Research and Innovative Technology Administration

the VOLPE center

National Transportation Systems Center

HIGHLIGHTS

Cambridge, Massachusetts Sept/Oct 2006

Letter from the Director

Long-Term Institutional Knowledge

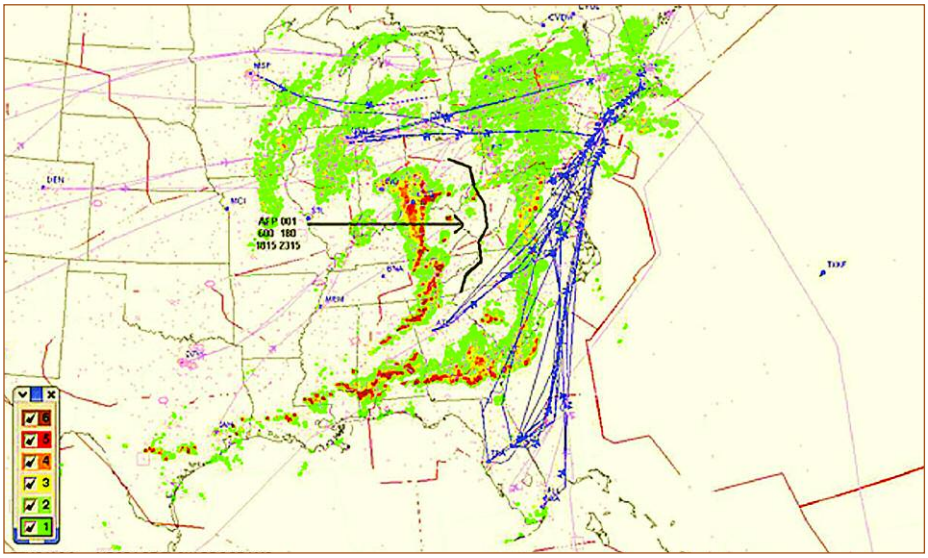
After almost two years as Director of the Volpe Center, I continue to be impressed by the breadth and depth of our staff's collective knowledge. This long-term institutional memory has enabled successive teams to work together on key efforts that help the Department of Transportation meet challenges in a rapidly changing transportation enterprise.

The Center has been in existence almost as long as the Department and, therefore, understands these transportation challenges. The Center's support to the Federal Aviation Administration's (FAA) Traffic Flow Management, and, specifically, our work on the Enhanced Traffic Management System (ETMS) described in the Focus article of this issue, is a key example of this support.

Continued on back page

Inside

Focus



The spring release of Enhanced Traffic Management System (ETMS) introduced a new traffic management tool, the Airspace Flow Program, which targets delays to those flights whose flight paths traverse airspace affected by severe weather. Pictured: A screenshot of the Airspace Flow Program in use. ETMS is a mission-essential system used by FAA to support its Traffic Flow Management mission and increase air system capacity. It integrates real-time flight and weather data from multiple sources, presenting information graphically in a highly adaptable format, enabling more efficient, predictable, and equitable management of air traffic in congested airspace.

Congestion Reduction: Supporting FAA's Air Traffic Flow Management (TFM)

The National Airspace System (NAS) handles 60,000 flights a day. As the number of air passengers increases every year, reducing aviation congestion while meeting projected demands on the national airspace system is a critical objective of the Federal Aviation Administration (FAA). To improve the reliability and predictability of air travel and thus increase air system capacity, FAA integrates new technologies and techniques that enable ever more effective responses to changing conditions, such as travel patterns, equipment outages, and weather. Key FAA programs such as Traffic Flow Management and Collaborative Decision Making need automated systems that provide accurate and timely information for all airspace users. One such system is the Enhanced Traffic Management System (ETMS), developed by the Volpe Center and employed by FAA at more than 80 operational facilities.

ETMS Enables Systematic Approach to Traffic Flow Management

The Volpe Center is responsible for the development and daily operation of ETMS, which FAA uses to:

- track, predict, and plan air traffic flow;
- analyze effects of ground delays; and
- evaluate alternative routing strategies.

