

“By modifying these railcars,” Grant said, “we found a cost-effective, sustainable solution that brings value to the customer.”

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**LEFT:** An NS bi-level automotive train moves through the countryside.

**RIGHT:** from top to bottom, are photos showing a side-by-side view of high- and medium-roof Ford Transits; a medium-roof Transit being loaded in a modified bi-level railcar; a modified bi-level fully loaded with Transits; and a high-roof Transit inside a modified bi-level car.
INTERMODAL’S CHRIS LUEBBERS AND JEFF MONDAY

Getting business ‘inside the box’
a SPIRIT winner for employees

Innovation often is described as “thinking outside the box.” At Norfolk Southern, Chris Luebbers and Jeff Monday scored big by thinking inside the box – an intermodal box.

In late 2012, Luebbers, group manager intermodal marketing, and Monday, division manager intermodal, teamed up to secure business transporting soybeans from Ohio to Asian markets for use in premium soy products, such as tofu and soy milk. While NS moves a lot of grains, this project was decidedly nonconventional.

These export beans moved in intermodal containers – not in hopper cars as is traditional – and the deal involved partnering with a short line railroad, an unusual move for NS’ intermodal group.

For NS, the project resulted in 3,300 units of additional intermodal business in 2013, and prospects for growth appear promising.

For Luebbers and Monday, the enterprising effort has brought them company honors: They recently won the 2013 Chairman’s SPIRIT Award for Excellence.

NS senior executives, led by CEO Wick Moorman, chose Luebbers and Monday for the honor from more than 200 employees who earned SPIRIT awards in 2013.

What Luebbers, Monday, and the team they assembled accomplished hit very strongly on three of NS’ SPIRIT values — performance, innovation, and teamwork, said Deb Butler, executive vice president planning and chief information officer, who supervises the SPIRIT award program.

“We captured business that we had not handled in the past, and that clearly contributed to our bottom line,” Butler said. “They were innovative in their approach, because hauling grain in intermodal containers is not something NS typically does. They also reached out and worked with a lot of other stakeholders in the process, including operations and our short line marketing group, to ensure the project was a success. What they achieved is a very clear example of the discretionary effort that we value at our company.”
Challenges to sealing the deal

NS had an opportunity to go after this business following the March 2012 opening of the Central Ohio Logistics Center, a rail-connected grain transload facility in Jeffersonville, Ohio, operated by Bluegrass Farms of Ohio, Inc. This facility enables Bluegrass Farms to load containerized soybeans directly on to trains instead of transporting them by truck to an intermodal rail terminal. A short line railroad, the Indiana and Ohio Railway, has direct rail access to the transload facility.

Before opening the center, Bluegrass Farms shipped a large portion of their export beans on ocean carriers aligned with another rail carrier. Luebbers and Monday faced an array of challenges to win this business for NS. For one, they started from scratch. For another, the IORY short line was not accustomed to handling intermodal equipment, and there were no established protocols for interchanging containers with NS. For yet another, NS and Bluegrass Farms had no commercial agreements in place for such moves.

NS’ agricultural marketing group handles most of the railroad’s soybean business. Most export beans move in hopper cars and are loaded into the hold of bulk ocean carriers. Bluegrass Farms, however, deals in a niche market that requires special handling practices, Luebbers said. Luebbers took the lead in negotiating commercial terms, operating agreements, and service parameters with IORY and Bluegrass Farms.

“Bluegrass Farms deals in high-quality, non-genetically modified soybeans that are going primarily to Japan and Korea for use in premium food products,” Luebbers said. “They are very particular about their shipments. They do a chain of custody to ensure purity through the supply chain. Shipping them in containers is more conducive to keeping the integrity of the shipment than shipping them in bulk.”

Christopher Luebbers has worked for 15 years in NS’ intermodal marketing, focusing on the company’s international business. As group manager intermodal marketing, he manages internal business development functions such as pricing and budgeting and contract analysis and development. He has direct customer responsibility for intermodal business associated with Archer Daniels Midland Co.

Luebbers contributes to numerous projects that involve development of new services and terminals, including NS’ efforts establishing exclusive rail service to the South Carolina Inland Port in Greer, S.C., in 2013. He also helps manage NS’ intermodal relationships with Canadian railroads CN and CP.

