

VOLPE HIGHLIGHTS



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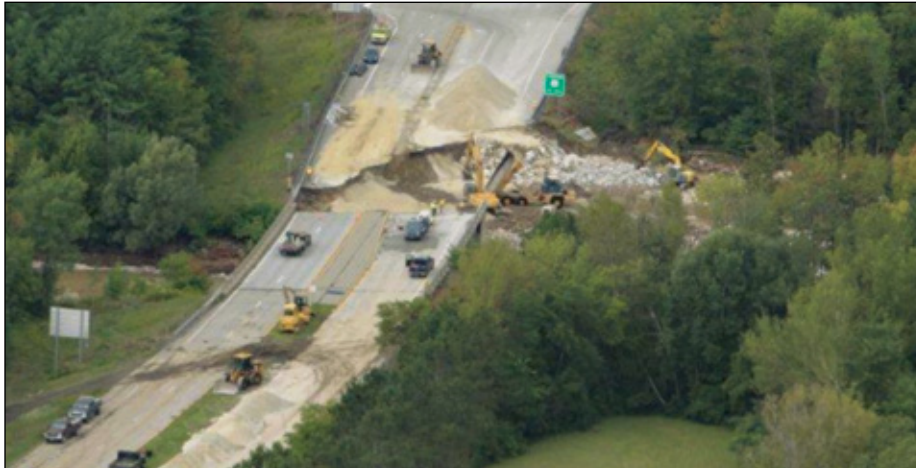
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Out-of-the-Box Thinking Proves Successful for Emergency Response Team



Damage to Rte 7 in Vermont due to Tropical Storm Irene. (Photo: FHWA - Vermont Division)

When Tropical Storm Irene barreled through New England on August 28, 2011, the torrential rains caused severe flooding and millions of people lost power due to downed trees. Roads were washed out and thousands of residents were cut off from life sustaining items such as food and water.

As Hurricane Irene passed the Bahamas, Mr. Terry Sheehan of the Volpe Center Intermodal Infrastructure Security and Operations Division and his Volpe and multi-modal Emergency Response Team were activated. The team convened at the Federal Emergency Management Agency's (FEMA) Regional Response Coordination Center (RRCC) in Maynard, MA. The team included Lee Biernbaum, Ryan Cummings, and Bob Hallett from the Volpe Center and Jim O'Leary from the FAA.

While trying to implement alternative transportation solutions for vehicles supporting emergency response during Tropical Storm Irene, the Volpe Center team quickly learned their work was only as good as the information they received. The critical issue that faced the team was determining which routes were passable and which routes were impassable due to washed out roads, downed trees or debris blocking the roadways.

Road closure information was communicated to the group via reports from the State Departments of Transportation. Early on, it became clear to the team some of the information was inaccurate. For example, trucks carrying food, water and cots were unable to make it to emergency shelters due to road closures. The challenge for the Volpe team was to swiftly come up with a solution to obtain more accurate information.

The resourceful team implemented an innovative way to obtain more accurate information. They sought help from local post offices whose mail carriers effectively communicated which roads were closed. They used Google Earth in conjunction with information they received from post offices and were able to devise (Continued on p. 4)

Revamped Web Pages Showcase Volpe Capabilities and Expertise

Are you searching for a report or a technical expert? Do you want to gain insight into a transportation issue or learn more about Volpe Center capabilities and projects? Are you interested in what experts from around the country have to say about the transportation enterprise?

[Access clips of transportation experts speaking on topics to which they've devoted their life's work.](#)

Visit and bookmark the new and improved Volpe Center web pages (www.volpe.dot.gov). Featuring over 100 projects from our eight Technical Centers and twenty-three technical divisions, the new web pages highlight the vast and diverse capabilities of our staff.

Our expertise spans a wide range of transportation modes and disciplines—staff include civil, electrical, mechanical, aeronautical engineers, physical (Continued on p. 3)

Former RITA Administrator Shares Insights on Technology and Policy

Prior to stepping down as administrator for the Research and Innovative Technology Administration (RITA), Peter Appel traveled to the Volpe Center on Sept. 1 to share his insights on the intersection between transportation technology and policy. Appel has been a strong advocate for innovative transportation solutions, and the Volpe Center wishes to thank him for his years of service, vision, and support.

Budget constraints in Washington, D.C., are about to trickle into the transportation sector, warned Peter H. Appel, former administrator for the U.S. Department of Transportation's Research and Innovative Technology Administration (RITA).

Compounding these constrained resources, the nation's population is estimated to grow by 100 million people during the next few decades—which means 100 million more users of our transportation system.

"We need to work smarter," said Appel, who spoke about the intersection between technology and policy on Sept. 1 in the latest "Straight from the Source" series at the John A. Volpe National Transportation Systems Center. "We need to drive a better transportation system without necessarily the same kind of budget that we had to build the transportation system we have today."