ETMS integrates real-time flight and weather data from multiple sources, presenting information graphically in a highly adaptable format, enabling more efficient, predictable, and equitable management of air traffic in congested airspace. As the system continues to evolve and provide new capabilities to air traffic managers, aviation congestion can be tackled in a systematic way that encompasses the entire airspace. ETMS facilitates a common air traffic situational awareness that makes possible collaborative decision making among FAA, NAS users (airlines, business aviation, and general aviation), and military operations.

New ETMS Traffic Management Tool Reduces Severe-Weather Delays

The spring 2006 release of ETMS, Version 8.2, was deployed in early June in time for the 2006 severe weather season. The main new component of ETMS 8.2 is the Airspace Flow Program, a traffic management tool designed to help reduce delays in the air traffic system by targeting delays to those flights whose flight paths traverse airspace impacted by severe weather. The Volpe Center's Traffic Flow Management team was responsible for integrating this new capability into the ETMS system and deploying it on time and within budget.

The Airspace Flow Program combines the power of existing Traffic Flow Management capabilities, including Ground Delay Programs and Flow Constrained Areas, to allow for more efficient, predictable, and equitable management of the National Airspace System. It allows air traffic managers to delay only those flights that are expected to encounter extremely bad weather. As a result, the new program minimizes the crippling effects of the sudden thunderstorms that frequently affect the nation's airspace system during the summer when travel is at its highest.

Under the Airspace Flow Program, air traffic controllers issue expected departure times to aircraft that they anticipate will to pass through airspace affected by bad weather and safely meter them through the constrained area, improving the FAA's ability to respond to severe weather and reducing the number of unnecessary delays and disruptions. Through Collaborative Decision Making, the FAA can

ETMS Benefits

- Air traffic managers—as they balance limited air capacity with demand
- NAS users—as they seek to provide more efficient and cost-effective service
- The public—who needs safe and efficient air transport

"This program [the Airspace Flow Program] allows us to work around severe weather in highly congested airspace with greater precision and efficiency than in the past. As a result, we will cut delays, keep passengers safe, and make summer travel easier."

—FAA Administrator
Marion C. Blakey

provide advance notice on specific flights that would be affected, making it easier for travelers to get advance notice of flight delays.

ETMS Evolves to Optimize New Opportunities

Since 1984, the Volpe Center has been advancing research in Traffic Flow Management. ETMS has evolved out of this research to accommodate FAA needs. Each new release is driven by FAA policy, user requests, and the Volpe Center's knowledge of emerging technologies.

Historically, air traffic analysts have viewed congestion primarily as an "airport problem." Airports were considered the congestion points because, for example, an airport would close runways based on weather. However, many problems are not in the immediate area of one airport; some severe weather disturbances are in the airspace between airports and may affect multiple airports—e.g., a weather system may impact flights heading for multiple airports. At the same time that this newer, systematic perspective was emerging, advances in automation and telecommunications were enabling expansive data gathering and transmitting capabilities, making it possible for ETMS to incorporate ways to relieve airspace congestion. This was an historic change—for the first time air traffic managers could see beyond their own sectors to view the entire airspace.

This new window on the complex nature of air traffic confirmed the need for evolving systems that could collect, integrate, and share data in a variety of ways. Today, ETMS receives direct data feeds from the FAA and NAS users; data are integrated with direct input from several other sources and made available through ETMS and its range of traffic management tools. Some recent additions to the tools available within ETMS include:

- Runway Visual Range: Data system provides real-time information on changing weather conditions at 45 high-activity airports; airlines and the FAA are notified immediately that conditions at the destination airport are improving.
- Reroute Manager Tool and Flow Evaluation Area Tool: Uses 3-D visualization to identify which flights are going through certain areas of the airspace that could be affected by congestion and options to reroute them.
- National "Playbook" Database: Holds prescribed reroutes—weather patterns repeat during a season, year to year, enabling the development of standard approaches to certain weather patterns.

