



*One line, infinite possibilities.*

# CONNECTIONS

2014 SUSTAINABILITY REPORT



# INTRODUCTION



## Norfolk Southern's Connections

At Norfolk Southern, we believe in ties that bring us closer together: Wooden ties on tracks that span 20,000 miles, connecting us to ports, highways, and warehouses, and invisible ties that are just as strong, connecting us to communities, the land, and each other.

Our business is intricately connected to jobs, economies, environmental benefits, and more efficient delivery of goods. These connections create lasting, mutually beneficial relationships with our communities, our employees, our customers, our environment, and our economy.

As we seek out and create these connections, we use every tool within reach to hone and improve operations all along the Norfolk Southern line. As a result, we do business in innovative ways that are more efficient, less resource-intensive, and sustainable now and for generations to come.

Ultimately, everything we do is connected. What sustains us as a company is what sustains us as a people, an economy, and a planet. We'll continue to do our part to create a better world, and show that Norfolk Southern is in it for the long haul.

### A SONG ABOUT CONNECTIONS

Employees all across Norfolk Southern contribute to the company's sustainability efforts. In 2013, the Norfolk Southern Lawmen, the railroad's corporate band, made a musical contribution. The band's song "Footprints" highlights our connections to the environment, the economy, and communities. The Lawmen are part of the railroad's community outreach and also perform at company functions.

### IN THIS SECTION

[INTRODUCTION](#)[CEO LETTER](#)[CSO LETTER](#)[ABOUT OUR REPORT](#)[SUSTAINABLE  
TRANSPORTATION](#)[2013 SUSTAINABILITY  
HIGHLIGHTS](#)[2013 AWARDS AND  
RECOGNITION](#)

## Esi Waters: Sustainability is Her Mission



Esi Waters joined Norfolk Southern in September 2013 as manager of corporate sustainability. In her previous job, Waters worked in the green building industry—she is a LEED (Leadership in Energy and Environmental Design)-accredited professional specializing in existing buildings.

While Waters knew little about railroads initially, the more she learned, the more she liked the environmental benefits of freight rail and the company's efforts to be a responsible corporate citizen.

"I never anticipated working for a railroad. I just knew I wanted to work for an organization whose core business was in keeping with the environment," said Waters, who holds bachelor's and master's degrees in environmental science and management from Duke University. Waters grew up in Maryland and learned early the importance of environmental stewardship through lessons in school about the Chesapeake Bay. "I like it that Norfolk Southern is trying to operate in a sustainable way and is putting its money where its mouth is."

One of Waters' key roles is serving as an internal resource to expand sustainability efforts across the company. She has worked with NS business marketing groups to engage customers in how Norfolk Southern trains can help them reduce their supply-chain carbon footprint as compared with shipping by truck. She also has met with NS purchasing employees to discuss the sustainable business practices of our supply vendors. In another instance, she helped the assistant superintendent of our Toledo, Ohio, terminal identify benefits of replacing dot-matrix printers with more efficient laser printers.

Another important part of her job, Waters said, is engaging employees to contribute to the company's sustainability efforts.

"I don't necessarily know the best way to implement a recycling program at one of our locomotive shops, but the employees there will know what would work," she said. "I really get excited when I get emails from employees who are doing things to support sustainability."

Waters also reaches out to external stakeholders. Those include nonprofits and conservation groups that Norfolk Southern might partner with on community projects, such as our proposed "living shoreline" on the Elizabeth River at our Lamberts Point coal pier in Norfolk, Va. In addition, she coordinates the company's voluntary reporting of details about our corporate sustainability program to groups such as CDP and the Dow Jones Sustainability Index.

One of her primary goals is to help people understand the role that freight rail plays in today's economy and in reducing greenhouse gases from U.S. transportation sources.

"Trains are almost this invisible backbone that holds the economy together," she said. "They get things to the places where they need to be. It's so cool to be part of an industry that touches so many other industries."

## CEO LETTER

Since the 1830s, Norfolk Southern has been an integral part of the American transportation landscape. From our earliest beginnings, our commitment has always been to deliver our customers' freight safely, efficiently, and economically, and in doing so to provide fair returns to our shareholders and a desirable workplace for employees.

Today we understand that everything we do must respect the planet. We understand that everything we do is connected. And we understand that environmental sustainability is smart business.

The 2014 Sustainability Report highlights our pursuit of better ways of doing business—ways that, whenever possible, benefit the environment. This report explains how NS integrates sustainability into the fabric of the corporation.

There is no getting around the fact that rail freight transportation requires the consumption of tremendous amounts of diesel fuel. Manufacturers are steadily improving locomotive efficiency, but rather than just waiting for others to move ahead, NS is going beyond by developing our onboard technology, LEADER, to give engineers real-time feedback on how to operate trains with maximum fuel efficiency. By the end of 2013, LEADER was installed on more than 60 percent of our road fleet, and it promises to deliver measurable progress toward reducing our carbon emissions.

Recognizing that diesel or some fossil fuel is part of our foreseeable energy supply, NS has extended its carbon mitigation strategy through the efforts of sustainability partners in order to minimize or offset our impacts. Through carbon sequestration and watershed protection, forest habitats are important to the planet's health, and they represent opportunities for NS to contribute toward a better environment. Leveraging experience with our Brosnan Forest conservation property, NS is participating with GreenTrees in planting hardwood forests on previously cleared land in the Mississippi Alluvial Valley. The project is well ahead of its initial timetable to plant 6 million trees on 10,000 acres by 2016. We support the woodlands sustainability projects of other organizations as well, including The Longleaf Alliance, The Nature Conservancy of Virginia, and the American Chestnut Foundation. Collaboration with effective partners such as these helps sustain their work while supporting the economies and ecosystems of our rail service territory.

NS shares sustainability ideas, because doing so augments and sharpens our own thinking. Working with host partner GE Transportation, we co-sponsored our third annual railroad sustainability symposium in 2013. Attendees from 25 companies offered insights on a range of topics, including natural gas as a fuel alternative. For our fourth symposium in 2014, we welcome a new host partner, BNSF, as sustainability grows in significance across the rail industry. Additionally, as one of the first



**Wick Moorman, CEO,**  
Norfolk Southern

1

2

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

transportation companies to commit formally to sustainable business practices, we find ourselves in a position to share our experiences with smaller domestic railroads and carriers from other countries, such as Australia and New Zealand.

Norfolk Southern is proud of its long-term leadership in corporate responsibility and invites your review of the efforts outlined in this report.



**Wick Moorman**  
*Chairman and CEO*

## A leader in railroad innovation

CEO Wick Moorman began his railroad career as a co-op student in 1970 on the Southern Railway, a Norfolk Southern predecessor railroad whose motto was “Give a green light to innovation.” Since becoming Norfolk Southern’s CEO in 2005, Moorman has continued to promote that philosophy.

In 2013, the rail industry trade magazine *Progressive Railroading* presented Moorman with its Railroad Innovator Award, which recognizes an individual’s outstanding achievement in the rail industry. In an October 2013 cover story announcing the award, the magazine’s editor, Pat Foran, had this to say about Moorman:

“During his nearly eight-year run as chairman and CEO, Charles Wickliffe (Wick) Moorman has charted what’s shaping up to be a unique course for Norfolk Southern Railway. As constructively as any of his Class I counterparts, he’s embraced the link between technology, operating efficiency and productivity. He’s leading the charge to inculcate a safety culture change at his railroad. And he continues to push the partnership envelope in strategic rail corridors, brightening the railroad’s intermodal future and paving the way for new opportunities along the way.

“Ultimately, Moorman has prepared NS for what’s next, and that includes ensuring the railway is well-positioned for growth and service improvements. And he’s done it in his own way, in his own style.”

Read the full article [here](#).

## CSO LETTER

I am pleased to introduce Norfolk Southern's seventh annual sustainability report, which documents continuing progress toward excellence in environmental stewardship.

By objective and qualitative measures, we have made strides beyond the initial achievements of the formative years of our program, yet we are not content to rest on our early success. Rather, we are emboldened to demonstrate how our corporate commitment to sustainability is supported and leveraged by employees across our network.

In 2013, we built a foundation for deeper engagement with employees. Interacting with a digital communications strategy launched early in 2014, we made it easy for employees to tell us how they embrace sustainable lifestyles—at work and in their daily lives—and to share their improvement ideas with us. "Connections Challenge" is a platform for dialogue. It's one way we are continuing to engage the 29,000 people whose talents make Norfolk Southern a company of infinite possibilities—whether in safety, service, or corporate responsibility.

Over the past year, we have studied how to integrate sustainability into our day-to-day operations more fully. Some initiatives, such as a comprehensive energy review of the Juniata Locomotive Shop at Altoona, Pa., are in early stages. Led by our mechanical and real estate groups, we're looking at how we can transform an existing facility to accomplish work requirements more efficiently while lowering energy consumption and reducing operating costs. This effort, implemented through a series of capital projects, confirms the integration of environmental responsibility into the operating fabric of our company.

I invite you to read this report for other examples of how Norfolk Southern strives for continuous progress toward fulfilling our sustainability mission.



**Blair Wimbush**

*Vice President Real Estate and  
Corporate Sustainability Officer*



**Blair Wimbush, CSO,**  
Norfolk Southern

2

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

## ABOUT OUR REPORT



This is Norfolk Southern Corporation's seventh annual sustainability report. It details the railroad's corporate responsibility programs and sustainability performance data during calendar year 2013, unless otherwise noted.

The report discloses Norfolk Southern's environmental, economic, and social impacts to help stakeholders assess the company's commitment to corporate sustainability. Key impact areas covered include locomotive fuel efficiency and emissions; energy use; land and land conservation; waste management; water conservation; and engagement with stakeholders. Our stakeholders include employees, shareholders, customers, suppliers, government and nongovernmental organizations, industry partners, and communities served by the railroad.

The report's purpose is to offer transparency in Norfolk Southern's ongoing sustainability challenge: to achieve a healthy balance between our business imperatives as a publicly traded enterprise and our social commitments as a responsible corporate citizen to minimize and mitigate unavoidable environmental impacts of railroad operations. While respecting the interests of employees, communities, and the environment, the company strives to provide the most competitive freight transportation service for customers and solid returns for shareholders. Our long-term economic success requires that we meet present business needs without compromising the ability of future generations to meet their own needs.

In this year's report, the company changed the presentation of CO<sub>2</sub> emissions produced by our locomotive fleet, the railroad's largest source of greenhouse gas emissions. Based on Greenhouse Gas Protocol reporting standards, the company excluded biodiesel from CO<sub>2</sub> calculations. Details about the change are found in the Environmental Performance section of this report.

18

23

24

28

30

31

32

48

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

Norfolk Southern's formal sustainability program is managed by our corporate sustainability officer, a position appointed by the corporation's board of directors. The CSO reports to the chair of the company's Environmental Policy Council, which in turn reports to the chief executive officer. The council is composed of senior managers, including the CSO, and ensures that appropriate policies, procedures, and resources are in place to address environmental issues across our rail system, including activities deemed related to climate change.

This report was prepared under the supervision and direction of the CSO and was reviewed for accuracy and reliability by the CSO, an intra-departmental corporate sustainability team, and Norfolk Southern subject-matter experts. The company prepared this report in accordance with the Global Reporting Initiative's G4 Core Level reporting standards. GRI is a nonprofit organization that promotes environmental, economic, and social sustainability initiatives and has established a globally accepted framework for corporate sustainability reporting.

Norfolk Southern takes pride in the accomplishments noted in the report and is aware that challenges remain in achieving sustainability goals. As the company's sustainability journey continues to evolve, we pledge a commitment to responsible environmental, economic, and social stewardship.

Norfolk Southern welcomes feedback on the report and invites you to send comments and suggestions to [footprints@nscorp.com](mailto:footprints@nscorp.com).

## Third-Party Review

Auditing firm KPMG LLP reviewed Norfolk Southern's 2013 Greenhouse Gas Emissions Report. KPMG's review, conducted in accordance with accounting industry attestation standards, resulted in the issuance of a limited assurance report.

This is the third consecutive reporting year that Norfolk Southern has engaged an outside firm to review the company's greenhouse gas emissions information. Our aim is to add transparency to the railroad's disclosure of carbon emissions data for stakeholders, including employees, customers, investors, and communities we serve. Norfolk Southern has implemented controls and processes that we believe have resulted in credible data regarding the company's GHG emissions.

KPMG's assurance letter and the emissions data reviewed by the auditor are included in this report's Environmental Performance section.

- [\*\*Read the independent accountants' report and NS' 2013 GHG emissions report\*\*](#)
- [\*\*Review 2013 greenhouse gas emissions data\*\*](#)

## SUSTAINABLE TRANSPORTATION



### Rail's Environmental Advantage

Moving freight by rail offers an efficient, cost-effective, and immediate way to reduce U.S. greenhouse gas emissions. If only 10 percent of long-distance freight now moving by truck moved by rail instead, annual U.S. fuel savings would approach nearly 1 billion gallons and greenhouse gas emissions would fall by around 11 million tons, based on a comparative study of the fuel efficiencies of trains vs. trucks.

The independent study, conducted for the Federal Railroad Administration, shows that trains are the most environmentally friendly way to move freight over land. The [2009 study](#) revealed that trains are between 1.9 and 5.5 times more fuel-efficient than trucks—depending on the commodity being transported and length of haul—and generate up to two-thirds fewer greenhouse gas emissions.

Comparing trains and trucks on 23 different routes, the study found that rail fuel efficiency was higher than truck fuel efficiency on every route in terms of ton-miles of freight per gallon. Rail fuel efficiency varied from 156 to 512 ton-miles per gallon, while truck fuel efficiency ranged from 68 to 133 ton-miles per gallon.

The study provided a comparative evaluation of rail and truck fuel efficiency on corridors and for services over which both trains and trucks compete. Competitive moves were defined as those involving the same commodity and having the same or proximate origin and destination points. The study included a mix of short-, medium-, and long-distance movements; a mix of different commodities and different railcar and truck types; and a mix of geographic regions.

In addition, using trains instead of long-haul trucks helps reduce congestion on interstate highways. The Texas Transportation Institute's [2012 Urban Mobility Report](#) found that highway congestion annually wasted 2.9 billion gallons of fuel, generated 56 billion pounds of additional CO<sub>2</sub>, and carried financial costs of \$121 billion. About \$27 billion of that cost was attributed to wasted time and diesel fuel from trucks moving freight on the highway system.

## TRAINS VS. TRUCKS

ON AVERAGE, TRAINS:

are 4 times more fuel efficient

emit 75% fewer GHG emissions



## Shippers Recognize Rail's Eco-Friendly Benefits

More companies are strategically shifting their mode of product transportation to rail to reduce their supply-chain carbon footprint and achieve business sustainability goals.

In their corporate sustainability reports, some of Norfolk Southern's largest customers are making note of the move from trucks to rail and intermodal transport. Intermodal land transport typically involves rail for the primary move, with trucks providing short-haul moves for door-to-door customer pickup and delivery. Examples of our customers' shift to rail transport include:

- **BMW** in its [2013 Sustainable Value Report](#) said that the company is shifting to “low-carbon modes” of transportation where possible, reporting that the share of vehicles shipped by rail from BMW Group facilities increased to 60.7 percent in 2013, up from 56.9 percent the previous year.
- **J.B. Hunt** stated in its [Sustainable Innovations](#) report that converting over-the-road shipments to intermodal is part of its approach to sustainability. The trucking company estimated that converting to intermodal saves on average more than 200 gallons of fuel and 2 tons of carbon gas emissions per shipment.
- **Kimberly-Clark** stated in its [2012 Sustainability Report](#) that maximizing use of intermodal to transport its consumer products has reduced diesel fuel use by more than 100 gallons per shipment and carbon dioxide emissions by 2,600 pounds per shipment. The company said it has increased use of intermodal by 86 percent since 2006, reducing diesel fuel consumption by 66 million gallons and saving more than 700,000 tons of carbon dioxide equivalents.
- **Procter & Gamble** in its [2013 sustainability report](#) said the company has a 2020 goal to reduce truck transportation kilometers by 20 percent per unit of production versus its 2010 baseline. The company said it had reduced truck transportation kilometers by approximately 12 percent since 2010, in part by converting loads to intermodal—taking kilometers off the road to reduce pollution.
- **TJX Companies** in its [2013 corporate responsibility report](#) said it is reducing fuel costs and carbon footprint through expanded use of rail intermodal for shipping merchandise. The value retailer said that in the U.S., the company had increased the use of inbound intermodal to distribution centers from 30 percent of miles traveled in fiscal year 2008 to 69 percent of miles traveled in fiscal 2013. The company said it intends “to continue using this greener transportation alternative to reduce both our costs and logistics-related emissions” as U.S. rail service continues to improve.

- Unilever in its [2013 Sustainable Living plan](#) discussed using rail to help meet a 2020 CO<sub>2</sub> emissions-reduction goal. “Transporting our goods to markets by rail is an effective way for us to grow our business sustainably,” Unilever noted.
- UPS in its [2012 sustainability report](#) noted that trains provide a low-carbon transportation alternative to road and air transport, and said the company avoided 0.9 million metric tons of carbon emissions for the year by shifting delivery volume from ground to rail.

## 2013 SUSTAINABILITY HIGHLIGHTS



### Environmental Performance

#### GHG EMISSIONS

- After four years, Norfolk Southern reached nearly 79 percent of a five-year goal to reduce the company's greenhouse gas emissions by 10 percent per revenue ton-mile of freight
- Achieved best-ever carbon disclosure score in CDP's S&P 500 and Global 500 climate change reports

#### FUEL EFFICIENCY AND AVOIDED EMISSIONS

- Saved an estimated 10 million gallons of locomotive diesel fuel and avoided around 110,500 metric tons of GHG emissions through use of LEADER, a train-handling technology
- Launched plans to install electric plug-in locomotive heaters at rail terminals to further reduce unnecessary idling, saving on fuel and emissions and becoming the first Class I railroad to adopt a systemwide initiative using engine heaters

#### ENERGY EFFICIENCY

- Roanoke, Va., office building earned the EPA ENERGY STAR rating
- Invested \$1.2 million to replace outdated lights with more energy-efficient bulbs and fixtures and nearly \$900,000 to replace old HVAC systems with high-efficiency units

## CARBON CONSERVATION

- Completed 65 percent of the company's Trees and Train partnership with GreenTrees® to reforest 10,000 acres in the Mississippi Delta
- Collaborated with The Nature Conservancy in support of the largest longleaf pine reforestation effort in Virginia
- Received first transfer of carbon credits from Climate Action Reserve in Los Angeles for the railroad's Brosnan Forest longleaf pine preserve, receiving 300,000 carbon offset credits that can be traded through the California Air Resources Board cap-and-trade program

## WATER CONSERVATION

- Began operating a stormwater recycling system at the company's Lamberts Point Coal Terminal, reclaiming stormwater for use in facility processes and reducing use of municipal water supplies by an average of 1 million gallons a month

## WASTE MANAGEMENT

- Recycled 1.6 million gallons of recovered locomotive engine oil; more than 3 million crossties for energy recovery or landscaping; 1 million pounds of batteries; and 260,539 tons of scrap steel

# Economic Performance

## FINANCIALS

- Record year for operating revenues, net income, earnings per share, and operating ratio

## ECONOMIC DEVELOPMENT

- Helped customers locate 67 new industries and expand 25 existing industries, representing customer investment of \$2.3 billion, 3,100 new jobs, and more than 136,000 carloads of new rail business annually
- Partnered with the South Carolina Ports Authority to make rail service available to a new inland port in Greer, S.C., gaining new intermodal business moving parts and components for automaker BMW—a deal expected to remove 20,000 to 25,000 trucks a year from Interstate 26 between Greer and the Port of Charleston

## RAIL EFFICIENCIES

- Opened new regional intermodal facilities at Charlotte, N.C., and Greencastle, Pa., on the railroad's Crescent Corridor, expanding freight capacity and advancing our highway-to-rail conversion strategy
- Since the Heartland Corridor opened for double-stack intermodal traffic in fall 2010—cutting an average 250 miles of transit between Virginia port terminals and Midwest markets—the company estimates it has avoided consuming nearly 12 million gallons of diesel fuel and emitting 120,000 metric tons of CO<sub>2</sub>
- Administration buildings at Crescent Corridor regional intermodal facilities at McCalla, Ala., and Rossville, Tenn., were certified as meeting LEED (Leadership in Energy and Environmental Design) standards

## CAPITAL INVESTMENT

- Invested \$1.97 billion in capital projects, including rail and terminal improvements; locomotives; and technology to continue safe, reliable service, grow the business, and return value to shareholders

# Social Performance

## SAFETY

- The company's unionized workforce of approximately 24,000 agreement employees received training in behavior-based safety principles, with a focus on peer-to-peer efforts to enhance on-the-job safety; non-agreement employees received training in behavior-based leadership
- Employees at Roanoke Locomotive Shop reached 2 million consecutive employee-hours of working without a reportable injury, while employees at three other work locations reached 1 million consecutive hours of reportable injury-free service
- Serious workplace injuries declined by more than 5 percent

## JOBS

- Hired more than 1,000 employees

## COMMUNITY

- Four chapters of Thoroughbred Volunteers, the company's formal volunteer program, contributed more than 2,000 hours of combined volunteer service in their communities.
- Distributed charitable donations of \$12.8 million through combined Norfolk Southern Foundation and corporate giving, including grants to food banks, homeless shelters, free medical clinics, environmental and conservation organizations, cultural arts organizations, and educational organizations.

## 2013 AWARDS AND RECOGNITION



Norfolk Southern strives to be the rail industry leader in sustainability. Our corporate goal is to reduce and mitigate environmental impacts, to support the communities we serve, and to deliver unrivaled service to customers. We are honored and gratified when others recognize our efforts to improve and excel.

### ENVIRONMENTAL PERFORMANCE

- Achieved our best-ever CDP carbon disclosure score
- Earned sustainability award from Loudon County Economic Development Agency for Tennessee land-reuse project
- Earned an Elizabeth River Project distinguished performance award for stormwater recycling system in Norfolk, Va.
- Earned EPA ENERGY STAR rating for Roanoke, Va., office building

### ECONOMIC PERFORMANCE

- Named “Logistics/Transportation Provider of the Year” by American Metal Market
- Named among top three performing railroads on Soy Transportation Council's 2013 report card
- Named a Top 25 socially responsible stock by Dividend Channel

## SOCIAL PERFORMANCE

- Earned National Achievement Award from TRANSCAER® (Transportation Community Awareness and Emergency Response)
- Named a “Best for Vets” employer by Military Times EDGE magazine
- Listed among G.I. Jobs magazine’s “Top 100 Military Friendly Employers”
- CEO Wick Moorman received “Railroad Innovator Award” from Progressive Railroading
- EVP and CIO Deb Butler named “Outstanding Woman of the Year” by the League of Railway Industry Women
- Legal department earned “Virginia Strawberry Award” for food bank collections in the 2013 Legal Food Frenzy event
- Named Atlanta’s No. 3 healthiest large employer by Atlanta Business Chronicle
- Received United Way Gold Trailblazer Award for our Norfolk fund-raising campaign

# ENVIRONMENTAL PERFORMANCE



Norfolk Southern has developed a broad strategic approach toward responsible environmental stewardship. The company in 2010 set a five-year carbon reduction target, and we have invested in technologies and operational programs across the rail network to improve locomotive fuel economy, energy efficiencies at facilities, and movement of trains to reduce the railroad's carbon footprint.

As a responsible corporate citizen, the company strives to minimize and mitigate the environmental impacts of business operations on the communities we serve. Beyond managing operations, we work with private and public partners on reforestation and other conservation projects across our 22-state territory, from the Mississippi Delta and the mid-Atlantic to the Midwest and the Northeast.

The company's overarching goal is to be the rail industry leader in fuel conservation, emissions reduction, efficient energy use, recycling, and environmental partnerships.

## ENVIRONMENTAL AWARDS AND RECOGNITION

Achieved our best carbon disclosure score

Sustainability award for Tennessee land reuse

Distinguished performance award for stormwater recycling

ENERGY STAR rating for one of our office buildings

## IN THIS SECTION

ENVIRONMENTAL  
PERFORMANCE

CARBON

FUEL EFFICIENCY

FOLLOW THE LEADER

BEYOND LEADER: OTHER  
FUEL-EFFICIENCY  
INITIATIVES

LOCOMOTIVE REBUILDS

A BATTERY-POWERED  
ALTERNATIVE

ALTERNATIVE FUELS FOR  
THE FUTURE

ENERGY-EFFICIENCY  
EFFORTS

CARBON CONSERVATION

NS AND THE NATURE  
CONSERVANCY

BEYOND CARBON

ENVIRONMENTAL  
MANAGEMENT

MANAGING SOLID WASTE

CONNECTIONS

## CARBON



Norfolk Southern's absolute emissions of greenhouse gases increased in 2013 as business volumes grew. Strategic operations initiatives helped curb the rate of increase, including the use of technologies that improve locomotive fuel economy and increase the energy efficiency of office buildings and rail facilities.

**GOAL:** To reduce carbon emissions by 10 percent per revenue ton-mile between 2009 and 2014.

**STATUS:** By the end of 2013, the company had achieved nearly 79 percent of our goal, reducing emissions by 7.8 percent per revenue ton-mile.

**EMISSIONS GOAL STATUS** In 2010, Norfolk Southern set a five-year goal to reduce greenhouse gas emissions by 10 percent per revenue ton-mile by the end of 2014.

For this year's sustainability report, Norfolk Southern changed our presentation of CO<sub>2</sub> emissions, a primary greenhouse gas. To calculate the railroad's CO<sub>2</sub> emissions in 2013, we excluded the direct CO<sub>2</sub> emissions generated from the consumption of approximately 11 million gallons of biodiesel locomotive fuel. In past sustainability reports, we had included the plant-based fuel in our CO<sub>2</sub> calculations, giving it the same emissions weight as petroleum diesel, the company's main locomotive fuel source.

23

EN15

EN16

EN17

EN19

EN21

### GRI G4 DISCLOSURES

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The change is in accordance with Greenhouse Gas Protocol reporting standards. According to the Alternative Fuels Data Center, a resource for the U.S. Department of Energy, use of biodiesel actually reduces CO<sub>2</sub> emissions: CO<sub>2</sub> released during combustion is offset by the carbon dioxide captured while growing soybeans and other feedstock used to produce the fuel. The nearly 11 percent biodiesel mix the company purchases in Illinois to fuel locomotives at Chicago and Decatur rail facilities reduces CO<sub>2</sub> emissions by roughly the same percentage as the blend.

With biodiesel excluded from the CO<sub>2</sub> calculations, the company reports achieving nearly 79 percent of our goal by the end of 2013, the fourth year of our five-year goal.

The company included biodiesel use to calculate emissions of nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>)—the other primary components of fossil fuel generated greenhouse gas—because biodiesel combustion generates roughly the same amount of those gases as does petroleum diesel combustion.

**HOW WE MEASURE PROGRESS TOWARD OUR GOAL** Norfolk Southern calculates progress on our greenhouse gas reduction goal using revenue ton-miles, an accepted industry metric for measuring business activity. This provides a normalized basis to gauge progress regardless of business growth or decline.

The goal's baseline year came from 2009 performance data. That year, the railroad transported 158.5 billion revenue ton-miles of freight and produced emissions of 29.96 grams of CO<sub>2</sub> equivalents per revenue ton-mile. We rounded the baseline to 30 grams.

To meet the reduction goal of 10 percent per revenue ton-mile, emissions must be reduced to 27 grams per revenue ton-mile. For 2013, the company moved 193.5 billion revenue ton-miles of freight and generated 27.64 grams of CO<sub>2</sub> equivalents per revenue ton-mile.

We set the bar high by aiming for a 10 percent reduction, concluding that it would be better to be ambitious and fall short rather than set an easily achieved standard. Over time, the company aspires to achieve reductions in absolute emissions even as business volumes grow.

**IMPROVED CARBON DISCLOSURE SCORE** Norfolk Southern continues to make progress managing carbon, achieving our best-ever score on carbon disclosure in the CDP S&P 500 Climate Change Report 2013 and the CDP Global 500 Climate Change Report 2013.

The railroad scored 90 on a scale of 100 for carbon disclosure. That is a 2 percent improvement over the 2012 score of 88 and is the company's highest score in six years of participating in the voluntary CDP survey. Of 44 U.S. industrial-sector corporations in the CDP's S&P 500 report, Norfolk Southern was among 14 that scored 90 or higher.

CDP gave Norfolk Southern a performance grade of B, on a scale of A to E, on efforts to mitigate climate change and reduce greenhouse gas emissions. That matches performance in 2012 and 2011.

CDP, formerly known as the Carbon Disclosure Project, is an independent not-for-profit organization that supports greenhouse gas emissions reduction and sustainable use of water and forest resources.

“We are taking a comprehensive, strategic approach to reduce emissions. We are committed to maintaining a high-quality system that leverages freight rail’s inherent efficiencies in support of the economy, less highway congestion, and lower overall fuel consumption and greenhouse gas emissions.”

**Blair Wimbush**, *vice president real estate and corporate sustainability officer*

**2013 CARBON FOOTPRINT** During 2013, Norfolk Southern Corporation generated 5.35 million metric tons of greenhouse gas emissions. The total includes 5.09 million metric tons of direct Scope 1 emissions from business operations; 260,792 metric tons of indirect Scope 2 emissions from the generation of purchased energy; and 6,346 metric tons of indirect Scope 3 emissions from employee travel and energy use at leased facilities.

