

VOLPE HIGHLIGHTS

Aylward Appointed to Lead Centers of Innovation

In this issue



Volpe Center Photo

New Deputy Associate Administrator for Research, Innovation and Technology, Anne Aylward.

Peter Appel, Administrator of the U.S. DOT's Research and Innovative Technology Administration, recently announced the appointment of Anne Aylward to the position of Deputy Associate Administrator for Research, Innovation and Technology at the Volpe Center. In this role, Anne leads the Centers of Innovation (COIs), which encompass all of the research, innovation, technology, and transportation program analysis functions performed by the Volpe Center. Most recently, Anne served as Director of the Multimodal Systems Research and Analysis COI and Acting Director of the Advanced Vehicle and Information Network Systems COI. Anne reports to Robert Johns, Associate Administrator and Director of the Volpe Center.

"Anne has extensive multimodal, interdisciplinary, and multi-sector experience, with years of success in working across those boundaries," said Robert Johns.

Anne brings over 30 years of experience in transportation planning, policy, and research management, and is a nationally-recognized expert in intermodal transportation planning and operations issues. At the Massachusetts Port Authority, Anne served as its Port Director for ten years and was the first woman to serve as Chairman of the American Association of Port Authorities. Since her initial Federal appointment at the Volpe Center in 2006, Anne has developed a solid record of achievement in collaborating with colleagues inside and outside the Center, hiring and developing staff, and facilitating transportation systems assessment and technology deployment.

Anne has a Master in City Planning degree from the Massachusetts Institute of Technology and an A.B. from Harvard/Radcliffe. She has served on several committees of the Transportation Research Board of the National Academy of Sciences and was named Woman of the Year by the national Women's Transportation Seminar.

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Tackling Traffic at John F. Kennedy International Airport

At one of America's busiest airports, John F. Kennedy International Airport (JFK), one might wonder what measures air traffic controllers and managers take behind the scenes to address congestion and reduce delays.

The Volpe Center is assisting FAA's efforts to design and deploy cutting-edge technology that enables air traffic personnel to provide increasingly safer and more efficient service to airlines and passengers. At JFK, the Volpe Center has supported implementation of two enhancements of the Airport Surface Detection Equipment, Model X (ASDE-X) aircraft tracking system. These operational improvements are especially valuable as the airport has temporarily closed its longest runway for upgrades.



Photo courtesy of Ad Almekkens

With ASDE-X enhancements, air traffic controllers and managers can track aircraft on the entire airport surface, right up to the parking gate.

ASDE-X is an Internet-age version of radar that enables controllers and traffic managers to "see" aircraft even when they are not visible from the tower cab, potentially due to an obstruction, fog or haze. JFK's controllers and traffic managers employ ASDE-X to view a real-time display of aircraft on taxiways and runways.

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Volpe Center Assists Fuel Cell Bus Technology Development

The Volpe Center, in support of the Federal Transit Administration (FTA), will coordinate a two-day National Fuel Cell Bus Program (NFCBP) meeting April 8-9 in Washington, D.C. Three consortia—the Center for Transportation and the Environment, the Northeast Advanced Vehicle Consortia and CALSTART—will present and discuss successes, drawbacks and best practices relating to recent advancements in fuel cell technology.

Barry Mickela of the Volpe Center's Physical Infrastructure Systems Center of Innovation is coordinating the meeting. The FTA administers the NFCBP, which is authorized through the Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) to facilitate the development of commercially viable fuel cell bus technologies and related infrastructure. Goals of the NFCBP are to advance technology, reduce production costs, and increase public acceptance of fuel cell vehicles.

The Volpe Center provides technical assistance and management support to FTA with an emphasis on system safety, energy storage, bus systems integration, and fueling infrastructure. In addition, the Center is tracking fuel cell bus technology demonstrations across the country and around the world, including California, Connecticut, Canada, Japan, China, Brazil, and several European cities.

As part of the Volpe Center's support to the NFCBP, Karen Shilo of the Environmental and Energy Systems Center of Innovation recently represented FTA at the Fuel Cell Exposition 2010 in Tokyo, Japan. The Tokyo Fuel Cell Exposition addressed strategies on fuel cells, connections between clean and energy-secure systems, the creation of sustainable communities, and improved livability via reduction of particulates and other urban emissions in transportation.