Regular Releases Help to Keep Users Up to Speed

The Volpe Center has deployed a new ETMS release about every six months, introducing new tools or adding enhanced functions in each release. These incremental builds decrease the amount of time that users need to learn new functionalities. Nevertheless, training is a critical

Collaborative Decision Making

ETMS has become central to an innovative FAA program: Collaborative Decision Making (CDM). This government-industry partnership aims to improve information sharing and collaboration between NAS users and the FAA's air traffic management and control organization. CDM enables NAS users and the FAA to make informed decisions regarding aircraft delays and rerouting. ETMS provides the common situational awareness that supports and facilitates CDM.

Air Traffic Flow Team

Mr. Rick Oiesen, Volpe Center
Program Manager
Mr. George Curley

Mr. Ken Howard, Lead Developer
Mr. Tom Ciolino
Mr. Mike Francis
Ms. Claire Morton
Mr. Bob Sharick
Ms. Melia Stefanescu
Ms. Sylvia Todero
Mr. Huimin Xu

On a single severe weather day, hundreds of flights can be delayed, diverted, or canceled, affecting thousands of passengers and resulting in millions of dollars in operating losses for NAS users and lost time for passengers. There are as many as 40 severe weather days each year. A recent analysis by MITRE estimated that using the Airspace Flow Program for 19 days in the summer of 2006 resulted in an estimated savings to the users of $3.6 million each day. Over 10 years, the program is expected to save airlines and travelers a combined total of over $900 million. (©iStockphoto)

element of each new release. The Center ensures that the trainers work with system developers to create high-quality training materials. Training is designed to help air traffic managers quickly understand how they can best use ETMS to increase efficiency and reduce workload.

For the ETMS 8.2 release, the Volpe Center's Traffic Flow Management Division was responsible for system integration, development of key components, and deployment of the Airspace Flow Program functionality, and the Aviation Infrastructure Division developed user training to educate FAA users on the new tool.

Deployment of ETMS Version 8.3 is expected in October 2006. Its signature component will replace the manual compression process for Ground Delay Programs, automatically adjusting ground delay timeframes—a process called Adaptive Compression—according to changes in factors such as weather and traffic levels.

ETMS and the Future

The Volpe Center's long-term involvement with Traffic Flow Management has included system integration, development, deployment, operations, and training, a synergy that has benefited the evolution of the system. With the maturity of the ETMS, system deployment and operation may be effectively moved to an FAA facility. Working with industry and with the FAA, the Volpe Center will continue to take a lead role that combines research and systems engineering and includes assessing emerging ideas

and technologies that could benefit the national traffic management system and the overall NAS.

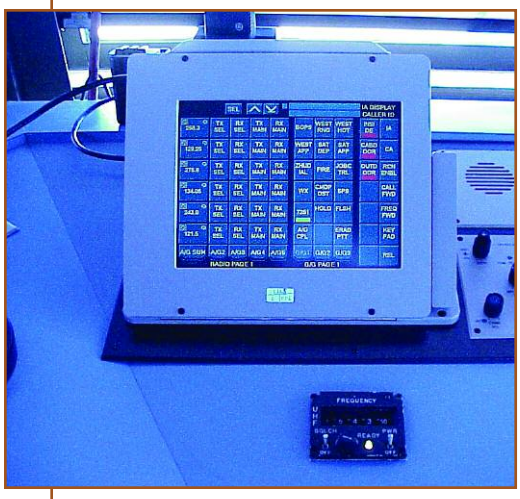
ETMS Supports DOT's Strategic Goals

An increased awareness of the effect of congestion on the nation's economy is reflected by two recent actions taken by the U.S. Department of Transportation (DOT). In May 2006, the DOT announced the *National Strategy to Reduce Congestion on America's Transportation Network*—a national congestion relief initiative. For the first time congestion reduction is also called out as a strategic goal in the U.S. DOT Draft Strategic Plan for Fiscal Years 2006–2011.