Scope 1 emissions were generated primarily by the company’s diesel-burning locomotive fleet, accounting for 90 percent of total emissions. Scope 2 emissions, 5 percent of the total, were derived from the company’s use of purchased electricity to heat, cool, and light office buildings and railroad facilities. The calculated Scope 3 emissions were associated with employee business travel, by air and in personal vehicles, and with the company’s electricity use at leased facilities.

The railroad’s absolute emissions of greenhouse gases increased 3.3 percent over 2012 emissions. We attribute the increase primarily to three factors. Chief among them was a 4.3 percent increase in revenue ton-miles, reflecting an increase in business volumes that drove up year-over-year use of diesel fuel by 5 percent. Another factor was a continuing change in business mix that resulted in an increase of high-velocity intermodal freight and a decline in coal carloads. Locomotives pulling time-sensitive intermodal freight typically operate at higher horsepower, thus consuming more fuel, to meet customer service demands. Heavy coal trains, which operate at slower speeds and over downhill routes from mountain mining sites, are among the most fuel-efficient. The third factor was weather-related rail traffic congestion caused by snow, ice, and storms.

**AVOIDING CARBON EMISSIONS** Strategic efforts to improve fuel and operating efficiencies helped offset the rise in absolute emissions. For example, the emissions increase was 1 percentage point below the growth in revenue ton-miles, a difference attributed to the company’s emissions-reduction strategies. In one key initiative, the railroad estimates that locomotives equipped with LEADER, a train-handling technology, saved more than 10 million gallons of diesel during the year. That translates into an equivalent CO<sub>2</sub> avoidance of around 110,500 metric tons.

Overall, the company projects that fuel-efficiency initiatives resulted in avoided emissions of about 2.6 percent.

#### CDP SCORE

90/  
100

for carbon disclosure

NORFOLK SOUTHERN 2013 EMISSIONS (IN METRIC TONS CO<sub>2</sub>E)

	Scope 1	Scope 2	Scope 3
CO <sub>2</sub>	5,040,534	259,429	6,327
CH <sub>4</sub>	9,832	110	2
N <sub>2</sub> O	37,949	1,253	17
HFCs	0	0	0
PFCs	0	0	0
SF <sub>6</sub>	0	0	0
<b>SUBTOTAL</b>	<b>5,088,315</b>	<b>260,792</b>	<b>6,346</b>

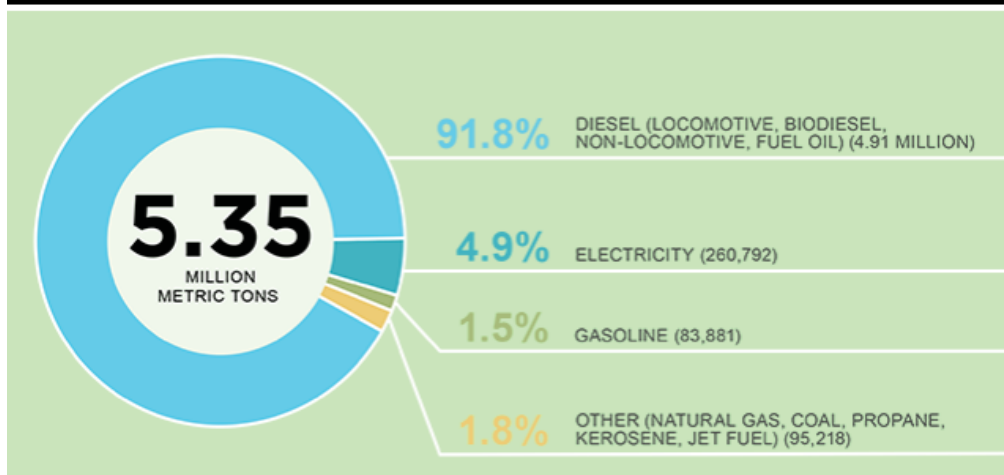
**Total 5,355,453 MT CO<sub>2</sub>e**  
total CO<sub>2</sub> equivalent emissions

Auditing firm KPMG LLP reviewed the raw data and methodologies that Norfolk Southern followed to calculate the company's 2013 greenhouse gas emissions, as presented in the above chart of the railroad's CO<sub>2</sub> equivalent emissions. To read the assurance letter provided by KPMG, please [click here](#).

## NORFOLK SOUTHERN EMISSIONS

	2009	2010	2011	2012	2013
Total Scope 1 and Scope 2 emissions of carbon dioxide equivalents (MILLION METRIC TONS)	4.7	5.2	5.4	5.18	5.34
Emissions per revenue ton-mile (GRAMS)	29.96	28.78	28.78	27.93	27.63
Total revenue ton-miles of freight moved (BILLIONS)	158.5	181.9	191.7	185.6	193.55
Total railway operating revenues (BILLIONS USD)	7.9	9.5	11.2	11.0	11.24

## PERCENTAGE OF CARBON DIOXIDE EMISSIONS BY SOURCE



## FUEL EFFICIENCY



### Fuel Economy: A Key Sustainability Challenge

Locomotives generate all but about 10 percent of the company's total CO<sub>2</sub> emissions. For that reason, these workhorses are a main focus of Norfolk Southern's sustainability efforts.

The pursuit of fuel efficiency and lower emissions goes beyond reducing the company's environmental impact. In 2013, our locomotive fuel bill was around \$1.4 billion—one of the largest operating expenses. Figuring out ways to cut that expense is simply good business.

An accepted industry metric to gauge locomotive fuel efficiency is expressed in revenue ton-miles. RTMs are calculated by multiplying total tonnage of paid freight by the number of rail miles moved. The average fuel economy per ton of freight is calculated by dividing total RTMs by the total gallons of fuel consumed. The resulting number is the railroad's basic unit of production in terms of moving freight.

In 2013, Norfolk Southern trains rolled up 193.5 billion revenue ton-miles while burning more than 479 million gallons of diesel and biodiesel fuel. That means, on average, our locomotives moved a ton of freight 404 miles on one gallon of diesel. That's compared with 407 miles in 2012. The slight fuel-efficiency drop—less than 1 percent—is attributed largely to weather-related conditions, such as snow and storms that caused rail delays, and a changing traffic mix that included more high-velocity intermodal traffic and fewer unit coal trains.

Increased 2013 business volumes led to a 5 percent increase in overall fuel consumption. However, locomotive fuel use on a relative basis has trended downward by about 1 percent annually over the past five years as the railroad has deployed technologies to improve operating efficiencies. We helped pioneer LEADER, for example, a cutting-edge technology that prompts locomotive engineers on optimal train speed to achieve maximum fuel economies.

In addition to LEADER, the company has adopted initiatives that directly or indirectly contribute to fuel and carbon-emissions savings. They include:

- **Idle-reduction technologies for locomotive engines**
- **An in-house locomotive recycling program to equip older units with more fuel-efficient and cleaner-burning engines**
- **Alternative-fuel technologies, including battery-powered electric locomotives**
- **Track wayside sensors that improve fuel economy while reducing maintenance costs**
- **Dispatcher technologies such as Unified Train Control System and Movement Planner**

## FOLLOW THE LEADER



### LEADER Boosts Fuel Economy

In 2003, Norfolk Southern began testing a new train-handling technology on locomotives that moved coal on a 105-mile stretch of hilly, curvy track in the Blue Ridge Mountain foothills between Roanoke, Va., and Belews Creek Steam Station near Winston-Salem, N.C.

In mid-2013, the railroad reached a milestone: Every division on the network had the ability to run locomotives outfitted with LEADER, our flagship fuel-efficiency technology. LEADER—or Locomotive Engineer Assist/Display Event Recorder—is helping the company reduce locomotive fuel burn and carbon emissions.

The fuel savings achieved vary depending on train makeup, track profile, and speed. On average, an approximate 5 percent fuel-efficiency advantage has been achieved when a LEADER-equipped locomotive is used as the lead unit in a consist of locomotives. Coleman Lawrence, senior director process engineering, shared results with the industry at a November 2013 conference hosted by New York Air Brake, which developed the LEADER software with input from Norfolk Southern.

“With average fuel savings in the mid-single digits and an annual fuel burn approaching 500 million gallons, 5 percent saves NS 25 million gallons of diesel fuel,” Lawrence said. “At today’s prices, that is nearly \$75 million a year.”

Reducing diesel burn by 25 million gallons would equate to lowering CO<sub>2</sub> emissions by about 277,500 tons annually.

By end of 2013, LEADER was installed on 63 percent of the railroad’s road locomotives. The GPS-based software that powers LEADER processes train-operating conditions in real time—including track topography, curves, and train length and weight—and calculates optimal speed for those conditions. A LEADER monitor in the locomotive cab offers visual and audio cues

that alert engineers to opportunities to save fuel. During 2014, we expect to finish training all of the company's approximately 7,000 locomotive engineers on the use of LEADER.



"Conserving fuel has a positive impact on the corporation's bottom line and it reduces our greenhouse gas emissions and environmental impacts," Collins said.

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

## Employee's Ingenuity Speeds LEADER Rollout

Call Jonathan Collins a computer geek, and he will laugh. He'll also agree with you: In his job as Norfolk Southern's manager of locomotive systems and special projects, the moniker comes with the territory.

Since early 2011, Collins has managed the development and deployment of LEADER. Thanks in large part to Collins' technical ingenuity, the railroad in 2013 rapidly accelerated the territories capable of supporting LEADER-equipped trains, going from 2,500 track route miles in 2012 to 14,500 route miles—all of the railroad's line-of-road territories.

In his role, Collins helped Norfolk Southern customize LEADER to software developed by industry partner New York Air Brake. While the onboard LEADER system is easy for locomotive engineers to use, there's a lot of complexity behind the user screen. That's where Collins made his mark.

LEADER, Collins said, essentially is a physics engine, powered by algorithms that calculate optimum train speed based on track topography and dynamic train forces. For LEADER to work, Norfolk Southern first had to digitally map its rail network to collect the track topography information. In 2009 and 2010, the company deployed helicopters outfitted with infrared laser technology and precise GPS systems to do that. This aerial "fly-mapping" generated a series of latitude and longitude points along with elevations, accurate to within an inch. The infrared lasers and GPS-based camera systems recorded data points every three feet over roughly 16,000 route miles of track, generating a massive amount of raw data.

Collins and his team had the challenge of figuring out how to efficiently convert all those data points into information that could be integrated into LEADER. Before LEADER could accurately prompt engineers on train handling, the software had to be able to identify the precise location of curves, for instance, and the track elevation as a train passed over the rails.

"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 grade, and turnout."

Collins' solution combined technology and innovation. It involved 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 Norfolk Southern's timetables—the “bible” for locomotive engineers. These timetables 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. In addition to collaborating with railroad operations and information technology groups, Collins served as liaison to New York Air Brake. Even now, Norfolk Southern is continuing efforts to advance LEADER's capabilities.

“We want to be forward-thinking in how we do business,” Collins said, “and we're looking at tools and techniques that might be introduced and leveraged with LEADER to advance fuel conservation and train movements.”

Collins said he gets personal satisfaction from his LEADER work because the outcome has environmental, economic, and social benefits.



## How a Locomotive Engineer Uses LEADER to Do His Job Better

Locomotive engineer Raiford Wilson has operated trains for 27 years for Norfolk Southern. Before using LEADER for the first time four years ago, he was skeptical. “I felt that I knew how to run a train, and I didn't need something to tell me how,” said Wilson.

After only a few road trips with LEADER, however, he began to recognize the value of the train-handling technology. “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.

Initially, the most difficult thing for Wilson was when LEADER prompted him to do things that contradicted the way he normally operated a train—such as when driving one up a steep grade. Typically, Wilson said, engineers would run the locomotive's throttle on maximum power to reach the top of the grade and begin braking or notching back on throttle speed after cresting the hill. LEADER, however, prompts engineers to reduce speed before reaching a hilltop, letting the train's

momentum carry it over. As it turns out, that technique burns less fuel and reduces use of dynamic brakes or air brakes, which helps reduce wear and tear on the track.

In another example, while engineers might run their trains at the maximum allowable track speed, LEADER might prompt them to notch back based on track elevation or curvature.

“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.”

Now that he recognizes the benefits, Wilson and other engineers he knows work to outsmart LEADER. During road trips, they try to adjust speed or braking before LEADER gives them a prompt on the cab monitor, such as “Fuel Conservation Opportunity—Reduce Throttle.”

“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 one-way trip of about 135 miles. Wilson said he has seen fuel savings of 5 to 8 percent per trip with LEADER. He became such a believer that he was tapped in 2013 to help train other engineers on using the technology.

Wilson said he takes pride in helping the company save money on fuel while benefitting 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.”

## BEYOND LEADER: OTHER FUEL-EFFICIENCY INITIATIVES



Norfolk Southern has identified multiple opportunities to improve locomotive fuel efficiencies. Some do not directly involve locomotives, but instead feature innovative technologies that improve the efficiency of operations.

In addition to LEADER and locomotive rebuild programs, the company's primary fuel-efficiency initiatives include:

### Reduced Train Idling

More than 70 percent of locomotives have been equipped with idle-reduction technologies to eliminate unnecessary idling. More than 2,300 locomotives are outfitted with an automatic engine stop-start microprocessor system that monitors engine and ambient air temperature, among other parameters, and shuts off or restarts engines without operator action.

In 2013, Norfolk Southern launched a plan to equip rail yards in Chicago, Kansas City, Mo., and northeastern Ohio with electric plug-in locomotive engine heaters. Using the heaters, engines can be shut down and kept warm for extended periods without having to be restarted when temperatures drop. (Locomotives do not use antifreeze, meaning they must be kept warm to prevent engine damage in freezing weather.)

In addition to use of technologies, the railroad has an idle-reduction policy in place that requires shop and terminal employees to shut off locomotives unless there is an operational need for them to remain idling.

## Rail Lubricator Systems

Norfolk Southern's Research and Test Department in Roanoke, Va., has worked with industry partners to pioneer rail lubrication technologies that reduce fuel burn and track maintenance costs by reducing the friction between locomotive and railcar wheels and rails.

A major initiative has involved solar-powered top-of-rail friction-modification systems that dispense a liquid friction-modifier on rail surfaces. The liquid modifier is picked up by passing wheels, which reduces downstream wheel-rail friction. The systems are being installed on routes with heavy curvature, helping to reduce rolling resistance and thus the energy needed to pull a train. Rail corridors equipped with these systems generate an estimated 2 percent in fuel savings, in addition to reducing maintenance costs on both tracks and wheels. Because they are solar-powered, the systems can be placed in remote locations where commercial power is unavailable. By the end of 2013, the company had installed 965 of these systems, including 51 during 2013.

In addition, Norfolk Southern in 2013 installed 65 solar-powered gage-face rail lubricators, which dispense grease onto passing wheel flanges to reduce friction between the flanges and the inside face of the rail—the gage—on curves.

## Wayside Detecting Systems

Norfolk Southern has helped develop remote-sensing wayside detectors that promote fuel conservation while enhancing safety and reducing track maintenance. In 2013, the company installed two acoustic wheel-bearing detectors, a new technology that can predict future bearing failures based on noise signatures of rolling wheels. Acoustic detectors offer an operating efficiency compared with conventional temperature-based detectors, which identify problem bearings only after they have started to fail. In those cases, the company loses time and burns fuel unproductively in stopping trains en route to remove a railcar with a defective bearing.

The acoustic detectors, costing upwards of \$450,000 each, identify issues early enough that a train can proceed to destination, where a railcar can be removed without disrupting traffic flow. We validated the acoustic detectors under criteria established by the Association of American Railroads. The company now has a total of three on some of the busiest main lines: between West Virginia coal mines and Lamberts Point Coal Terminal in Norfolk, Va.; between Cincinnati, Ohio, and Chattanooga, Tenn.; and between Bellevue and Columbus, Ohio.

## New Locomotive Purchases

Over the past three years, we have purchased 200 new fuel-efficient alternating-current locomotives, including 50 in 2013. The AC units, which power electric traction motors with alternating instead of direct current, provide superior tractive effort on heavy unit trains, including those moving coal, grain, and crude oil. At low speeds, two AC locomotives can perform the work of three DC units, significantly improving productivity and delivering the economic and environmental benefits associated with reducing the number of diesel engines used in operations.

## Distributed Locomotive Power

In recent years, Norfolk Southern has expanded use of distributed power, a technique that involves placing locomotives at intermediate points on a train to distribute pulling power. Lead locomotives are outfitted with equipment to remotely control the other locomotives. The technique primarily is

used on heavy unit trains to reduce train drag and lateral wheel-to-rail forces to maximize fuel efficiency.

## Low-Torque Bearings

Norfolk Southern several years ago began equipping railcar wheels with low-torque roller bearings at wheel renewal change-outs. The bearing manufacturer estimates fuel savings of 1 to 2 percent compared with the older bearings they replace.

## UTCS and Movement Planner

Unified Train Control System and Movement Planner technologies are train dispatch systems that expand a dispatcher's view of train movements from a single territory to a systemwide perspective. These technologies promote operating efficiencies that help avoid traffic congestion and train delays that can cause excessive idling, fuel burn, and emissions.

In 2013, the company completed rollout of UTCS on all 11 operating divisions, providing the company with an integrated dispatch system. UTCS, an approximately \$70 million investment, replaced a hodgepodge of legacy dispatch systems that functioned differently and did not communicate with each other. UTCS offers a "track line" view that employees can access on a laptop or iPad, a feature that helps improve efficiency of operations, such as scheduling track maintenance times.

NS has worked to develop and refine UTCS and Movement Planner with industry partner GE Transportation, the manufacturer of both technologies. UTCS provides a platform for Movement Planner, a software that analyzes thousands of pieces of information and plots the most efficient, cost-effective train moves across a railroad's network. By mid-year 2014, Movement Planner was operational on all or parts of six divisions, and rollout continues.

## LOCOMOTIVE REBUILDS



### One ‘Big’ Recycling Project

Don Faulkner, Norfolk Southern’s general superintendent locomotive shops, describes the company’s locomotive rebuild program as the “ultimate in recycling.” However it is described, the program has developed into a successful business model while enhancing the company’s sustainability efforts.

The program is giving new life to locomotives built from the 1970s to the 1990s through a combination of recycling and modernizing. Existing steel platforms, wheel assemblies, traction motor frames, and engine blocks of these older locomotives are reused. Through employee innovation and ingenuity, the engines are upgraded with reconditioned parts and digital-era technologies that improve fuel efficiency and reduce emissions, including carbon, particulate matter, and nitrogen oxide. The made-over locomotives are known as “E” models—for “enhanced.”

The end result are cost-efficient, cleaner-burning, and more user-friendly locomotives for train crews that will serve the railroad for another 15 to 20 years. With these rebuilds, the company is reducing operating costs and impact on the environment.

In 2013, employees at the railroad’s two heavy-repair locomotive facilities—the Juniata shop in Altoona, Pa., and the Roanoke shop in Roanoke, Va.—worked on rebuild projects that spanned a half-dozen locomotive models including yard, local, and line-of-road engines. The rebuild program includes locomotives manufactured by the two largest locomotive builders, Electro-Motive Diesel and GE Transportation.

### The SD60E: A Model of Sustainability

One of Norfolk Southern’s most ambitious locomotive rebuild projects involves SD60E long-haul locomotives. These 4,000-horsepower units are rebuilds of 1980s-era SD60s manufactured by EMD.

Juniata shop employees rolled out the first SD60E in 2010 and expect to rebuild at least 150 of them. By rebuilding instead of buying new, the company anticipates cost savings of around \$240 million. By end of 2013, about 60 of the SD60Es were pulling trains across the network.

Engine upgrades have improved fuel efficiency by about 7 percent compared with the original SD60 engines. That translates to annual diesel-fuel savings of 15,000 to 20,000 gallons and about 224 fewer tons of carbon dioxide emissions per locomotive. For 60 SD60Es, that amounts to annual savings of around 1.2 million gallons of diesel and 13,340 tons of carbon dioxide emissions.

In December 2013, Norfolk Southern received a U.S. patent for the design of one of the SD60E's key engine enhancements, a dual-circuit engine-cooling system dubbed "split cooling." Two employees based at Juniata were the brains behind the system—Don Faulkner, general superintendent, and Bill Thompson, a mechanical supervisor, self-described "old hot rodders" who draw inspiration from high-performance racing engines.

In another key development, the U.S. Environmental Protection Agency in May 2013 issued Norfolk Southern a "certificate of conformity" that will enable the company to build and install custom-made emission kits for the SD60Es. Norfolk Southern applied for the certificate after completing construction in 2012 of an indoor emissions-testing facility at Juniata. The two-story testing facility, one of a handful of its kind in the United States, allows us to quickly test a variety of engine designs and fine-tune components for maximum fuel economy and emissions reduction.

## The Anatomy of an SD60E

The SD60Es feature engine technologies that achieve optimal fuel economy while reducing emissions. We've also added creature comforts for train and engine crews. Similar upgrades are incorporated into the rebuilds of other locomotive models.

Here are six key enhancements that put the "E" on the rebuilt SD60s:

**ELECTRONIC FUEL INJECTION:** Operated by a new microprocessor system, the electronic fuel-injection distributes fuel more precisely to engine cylinders, requiring less fuel to achieve power. The injection system improves engine efficiency and enables shop employees to fine-tune the engine for maximum fuel economy. In turn, emissions are cleaner—in particular, engine opacity, or smoke, and particulate matter are reduced.

**DUAL-CIRCUIT ENGINE COOLING:** This Norfolk Southern-patented radiator system works with the engine's primary radiator to cool intake air and radiator jacket water. The split cooling concept lowers engine-water temperature an additional 40 to 50 degrees, which improves fuel economy and reduces emissions at higher throttle speeds while providing a boost to horsepower. In particular, emissions of nitrous oxide and hydrocarbons are reduced.

**AUTOMATIC ENGINE STOP/START:** Controlled by the new microprocessor system, the stop/start feature reduces unnecessary engine idling. Sensors shut off and restart engines based on engine temperatures.

**LARGER CREW CAB:** Constructed of high-strength steel, the new cab, designed in-house by Don Faulkner, general superintendent, and Barry Wertz, manager locomotive overhauls, is one of the roomiest ever built. For added creature comforts, the cab features a padded floor and ceiling, sun visors, a conductor console table, and an air-controlled stainless-steel restroom.

**LEADER:** The Locomotive Engineer Assist Display Event Recorder train-handling system, or LEADER, is being installed on all of Norfolk Southern's long-haul locomotives. The GPS-based system calculates and displays in real time the optimum train speed for achieving maximum fuel efficiency.

**POSITIVE TRAIN CONTROL:** Known as PTC, this advanced technology is designed to automatically stop or slow a train to prevent accidents, including collisions with other trains and derailments caused by excessive speed. At present, PTC remains under development. In the meantime, Norfolk Southern is equipping the SD60Es and other road locomotives with the hardware required to run PTC. Eventually, all Class I railroads must install the congressionally mandated PTC system on tracks they share with passenger trains or that are used to move federally regulated toxic-by-inhalation materials. Norfolk Southern plans to integrate PTC and LEADER into a seamless software operating system.



## Our Stable of Rebuilds

In addition to the SD60Es, Norfolk Southern's other locomotive rebuilds include:

**SD40E:** These 3,000-horsepower units, rebuilds of 1980s EMD SD50 six-axle locomotives, are used as "helper" engines in mountainous terrain and on track maintenance-of-way work trains. Equipped with new microprocessor control systems and upgraded engines, the SD40Es are reliable workhorses that burn less fuel with their reduced-horsepower engines.

**GP40-2 AND GP40 MOTHER/SLUG SETS:** These combo units are rebuilds of 1970s and 1980s EMD GP38 and GP40 locomotives. The "slug" units do not have engines but are equipped with traction motors to provide propulsion power. The concrete-filled slugs are paired with four-axle GP40-2 "mother" units featuring reconditioned 3,000-horsepower engines that provide electrical power to turn the traction motors. Together, a GP40-2 and companion slug can provide nearly the same pulling power of two 2,000-horsepower GP38-2 locomotives at slow speeds and consume 40 to 45 percent less fuel.

**GP59E MOTHER UNITS:** These rebuilds of 1980s EMD GP59 units are intended for yard work and local delivery runs. They feature a new microprocessor control system, electronic fuel injection, a low-emissions engine, and the patented split-cooling system.

**MP15E:** These rebuilds of 1970s and 1980s EMD MP15 DC units are used to switch railcars in yard operations. They are being upgraded with electronic fuel-injection to increase fuel efficiency and reduce emissions. The company also has developed a turbocharged prototype MP21E locomotive with a 2,000-horsepower engine that competes with the GP38-2 model.

**DASH 8.5:** These rebuilds of 1989 and 1990 Dash 8 locomotives are the first rebuilds of older GE locomotives. The first of the 4,000-horsepower Dash 8.5 units is expected to roll out of the Roanoke shop in 2014. These units feature enhancements similar to those on SD60Es. They also are being equipped with a novel AC-power feature that will convert them into mobile generators for use by rail terminals that lose power during hurricanes or other storm events.

## A BATTERY-POWERED ALTERNATIVE



### NS 999: Generation 2.0

#### THE NEXT STEP IN BATTERY-POWERED LOCOMOTIVES

In the quest to conserve fuel and reduce emissions, Norfolk Southern has pioneered industry efforts to develop battery-powered locomotives.

Currently, the company is working on the second generation of our NS 999 electric prototype four-axle switcher locomotive. The NS 999, built on a reused 1969 Electro-Motive Diesel GP 38 platform, is designed to switch railcars in yard operations and is the first all-battery locomotive of its type. In addition to the NS 999, the company continues to research development of a hybrid electric six-axle long-haul locomotive.

Since work on the NS 999 began in 2007, Norfolk Southern has received three U.S. patents related to locomotive battery technologies. The latest, issued in February 2014, covers designs for a hybrid electric line-of-road locomotive equipped with a regenerative braking system to capture and reuse energy generated during dynamic braking. In one configuration, a battery-tender could be positioned between two diesel-electric locomotives to store the captured energy, using braking energy to recharge batteries and to power traction motors. A locomotive's traction motors, which generate pulling power, are used in dynamic braking on hilly terrain to maintain safe speeds. On conventional locomotives, the braking energy generated—up to 3 megawatts of power—is blown off as heat through a resistor grid. Our eco-friendly hybrid approach to capture and reuse this energy to power traction motors would conserve diesel fuel and reduce emissions.

Since publicly introducing the NS 999 in 2009, the company has continued testing and refining the prototype to resolve technical operating challenges. The next-generation NS 999 will feature advanced lead-carbon hybrid batteries that replace conventional lead-acid batteries; a new modular container system to house the batteries; and a more technologically advanced battery management system.

Our development team has conducted around 300 simulated switcher cycles on a new battery-power system at the company's testing lab in Roanoke, Va. In a partnership with Norfolk Southern, scientists at Penn State University's Transportation Institute have done separate testing.

"Our testing shows that the systems are working as designed and that the batteries should have a long life in the locomotive," said Gibson Barbee, our senior energy engineer.

Mechanical Department employees at the Juniata Locomotive Shop, who assembled the original NS 999, are outfitting the updated locomotive. If all goes as planned, the new and improved 999 will be ready for field testing in the summer of 2014.



Barbee has become philosophical about the ultimate outcome of his efforts, recognizing that Norfolk Southern might not revolutionize rail transportation as he once envisioned. He believes the groundbreaking work he's involved in will help define whether locomotive energy-storage systems are economical and at what cost point they could compete with diesel fuel. The research has been supported by the Federal Railroad Administration and the U.S. Department of Energy, he added.

"All of the work we've done is necessary to develop an economically feasible hybrid locomotive," Barbee said. "This

research is a long-term effort. It is one of the many applications on Norfolk Southern that will help us achieve our sustainability goals."

## A PERSONAL QUEST TO IMPROVE THE PLANET

Gibson Barbee studied environmental engineering in college for the most idealistic reason: "I wanted to make the planet a better place," he said. Barbee has since tempered his expectations of saving the planet. He is, however, working on making a difference.

Barbee, Norfolk Southern's senior energy engineer, helped launch our research into battery technologies and has been involved in every stage of development of the NS 999 prototype battery-powered switcher locomotive.

"It's consumed the last five years of my professional life—and a lot of nights and weekends. I know every curve on I-81 between Roanoke and Altoona," he said, referring to the five-hour drive between his office in Roanoke, Va., and the Juniata Locomotive Shop in Altoona, Pa., where the NS 999 has been assembled and field-tested. "It's been a real learning experience. I feel I have the best job on the railroad, getting to pursue locomotive energy storage and constantly defining and solving problems."

When he joined Norfolk Southern in 1994, Barbee handled compliance issues for operating facilities that required state and federal air-emissions permits. After the U.S. Environmental Protection Agency adopted rules regulating locomotive emissions a few years later, Barbee worked with the company's Mechanical Department on the most efficient and effective ways to meet the standards. He was manager of continuous improvement in the Research & Tests Department when approached about working on NS 999.

"That was really exciting to me," Barbee said. "You think about trains as the most efficient mode of surface transportation, and if we are effective in developing locomotive energy storage, we have an

opportunity to further improve our efficiency and to provide cleaner air, especially in urban areas. This is all about emissions and emissions savings.”

The NS 999 generates zero emissions when running, giving it many advantages, including elimination of criteria pollutants such as ultrafine particulate matter and nitrous oxide emitted by conventional locomotives.

