RITA Volpe National Transportation Systems Center

Volpe Highlights

U.S. Department of Transportation • Research and Innovative Technology Administration NOVEMBER 2010

Commemorating 40 Years of Service to America

In honor of its 40th anniversary as an integral part of the U.S. Department of Transportation, the Volpe Center held an Open House on Friday, October 15 in Cambridge, Massachusetts.

In a keynote speech at the event, U.S. Chief Technology Officer Aneesh Chopra (pictured right) described how the White House is committed to tapping into the creativity of the nation's entrepreneurs:

President Obama has given me one clear instruction: in this Administration, entrepreneurs are welcome. Entrepreneurs at the Volpe Center, entrepreneurs in the community, entrepreneurs in Silicon Valley and Route 128, you are welcome.

You are… going to design something incredible, that will improve our transportation experience not in ten years, but tomorrow… That's the entrepreneur in your heart, we want to tap into your mojo!

Aneesh Chopra
U.S. Chief Technology Officer

The Volpe Center is a great example of an experiment in government that's worked. Every day, you collaborate within every mode within the Department of Transportation, as well as with the larger industry to give form, shape and direction to innovation. You are truly the laboratory of innovation.

John D. Porcari
U.S. Transportation Deputy Secretary

Volpe Center staff presented a showcase (pictured below) of over twenty projects to local, state and Federal officials, representatives from industry and academia and the Volpe Center community. For a full list of the projects in our showcase, visit: http://www.volpe.dot.gov/infosrc/sf/vcd/docs/volpe-center-open-house-project-showcase.pdf. Guided tours took visitors to demonstrations of our Traffic Flow Management System, an emergency bus egress simulator, and the Cab Technology Integration Laboratory, a state-of-the-art rail locomotive simulator.

Page 1: All Photos Courtesy of Linda Haas

Cars that don't crash… a truly interconnected transportation system… [and] innovations in non-motorized transportation… the Volpe Center is hard at work laying the seeds to ensure that we can capitalize on the opportunities and overcome these challenges, and achieve much greater successes over the next 40 years.

Peter H. Appel
U.S. DOT Research and Innovative Technology Administration Administrator

In this issue

Volpe Center Director Robert C. Johns, U.S. Transportation Deputy Secretary John D. Porcari, Research and Innovative Technology Administration Administrator Peter H. Appel, and U.S. Congressman Michael E. Capuano (pictured below left to right) also spoke of the important contributions Volpe Center staff have made to transportation innovation since research first began here in 1970.

Volpe Center Promotes Walking and Bicycling Options

Under the provisions of the last reauthorization of the Highway Trust Fund, $100 million was authorized for four communities in the U.S. to develop an infrastructure for expanding local pedestrian and bicycle travel in order to decrease highway congestion and energy use and promote a healthier and cleaner environment. This initiative, the Nonmotorized Transportation Pilot Program (NTPP), is currently funding projects in Columbia, MO; Marin County, CA; Minneapolis, MN; and Sheboygan County, WI.

Volpe Center Photo

Participating in the Twin Cities bike tour are, from left: Volpe staff William Lyons, FHWA sponsor and Livability and Nonmotorized Team Leader Gabe Rousseau, and Volpe staff members Ben Rasmussen and Anna Biton.

The Volpe Center is supporting the Federal Highway Administration Office of Human Environment and these communities to develop and implement this program to expand travel options, to evaluate the results of the program, and to report the results to Congress. Volpe Center staff members from the Multimodal Systems Research and Analysis Center of Innovation attended last month's Annual NTPP Meeting in Minneapolis, where they led discussions of the project working group on program evaluation and the final report to Congress. They met with local officials and took part in an eight-mile bicycle tour of the NTPP-funded Twin Cities projects on bicycles provided through the new Nice Ride Bike Sharing project, also funded through the NTPP. NTPP goals are compatible with those of the Interagency Partnership for Sustainable Communities, recently announced by the Secretaries of Transportation and Housing and Urban Development and the Environmental Protection Agency Administrator. Goals include providing more transportation choices and enhancing the unique characteristics of each community.

Maritime Vessel Traffic Tracking Along the Mexican Gulf Coast

Volpe Center Photo

An international team at work at one of the ten sites where they installed AIS antennae along Mexico's Gulf Coast in August 2010.

In support of U.S. Northern Command (NORTHCOM) and the U.S. Department of Defense Counter-Narcoterrorism Technology Program Office and in collaboration with the U.S. Embassy in Mexico and SEMAR (Mexican Navy), Volpe Center engineers are providing technical expertise and system deployment support to enhance Mexico's maritime vessel tracking capabilities.

