



Research
and Tests
Drawing on the
leading edge
of rail
technology

Biz NS

Nov/Dec '09

1 RESEARCH AND TESTS HELPS NS IMPROVE SAFETY

5 WHERE THE WILD THINGS ARE

7 NS 999: HORSE OF A DIFFERENT COLOR

10 NS POLICE AND THE G-20 MEETING

12 BENEFITS OF SOCIAL MEDIA AND GUIDELINES

14 TRAINYARD TECH KEEPS THE CARS ROLLING

16 SPIRIT AWARD WINNERS

17 THEFUTURENEEDS US.COM

BACK COVER ROUSIS RECEIVES AWARD FROM RTA
CALENDARS AVAILABLE



On the leading edge

Research and tests helps NS improve safety, cut costs, get greener

A sign outside **Bob Blank's** office sums up the mission of Norfolk Southern's research and tests group: "Be the most respected and responsive industry resource for quality technical services and innovative developments."

It's a straightforward statement, suggesting specialized knowledge, out-of-the-box thinking, and pride in work. It barely does justice, however, to the contributions this team of engineering whizzes makes to NS and its railway operations.

Headquartered on the top floor of a red-brick NS office building in Roanoke, the employees in research and tests play a role in virtually every major initiative the railroad has going.

Blank, the director, recently notched his 36th year with the group, known as R&T.

"Research and tests has evolved over the last few years," said Blank, a mechanical engineer. "For many years we did a lot of 'fire fighting' – an incident happened, and we tried to figure out why. We've migrated into bigger, higher profile strategic projects."

Now, R&T is an industry leader in evaluating "green" technology that is changing the way NS does business.

R&T researchers helped NS pioneer such technologies as top-of-rail friction modification, which reduces rail wear and conserves diesel fuel, and LEADER, a new computer-based train handling system that reduces fuel use and improves safety.

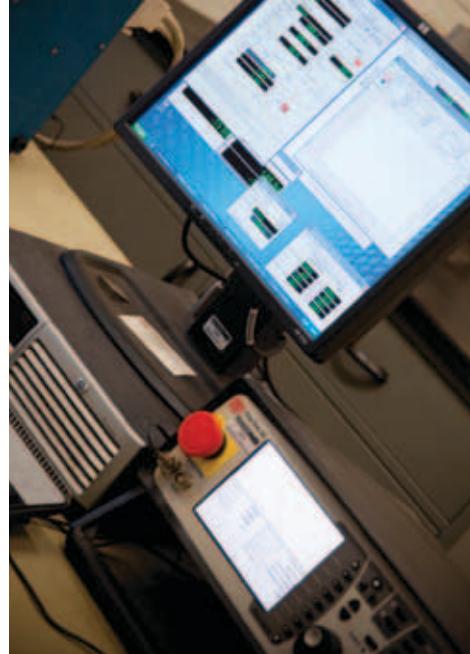
For the past two years, the group has guided NS' development of an electric switcher locomotive, a battery-powered prototype that makes use of dynamic braking to charge its battery energy storage system – a first for the U.S. rail industry.

Besides batteries, R&T assesses biofuels, natural gas, liquefied coal, and electricity as alternatives to power locomotives. In August, **Hayden Newell**, R&T's manager innovative research, attended a national conference on algae – a potential biofuel source.

"In this job, you feel like you're breaking ground almost every day on some kind of technology or advancement," said Newell, a 37-year R&T veteran.

Among North America's Class 1 railroads, NS has the most aggressive research and tests effort for technology development, according to **Gerhard Thelen**, who oversees the group as vice president operations and planning support.

"We have a lot of in-house institutional knowledge," Thelen said, "and that's what it takes to run this business successfully in the long run."



"We've migrated into bigger, higher profile strategic projects."

Bob Blank, director research & tests



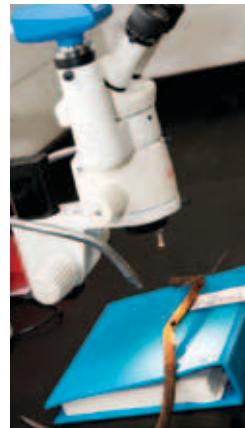
■ Top: Research and tests engineers work with computer models to examine railroad operations, including one called VAMPIRE, which can simulate a rail car's movement over track and help NS analyze and prevent accidents and derailments.

■ Bob Blank, a mechanical engineer and 36-year veteran of R&T, is director of the group.

■ Facing page: R&T conducts a variety of tests on car knuckles and couplings, such as this one, to gauge their strength and endurance.

"We've got people who like to break things."

Bob Blank, director research & tests



■ Top left: R&T engineers use electron scanning microscopes to analyze everything from chemical makeup of rail equipment to defects in tools, rail, and track infrastructure.

■ Top center: A hydraulic machine, capable of producing 600,000 pounds of pressure, is used to run fatigue tests on car coupler knuckles. A 45-minute cycle with maximum loads of 300,000 pounds is equivalent to 1,000 miles of severe rail service.

■ Top right: R&T does precision, computer-controlled testing to evaluate railroad equipment. Shown are cables that connect various servo-hydraulic testing machines to a central computer, enabling R&T engineers to control and monitor up to 11 different testing stations simultaneously while collecting desired data.

■ Above: R&T is interested in the strength and endurance of coupler parts, including knuckle pins and draft keys, pictured here, which get a workout during knuckle fatigue tests.

Adding value to the railroad

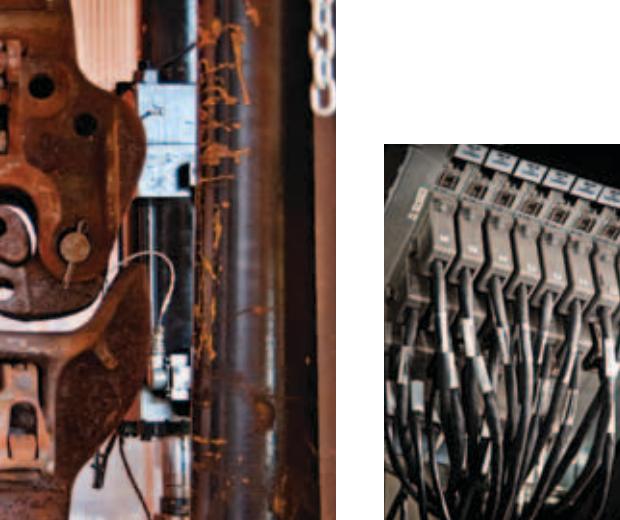
Most of the 27 employees in R&T have engineering or technical backgrounds. The group is heavy in mechanical and material engineers, also called metallurgists, and there are chemical and civil engineers. Because track is NS' No. 1 maintenance and capital expense, metallurgists are key.