While Barbee knows a lot about emissions, he had little technical knowledge of battery technologies when he started on the project. Now, his office bookcase is stuffed with titles such as “Alternate Energy Systems,” “Electric Machines,” and “The Handbook of Batteries.” Because Norfolk Southern was treading new territory for the rail industry, very little was published on battery-powered locomotives. Now, Barbee could write a book about the challenges involved.

He has spent much of the past five years trying to perfect the use of long strings of batteries and of battery management systems, and figuring out how to capture, store, and reuse the energy released by locomotive traction motors during dynamic braking.

“I would say that we underestimated the difficulties involved,” Barbee said. “We felt we could do it in a couple of years, and we were overly optimistic.”

Based on lab tests of more advanced batteries and an upgraded battery management system, Barbee is confident that NS 999 2.0 will perform as expected during anticipated field trials in 2014. Whether or not it will lead to an affordable alternative to diesel-powered switchers is another question.

## ALTERNATIVE FUELS FOR THE FUTURE



Norfolk Southern's interest in alternative locomotive power is not limited to battery technologies. The company is committed to exploring and developing alternatives that are cleaner-burning, more fuel-efficient, and less expensive than petroleum diesel and that also promote U.S. energy independence and homegrown fuel sources.

The company's Mechanical Department, for example, is looking at the opportunities and challenges involved in using liquid natural gas to fuel locomotives. That possibility has drawn widespread interest within the rail industry, as new drilling and recovery technologies have expanded U.S. production and supplies of the relatively low-cost domestic resource.

In 2010 in Illinois, the railroad partnered with locomotive maker Electro-Motive Diesel to do extensive testing on biodiesel blends, including soybean-based additives. Since mid-2011, Norfolk Southern has used an approximately 11-percent biodiesel blend to fuel locomotives operating out of the Chicago and Decatur terminals.

In 2013, the company used around 11 million gallons of biodiesel for Illinois operations, taking advantage of state and federal tax credits that offset the higher production costs associated with biodiesel versus petroleum diesel. According to the Alternative Fuels Data Center, use of biodiesel reduces greenhouse gas and other emissions associated with petroleum diesel. In 2012, Norfolk Southern began an experiment at our Meridian, Miss., terminal fueling locomotives with a synthetic biodiesel made from waste animal fats and grease. Norfolk Southern was the first U.S. railroad to use the 100 percent biodiesel fuel. However, the terminal resumed fueling locomotives with petroleum diesel during 2013 after the Louisiana plant supplying the biodiesel was idled by its owner in late 2012.

## ENERGY-EFFICIENCY EFFORTS



In 2013, energy purchased to heat, cool, and light office buildings and rail facilities accounted for 5 percent of Norfolk Southern's greenhouse gas emissions—our second-largest source of emissions. The company has strategies to reduce energy consumption, including ongoing programs to upgrade yards and shops with more energy-efficient lighting systems and to replace aging heating and cooling systems with high-efficiency units.

In 2008, the company launched a long-term program to install technologically advanced lighting and fixtures in 600 offices, shops, rail yards, and facilities at 300 locations. Since that effort began, we have installed more than 96,000 more-efficient bulbs and fixtures.

### 2013 Energy Savings Projects

Norfolk Southern's energy services group continually looks for ways to reduce power consumption at company facilities, which generate more than 24,000 utility bills every month across 22 states. While tracking energy use at these far-flung locations is challenging, the payoff can be significant.

## Lighting Upgrades

In 2013, the railroad invested \$1.2 million to replace outdated lights at six shops, yards, and terminals. The projects have reduced energy consumption for lighting these facilities by an estimated 60 percent.

In late 2012, energy services initiated an energy audit program to analyze the railroad's biggest spenders on electricity. To start, electricity submeters were installed at Norfolk's Lamberts Point coal transload facility, which spends about \$1 million annually on electricity, and at our Roanoke, Va., office building. The goal was to identify the areas of operations that consume the most electricity and look for opportunities for savings.



"Monitoring allows us to see in real time the changes we make by turning on and off equipment," said Jordan Plikerd, superintendent of facilities. "The submetering data helped us identify certain pieces of equipment that were staying on when they were in the 'off' position."

Correcting those discrepancies helped the Roanoke office building earn an ENERGY STAR rating in 2013.

## HVAC Replacements

In 2011, Norfolk Southern launched a program to replace heating and cooling systems that were 15 years old or older or that were mismatched to facilities. Work on that initiative continued in 2013, with more than \$839,000 invested to replace 61 pieces of equipment with high-efficiency HVAC units. We estimate the replacements will reduce annual HVAC operating costs at these facilities by 43 percent.

Energy services also has introduced centralized online utility manager software that allows site managers across the system to track electricity and water usage at their facilities. The software helps managers determine what drives energy usage and pinpoint possibilities to reduce consumption, said Andy Paul, manager energy services.

"You can't manage consumption," Paul said, "if you have no idea what you're consuming."

## 2013 Energy-Efficiency Projects

### HVAC EQUIPMENT UPGRADES AT 17 FACILITIES

- 61 complete systems installed
- Total cost: \$839,000
- Estimated annual savings: \$155,000
- Estimated annual energy reduction: 1,520,348 kilowatt hours
- Estimated annual CO<sub>2</sub> equivalent savings: 870 metric tons

## LIGHTING REPLACEMENTS AT SIX FACILITIES

- Project cost: \$1.2 million
- Estimated annual energy savings: \$564,000
- Return on investment: An average 2.68 years for all yards
- Estimated annual CO<sub>2</sub> equivalent savings: 3,160 metric tons

ENERGY EFFICIENCY					
	2009	2010	2011	2012	2013
Revenue ton-miles per gallon diesel fuel	404	413	407	407	404
Diesel fuel per million dollars of revenue (GALLONS)	49,860	46,253	42,200	41,345	42,628
Gasoline per million dollars of revenue (GALLONS)	1,430	1,235	915	834	819
Propane & heating oil per million dollars of revenue (GALLONS)	248	288	253	150	341
Electricity per million dollars of revenue (KWH)	58,826	46,319	40,410	39,596	40,165
Natural gas per million dollars of revenue (CUBIC FT.)	78,173	39,141	50,448	57,352	64,219
Fuel oil and non-locomotive diesel per million dollars of revenue (GALLONS)	2,926	1,330	916	785	902

ENERGY CONSUMPTION					
	2009	2010	2011	2012	2013
Gallons of diesel fuel (MILLION)	397.3	440.1	476.6	459.3	479.3
Gallons of gasoline (MILLION)	11.4	11.7	10.2	9.2	9.2
Gallons of propane and heating oil (MILLION)	2.0	2.7	2.8	1.6	3.8
Kilowatt-hours of electricity (MILLION)	468.8	440.7	451.5	437.1	451.6
Cubic feet of natural gas (MILLION)	622.9	372.4	563.6	633.2	722.1

## 2013 ENERGY CONSUMPTION BY PRIMARY ENERGY SOURCE

Source	Consumption (Megajoules)	
Biodiesel	614,959,200	614,959,200 MJ total direct energy consumption from renewable energy sources
Coal	352,841,915	72,425,758,258 MJ Total direct energy consumption from nonrenewable sources
Diesel	68,612,343,549	
Fuel Oil	1,018,030,780	
Kerosene	36,422,113	
Gasoline	1,214,080,516	
Jet fuel	46,391,470	
Natural gas	785,093,648	
Propane	360,554,267	
Electricity	1,625,927,000	1,625,927,000 MJ total indirect energy consumption
Total: 74,666,644,458 MJ Total energy consumption from all sources		



## An ENERGY STAR in Roanoke

In 2013, Norfolk Southern's 11-story office building in Roanoke earned the U.S. Environmental Protection Agency's ENERGY STAR certification. The designation signifies that the building performs in the top 25 percent of similar facilities nationwide for energy efficiency and meets strict energy-efficiency performance levels set by the EPA. Commercial buildings that earn ENERGY STAR certification use an average of 35 percent less energy than typical buildings and release 35 percent less carbon dioxide into the atmosphere.

“This demonstrates our commitment to environmental stewardship while also lowering our energy costs,” said Andy Paul, manager energy services. “ENERGY STAR is a great tool to compare our building performance with our peers. This inspired us to do what we can to achieve the triple bottom line—planet, people, and profit. We are proud of this accomplishment and excited about similar work across our network.”

The Roanoke building was constructed in 1992. Norfolk Southern earned the ENERGY STAR rating by making energy-efficient upgrades and taking steps to better monitor and conserve energy use. Among other things, Norfolk Southern installed a new independent HVAC system for off-hour building use, upgraded exterior lights to energy-efficient LEDs, and replaced stairwell lights with on-demand LEDs. In addition, the company began using real-time metering to monitor electricity usage and reanalyzed the building automation system to ensure the building’s energy systems weren’t running when not needed.

By using these techniques, Norfolk Southern is saving more than \$60,000 a year in energy costs at the building.

“Improving the energy efficiency of our nation’s buildings is critical to protecting our environment,” said Jean Lupinacci, chief of the EPA’s ENERGY STAR Commercial & Industrial Branch. “From the boiler room to the board room, Norfolk Southern is leading the way by making their buildings more efficient and earning EPA’s ENERGY STAR certification.”

## CARBON CONSERVATION

### A Natural Approach to Reducing Carbon

Norfolk Southern aims to reduce CO2 emissions by improving the fuel and energy efficiencies of locomotives and office facilities, the company's two largest sources of greenhouse gases. However, as a corporate citizen, we have a broader strategy. "Trees and Trains" is the company's model for investing in community conservation initiatives that mitigate carbon emissions the natural way.

The company launched Trees and Trains in 2011 by partnering with GreenTrees®, the nation's leading reforestation program. The company also has partnered with The Longleaf Alliance and The American Chestnut Foundation. In 2013, Norfolk Southern assisted The Nature Conservancy on the largest-ever longleaf pine reforestation effort in Virginia.

These tree-planting efforts generate benefits related to all three pillars of corporate sustainability: environment, society, and economics. Over time, the trees will store millions of tons of carbon emissions, which is good for the planet. Residents will benefit from improved air and water quality as well as recreational opportunities and jobs. Norfolk Southern will be able to recoup our investment on some of these projects by selling carbon credits that will be earned as the trees we helped plant grow.



"Norfolk Southern set out to pursue a carbon mitigation strategy, including reducing greenhouse gas emissions. We recognize the benefits for air, water, wildlife, plants, and humans."

**Blair Wimbush**, *vice president real estate and corporate sustainability officer*

EN12

EN13

EN27

EN31

#### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

## Reforestation the Mississippi Delta

Norfolk Southern has long served communities in the Mississippi Alluvial Valley. Partnering with GreenTrees, the railroad pledged \$5.6 million over five years to plant 6.04 million cottonwood and hardwood trees on 10,000 acres in Mississippi, Louisiana, and Arkansas. By the end of 2013, trees had been planted on about 6,500 acres. The final 3,240 acres of plantings are scheduled for completion by early 2015—a year ahead of schedule.

The GreenTrees initiative, aiming to reforest 1 million acres in the Mississippi Delta, is the largest carbon reforestation project in the nation. As they mature, the trees planted through Norfolk Southern's investment are expected to generate 1.12 million tons of carbon-offset credits, which can be sold to individuals or businesses wishing to offset their carbon emissions. The carbon credits are verified and registered by the American Carbon Registry, a nonprofit enterprise that handles over-the-counter transactions in the voluntary U.S. carbon-offset market. The first 10,000 tons of carbon credits from the Trees and Trains initiative were transferred into Norfolk Southern's account in late 2013.

GreenTrees has developed a measure it calls an Advanced Carbon Restructured Ecosystem, or ACRE, that quantifies the environmental attributes associated with the restoration or conservation of an acre of land. Using U.S. Forest Service estimates of the ecological value of a single tree, GreenTrees calculates that the 6 million trees Norfolk Southern is planting will create nearly \$1 trillion in value over 50 years. That includes dollar values assigned to the trees' natural attributes of releasing oxygen, controlling air pollution, recycling water, and controlling soil erosion.

GreenTrees presented Norfolk Southern with a digital ACRE certificate in 2013 that recognizes the railroad's environmental investment. The certificate shows in real time what is happening environmentally because of the investment.



## Expanding the Reach of Longleaf Forests

Through the Norfolk Southern Foundation, the company is helping The Longleaf Alliance, a nonprofit in Andalusia, Ala., return longleaf pine habitats to the southeastern U.S. These forests, once blanketing up to 90 million acres, had dwindled to about 2.9 million acres by 1990. Norfolk

Southern began supporting the alliance's efforts in 2010, and in 2013, the Norfolk Southern Foundation provided a \$50,000 grant.

Helping to restore longleaf pine forests is a natural for Norfolk Southern. Our Brosnan Forest conference facility near Charleston, S.C., boasts 6,200 acres of longleaf pines that provide a habitat for more than 80 colonies of endangered red-cockaded woodpeckers, the largest U.S. population of these birds on a single tract of private land. To help restore this ecosystem, the railroad plans to plant an additional 2,000 acres of longleaf pines over the next decade.

## Reforesting Former Coal Mines

Since 2010, Norfolk Southern has helped the American Chestnut Foundation reforest former coal mine sites in Kentucky, Virginia, West Virginia, Pennsylvania, and Tennessee with American chestnut trees.

In 2013, the Norfolk Southern Foundation provided a \$25,000 grant to support the Asheville, N.C.-based organization's planting of 230,000 trees—including about 8,055 American chestnuts—on 350 acres of reclaimed coal mine sites throughout Appalachia. The Foundation is the organization's primary private-sector funder for these plantings.

## A Carbon Credit Milestone for Brosnan Forest

Because of their relatively long life spans, longleaf pines are effective at storing carbon emissions. To take advantage of that opportunity, Norfolk Southern teamed with Finite Carbon, the country's top developer of forest carbon offsets, to register carbon sequestered in the railroad's Brosnan Forest longleaf pines with the Climate Action Reserve in Los Angeles.

In 2013, the railroad received the first transfer of carbon credits from CAR. Brosnan Forest is one of 10 Improved Forest Management carbon projects that Finite Carbon is helping to develop for the California Air Resources Board carbon-offset program.

Credits are issued for projects that significantly reduce greenhouse gas emissions. Carbon stored in Brosnan Forest trees resulted in 300,000 carbon-offset credits. Each credit represents one metric ton of carbon dioxide equivalents avoided by the trees naturally absorbing carbon dioxide from the atmosphere. Proceeds from the sale of carbon credits might be used to promote sustainable management and conservation of wildlife and forestry resources at Brosnan Forest.

Norfolk Southern has agreed to maintain the level of carbon capture at Brosnan Forest for 100 years. Carbon credits currently range in price from \$9 to \$12 each, based on supply and demand. Norfolk Southern potentially could earn around \$3 million from the program.

"It's cleaning the air and doing something good for the environment," said Josh Raglin, general manager Brosnan Forest. "At the same time, we get a credit through a market-based fee system, so it's contributing to the company's bottom line."

## NORFOLK SOUTHERN AND THE NATURE CONSERVANCY: A LONGLEAF PINE PARTNERSHIP TAKES ROOT



In a rural Sussex County enclave where turkey vultures seem to outnumber humans, Norfolk Southern is helping The Nature Conservancy grow the largest-ever longleaf pine reforestation project in Virginia.

In 2013, the Norfolk Southern Foundation, our charitable giving arm, pledged \$50,000 over two years to support the conservancy's efforts to restore one of North America's most threatened forest ecosystems. The grant is being used in part to plant about 125 acres with longleaf pine seedlings—about 77,500 trees—at the Raccoon Creek Pinelands and Owen Tract near the Sussex County village of Yale. They are part of a larger 1,800-acre tract the conservancy is converting to longleaf pines with the help of landowner Bill Owen.

The grant also will pay for prescribed burns at the conservancy's Piney Grove longleaf pine preserve outside Wakefield, Va., a refuge for Virginia's rarest bird—endangered red-cockaded woodpeckers. Periodic controlled burns are essential to the health of longleaf pine forests, helping to maintain their rich ecological diversity.

The conservancy is working to restore longleaf pine forests in all nine states across their historic range in the U.S. southeast. In Virginia, the conservancy hopes to restore 100,000 to 125,000 acres. A 1998 census in Virginia found that approximately 4,400 of the rare pine trees remained on less than 800 acres. Longleaf pines once covered 1.5 million acres in Virginia's southeastern coastal plain and Piedmont regions.

"This is all about trying to re-establish a northern foothold for longleaf pines," said Brian van Eerden, the conservancy's Southern Rivers project director. "Norfolk Southern has been a leader in longleaf pine conservation at its Brosnan Forest in South Carolina, and now it has this great longleaf pine project in the company's backyard in Virginia."

Norfolk Southern's support, he said, helped attract a grant from the U.S. Fish and Wildlife Service. The National Resources Conservation Service, part of the U.S. Department of Agriculture, also is a partner in the project.

"When you have a major corporation like Norfolk Southern stepping in to be a leader, it lifts the significance of the project and really underscores how this forest type is of interest to a cross-section of interest groups," he said.

The Norfolk Southern Foundation supports conservation projects that align with the railroad's corporate sustainability goals. Longleaf pines are part of the railroad's legacy, dating to woodlands owned in the 1800s by the South Carolina Canal and Railroad—our earliest predecessor railroad. Today, we maintain an approximately 6,200-acre longleaf pine forest in Dorchester, S.C., at our Brosnan Forest preserve. There, we have partnered with government agencies and nonprofit conservation groups to advance research, conservation, and restoration of the longleaf ecosystem. Our partnership with the conservancy in Virginia deepens that commitment.

"The Nature Conservancy's efforts are very much in line with Norfolk Southern's conservation values," said Esi Waters, our manager corporate sustainability. "By offering them financial support, we help empower them to do even more. We're especially happy that The Nature Conservancy was able to leverage our donation to bring in additional grant money, because it magnifies the effect we're having."

The longleaf pine seedlings planted at the Raccoon Creek Pinelands eventually will help filter out nutrients and sediments from the Nottoway River, a source of drinking water for the Norfolk, Va., region. In addition, the trees, which can grow to 150 feet, one day could provide critical habitat for a variety of animal species, including red-cockaded woodpeckers, Bachman's sparrows, and Mabee's salamanders. The trees also could support a diverse flora, including pitcherplants, orchids, lilies, showy wildflowers, grasses, and sedges.



## BEYOND CARBON

As part of corporate sustainability efforts, Norfolk Southern looks for opportunities to improve business operations that make good economic sense and benefit the environment. A stormwater reclamation and coal fines removal system installed at our coal terminal in Norfolk, Va., is a model of this “win-win” approach.



### Stormwater Recycling Project Serves as a Model for Sustainability Efforts

Norfolk Southern’s Lamberts Point Coal Terminal is on the Elizabeth River, a southern tributary of the Chesapeake Bay, an important nursery and habitat for numerous fish species, crabs, oysters, and other wildlife. The terminal’s Pier 6 transfers export coal from railcars onto colliers for use around the world, mainly in steel-manufacturing processes but also for electricity generation.

In the late 1990s, the railroad constructed a stormwater-retention pond system to control runoff going into the river. In March 2013, we added a new feature: stormwater recycling. The innovative project, a voluntary upgrade of the retention pond, has enabled the company to conserve municipal water supplies, support community efforts to enhance the ecological health of the river, and reduce operating expenses.

The approximately \$3 million upgrade allows us to reclaim stormwater for use in washing equipment and suppressing coal dust at the terminal. It also gives us an easier and less expensive way to continue the removal of coal fines—small pieces of loose coal—from the runoff.

**EN10****GRI G4 DISCLOSURES**

These disclosures from the 2014 report are addressed on this page.

The reclamation system generates economic benefits. It has cut the company's cost of recovering the marketable coal fines and also reduced spending on municipal water for controlling dust and washing equipment. The project's core focus, however, is environmental, supporting our corporate sustainability goal to mitigate and reduce the impacts of railroad business operations.

Using recycled stormwater for dust suppression, rather than city water supplies, has reduced the terminal's monthly use of municipal water by 1 million to 1.5 million gallons. During the first year of operation, the system reclaimed roughly 10 million gallons of stormwater.

The reclamation system collects rainfall by gravity through waterfront storm drains. The stormwater is then pumped through Hydrocyclone filtration units that spin with centrifugal force to remove the coal fines and deposit them into railcars. The filtered water flows into the retention pond. On the opposite end of the pond, about 800 feet away, a pump draws water near the surface and sends it through a two-step "eco-friendly" treatment process—carbon filtration to remove organic material and ultraviolet light that neutralizes bacteria, such as E coli. The water then is pumped into a storage tank for use as terminal process water.

Norfolk Southern and other businesses have partnered with the Elizabeth River Project, a community nonprofit, to help restore the river's water quality, polluted by decades of industrial activity. Because Norfolk Southern is a user of the river, the company believes it has a corporate responsibility to assist efforts to improve the waterway's ecological health. Norfolk Southern supports the Elizabeth River Project's goal to make the river safe again for swimming and fishing by 2020.

"A lot of people think that big industry doesn't care about the environment until somebody forces their hand," said Ray Jones, director piers and facilities, who spearheaded the project. "Norfolk Southern has done many other projects that show we care about the environment and are taking care of the land and waterways around us."

## Sustained Environmental Performance

Norfolk Southern earned recognition from the Elizabeth River Project for installation of the stormwater reclamation system at Lamberts Point.

The ERP, a nonprofit conservation group, presented Norfolk Southern with a 2013 Sustained Distinguished Performance award. Norfolk Southern is a "Model Level" partner in the ERP's River Star Business program, the highest level for businesses. The railroad has received the Distinguished Performance award for two consecutive years.

"It really is an impressive project," said Pamela Boatwright, the ERP's deputy director administration and River Star program manager. "Through its efforts at Lamberts Point, Norfolk Southern has shown its commitment to environmental stewardship and is contributing to our long-term goal to make the Elizabeth River safe again for swimming and fishing."

# ENVIRONMENTAL MANAGEMENT

## Committed to Environmental Protection

Norfolk Southern has internal controls and procedures in place to ensure that we meet or exceed environmental regulations that apply to the company and its operating facilities. The company complies with an array of federal environmental statutes and programs delegated to state and local governments. Among relevant laws and regulations are the Clean Water Act, the Clean Air Act, the Oil Pollution Control Act, and the Resource Conservation and Recovery Act.

The railroad's formal corporate environmental policies and procedures follow industry best-management practices. To ensure programs are robust and up-to-date, we regularly compare our efforts with those of other Class I railroads and Fortune 500 companies.

Employees charged with administering and managing environmental policies are an integral part of the railroad's Operations Division, working alongside operations employees across the system to ensure facilities are functioning in accordance with applicable permits, rules, and environmental laws. The decision to integrate the company's Safety and Environmental Department into operations reflects our belief that adhering to safety and environmental policies is essential to the railroad's business success.

Ultimately, Norfolk Southern believes that each employee is responsible for safety and environmental compliance. All employees have access to the company's environmental management program on a corporate intranet site.

## Dedicated Staff Leads Performance

Norfolk Southern's environmental protection group, headed by a system director, administers the railroad's environmental management program. The group, part of the Safety and Environmental Department, is divided into subgroups that focus on environmental operations, environmental engineering, remediation, compliance, and hazardous materials.

**ENVIRONMENTAL OPERATIONS:** Field personnel in this group provide "boots on the ground" to help implement environmental compliance programs. In addition to providing guidance to operating departments on compliance issues, they offer 24/7 emergency preparedness and response to spills and releases. The group manages approximately 80 wastewater-treatment facilities and provides field management of solid and hazardous waste programs.

**ENVIRONMENTAL ENGINEERING:** This group manages design and construction of pollution-control equipment to ensure that infrastructure such as wastewater-treatment plants and secondary containment structures meet or exceed applicable environmental regulations. The group also helps monitor performance of these facilities with an eye toward upgrades or new construction needed to ensure compliance as requirements evolve and become more stringent.

**ENVIRONMENTAL REMEDIATION:** This group is responsible for ensuring that environmentally impacted company-owned properties are remediated in the most practical and expedient manner, coordinating most projects with state regulatory agencies under voluntary programs. Along with a team of environmental attorneys and accountants, this team tracks, estimates, discloses, and reports on corporate environmental liabilities associated with environmentally impacted company-owned properties.

EN29

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

**ENVIRONMENTAL COMPLIANCE:** This group is responsible for monitoring and managing the company's compliance with various air and water permits and plans. Among other things, employees on the team conduct regular environmental audits of operating facilities and other properties, and design, develop, and distribute environmental awareness and employee training programs.

**HAZARDOUS MATERIALS:** This group manages risks associated with rail transport of hazardous materials. The group ensures compliance with Federal Railroad Administration and U.S. Pipeline and Hazardous Materials Safety Administration regulations regarding hazmat transport, including designing and administering training programs for employees, industry members, and first responders. The group also prepares security and High Threat Urban Area plans, audits customer facilities that pose potential safety risks to railroad employees, and helps train approximately 5,000 emergency responders annually in communities we serve to enhance emergency preparedness and response capabilities in the event of a rail hazmat incident.

## Environmental Compliance

### INVESTMENTS FOR ENVIRONMENTAL PROTECTION

Norfolk Southern makes significant investments in environmental protection initiatives to minimize the impacts of business operations and to ensure compliance with environmental laws. In 2013, the company invested \$7.8 million in environmental capital projects such as wastewater-treatment plant upgrades, aboveground storage tank dike liners, tank-car spill pans, and other improvements to enhance environmental performance. In addition, the company spent more than \$20.8 million to support environmental compliance initiatives and remediation activities.

### SELF-POLICING AND OUTSIDE INSPECTIONS

Norfolk Southern's policy is to ensure that facilities and operations comply with applicable environmental laws and regulations. We routinely perform self-audits on operations to ensure compliance and to identify and resolve potential compliance issues.

Federal, state, and municipal agencies inspect company facilities on an ongoing basis. In 2013, environmental regulatory agencies conducted 43 inspections at Norfolk Southern facilities. On occasion, inspectors for those agencies note exceptions that can result in fines. In May, the Altoona Water Authority issued a notice of violation involving a wastewater pretreatment system at the Juniata Locomotive Shop in Altoona, Pa. The AWA alleged that the wastewater system in late 2012 and early 2013 had violated new metal effluent permit limits issued by the authority. The corporation's Norfolk Southern Railway Company subsidiary entered into a settlement agreement with AWA and paid a penalty of \$11,000 to resolve the alleged violations.

### STATE-OF-THE-ART DISCHARGE TREATMENT

Systemwide, we have 166 water discharge permits that govern the quality of our water discharges and protect the environment. Typical water discharges from railroad facilities include treated washwater, water from repair and maintenance operations, sanitary water, and stormwater.

The company continues to upgrade and install state-of-the art wastewater treatment systems to ensure that we meet or exceed wastewater discharge standards applicable to our operations.

### RESTORING A PROPERTY TO PRODUCTIVE USE

Norfolk Southern earned recognition in 2013 for a project in Loudon County, Tenn., to restore a 100-acre "brownfield" property to productive use. The Loudon County Economic Development

Agency presented Norfolk Southern with its 2013 Economic and Environmental Sustainability Award for our project to remediate a property that previously had housed a railcar manufacturing facility.

During the two-year project, Norfolk Southern has worked cooperatively with the Tennessee Department of Environment and Conservation's Division of Remediation to address the environmental concerns associated with foundry slag on the property.

With guidance from the state agency, Norfolk Southern developed a strategy that will make around 80 acres available for future industrial development. The project is scheduled for completion in mid-2014. Employees with Norfolk Southern's industrial development group are marketing the property to potential rail-served customers in coordination with state and county economic development officials.

From 1893 to 1985, foundries, machine shops, and, later, Lenoir Car Works, used the site to manufacture railroad freight cars and components. The car works operations produced metal slag and foundry sand that contained trace amounts of lead and arsenic. It once was acceptable practice to use slag and sand to fill in low-lying sections of the property. Current state environmental laws require that these materials be safely managed and contained.

Southern Railway, a Norfolk Southern predecessor railroad, bought the property and operations in the 1920s. The site now is owned by Southern Regional Industrial Realty, Inc., a Norfolk Southern subsidiary. Norfolk Southern hired an environmental contractor to perform the cleanup in compliance with state-approved plans and has paid all the costs.

## MANAGING SOLID WASTE

As a longtime business practice, Norfolk Southern has recovered, reused, and recycled many industrial-process materials, such as track crossties. The company now is going after items that could be recycled but instead have been ending up in trash cans and waste bins in rail yards, shop facilities, and offices. The goal is to reduce the amount of trash the company is sending to landfills.

In addition to the environmental benefits associated with recycling, we have an economic incentive for doing so. Because the company pays for waste disposal by the ton, keeping trash out of landfills also will lower the railroad's waste collection bill.

### Waste Diversion a Challenge

With facilities across 22 states, waste diversion on a systemwide basis is one of the company's largest sustainability challenges. In 2013, the company tracked trash collection at more than 750 individual facilities. Based on available information, those facilities generated 20,125 tons of trash. Of that, 1,143 tons were kept out of landfills through recycling, for a diversion rate of 5.7 percent.

Recycling occurred at roughly 10 percent of the facilities. One challenge the company faces in increasing that percentage is that recycling programs are not available in every municipality where the railroad operates.