Before joining NS, Luebbers held management positions with “K” Line America, including handling the ocean carrier’s inland transportation network and rail contract negotiations. He holds a bachelor’s degree in business administration from Ohio State University and a Master of Science in Transportation from Northwestern University. In 2012, he completed a Master of Science in Intermodalism with the University of Denver’s Intermodal Transportation Institute.
Keeping up with the moving parts

Once Luebbers reached service and rate terms with Bluegrass Farms, Monday led the operations side to ensure that NS met customer-service expectations. This responsibility included working closely with IORY, Bluegrass Farms, and NS’ Transportation Department to coordinate shipments.

“There were a lot of moving parts and a lot of people involved to make sure those containers moved in a timely fashion,” Monday said.

Under the initial plan, the IORY short line picked up the soybean containers at the Bluegrass Farms facility and handed them off to NS in Cincinnati. NS train and engine crews then moved the cargo to Rickenbacker Intermodal Terminal in Columbus. There, the containers were cut into outbound trains moving to Norfolk for East Coast export or, more often, to Chicago, where the containers were handed off to a western interline rail partner for transport to West Coast ports.

Monday said NS transportation crews often provided Bluegrass Farms with same day service at Rickenbacker terminal, placing the containers on outbound trains within hours after arriving. Typically, such terminal interchanges offer next day service, he said.

“Providing same day service was a significant accomplishment, and I had great help from transportation,” Monday said. “We worked together to come up with a plan to keep the freight moving.”

Working on a new deal

Costs associated with the rail route and interchange points between the Jeffersonville transload facility and Columbus led Bluegrass Farms to suspend shipments late last year, pending efforts to renegotiate terms. Since then, Luebbers has worked with intermodal operations, strategic planning, and transportation to identify a more direct and cost-effective rail route, opening the door to resuming the intermodal business.

“We had a proof of concept that intermodal container by rail worked for them, we just needed to make it more efficient to really start growing the business,” Luebbers said. “Being able to use rail is more environmentally friendly, and it gives Bluegrass Farms the ability to grow beyond what truck capacity allows them to do. They can do a whole lot more with rail.”

Jeffrey Monday, division manager II, has spent most of his nearly 20-year career at Norfolk Southern keeping intermodal operations running smoothly through Chicago, home of the railroad’s busiest intermodal yards.

Monday joined NS in January 1995 as an extra board clerk with the Transportation Department, a job that involved operating the Cummings drawbridge at the east end of NS’ Calumet Yard. He moved into intermodal in 1999 after being named assistant terminal manager, working primarily at Chicago’s 47th and 63rd street terminals. In 2007, he became operations manager at Chicago’s Landers Yard.

From 2008 until earlier this year, he served as division manager of NS’ intermodal facilities in Columbus, Ohio, including the Rickenbacker terminal. In February, he returned to Chicago to manage the 63rd Street terminal. In his current job, Monday’s responsibilities include ensuring fluid terminal operations, protecting service commitments for intermodal customers, and coordinating with NS transportation to keep trains running on schedule.
A KEY TO FUTURE COMPETITIVENESS

NS aims to recruit more women in operations

Earlier this year, on his last stop at Chattanooga’s DeButts Yard, Dave Dixon handed off the keys to his company vehicle to the man replacing him as terminal superintendent. As he and his family pulled out of the parking lot, ready to begin the drive to Norfolk and his new job in Norfolk Southern’s Human Resources Department, Dixon’s 12-year-old daughter, Caroline, had something on her mind. “Daddy,” he recalled her asking, “are women allowed to work on the railway?” Initially surprised that she would ask such a thing, Dixon realized later that his daughter’s question was perfectly logical. On visits to DeButts and Sevier yards over the past five years, his daughter saw men cutting off railcars at the hump yard and men maintaining track facilities – but no females.

In his new role as NS director planning and staffing, Dixon is aiming to bring more women into the picture. He is helping to lead a recruiting initiative that he hopes, over time, will leave no doubt in a little girl’s mind that women are an essential part of Norfolk Southern’s rail operations. “In order for Norfolk Southern to continue to be a leader in the industry, we have to hire and retain the best talent – and the fact is, the best talent is male and female,” said Dixon, who began his nearly 19-year career at NS in human resources before moving into operations, where he spent the past seven years. “There’s not a single position in this company that is gender specific or that has gender-specific requirements. It’s as simple as that.”
A competitiveness issue

While women make up about 47 percent of the total U.S. workforce, females comprise about 7 percent of Norfolk Southern’s overall workforce – around 2,100 employees out of about 30,000. That includes NS’ nonagreement workforce, where about 19 percent of employees are female, and craft positions, where about 5 percent of employees are female.