"We're concentrating on how to extend the life of rail and the time between maintenance cycles, such as surfacing or cross tie work," Thelen said.

Overall, the group's range of expertise is impressive.

Before joining R&T 26 years ago, **Jack Hughes**, senior research engineer, did drug analysis and trace evidence work for the Virginia Bureau of Forensic Science. Hughes, who has a chemistry degree, currently is evaluating preservative treatments for wood cross ties. He's also involved in weed control, a multi-million dollar program at NS to keep trackside rights-of-way clear of vegetation.

Kevin Conn, a research engineer, once worked as an analytical chemist in the petroleum and industrial chemical industries. Conn is R&T's lead researcher in top-of-rail friction modification, a technology NS has advanced for the industry.



The idea behind top-of-rail is to reduce the lateral force of rail cars as they run over curved sections of track. A water-soluble material similar to toothpaste is dispensed on the rail running surface as a train passes, easing friction between wheels and rail. The result: reduced rail wear and locomotive fuel savings. Conn now is doing research with vendors on different lubricant materials and equipment to improve the system.

Working with a vendor, **Scott Keegan**, R&T manager project engineering, helped develop the industry's initial application of LEADER on coal trains running between Roanoke and a power plant near Winston-Salem, N.C. LEADER, which stands for Locomotive Engineer Assist Display and Event Recorder, has an on-board computer that prompts locomotive engineers with real-time information about a train's operating conditions, including optimum speed for maximum fuel savings.

"The challenge," Keegan said, "is to give enough information at critical points to ensure that an engineer makes the right decision."

R&T is using LEADER to help NS find other ways to save money and operate more efficiently. One recent project identified optimum speed and throttle settings for bulk commodity trains, producing fuel savings of up to 20 percent per trip.

They get to break things

Much of R&T's work occurs at two laboratory buildings in Roanoke. On a press machine that generates enough pressure to snap rail in half, employees conduct "slow bend" tests to measure the quality and strength of rail welds.

Using a hydraulic machine, R&T runs fatigue tests on car coupling knuckles. A 45-minute workout with maximum loads of 300,000 pounds of pressure is equal to 1,000 miles of severe railroad wear and can push knuckles to the breaking point.

"We've got people who like to break things," Blank says, grinning.

Other R&T engineers want to know why equipment breaks. In search of causes, they peer through electron scanning microscopes, use ultrasonic scopes, and perform spectrographic chemical analyses on everything from failed rail welds to broken switch clip bolts.

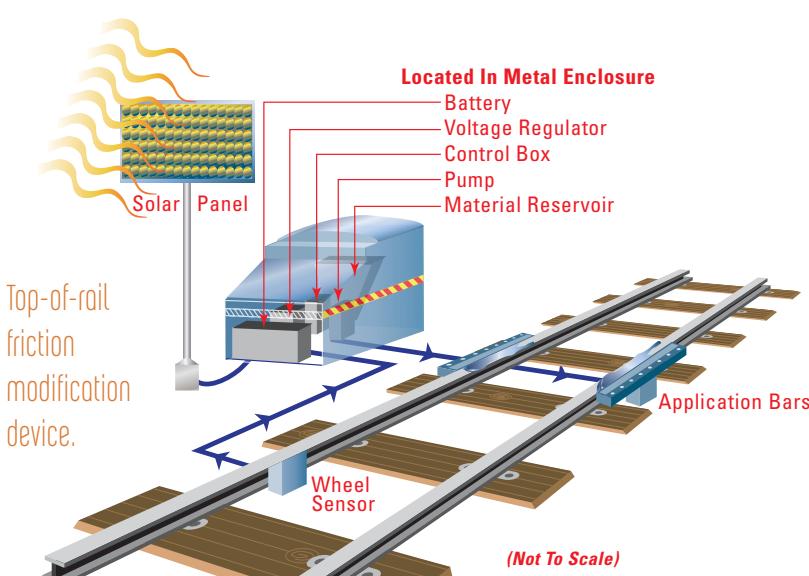
After NS mechanical shop employees reported repeated chisel failures, R&T discovered through testing that a supplier had switched to a different material to make the tool, said **Tim Ward**, R&T manager material engineering.

Some of the engineers work with sophisticated computer models, such as the VAMPIRE – for Vehicle Dynamic Modeling Package in a Railway Environment. The models help the railroad analyze and prevent such things as derailments. "We can simulate how a rail car reacts to rolling over a certain piece of track," said research engineer **Walter Rosenberger**.

The group also monitors data from track wayside sensors that alert operations departments of potential problems, from imbalanced rail cars to faulty wheels. They also evaluate employee gear, such as best footwear in icy conditions and the most durable train lanterns.

In addition to all that, R&T operates NS 32, a research rail car that tests the pulling power of locomotives and freight car dynamics, and two sets of track geometry cars equipped with sensors that detect defects in rail, cross ties, and other track infrastructure. Typically, the cars collect data on about 40,000 track miles every year.

R&T is working with other NS departments to create a computer-based track infrastructure database.



"The goal is to use this data for long-term trending and forecasting, and to do a more sophisticated analysis of where NS' maintenance and capital dollars should be spent," said **Russ McDaniel**, R&T director process improvement. The database will include information from such things as rail grinding, which smoothes out rail surface defects, and ultrasonic testing that detects internal flaws in rail.

"This should help us identify the root causes of rail degradation," said **Sean Woody**, a metallurgist and R&T manager track inspection and development. "If we can address those issues, we can increase rail life, and that has tremendous savings."