To better manage the company's waste stream, Norfolk Southern has centralized oversight for trash collection and hired a single waste contractor to handle collections. In 2013, the company worked with the contractor on a "right-sizing" strategy to ensure that facilities have the right number and size of waste bins, a strategy that can reduce collection frequency and costs. The railroad also has worked with the contractor on a waste-stream audit to identify opportunities to expand recycling.

### Recycling Railroad Materials

Norfolk Southern recycles and reuses industrial railroad materials. This program keeps millions of pounds of track crossties, scrap metals, scrap steel rail and railcar wheel sets, and batteries out of landfills while conserving resources through reuse. In addition, locomotive shops and large fueling facilities in 2013 recycled 1.6 million gallons of recovered oil.

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EN23

EN25

#### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

### 2013 MATERIALS RECYCLED

- Crossties for energy recovery (millions): 2.77
- Crossties for landscaping: 519,680
- Crossties reused internally (cascading category in last year's report): 235,801
- Scrap metal (tons): 128,531
- Scrap steel (tons): 260,539

### 2013 BATTERY RECYCLING

- Pounds of batteries (millions): 1.03
- Pounds of lead: 614,270
- Pounds of cadmium: 28,980
- Pounds of nickel: 30,277

### 2013 TRACK MATERIAL REPLACED

- Crossties (millions): 2.4
- Switch & bridge ties: 84,854
- Rail: 443 miles
- Tons of ballast (millions): 3.2

## Juniata Shop Keeps It Clean

The company's Juniata Locomotive Shop is an achiever when it comes to recycling. In 2013, the shop earned a certificate of environmental achievement from the Safety-Kleen "Make Green Work" program through its participation in Safety-Kleen's closed-loop recycling program for used oil and cleaning solvents.

Between Aug. 1, 2012, and Aug. 1, 2013, Juniata avoided 750 metric tons of greenhouse gas emissions through employee efforts to recycle used oil and solvents.

Using the U.S. Environmental Protection Agency's calculator of carbon dioxide equivalents, Safety-Kleen calculated that the emissions avoided were equal to consuming 84,143 gallons of gasoline or to the amount of carbon absorbed by 19,449 trees grown for 10 years in an urban environment.

Juniata, a 70-acre facility with 30 acres under roof, is the largest locomotive repair facility in North America. During the past four years of participating in Make Green Work, the shop has avoided 4,272 metric tons of CO2 equivalent emissions.

## Managing Hazardous Wastes: Focus on Recycling, Recovering

In 2013, Norfolk Southern had four locations considered large-quantity generators of hazardous waste—facilities that generate 1,000 kilograms or more of such wastes in any given month of the year.

Two locations were onetime generators—a building cleanup at Danville Yard in Danville, Ky., and a federal government Superfund site cleanup in Elkhart, Ind. The other two locations are major locomotive repair facilities—the Juniata Locomotive Shop in Altoona, Pa., and Moore Locomotive Shop in Chattanooga, Tenn.—that generated painting-related wastes.

The quantities of hazardous wastes generated are shown below.

#### JUNIATA SHOP

- 37,786 pounds of spent paint and solvent: Handled by fuel blending and off-site fuel recovery
- 3,460 pounds of spent immersion cleaner: Recycled for reuse
- 12,875 pounds of spent antifreeze: Recycled for reuse

#### MOORE SHOP

- 24,640 pounds of spent paint and solvent: Handled by fuel recovery
- 1,843 pounds of spent laboratory solvent: Handled by fuel recovery
- 2,302 pounds of spent lab pack waste: Handled by fuel recovery
- 158 pounds of waste lead paint scrapings: Sent to a hazardous-waste landfill

#### DANVILLE YARD

- 4,253 pounds of waste flammable-liquid mixture: Handled by fuel blending for energy recovery

#### ELKHART SITE

- 4,222 pounds of impacted groundwater: Handled by stabilizing prior to disposal in a hazardous-waste landfill

## ConnectionS



From members of Congress to rail partners, Norfolk Southern makes efforts to connect with communities and stakeholder groups. Below are examples of how we engaged our communities in 2013.

### Searching for Sustainable Rail Solutions

For the third year, Norfolk Southern joined with industry partner GE Transportation to sponsor the Railroad Sustainability Symposium, a gathering of rail industry thought leaders, customers, suppliers, and partners to discuss best practices in sustainability.

More than 60 participants from 25 different companies convened at GE's Crotonville Learning Center in Ossining, N.Y., to discuss new methods and technology that will continue to improve the rail industry's overall sustainability. In 2012, Norfolk Southern hosted the event at the company's Brosnan Forest conference facilities.

Topics for the two-day 2013 conference focused on current sustainable practices, reporting and disclosure, financial value, and future energy sources. Speakers represented organizations and companies such as the Association of American Railroads, the Environmental Defense Fund, Stella-Jones Corporation, J.B. Hunt Transport, Ford Motor Company, and Bloomberg.

Innovation and technology were focal points, particularly as rail companies, including Norfolk Southern, explore alternative locomotive energy sources such as liquid natural gas, or LNG.

GE Transportation, for example, currently is piloting LNG technology that it believes will generate 50 percent fuel savings and a 30 percent reduction in emissions of nitrous oxide and particulate matter.

"Reducing the carbon footprint of the rail industry will save our customers money while improving the communities where they work," said Deb Frodl, global executive director of GE's ecomagination.

"Norfolk Southern and the rail industry have come a long way on the sustainability path, but the journey continues," said Blair Wimbush, Norfolk Southern's vice president real estate and corporate sustainability officer. "This symposium was a great opportunity to bring together some of the best minds in sustainability to exchange innovative ideas and best practices for incorporating economical environmental practices into core business strategies."

## CEO Talks to U.S. House Panel About Role of Rail

In an April address to a federal panel in Washington, CEO Wick Moorman said America needs fair and clear long-term policies that encourage continued investment in railroad infrastructure, technology, and sustainability initiatives.

"Industries, jobs, and taxes want to go where the railroad is," Moorman told the U.S. House of Representatives Transportation and Infrastructure Committee's Special Panel on 21st Century Freight Transportation. "In the last decade, 1,021 new and expanded facilities located along Norfolk Southern rail lines, representing \$28.7 billion in customer investment and generating more than 48,000 jobs. That's just one railroad. What an incredible incentive to support railroads everywhere."

Among the initiatives Moorman highlighted, he said Norfolk Southern's Crescent Corridor infrastructure improvements are creating an efficient, cost-effective freight route between the Southeast and the Northeast that can help ease traffic congestion and cut greenhouse gas emissions by taking long-haul trucks off the interstates.

"Privately owned railroads are not only a barometer of the economy, but an essential element in solving this country's freight transportation problem," Moorman said. "We are planning for growth and investing for the future. I hope that, working with you, we all can look far ahead and do everything possible to make it happen."

## Clean-Coal Supporter

In October, Norfolk Southern's government relations team in Washington supported the American Energy Jobs Rally on the Capitol steps. Energy producers, shippers, receivers, rail and mining labor union representatives, technologists, and others from around the country attended. Norfolk Southern showed its support as a transporter of coal, gas drilling equipment and supplies, and a number of other energy resources and products.

Norfolk Southern is a longtime sponsor of The American Coalition for Clean Coal Electricity, a partnership that promotes understanding of coal's role as the dominant and affordable source of electricity.

Information about coal's role in life and work in the modern world can be found at [www.coalfacts.org](http://www.coalfacts.org).

## Natural Setting for Rail Safety

In July, Norfolk Southern and Virginia's Natural Tunnel State Park hosted a Railroad Day, combining railroad safety with history and the natural environment. Casey Thomason, Norfolk Southern's staff photographer, conducted a workshop on safe, creative, and legal ways to photograph trains. An Operation Lifesaver volunteer discussed highway-rail safety and the dangers of trespassing on railroad property.

The Natural Tunnel is part of the Appalachian Mountains located in Scott County, Va. In 1890, the South Atlantic and Ohio Railroad constructed the first railroad tracks through the 850-foot tunnel. The tracks now serve as Norfolk Southern's main line on our Central Division, connecting Knoxville, Tenn., with the coal region of Southwestern Virginia.

## ECONOMIC PERFORMANCE



As a 187-year-old freight transportation company, Norfolk Southern thinks long-term. As a publicly traded company, we keep a sharp eye on the bottom line while focusing on ways to grow business markets and add shareholder value. As a service company, we are committed to delivering goods in a safe, cost-efficient, eco-friendly way that meets and exceeds customer expectations.

Norfolk Southern relies on the innovation and adaptability of employees to adjust to changing business markets. The railroad invests in technologies and network infrastructure to improve operating efficiencies, reliability, and flexibility of shipping options. These investments help build a stronger U.S. transportation network, contributing to the nation's competitive edge in a global economy.

The railroad supports healthy economies by working with customers and with local and state economic development officials to locate businesses across our network, creating jobs and tax revenues that support communities and states.

### 2013 ECONOMIC AWARDS AND RECOGNITION

Named by American Metal Market as the steel industry's

Logistics/Transportation Provider of the Year

Named among top-three performing railroads by grain shippers

Named a Top 25 socially responsible stock by Dividend Channel

**EC1**

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

## BUSINESS PROFILE



### Premier Freight Rail Transportation

Headquartered in Norfolk, Va., Norfolk Southern Corporation is one of the nation's premier transportation companies.

The company's Norfolk Southern Railway subsidiary operates approximately 20,000 route miles of rail in 22 states and the District of Columbia. The railroad serves every major container port in the eastern United States and offers efficient connections to other rail carriers, extending the company's reach to the U.S. West Coast and markets across North America. Norfolk Southern operates the most extensive intermodal freight network in the East and is a major transporter of automotive, coal, and industrial products.

Although most of the railroad's customers are domestic, the ultimate points of origination or destination for many products are outside the United States. For example, some coal is transloaded onto colliers and shipped to countries in Europe, Asia, South America and elsewhere for use in steel manufacturing and electricity generation. Likewise, much of the intermodal traffic moves through ports on the East, Gulf, and West coasts, going to or coming from ports around the globe.

A publicly traded company, Norfolk Southern lists its common stock on the New York Stock Exchange under the symbol NSC.

### Connecting Customers and Communities

Norfolk Southern trains transport raw materials, intermediate products, and finished goods primarily in the Southeast, East, and Midwest.

These products are connected to virtually every aspect of daily life. They include such things as vehicles; lumber to build homes; coal for generating electricity and manufacturing steel; canned goods that stock grocery shelves; and a host of other products essential to households, businesses, and industries in the United States and across the world.

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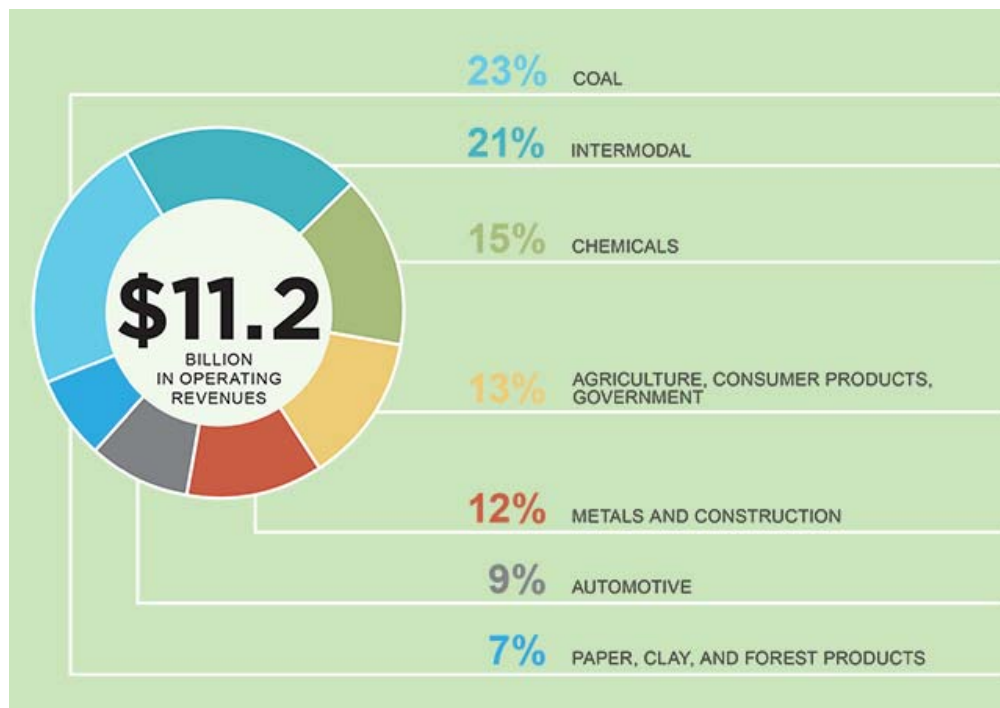
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#### GRI G4 DISCLOSURES

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In 2013, the railroad moved 7.3 million railcars and intermodal units. The intermodal business, at 3.5 million units, accounted for nearly half of the volume.

## 2013 Railway Operating Revenues By Market Group



## Primary Business Markets

**COAL:** Norfolk Southern handled 150.1 million tons of coal in 2013, most of it originating on our lines from major eastern coal basins, with the balance from major western coal basins received through interline rail partners at Memphis, Tenn., and Chicago gateways. Our coal franchise supports domestic electric generation and steelmaking; global power generation and steelmaking; and industrial markets.

**INTERMODAL:** This freight includes nearly anything found in retail stores, including appliances, clothes, beverages, and furniture. It moves in trailers, domestic and international containers, and RoadRailer® equipment, which are hybrid trailers that move over highway or rail and are operated by Norfolk Southern's Triple Crown subsidiary to provide door-to-door service.

**CHEMICALS:** This freight includes sulfur and related chemicals; petroleum products such as crude oil; chlorine and bleaching compounds; plastics; rubber; industrial chemicals; and chemical wastes.

**AGRICULTURE, CONSUMER PRODUCTS, AND GOVERNMENT:** This mix of freight includes soybeans, wheat, corn, fertilizer, livestock and poultry feed, food oils, flour, beverages, canned goods, sweeteners, consumer products, ethanol, transportation equipment, and items for the U.S. military.

**METALS AND CONSTRUCTION:** This freight includes steel, aluminum products, machinery, scrap metals, cement, aggregates, sand, and minerals.

**AUTOMOTIVE:** This freight includes finished vehicles for BMW, Chrysler, Ford, General Motors, Honda, Hyundai, Mercedes-Benz, Mitsubishi, Subaru, Toyota, and Volkswagen. It also includes auto parts for BMW, Chrysler, Ford, General Motors, Honda, Hyundai, Mazda, Mitsubishi, Nissan, Subaru, Toyota, and Volkswagen.

**PAPER, CLAY, AND FOREST PRODUCTS:** This freight includes lumber and wood products, pulp board and paper products, wood fibers, wood pulp, scrap paper, and clay.

## Norfolk Southern Business Facts

### RAIL CORRIDORS WITH HEAVIEST FREIGHT VOLUME:

- New York City area to Chicago (via Allentown and Pittsburgh, Pa.)
- Chicago to Macon (via Cincinnati, Ohio, Chattanooga, Tenn., and Atlanta)
- Appalachian coal fields of Virginia, West Virginia, and Kentucky to Norfolk, Va., and Sandusky, Ohio
- Cleveland to Kansas City
- Birmingham, Ala. to Meridian, Miss.
- Memphis to Chattanooga, Tenn.

### MILES OF ROAD: 19,961

15,181 owned; 4,780 under lease, contract, or trackage rights

### LOCOMOTIVES: 4,192

4,113 owned; 79 leased

### FREIGHT CARS: 79,295

72,560 owned; 6,735 leased

### IN 2013:

Installed 549 track miles of rail

Surfaced 5,475 miles of track

Installed 2.5 million new track crossties

#### NEW TO FREIGHT RAIL?

Find out more about the goods Norfolk Southern transports, where the goods go, and how we do it [here](#).

### A LINE IN TIME

Norfolk Southern was incorporated in Virginia on July 23, 1980. On June 1, 1982, the corporation acquired control of two major operating railroads—Norfolk and Western Railway Company and Southern Railway Company—and consolidated them to form the modern-day Norfolk Southern. While the company celebrated 30 years in 2012, our heritage dates to the earliest days of U.S. railroading—the South Carolina Canal and Rail Road, chartered in 1827.

Trace the railroad's heritage and milestones from our beginnings with this interactive [time line](#).



## More About the Business

The following documents relating to Norfolk Southern's business and governance principles are on our corporate website:

- [Corporate Governance Guidelines](#)
- [Charters of the Committees of the Board of Directors](#)
  - [Audit Committee Charter](#)
  - [Compensation Committee Charter](#)
  - [Executive Committee Charter](#)
  - [Finance Committee Charter](#)
  - [Governance and Nominating Committee Charter](#)
- [The Thoroughbred Code of Ethics](#)
- [Code of Ethical Conduct for Senior Financial Officers](#)
- [Categorical Independence Standards for Directors](#)

## 2013 FINANCIAL PERFORMANCE



### Moving the Economy

For a detailed look at our 2013 financial performance, see Norfolk Southern's [annual report](#), "What we move, moves the economy," on our corporate website.

FINANCIAL HIGHLIGHTS Norfolk Southern Corporation & Subsidiaries			
For the Year (Numbers in millions, except per-share amounts)			
	2011	2012	2013
Railway operating revenues	\$ 11,172	\$ 11,040	\$ 11,245
Income from railway operations	\$ 3,213	\$ 3,124	\$ 3,257
Net income	\$ 1,916	\$ 1,749	\$ 1,910
Per share — basic	\$ 5.52	\$ 5.42	\$ 6.10
Per share — diluted	\$ 5.45	\$ 5.37	\$ 6.04
Dividends per share	\$ 1.66	\$ 1.94	\$ 2.04
Dividend pay-out ratio	30%	36%	33%
Cash provided by operating activities	\$ 3,227	\$ 3,065	\$ 3,078
Property additions	\$ 2,160	\$ 2,241	\$ 1,971
Free cash flow	\$ 1,067	\$ 824	\$ 1,107
At Year-End			
	2011	2012	2013
Total assets	\$ 28,538	\$ 30,342	\$ 32,483
Total debt	\$ 7,540	\$ 8,682	\$ 9,448
Stockholders' equity	\$ 9,911	\$ 9,760	\$ 11,289
Shares outstanding	330.4	314.0	308.9
Stockholders' equity per share	\$ 30.00	\$ 31.08	\$ 36.55
Financial Ratios			
	2011	2012	2013
Operating ratio	71.2%	71.7%	71%
Debt-to-total-capitalization ratio	43.2%	47.1%	45.6%

## 2013 COMPANY RECORDS

- Operating revenues: \$11.2 billion
- Income from railway operations: \$3.2 billion
- Net income: \$1.9 billion

- **Earnings per share: 12% increase (\$6.10 basic, \$6.04 diluted)**
- **Dividends per share: \$2.04**
- **Operating ratio: 71%**

#### A SOCIALLY RESPONSIBLE STOCK

During 2013, Norfolk Southern was listed among the “Top 25 Socially Responsible Dividend Stocks” by the Dividend Channel, an online investment research website. According to the Dividend Channel, which focuses on dividend-paying stocks, the ranking means prominent asset managers recognize the railroad as being a “socially responsible investment” through an analysis of various social and environmental criteria.

Environmental criteria include the environmental impact of a company’s products and services, as well as its efficiency in using energy and resources. Social criteria include corporate diversity and impacts of business activities on society.

## A Big Year in 2013

Norfolk Southern set new precedents for operating revenues, net income, earnings per share, and operating ratio.

**REVENUE:** Railway operating revenues exceeded \$11 billion for the third consecutive year, rising by \$205 million, or 2 percent, over 2012. Net income was up 9 percent, while earnings per share increased 12 percent. In July, the company’s board of directors raised the quarterly dividend on our common stock by 4 percent, to 52 cents from 50 cents per share.

Revenues rose in 2013 despite a 12 percent year-over-year revenue decline in our coal business. The drop in coal revenue was offset by growth in other markets: General merchandise revenues rose by 7 percent overall, led by a 14 percent increase in chemicals revenue, a 10 percent increase in automotive, and a 5 percent increase in metals and construction. Intermodal revenues increased 6 percent.

**EXPENSES:** On the cost side, Norfolk Southern delivered on a commitment to hold operating expenses to a 1 percent increase. Higher revenue and increased network efficiencies enabled us to achieve a record-best operating ratio of 71 percent—a measure of the amount of operating revenues consumed by operating expenses.

**VOLUME:** Traffic volumes rose by 3 percent for the year—despite a 3 percent decline in coal volumes. Increases in domestic and international intermodal traffic, up by an overall 6 percent, led volume growth, fueled by investments in rail corridor infrastructure. A highlight included the opening of two new intermodal terminal facilities at Charlotte, N.C., and Greencastle, Pa., that increased capacity on the Crescent Corridor.

Merchandise volumes were up 4 percent overall, with chemicals and automotive markets experiencing significant growth. Growth in chemicals is attributed largely to increased carloads of crude oil from the Bakken (in North Dakota) and Canadian oil fields and more carloads of liquefied petroleum gas from the Utica Shale region. Auto volumes reflected an increase in vehicle production at plants we serve and new business from existing customers, including auto parts and finished vehicles.

**JOB CREATION:** Norfolk Southern helped in the location of 67 new industries and expansion of 25 existing industries, representing customer investment of \$2.3 billion, a projected 3,100 new jobs, and more than 136,000 carloads of new rail traffic annually.

#### **MORE THAN 44,000 CUSTOMER JOBS**

In the last decade, Norfolk Southern has helped customers locate or expand 1,024 facilities. That represents a \$29 billion customer investment and more than 44,000 customer jobs.

**A KEY CHALLENGE:** Changes in markets and business mix pose a challenge as we develop strategies and identify investments to advance the company's economic goals. For example, the railroad's coal business, currently our top revenue producer, faces challenges from increased supplies of relatively cheap domestic natural gas, making gas a coal-competitive alternative for power utilities. Additionally, actions by the U.S. Environmental Protection Agency to regulate carbon emissions from coal-fired power plants pose a long-term risk to the coal business.

**AN OPPORTUNITY:** While maintaining a strong commitment to the coal business, the railroad is adapting to market changes. We recognized early on the value that rail offered to support increased U.S. production of oil and gas, and we are developing that emerging energy market. Additionally, investments in our primary intermodal rail corridors, including the Crescent and Heartland corridors, have improved competitiveness with long-haul trucks, bringing growth to the railroad's intermodal business portfolio. Further, we are aggressively seeking new business possibilities across all market areas. By investing in innovative technologies and processes that enhance operating efficiencies, Norfolk Southern is reinventing our markets.

## EXCELLING IN SERVICE

Each year, Norfolk Southern celebrates employee excellence in safety and service at a two-day expo and awards ceremony. Operations Division work groups contributed to the company's record-setting 2013 financial performance. The following are thumbnail summaries of service achievements.

**NORTHERN REGION:** Employees on this region handle some of Norfolk Southern's most time-sensitive freight, including UPS and FedEx cargo, and have seen strong growth in crude oil shipments moving to the East Coast. While achieving the lowest ratio of reportable injuries, employees handled increased traffic volumes and maintained high service levels in on-time train departures, train connections, plan adherence, and work-order compliance. Implementation of the company's behavior-based culture change initiatives improved communication across all operating departments and led to service and operating efficiencies.

**WESTERN REGION:** Employees on this region achieved an unprecedented year in service, including all-time highs for on-time train performance, even while implementing new technologies, including Movement Planner software that assists dispatchers in routing trains across the network. Employees maintained strong train performance, for example, during the rollout of the Unified Train Control System auto-router technology, part of Movement Planner. UTCS, now in use on all our operating regions, gives dispatchers a global view of the whole network rather than a view of a single dispatch territory.

**EASTERN REGION:** Employees on this region improved operating efficiencies and maintained high service levels while handling increased traffic volumes on the Crescent Corridor and record volumes from the BMW auto-manufacturing facility in Greer, S.C. Employees provided strong train performance, connection performance, and plan adherence. They also found ways to reduce expenses while handling higher shipment volumes.

### AN EFFICIENT RAIL NETWORK

Norfolk Southern's efficient and cost-effective service to the U.S. steel industry brought recognition from American Metal Market, the leading industry provider of news. In its 2013 Awards for Steel Excellence, the AMM selected Norfolk Southern as the industry's Logistics/Transportation Provider of the Year.

The AMM cited the railroad's Thoroughbred Operating Plan, which enables our Operations Division to streamline train scheduling and improve overall network efficiency. The primary benefits of TOP include better use of locomotive and railcar assets, a decrease in the length of train trips, and an increase in network velocity. Those benefits translate into cost savings and service improvements for customers.

The railroad's steel business is handled by the metals and construction marketing group. AMM said the awards recognized the efforts of industry "movers and shakers who have brought real change to the steel supply chain."

"This year's winners join a select group of trailblazers, whose ideas, energy and grit have combined to ensure a competitive future for steel," said David Brooks, senior vice president, publisher and editor in chief of American Metal Market.

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### GRI G4 DISCLOSURES

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### HIGHER MARKS FROM GRAIN SHIPPERS

Norfolk Southern improved its ranking on the Soy Transportation Coalition's 2013 Railroad Report Card. In the coalition's annual survey of agriculture shippers, Norfolk Southern moved up to third place from fourth among the seven Class I railroads.

Questions on the anonymous survey dealt with on-time performance, customer service, and costs. The Soy Transportation Coalition comprises 11 state soybean boards, the American Soybean Association, and the United Soybean Board.

## Innovation with HorsePower

Norfolk Southern embraces innovation as a core business value. When it comes to enhancing the railroad's safety and service performance, the most creative ideas to business challenges often come from employees. That axiom forms the basis for an "InnovationNS" program known as HorsePower.

In 2013, HorsePower chapters were formed in Norfolk, Va., Harrisburg and Pittsburgh, Pa., and Roanoke, Va., joining chapters in Illinois and in Atlanta. Employees brainstorm ideas and collaborate on projects involving workplace safety and customer service. They collaborate across departments and work groups to bring in fresh perspectives.

### "HORSEPOWERFUL" RESULTS IN 2013 INCLUDED:

- The Atlanta chapter created posters about the Heimlich maneuver to hang in break rooms, helping to raise safety awareness. A daycare center that Norfolk Southern provides for employees in the same building followed suit.
- George Fletcher, a 38-year reportable-injury-free locomotive engineer from Elkhart, Ind., worked with the Illinois chapter to develop a track clearance marker that remains visible during inclement weather, such as heavy snowfall. Typically, markers are strips of paint on the tracks that signify where train and engine crews should stop their train to provide clearance for other trains. To enhance safety and efficiency of operations, Fletcher worked with members of the chapter to pilot a new design—a reflective marker that protrudes vertically from the tracks and can be seen easily during times of limited visibility.
- The Roanoke chapter is collaborating with the Safety and Environmental Department's ergonomics group to develop a new and improved tool to move "knuckles," the pivoting hook-like casting used to couple railcars to form a train.

InnovationNS in early 2014 launched a new online initiative that promotes collaboration, encouraging employees to submit and discuss ideas addressing specific business challenges. Learn more about how Norfolk Southern approaches business challenges at InnovationNS.

## Connecting with Stakeholders

Norfolk Southern engages with members of Congress, business organizations, and other economic interests in support of a strong economy, job creation, and future growth. The following is a small sampling of how we engaged stakeholders in 2013.

### A PARTNER IN BUILDING ECONOMIC STRENGTH

Norfolk Southern served as a key sponsor of The Wall Street Journal's sixth-annual CEO Council summit, a two-day event in Washington that drew more than 100 of the world's top chief executives to discuss critical business and policy issues.

Three of the company's senior executives participated in the November 2013 event—CEO Wick Moorman; Don Seale, executive vice president and chief marketing officer; and Cindy Earhart, executive vice president administration.

The forum focused on such economic issues as how to stay competitive, the future of capitalism, health care, energy, and cyber espionage. Moorman took part in a task force that discussed how to use America's surplus energy while protecting the environment.

Participants in the high-profile forum included President Barack Obama; Jacob J. Lew, secretary of the U.S. Treasury; James Clapper, director of national intelligence; Gen. Martin E. Dempsey, chairman of the Joint Chiefs of Staff; Penny Pritzker, secretary of Commerce; Jim Yong Kim, president of the World Bank; U.S. Rep. Paul Ryan, chairman of the House Budget Committee; Lawrence H. Summers, former director of the National Economic Council; and New Jersey Gov. Chris Christie.

Norfolk Southern had a significant presence, including a display booth and an informational advertising campaign.

### RAIL IS KEY TO LONG-TERM TRANSPORTATION NEEDS

In an April 2013 address to a federal panel in Washington, CEO Wick Moorman said America needs fair and clear long-term policies that encourage continued investment in railroad infrastructure, technology, and sustainability initiatives.

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## AN ENGINE OF ECONOMIC GROWTH



Norfolk Southern's rail network is a business magnet across our 22-state network. We work with customers and state and local economic development officials to identify suitable sites along our tracks to locate manufacturing plants, warehouses, distribution facilities, and other facilities that require rail to get their products to market. We help stimulate business growth, create jobs, and generate tax revenues for the communities we serve.

