VOLPE HIGHLIGHTS

U.S. Department of Transportation, Research and Innovative Technology Administration

OCTOBER 2009

Robert Johns Named as Volpe Center Director

(Photo courtesy of University of Minnesota)

The Volpe Center's new director, Robert Johns.

Robert C. Johns has been named as the new director of the Volpe Center. Mr. Johns has been director of the Center for Transportation Studies (CTS) at the University of Minnesota since 2001.

"Bob Johns stood out as a leader who brings a strong combination of deep transportation knowledge, research experience, management skills, and extensive ties within the national and global transportation communities. He brings entrepreneurial leadership in building multimodal and inter-disciplinary research programs along with his strong management and organizational development expertise," said Peter H. Appel, Administrator of the U.S. DOT's Research and Innovative Technology Administration (RITA).

Continued on Page 4

In this issue

New RITA Deputy Administrator Visits Volpe Center

The Volpe Center recently welcomed Dr. Robert L. Bertini, recently appointed as the Deputy Administrator of the Research and Innovative Technology Administration.

During his visit, Dr. Bertini was briefed by Dr. Richard John, Director Emeritus, and met with the Centers of Innovation Directors. He also met with senior technical staff and greeted some of the Volpe Center's new employees.

Dr. Bertini served as Professor of Civil and Environmental Engineering and Urban Studies & Planning at Portland State University (PSU). He was the founding Director of the Oregon Transportation Research and Education Consortium, led the Intelligent Transportation Systems Laboratory at PSU, and was a recipient of the National Science Foundation CAREER Award. He has more than 21 years of experience in the transportation field, including work with local government, several national transportation consulting firms on transit and highway projects, the auto industry, and university research and education.

A registered professional engineer and a former city planning commissioner, Dr. Bertini received a B.S. *cum laude* in Civil Engineering from California Polytechnic State University, San Luis Obispo; an M.S. in Civil Engineering from San Jose State University, and a Ph.D. in Civil Engineering from the University of California at Berkeley.

(Volpe Center Photo)

Dr. Robert Bertini (center,) with new Volpe Center employees, left to right: Angel Williams, graduate of the Harvard Graduate School of Design, Arlen Spiro, graduate of Tufts University, Jennifer Michaels, graduate of Pennsylvania State University, Kent Hymel, graduate of University of California - Irvine, Paul Minnice, graduate of Haverford College, Ken Miller, recently Director of Asset Management for Mass Highway, and Garrett Hagemann, graduate of University of Chicago.

Volpe Supporting Transformation of the Nation's Air Traffic System

In order to meet the projected growth on demand for future aviation service, Congress enacted legislation which created the Joint Planning and Development Office to manage a public-private partnership to implement the Next Generation Air Transportation System by 2025.

NextGen is designed to reduce congestion, accommodate growth in commercial aviation, and benefit the environment. New systems will analyze and display real-time, detailed flight and weather data to create common situational awareness and inform decision making among air traffic personnel and pilots. NextGen will also benefit the environment through reductions in carbon emissions, fuel consumption and noise.

In partnership with the Federal Aviation Administration and other key stakeholders, the Volpe Center is applying its expertise in engineering, operations, human factors, environmental and energy technology and safety management systems to help design, develop, and deploy cutting-edge aviation systems.

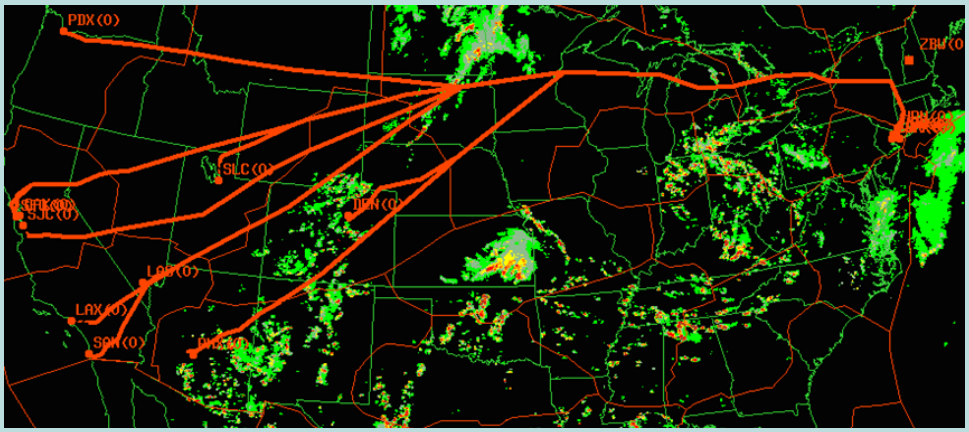
The Volpe Center has been making significant contributions to major NextGen initiatives since the program's inception. A multidisciplinary Volpe Center team is supporting efforts to accelerate the NextGen components that will yield near-term benefits and providing key support on critical mid-and long-term NextGen programs.