In one ground-breaking effort, **Tim Caldwell**, research project engineer, has culled geometry car data to analyze past derailment sites. Caldwell, who once maintained computer hardware for the Naval Intelligence Command Center, is using mapping software to pinpoint similar track conditions across the network. The aim is to create an early warning system to repair or replace track.

NS' engineering department, which handles track maintenance, is one of the biggest beneficiaries of R&T's work.

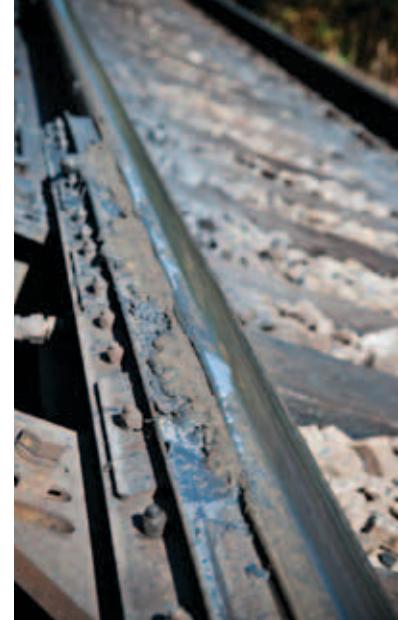
"They're an indispensable tool for us," said **Phil Merilli**, NS chief engineer lines north. "They help us find problem areas and plan for the future – where to put in ties or rail, or to surface."

R&T, however, works across the railroad. It does locomotive traction tests for the mechanical department, winning NS price concessions on repair parts for locomotives that don't meet a manufacturer's specifications.

Recently, R&T assessed a curved section of track owned by Canadian National Railroad outside Memphis to help the intermodal department evaluate its potential use by NS until a new terminal is constructed nearby to serve the Crescent Corridor.

R&T now is using top-of-rail and LEADER to identify ways to reduce transit times on the corridor, enabling NS trains to better compete against trucks.

With R&T, the possibilities seem endless. ■ **BizNS**



■ At top left is an illustration showing how top-of-rail friction modification works. A solar panel powers the computer-based system, saving on energy costs and allowing the system to be used in remote locations. As a train approaches, the wheel sensor activates the system.

■ Pictured at bottom left is the box that contains the "brains" of the top-of-rail system and also serves as reservoir to store the lubrication material. R&T is conducting experiments on different types of material as part of continuous efforts to improve the savings NS receives from top-of-rail.

■ Above: A thin film of gray colored material, the consistency of toothpaste, is dispensed on the surface of rail in the top-of-rail friction modification system.

R&T works where the WILD things are

The engineering brainiacs at Norfolk Southern's research and tests group call it a WILD site. It's off the beaten path and surrounded by woods along a stretch of track at Ironto, Va., but that's not what makes the place WILD.

R&T maintains a wheel impact load detector, aka WILD, there.

Sensors attached to the rail are wired to a computer processor in a climate-controlled metal hut next to the track. When a train passes, the strain gauge sensors detect imbalanced or overloaded rail cars and wheel defects that could damage rail or, in extreme cases, cause a derailment. The WILD sensors also can spot a wheel assembly that's not riding properly on the rail.

Before installing the WILD system two years ago at Ironto, a 30-minute drive from R&T's downtown Roanoke offices, NS had experienced a number of rail breaks on a line just east of there. No known breaks have occurred since NS has been monitoring data from the WILD, said **Nate Stoehr**, an R&T research engineer who helps install and monitor railroad sensors.

"This site has been very useful in getting bad wheels that can cause rail breaks and other problems off our network," Stoehr said. "It's a money saver and maintenance saver as far as our track and infrastructure are concerned, and it's another tool we can use to better plan and perform preventive maintenance on our rail cars."

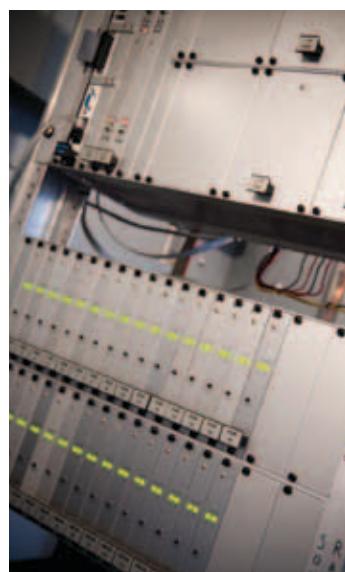
As sensor technology advances, NS relies more on such wayside detectors to increase safety of operations, better maintain track infrastructure, and reduce fuel and other operating costs.

"Wayside defect detectors have become essential and have been adapted to the railroad environment," said **Hayden Newell**, NS manager innovative research. "Our goal is to identify poorly performing cars and track defects and get the worst of the worst out. Safety and risk reduction are foremost."

A low-hanging air hose detector, in top photo, is positioned on a section of track in Ironto, Va., outside Roanoke. The device emits an infrared beam to detect low-hanging hoses that could catch on something and uncouple, causing a train to stop and disrupt on-time delivery of customer freight.

Data from a wheel impact load detector, aka a WILD, at the Ironto site is sent via wireless links to alert NS of a range of potential problems, from imbalanced rail cars to defective wheels. The telecommunications equipment for the WILD is maintained inside a metal hut beside the track.

WILD sensors attached to the track are wired into a console inside a trackside metal hut. In photo at right, the green lights on the console correspond to individual sensors. When a train passes over the sensors, the console lights flash red to indicate they are recording data.



If the WILD detects an abnormality, it will send a wireless alert to a vendor's computer server, to R&T's offices, and then on to NS operations crews so that repairs or other preventive action can be taken.

Across NS' rail network, 15 of the WILD systems are expected to be in place by the end of 2009, all located on high-traffic or high-tonnage lines used for hauling coal, bulk commodities, or hazardous materials, Stoehr said.

If the WILD detects an abnormality, it will send a wireless alert to a vendor's computer server, to R&T's offices, and then on to NS operations crews so that repairs or other preventive action can be taken. Automatic Equipment Identification tags affixed to NS rail cars, scanned by a track-side antenna, help NS employees pinpoint the problem car.