### GROWTH IN OUR NETWORK IN THE PAST DECADE

1,024

NEW AND EXPANDED  
FACILITIES

\$29

BILLION  
IN CUSTOMER  
INVESTMENTS

44,000

JOBS CREATED

## Keeping the Economy Moving

In 2013, Norfolk Southern's Industrial Development Department helped customers locate 67 new industries and expand 25 businesses. Those economic development projects resulted in customer

EC8

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

investments of \$2.3 billion in 14 states across our network that is projected to create more than 3,100 new jobs and 136,000 carloads of new rail traffic.

Continuing a trend over the past few years, energy sector development contributed to strong growth across our service area. Projects involving crude oil transportation and support for natural gas exploration and production accounted for 65 percent of the new carload traffic resulting from economic development projects in 2013. Norfolk Southern assisted in the location or expansion of 11 energy-related facilities.

The balance of development projects secured during 2013 was distributed among the business markets the railroad serves, with notable representation in the metals, agriculture, and automotive sectors.

One of the single largest development projects was the expansion of V & M Star's steel pipe mill in Youngstown, Ohio. The steel company's \$650 million investment is projected to create 350 new jobs and 4,350 new carloads of rail business annually. Another substantial project was General Motors Corp.'s \$275 million truck assembly plant expansion in Fort Wayne, Ind., which is projected to lead to 150 new jobs and 7,700 new carloads.

## New Bulk Terminals Expand Reach of Rail

For areas not directly served by rail, Norfolk Southern promotes economic development through 32 Thoroughbred Bulk Terminals. Operating in 17 states, these specialized facilities allow non-rail served customers to transfer an array of dry and liquid commodities between railcars and trucks. The TBT terminals handle commodities such as flour, plastic pellets, steel, sand, cement, and corn syrup.

In 2013, Norfolk Southern opened new TBT facilities in Knoxville, Tenn., and Columbia, S.C., and expanded a facility in Elizabeth, N.J. These terminals enable us to offer truck-competitive rail service to customers who otherwise might have no other option than to move their product over the highway.

## A Tax Engine for State and Local Economies

Norfolk Southern makes significant contributions in taxes, payroll, and purchased services in the communities we serve.

### MEASURES OF THE RAILROAD'S ECONOMIC IMPACT IN 2013 INCLUDE:

- **\$2.18 billion in total payroll**
- **\$311.5 million in total state and local taxes**
- **\$6.2 billion in purchases and other payments**

## EFFICIENCIES OF RAIL

### NS Rail Corridors: Sustainable Transportation Solutions

Reflecting a trend in U.S. freight transportation, Norfolk Southern's intermodal rail traffic has been one of our fastest-growing business segments over the past few years. That growth is expected to continue as congested highways, truck driver shortages, rising fuel costs, and environmental concerns lead shippers to intermodal transport as an alternative to the highway.

Over the past decade, Norfolk Southern has positioned the company to take advantage of these business opportunities through investments in our intermodal corridor network. By improving the efficiency and capacity of these corridors, the company is advancing goals on all three pillars of sustainability—environmental, economic, and social. The corridors promote fuel conservation and greenhouse gas reduction, create good-paying jobs and tax revenue for communities, and expand opportunities for economic growth.

### At-A-Glance

Our Four Primary Intermodal Corridors

**CRESCENT:** Forming a 2,500-mile backbone for the company's rail network, the Crescent Corridor spans 11 states, from Louisiana and Tennessee to New Jersey. Four new terminals opened during 2012 and 2013 have given us increased freight capacity, positioning our trains to compete head-to-head with long-haul trucks and opening substantial market potential for highway-to-rail conversions in our East Coast markets. In early 2013, we opened 30 new lanes of truck-competitive service on the corridor, including 18 lanes that expanded business opportunities for trade in consumer and manufactured goods between Mexico and the United States.

**HEARTLAND:** Opened in 2010, the Heartland connects the coastal Port of Virginia with Columbus, Ohio. This corridor primarily serves international import and export freight, efficiently moving goods on double-stack container trains between the port and Midwest markets. The Heartland was the rail industry's first multistate public-private partnership and a feat of modern railroad engineering, requiring heavy construction to raise the heights of 24 tunnels through the Appalachian Mountains. For customers, the corridor shaved an average of 250 miles and a day's transit time between the port and Chicago markets.

**PAN AM SOUTHERN:** This corridor was created by a 2009 joint venture with Pan Am Railways. The corridor expanded the company's reach into New England markets between Albany, N.Y., and Boston, and taps markets in Connecticut, Massachusetts, New Hampshire, New York, and Vermont.

**MERIDIAN SPEEDWAY:** Created through a 2005 joint venture with Kansas City Southern Railway, this corridor runs 320 miles, linking Meridian, Miss., and Shreveport, La. The corridor offers customers the shortest, fastest rail route between the Southeast and the West Coast. It shaves two days of transit between California and Atlanta, giving us a quicker transit time than single-driver trucks and allowing us to compete with team-driver trucks for transcontinental freight service.

Learn more about our corridors [here](#).

“Projects like the Heartland Corridor are models for the future. They reflect the public-private cooperation needed to enhance access to global markets and stimulate economic growth across the country. Without efficient access to intermodal, many firms would be locked out of business opportunities in an increasingly competitive global marketplace.”

SCOTT HERCIK, transportation and international trade advisor for the Appalachian Regional Commission



Removed  
20,000 to 25,000  
trucks from the  
highway

Annual CO<sub>2</sub>  
savings:  
5,700 metric tons

## NS Helps BMW Reduce Emissions

### MAKING A BUSINESS CASE, MEETING SUSTAINABILITY GOALS

Most people probably wouldn't think about Norfolk Southern when they see a BMW sports activity vehicle cruising down the road. In fact, our double-stack intermodal container trains are transporting the parts and components that go into every SAV manufactured at the luxury automaker's Greer, S.C., assembly plant.

Another thing people might not realize: Our business partnership with BMW is good for the environment, the economy, and residents who commute on South Carolina's Interstate 26 corridor.

Before we began offering intermodal rail service to the BMW plant in fall of 2013, all of its car parts and components moved in boxes on 18-wheel tractor-trailer trucks to and from the Port of Charleston and the BMW plant. That added to congestion on Interstate 26 and to the automaker's supply-chain carbon emissions—something the company monitors closely.

In Greer, we now provide BMW with a truck-competitive service that is economical and eco-friendly.

"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 Alfred Haas, the BMW plant's department manager for material control and transportation control. "This was a business case, and it supported our sustainability targets with reduced emissions that rail service provides in comparison with trucking."

A Norfolk Southern analysis—using Federal Railroad Administration data that compares average emissions of double-stack intermodal rail and dry van trucks—shows that we will help the BMW plant reduce its supply-chain CO2 emissions by around 64 percent. Our analysis shows that moving 20,000 containers by rail over the 235-mile journey between the BMW factory and the Charleston seaport generates about 3,195 metric tons of CO2 emissions annually. That's nearly two-thirds less than the 8,895 metric tons emitted when using trucks.

In addition to reducing greenhouse gas emissions, the shift to rail is expected to enhance the commute on I-26, easing truck-traffic congestion and making it safer for passenger vehicles. BMW has estimated that shipping parts by rail will remove 20,000 to 25,000 trucks a year from the interstate.

Opened in 1994, the Greer 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, reflects BMW's commitment to sustainability. About 50 percent of the facility's energy requirements, for example, is supplied by recovering methane gas that is collected, cleaned, and piped from a regional landfill about 10 miles away, significantly reducing the plant's CO2 emissions and saving energy costs. Today, the plant is the only one in the world 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.

From the start, Norfolk Southern has transported finished vehicles in multilevel railcars to the Port of Charleston for export to global markets. We gained the ability to offer intermodal service with the opening in October 2013 of the South Carolina Inland Port intermodal terminal, which was constructed and is owned and operated by the South Carolina Ports Authority. Recognizing the economic benefits of an inland port in the state's growing Upstate region, Norfolk Southern partnered with the ports authority. We provided rail, signal, and other track infrastructure to support the nearly \$50 million terminal project.

The inland port is located near Interstate 85 and is less than two miles from the BMW plant. We offer BMW overnight intermodal service, moving containers loaded with parts and components between the factory and the Charleston seaport. The traffic includes import containers shipped on ocean carriers from Europe and also export containers from Greer that are loaded with parts and components for markets such as Russia and India, where final assembly is done. On each end of the move, trucks dray the containers between our rail line and the factory or the port, a trip of about two miles or less.

A Norfolk Southern subsidiary, Thoroughbred Direct Intermodal Service, is responsible for managing these movements, either by rail or truck, and ensuring just-in-time delivery of parts to the BMW plant, making this a unique Norfolk Southern product.

## Short Hauls Add to Norfolk Southern's Edge

While trains have a clear environmental edge over trucks, rail companies have had a harder time competing on cost with over-the-road transport on freight moves of less than 500 miles—known in the business as short hauls. Historically, trucks had a cost-structure benefit over rail and were able to compete better on price and service delivery times in shorter-haul markets. In the intermodal market, containers typically must be trucked over the “last mile” between a rail terminal and the customer’s door, which has inhibited rail routing to match truck pricing and still provide value for railroads over shorter distances.

The current trucking environment, however, is changing this balance. Higher fuel and insurance costs, a tight driver market, and new government regulations on a driver’s hours of service and safety performance are pushing up truck costs. In addition, growth of international cargo volume at the East Coast ports Norfolk Southern serves is putting more pressure on available truck capacity. Finally, environmental stewardship is driving more shippers to look to rail wherever they can to reduce their carbon footprint.

The conversion of freight from truck to rail on long-haul moves of more than 500 miles is a focus of Norfolk Southern’s corridor development strategy. However, the company is making inroads on short-haul markets as we improve operating efficiencies and service times and promote innovative business partnerships. Given the proximity of key consumer markets to the East Coast ports, a number of short-haul markets could benefit from a shift to rail.

Norfolk Southern’s business with BMW and the South Carolina Ports Authority in Greer, S.C., is just one example. We have used existing terminal and train capacity to reduce our cost structure in other short-haul East Coast markets.

### THESE INCLUDE:

- **Charleston, S.C., and Savannah, Ga., to and from Atlanta**
- **Charleston and Savannah to and from Charlotte, N.C.**
- **Norfolk, Va., to and from Greensboro, N.C.**
- **Port of New York/New Jersey to and from Pittsburgh, Pa.**

## PUBLIC-PRIVATE PARTNERSHIPS



Our public-private partnerships offer solutions to U.S. transportation needs

Norfolk Southern has led the rail industry in seeking innovative solutions to the nation's transportation challenges.

In the mid-2000s, we partnered with state and federal officials to create the rail industry's first multistate public-private partnership on our Heartland Corridor. In the 2005 federal highway reauthorization bill, Congress identified the Heartland as one of 25 transportation projects nationwide with the potential to facilitate international trade, relieve traffic congestion, improve transportation safety, and address critical national economic and transportation needs.

Since then, we forged a public-private partnership to expand capacity on the Crescent Corridor. In addition, we joined with other freight railroads to help fund the CREATE public-private partnership in Chicago, one of the nation's busiest railroad hubs.

Through these partnerships, federal and state governments contribute a percentage of costs based on public benefits generated. These benefits include jobs and tax revenue; economic development; less congestion and fewer truck-related accidents on interstate highways; reduced maintenance and construction costs of roads and bridges; and a decline in fuel use and greenhouse gas emissions.

Public participation allows large-scale corridor projects to be completed much sooner than they otherwise would be, accelerating the public benefits associated with them.

Selected benefits associated with our three largest public-private partnerships are described below.

16

### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

## Crescent Corridor

As a testament to the corridor's widespread benefits, the corridor project received endorsement by business and environmental groups, including leading business associations in Alabama, Maryland, North Carolina, Pennsylvania, Tennessee, and Virginia. Joining in support were conservation-minded groups such as the Southern Alliance for Clean Energy, A Greener Gulf Coast, the Southeast Energy Efficiency Alliance, and the Virginia Chapter of the Sierra Club.

The corridor equips Norfolk Southern with truck-competitive service along several major interstates, including I-81, I-85, I-20, I-40, I-59, I-78, and I-75. The corridor improvements will provide rail capacity to annually divert an estimated 1.3 million long-haul trucks from those highways.

In 2013, freight volume on the corridor increased 8 percent over 2012. Rail volume grew by 21 percent in 2012 versus 2011.

Independent studies conducted for the railroad estimate that when fully developed, the corridor has the potential to:

### SAVE

- More than 160 million gallons of fuel annually
- More than \$500 million in costs associated with traffic congestion
- More than \$90 million in highway maintenance

### REDUCE

- Greenhouse gas emissions by 1.9 million tons

### CREATE OR PRESERVE

- More than 70,000 jobs by 2030

### AVOID

- More than \$100 million in property damage and injuries from accidents

## Heartland Corridor

The Heartland Corridor created a shorter route for moving international freight on double-stack trains between Virginia port terminals and Midwest consumer markets. By eliminating about 25 percent of the miles of the former double-stack route, we're burning less fuel and reducing greenhouse gas emissions.

The railroad's Rickenbacker Intermodal Terminal, constructed in Columbus, Ohio, as part of this public-private partnership, has helped attract job-creating warehouse and distribution facilities at a nearby global logistics park, including companies such as Whirlpool, Kraft Foods, and Toys "R" Us.

The Heartland Corridor supports a national goal to grow U.S. export volumes. The company expects business to continue to grow, particularly after the Panama Canal expansion is completed, enabling larger ships to call on East Coast ports. Increased use of the Suez Canal by international container ships offers another avenue of growth.

In 2013, traffic volume on the corridor increased 16 percent over 2012. That rise followed a 26 percent increase in volume in 2012 versus 2011.

## CREATE

Known by its acronym, the \$3.2 billion Chicago Regional Environmental and Transportation Efficiency project is designed to reduce rail and highway congestion and add freight and passenger capacity in the metropolitan Chicago area. The CREATE partnership involves the U.S. Department of Transportation; the Illinois Department of Transportation; Chicago; the six largest North American freight rail carriers, including Norfolk Southern; and two passenger carriers, Amtrak and Metra.

Chicago is one of the nation's busiest and most congested rail intersections, with 2,800 route miles of track and about 500 freight and 800 passenger trains passing through daily. It is a key interchange point for domestic and international freight rail traffic moving to and from the East and West coasts. It's also a hub for Amtrak passenger rail service and Metra commuter trains.

The CREATE improvements, financed by the railroads and public partners, target 70 rail and highway infrastructure projects, including 40 that will reduce delays for Amtrak and Metra passenger trains. Some of the major projects, including the Englewood Flyover, will separate freight and passenger trains to eliminate conflicts and congestion. Other projects will separate rail and highway traffic, resulting in fewer delays, less fuel consumption, and reduced greenhouse gas emissions

## NEW CORRIDOR TERMINALS ANCHOR LONG-TERM GROWTH



Norfolk Southern's intermodal corridor strategy continued to advance in 2013. The most significant developments were the opening of regional intermodal terminal facilities in Charlotte, N.C., and in Franklin County's Greencastle, Pa. The two facilities are the last "keystone" terminals planned in the first phase of the Crescent Corridor improvement program.

The terminals complement regional facilities opened in 2012 on the corridor at Rossville, Tenn., near Memphis, and at McCalla, Ala., near Birmingham. Together, the four terminals provide capacity to remove more than 1 million long-haul trucks off of interstate highways across the 11-state corridor.

### Charlotte Regional Intermodal Facility

The Charlotte facility replaced an existing 40-acre terminal near downtown that was overcrowded and lacked room to expand. To accommodate traffic at the old facility, the company operated a satellite parking lot about five miles away, unloading containers from trains and draying them to the lot for pickup. This process was costly, consumed time, and made it more difficult to compete with trucks for long-haul freight.

The new terminal, uniquely situated between runways at the Charlotte Douglas International Airport, has ample space for growth and truck-competitive service. It covers 200 acres and offers three loading tracks, more than 1,300 parking spaces, and the capability of 200,000 container lifts annually. Located near Interstate 485, the terminal is easily accessible to short-haul truckers making last-mile pickups and drop-offs for customers, reducing congestion and unnecessary emissions caused by stalled traffic and idling trucks.

Much of the business at the new Charlotte terminal is transcontinental freight moving to and from Texas markets, the West Coast, and Mexico.

“This intermodal facility is projected to bring billions in business, and places Charlotte even more in the manufacturing, distribution, transportation, and economic growth business.”

ANTHONY FOXX, former Charlotte mayor and current U.S. Secretary of Transportation, speaking at the May 2012 groundbreaking of the new Charlotte terminal

## Franklin County Regional Intermodal Facility

Located in Greencastle in south central Pennsylvania, the 200-acre Franklin County facility places Norfolk Southern into a new market that serves as a freight gateway in the mid-Atlantic region. The terminal complements existing intermodal facilities at Harrisburg and Rutherford, Pa., providing an additional option for customers in southeastern Pennsylvania, western Maryland, and northern Virginia to connect with domestic and world markets.

The facility, less than a mile from Interstate 81, has 670 trailer and container parking spots. For some customers, the new terminal reduces the length of truck drayage, one of the biggest shipping expenses, offering customers a more affordable option and the possibility to remove trucks from I-81.

Rail traffic through the terminal moves north and south and runs to such markets as Memphis, Tenn., Charlotte, N.C., and Atlanta. Greencastle also serves as an anchor for freight moving to and from Mexico. Its opening was key to our ability in early 2013 to begin offering 18 new service lanes to three regional Mexican markets, including business in auto parts and appliances. Other product moving through the terminal includes paper, plastic, and food products.

Markets served include Baltimore, Perryville, Eldersburg, and Frederick in Maryland; Carlisle, Mechanicsburg, and York in Pennsylvania; and Raphine, Winchester, and Covington in Virginia.

“These facilities are proven centers of business growth, and I am sure it will create many opportunities for Franklin County and the region. I have long supported freight rail because of its efficiency and see this terminal as a vital infrastructure improvement.”

U.S. Rep. BUD SHUSTER, chairman of the U.S. House Committee on Transportation and Infrastructure

“Since the facility opened, more than 2 million square feet of new construction has commenced in Franklin County, that when completed will lead to more than 1,000 new jobs.”

MIKE ROSS, president of the Franklin County Area Development Corporation

“Freight rail is perhaps the most cost-effective, fuel-efficient, and environmentally sensible mode of freight transportation available to us today. Investing in freight rail infrastructure projects like these will encourage job growth, improve our local and national economies, and provide tremendous environmental benefits.”

Pennsylvania state Sen. RICH ALLOWAY

## Crescent Terminals Are Efficient, Speedy, and Green

All four of the new regional intermodal facilities constructed on the Crescent Corridor are designed for ease of business and minimal environmental impact. That includes use of high-tech systems and low-emissions equipment.

### FEATURES INCLUDE:

- **Automated gate systems outfitted with digital cameras and scanners.** These systems speed the flow of drayage truckers moving in and out of the terminals to drop off or pick up intermodal containers or trailers. The AGS systems improve driver productivity while reducing idling, emissions, and fuel costs.
- **Low-emission cranes to move containers on and off trains.** The rubber tire gantry cranes at our new terminals at Charlotte and Greencastle, for example, feature power-on-demand technology that automatically adjusts diesel engine power to load demands, resulting in fuel savings of 36 percent, according to the manufacturer. Our Birmingham Regional Intermodal Terminal in McCalla, Ala., is using a new type of battery-powered hybrid RTG crane, which consumes about two-thirds less fuel than do standard diesel cranes.
- **Administration buildings constructed to Leadership in Energy and Environmental Design, or LEED, standards to reduce environmental footprint.** The buildings feature LEED best practices, including “low-impact” construction materials such as light-colored metal “cool” roofs that reflect heat, low-flow plumbing fixtures, and high-efficiency heating and cooling units. In addition, windows are arranged to make better use of sunlight, while extended roof overhangs act as sun shades to reduce air-conditioning use.



### THE LEED STAMP OF APPROVAL

In 2013 and early 2014, the U.S. Green Building Council officially certified that the administration buildings at Norfolk Southern's regional intermodal facilities at McCalla, Ala., and Rossville, Tenn., opened in 2012, meet the best-practice standards of Leadership in Energy and Environmental Design.

"LEED certification underscores Norfolk Southern's commitment to a sustainable business strategy benefiting our customers and the communities we serve," said Blair Wimbush, our vice president real estate and corporate sustainability officer.

New terminal facilities opened in 2013 in Charlotte, N.C., and Greencastle, Pa., also incorporate LEED design standards, but have not yet received official certification.



## 2013 CAPITAL INVESTMENTS



With track and facilities spread across 22 states, Norfolk Southern operates a capital-intensive business. In 2013, the company's \$1.97 billion capital expenditure program consumed nearly 18 percent of railway operating revenues.



## Strategic Capital Projects Sustain and Grow Business

The company must make significant investments to provide safe, efficient, and reliable service, to continue to grow business, and to return value to shareholders. To achieve those goals, the company's annual capital expenditure budget has four focus areas:

- **Asset renewal, such as rail, locomotives, and railcars**
- **Service reliability**
- **Operational efficiency and productivity**
- **Targeted market growth**

In 2013, the largest capital effort focused on roadway replacement projects and core business needs. Roadway projects primarily involved replacement of rail, crossties, and track ballast. During the year, the company installed 549 track miles of new rail, surfaced 5,476 miles of track, and installed 2.5 million new crossties.

Core business components included investments in locomotives, the railroad's workhorses. The company purchased 50 new AC-powered locomotives and continued investing in our locomotive rebuild program at the Juniata and Roanoke locomotive shops. A key goal is to improve fuel efficiency and reduce emissions of the locomotive fleet.

Expenditures to facilitate growth and improve operating efficiencies included targeted investments in terminal and yard improvements, technology, and service equipment and facilities. The company invested \$57 million to continue installing LEADER fuel-efficiency hardware and software in road locomotives. Investments in yards and other facilities included improvements that will double rail volume capacity at the Bellevue, Ohio, hump yard. In addition, funds went for facility improvements at the Juniata Locomotive Shop, our largest shop; opening two new bulk transfer facilities; and purchasing new multilevel automobile racks to serve auto customers.

A significant portion of the capital budget supported continued implementation of Positive Train Control. PTC, a congressionally mandated program, is a multiyear, industry wide initiative. PTC is designed to improve rail safety on freight lines that also carry passenger rail trains and that move products the federal government regulates as hazardous materials, such as certain chemical products.

Another capital category, labeled "other projects," included vehicle replacements and communications and signals projects.

<b>2013 CAPITAL EXPENDITURES BY CATEGORY</b>			<b>Total: \$1.97 billion</b>
<b>Maintenance-of-Way:</b>	\$806 million		40.8%
<b>Facilities &amp; Terminals:</b>	\$273 million		13.8%
<b>Locomotives:</b>	\$245 million		12.4%
<b>Freight Cars:</b>	\$206 million		10.4%
<b>Positive Train Control:</b>	\$163 million		8.2%
<b>Other Projects:</b>	\$144 million		7.3%
<b>Infrastructure:</b>	\$91 million		4.6%
<b>Technology:</b>	\$43 million		2.1%

## SOCIAL PERFORMANCE

Norfolk Southern recognizes that our ability to thrive as a business is connected to the health of our communities, our environment, and our employees. Our corporate success reflects the dedication, talent, and hard work of our people.

Norfolk Southern strives to be a responsible corporate citizen. We recognize that the company's success is connected to the dedication, talent, and hard work of our employees and to the health and safety of the communities we serve.

As an employer, Norfolk Southern is committed to a safe working environment and to providing employees with rewarding, meaningful careers. The company supports workplace diversity and a well-trained, healthy workforce. The company and our employees help support the cities and towns where we live, work, and play, providing financial assistance and volunteer hours to help make our neighborhoods better places to live.

## 2013 Social Awards and Recognition

- **National Achievement Award from TRANSCAER®**
- **"Best for Vets" employer**
- **"Top 100 Military Friendly Employer"**
- **CEO Wick Moorman "Railroad Innovator Award"**
- **EVP and CIO Deb Butler "Outstanding Woman of the Year"**
- **"Virginia Strawberry Award" for foodbank collections**
- **Top 25 socially responsible stock**
- **No. 3 healthiest large employer in Atlanta**
- **United Way Gold Trailblazer**

**AN OUTSTANDING WOMAN RAILROADER**

Deb Butler studied English literature in college and said she became a railroader “strictly by accident.” However, 36 years after joining Norfolk Southern predecessor Southern Railway as a customer account representative, Butler is helping to lead Norfolk Southern as an executive vice president and chief information officer. To recognize her many achievements, the League of Railway Industry Women selected Butler to receive the organization’s 2013 “Outstanding Woman of the Year Award.” Sponsored by Progressive Railroading, a rail industry trade magazine, the award recognizes an individual’s dedication, commitment, and contribution to the industry.

Read a profile of Butler in Progressive Railroading [here](#).



## ALL ABOUT SAFETY



Safety is embedded in Norfolk Southern's work culture. It is the "S" in our SPIRIT values and is first for a reason: Our No. 1 priority is to ensure a safe working environment for employees.



### Employee Safety Comes First

Norfolk Southern's overarching safety goal is to eliminate at-risk, high-impact behaviors that can result in fatalities, injuries, and operations incidents. Behavior-based safety processes, introduced in 2012 and still evolving, help create a positive working environment and reinforce safe work behaviors.

**LA5****GRI G4 DISCLOSURES**

These disclosures from the 2014 report are addressed on this page.

Safety performance is led by local safety and service committees at terminals, yards, shops, and facilities. These interdepartmental committees are chaired by employees in our mechanical, transportation, and engineering departments. This “bottom-up” approach is beneficial because it empowers employees to share responsibility for ensuring their own safety and the safety of coworkers.

Through positive reinforcement and coaching—and discipline, if necessary—we strive through behavior-based safety to promote safe behavior, discourage at-risk behavior, and improve working relationships between supervisors and employees.

Safety is reinforced daily. For example, operations employees hold job-safety briefings at the start of each shift and throughout the day to discuss work assignments, relevant safety rules pertaining to work activities, changing conditions, and potential hazards, such as weather.

Regular workplace safety checkups give managers and employees opportunities to recognize and reinforce co-workers who display safe working behaviors, or to offer coaching and constructive feedback to correct behaviors that could result in an injury or incident.

## Training for Behavior-Based Success

In 2013, Norfolk Southern’s approximately 24,000 unionized craft employees received training in behavior-based safety. The training focused on peer-to-peer relationships and employees’ power to drive change, aimed at boosting the company’s safety performance, competitive edge, and business success.

“Long term, that’s what sustainability is all about,” said David Julian, vice president safety and environmental. “It’s doing the right things to sustain our company and create a much better culture for us.”

## PROUD RECORD OF WORKING SAFELY



Employees take pride in maintaining outstanding safety performance. Evidence of their commitment is seen across the system. Some examples from 2013 are:

### 2 Million Hours

Employees at the Roanoke Locomotive Shop, in Virginia, became the second work group to achieve 2 million consecutive employee-hours of service without a reportable injury. Employees at the Enola Locomotive Shop, in Pennsylvania, became the first group to achieve the 2 million-hour mark in 2012.

### 1 Million Hours

Employees at three locations achieved 1 million consecutive hours of reportable injury-free service. They were:

- Mechanical employees at the Decatur, Ill., terminal
- Operations employees, including transportation, mechanical, and engineering, at the Valdosta, Ga., yard
- Transportation employees at the St. Louis terminals

### Zero Injuries

Many Operations Division work groups served in 2013 without a reportable injury. By department and group, they include:

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#### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

## ENGINEERING DEPARTMENT

- Communications & Signals employees on the Dearborn, Pittsburgh, Alabama, Georgia, and Pocahontas divisions
- Communications & Signals Construction employees on Lines East, Western Region Group 1, Lines West-CGA groups
- The maintenance-of-way production gang in Ft. Wayne, Ind.

## MECHANICAL DEPARTMENT

- Employees at the Roanoke, Va., the Elkhart, Ind., and the Conway and the Enola, Pa., locomotive shops

## TRANSPORTATION DEPARTMENT

- Employees at transportation terminals in Kansas City, Mo.; Chattanooga, Tenn.; Elkhart, Ind.; Norfolk, Va.; Charlotte and Linwood, N.C.; Allentown, Pa.; Louisville, Ky.; New Orleans, La.; and Sheffield, Ala.

## SUPPORT SERVICES

- Employees in the Crew Management Center, Operations Services and Support, Mail Room and Reprographics, Intermodal Operations, and Police Operations Building Security

# Serious Injuries Down in 2013

Norfolk Southern's operations employees work in all kinds of weather and around large, moving pieces of equipment. A majority of reportable injuries on the railroad stem from slips, trips, or falls -- always a potential when employees work on equipment or walk on rock ballast around railroad tracks. Other common reportable injuries relate to overexertion, sprains, and muscle pulls.

A safety highlight of 2013 was a decline in serious injuries. We recorded 53 serious injuries, a decline of more than 5 percent from the 56 reported in 2012. We classify serious injuries as death or one of the following that results in seven or more lost work days: amputation, concussion, dislocation, fracture, internal injury, laceration, one-time exposure to fumes or chemicals, burns, electric shock, rupture or tear, or crushing injury.

Overall, the company experienced 336 reportable injuries, a 41 percent increase over the 239 reported in 2012. Reportable injuries, as defined by the Federal Railroad Administration, are those in which an employee might have required medical treatment, received prescription medication, received a physician's recommendation for restricted activity, or received a physician's recommendation to take time off from work.

Unfortunately, we experienced one fatal injury. In May 2013, a track maintenance-of-way employee with seven years of seniority in our Engineering Department was killed when he was trapped by a mudslide while working on track near Black Mountain, N.C.