Aviation delays caused by air traffic congestion are specifically cited in the plan; it is estimated that aviation delays cost Americans $9.4 billion annually. The plan calls for ways to meet new and growing demands for air transportation services through 2025 and beyond and for designing and deploying the Next Generation Air Transportation System—a modernized aviation system with greater capacity and less congestion. Traffic Flow Management (TFM) is considered to be a central component of the system.

The Volpe Center is committed to supporting U.S. DOT in addressing this issue; the TFM team provides leadership in this area, and the evolving functionality of ETMS offers a dynamic tool for meeting this requirement.

Runway Visual Range (RVR) is the range over which the pilot of an aircraft on the center line of a runway can see runway surface markings or lights delineating the runway or identifying its center line. The Volpe Center developed the RVR data system, which provides real-time visibility data to ETMS.



The Volpe Center has provided engineering, installation, and integration support for new systems installed at DoD air traffic control facilities. Pictured: a touch-screen display that is part of the Enhanced Terminal Voice Switching (ETVS) system.

Supporting National Airspace System Upgrade (USAF)

Over the last seven years, the Volpe Center has provided a broad range of support to the U.S. Air Force (USAF) Electronic Systems Center (ESC) on the Department of Defense (DoD) National Airspace System (NAS) Program. In a major effort to make the DoD air traffic control (ATC) facilities interoperable with Federal Aviation Administration (FAA) ATC facilities, the team has participated in a project to replace the DoD's terminal radars, voice switching systems, and terminal automation systems, as well as to consolidate several existing informational displays into a single unit. Specifically, the Center staff has provided engineering and installation support for the implementation of the following major acquisitions: Digital Airport Surveillance Radar (DASR), Enhanced Terminal Voice Switching (ETVS), Standard Terminal Automation Replacement System (STARS), and Airfield Automation System (AFAS). While each component

National Air Space Upgrade State-of-the-Art Technology

Digital Airport Surveillance Radar (DASR) is a terminal air traffic control radar system that replaces current analog systems with new digital technology. The DASR system detects aircraft position and weather conditions in the vicinity of civilian and military airfields. Older radars, some up to 20 years old, are being replaced to improve reliability, provide additional weather data, reduce maintenance cost, improve performance, and provide digital data to new digital automation systems for presentation on air traffic controller displays.

Standard Terminal Automation Replacement System (STARS) accepts data from DASR and can receive data from many other radars. STARS also accepts data from, and provides data to, the FAA's En Route Centers.

Enhanced Terminal Voice Switching (ETVS) ties the air traffic controller, air crews, and ground personnel into a digital voice communications network. These communication systems replace existing analog voice systems that are approaching the end of their life cycle, and they provide state-of-the-art, air-to-ground, ground-to-ground, and intercom communications for controllers of military and civil air traffic.

A Digital Airport Surveillance Radar (DASR) antenna.

is individually critical, together they create a dramatic, positive difference for air traffic controllers.

To perform this task, the Volpe Center has created a team with skills ranging from electrical engineering to program management to aviation operations. Team members participate in the deployment of these systems at more than two-thirds of the 177 USAF and Air National Guard (ANG) Bases worldwide. The Center has played a major role in requirements definition; system engineering; site engineering; and analysis of communications, surveillance, and automation systems for the NAS program office. These efforts, spearheaded by the Volpe Center's System Engineering and Integration Division, draw support from several offices within the Center.

Recently, the Volpe Center team achieved a major milestone when the last of more than 100 ETVS systems was deployed at the Cowboy Range Control facility at Mountain Home Air Force Base, Idaho. This year, the Volpe Center team has conducted more than 40 AFAS site surveys and installed AFAS at the air traffic control tower (ATCT) and radar approach control facilities at Shaw AFB, South Carolina. The ESC NAS Program Office had designated Shaw AFB as the key test site for AFAS Operational Testing. Key site testing proved to be extremely successful for future deployments of the AFAS to other sites. The Volpe Center's team efforts contributed to the ESC AFAS team receiving an ESC program quarterly award.