Ironto and most other WILD sites also are equipped with infrared sensors that detect low-hanging air hoses. If left unrepairs, the hoses could catch on something and uncouple, causing a train to stop.

Since NS began using the WILD system in the 1990s, sensors have become increasingly sophisticated. These days, NS operates acoustic sensors equipped with microphones that detect problems in wheel bearings, as well as detector systems equipped with cameras and lasers that monitor rail car truck assemblies and wheels and how they're riding on the rail head, which affects fuel usage and rail wear. Other detectors measure lateral forces as cars maneuver curving track, key issues in rail maintenance and prevention of derailments.

"A main advantage of these detectors is that they're able to look at equipment in a dynamic environment, while trains are moving, whereas a person who is doing a mechanical inspection mainly looks while a train car is sitting still," said **Bob Blank**, NS director research and tests. "They really can't see how the cars are responding to speed and track conditions."

R&T has helped pioneer the use of some sensors. This winter, for example, Ironto will become a test site for R&T to evaluate a new sensor called an Automatic Safety Appliance Inspection System. The system has high-intensity strobe lights and digital cameras to detect problems with safety equipment on rail cars, such as steps and hand holds that are bent or broken. NS is the first U.S. railroad to field test the sensor.

Blank said R&T routinely works with vendors to evaluate promising sensor products, often providing feedback that has resulted in improvements for the industry. In some cases, the Federal Railroad Administration has provided NS with research grants to study sensors that have made the industry safer and more efficient.

Other NS departments, including IT, mechanical, and engineering, work closely with R&T to develop alert thresholds and ways to manage and distribute the huge amounts of data collected.

"You've got to do that very quickly," Blank said. "If you have a rail car carrying a large, imbalanced load, for example, you want to be able to get that message to the train in a hurry so they can stop and take a look and set the car out if necessary." ■ **BizNS**



■ Wheel impact load detector, or WILD, sensors are installed on the rail and covered by a protective metal panel, shown above, at a WILD site in Ironton, Va.

NS 999: Horse of a different color

Prototype battery-powered locomotive puts NS at forefront of green rail technology



■ NS 999 eases down a section of track outside the Juniata Locomotive Shop.

NS 999 emerged from a bay at Juniata Locomotive Shop, bell clanging, lights flashing, and steel wheels rolling.

One thing, however, was noticeably absent – the loud rumble of a diesel engine.

The shiny electric green and black switcher locomotive, with a curving white accent line, eased down the track with a soft whir.

After two years in the making, Norfolk Southern in late September publicly rolled out a battery-powered locomotive prototype that has the potential to transform freight rail transportation.

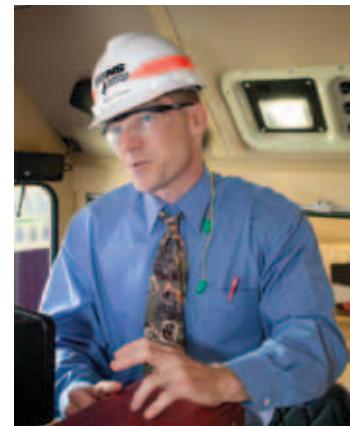
NS 999 is a first of its kind for the North American rail industry, and represents a quantum leap forward in “green” railroad technology. It has NS leading the way toward clean, alternative-powered locomotives that could help improve air quality, reduce U.S. reliance on imported oil, and save on fuel costs. The 1,500-horsepower prototype, with zero point-source emissions, runs on 1,080 rechargeable lead-acid batteries.

“NS 999 actually doesn’t have an engine at all – it’s all batteries,” said **Gerhard Thelen**, NS vice president planning and operations support.

During initial trials at NS’ Rose Yard in Altoona, Pa., the electric locomotive excelled. With only 80 percent of its batteries connected, NS 999 operated a full switcher shift, at one point pulling 2,200 tons of rail cars on an uphill track – without using a sanding system, which helps locomotives gain traction. After the shift, the four-axle locomotive had enough juice in its 12-volt batteries to run two more eight-hour shifts.

“It did all the work a diesel locomotive would do,” said **Gibson Barbee**, manager continuous improvement with NS’ research and tests group, which has led the NS 999 project. “I think we quieted some of our skeptics.”

The locomotive won over **Jim Blodis**, a road foreman of engines who supervised the yard trials. “I was pessimistic about the horsepower we could achieve with just battery power, but it made me a believer,” Blodis said. “Right out of the box, it was a winner.”



In a first for freight rail, NS 999 features "regenerative" braking technology that helps recharge the batteries while it operates. The system works by converting the kinetic energy created when the locomotive's dynamic brake is applied into a power source that is stored in the batteries – similar to the way hybrid automobiles work. By contrast, conventional diesel locomotives blow off the energy as heat.

NS teamed with Brookville Equipment Corp., a locomotive maker in Brookville, Pa., and TMV Control Systems, an Ontario, Canada, vendor of locomotive control systems, to develop the regenerative energy and battery management systems.

"In initial tests, we've seen up to 35 percent of NS 999's regenerated power being stored in the batteries," said Thelen. "That's good savings in the long run, and that's free, clean energy."

A crew of about 30 employees at Juniata built NS 999. They started with a GP38 body, built by EMD in 1969, and operated previously by Penn Central and Conrail. The Juniata shop stripped the old diesel locomotive to its frame.

The shop crew fabricated and assembled everything on the new body and hood except for the cab, the battery boxes, and the steps. The prototype's custom pug nose is three feet shorter than a conventional diesel, a design innovation needed to shift the cab forward and make space for its 60 racks of batteries, said **Tim Wiedemer**, senior general foreman insourcing at Juniata.

"That gives it a distinctive look," said Wiedemer, who along with **Joe Richardella**, system manager locomotive sales and marketing, led Juniata's construction and engineering team. **Gary Fischer** was NS' lead electrician on the locomotive, which contains around 1,700 separate electrical wires.

The railroad's work with NS 999 is part of a broader push to pursue energy conservation technologies that reduce operating costs and NS' footprint on the environment.

At NS 999's unveiling in September, U.S. Transportation Secretary Ray LaHood called the event a "green letter day" for Juniata, adding, "Norfolk Southern really stands out as the leader in greener, cleaner rail opportunities."