NFCBP Battery Dominant Hybrid Hydrogen Fuel Cell Transit Bus outside U.S. DOT Headquarters in Washington, D.C.

Photo courtesy of the Center for Transportation and the Environment (CTE)

Improved Safety for Hazmat Rail Tank Cars



Volpe Center photo

Michael Carolan, mechanical engineer at the Volpe Center, inspects a prototype panel after a structural bend test at the Lehigh Center for Advanced Technology for Large Structural Systems.

Rail transport has been proven to be the safest method of moving large quantities of hazardous chemicals around the nation. In support of the Federal Railroad Administration (FRA) Office of Research and Development's rail tank car safety program, the Volpe Center's Physical Infrastructure Systems Center of Innovation conducts detailed research into the design, structural behavior, and causes of metal fatigue and fractures in the railroad tank cars that carry hazardous freight.

The Volpe Center has provided the FRA with technical support over the past three decades. Activities included developing head shield protection and shelf coupler design options to protect tanks during derailments and reducing derailment likelihood, undertaking damage tolerance analyses to determine the point at which the detectable flaws in a tank car require repair or replacement, understanding the contribution of residual cracks caused by welding processes to the growth of these flaws, and studying the behavior of tank car shells under extreme conditions such as impacts, derailments and collisions.

The Volpe Center recently utilized the unique resources of Lehigh University in Bethlehem, Pennsylvania to assist in studying tank car shell protection. Lehigh's Center for Advanced Technology for Large Structural Systems operates a Baldwin Universal Test Machine that can exert up to 5 million pounds of force on a test panel. An FRA contractor manufactured sixteen test options for panel reinforcement. The Baldwin machine deformed these panels and measured their structural characteristics. Results were compared to determine which options would best help protect tank cars against impacts and collisions.

Volpe Center staff are using these test results to develop new design concepts for protecting tank cars. The draft report on this project, *Deformation Behavior of Welded Steel Sandwich Panels under Quasi-Static Loading*, is currently under review by FRA for publication.

Award-winning Expansion of ATC in the Gulf of Mexico

The Federal Aviation Administration's (FAA) Automatic Dependent Surveillance-Broadcast (ADS-B) team, including Volpe Center staff, was recently recognized by FAA Administrator J. Randolph Babbitt and by the Helicopter Association International (HAI) for successfully expanding Air Traffic Control (ATC) services in the Gulf of Mexico. ADS-B is one of the major programs that will enable NextGen.

The team has been working to ensure that aircraft over the Gulf can take advantage of the full array of ATC services available from Houston Control. The Volpe Center was instrumental in the selection of and negotiation for deployment sites on petroleum exploration and production platforms. With ADS-B radio stations located on these platforms, significantly reduced aircraft separations will be achieved.

Early in the year, FAA Administrator Babbitt traveled to Texas to [announce](#) that Houston air traffic controllers are beginning to use ADS-B in the Gulf of Mexico, and to recognize the FAA and Volpe Center staff for successfully attaining the Initial Operating Capability target date for ADS-B service in the area. Matthew Maki, of the Volpe Center's Communications, Navigation and Surveillance and Traffic Management Services Center of Innovation participated in the award ceremony.

HAI recently recognized this accomplishment at their annual conference. Matthew accepted the "Salute to Excellence" group award—which recognized Volpe Center support to this effort—and the individual award for Meritorious Service, "in recognition and appreciation of outstanding service to the international helicopter community."



Members of the ADS-B team with FAA Administrator J. Randolph Babbitt (pictured fourth from left): Vincent Capezzuto (FAA), Jim Linney (FAA), Robert Bradley (contractor support), Juanita Kennedy (FAA), Robert Novia (FAA), and Matthew Maki (Volpe Center).

New Rail Simulator Installed at Volpe



The Federal Railroad Administration (FRA) recently installed the Cab Technology Integration Laboratory (CTIL), a state-of-the-art locomotive simulator, at the Volpe Center. It will allow researchers to simulate a number of conditions and scenarios encountered during railroad operations to help identify safety problems and develop effective solutions. Featured above is Michael Jones of the FRA Office of Research and Development at the controls of the simulator in Cambridge, Massachusetts.