Volpe Center USAF Electronic System Center Technical Support Team

Mr. Mike Egan, NAS Program Manager
Mr. Antonino D'Eramo
Mr. Erik Ferland
Mr. Robert Glass
Mr. Peter Kennett
Mr. Philip King
Mr. Theofolis Papadopoulos
Mr. Angelo Rallo
Mr. Edward Recka
Ms. Linda Tang

In addition to the enormous task of installing these new systems worldwide, the Center team has provided substantial support for system upgrades and improvements:

- Mr. Michael Egan of the Systems Engineering and Integration Division chairs the joint DoD-FAA DASR-STARS interoperability working group; this group has developed and refined the process for optimizing these systems as a single entity rather than as individual components, resulting in the best possible air picture for air traffic controllers.
- Mr. Peter Kennett of the Systems Engineering and Integration Division has led the Center team in guiding the development of the DASR Advanced Signal Data Processor; this processor will ultimately provide the DASR with capabilities no other terminal radar in the world will have.
- Mr. Erik Ferland and Ms. Linda Tang of the Systems Engineering and Integration Division serve as the Host Nation Interface Leads; they head the development of requirements to deploy STARS and DASR to overseas sites, including the incorporation of Mode S into both the radar and automation systems.

Environmental Stewardship

Developing Aircraft Noise Mitigation Standards (FAA)

The Volpe Center supports the Federal Aviation Administration (FAA) Office of Environment and Energy in the development and evaluation of novel technologies related to the mitigation of aircraft noise. As part of this ongoing support, the Center's Environmental Measurement and Modeling Division works with national and international technical organizations on standards development. Mr. Gregg Fleming and Mr. Christopher Roof of the Division were the principal authors of an aerospace standard recently published by the Society of Automotive Engineers. Aerospace Information Report 5662, *Method for Predicting Lateral Attenuation of Airplane Noise,* provides a methodology for adjusting aircraft noise model predictions for the lateral propagation of sound between aircraft and receivers on the ground (i.e., people and/or homes, schools, etc.). The standard culminates several years of noise measurements, analysis, and collaboration; development was supported by staff from the NASA Langley Research Center, the United Kingdom Civil Aviation Authority, Boeing, and Airbus, among other organizations.

Volpe Center staff led the development of an aerospace standard for predicting airplane noise that was recently published by the Society of Automotive Engineers. Pictured: a flight test with acoustic equipment in the foreground that the Center conducted with NASA and a major U.S. airline in support of algorithm development for this project.

The reduction of airport noise is an important issue in communities across the country and the world, and noise prediction models have been essential to the multi-million-dollar land-use planning activities related to airports. (Between 1982 and 1999, approximately $4.3 billion was spent on noise mitigation activities around U.S. airports.) The Environmental Measurement and Modeling Division designed and developed, and continues to update and maintain, FAA's Integrated Noise Model, the standard tool for airport noise modeling and impact assessment in the vicinity of airports in 33 countries. As research in this area advances, future noise prediction models will produce significantly more accurate noise contours, enabling more efficient use of airport-noise mitigation funds.

Volpe Center Staff Continue to Support Emergency Preparedness for Hurricane Season

The Department of Homeland Security (DHS) is taking a proactive role to ensure that different regions of the country are better prepared to deal with hurricanes or other disasters. In preparation for the hurricane season that started in June 2006, the Department planned five regional hurricane preparedness exercises to test improvements made since last year's hurricane season and to identify areas that require additional coordination.