This active collaboration is on display this October 4-7 at the 54th Annual Conference and Exposition of the Air Traffic Control Association in Washington, DC. The Volpe Center exhibit will highlight a number of key Volpe Center contributions to NextGen, including: the Aviation Environmental Design Tool for displaying the environmental impacts of aircraft flights; the System Wide Information Management Integrated Terminal Weather System program, which displays real-time weather conditions near an airport; flight planning tools to support Area Navigation (RNAV) operations; and a Low-Cost Ground Vehicle Driving Simulator for Training operators of this equipment.

(Photo courtesy of AirTeamImages.com)

Aircraft trailing vortices.

Building NextGen's Foundation: ADS-B and TFM



(Volpe Center Photo)

The Re-Route Impact Assessment Tool displays a re-route around convective weather.

The Volpe Center, in support of the Federal Aviation Administration (FAA), is actively engaged in the development and implementation of two foundational NextGen concepts: Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Flow Management (TFM). ADS-B systems provide a continuous flow of data messages such as real-time aircraft positions and trajectories, weather conditions and airspace restrictions among aircraft in-flight and ground stations, via satellites. The Volpe team was instrumental in negotiating the deployment of ADS-B weather and communications equipment to offshore oil platforms in the Gulf of Mexico. This will significantly increase the airspace capacity for the region by decreasing safe aircraft separation minimums.

New TFM initiatives are now under development at the Center –the Airspace Flow Program (AFP) and Re-Route Impact Assessment (RRIA) tool. AFP allows FAA personnel to deal with congestion in en route airspace by metering the flow of traffic into overloaded portions of the airspace. RRIA will allow traffic managers to determine pre-departure re-routes around adverse weather conditions or other factors that cause congestion. Together these two innovations will create a significantly more effective TFM toolkit for the FAA.

U.N. Committee Focuses on Global Navigation Satellite System

The Volpe Center is deeply involved in identifying and analyzing Global Positioning System (GPS) vulnerabilities and interference mitigation techniques for all modes of transportation. Karen Van Dyke, the Volpe Center's National Expert on GPS and the Acting Director of Positioning, Navigation, and Timing at the U.S. DOT's RITA, is civil sector leader in the Federal development of a National PNT Architecture for 2025 with the National Security Space Office. Ms. Van Dyke recently traveled to St. Petersburg, Russia to participate in working group discussions of the International Committee on Global Satellite Navigation Systems, which operates under the United Nations Office of Outer Space Affairs. The committee is a voluntary association that brings together Global Navigation Satellite System and augmentation providers including the U.S., the European Union, Russia, China, India, Japan and those representing key user communities.

Mitigating the Environmental Impact of Aviation

A key goal of NextGen is to introduce new concepts and technologies that mitigate the environmental impacts of aviation. The FAA has turned to the Volpe Center to support them on several key fronts.

The Volpe Center is leading the design, development and maintenance of the Aviation Environmental Design Tool, which calculates fuel burn, emissions, and dispersion under different scenarios for global aviation demand. The FAA is seeking international acceptance of these and related tools as the standards for assessing global aviation emissions, their environmental impacts and potential solutions.

The Volpe Center is providing key expertise to the FAA-sponsored Commercial Aviation Alternative Fuels Initiative. This activity promotes the development, assessment and deployment of non-carbon and low carbon-based aviation fuels.

