

# VOLPE HIGHLIGHTS

## Early Win for NextGen: Leaner, Greener Aircraft Arrivals



Airbus 380 aircraft descending into SFO Airport.

San Francisco (SFO), Los Angeles (LAX) and Miami (MIA) International Airports report fuel savings and emissions reductions after three years of testing oceanic Tailored Arrivals (TA), a project that supports the Federal Aviation Administration (FAA) NextGen program and includes the Volpe Center, air traffic control facilities, NASA, airlines and aircraft manufacturers. In an oceanic tailored arrival situation, a properly-equipped aircraft approaching a coastal destination from the ocean follows a path that optimizes fuel use during its descent. TA trials at SFO demonstrated significant benefits including reduced controller and pilot workload by decreasing the number of discrete arrival clearances and radio transmissions; decreased noise, fuel burn and emissions by flying at near-idle thrust engine settings during descent; improved overall efficiency; and predictability of flight paths.

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## Volpe Center Organizes Joint Rail Conference 2011



Michelle Muhlanger, Michael Coltman, David Tyrell, RITA Administrator Peter Appel, Karina Jacobsen, Michael Carolan, Patricia Llana, and Brian Marquis shortly after RITA Administrator Appel's keynote speech.

Nine Volpe Center staffers participated in, and helped to plan and organize, the [Joint Rail Conference \(JRC\) 2011](#) held this March at the Pueblo Convention Center in Pueblo, CO. This is one of the largest professional rail meetings in the nation, drawing more than 200 attendees from railroads, suppliers, consultants, academia, and government. David Tyrell of the Volpe Center's Physical Infrastructure Systems Center of Innovation chaired the organizing and planning committee for this year's event, which included a keynote speech by RITA Administrator Peter Appel during the conference dinner program. JRC encompassed all aspects of rail transportation and engineering research. Papers were presented on railroad civil, mechanical, electrical, and systems engineering; as well as safety, planning, design, operations, maintenance and management. The Volpe Center's Michelle Muhlanger chaired the "Track 6: Safety and Security" Session and Physical Infrastructure Systems Center of Innovation Director Robert Dorer was the Co-Chair for the Transportation Research Board (TRB). Center attendees made a total of eleven presentations

on recent projects and ten papers by Volpe Center authors are included in the conference proceedings. Other members of the Volpe Center JRC Team are: Michael Coltman, Michael Carolan, Patricia Llana, Karina Jacobsen. Brian Marquis, Fred Mottley, Marco DaSilva, David Jeong, Yim Tang, Bob Grief, Jon LeBlanc, Anya Carroll, Kris Severson, Benj Berلمان, Laura Sullivan and Dan Parent.

The JRC is co-sponsored by the American Society of Mechanical Engineers (ASME), the American Society of Civil Engineers (ASCE), the Institute of Electrical and Electronic Engineers (IEEE), the American Railway Engineering and Maintenance-of-Way Association (AREMA), TRB, the American Public Transportation Association (APTA), and the Institute for Operations Research and the Management Sciences (INFORMS).

## New Tools for Regional Transportation Planning

Photo courtesy of Greater Buffalo-Niagara Regional Transportation Council



Simulated traffic queue at U.S. Customs in Lewiston, NY, near Niagara Falls. Red blocks represent vehicle in line.

Over the past four years, the Volpe Center has supported the Federal Highway Administration's Transportation Analysis and Simulation System (TRANSIMS) program. TRANSIMS is an open-source transportation planning model intended for regional use which provides several capabilities beyond those of traditional planning models, including the use of either tours or trips, a very fine grained time-of-day detail, and the ability to perform traffic simulation over a region. Volpe Center project staff, led by Scott Smith of the Advanced Transportation Technologies Center of Innovation, has been supporting the TRANSIMS online community, participating in peer reviews and providing oversight over TRANSIMS projects in Moreno Valley, CA and Buffalo, NY.

One significant milestone was recently reached with the completion of the Moreno Valley TRANSIMS project. Moreno Valley is located approximately 50 miles east of Los Angeles, near Riverside. This project, with work primarily done by city personnel, used TRANSIMS to examine regional economic development and freight issues. Accomplishments included:

- Use of parallel processing to route the Southern California Association of Governments (SCAG) network under both current and future (2035) conditions; some 48 million daily trips are projected in the year 2035
- Micro-simulation of approximately two million projected daily trips over a substantial area, i.e., the city of Moreno Valley and environs
- Achieving results quality comparable to that from the current planning model

The project at the [State University of New York - University at Buffalo \(UB\)](#) is examining the usability of TRANSIMS for on-line transportation system management during emergencies. In light of major road closures in the Buffalo area due to snow, the project [received some media publicity](#) in early December 2010. It is hoped that when the model is complete, which is expected to be in 2012, it could be used to design better responses to weather events.