Mr. Terry Sheehan of the Volpe Center's Service and Operations Assessment Division was actively involved in the combined Regions I and II exercises held in Monmouth, New Jersey, and New London, Connecticut, as well as the Caribbean exercise in San Juan, Puerto Rico. Mr. Sheehan is the Region I & II Regional Emergency Transportation Representative, and is responsible for all Emergency Support Function 1 (ESF-1) Transportation, as defined in the National Response Plan. Mr. Sheehan participated in the initial planning sessions with DHS staff and other ESF functions to ensure that the exercises are credible and plausible for exercise participants. Mr. Sheehan helped to coordinate commodity movements and evacuation activities during Hurricanes Katrina and Rita, and was able to provide valuable lessons learned that were incorporated into the actual exercises.

The tabletop exercises focused on several key preparedness and disaster response functions, including citizen protection; evacuation and/or in-place protection; communications; critical response logistics and distribution; emergency public information and warning; mass care;

The regional exercises, designed to enhance integration and coordination among public agencies as well as private industry enterprises, focused on several key preparedness and disaster response functions.

National Response Plan implementation; and National Incident Management System activation. The exercises are designed to engage officials from states and territories in the likely hurricane impact zone. They bring together all levels of government, as well as tribal entities, non-governmental organizations, and private industry. In addition to refining the overall response and decision-making processes, the exercises are intended to enhance the integration and coordination among responding public health, emergency management, and public safety agencies, as well as private industry enterprises, in the event of an actual Incident of National Significance, such as a major hurricane.

The exercises leveraged lessons learned and best practices determined through an analysis of 2005 hurricane-related after-action reports. Given the regional construct of the exercises, they can serve as forums for top officials to address the communication and coordination challenges that could arise if a catastrophic storm were to strike.

"Hurricane preparation is a shared responsibility among local, state, and federal agencies and our non-governmental partners," said George Foresman, Undersecretary for Preparedness at the DHS. "By training together now, we better integrate planning and response capabilities and make certain that roles and responsibilities are understood at all levels of government."

Published & Presented

- **Production and Operations Management.** On May 1, 2006, Dr. Seamus M. McGovern of the Airport Surface Division presented the technical paper "Performance Metrics for End-of-Life Product Processing" for publication in the proceedings of the Seventeenth Annual Conference of Production and Operations Management Society held in Boston, Massachusetts.
- **Communications, Navigation and Surveillance.** On May 2, 2006, Volpe Center staff presented papers for publication in the proceedings of NASA's Sixth Integrated Communications, Navigation, and Surveillance (ICNS) Technologies Conference and Workshop held in Baltimore, Maryland.
  - Dr. Seamus McGovern of the Airport Surface Division presented two technical papers co-authored with Mr. Steven Creaghan, "Tandem Optical Sensors to Assist in Runway Incursion Prevention" and "Simple Methodology for the Stochastic Independent Event Calculation of Air Traffic Conflicts."

- Mr. Kevin Harnett of the Infrastructure Protection and Operations Division presented "Cyber Security Research Plans for a Secure Aircraft Data Network."

- **Highway-Rail Safety.** Ms. Suzanne Sposato of the Rail and Transit Systems Division presented the results of the Public Education and Enforcement Research Study sponsored by the Federal Railroad Administration at the 2006 Midwest States Highway-Rail Safety Meeting and Training held in Minneapolis, Minnesota, May 7–10, 2006.

- **Intelligent Transportation Systems.** Dr. Mary Stearns of the Human Factors Division presented "Driver Acceptance of Forward Collision Warning (FCW)" at the ITS America 2006 16th Annual Meeting and Exposition, Philadelphia, Pennsylvania, May 8, 2006. The presentation was co-authored by Dr. Heidi Howarth of the Human Factors Division and Dr. Wassim Najm of the Advanced Safety Technology Division.

- **Wake Turbulence.** Members of the Surveillance and Assessment Division co-authored four papers on wake turbulence presented at the 12th American Institute of Aeronautics and Astronautics Aeroacoustics Conference held in Cambridge, Massachusetts, May 8–10, 2006. The papers, listed below, may be obtained either by purchase from the conference website *www.aiaa.org/content.cfm?pageid=320* or by contacting the authors at the Volpe Center.