This summer, Volpe Center engineers along with a SEMAR technical team successfully deployed Automatic Identification System (AIS) sensors at ten facilities along the Gulf Coast of Mexico. The Volpe Center also provided technical support and systems training to the Mexican Navy, building off expert knowledge gained from previous deployments of vessel tracking systems for the Panama Canal Commission, Saint Lawrence Seaway, U.S. Coast Guard and the U.S. Navy. Site surveys, site design and on-site installation support was provide by the Volpe team. During site installations, the Volpe team also recommended best practices for safety, site equipment configuration, installation and long term systems sustainment.

The newly deployed sensor network has made vast improvements in maritime domain awareness by providing Mexican authorities with the location and identity of commercial vessels operating off their East coast. The launch of the sites centralizes previously fragmented tracking of coastal commercial ship traffic.

During the next phase of enhancing Mexican and global maritime domain awareness, NORTHCOM and the Volpe Center will continue to provide technical support in the installation of AIS systems at thirteen sites along Mexico's Pacific Coast. Each of those sites will contribute local ship traffic information to the Volpe Center developed Maritime Safety and Security Information System (MSSIS).

Ultimately, data from all 23 Mexican sites will be consolidated as part of the country's maritime information network, prior to streaming the data to the Volpe Center. As Mexico further develops its maritime domain awareness capabilities, it joins over 60 nations freely contributing their data to MSSIS, enhancing situational awareness and increasing safety and security worldwide.

Assisting DHS to Strengthen Cyber Security Across Modes

U.S. Presidential Decision Directive 63 (1998) established Critical Infrastructure Protection (CIP) as a national goal that requires the government and private sector cooperation in order to "protect the physical and cyber-based systems essential to the minimum operations of the economy and the government." The Department of Homeland Security (DHS) has been assigned Federal "Sector-Specific Agency" responsible for coordinating cyber security activities with the private sector and other levels of government for transportation and ten additional critical infrastructure sectors.

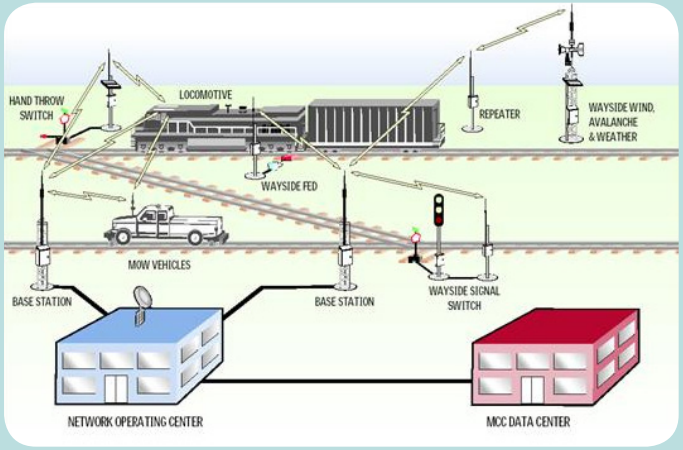


Photo courtesy of Meteorcomm LLC

Diagram of a typical Positive Train Control communications network, showing reliance on a potentially vulnerable wireless service.

To assist them in carrying out this responsibility, the DHS National Cyber Security Division's Control Systems Security Program (CSSP) office has initiated a support agreement with the Volpe Center's Freight Logistics and Transportation Systems Center of Innovation. DHS selected the Center because of its extensive knowledge base, expertise in transportation and information systems, and forty years of experience in the development and implementation of complex technology-based systems within transportation.

Under this new agreement, the Volpe Center will support CSSP over a comprehensive range of specific transportation cyber security tasks that cover every mode. Anticipated activities include: identifying and assessing the vulnerabilities of major U.S. transportation control systems (TCS); preparing a Cyber Security Roadmap with information on how to enhance the security of these systems; creating a prototype cyber laboratory for testing and validating TCS cyber security measures; developing transportation-based scenarios for use in national-level cyber exercises; providing outreach, awareness and educational support and enhanced professional capacity building; and expanding collaborative cyber security efforts with other U.S. and international members of the transportation community.

Volpe-organized Aviation Security Workshop Brings Together Stakeholders in Government, Industry and Academia

Image courtesy of FAA

NextGen Air Transportation System concept.