U.S. Rep. Bill Shuster, R-Pa., who helped secure federal dollars for development of the prototype, said NS' work will benefit the entire rail industry. The Federal Railroad Administration and the U.S. Department of Energy have provided matching grant funds for the project.

■ In photo at top left, **Barry Wertz**, manager locomotive overhauls and tests at Juniata, runs NS 999 down track outside the Juniata shop.

■ Above: **Gibson Barbee**, manager continuous improvement research and tests, helped lead NS efforts to develop the battery-powered NS 999.

"NS 999 is our mobile battery lab at this point. It will move our energy models ahead by light years."

Gibson Barbee, manager Research & Tests

"With the exceptionally talented employees we have at Juniata and with our partners at Penn State and Brookville, the sky's the limit."

Don Faulkner, general superintendent Juniata

Electric switcher locomotives could replace low-emission Genset diesel locomotives in metropolitan areas to help cities meet federal Clean Air standards, Barbee said. Gensets have three 700-horsepower engines used only when needed, reducing emissions and fuel use.

By late 2010, NS hopes to roll out a battery-powered road prototype that will be coupled with a Genset, forming an electric-diesel hybrid. That prototype would provide pushing power on uphill track, recharging on downhill sections as the engineer applied the dynamic brake.

"We think there's a lot of opportunity for a road locomotive," Thelen said. "We've just got to figure out how to develop an energy management system that allows us to take maximum advantage of the kinetic energy."

NS is evaluating NS 999 at Rose Yard to gauge how it performs in weather. "NS 999 is our mobile battery lab at this point," said Barbee, who totes around thick books on hybrid and battery technology. "It will move our energy models ahead by light years."

Advances in battery technology will be the primary driver for widespread industry use of electric locomotives, he added. NS currently is eying the use of lithium ion and nickel-based rechargeable batteries, as well as improved lead-acid batteries.

"With the exceptionally talented employees we have at Juniata and with our partners at Penn State and Brookville, the sky's the limit," said **Don Faulkner**, general superintendent Juniata. "We can really push the envelope of locomotive technology a long way." ■ **BizNS**



■ At NS 999's unveiling in September, U.S. Transportation Secretary **Ray LaHood**, keynote speaker, left, is joined by U.S. Rep. **Bill Shuster**, R-Pa., and NS' **Mark Manion**, executive vice president and chief operating officer, for a tour of the NS 999.

NS police are integral part of security at G-20 meeting

When the top 20 world leaders representing 85 percent of the global economy decided to hold a summit in Pittsburgh, security was priority one.

The Group of Twenty – or G-20 – was established in 1999 to bring together major industrialized and developing nations to discuss key economic issues. They were meeting to assess progress and to discuss further actions to assure a recovery from the global economic and financial crises.

Hosted by President Barak Obama, the summit was considered a national special security event by the Department of Homeland Security. Other meetings of the group had seen thousands of protesters and significant damage to property.

For Norfolk Southern, security was complicated by the proximity of the railroad to the meeting site, the David L. Lawrence Convention Center. NS tracks run directly behind the facility. Three main NS lines run through Pittsburgh including the bridge on the main line toward Chicago. Plus, the passenger station that serves AMTRAK is owned by NS. All were located in the “hot zone” and had to be secured.

The Pittsburgh Police Department's 1,200-member force was augmented with others from across the country, swelling police numbers to more than 4,000. Among them were 40 NS police officers and K9 partners from Illinois, New Jersey, Kentucky, Ohio, Georgia, Indiana, Michigan, New York, and Pennsylvania, and a K9 explosive identification team.

“This was one of the biggest events I ever had to deal with,” said **Bob Karwoski**, special agent in charge in Pittsburgh. “We worked with other railroad police, local police, the Transportation Security Administration, the Federal Railroad Administration, and the Secret Service to ensure the safety of those attending events at the convention center, our facilities, and our people.”



NSPD officers not only provided protection for NS facilities. They provided motorcade security from railroad bridges on NS lines as well as on some short line railroads. Hazardous material shipments were stopped during the summit, and some other rail traffic was rerouted or held.

The Secret Service asked for a plan to quickly move world leaders and their finance ministers and secretaries in the event of an emergency. NS provided an escape train for such a contingency.

The Secret Service asked for a plan to quickly move world leaders and their finance ministers and secretaries in the event of an emergency.

Karwoski said NS crews and other employees were vigilant in looking for suspicious objects and people.

“Our train crews, maintenance of way crews, and others kept watch during their normal duties to make sure we were aware of anything unusual on or near our properties,” Karwoski said. “We got a number of reports and checked all of them out. Fortunately, none was serious.”

Al Shackelford, NS director police, said his department's efforts received extraordinary support.

*“Maintenance of way employees and **Craig Webb**, division engineer, patrolled tracks on hy-rail vehicles. **Emory Hill**, assistant general manager, **Jim Young**, assistant division superintendent, and other transportation officers were on site every day to make sure train crews were in place to expedite trains when or if needed,”*



Shackelford said. "Our safety and environmental professionals provided gas masks and the training to wear them properly in the event our officers needed them."

Shackelford said **Mark Manion**, executive vice president and chief operating officer, **Tim Drake**, vice president engineering, **Tim Heilig**, vice president mechanical, **Mike Wheeler**, vice president transportation, and **Hugh Kiley**, assistant vice president operations and NS' liaison with the federal government on national security issues, were either on site or readily available to discuss any issues that arose.

"The support shown for us was tremendous," Shackelford said. "That, and the high level of cooperation and teamwork, was a key to our success. It showed the world what NS people can do and do well." ■ BizNS

■ Top: Norfolk Southern has three rail lines that run through Pittsburgh including the Fort Wayne bridge that carries traffic to Chicago.