## 2013 SAFETY STATISTICS

- Number of work-related fatalities—1
- Number of reportable injuries—336
- Number of people with restricted activity—7

- Number of people requiring medical attention but who lost no work time—95
- Number of people who lost work time because of an injury—233
- Injury ratio—1.17 per 200,000 employee-hours of service



## Achieving a Safety Milestone

An overhead banner in the Roanoke Locomotive Shop proclaims: “Safety Protects People/Quality Protects Jobs.” Employees take that slogan to heart. In 2013, the shop’s 236 employees celebrated 2 million consecutive employee-hours without a reportable injury, an injury-free streak that spanned six years.

“The participation of people on the shop floor is the key,” said Kevin Fletcher, a boilermaker and chairman of the shop’s safety and service committee during the year. “If they see something, they speak up.”

Active support from shop management also is important. “If there’s ever a problem or something needs to be fixed, it’s never, ‘We’ll have to wait and see’, or ‘We’ll get it when we can,’ ” Fletcher said. “It’s taken care of right then.”

Machinist Brian Porterfield, with no reportable injuries during 22 years at the company, credited teamwork: “We look out for each other and keep each other safe.”

Cecil Greene, a boilermaker with two years of experience, said veteran employees model good safety behavior and reinforce that with less experienced coworkers. “The first day I walked in this shop, they were making sure I had everything on—earplugs, hard hat, safety glasses, and jacket,” he said.

The shop’s safety and service committee helped develop a program that allows employees to identify safety focus areas, such as communication on the shop floor or safe operation of shop equipment. Employees use cards supplied by the committee to record instances of co-workers demonstrating proper work behaviors, and they are encouraged to reinforce those safe behaviors on the spot. They also can point out coaching opportunities. Employees drop the cards in collection boxes, and the results are graphed and discussed during shift safety meetings.

## Detroit Team Spreads Safety Message

In more than eight years of operations, the Detroit Terminal has experienced one reportable injury—an employee who pinched his finger in a vehicle door. A couple of years ago, employees chalked up an impressive 1 million consecutive hours of service without a reportable injury.

In May 2014, members of the terminal's safety and service committee represented Norfolk Southern in Atlanta at the Railroad Safety Leadership Forum, an event sponsored by the Association of American Railroads to share industry best safety practices. The Detroit Terminal was selected because of its successes in implementing behavior-based safety principles, including efforts that focus on peer-to-peer reinforcement of safe behaviors and constructive correction of unsafe work behaviors.

Dave Arnovitz, terminal superintendent, said employees from all operations departments conduct joint safety checkups to keep lines of communication open.

"This has led to some of the best safety metrics that Detroit or any other place on Norfolk Southern has had," Arnovitz said. "The bigger best practice is people treating each other with respect and looking out for each other all the time, every day, and just getting better and better."

## Ergonomics at Work: Job Tasks Get Easier

Operations employees at Norfolk Southern often lift, stretch, and bend as they work on locomotives, railcars, and track. Two years ago, Norfolk Southern created the "Ergo Cup" competition to recognize employees who devise innovative ways to improve equipment, tools, or work processes that make jobs easier to perform and enhance safety.

In 2013, mechanical and engineering employees from across the system submitted 40 ergonomic design projects. The winning entries, judged by professional ergonomists from Coca-Cola, Georgia-Pacific, and Liberty Mutual, reflected innovative problem-solving and teamwork.

A team of Roanoke Locomotive Shop employees represented Norfolk Southern at the National Applied Ergonomics Conference in Orlando, Fla., for creating a device used to replace or install battery charger cables on a locomotive. They fashioned the simple, yet elegant, device from a metal pipe clamp and a piece of Schedule 80 pipe. The "battery charger receptacle tool" improves arm and shoulder postures, making it easy for one person to replace or install the cables.

Mechanical employees from the Bluefield, W.Va., car shop won a first-place award for developing a procedure that reduces the exertion required to grease an overheated railcar wheel roller bearing. From engineering, a Charlotte Roadway Shop team earned a first-place award for developing a hydraulic rail saw that cuts through rail faster than available off-the-shelf equipment can while also reducing operator effort and enhancing safety.

The Ergo Cup evolved from the railroad's commitment to workplace ergonomics, a part of safety that seeks to "design the job to fit the employee."

## COMMUNITY SAFETY

Norfolk Southern's ability to safely transport freight is essential to our business success. That is particularly the case regarding movement of products regulated by federal law as hazardous materials.



### Working Hard to Move Freight Safely and Securely

As a common carrier, we, like other Class I railroads, are required by federal law to offer to transport hazardous materials. These goods—such as crude oil, ethanol, and fertilizers—are essential to consumers and the U.S. economy, but they can be harmful if mishandled. Rail is a safe way to transport these goods. According to the Association of American Railroads, 99.9977 percent of all hazardous material rail shipments reach their destination without a release caused by a train accident.

Norfolk Southern adheres to comprehensive federal regulations covering the movement of hazardous materials. The railroad also has adopted many voluntary safeguards to ensure the safety of employees and the communities we serve.

The company's goal is to transport all shipments of hazardous materials without incident or release.

### Releases of Hazardous Materials in 2013

Over the past three years, carload volumes of hazardous materials moved by Norfolk Southern have increased steadily. At the same time, the number of incidents involving the release of material during transport has decreased.

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#### GRI G4 DISCLOSURES

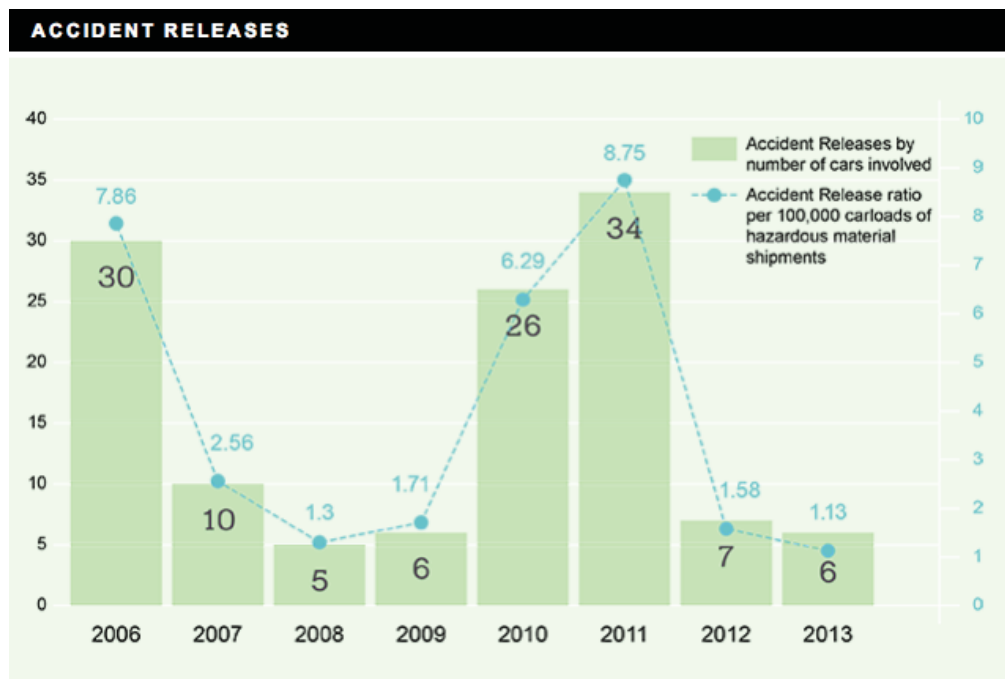
These disclosures from the 2014 report are addressed on this page.

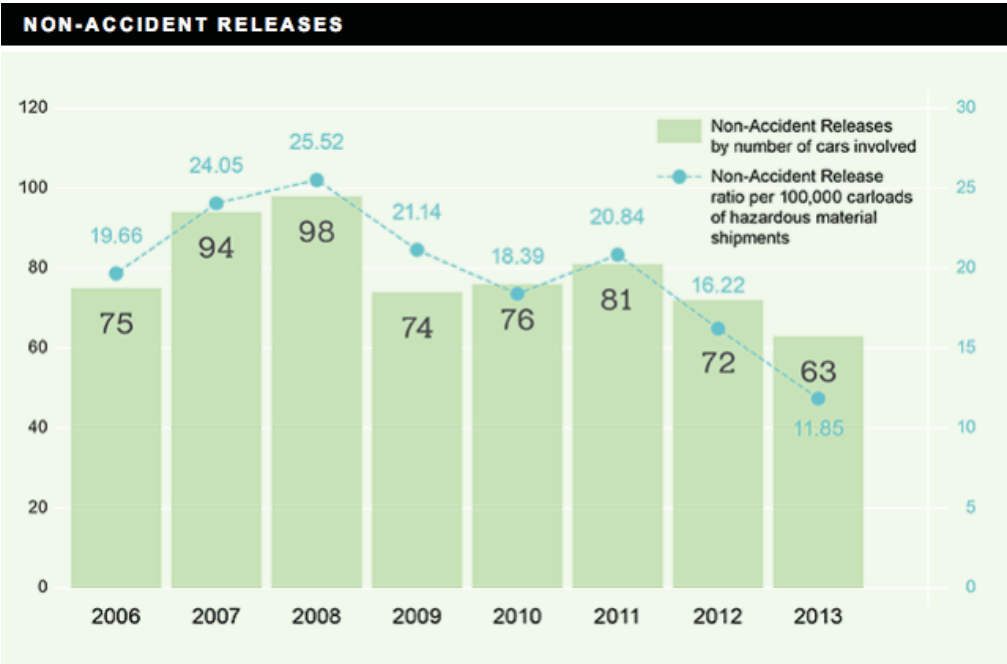
During 2013, Norfolk Southern transported 531,582 carloads of freight regulated as hazardous materials, up from 443,779 loads in 2012. We reported three accidental releases involving six tank cars. All releases involved relatively small amounts.

Two of the accidental releases occurred in May 2013. One, at Lemoyne, Ala., involved five gallons of acetone from one tank car. The other, at Box Springs, Ga., involved one tank car and the release of 35 pounds of a specialty chemical used for such things as synthetic resins and pesticides. The third incident occurred in December 2013, involving the release of 40,000 gallons of asphalt from four railcars that derailed at Vivian, W.Va.

In all cases, Norfolk Southern environmental management employees worked with appropriate regulatory authorities to ensure the spill sites were secured, cleaned, and remediated.

During 2013, Norfolk Southern reported non-accident releases of hazardous materials involving 63 railcars. That's the lowest number of non-accident releases over the past eight years. As defined by the rail industry, a non-accident release, or NAR, is the unintentional release of a hazardous material while in transportation—including loading and unloading while in railroad possession—that is not caused by a derailment, collision, or other rail-related accident. The majority of NARs involve small quantities.







## Partnering with Customers to Safely Move Freight

To recognize the safe business practices of customers who ship hazardous materials on our railroad, Norfolk Southern 18 years ago established the Thoroughbred Chemical Safety Award. For 2013, we recognized 60 customers who shipped at least 1,000 carloads of hazardous product across our network without a single incident. Norfolk Southern works closely with chemical customers to ensure their product arrives safely to its destination, including offering training in safe rail-shipping practices.

“We commend these valued business partners for their absolute commitment to safety,” CEO Wick Moorman said. “Their efforts might not make news headlines, but the safe movement of chemicals that are the building blocks to jobs and a strong economy is the good-news story that occurs every day across our rail network. We thank these customers for helping us demonstrate that rail is the safest, most efficient, and environmentally friendly way to transport consumer goods.”

## A Trained Workforce is Essential

More than 300 employees—known as “NS Sentinels”—have been specially trained and certified through the Hazardous Waste Operations and Emergency Response program developed by the U.S. Occupational Safety and Health Administration. NS Sentinels are based in areas that serve as key routes for the transport of hazardous materials. Employees trained in hazardous materials, environmental operations, and industrial hygiene are available to respond 24/7, if needed.

All employees who directly affect hazardous material safety—including train and engine crews who operate trains moving hazardous products—receive annual training in awareness, safety, and security. This schedule exceeds federal regulations, which require such training every three years.

Working with the National Transit Institute at Rutgers University, Norfolk Southern helped develop national training standards for safely transporting hazardous materials. We also have partnered with the federal Transportation Security Administration to develop other industry training programs.

#### TO HELP COMMUNITIES STAY SAFE, IN 2013 WE:

- Held 256 rail-accident response classes
- Trained more than 4,880 local emergency responders
- Offered more than 18,720 hours of training

## Helping to Train Responders

Norfolk Southern employees help train local police, firefighters, and other first responders in how to safely respond to rail incidents involving hazardous materials.

To safeguard communities, we participate in the Transportation Community Awareness and Emergency Response program known as TRANSCAER®. In 2013, Norfolk Southern employees through TRANSCAER conducted 256 rail-accident-response training classes in 110 locations in 17 states across our network. More than 4,880 emergency responders participated in classroom and hands-on training, tabletop simulations, and field drills. The locations chosen were based on Norfolk Southern's hazardous material key routes and requests from hazardous material shippers and local emergency responders.

Representing 18,726 hours of training, these sessions provided a unique opportunity for local responders. With the help of industry partners DuPont, PCS, BASF, and GATX, the training often featured tank cars that transport hazardous materials, giving responders a hands-on opportunity to learn about their safety features.

"The TRANSCAER program is immensely important to Norfolk Southern," said Richard Russell, our system director of environmental protection. "In the unlikely event of an incident, this proactive training ensures that shared knowledge, mutual areas of expertise, and a wealth of resources can be leveraged to protect the communities we serve."



**AWARD FOR COMMUNITY SAFETY**

Norfolk Southern earned the 2013 National Achievement Award from TRANSCAER. The award recognizes companies for exceptional efforts to ensure that first responders are trained in how to safely respond to a possible rail incident involving hazardous materials.

Norfolk Southern has earned this achievement for 12 consecutive years and 14 times overall. TRANSCAER is a voluntary national outreach program that helps communities prepare for and respond to possible hazardous-material transportation incidents. Norfolk Southern is an industry member of the program, joining other transportation companies as well as members from chemical manufacturing, distribution, and emergency-response businesses and organizations.

**FUNDS FOR TRAINING**

In 2013, the Norfolk Southern Foundation contributed more than \$249,700 to 80 communities and emergency response organizations to assist in purchasing hazardous-material response equipment and safety gear. In addition, scholarships valued at \$16,400 were provided to send emergency responders on our system to the Transportation Technology Center Inc.'s Security and Emergency Response Training Center in Pueblo, Colo. The TTCI is a subsidiary of the Association of American Railroads.

**AN NS EMERGENCY GUIDE**

To assist local emergency responders, Norfolk Southern produces a Railroad Emergency Response Planning Guide, a reference source that supplements our TRANSCAER training programs. The guide includes railroad phone numbers, important notification procedures, hazmat identification information, and other training opportunities.

## Partnering with Government Agencies

Norfolk Southern maintains close working relationships with numerous federal and state agencies to ensure rail security.

Under the auspices of the Association of American Railroads, a Norfolk Southern police special-agent-in-charge serves on the National Joint Terrorism Task Force in Washington and acts as liaison between the rail industry and rail-oriented departments of federal agencies. This arrangement improves the flow of security information among industry, law enforcement, and senior federal government officials.

In addition, we work with the U.S. Coast Guard to develop security plans at the six port facilities we manage on the East Coast, the Great Lakes, and the Ohio River. Norfolk Southern employees who work at security-controlled ports hold the Transportation Security Administration's Transportation Worker Identification Credentials. We also are a member of the Customs-Trade Partnership Against Terrorism program, assisting U.S. Customs officials in protecting the integrity of rail freight shipments.

## Moving Crude Oil Safely

Technology advances in drilling and recovering crude oil deposits have led to increased U.S. oil production, which contributes to the nation's energy security, jobs, and competitiveness. A rise in oil production has created new business opportunities for Norfolk Southern and the rail industry.

In 2013, Norfolk Southern safely moved approximately 75,000 carloads of crude oil across our network. Working with western interline rail partners, we move crude over high-capacity routes from Chicago to refineries in Pennsylvania, Delaware, and New Jersey. Our network offers customers the shortest, most direct route from western oil deposits to East Coast refineries. In addition, we move crude oil recovered from drilling sites in Canada.

Norfolk Southern has invested in track infrastructure improvements and technology to ensure that crude moves safely across key transport routes. For example, we closely monitor crude oil trains through a computer software tracking system. Wayside wheel bearing detector devices are installed along the routes to detect potential railcar defects that could trigger an incident. We also conduct frequent track inspections to ensure that rail is maintained for safe operations. In addition, we have strict operating procedures in place for train crews, including speed restrictions and protocols for ensuring train security during transit.

In February 2014, Norfolk Southern and the nation's other major freight railroads agreed to participate in a voluntary initiative with the U.S. Department of Transportation to further enhance the safety of transporting crude by rail.

### AMONG OTHER THINGS, THE RAILROADS AGREED TO:

- Perform additional track inspections, including at least two high-tech track geometry inspections on main line routes used to transport crude oil
- Equip crude oil trains of 20 or more tank cars with technologies that enable train crews to apply emergency brakes from both ends of a train to stop it faster
- Use the Rail Corridor Risk Management System, an analytical tool developed with the federal government, to help identify the safest and most secure rail routes for moving crude
- Operate certain crude oil trains no faster than 40 mph within 46 federally designated high-threat urban areas
- Install additional wayside wheel bearing detectors, as needed, to have one detector at least every 40 miles along key rail routes
- Develop an inventory of emergency response resources for responding to the release of large amounts of crude oil along key routes of transport
- Continue to work with local communities to address their concerns regarding the safe transport of crude oil trains
- Continue to work with industry and customer groups to encourage the enhancement of federal tank car safety standards

## COMMUNITY ENGAGEMENT



Norfolk Southern works hard to educate communities about railroad safety. A primary focus is reducing incidents at highway-rail grade crossings across our system.

### Reducing Highway-Rail Grade-Crossing Incidents

Nearly all grade-crossing incidents occur when motorists fail to yield to approaching trains. With sometimes tragic outcomes, motorists too often ignore flashing warning lights and drive around crossing gates to try to “beat the train.” In 2013, Norfolk Southern recorded 341 vehicle/train incidents at grade crossings, an increase of seven incidents over 2012. However, the number of incidents per million train miles actually decreased in 2013.

Of the total incidents in 2013, 41 percent occurred in four states—Georgia, Indiana, Pennsylvania, and Alabama. We attribute that in part to heavier train and vehicular traffic, larger populations, and more grade crossings in those areas than in other U.S. states across our network.

Norfolk Southern’s Safety and Environmental Department works with a national nonprofit safety organization, Operation Lifesaver, to educate community leaders, safety partners, and the public about rail safety. Our “Train Your Brain” campaign aims to educate college-age drivers about grade-crossing safety. Our overall goal is to reach as many people as possible on key rail routes and in places where we experience higher rates of incidents.

The key is building relationships with community and city leaders and with state transportation department partners, said Will Miller, manager grade-crossing safety.

“We all are interested in the same issues: safe and efficient movement of freight and economic development,” he said. “We need solid relationships to work on developing solutions together.”

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#### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

**HIGHWAY-RAIL GRADE-CROSSING INCIDENTS ON  
NORFOLK SOUTHERN NETWORK 2007-2013**

Year	No. of highway-rail incidents	No. of train miles (millions)	Incidents per million train miles
2007	449	102	4.4
2008	410	101	4.1
2009	277	85	3.3
2010	318	91	3.5
2011	348	83	4.2
2012	334	87	3.8
2013	341	95	3.6

## Train Excursions Promote Rail Safety

Residents in communities served by Norfolk Southern don't often get a chance to ride a train to learn about railroad safety. In April 2013, NS teamed with Operation Lifesaver to offer two weeklong excursions that promoted awareness of highway-rail safety and the risks of trespassing on railroad tracks along major NS routes.

As the safety train traveled the tracks, a camera mounted on the lead locomotive streamed live video into passenger cars. Guests enjoyed the scenery while observing potential safety issues that train crews encounter daily.

Together, the safety trains—one traveling between Buffalo, N.Y., and Huntingburg, Ind., the other between New Orleans, La., and Greensboro, N.C.—stopped in 23 cities in 11 states, covering 1,381 route miles. More than 100 guests participated, including community leaders, law enforcement officers, safety officials, first responders, and Operation Lifesaver volunteers.

## Grassroots Safety Effort

In April 2013, Norfolk Southern police met for two days with local law enforcement and elementary and high school students in Cabarrus County, N.C., to reduce railroad trespassing. Police visited a popular hangout near railroad tracks where intermodal trains pass by at nearly 60 mph. Their message: Trespassing on railroad rights-of-way is illegal and dangerous.

## Brainy Knows Best

Norfolk Southern's most popular safety ambassador has to be "Brainy," a giant pink mascot who makes appearances at community events as part of our "Train Your Brain" campaign. The campaign aims to increase public awareness about being smart and careful at highway-rail grade crossings, reaching more than 800,000 people during the past six years.

The 2013 campaign focused on East Tennessee markets, particularly Knoxville, Chattanooga, and the Tri-Cities area of Kingsport, Johnson City, and Bristol. Brainy appeared at 20 public events, including university sporting events and family-friendly festivals. Tennessee in 2012 experienced

66 highway-rail collisions, resulting in four deaths and 18 injuries. Additionally, 10 people died and another 10 were injured while trespassing on railroad tracks, equipment, and property in the state.

Train Your Brain targets drivers 16 to 24 years old. In Knoxville, our representatives gave educational presentations to new student drivers about the dangers of distracted driving and of trespassing on railroad property.

The campaign's safety messages are promoted using traditional and nontraditional marketing, including advertising, event marketing, public relations, digital marketing, and social media. In 2014, we are taking the campaign to South Carolina and Charlotte, N.C. For railroad safety tips, event photos, or to find out more about the campaign, visit [www.BrainysWorld.com](http://www.BrainysWorld.com) or find Brainy on Norfolk Southern's [Facebook](#) page.



## NS AS AN EMPLOYER



Norfolk Southern recognizes that employees are the company's most valuable asset. To attract and retain the best and brightest talent, we provide a positive and constructive work environment. We train employees to work safely and efficiently; offer good pay and rewarding benefits; create opportunities for career development and advancement; and provide wellness programs to encourage a healthy and fit workforce.

While we function as one company and one team, we understand that it takes a diverse workforce to generate the creativity and vitality needed to fulfill our vision to be the safest, most customer-focused, and successful transportation company in the world. Managing diversity is a continuous process of recognizing, cultivating, and deploying the different skills and perspectives of all employees to improve service and create better business outcomes. This spirit of inclusion is a key component of employee engagement and allows individuals to contribute to their fullest potential.

### More Than 1,000 New Hires in 2013

As a FORTUNE 300 company, Norfolk Southern's team is nearly 30,000 strong across 22 states and the District of Columbia. The railroad offers a range of career opportunities in the communities we serve.

In 2013, we hired more than 1,000 employees in jobs essential to operations. Among positions with the largest number of hires were: conductor trainees, management trainees, and signal trainees. The top five states for new hires were Pennsylvania, Georgia, Virginia, Indiana, and Illinois.

A majority of hires were for unionized craft positions that pay well, are relatively stable, and don't require a college education. Overall, about 83 percent of the company's workforce is covered by collective bargaining agreements with various labor unions. These include employees who operate trains, maintain track and communication signals, and repair and maintain locomotives and railcars.

Pay for conductor trainees starts at around \$40,000, not counting benefits, and rises to between \$50,000 and \$75,000 annually as they become conductors and gain certification as train engineers.

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#### GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.

Other craft positions range in pay from \$50,000 to \$70,000 a year, not including medical and other benefits.

<b>WORKFORCE GENERAL INFORMATION</b> Employee snapshot on Dec. 31, 2013	
Total number of ns employees	29,034
Total number of senior management	29
Percentage of the workforce covered by a collective bargaining agreement	82.9%
Number of new hires in 2013	1,056
Total number of employees leaving employment in 2013	1,976
Breakdown of entire workforce by country:	
— U.S.	29,023
— Canada	11

## Training Center Offers Solid Foundation for New Employees

With employees spread across 22 states, it's critical to provide a strong, structured, and common foundation for new hires. The company's training center in McDonough, Ga., south of Atlanta, is unique in the rail industry, offering centralized training with hands-on railroading experience in a safe, controlled environment. Employees are exposed to the same messages, standard procedures, and core operating rules.

In 2013, the center trained 2,100 employees, 1,800 of whom were craft employees. Conductor trainees made up the largest group, but technical training programs were offered for other operations employees as well. The training classes typically run from three to eight weeks.

Part of the training focuses on helping employees understand how they fit into the bigger picture of Norfolk Southern's business. "Not only are they performing tasks and building knowledge of operating and safety rules," said Daniel MacKay, training center manager, "but they also are learning how and why their positions impact productivity and efficiency for Norfolk Southern."

Opened in 1975, the state-of-the-art training facility has working car and locomotive shops, a locomotive simulator, a welding lab, a signal lab, and two miles of track. In 2013, NS updated the car shop and locomotive lab with advanced equipment and constructed a welding pavilion storage facility as dedicated space for track welding. In early 2014, the company broke ground on a 23,000-square-foot building that will provide additional classroom space.

## Diversity as a Critical Business Asset; Inclusion as a Workplace Imperative

Norfolk Southern is committed to workplace diversity and strives to foster an environment of inclusion and innovation. We believe that leveraging employees' similarities and differences adds strength to our organization: Only through inclusion can we gain the full value of a diverse workplace.

The company formed a Diversity Council in 2002 comprising a cross-section of employees who assist in developing and implementing initiatives to promote diversity, mutual respect, and professionalism. Since then, more than 100 employees have served as members, helping to lead the company toward workplace diversity and inclusion.

In recent years, senior managers have supported the formation of employee resource groups to promote the benefits of diversity and to strengthen teamwork across departments and locations. Started by employees who wanted to join together to make a difference, these groups help to keep employees active in the workplace and in the communities we serve.

Three of the primary Norfolk Southern employee resource groups are:

**WiNS** : Formed in 2004, WiNS is a networking group that fosters the professional development and leadership of women. It is open to all employees, and more than 1,570 employees across the company are members, including 139 who joined in 2013.

**YoungNS** : Formed in 2009, YoungNS is aimed at developing young and short-tenured professional employees. YoungNS seeks to strengthen the ranks of the management talent pool and improve retention through mentoring, education, professional development, and networking. This group originated at our Norfolk headquarters and now has about 231 members of all ages and years of service. YoungNS chapters later launched in Atlanta and Roanoke and have around 760 and 400 members, respectively.

**VeteraNS** : Formed in 2012 in Atlanta, the VeteraNS group reflects the growing number of military veterans joining the company's workforce. The mission of this networking and support group is to educate, develop, and connect the railroad community with the military—past and present. During the 2013 holiday season, VeteraNS was involved in an effort that helped Operation Gratitude send more than 100,000 care packages to U.S. military personnel.

Learn more about our diversity efforts and employee programs [here](#).