Technology informs good policy, Appel said, and four key areas of transportation where technology and policy intersect are satellite-based navigation, alternative energy solutions, advancing the infrastructure's health, and workforce development.

Satellite-based navigation—specifically, Global Positioning System (GPS)—is critical to modern transportation initiatives, including NextGen, Positive Train Control, and Intelligent Transportation Systems (ITS). However, there are consequences that come with this mounting dependence on GPS, Appel said.

To illustrate, Appel explained that current efforts by the company LightSquared to achieve nationwide wireless broadband coverage



*Former RITA Administrator Peter Appel.
(U.S. DOT Photo)*

may compromise GPS due to the technologies' close proximity to one another along the radio spectrum. A portion of the spectrum that LightSquared plans to use emits a strong signal that conflicts with a portion of the signal used for GPS. "It's a technology issue, it's a policy issue," said Appel.

Finding alternative energy solutions is another key issue for RITA. Currently, almost one-third of greenhouse gas emissions in the U.S. come from transportation, and 97 percent of vehicle greenhouse gas emissions come from fossil fuels, Appel said.

"That's got to change," Appel said.

From a policy perspective, the Obama Administration has taken a bold step by raising the Corporate Average Fuel Economy (CAFE) standard to 35.5 miles per gallon by 2016, Appel said. From a technology perspective, the DOT is helping advance clean energy by conducting research into biofuels and other clean energy technology.

"We don't know how it's going to play out, but that's a key reason for people like us to be involved."

Another priority for RITA is bringing the nation's transportation infrastructure to a state of good repair. Appel noted that a significant number of bridges in this country are beyond their useful life, and that number grows every month. "In a perfect world, we take out a checkbook and fix all of them or rebuild all of them," Appel said. "We can't. The budget's just not there for it."

Technology can play a major role in advancing infrastructural repairs, including technologies like remote sensing and ITS, which can monitor the health of transportation networks and support targeted, priority investments.

The cross-cutting issue, Appel said, is that all of this new and emerging technology requires a highly skilled workforce; however, up to 50 percent of the current transportation workforce may retire over the next decade, and fewer people are entering transportation-related fields.

To bolster workforce development, RITA is partnering with University Transportation Centers, vocational schools, and community colleges, and working with the White House to advance science, technology, engineering, and math in K-12 schools. There is also a need to advance initiatives that promote diversity, Appel said. In addition, the slow and steady growth transportation industry needs to do a better job at marketing itself.

"There are plenty of industries that do a dramatically better job at marketing themselves than transportation does, and I think we can do a lot better and I want to be a part of it," Appel said. "I think we all could be a part of it." ■

Volpe Scientist Recognized by White House With Early Career Award

The White House recently named Volpe Center employee Dr. Kristin C. Lewis a recipient of the Presidential Early Career Award for Scientists and Engineers. The award is the highest honor bestowed by the United States government on science and engineering professionals in the early stages of their independent research careers.

An environmental biologist with numerous articles published in peer-reviewed journals, Dr. Lewis is working to find alternative fuel solutions for our commercial aviation needs. “The aviation community is actively researching sustainable alternative fuel solutions. It’s an exciting time to be involved in alternative fuels because momentum is really building” says Lewis.

Dr. Lewis distinguished herself by working to develop a standard for synthesized hydrocarbon jet fuels which has since received international approval. She is also recognized for her outstanding leadership coordinating the aviation-related fuels research of 200+ organizations from Government, industry and academia.

Dr. Lewis serves as the Head Research and Technical Advisor for the Federal Aviation Administration’s Commercial Aviation Alternative Fuels Initiative (CAAIFI), a coalition that seeks to enhance energy security and environmental sustainability for aviation through alternative jet fuels.

Prior to joining the Volpe Center in 2009, Dr. Lewis worked as a Rowland Junior Fellow at Harvard University’s Ecology Lab, where she received her Ph.D. in Biology in June 2004.



Dr. Kristin C. Lewis (Volpe Center photo)

Presidential Early Career awardees are selected for their pursuit of innovative research at the frontiers of science and technology and their commitment to community service as demonstrated through scientific leadership, public education, or community outreach.

“This recognition from the White House of Kristin’s outstanding accomplishments and future promise is very well deserved,” said CAAIFI Executive Director, Richard Altman.

Dr. Lewis is one of ninety-six awardees and the only recipient in the U.S. Department of Transportation.

At the Volpe Center, we take pride in our staff’s proficiency and the high caliber of their work. It is this expertise and passion that is at the heart of the Volpe Center and our mission to drive transportation research innovation. ■

Revamped Web Pages Showcase Capabilities, Expertise *(continued from page 1)*

Advanced Transportation Technologies
The Center for Advanced Transportation Technologies is at the vanguard of research, development, and deployment of Intelligent Transportation Systems (ITS) and advanced vehicle and information technologies.