New "E-enabled" aircraft -- such as the Boeing 787 and 747-8, Airbus 380 and 350, and the U.S. Air Force KC-X tanker -- are incorporating increasing amounts of non-classified technologies such as open standard internet communication protocols and commercial-off-the-shelf equipment that can add significant benefits in terms of aircraft efficiency and capabilities. The open nature of these systems raises concerns about the corresponding increase in cyber security vulnerabilities and threats to aircraft safety.

To assist in managing this concern, the Volpe Center developed the Airborne Network Security Simulator (ANSS) at Wichita State University (WSU) in Kansas for the Federal Aviation Administration (FAA) and U.S. Department of Defense (DOD). ANSS integrates commercial and military aeronautical simulators to provide a controlled test bed to identify security threats in airborne network environments. It can be used to test, evaluate and calibrate aviation systems and equipment; assess their potential weaknesses and vulnerabilities in a safe environment; and develop new and upgraded industry and regulatory policies and standards to address aviation security issues.

Recently, Volpe staff member Kevin Harnett of the Freight Logistics and Transportation Systems Center of Innovation organized the first ANSS Demonstration and Technical Workshop at WSU. The meeting attracted over seventy participants from around the world in both the military and commercial aviation communities, including: the Federal Aviation Administration; the Department of Defense; the Defense Information Systems Agency; Department of Homeland Security; the United Kingdom Communications Electronic Security Group (CESG); representatives from American, Delta, Lufthansa and United airlines; aircraft, engine and avionics manufacturers including Airbus, Boeing, Cessna, Honeywell, Pratt and Whitney, Rockwell Collins and Thales; IT companies and several universities. The Volpe Center/WSU demonstration included a security test of a Class 3 Electronic Flight Bag, wireless connection to an airport gate, flight plan/performance calculation distribution from an airline, and a man-in-the-middle attack at an airport in which the attacker was able to change EFB performance calculation information. A Volpe Center/CESG team also provided recommendations on security risk mitigation strategies, such as Secure Baseline Configurations.

New Volpe Library Embraces Accessibility and Knowledge-Sharing

Volpe Center's Technical Library and Information Center celebrated its grand opening with a ribbon-cutting ceremony last week.

The new location of the Volpe Center's Technical Library and Information Center officially opened on Friday, October 15, during the 40th Anniversary Celebration in Cambridge, Massachusetts.

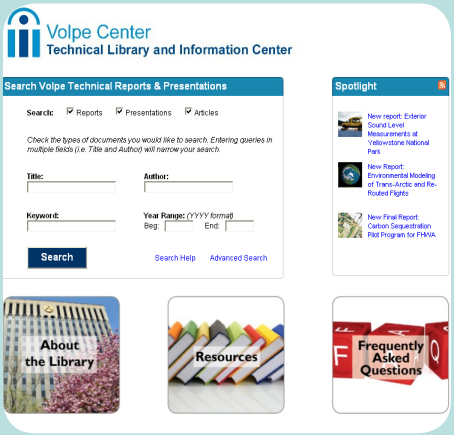
The ceremony celebrates a new and improved library with a revamped website, emphasizing searchability and electronic delivery of resources as well as a modernization of the library space. A new partnership with the National Transportation Library (NTL) and the U.S. Department of Transportation (U.S. DOT) Library further supports the Volpe Center's efforts to make our knowledge base more open to the greater transportation research community. A major new feature is the Library's new publications search engine. The Volpe Center's catalog holdings will also be available through the U.S. DOT's Library catalog and full-text of Volpe publications are being made accessible through the NTL.

In addition to becoming more accessible to transportation stakeholders, the new Volpe Center Library provides a modern space for seminars and meetings for staff and visitors. The library is now better positioned to serve as a vital knowledge-sharing hub for transportation professionals. Plans are currently underway to more prominently showcase the work of our technical experts through greater access to publications and increased dialogue with staff.

Check out the new Library website featuring a Spotlight where new reports and publications written by Volpe Center staff are highlighted. Subscribe to our RSS Feed to stay up to date on new Volpe publications.

For any questions, feel free to contact Susan Dresley, Volpe Center Librarian.

All: Volpe Center Photos



The Volpe Center's new Library was inaugurated in October. Above, from left to right: Amanda Wilson, Director of the National Transportation Library; Anne Aylward, Volpe Center's Deputy Associate Administrator for Research, Innovation and Technology; Peter Appel, Research and Innovative Technology Administration Administrator; Robert Johns, Volpe Center Associate Administrator and Director; and Susan Dresley, Volpe Center Librarian.

Above right: The new library space. Right: The newly redesigned Volpe Library website.

Volpe Center Information

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

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