■ Bottom: K9 partners played a big role in securing and patrolling during the G20 summit. Seven NS teams joined in the effort. Officers from left to right:
Specialist K9 Murray Haines, Buffalo, N.Y.
Specialist K9 Tyler Holland, Pittsburgh
Specialist K9 Joey Shirley, Atlanta
Specialist K9 Bob Swank, Harrisburg, Pa.
Supervisor K9 Hugh McCormack, Chicago
Specialist K9 Walt Tylicki, Toledo, Ohio
Specialist K9 Jeff Mason, Chicago

NS taps benefits of social media, creates guidelines for employees



Norfolk Southern's New Media Team is tackling projects that reflect both the promise and the potential peril of Web-based social media.

When Congress earlier this year began discussing an antitrust bill that threatened harm to the rail industry, members of the team responded by going cyber.

Working with NS' government relations group, the team helped launch a letter-writing campaign, posting information about the negative effects of the proposed legislation on various social networking Web sites, including Facebook. Along with that, the team provided NS employees and their families and friends with Internet links to contact members of Congress as concerned citizens and with sample letters explaining why legislators should oppose the bill.

Team member **Kimberly Thompson**, strategic program manager, along with **Stacey Parker**, administrator political programs, and **John Scheib**, general attorney, played key roles brainstorming ideas for the innovative grassroots campaign.

"It helped sway the day as more than 2,000 people quickly sent e-mails opposing the legislation," said **Rick Harris**, NS director corporate communications and team chairman. "While activity on Capitol Hill effectively sidetracked that bill, efforts are ongoing to prevent harm to the industry from other legislation. When future legislative and other issues need our attention, we now have in place another way to inform and engage the public on behalf of our industry. For Norfolk Southern, that's a positive and powerful application of Web-based social media."

Likewise, Harris' team launched a feature that allows employees to have updates from NS' Web site sent to their computers through RSS feeds. Employees who sign up for the Really Simple Syndication feeds automatically receive such things as NS news releases, executive speeches, analyst presentations, and customer publications. The service has improved the immediacy and communications value of the railroad's Web site, said **Frank Brown**, assistant vice president corporate communications.

However, pitfalls lurk in the wild, wide world of the Internet, and missteps could compromise NS' business interests and expose employees to legal risks.

In late June, Harris' team, working with NS Information Security, unveiled the NS Social Computing Guidelines, aimed at helping employees and NS contractors avoid online communication blunders that could, intentionally or not, cause harm to the company or to co-workers.

The guidelines apply to users who access multimedia and social networking sites, chat rooms and bulletin boards, instant messaging, blogs, wikis, Web sites, and other Internet-based communications. They also apply to use of NS-supplied equipment, including desktop computers, laptops, BlackBerry devices, and cell phones.

This is not an attempt to quell employees' freedom of expression, Harris said, but to remind them to exercise that right in a manner consistent with corporate policies, the SPIRIT values, ethics guidelines, and good judgment.

"What people need to consider first and foremost is good common sense," Harris said. "Social media are prevalent and people could unintentionally cross a line without even thinking about it."





NS' Social Computing GUIDELINES

R U U or R U NS?

Identify yourself appropriately. If you draw an association with NS, you are accountable for its impact. Don't give the appearance of speaking on NS' behalf unless you are doing so as part of your official railroad duties.

Include the fine print.

Label the contents of your personal blog, Web site, and other postings as yours alone. Don't let anyone incorrectly assume your contents represent the views or opinions of NS.

Nothing is private.

Whether you visit or comment on a public Web site as a private citizen or NS employee, remember that you leave an electronic record visible to millions, including your co-workers.

Don't hurt anybody.

Your searches and postings can purposefully or unintentionally offend, disrespect, demean, and even defame other people and companies. This can carry serious legal consequences.

My.name@nscorp.com

Avoid using your NS e-mail address when sending personal messages. When sent through NS e-mail, messages are NS' property and are not private.

The full set of NS Social Computing Guidelines can be found at: <http://connection.nscorp.com/departments/IT/Security/Pages/SocialComputingGuidelines.aspx>

If you were being considered for a promotion, for example, would you want that blog you just posted in your personnel file? Would you be proud if that text message you sent was printed in the newspaper or broadcast on TV?

New Media Team member **Lisa Wilson**, business account analyst in information technology, chaired a subcommittee that drafted the guidelines. "These are not black and white issues," she said. "In the end, it's up to the employees to use their best judgment."

The company has already experienced NS users crossing into risky online behavior, she said. That includes updating a personal Web site with links to NS during work hours; making multiple Wikipedia entries about soccer from an NS computer; and sending a local government official a "flaming" e-mail about potholes from an NS e-mail account. While that may seem innocuous, the impact on the employees and the company's image was not, Wilson said.

"Our guidelines are there to raise employees' awareness to help them navigate social media more judiciously," she said. "If you're going to make any kind of association with NS, you need to tread very carefully because what you put out there is for the entire world to see."

Since forming in July 2008, the New Media Team has explored how NS can benefit from social media technologies while recognizing the company must exercise caution.

Over the past year, NS has expanded its online presence, ranging from CEO **Wick Moorman**'s Wick's Page site on the company's Employee Resource Center to creation of its own "brand channel" on YouTube to promote the railroad. In addition to YouTube, NS has accounts on social networking sites Facebook, Flickr, LinkedIn, and various railroad-oriented forums.

Employees can expect to see more, Harris said. The team, for example, is exploring the possibility of creating an internal YouTube-like site to serve as a central clearinghouse for employees to view NS Focus and other NS video content.

 BizNS



The system calculates the proper speed at which each car should couple based on weight, and operates the retarders – a braking system along the track – to ensure that cars do not exceed maximum coupling speed of 4 miles per hour.

Keeping rail cars moving to destination can be a tough job sometimes. With 165,000 rail cars on the Norfolk Southern system daily, it is essential that they move safely and efficiently, especially those that move through classification yards also known as hump yards.

When rail cars arrive at a hump yard, they are moved from their inbound train to their outbound train based on a switching list generated by NS' Thoroughbred Yard Enterprise System. As the cars are switched, they travel over a hump and slowly coast to the proper track where outbound trains are assembled.