  - *Wake Acoustic Analysis and Image Decomposition via Beamforming of Microphone Signal Projections on Wavelet Subspaces,* by Mr. Hadi Wassaf of the Volpe Center and co-authors from the Jet Propulsion Laboratory and the University of Massachusetts. AIAA 2006-2536.

  - *Use of a Commercial SODAR for Measuring Wake Vortices,* co-authored by Mr. Stephen Mackey of the Volpe Center and Scientific and Engineering Solutions. AIAA 2006-2537.

  - *Influence of Vortex Core on Wake Vortex Sound Emission,* by Kansas State University, with co-authors Mr. Hadi Wassaf and Dr. Frank Wang of the Volpe Center. AIAA 2006-2538.

  - *Atmospheric Effects on Microphone Array Analysis of Aircraft Vortex Sound,* by Mr. Hadi Wassaf and Dr. Frank Wang of the Volpe Center with co-authors from L3-Communications and the Titan Group. AIAA 2006-253.

- **Child Safety.** Dr. John Brewer of the Crashworthiness and Occupant Safety Division, Ms. Linda McCray of the National Highway Safety Administration, and Mr. Kenneth Paciulan of CSC (a Volpe Center on-site contractor) co-authored "Protection of Children in the Rear Seat: Safety Problem Status Report." Ms. McCray presented the report at the

Wake Turbulence Sound Studies

The Volpe Center has a long tradition in leading research and data collection campaigns aimed at a better understanding of wake vortex transport and strength characteristics. A better understanding of wake behavior can lead to recommendations for the safe modification of separation standards and therefore potential increase of airport capacity without the need to build new runways. Recently, Center researchers have focused on understanding wake vortex passive sound emission as well as using active acoustic sensors to track and characterize their behavior.

Society of Automotive Engineers (SAE) Annual Government/Industry Meetings held in Washington, DC, May 9–10, 2006.

- **Strategic Highway Safety Planning.** Dr. John Brewer of the Crashworthiness and Occupant Safety Division presented "The Importance of Seat Belts in the Age of Airbags" at the Stakeholder Meeting for the Massachusetts Strategic Highway Safety Plan, hosted by the Federal Highway Administration and held at the Volpe Center on June 14, 2006.
- **Grade Crossing Safety Conference.** Ms. Anya Carroll of the Rail and Transit Systems Division presented "Recent Advances and Research Needs Assessment" at the 2006 Western Regional Grade Crossing Safety Conference held in Vancouver, Washington, June 5–7, 2006.
- **World Congress on Railway Research.** Mr. David Tyrell of the Structures and Dynamics Division and Mr. Thomas Tsai of the Federal Railroad Administration Office of Research and Development co-authored "Improved Crashworthiness of Rail Passenger Equipment in the United States," presented at the 7th World Congress on Railway Research, Montreal, Canada, June 5–8, 2006.
- **Fatigue Management.** Dr. Stephen Popkin, Chief of the Human Factors Division, presented work conducted by the Volpe Center for the Federal Motor Carrier Safety Administration at a conference titled "Monitoring Sleep and Sleepiness—From Physiology to New Sensors" held in Basel, Switzerland, May 28–30, 2006. Dr. Popkin presented research on the in-vehicle alertness monitoring and warning technologies for use in a commercial motor carrier environment.
- **Human Factors in Airport Surface Incidents.** On May 15, 2006, Ms. Amanda DiFiore and Dr. Kim Cardosi of the Human Factors Division published a report of an analysis conducted for the Federal Aviation Administration Office of Runway Safety and Operational Services, *Human Factors in Airport Surface Incidents: An Analysis of Pilot Reports Submitted to the Aviation Safety Reporting System.* ASRS, DOT/FAA/AR-06/5.