Viewable Slideshow

Explore our Technical Centers							
Center for Transportation Policy and Planning	Center for Safety Management Systems	Center for Environmental and Energy Systems	Center for Transportation Logistics and Security	Center for Infrastructure Systems and Engineering	Center for Air Traffic Systems and Operations	Center for Human Factors Research and System Applications	Center for Advanced Transportation Technology
<ul style="list-style-type: none"> Economic Analysis Organizational Performance Transportation Planning 	<ul style="list-style-type: none"> Safety Information Systems Aviation Safety Management Safety Measurement 	<ul style="list-style-type: none"> Environmental Measurement and Modeling Energy Analysis Environmental Science and Engineering 	<ul style="list-style-type: none"> Security and Emergency Management Situational Awareness and Logistics 	<ul style="list-style-type: none"> Structure and Dynamics Systems Safety and Engineering Infrastructure Engineering 	<ul style="list-style-type: none"> Air Navigation and Surveillance Aviation Systems Engineering Air Traffic 	<ul style="list-style-type: none"> Surface Transportation and Aviation Human Factors 	<ul style="list-style-type: none"> Technology Innovation Policy Advanced Vehicle Technology

and social scientists, human factors experts, economists, planners, information technologists, and safety operation specialists to name a few.

Be sure to also visit our unique Strategic Initiatives pages, where you can access video clips of transportation experts speaking on topics to which they’ve devoted their life’s work. Past speakers have included experts in academia, industry and government, such as Dr. Joseph Coughlin of the Massachusetts Institute of Technology and Shelley Row, Director of the U.S. DOT’s Intelligent Transportation System (ITS) Joint Program Office. Don’t forget to visit these pages often, as we will be frequently updating with news about the latest speakers at the Volpe Center, which you can participate via webinar. ■

Modeling Tool Helps FAA Ease Airport Congestion

Boarding an airplane, pushing back from the gate and then getting caught in a long departure queue on the runway is a common and annoying aspect of air travel. The Federal Aviation Administration (FAA) has invested heavily in tools and technologies to address congestion of the airspace, and now is examining how to reduce congestion on the airport surface.

Easing congestion on the airport surface potentially improves the level of customer satisfaction and significantly cuts down on the amount of fuel burned during taxi operations. An added benefit is a reduction in greenhouse gas emissions.

The Volpe Center is applying operations research techniques to support the FAA's Collaborative Departure Queue Management initiative (CDQM). CDQM is one of many technologies under development as part of the Next Generation Air Transportation System (NextGen).

As part of the CDQM prototype evaluation at the Memphis airport, flight schedules and air capacity data are shared between flight operators (e.g., airlines) and air traffic control. Sophisticated algorithms are used to assess real-time surface capacity and provide flight operators recommendations on when aircraft can push back and begin taxi-out procedures to minimize wait times.

In some cases, aircraft may push back from the gate and sit in a virtual queue without starting their engines, and then begin the taxi-out procedure only when the actual departure runway queue is short. In other cases, passengers may be held in the terminal and begin boarding only when surface capacity has opened up sufficiently to allow for departure. The FAA has estimated that

when fully implemented at the Memphis airport, CDQM can potentially reduce taxi-out time by 5000 hours per year, resulting in savings of thousands of gallons of fuel.

As part of the CDQM project, the Volpe Center's Aviation Systems Engineering Division has developed a modeling and simulation tool that is being used by the FAA to assess applicability and likely benefits of implementing CDQM in other airports. The data from the modeling and simulation tool, along with results of the Memphis CDQM evaluation, will provide key insight into the effectiveness of CDQM as an airport congestion management system. CDQM efforts at the Volpe Center are supported by Vince Orlando, Bruce Wilson, Zale Anis, Ray Lambert, Jose Ortiz, and Jacob Zielinski. ■



(FAA photo)

Out-of-the-Box Thinking Proves Successful *(continued from page 1)*

alternative routes. Finally, in conjunction with Region 2 staff in New York City who was responding to Hurricane Irene in New Jersey and upstate New York State, a toll-free number was established for people to call and provide information about road closures. With several million customers without power in the Northeast, power companies needed to route repair crews and their equipment around chokepoints and closed roads, getting transformers and generators to areas in need.

The team's solution decreased the travel time for vehicles providing critical products and services. Trucks carrying generators to vital places like hospitals reached their destinations without significant delays. Utility crews were able to reach downed power lines and bring power back to homes in a timely manner. During any emergency, response time is crucial, especially when people's lives are at stake. Leave it to Volpe Center employees to use technology and innovation to solve a problem. ■

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Visit the Volpe Center at: www.volpe.dot.gov



U.S. Department of Transportation

Research and Innovative Technology
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