#### ALL EMPLOYEES BY STATUS

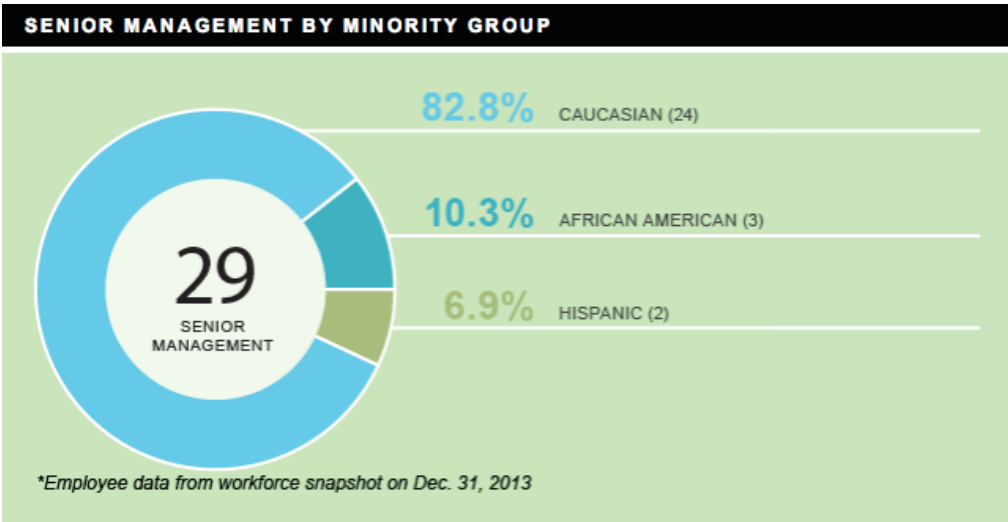
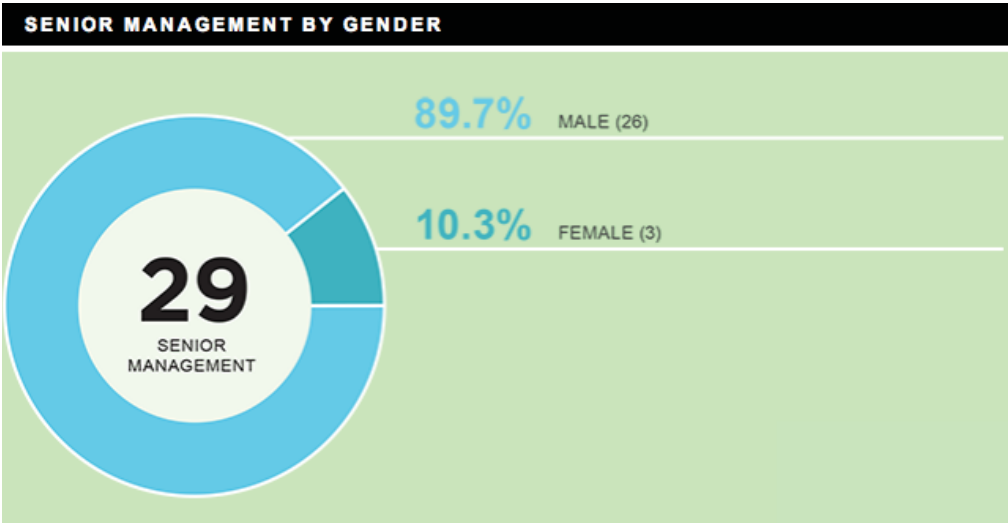
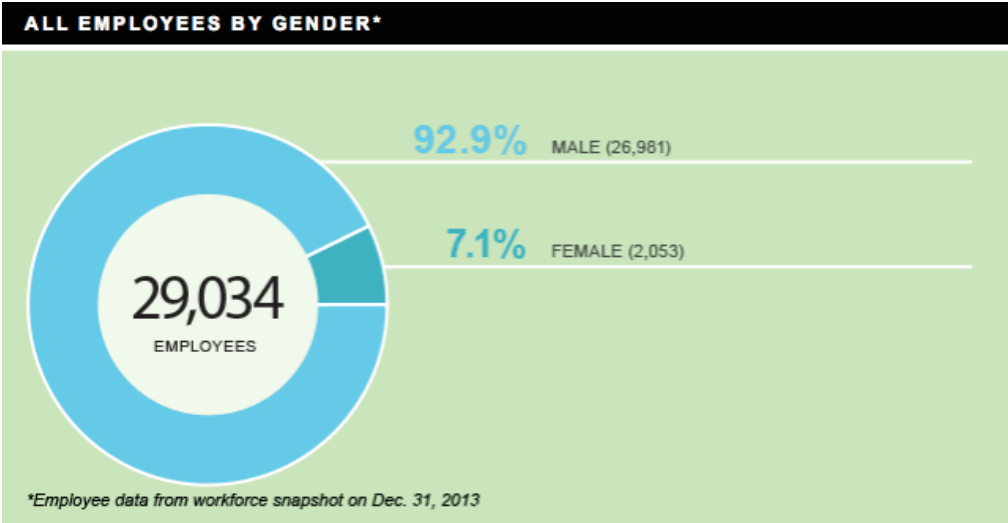
Employee status	%	Male total	Male %	Female total	Female %	Total
Agreement	82.9%	22,972	95.5%	1,093	4.5%	24,065
Non-agreement	17.1%	4,009	80.7%	960	19.3%	4,969
Senior management	0.001%	26	89.7%	3	10.3%	29

**NEW HIRES BY STATE OF EMPLOYMENT**

State	%	No. of Employees
Regional	11.2%	118
AR	0.1%	1
AL	2.2%	23
DC	0.2%	2
DE	0.8%	8
FL	0.3%	3
GA	22.3%	236
IA	0.1%	1
IL	4.4%	46
IN	5.8%	61
KY	0.6%	6
MD	1.0%	11
MI	0.5%	5
MO	2.6%	27
NC	0.9%	10
NJ	1.4%	15
NY	0.9%	9
OH	4.0%	42
PA	24.9%	263
SC	2.7%	29
TN	1.5%	16
VA	10.2%	108
WV	1.5%	16
<b>Total new hires</b>		<b>1056</b>

**ALL EMPLOYEES BY ETHNICITY**

Minority group	%	Male total	Male %	Female total	Female %	Total
White	84.34%	23159	94.58%	1327	5.42%	24486
Black or African American	13.16%	3160	82.68%	662	17.32%	3822
Asian	0.49%	108	76.06%	34	23.94%	142
Other	2.50%	554	94.86%	30	5.14%	584



**NSC BOARD OF DIRECTORS DEMOGRAPHICS 2013**

	Male	Female	Caucasian	Black	Hispanic	Other minorities	Total
<b>Board of directors</b>	11	1	10	2	0	0	12
<b>Governance and nominating committee</b>	4	1	4	1	0	0	5
<b>Audit committee</b>	5	1	4	2	0	0	6
<b>Compensation committee</b>	5	0	5	0	0	0	5
<b>Executive committee</b>	5	0	5	0	0	0	5
<b>Finance committee</b>	6	0	5	1	0	0	6

**CEO WICK MOORMAN ON DIVERSITY**

Some people think of diversity as having to do only with race, gender, religion, and nationality. But it goes far beyond that to define the perspectives that we all bring to our jobs. At Norfolk Southern, diversity impacts not just our workforce, but also our workplace and marketplace.

Increasingly, our company performs on a world stage, and in this highly competitive environment we need to keep a broad range of opinions and outlooks if we are to deliver for our shareholders, shippers, and employees.

What I ask of everyone at Norfolk Southern in regard to diversity and inclusion is simple: As you go about your daily activities, ask yourself how you can use diversity to achieve better business outcomes. Keep inclusion in mind as you form problem-solving teams, and use it as a tool as you identify opportunities, develop objectives, and execute our business plans.

## Equal Opportunity

Norfolk Southern offers employment, training, remuneration, advancement, and other privileges of employment based on qualification and performance, regardless of race, religion, color, national origin, gender, age, status as a covered veteran, sexual orientation, the presence of a disability, genetic information, or any other legally protected status.

To learn more about careers at Norfolk Southern, including benefits offered to employees, visit our [corporate website](#).

## A GOOD PLACE FOR MILITARY VETERANS



Norfolk Southern actively recruits people with military backgrounds for railroad operations and management. Over the past seven years, NS has hired 2,400 veterans, and today, about 12 percent of NS' workforce—more than 3,300 employees—comprises veterans, members of the National Guard, and reservists.

"The railroad is an excellent environment for veterans to continue using their training and leadership skills in a second career," said Norfolk Southern President Jim Squires, a U.S. Army veteran. "There are many opportunities for veterans at Norfolk Southern, and we make a special effort to encourage those who have served their country to join the Thoroughbred team."

Norfolk Southern recruits veterans through [www.NorfolkSouthern-veterans.jobs](http://www.NorfolkSouthern-veterans.jobs), at job fairs on military bases, and at the federal government's Transition Assistance Program classes. Service members preparing to leave the military can register their separation dates and desired work locations with Norfolk Southern, allowing recruiters to contact them with current job opportunities.

Additionally, Norfolk Southern provides training to help veterans who have management experience transition into supervisory roles within the company. If veterans are called to active duty through the Reserves or National Guard while working at Norfolk Southern, they can serve their country knowing they can return to their railroad jobs.

## Patriotic Gathering

In October 2013, trains, patriotism, and history were on display at Rose Yard in Altoona, Pa., as Norfolk Southern and Amtrak hosted “All Aboard Altoona.” Amtrak displayed its Exhibit Train, pulled by its custom-painted Locomotive 42, while Norfolk Southern displayed our Veterans Locomotive.

### TOP 100 EMPLOYER

For the seventh time, *G.I. Jobs* magazine named our railroad as one of the nation’s Top 100 Military Friendly Employers®, ranking Norfolk Southern No. 75 on the 2014 list. The list represents the top 2 percent of more than 5,000 eligible companies with annual revenues exceeding \$500 million. The magazine’s selection criteria included the strength of a company’s military recruiting efforts, percentage of new hires with prior military service, retention programs, and company policies toward National Guard and Reserve service.

### BEST FOR VETS

*Military Times EDGE* magazine ranked Norfolk Southern among the top 50 companies on its 2013 list of “Best for Vets” employers. The railroad ranked No. 44 out of more than 1,000 large companies and government contractors surveyed by the magazine. The rankings were based on veteran recruiting, corporate culture, reserve policies, and other criteria.

## HEALTHY AND WELL

### WellNS helps employees stay on a healthy track

Norfolk Southern's slogan for the company's health and wellness program is, "You have the Power." Introduced in 2008, WellNS encourages employees to get regular medical screenings, become active, quit tobacco use, and make nutritious food choices.

#### 2013 WELLNS HIGHLIGHTS INCLUDE:

- A team of five Norfolk Southern employees in Norfolk, Va., won the Weight Watchers "50 Years of Success" contest in the At-Work category, losing a combined 223 pounds. Learn more about their story on the Weight Watchers website.
- The company created dedicated studio space for on-site employee-fitness classes, including Pilates, Zumba, and power abs, in our three corporate office buildings in Norfolk, Roanoke, and Atlanta, and in the training center in McDonough, Ga. Fitness classes also are offered in a field location near our Lamberts Point coal transload facility in Norfolk.
- Norfolk Southern hosted a rally and water stop for veterans during the "Ride 2 Recovery" memorial challenge. Ride 2 Recovery is a rehabilitation program that features cycling as a core activity to help veterans overcome physical and mental challenges after returning from service.
- More than 10,000 employees—a third of our workforce—now participate in Virgin Pulse HealthMiles. Participants earn points and can pocket up to \$500 a year by walking, participating in healthy activities, and tracking their health.
- Thirty Norfolk Southern teams participated in PowerTrain, a WellNS program in which teams of at least 10 co-workers train and compete in activity-based events that benefit nonprofit organizations. On behalf of teams that complete the events, Norfolk Southern donates \$1,000 to selected nonprofit groups.
- WellNS introduced a "buy local" effort to support farmers in Hampton Roads, Va. Employees can sign up for weekly deliveries of locally grown fruits and vegetables delivered to the company's Norfolk office.

### WellNS Recognition: Heart-Healthy Employer

The American Heart Association recognized Norfolk Southern as a Platinum Fit-Friendly Workplace for encouraging physical activity and health in the workplace.

### One of Atlanta's Healthiest Employers

Norfolk Southern ranked No. 3 among large Atlanta companies in the Atlanta Business Chronicle's 2014 Healthiest Employers awards. The journal cited the company's WellNS health program and partnership with Virgin Pulse to encourage employees to get active and lead healthy lifestyles. About 2,800 of Norfolk Southern's 30,000 employees work in Atlanta.

Employees in the Atlanta office who participate in the Virgin Pulse HealthMiles program can track their weight, blood pressure, and body mass index at WellNS kiosks. In addition, WellNS offers a gym and track at the company's Atlanta training center, fitness classes, and healthy eating workshops.

## IN THE COMMUNITY



### Our Volunteers Make a Difference

Norfolk Southern's formal volunteer program, the Thoroughbred Volunteers, offers employees a way to give back to their communities while serving as official railroad ambassadors. The program has an active presence at four of our largest centers of employment—Atlanta, Norfolk and Roanoke, Va., and Harrisburg, Pa. In 2013, we added a new chapter in Altoona, Pa., home to our Juniata Locomotive Shop, the largest locomotive repair and maintenance facility in North America.

The Thoroughbred chapters below recorded more than 2,000 volunteer hours in 2013. This does not include the many hours of service contributed by individual employees while volunteering on their own. In an informal 2012 survey, 360 employees reported contributing around 82,000 volunteer hours to organizations representing community, civic, culture and arts, education, environmental, health and human services, and business and economic development interests.

### 2013 Thoroughbred Volunteers Highlights Include:

#### ATLANTA:

- Contributed 907 volunteer hours during nine events
- Packed 460 boxes (6,700 pounds) of medical supplies for countries in need (MedShare)
- Sorted more than 11,000 pounds of food for distribution through the Atlanta Community Food Bank
- Collected 37 boxes of school supplies for the Boys & Girls Clubs of America
- Participated in Hands on Atlanta to clean Kittredge Park

**NORFOLK:**

- Contributed 933 volunteer hours during 11 events
- Participated in Clean the Bay Day, Paint Your Heart Out, Special Olympics, and various food drives and sorting events
- Volunteered at the Dwelling Place and ForKids, organizations that support homeless families

**ROANOKE:**

- Contributed 276 volunteer hours during eight events
- Collected 405 pounds of food for a food drive
- Sorted 18,500 pounds of food at the Feeding America Southwest Virginia warehouse
- Participated in Clean Valley Day
- Helped distribute school supplies to more than 1,300 children at the Back to School Blast

**HARRISBURG:**

- Collected more than 800 pounds of food for the Central Pennsylvania Food Bank
- Gathered five 55-gallon bags of toys for the U.S. Marine Corps' Toys for Tots program
- Filled more than 50 backpacks with school supplies in support of Operation Backpack

## Legal Department Takes Food Fight

Norfolk Southern lawyers do more than handle legal matters. Participating in the 2013 Legal Food Frenzy, a competition among Virginia's legal community to support local food banks, railroad lawyers in Norfolk placed second among medium-size legal firms, departments, and offices. Our team won "The Virginia Strawberry Award" for per capita results, collecting the equivalent of 844 pounds per person in food and monetary donations.

## United Way Trailblazer

The United Way of South Hampton Roads recognized Norfolk Southern as a Gold Trailblazer for the company's 2013 United Way campaign at our Norfolk headquarters, where 76 percent of employees participated. Employees contributed more than \$900,000, one of the largest corporate gifts in the Southeastern Virginia United Way region.

**A MODEL RAILROADER**

Norfolk Southern's Melvin Crawley is known for his collaborative efforts to help improve safety and customer service. To recognize his industry contributions, the St. Louis Railway Club, a group comprising Class I and short line railroads and suppliers, named Crawley its 2013 Club Man of the Year.

During Crawley's five years as superintendent of our terminal at St. Louis, employees worked 2 million consecutive hours without a reportable injury. He was cited for helping other railroads adopt safety practices successful at Norfolk Southern. Crawley became superintendent of Norfolk Southern's Georgia Division in early 2014.



"I've always tried to extend myself and maintain a high level of communication with the other railroads to make sure there's a sharing of ideas and best practices, because you can learn a lot from them, and they can help you, too," Crawley said. "You have to be a good corporate partner if you want to survive and thrive in today's market. It's just good business sense."

## NORFOLK SOUTHERN FOUNDATION



### Our charitable giving foundation helps communities grow stronger

Norfolk Southern is committed to providing human and financial resources to help build stronger communities across our network. The Norfolk Southern Foundation, which directs the railroad's charitable giving programs, helps us achieve that goal.

Since it was formed in 1983, the Foundation has distributed donations of nearly \$138 million to assist communities. The Foundation's priorities are to ensure that children have first-rate educational opportunities; that basic human services are available to those in need of them; that residents have access to enriching cultural activities; and that residential and work environments are safe, attractive, and desirable.

In 2013, the Foundation and corporate combined giving was \$12.8 million, excluding noncash giving and the company's Good Government Fund matching program.

Food banks that received significant grant funding included Foodbank of Southeastern Virginia, Feeding America Southwest Virginia, Central Pennsylvania Food Bank, and Atlanta Community Food Bank.

Homeless shelter providers that received grants included ForKids, YWCA of South Hampton Roads, Nicholas House, and Samaritan House.

Free clinics that received grants included the Chesapeake Care Free Clinic, Western Tidewater Free Clinic, Free Clinic of the New River Valley, Beach Health Clinic, Macon Volunteer Clinic, Shelter Health Services, and Kansas City Free Care Clinic.

Supporting the company's commitment to environmental stewardship, the Foundation provided grants to a range of environmental and conservation organizations. Major recipients included The Nature Conservancy of Virginia, which protects ecologically important lands and waters throughout the commonwealth; the Elizabeth River Project, which works to restore that river's ecological health; The American Chestnut Foundation, which reforests former coal mines around the eastern United States; The Longleaf Alliance Inc., whose mission is to preserve and expand longleaf pine forests; and the Chesapeake Bay Foundation, which seeks to restore the nation's largest estuary.

Cultural and arts groups that received funding included the Chrysler Museum of Art, the Virginia Arts Festival, the Woodruff Arts Center, the Center in the Square, the Virginia Opera, and Young Audiences of Atlanta.

Educational organizations that benefitted included Virginia Tech, Georgia Tech, the College of William & Mary, Old Dominion University, the National Merit Scholarship Program, the Virginia Foundation for Independent Colleges, and the Virginia Early Childhood Foundation.

The Foundation awarded more than \$1.6 million to match donations given by employees and retirees to more than 500 nonprofit organizations across our network that support the arts, education, and the environment.

#### 2013 NS FOUNDATION, CORPORATE, AND BUSINESS GRANTS

Community Relations	<b>\$3,015,695</b>
— United Way 79 organizations	\$1,554,550
— Other Health & Human Services 110 organizations	\$1,461,145
Culture & Arts 76 organizations	<b>\$2,946,742</b>
Education 71 organizations	<b>\$1,721,615</b>
Civic & Community 112 organizations	<b>\$670,360</b>
Environment & Ecology 20 organizations	<b>\$255,500</b>
Other 70 organizations	<b>\$2,560,982</b>
Matching Gifts 1,289 gifts to 501 organizations; 473 individual donors	<b>\$1,655,412</b>
— Arts & culture 664 gifts to 226 institutions	\$666,795
— Education 580 gifts to 257 institutions	\$970,697
— Environment 45 gifts to 18 organizations	\$17,920
<b>Total</b>	<b>\$12,826,306</b>

## Art Sale Benefits Communities We Serve

As a supporter of the arts, Norfolk Southern over the years has established a collection of visual art and historic artifacts. In 2013, merging the worlds of fine art and railroading, the company sold an untitled 1959 Mark Rothko abstract expressionist painting in our collection for \$3.7 million through a New York auction.

We used \$2.3 million of the proceeds to support educational, human service, and cultural organizations in communities where Norfolk Southern has a major presence.

In Norfolk, we directed \$500,000 to the ACCESS College Foundation, an organization that provides scholarships to students who might not otherwise be able to afford college.

### COLLEGE CHANGES EVERYTHING

“Norfolk Southern’s support of our College Changes Everything campaign assisted ACCESS in raising the capital needed to not only sustain our programs but also to deepen our level of services,” said Bonnie B. Sutton, president and CEO of the ACCESS College Foundation-Norfolk. “Through the gift of higher education, Norfolk Southern has increased the opportunity for thousands of local students to become the next generation of corporate and community leaders in Hampton Roads.”

In Roanoke, \$252,000 went to Feeding America Southwest to purchase a new roof for its food bank, where Roanoke employees frequently conduct food drives and volunteer to sort donations. Also in Roanoke, we donated \$25,000 to the Harrison Museum of African American Culture for exhibits and displays.

In addition, \$1.5 million went to the Virginia Museum of Transportation’s “Fire Up 611!” capital campaign to restore the Norfolk & Western Railway Class J 611 steam locomotive and return it to passenger-excursion service.

## A Helping Hand

In 2013, the Norfolk Southern Foundation provided more than \$67,000 in disaster relief through donations to the American Red Cross. The funding assisted recovery efforts after Hurricane Sandy struck the U.S. East Coast and after other natural disasters.

## PARTNERING WITH PASSENGER RAIL



Freight rail is Norfolk Southern's business, but we support safe, efficient passenger rail service as a means of relieving highway congestion and reducing greenhouse gas emissions. To that end, we work with communities, states, and rail operators to give passenger trains access to our network when we determine it can be done safely and without negatively affecting our current and future business operations.

Currently, part or all of more than a dozen Amtrak intercity passenger-service routes run over Norfolk Southern lines, and several commuter rail systems also use our lines, including Metra in Chicago and Virginia Railway Express in Northern Virginia.

In the past five years, Norfolk Southern has helped develop several successful passenger rail initiatives. We partnered with Virginia to reintroduce Amtrak passenger service to Norfolk and daily passenger service to Roanoke over our rail lines. We continue to work with the Charlotte, N.C., Area Transit system on a light rail project expected to create significant community benefits. In 2013, we worked on the Indiana Gateway, a group of projects along the Chicago-to-Detroit high-speed rail line, and on our portion of the public-private Englewood Flyover project in Chicago, which is elevating Metra trains so they no longer cross grade-level tracks used by freight and Amtrak trains.

## A Good Passenger Rail Project

While we support passenger rail programs, we must ensure that they are implemented in a way that sustains future freight traffic. We follow five guiding principles when evaluating the compatibility of passenger rail on our lines.

### **PASSENGER RAIL MUST:**

- **Provide safe operations for freight and passenger trains and the communities they serve**
- **Be transparent to freight operations, meaning sufficient infrastructure must be available, for both passenger and freight trains to operate without delays and to support business growth**
- **Provide fair value for the use of Norfolk Southern assets**
- **Offer full liability protection**
- **Operate without subsidy from Norfolk Southern**

## COMMUNITY ConnectionS



### Our ‘Virtual’ Connection with Communities

For an organization with operations in 22 states, the use of social media helps us put a face on a large company. Social media outlets give us tools to personally connect with communities we serve and help us educate people about the economic and environmental benefits of rail and how trains deliver many of the goods they use every day.

As of early 2014, the railroad had more than 38,200 fans on Facebook, 11,500 followers on Twitter, and 2,100 followers on Instagram. We also have a presence on LinkedIn, Pinterest, Flickr, and Tumblr.

“We want people to understand that Norfolk Southern is part of their community,” said Stacey Hugo, manager community outreach. “Our employees live and work in these communities, so what is important to the general public is important to us as well.”

### The Personal Touch

When it comes to discussing rail transportation, Norfolk Southern employees are the company’s best advocates. Employees volunteer to share the railroad’s message with an array of civic, business, school, and community groups through our Thoroughbred Speakers Network. In 2013, employees spoke to approximately 20 groups, providing a vital link to the communities we serve.

Among employees speaking to local groups were a chief train dispatcher, an industrial development manager, and the railroad’s historical archivist.

## Recreating History in the 21st Century

The sights and sounds of steam locomotives are alive today on Norfolk Southern lines. As part of the railroad's 21st Century Steam Program, the Tennessee Valley Railroad Museum and the Fort Wayne Railroad Historical Society offer public steam excursion trips pulled by restored steam locomotives.

Employees, customers, suppliers, government officials, and other guests are invited on these short trips in climate-controlled coaches as part of the program's efforts to highlight the rail industry's long history and to showcase the role Norfolk Southern plays in today's global economy. In 2013, steam-excursion trips were offered in Tennessee, Virginia, North Carolina, Ohio, and Pennsylvania.

## Exhibit Car Educates and Entertains

Norfolk Southern's Exhibit Car, a restored 1926 Pullman car, is a mobile museum that gives visitors a hands-on view of the company's history as well as modern-day contributions to U.S. freight transportation. In its 43 years of service as a display car, more than 1.5 million people in 300 communities have toured its exhibits.

A locomotive simulator, complete with throttle, brake, and horn, is a popular display, putting visitors in control of a virtual freight train. A new game, "Load the Line," challenges players to match freight products with the correct type of railcar. The Exhibit Car also features displays about the railroad's heritage, volunteer programs, safety, and sustainability.

In 2013, the Exhibit Car made a public tour through Pennsylvania, Tennessee, North Carolina, South Carolina, and Virginia.

## Girl Scouts Appreciate Us

Members of Girl Scout Troop 5455, part of the Girl Scout Council of the Colonial Coast in Virginia and Northeastern North Carolina, presented the company with a Girl Scout "Community Award" that reads: "Your support of Girl Scouting and Service Unit 717 Hickory has helped build girls of courage, confidence, and character who make the world a better place."

Norfolk Southern employees developed an "Explore Norfolk Southern" Girl Scout merit badge in 2010. Scouts earn the badge by learning about railroad safety, rail's environmental benefits, and rail's contribution to the economy. During 2012 and 2013, the company hosted the scouts on a special train ride and provided a tour of the railroad's museum in Norfolk.

## SUSTAINABILITY IN ACTION:

# LOCOMOTIVE ENGINE HEATER PROJECT SAVES FUEL AND REDUCES EMISSIONS



**Mark Duve, Norfolk Southern's mechanical engineer of locomotive design, spends many hours developing technologies to improve locomotive performance. His latest project is helping the railroad conserve fuel and reduce environmental impacts.**

MARK DUVE, Norfolk Southern's mechanical engineer of locomotive design, spends many hours developing technologies to improve locomotive performance. His latest project is helping the railroad conserve fuel and reduce environmental impacts.

Duve led a project to develop an electric plug-in locomotive-engine heating system that will reduce fuel use and emissions in rail yards and local operations. Because locomotive engines do not use antifreeze, they often must remain idling in cold weather to prevent engine-cooling water and engine components from freezing. With the heater, which is plugged into an external power source, a locomotive can be turned off for extended periods, resulting in environmental benefits and cost savings.

"Idling locomotives consume between three and four gallons of diesel fuel per hour," Dave said, "and colder weather causes the fuel consumption rate to increase."

Over the past several years, Norfolk Southern has installed automatic engine start-stop systems on locomotives to reduce idling. They shut down or restart an engine based on ambient air and

engine temperatures. During extremely cold winters in the company's Northern Region, however, the AESS' start function typically keeps the engines running. By contrast, the electric heating system Duve's team developed will keep the engine warm when plugged in, making it more effective than the AESS in reducing emissions from engine idling.

Largely through Duve's efforts, Norfolk Southern received three state and municipal grants totaling more than \$2 million to install 45 locomotive heaters and 36 plug-in stations in rail yards in Chicago, Kansas City, Mo., and northeastern Ohio. The plug-in stations include a 480-volt, three-phase power cord, poles, transformers, and a power distribution panel. Train crews connect the 20-foot to 30-foot power cord from the plug-in station to the locomotive heater using a fuel crane that Duve and his team modified to lift and hold the cord. "That makes it easier and more ergonomic for people to pick up," he said.

Norfolk Southern is the first Class I railroad to adopt a systemwide initiative involving locomotive engine heaters. The three initial projects will save an estimated 247,000 gallons of fuel annually and reduce emissions of nitrogen oxide by more than 80 tons and particulate matter by 2.87 tons. The heaters are being installed first on yard locomotives, where they have the most impact on local air quality. The plan is to continue installing them on yard and local locomotives and then, eventually, on line-of-road locomotives to extend the benefits.

Already, Duve is reviewing grant opportunities to expand the use of the locomotive heaters, including yards in Baltimore, Md., and in Allentown and Pittsburgh, Pa.

Duve worked 16 years at locomotive manufacturer EMD on locomotive performance and emission-reduction projects before joining Norfolk Southern in 2010. He regularly visits terminals and yards on the railroad to get input from crews, trainmasters, road foremen, and mechanical supervisors. "Local employees are best qualified to identify where changes are most appropriate," he said.

For his work, Duve was recognized as Norfolk Southern's 2014 nominee for the Association of American Railroads John H. Chafee Environmental Excellence Award. The award goes to a Class I railroader who displays a high degree of environmental awareness and leadership on the job.

## SUSTAINABILITY IN ACTION:

# RAISING THE BAR ON ENVIRONMENTAL PROTECTION



**Joe Gennette** has a simple way to describe his job at Norfolk Southern: “If it has anything to do with environmental protection, my team is probably involved,” he said.

JOE GENNETTE has a simple way to describe his job at Norfolk Southern: “If it has anything to do with environmental protection, my team is probably involved,” he said.

Gennette, manager of environmental operations, heads up a 12-member team that among other things oversees operation of 95 wastewater facilities at mechanical shops, intermodal facilities, and rail yards; provides emergency response to spills or incidents related to hazardous materials; ensures company compliance with environmental laws; and helps train operations employees in environmental protection.

During a 38-year career, Gennette has helped the railroad stay ahead of continually evolving state and federal rules that regulate air, land, and water quality. In recognition of his efforts, the company nominated Gennette for the 2013 Association of American Railroads’ “North American Environmental Employee Excellence Award.”

Norfolk Southern’s business approach, Gennette said, is to minimize environmental impacts of operations in the most efficient and cost-effective ways possible. The company’s goal is to exceed, not simply meet, government regulations, he said.

“If we’re not trying to excel, then we’re not trying hard enough,” he said. “I think we can always improve, and that’s what we’re looking for—continual improvement.”

Gennette, for example, served on a team that in 2013 revamped the process for the recycling of used oil in locomotive shops and fueling facilities. The railroad recycled more than 1.5 million gallons of used oil in 2013. With the changes, we expect to increase the amount by as much as 10 percent in 2014.

Nearly two decades ago, Gennette helped launch a program to recycle batteries systemwide. In 2013, we recycled more than 1 million pounds of batteries, keeping tons of contaminants such as lead and cadmium out of landfills.

Gennette said Norfolk Southern practiced sustainability long before it was recognized formally in corporate circles.

“I think sustainability just makes good business sense,” he said. “I encourage all of our employees at our shops and facilities to do everything they can to recycle and minimize the company’s environmental impacts, and the employees on my team work with them to do that.”

## SUSTAINABILITY IN ACTION:

# SUSTAINABLE SOLUTION TO A BUSINESS CHALLENGE



Finding solutions to business challenges does not always cost a lot of money or require major changes. **Laura Hoag**, assistant superintendent, and **Nick Wymer**, senior technology analyst on our Dearborn Division, can attest to that.

Finding solutions to business challenges does not always cost a lot of money or require major changes. Laura Hoag, assistant superintendent, and Nick Wymer, senior technology analyst on our Dearborn Division, can attest to that. Working together in early 2013, they came up with a plan that has saved money and time and reduced delays to train crews at terminals all across the system.