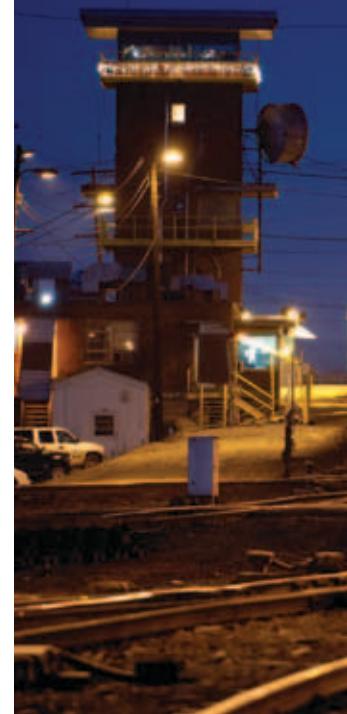
Making this process more efficient is the goal of Trainyard Tech, a PC-based information system that controls humping operations. The project is part of NS' Track 2012 process, a five-year plan to significantly improve all aspects of the company's business.

The system is unique in that it uses fiber optic cable in a network arrangement and much less copper wire. It also resides in zone bungalows that control operations in various sections of the yard. That makes it more reliable, says **John LeStrange**, director terminal operations.

"One of the chief reasons for delays in our hump yards was lightning strikes that knocked out copper-based systems," LeStrange said. "Lightning does not penetrate fiber optic cable, so we've minimized that problem, and that makes our switching operations more dependable. We also have been able to reduce downtime significantly due to system failure because of the zone structure where only one zone is affected by the failure and others can continue operations."

The technology provides other significant benefits.

Once the switching list is loaded into the Trainyard Tech system, a graphic representation of actual yard conditions is displayed, indicating how many cars are on each track and how much room is left. The system calculates the proper speed at which each car should couple based on weight, and operates the retarders – a braking system along the track – to ensure that cars do not exceed maximum coupling speed of 4 mph. This prevents damage to freight in the cars and reduces the possibility of accidents in the yard.





■ At left: Three views of the yard at Chattanooga, which is scheduled to receive Train Yard Tech in 2010.



Another issue was cornering, when rail cars moving to different tracks can bump into each other, causing damage to the cars, which the system has reduced significantly.

LeStrange said Trainyard Tech has other advantages. "Because the system is PC-based, our employees can access it 24/7 from anywhere," LeStrange said. "We can run diagnostics from laptop or desktop computers and know exactly what's happening and what needs to be done to adjust operations."

The system also automatically fine-tunes its data to ensure smooth and safe operations. It also integrates commercially available hardware and software, making it easier to customize."

To date, Trainyard Tech is installed at the Buckeye, Elkhart, Ind., Macon, Ga., Bellevue, Ohio, Roanoke, Va., and Birmingham, Ala., yards. Yards at Chattanooga, Tenn., and Allentown, Pa. will come on line in 2010, with remaining yards to follow. ■ BizNS

SPIRIT Award winners

Innovation

Kevin E. Fannin, carman, Portsmouth, Ohio
Brad W. Gaines, carman, St. Louis
David C. Garris, carman, St. Louis
Richard I. Goodbrake, carman, Decatur, Ill.
Tony T. Hyde, machinist, Decatur, Ill.
Jim R. Kalvitz, carman, Cleveland, Ohio
Joe A. Leonard, machinist, Decatur, Ill.
Mickey L. McCay, machinist, Decatur, Ill.
Ronnie L. Owens, carman, Macon, Ga.
Robert D. Rupp, carman, Allentown, Pa.
Tracy L. Sumpter, carman, Decatur, Ill.

Norfolk Southern's SPIRIT Award program recognizes the exceptional accomplishments of NS employees. Congratulations to these employees whose contributions were recognized in the third quarter.



Performance

James N. Ahonen, property manager, Harrisburg, Pa.
Kim K. Ashley, assistant director labor relations, Norfolk
Gibson V. Barbee III, manager continuous improvement, Roanoke
Patrick L. Barnes, flagging foreman, Lancing, Tenn.
Gerald T. Brandt III, assistant foreman, Huntingdon, Pa.
Kenneth R. Bryant, CTS crew transporter, Williamson, W.Va.
Tony E. Burchfield, assistant track supervisor, Lancing, Tenn.
David L. Butts, assistant director automotive distribution, Atlanta
James W. Cappy, manager damage prevention & field service, Atlanta
Nathan W. Charles, engineering associate, Cleveland
Mikel J. Cipollini, assistant track supervisor, Waynesburg, Pa.
Dennis A. Claar, gradall operator, Huntingdon, Pa.
Michael J. Critchley, trainmaster, Oakdale, Tenn.
David J. Demeester, police communication officer, Atlanta
Allen W. Dixon, inspection foreman, Altoona, Pa.
Amanda M. Downs, manager mixing center administration, Atlanta
B. David Dudley, data systems analyst, Atlanta
Larry P. Elia, engineer, Williamson, W.Va.
James D. Farley, police specialist, Atlanta
Eric W. Fell, machinist, Elkhart, Ind.
James A. Franklin, trainmaster, Mobile, Ala.
Timothy B. Garland, supervisor customer service operations, Atlanta
William A. Gorby, property manager, Roanoke
Steven W. Guinn, training coordinator, Knoxville, Tenn.
Douglas Alan Handley, conductor, Decatur, Ala.
Richard E. Harris, manager administration, Atlanta
Kevin L. Haynes, police communication officer, Atlanta
Gary W. Heiser, utility carpenter, Decatur, Ill.
Mark S. Hensley, trainmaster, Kansas City, Mo.
Terry A. Hill, carman, Shire Oaks, Pa.
Timothy Hoffman, track patrol foreman, Cleveland, Ohio
Norman W. Hurt, assistant track supervisor, Altavista, Va.
Tracy R. Jackson, secretary, Elizabeth, N.J.
Victor P. Jacobs, supervisor customer service operations, Atlanta
Stefan M. Johns, track supervisor, Waynesburg, Pa.