Air bags do not preclude the need for seat belts. (©iStockphoto.com)

Awards & Honors

Volpe Center Expert Honored for Contribution to Radar Technology and Meteorology

On August 1, 2006, the Institute of Electrical and Electronics Engineers Geoscience and Remote Sensing Society and the 27th Canadian Remote Sensing Symposium honored Dr. Thomas A. Seliga, an electronics engineer in the Volpe Center's Advanced Communication, Navigation,

The Impact of Pioneering Research

Dr. Seliga's pioneering work will contribute to future enhancements of the safety and mobility of travelers and freight in both air and surface transportation by improving the quantification of rainfall, the detection of severe weather conditions such as hail and tornados, and the forecasting of severe storms.

During the last eight years, Dr. Seliga has worked extensively in support of weather- and surveillance-related programs of the Federal Aviation Administration.

and Surveillance Technologies Division, for his pioneering research in weather radar technology. His contributions to the field of radar meteorology have led to improvements in radar's power to quantify rainfall rates, detect hail, and discriminate between water and ice phase hydrometeors; his work has also helped to advance the understanding of cloud physics.

A special session of the symposium, "Thirty Years of Dual-Polarization Radar in Precipitation and Cloud Measurements: Impact of Thomas Seliga's Pioneering Research," honored his contributions. The papers given in this session traced the history of dual polarization radar and its use in precipitation and cloud measurements. Each paper was a testimony to the impact Dr. Seliga had both in the groundbreaking research in the field and the application of his breakthrough concepts on radar meteorology and many areas of the hydrometeorological sciences. Dr. Seliga closed the session with his paper "Polarization-Based Multiparameter Weather Radar: Realization of a Concept and Insights into Future Applications."

Volpe Center RISC Team receives ATCA Award

The Volpe Runway Incursion Severity Classification (RISC) team will receive the prestigious Air Traffic Control Association (ATCA) Earl F. Ward Memorial Award for 2006. A runway incursion is any occurrence at an airport involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in a loss of separation with an aircraft taking off, intending to take off, landing, or intending to land. Reducing runway incursions lessens the probability of accidents that potentially involve fatalities, injuries, and significant property damage. The RISC system, designed for the FAA's Office of Runway Safety, produces and records a consistent assessment of runway incursion events. This is a critical component of measuring risk, where risk is a function of the severity of the outcome and the probability of recurrence. This model is currently being validated by the FAA and other countries and is under consideration at the International Civil Aviation Organization as a tool for standardized ratings of runway incursions. The team will be honored at the 51st Annual ATCA Conference on October 31, 2006 in Washington, D.C.

Volpe Center RISC Development Team

Dr. Kim Cardosi, Program Manager
Dr. Thomas Sheridan
Dr. Daniel Hannon
Mr. Matthew Isaacs
Dr. Stephanie Chase
Ms. Gina Melnik
Ms. Caroline Donohoe
Ms. Danielle Eon
Mr. Christopher Cabrall

Letter from the Director

Continued from page 1

FAA has been a major customer of the Volpe Center's since the early 1970s, when the administration turned to the new National Transportation Systems Center for help in enhancing aviation safety and efficiency. With the increasing frequency of air travel and the introduction of jet airlines, FAA was seeking ways to deal with the technical challenges of traffic management, navigation, and security, and recognized that the Center integrated expertise in various technical disciplines with an understanding of aviation-related needs as well as FAA responsibilities. The Center's early work with the FAA included projects to improve communications between pilots and air traffic controllers, develop guidelines for evaluating explosives and weapons detection technology, design a new radar beacon system, and support aviation flight plan efficiency. These early successes laid the groundwork for the Volpe Center's continuing support to the FAA as it responds to the growing aviation requirements of the Nation.

The dedicated people who worked on these early projects transferred their knowledge to newer staff members, a practice that continues at the Center today. This collective intellectual capital supports the development of innovative transportation systems solutions. As a vital research organization, the Volpe Center facilitates the evolution of technical and analytic skills; each new project enables us to build on what we have learned and to carry that knowledge into future work.

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