The gender scale currently is tipped toward men across NS’ organization. The operations departments are heavily male, especially in craft positions. Females make up less than 1 percent of employees in engineering, about 2.5 percent of employees in mechanical, and about 4 percent of employees in transportation.

Dixon views recruitment of women as a corporate sustainability issue. If NS fails to draw more females into the workforce and expand employee diversity, the company will lose competitiveness, he said. One key reason why, he explained, is that women are surpassing men in attaining education degrees at every level, from associate’s to doctoral degrees.

“My daughter’s question was an innocent one based on her observations, but it just hit me that there is a perception out there that we need to break down,” Dixon said. “I saw that I had failed with my own daughter because I had never even thought to discuss the railroad as a place where she might work.”

Reaching out to females has long been a part of Norfolk Southern’s recruiting strategy. HR has enhanced this effort by enlisting female operations employees to attend company recruiting and hiring sessions to talk with potential female job candidates about why they should consider making a career at Norfolk Southern.

This summer, HR plans to invite employees to participate by referring women they know for jobs at NS. That includes encouraging male employees to talk with their daughters, nieces, and family friends about the range of jobs available at NS.

“The people who can help us the most are employees in our own workforce,” Dixon said. “They are the ones who can help change the mindset and dispel the myths.”

Employees can help

Dixon said his daughter’s question about women working at the railroad drove home the challenge of breaking down social perceptions that railroad work is for men only. Those perceptions, he said, are based on the industry’s historic hiring trends and on railroad jobs traditionally held by men, such as locomotive machinists and pipefitters, track laborers, and locomotive engineers.

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Engine 397 — a Victorian-era class A switcher steam engine — was built at Norfolk & Western Railroad's Roanoke Machine Works, rolling out in September 1893. The Roanoke shop, chartered in 1881 to build and repair locomotive engines and railcars, weathered hard times in 1893 as an economic depression descended on the Magic City, forcing layoffs. N & W later went into receivership and was reorganized in 1896 as Norfolk & Western Railway.

Despite the financial upheavals, engine 397 was built before orders for new locomotives dried up almost completely and the railroad cut hours for the shop's remaining employees to four a day. The undated photograph from the Norfolk Southern archives, at top, shows the locomotive's crew, some with lanterns, ready to fire up the engine.

Like all switchers, the 397 was a small, powerful locomotive built not to move cars over long distances but to shift railcars around in a classification yard to assemble and disassemble trains.

— Jennifer McDaid, NS historical archivist
On the cover: LEADER train-handling technology prompts locomotive engineers on use of throttle and dynamic braking controls to achieve optimum fuel economy. LEADER, NS’ flagship fuel-efficiency initiative, has been outfitted on about 70 percent of NS’ road locomotive fleet.

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NS’ 2013 carbon footprint

Visit www.nssustainability.com to read NS’ 2014 sustainability report and learn more about what employees are doing to contribute to a cleaner environment, a healthier economy, and stronger communities.

In 2013, Norfolk Southern generated 5.35 million metric tons of greenhouse gas emissions. That included 5.09 million metric tons from business operations, 260,792 metric tons from the generation of purchased energy, and 6,346 metric tons of emissions associated with employee business travel and electricity used by other businesses at leased facilities.

About 90 percent of NS’ total emissions were generated by the company’s diesel-burning locomotive fleet. The next largest single source, at about 5 percent, derived from the company’s use of purchased electricity to heat, cool, and light office buildings and railroad facilities.

The railroad’s absolute emissions of greenhouse gases increased 3.3 percent over 2012, largely reflecting an increase in business volumes that drove up year-over-year diesel fuel use by 5 percent. Strategic efforts to improve fuel and operating efficiencies offset the increase. In one key effort, NS estimates that LEADER train-handling technology saved more than 10 million gallons of diesel during the year, translating into reduced greenhouse gas emissions of approximately 110,500 metric tons.

With one year to go, NS has achieved nearly 79 percent of its five-year goal to reduce GHG emissions by 10 percent per revenue ton-mile. ■ BizNS