## Replacing U.S. Army Watercraft Fire Suppression Systems



Volpe Center Photo

U.S. Army Vessel LCU 2019 at HEISCO Shipyard in Kuwait, 2009.

In the mid 1990's the U.S. Army's Surgeon General and Watercraft Program Manager determined that the Carbon Dioxide and Halon fire suppression systems used on all U.S. Army vehicles presented unacceptable risks. Carbon Dioxide posed a life safety asphyxiate risk to the soldiers if accidentally exposed, and Halon, a Chlorofluorocarbon (CFC), was identified as an ozone depleting substance which under international treaty would cease manufacture in 1994. The Army embarked on a long range project to replace these chemicals with safer alternatives. As part of this effort, the Army asked the Volpe Center to act as Program Managers and Technical Advisors as well as liaison to the U.S. Coast Guard for system approvals. The Army Watercraft fleet consists of more than 75 Logistics Support Vessels, Landing Craft Utility, and Large Tugboats scattered on the Atlantic and Pacific coasts and as far away as Japan, the United Kingdom and Kuwait.

After researching and testing alternatives, the Volpe Center project team, led by Chris Murray of the Physical Infrastructure Systems Center of Innovation, recommended a combination of the new emerging Heptafluoropropane "FM200" and water mist systems. The FM200 system provided fire suppression redundancy, mitigation of heat and any potential toxic by-products during chemical decomposition in a fire, and was deemed safe at the proper concentrations (less than 9%). Over the past decade, Volpe Center staff and contractors completed the entire U.S. Army Watercraft fleet fire system replacement. Recently the last three vessels, located in Kuwait, were finally retrofitted.



## Center Director Recognized for Support to TRB Council

During the Technical Activities Council (TAC) luncheon at the recent annual Transportation Research Board (TRB) meeting in Washington, D.C., Volpe Center Director and Associate Administrator Robert Johns was recognized for his three years as Chair of the TAC. The award emphasized his leadership of the TAC, his contributions to the Council's strategic planning activities, and his emphasis on emerging and cross-cutting issues in transportation research. TRB Executive Director Bob Skinner, TRB Technical Activities Director Mark Norman and incoming TAC Chair Katie Turnbull from the Texas Transportation Institute presented the award to Director Johns.



Pictured during the TRB award presentation, (from left to right): Bob Skinner, Robert Johns, Katie Turnbull and Mark Norman.

## Director Emeritus: 40 Years of Federal Service



Director Emeritus Dr. Richard R. John receiving his 40-year Federal Service Pin from Center Director Robert Johns.

Director Emeritus Dr. Richard R. John was recently honored by received a Career Service Pin commemorating 40 years of distinguished Federal Service, all at the Volpe Center. After joining the Center in 1970, Dr. John initiated and led the early development of the Center's current, world-class capabilities in ground transportation and participated in groundbreaking studies on the international competitiveness of the U.S. automobile industry. More recently he has raised awareness and advocated the importance of an educated workforce and long-term research in bringing about the technological innovations necessary to meet the transportation challenge of the 21st Century. His contributions to the U.S. Department of Transportation have been recognized by three Secretarial awards, one Presidential Rank Meritorious Executive Award, and two Distinguished Presidential Rank Awards, which is the federal government's highest civil service award. He received his undergraduate and graduate training at Princeton University. Dr. John served as Director of the Volpe Center for nearly fifteen years, longer than any other incumbent.

## Tailored Arrivals *(continued from page 1)*

The FAA Office of NextGen Operations Planning is leading this collaborative project with participation from Christopher Tracy, Jonathan Lee, Michael Geyer, PhD, and David Senzig of the Volpe Center. They have supported the TA test phase by providing project management assistance, analyzing emissions data, developing standard operational and measurement procedures, and accelerating procedural documentation of the trials. For example, Volpe Center aviation measurement experts quantified fuel savings from the TA trials at MIA that demonstrate worthwhile fuel and emissions savings with the new oceanic TA operations, as compared to standard approaches.

With the completion of the flight trial phase, the FAA Air Traffic Organization's En Route and Oceanic Services (ATO-E) is taking over management of the TA project. The results have provided an "early win" for NextGen by pointing to future success in advancing economic and environmental benefits as ATO-E replicates the trials at other U.S. airports and Air Force Bases.

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