The Volpe Center supports the FAA Tailored Arrival Project. Specifically, the Volpe team is working on Optimized Profile Descent, a procedure by which air traffic controllers can clear pilots for smooth landing paths instead of stepped descents, reducing aircraft noise, fuel burn and emissions.

(Photo courtesy of the FAA)

Conceptual representation of NextGen

Studying the Human Side of NextGen

The Volpe Center is becoming increasingly involved in assessing key NextGen concepts, particularly from the standpoint of safety and the man-machine interface. Much of this activity focuses on the issue of how pilots, air traffic controllers and air traffic managers perceive information in current aviation systems, how this process will change as a result of new NextGen systems, and how these new systems can be designed to maintain or improve current levels of safety.

(Photo by Linda Haas Photography)

Secretary LaHood observes the Airport Surface Low Cost Driving Simulator in the Volpe Center's Human Factors Lab.

(Photo courtesy Wikimedia Commons).

Air Traffic Control Tower at Chicago O'Hare International Airport

In the area of Flight Symbology Volpe Center researchers are studying how elements of aviation displays are visually perceived and how to develop standards for the safe implementation of new systems. Volpe's human factors staff is providing the FAA with guidance and recommendations for designing and approving Surface Moving Map devices which show cockpit crews their location on the airport surface. They are also developing guidance for analyzing new NextGen-related pilot-controller communications and runway lighting and markings concepts to assure that these innovations will lead to safer aviation operations.

SBIR Kicks Off 2010 Program with Call for Innovative Proposals

The U.S. DOT's Small Business Innovative Research (SBIR) Program seeks innovative research proposals from small businesses to address specific research challenges facing the modal administrations. The SBIR Program Office at the Volpe Center has posted the first of two SBIR Program solicitations for Fiscal Year 2010, inviting small businesses to submit research proposals that address high priority goals within the U.S. DOT.

The first solicitation of the year has identified 14 research topics, including human factors for NextGen, low-cost detection technologies for rail grade crossings, driver behavior and crash avoidance monitoring systems for vehicles, development of comprehensive signal analysis tool and radio frequency ID licensing systems for motor vehicles.

Proposals are due on November 16, 2009. The solicitation is now available online at http://www.volpe.dot.gov/sbir.

Robert Johns Named as Volpe Center Director *Continued*

As the director of the CTS, Mr. Johns more than doubled the revenue attracted to the University for transportation research, education, and outreach, leading CTS to the top echelon of university transportation centers in the U.S.

Prior to joining the university in 1988, he held research and management positions with the Santa Fe Railway, the Minnesota DOT, and the Metropolitan Council of the Twin Cities. He also has over 20 years of experience in leading Transportation Research Board (TRB) committees and currently is chair of the Technical Activities Council, which oversees TRB's 200 technical committees. He received a B.S. in Engineering Operations from Iowa State University and an M.B.A. and M.A. from the University of Iowa. Dr. Richard R. John, Director Emeritus at the Volpe Center , served as Acting Director of the Center since November 2008.

Kendall Square Learning Project: A Grassroots Success Story

(Volpe Center Photo)

Olive Lesueur with her student, Brutus Louimann. Olive was one of the founders of the Kendall Square Learning Project .

The Kendall Square Learning Project (KSLP) began its 18th year on Tuesday, September 22nd with volunteers from the Volpe Center community offering classes in English as a Second Language at no cost to students.

The students enrolled this fall come to the Volpe Center two evenings every week to develop their English language and life skills. During a class, teachers and students might decipher idioms from the newspaper, review the process for paying bills, and share a composition submitted by one of the students.

Olive Lesueur, a co-founder of KSLP, remains the project's leader, and teacher. Since its inception as a non-profit in 1992, KSLP has engaged over sixty volunteers from the Volpe Center community and from the Greater Boston area. The program has reached over 400 students who have moved to the area from five continents with a spectrum of occupational backgrounds ranging from engineering to biology to accounting. To learn more about the program or to get involved, visit http://kslp.volpe.dot.gov.

RITA *John A. Volpe National Transportation Systems Center*

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