It started at our Toledo, Ohio, terminal. Looking for ways to improve on-time train departures, Hoag began talking with road train crews about work issues that slowed them down. A key theme emerged: Old dot-matrix printers the crews used to get printouts of their daily work bulletins were slow and in constant need of repair.

“Train crews were frustrated with how long it took for bulletins to print, and I didn’t want people standing around waiting,” Hoag said. She enlisted Wymer to help with the technology side. Their solution: They developed a pilot program to replace the old printers with laser printers. In addition, they changed the format of the work bulletins, including removing outdated information. This reduced the size of the bulletins, allowing train crews to focus on safety and service issues of immediate concern.

The resulting efficiency improvements were remarkable, Hoag said. The Toledo terminal office went from using four unreliable dot-matrix printers to three laser printers. Because the laser machines print on both sides of the paper, the office expects to reduce paper use by about 240,000 sheets annually, a savings of around \$88,000. Because the laser printers are 78 percent faster, train crew productivity has improved. Over three shifts, crews saved about six hours a day in waiting time—equivalent to about \$270,000 over a year, Hoag said.

During more than six months of operation, there were zero laser-printer failures, compared with 28 failures a month on average for the old printers, she added. The company is saving on contractor repair calls, crew time, dispatcher time, and internal IT staff time. As an added bonus, the new printers consume 57 percent less energy.

Since the pilot’s success in Toledo, the company has begun replacing dot-matrix printers across the system. By the end of first quarter 2014, 45 new laser printers had been installed in terminal offices on every operating division. The project’s impact on corporate sustainability, Hoag said, goes beyond savings on paper and business costs.

“If you think about sustainability in terms of people coming to work every day and being frustrated just in getting their basic paperwork, it makes a big difference to remove that level of inconvenience and inefficiency,” Hoag says. “If you improve employee morale, you improve the company.”

## SUSTAINABILITY IN ACTION: A PASSION FOR SUSTAINABILITY



### It is not an exaggeration to say that **Jamie Helmer** lives sustainability.

Helmer is manager of process engineering for the Mechanical Department in Roanoke, Va. She is a founding member and former chair of Roanoke SustaiNS, an employee resource group formed in 2010 dedicated to promoting the company's environmental initiatives. She frequently bicycles to work, one of about 20 employees in our downtown Roanoke office building to do so—often to support the city's Ride Solutions program. Thanks to employees like Helmer, Norfolk Southern received an honorable mention in 2012 from the League of American Bicyclists for being a Bicycle-Friendly Business.

In her job, Helmer says sustainability comes naturally. "My main focus is working on process engineering—looking at everyday improvements that employees want to make in the workplace but need coaching in how to do it," she said.

Helmer sees a connection between sustainability and the company's focus on workplace innovation. She jumped at the chance in 2013 to help the company's InnovatioNS group pilot a HorsePower Chapter

in Roanoke, its purpose being to share and develop ideas to make the company stronger. That includes ways to enhance workplace safety and efficiency, increase business revenue, and reduce expenses—all key to the company's long-term success.

"I teach employees how to grow an idea and build a business case around it," Helmer said. "Often when people think of innovation, they think it has to be big, earth-shattering ideas, but it can be something small and local. Trying to make change across the system is an enormous undertaking, but you can contact local management or a local recycling company and start that way."

Helmer has spearheaded employee efforts to recycle aluminum cans, plastic bottles, and batteries and helps manage a corporate electronics recycling event each year in Roanoke. Typically, about 200 employees participate. "Recycling is as easy as throwing your aluminum soda can in a container as you walk by," she noted.

In Helmer's view, however, there's more to being sustainable than recycling. Roanoke SustaiNS sponsors regular "lunch-and-learn" programs that encourage employees to do everything from exercise more to join a local community-supported agricultural co-op that allows them to get local fresh food every week.

"Wellness has a piece in sustainability, too," she said. "Whenever you're walking, running, or biking to work, you're helping yourself as well." That's part of what has driven Norfolk Southern to introduce yoga, Zumba, and core classes in the Roanoke office building, all offered free of charge to employees.

Outside of work, Helmer and fellow SustaiNS members frequently partner with the Roanoke Thoroughbred Volunteers, part of the company's official volunteer program, and YoungNS, a resource group for Norfolk Southern's young professional employees. For example, the groups came together to assist Roanoke's Rebuilding Together, an organization that helps low-income individuals stay in their homes by building or providing funds for wheelchair accessibility.

"That is why I love this company so much," Helmer says. "Besides the job itself, there are all these groups that let you bring your personality and passions to the job and be part of the community."

## SUSTAINABILITY IN ACTION:

# PROMOTING SERVICE THROUGH SAFETY



**Gregory Murgonovich**, a locomotive engineer in Conway, Pa., lives Norfolk Southern's SPIRIT culture.

Gregory Murgonovich, a locomotive engineer in Conway, Pa., lives Norfolk Southern's SPIRIT culture. Since the railroad introduced behavior-based safety processes two years ago, Murgonovich has championed the change. The emphasis is on recognizing employees who display desired work behaviors and on coaching employees when they fall short.

"We do it through positive reinforcement," said Murgonovich, a former chairman of the Conway terminal's safety and service committee. "We're going out peer to peer and noticing what people are doing right," he said. "We're specific about the behavior we want to reinforce, we provide positive feedback for that, and we let people know what they need to work on."

The company's culture change, he said, has fostered a positive work environment and enhanced communication among employees. "I've seen changes," Murgonovich said. "There was a time when we only saw management when we did something wrong. It's good to see upper management noticing when we do things right and spreading that attitude throughout the system."

Murgonovich received training to facilitate classes in behavior-based safety for fellow craft employees. As he explains it, greater attention to safety promotes greater attention to service. "We want to gain the business and keep it going," he says. "Safety is the number one factor for gaining customer confidence."

## SUSTAINABILITY IN ACTION: SPEAKING UP FOR WORKPLACE SAFETY



**Pam Blakeney**, system safety coordinator, thinks of Norfolk Southern as one big family. That view formed the basis of a campaign to support the company's ongoing implementation of behavior-based safety processes.

Pam Blakeney, system safety coordinator, thinks of Norfolk Southern as one big family. That view formed the basis of a campaign to support the company's ongoing implementation of behavior-based safety processes.

In 2013, Blakeney, who works in the Atlanta office, co-chaired a committee that developed the "Care to Speak Up and Share" campaign, an initiative that encourages employees to look out for their own safety and that of co-workers as well.

"When someone says, 'I work for Norfolk Southern,' it provides a common identity," she said. "We are all on the same playing field. I don't want you to get hurt, and I hope you don't want me to get hurt."

The campaign focuses on "peer-to-peer interactions." For example, an employee who sees a co-worker observing a work-safety rule, such as maintaining three points of contact while dismounting a locomotive cab, is encouraged to offer recognition and positive reinforcement for the safe behavior. Conversely, employees are encouraged to offer coaching and constructive feedback if they see an at-risk work behavior.

The campaign's logo is a handshake modeled on the iron "knuckles" used to link one railcar to another. "The knuckle that connects the cars, I felt, symbolized our workforce," Blakeney said. "We all need to shake hands, knuckle up, and work together."

Blakeney helped develop a simple five-slide PowerPoint presentation on the "knuckling together" concept of safety that supervisors can quickly share with employees to provide what she called "little tidbits to trigger your memory."

When visiting field locations, Blakeney tests the new campaign's success by intentionally not wearing safety glasses and waiting to see if someone will speak up. "The idea is to talk to someone," she said. "Care to do it. If I care about you, you're going to care about me."

Blakeney added: "If we're safe, we're going to attract the most talented employees and we're going to keep them," she said. "Plus, safety and service go hand in hand. If we operate safely, we're going to better satisfy the customer."

## SUSTAINABILITY IN ACTION: SUPPORT FOR THE TROOPS



**James Erickson**, assistant division engineer track, knows how much Americans owe to the men and women serving in the U.S. military.

James Erickson, assistant division engineer track, knows how much Americans owe to the men and women serving in the U.S. military. He works alongside several veterans on his division, which extends from Elkhart, Ind., to Chicago. Two years ago, they inspired him to organize a holiday drive to collect care packages for soldiers serving in Iraq and Afghanistan.

Trackman Mike Cawley, a veteran of both Iraq and Afghanistan, gave Erickson the idea, and Chad Morris, assistant track supervisor and another vet of both wars, pitched in, too. Both men suggested items the troops would appreciate, including food, snacks, toiletries, and magazines. Erickson took advantage of working multiple territories with about 100 employees to spread the word. "The first year we did it, we had enough donated items to fill up the back of my truck," he said. The effort continued in 2013.

"We had agreement and nonagreement employees working together on this and taking ownership," Erickson says. "Everybody likes feeling good about donating, especially to the troops. You can spend \$10 to \$12 at the store and get a lot of things to donate that service members will appreciate."

Erickson shipped the donated items overseas through a nonprofit in Joliet, Ill., Operation Care Package.

"I think Norfolk Southern showing appreciation to the troops is important," Erickson said. "We serve a large portion of the United States, and the troops serve us. It's a small thing we can do to show our support."

## SUSTAINABILITY IN ACTION:

**MARY PITMAN: LEADING WELLNS BY EXAMPLE**

Who would have thought that eating a piece of cake could change someone's career?

**Mary Pitman**, Norfolk Southern's manager health promotions, is a believer.

Who would have thought that eating a piece of cake could change someone's career? Mary Pitman, Norfolk Southern's manager health promotions, is a believer.

Pitman joined the company in 2006 as an instructional designer in the Human Resource Department's employee development group. During a departmental trip to the company's Brosnan Forest conference center, Pitman and coworkers sampled a flourless chocolate cake—it was delectable, even without the flour.

That experience inspired her to learn more about healthier food options, leading her to organize a Weight Watchers group at work. At the same time, the company began developing a formal program to focus on employee health and wellness. When the company launched WellNS in 2008, Pitman was a natural to lead it.

She is an enthusiastic participant in many of the programs offered through WellNS. "I've struggled with weight my entire life, so I can relate to others who face similar experiences," she said. "Now I'm in the best shape of my life, and I want to help others reach that same point."

Pitman gets motivated by the success stories of coworkers. "When our employees have healthier lifestyles, they are more efficient, productive, and alert," she said. "You can just tell they are happier people."

In June 2013, Pitman submitted a winning entry in the "Innovation and Inspiration" contest sponsored by Employee Benefit Adviser, an online resource for human resource and benefits professionals. For winning, Pitman landed a speaking role at the organization's Workplace Benefits Summit. With her presentation, "Please...Not Another Biggest Loser Contest!", Pitman explained that typical "get-fit-quick" programs fail because they are based on unrealistic goals and short-term changes.

"Norfolk Southern's WellNS program focuses on long-term, sustained health changes where everyone wins," Pitman said. "It's a group effort."

## SUSTAINABILITY IN ACTION: GIVING BACK TO COMMUNITY



Canonization is not one of **Rob Martínez's** goals. Instead, Norfolk Southern's vice president of business development strives to be the best that he can be while using his gifts, skills, and faith to serve others.

Canonization is not one of Rob Martínez's goals. Instead, Norfolk Southern's vice president of business development strives to be the best that he can be while using his gifts, skills, and faith to serve others.

"I'm not called to be Mother Theresa," he said. "That's beyond my ability, but I do know what I'm capable of as myself."

Martínez and his wife, Cristina, have shown that they are capable of quite a bit. He serves on the boards of directors of the Virginia Arts Festival, the Jamestown-Yorktown Foundation Inc., St. Matthew's School, and the McMahon Parater Foundation, which provides

scholarships for children seeking a Catholic education in the Richmond, Va., diocese. A former college Spanish professor, Cristina serves on their church parish's Respect Life Ministry and chairs the Parish Pastoral Council. In her efforts, Cristina seeks to promote appreciation for the inherent dignity of every human life. In recognition of their community service, the Catholic Diocese of Richmond, in conjunction with Catholic Charities of Eastern Virginia, presented the couple with the 2013 Bishop's Humanitarian Award.

Norfolk Southern's support and encouragement of volunteerism factors into Rob's community involvement. "CEO Wick Moorman time and again encourages all of us to do what we can do to help those less fortunate," he said. "We're all expected to be active. This is a cornerstone of our corporate culture."

Martínez and his wife are drawn to groups that work among the poor, locally and globally, and they have traveled to Argentina and Mexico to work with the Sisters of St. Ann, a community of nuns that assists the poor in Latin America, India, and Africa.

His family's influence also contributed to his dedication to volunteerism. A native of Cuba, Martínez was almost 5 years old when his family fled the country after the communist revolution. In Cuba, his parents had been certified public accountants. In the United States, his father worked at a settlement house in New York that provided adult education and schooling for immigrants' children, and initiated other services for the poor and the working class. His family lived in a one-bedroom apartment in Brooklyn, N.Y.

Martínez said his parents worked hard to build a better future for their family. "We were never victims and were always in control of our own destiny," he said. "It never was what we didn't have. It was always what we had."

Martínez and his wife have three adopted children. Javier, a recent graduate of George Mason University, was adopted from Mexico; Pilar, a student at Catholic University, was adopted domestically; Sebastian, who is in high school, is a native of Colombia. They have instilled the importance of community volunteerism in their children. "We turn it into a family thing," Martínez said, "and the kids do it out of love."

## SUSTAINABILITY IN ACTION: SUSTAINABILITY IS ALL ABOUT CUSTOMER SERVICE



As manager of customer service, **Greg Honore** spends a lot of time looking at ways that Norfolk Southern can improve service and business relationships.

As manager of customer service, Greg Honore spends a lot of time looking at ways that Norfolk Southern can improve service and business relationships. During 2013, Honore initiated a project that significantly improved the railroad's operating efficiencies and on-time delivery of customer freight.

Honore leads a team in the railroad's Network and Service Management Department in Atlanta. He had noticed that customers' shipments on certain rail lanes of traffic consistently were being delivered much earlier than scheduled. Customers base business decisions on shipment trip plans supplied by the railroad, Honore

said, so freight that arrives earlier than the plan specifies can disrupt work and activities the customer had scheduled around the delivery time.

Honore wanted to know why this was happening—and figure out a way to solve it.

"One of our jobs in customer service is to validate our trip plans," Honore says. "Every shipment has a trip plan. Shipments are supposed to arrive at their destinations within a window of plus or minus 24 hours."

Honore and his team began studying the worst performing traffic lanes in terms of early shipments. As they analyzed train movements on the problem lanes, they discovered that the issue could be addressed by communicating better with customers. They found that delivery times of many shipments were changing as they moved across the system but those changes were not being updated and communicated to customers on the trip plan.

"Some train schedules changed, but our trip plans did not," Honore explains. They found that the lanes with best on-time performance were those where customer service representatives took corrective action and provided customers with updated and accurate trip plans when schedules changed. That also meant that Norfolk Southern was not penalized for delivering shipments outside of the 24-hour consistency window.

Honore's team worked with the railroad's operations service support, terminal operations, service design, and transportation departments on ways to better validate trip plans against real-time freight movements.

"After we analyzed and implemented corrective action, on-time performance increased to more than 80 percent from 40 percent in some of the lanes we analyzed," Honore said. The changes Honore's team initiated affected more than 40,000 railcars in more than 50 lanes of rail traffic.


"It helps the customers by giving them a better vantage point of their shipments as well as a more accurate arrival time," Honore said. "The definition of 'sustain' is to provide what is needed to continue, and that correlates directly with our customer service efforts. We don't sell anything—we just provide service. If we provide great service, it allows our company to maintain its sustainability."

# GOVERNANCE

## How we conduct business

Norfolk Southern has established high standards for corporate governance and ethical conduct in the workplace, the marketplace, and the communities we serve. As a freight railroad, we are in business to provide transportation services to customers. Our goal always is to meet and exceed customer expectations, following our vision to be the safest, most customer-focused, and successful transportation company in the world.

Norfolk Southern is committed to maintaining an injury-free work environment, delivering customers' products efficiently and reliably, and being a good corporate citizen. Our employees, senior officers, and board of directors are guided by a core set of values based on doing the right thing.



**BOARD OF DIRECTORS**

For more information about Norfolk Southern's board of directors, including the board's governing and committee structure, visit the investor relations page on our corporate website [here](#). Biographical information about our board members can be found on page 5 of our 2013 Annual Report [here](#).

## Our SPIRIT values

Employees at Norfolk Southern are guided by a core set of work values, known as the SPIRIT values. They provide a framework for who we are and what we do as a company.

THESE VALUES ARE:

- SAFETY.** We put safety first by taking care of the people around us and following the rules.
- PERFORMANCE.** We are performance-driven and committed to providing quality customer service. We act on facts and are accountable for results.
- INTEGRITY.** We do the right thing. We are open, fair, honest, and straightforward.
- RESPECT.** We believe in the importance of all of our stakeholders. We value the ideas and beliefs of our coworkers.
- INNOVATION.** We constantly seek new ideas and creative solutions to business challenges.
- TEAMWORK.** We believe that working together always produces the best results.



GRI G4 DISCLOSURES

These disclosures from the 2014 report are addressed on this page.



To learn more about Norfolk Southern's governance structure and the policies that guide the conduct of our employees, officers, and board of directors, visit the corporate governance section of the company's website here: [CORPORATE GOVERNANCE](#)

## Our Code of Ethics

Norfolk Southern's Thoroughbred Code of Ethics provides employees with a summary of the company's core values and the corporate policies and procedures that guide our business conduct and business relationships with customers, stockholders, fellow employees, and the communities we serve. The code of ethics is the foundation of our corporate ethics and compliance program, which is overseen by the company's Ethics and Compliance Committee. Committee members include our chief executive officer, executive vice presidents, and vice president of Audit and Compliance.

The code explains general guidelines for behavior, provides questions and answers for situations that employees might encounter on the job, and lists the resources for them to contact for help with questions or concerns.

To read a message from our CEO about the importance Norfolk Southern places on ethical behavior, or to download our code of ethics, click [here](#).

### **GOT AN ETHICS QUESTION? NS HAS AN APP FOR THAT.**

Keeping pace with modern technology, Norfolk Southern's Ethics & Compliance Office in 2013 introduced a mobile device app that guides employees through ethical business decisions wherever they are. The interactive Gifts and Entertainment app, available only to employees, walks users through several detailed scenarios, from accepting vendor gifts to the company's policies on meals and entertainment.

"We want to maintain the highest integrity in our business activities, and we seek to avoid even the appearance of inappropriate actions," says Wayne Lockwood, the company's director of ethics compliance. "It's important that employees know and follow corporate rules about giving and receiving gifts involving companies or people doing or seeking to do business with Norfolk Southern."

## Our key business objectives

Norfolk Southern's business procedures require that corporate activities be consistent with the railroad's policy objectives and comply with all applicable federal, state, and local laws and regulations.

### **OF PARTICULAR CONCERN ARE:**

- **Protecting people and communities**
- **Protecting the environment**
- **Budgeting for environmental quality**
- **Anticipating legislative impacts on current operations**

Norfolk Southern has developed processes to measure performance, report environmental information, and evaluate environmental effects as part of ongoing efforts to improve business operations, reduce pollution, and achieve policy objectives. We expect employees to regard this effort as a personal and a corporate responsibility. In addition, employees at all levels of the company have specific responsibilities for implementing our environmental policy. Our corporate policies and procedures are made available on the company's ethics and compliance intranet site.

## Our corporate sustainability structure

Norfolk Southern's Environmental Policy Council has oversight responsibility for the company's formal sustainability program. The council is composed of senior management executives, including department heads and our corporate sustainability officer.

The company formed the council in the mid-1990s to ensure that the railroad was in compliance with government regulations and corporate policies regarding environmental issues. In addition to monitoring compliance issues, the council ensures that all departments are aware of and contributing to our corporate sustainability efforts. The company created a formal corporate sustainability program in 2007, naming the rail industry's first corporate sustainability officer and issuing our first annual sustainability report the following year.

Because all members are department heads, the council provides a forum where significant initiatives can be reported, internal programs discussed, and issues quickly resolved because the decision-makers with authority to enact change are at the table. Part of the council's work involves reviewing Norfolk Southern's sustainability program as measured against corporate best practices in sustainability, particularly practices within the rail industry.

## Policies to safeguard the environment

Norfolk Southern has policies and procedures in place to minimize the environmental impacts of our business operations and to protect the quality of the environment for employees, customers, and communities. We are committed to conserving the company's real estate assets through sound management of land, water, and other property resources. We strive to minimize waste through activities such as recycling, reduced energy consumption, greater use of environmentally preferred materials, and use of nonpolluting technologies, procedures, and work practices.

Our company has numerous internal management systems in place to ensure responsible management of environmental compliance and corporate sustainability initiatives.

### FOR EXAMPLE, IT IS OUR POLICY TO:

- **Ensure that employees are trained in and fully understand the environmental requirements of their jobs and are responsible and accountable for meeting or exceeding applicable environmental compliance standards in their work.**
- **Fully comply with applicable laws and regulations related to environmental protection and transportation of environmentally sensitive materials.**
- **Cooperate fully with all governmental authorities charged with protecting the environment or with regulating transportation of hazardous materials. Employees accompany environmental personnel during inspections and audits of yards and terminals.**
- **Inform the appropriate public agencies about any incident relating to our operations that has the potential to cause harm to surrounding communities and the environment.**

## Safety is good business

Norfolk Southern is committed to the principle that safety is good business and that employees should have a safe working environment. All of our employees are expected to promote safety as both a personal and a corporate responsibility.

The railroad's Operations Division Safety and Service Steering Committee, led by our chief operating officer, is responsible for interpreting Norfolk Southern's safety policy. All department vice presidents are responsible for implementing and administering the policy in their respective departments. Each employee is accountable for complying with the policy.

### OUR SAFETY POLICY IS BASED ON THE FOLLOWING SIX TENETS:

- All injuries can be prevented.
- All exposures can be safeguarded.
- Prevention of injuries and accidents is the responsibility of each employee.
- Training is essential for good safety performance.
- Safety is a condition of employment.
- Safety is good business.

Safety is a proactive process at Norfolk Southern.

### THROUGH THAT PROCESS WE AIM TO:

- Minimize safety and health risk factors for our employees and the communities in which we operate by employing safe and appropriate technologies, programs, and operating procedures
- Educate employees about safety and health risk factors in their workplaces
- Evaluate procedures and work practices to minimize potential employee exposures and enhance workplace safety
- Inform the affected public about incidents relating to company operations that pose general safety or health hazards
- Comply with applicable laws, regulations, and rules related to safety and health in all of our business activities
- Cooperate with all regulatory authorities charged with protecting the safety and health of the public and our employees

## A part of the political process

Norfolk Southern, like all U.S. railroads, can be affected significantly by policies, legislation, and regulatory decisions made by government agencies and legislative bodies in Washington, and in the states where our railroad operates. The company's board of directors believes it is in the best interests of Norfolk Southern and our stockholders to participate in the political process by engaging in a government relations program.

To learn about Norfolk Southern's government relations program, including information about our political contributions, visit our corporate website [here](#).

**NS GETS GOOD MARKS FOR POLITICAL DISCLOSURE**

In 2013, the Center for Political Accountability ranked Norfolk Southern among the top tier of large American companies rated for political disclosure and accountability policies and practices. The 2013 CPA-Zicklin Index of Corporate Political Accountability and Disclosure gave Norfolk Southern a scaled score of 87.1 percent out of 100 percent, or 61 out of a possible 70 points. Norfolk Southern ranked 17th among the 195 companies scored. The strong standing reflects the company's voluntary commitment to transparency and accountability in our political contributions.

The third annual CPA-Zicklin index looked at companies' policies and practices regarding their political spending and disclosure. The report, found [here](#), was released by the CPA in conjunction with the Zicklin Center for Business Ethics Research at the Wharton School of the University of Pennsylvania.

## Managing business risks

Norfolk Southern's risk management program is integrated throughout the company and is pervasive in our day-to-day operations. Our ongoing efforts to manage risk are particularly enhanced by our robust culture of safety, which has developed over more than a century of railroad operations.

Management assesses risks through a disclosure control process designed to examine existing risks and identify and evaluate emerging risks. This process both drives actions to address risks and determines whether and what disclosure should be recommended to senior management and the board of directors for inclusion in the company's annual and quarterly financial reports filed with the U.S. Securities and Exchange Commission.

Our risk factors include, among others, environmental matters, transportation of hazardous materials, climate change legislation, relationships with our labor unions, workforce management and severe weather. All of our risk factors, including these environmental and sustainability risks, are evaluated regularly, and programs are in place to mitigate the risks.

The governance and nominating committee of our board of directors has assigned oversight of each risk factor to a board committee or to the full board, and our board has adopted an annual schedule for review of each risk factor. For example, our audit committee periodically reviews and discusses with management the major financial risk exposures and the steps management has taken or intends to take to monitor and control these exposures, while the full board oversees our major operational and strategic risks.

The board of directors has appointed F. Blair Wimbush as our corporate sustainability officer, and his team reports our activities with respect to sustainability issues and initiatives each year in our sustainability report.

Detailed information about Norfolk Southern's most significant risk factors is available in the company's [2013 Annual Report](#) on Form 10K (pages K13 through K16). The report is available for download in the Investor Relations section of the company's website.

## Compliance with antitrust laws

U.S. antitrust laws, enacted to promote free and fair competition, regulate what Norfolk Southern and its employees can do when acting alone or with our competitors.

Our policy is to comply fully with all applicable federal and state antitrust laws. No officer or employee is permitted or authorized to take any action inconsistent with the antitrust laws or to permit or order others to take such action.

Application of antitrust laws to particular facts rarely is simple, particularly in the railroad industry, where connecting railroads must work together to move customers' freight. Whenever company officers or employees believe that proposed activity raises antitrust questions, they are instructed to contact our law department, where designated attorneys can assist in ensuring that we comply with the law and company policy. In 2013, there were no findings of antitrust violations by Norfolk Southern.

## GRI G4 INDEX

GENERAL STANDARD DISCLOSURES		
	#	Location
Strategy & Analysis	1	CEO Letter
	2	CEO Letter and CSO Letter
Organizational Profile	3	Business Profile
	4	Business Profile
	5	Business Profile
	6	Business Profile
	7	Business Profile
	8	Business Profile
	9	Business Profile
	10	NS as an employer
	11	NS as an employer
Identified Material Aspects & Boundries	16	Public-private Partnerships
	17	Annual Report
	18	About Our Report
Stakeholder Engagement	23	About Our Report, Carbon
	24	About Our Report
Report Profile	28	About Our Report
	30	About Our Report
	31	About Our Report
	32	About Our Report, GRI Index
Governance	34	Our corporate sustainability structure
	35	Governance Section, specifically 5.4, 5.5, 5.6
	36	Our corporate sustainability structure
	38	Investor Relations
	39	Investor Relations
	40	Investor Relations
	41	Code of Ethics
	45	Managing business risks, CDP
	46	Managing business risks
	48	About Our Report
	51	Investor Relations
	52	Investor Relations
Ethics & Integrity	56	Our Code of Ethics
	57	Our Code of Ethics
	58	Our Code of Ethics

SPECIFIC STANDARD DISCLOSURES		
	#	Location
Economic	EC1	Economic Performance
	EC2	CDP
	EC7	Excelling in service
	EC8	An engine of economic growth
Environmental	EN1	Managing solid waste
	EN2	Managing solid waste
	EN3	Energy-efficiency efforts
	EN6	Energy-efficiency efforts
	EN10	Beyond carbon
	EN12	Carbon conservation
	EN13	Carbon conservation
	EN15	Carbon
	EN16	Carbon
	EN17	Carbon
	EN18	CDP
	EN19	Carbon
	EN21	Carbon
	EN23	Managing solid waste
	EN24	Community safety
	EN25	Managing solid waste
	EN27	Carbon conservation
	EN29	Environmental management
	EN31	Carbon conservation
Social: Labor Practices & Decent Work	LA1	NS as an employer
	LA2	NS as an employer
	LA5	All about safety
	LA6	Proud record of working safely
Social: Society	SO1	Community Engagement
	SO6	A part of the political process
	SO7	Compliance with antitrust laws

## Forward-Looking Statements

This sustainability report contains forward-looking statements that may be identified by the use of words such as “believe,” “expect,” “anticipate” and “project.” Forward-looking statements reflect management’s good-faith evaluation of information currently available.

However, such statements are dependent on and can be influenced by a number of external variables over which management has little or no control. These variables include: domestic and international economic conditions; interest rates; the business environment in industries that produce and consume rail freight; competition and consolidation within the transportation industry; the operations of carriers with which NS interchanges; acts of terrorism or war; fluctuation in prices of key materials, in particular diesel fuel; labor difficulties, including strikes and work stoppages; legislative and regulatory developments; results of litigation; changes in securities and capital markets; disruptions to Norfolk Southern’s technology infrastructure, including computer systems; and natural events such as severe weather, hurricanes, and floods.

For a discussion of significant risk factors applicable to Norfolk Southern, see the company’s annual and quarterly reports filed on our corporate website, [www.nscorp.com](http://www.nscorp.com), and with the U.S. Securities and Exchange Commission.

Forward-looking statements are not, and should not be relied upon as, a guarantee of future performance or results, nor will they necessarily prove to be accurate indications of the times at or by which any such performance or results will be achieved. As a result, actual outcomes and results may differ materially from those expressed in forward-looking statements. Norfolk Southern undertakes no obligation to update or revise forward-looking statements.