Look for expanded coverage of the new simulator in the next edition of the Volpe Highlights.

JFK *(continued from p. 1)*

At JFK, the Volpe Center and Sensis Corporation, on behalf of FAA, implemented a unique extension of ASDE-X to provide aircraft position data for the entire airport surface right up to the parking gate. With real-time monitoring of queues in these previously "invisible" areas, decision makers at JFK can better anticipate backups and balance departures and arrivals.

The second ASDE-X enhancement now distributes aircraft tracking data to FAA personnel and other key participants in the management of the airport: the Port Authority of New York and New Jersey, the Transportation Security Agency and the airlines. A commercial product developed to support operational use of ASDE-X data organizes this information for rapid, accurate interpretation and prediction of congestion trouble spots. With this common "airport picture" available to them, decision makers can make adjustments that impact operations sooner.

The Volpe Center is supporting FAA's efforts to ensure that ASDE-X is providing the best possible information to traffic managers at JFK under any scenario.

The 1970s: TSC Emerges as a Transportation Leader



Volpe Center Photo

Early air bag demonstration outside the Transportation Systems Center in Cambridge, Massachusetts.

On July 1, 1970, U.S. DOT established the Transportation Systems Center (TSC) in Cambridge, Massachusetts. The goal of the Center was to serve as a central research and development facility for the recently-established cabinet agency and to support the responsibilities of the Office of the Secretary of Transportation (OST) to assure coordination and management for intermodal and cross-modal activities. The Center initially reported to OST through the Assistant Secretary for Systems and Technology until 1977, when TSC was transferred to the newly-formed Research and Special Programs Administration, a predecessor to today's Research and Innovative Technology Administration.

In the 1970s, a number of new transportation issues and challenges emerged, many of which remain important to the present day. Challenges included enhancing rail, transit and aviation safety; increasing mobility through high speed rail, next-generation bus and rail, and personal rapid transit system concepts; reducing highway motor vehicle crashes associated with alcohol and drug abuse; strengthening airport security; managing public criticism of transportation-related noise and air pollution; and responding to mounting concern over the consequences of motor vehicle fuel consumption in light of oil embargoes and fuel shortages.

During its start-up decade, TSC supported U.S. DOT's efforts to respond to these complex issues. TSC hosted significant thought leadership events involving participants from government, industry and academia. Topics for these conferences and symposia included: motor vehicle fuel economy standards, the environmental impacts of supersonic aircraft, the Chrysler Loan Guarantee, high speed rail and highway-rail grade crossing safety, the design and development of the next generation of transit vehicles, satellite-based air traffic management and wake vortex measurement to establish aircraft separation standards.

As the 1970s evolved, it became clear that successfully implementing advances in transportation technologies—to truly innovate—also required that the impact of these advances on society and the users and operators of a given system be understood and integrated into the transportation innovations. To meet this challenge, the Center's workforce, initially dominated by the engineering disciplines, shifted to a new and more equal mix of both engineers and the social and behavioral sciences, including economics, human factors, and operations research.

TSC closed out the 1970s having fulfilled the initial vision for the Federal center. It emerged as a major contributor to enhancing and stimulating innovation across modes and sectors.



Volpe Center Photo

Transportation Systems Center roadside noise measurement van in the Boston, Massachusetts area.

This is the second in a special series of stories honoring the Volpe Center's 40th anniversary of Federal service to the Nation.



Volpe Center Information

617.494.2224 or askvolpe@dot.gov

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

Volpe Center contributors to this issue:

Anne Aylward, Ellen Bell, Joyce Chen, Michael Coltman, Stephen Creaghan, Bob Dorer, Susan Dresley, Michael Geyer, Kevin Green, Glenn Goulet, David Jeong, Dr. Richard John, Alison Kruger, Matt Maki, Barry Mickela, José Ortiz, Mark Safford, Karen Shilo, Diane Wells



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Research and Innovative Technology Administration