R. Gary Joiner, supervisor customer service operations, Atlanta
Lemuel Isaac Jones, laborer, Lancing, Tenn.
Rodney A. Kelly, conductor, Williamson, W.Va.
Donald I. Lamont, conductor, Savannah, Ga.
Arthur R. Lane, labor relations officer, Norfolk
William R. Liddle, supervisor customer service operations, Atlanta
James J. Lombardo, general foreman, Kansas City, Mo.
Kathleen S. Lynch, supervisor customer service operations, Atlanta
Steven C. McCurdy, senior manager facilities, Norfolk
Thomas R. Merrell, trainmaster, Moberly, Mo.
Michael A. Metz, trackman, Huntingdon, Pa.
Reggie D. Miles, machine operator, Fort Valley, Ga.
Joshua M. Patoka, transportation associate, Emory Gap, Tenn.
Guy W. Potter, electrician gang leader, Roanoke
Curtis L. Putnam, switchman, Decatur, Ala.
Alex U. Rocca, property agent, Atlanta
Malcolm G. Roop, senior real estate manager, Philadelphia
Eileen M. Roth, road foreman of engines, Emory Gap, Tenn.
Renalda M. Sanders, supervisor customer service operations, Atlanta
Richard W. Scott, manager crew transportation system services, Bluefield, W.Va.
Beverly Ann Sims, supervisor customer service operations, Atlanta
Alan L. Sisk, system manager, Atlanta
Earl R. Small, machinist, Enola, Pa.
Danny R. Stephens, signal maintainer, Somerset, Ky.
Jericho J. Stovall, track supervisor, Norfolk
Ryan M. Stroh, special agent, Chicago
Susan M. Sweitzer, steno clerk, Chicago
Sean K. VanDiver, trainmaster, Selma, Ala.
Darnell A. Vickers, service support systems consultant, Atlanta
Melody M. Villarini, steno clerk, Atlanta
Marion F. Wall, B&B project supervisor, Norfolk
John R. Weber, conductor, Atlanta
Tyler E. White, trainmaster, Moberly, Mo.
Carl D. Wilson, manager coal transportation, Roanoke
Joseph S. Young, laborer, Russellville, Tenn.

TheFutureNeedsUs.com focuses on the benefits of partnerships and rail corridors

The Future was looking mighty grim as it sat in a traffic jam. How could it move forward with all this highway congestion? Not to worry, because the Thoroughbred of Transportation had the answer.

Energized by a partnership of Norfolk Southern and federal, state, and local governments, the Future found a smart way to move ahead. To tell the story, NS has launched a new Web site focusing on the benefits of its corridor and public-private partnership projects.

The Web site, TheFutureNeedsUs.com, describes projects to increase rail freight transportation capacity and improve mobility and the environment. Information is provided for projects in Alabama, Georgia, Maryland, Mississippi, New Jersey, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia.

The site outlines how upgrading the Crescent Corridor – the existing 2,500-mile rail route from the Southeast to the Northeast – will support a stronger economy, less highway congestion, cleaner air, and fuel savings.

The Crescent Corridor will be among the largest additions of new freight transportation capacity since the interstate highway system. That means creating or benefiting some 73,000 green jobs by 2030 and producing these estimated annual benefits:

- \$326 million in tax revenues to states and communities
- 1.3 million long-haul trucks diverted from interstates
- \$146 million in accident avoidance savings
- 1.9 million tons in CO₂ reduction
- \$575 million in congestion savings
- \$92 million in highway maintenance savings
- 170 million gallons in fuel savings

Crescent Corridor components include new intermodal facilities at Memphis, Tenn., Birmingham, Ala., and Franklin County, Pa., and the expansion of terminals in Harrisburg, Pa., and Philadelphia. Other projects include straightening curves; adding passing tracks, double tracks, and signals; and running more efficient trains.

The site also features NS' battery-powered locomotive developed under a public-private partnership model.

TheFutureNeedsUs.com provides detailed information about other NS corridor projects, as well. This includes the Heartland Corridor to open a new gateway for double-stacked container traffic from the East Coast to the Midwest; the MidAmerica Corridor to create shorter and faster routes for merchandise moving between the Midwest and Southeast; and the Pan Am Southern Corridor to create an improved rail route between Albany, N.Y., and the greater Boston area.

The site includes photos, videos, maps, fact sheets, links, contacts, and a convenient form for contacting Norfolk Southern. ■ BizNS

**The Future
Needs Us
.com**

TheFutureNeedsUs.com



ON THE COVER:

Norfolk Southern's Research and Tests department's mission is "to provide quality technical services and innovative developments." Located in Roanoke, it is the largest research and tests group among Class I railroads with 27 employees who are mechanical, material, civil, and chemical engineers. The group has helped NS pioneer technologies to ease friction on rails, systems to achieve optimum use of locomotive power, and a battery-powered locomotive.

BizNS presents an in-depth look at the challenges and opportunities Norfolk Southern faces. It is produced by the Corporate Communications Department.

Andrea Just
EDITOR

Jon Glass
CONTRIBUTING WRITER

Frank Wright
DESIGN MANAGER

Audra Byrn
DESIGNER

Nicole Michael
PHOTOGRAPHER

CONTACT US:
Three Commercial Place
Norfolk, Va. 23510

e-mail:
bizns@nscorp.com



Three Commercial Place
Norfolk, Va. 23510

Presorted
First-Class Mail
U.S. Postage PAID
PPCO

Rousis receives Branding Hammer award from RTA



The Railway Tie Association recognizes three individuals for their contributions to the tie industry annually: one from sawmills, one from producers/treaters, and one from railroads. This year, the railroad recipient is Norfolk Southern's **Bill Rousis**, director of purchasing, engineering. Rousis applies his hardwood market and wood technical knowledge to both procurement responsibilities and active participation with the engineering and research and tests departments in seeking improvements for NS' use of wood tie treatment solutions and methods. ■ *BizNS*

NS 2010 calendars available for purchase

Norfolk Southern 2010 calendars can be purchased for \$11.95 which includes tax, postage, and shipping. For international shipments add \$12 for shipping costs. To order by credit card, call toll-free 1-800-264-4394 between 8:30 a.m. and 5:00 p.m. E.S.T.

Or send a check or money order to:

Norfolk Southern Calendar
c/o Nyberg Fletcher & White
801 Cromwell Park Drive, Suite 100
Glen Burnie, Md. 21061



All materials used in the production of this publication are recycled.

Please help the environment by doing your part and recycling.

