



Volpe  
National  
Transportation  
Systems  
Center

# Volpe Center Highlights

Cambridge, Massachusetts

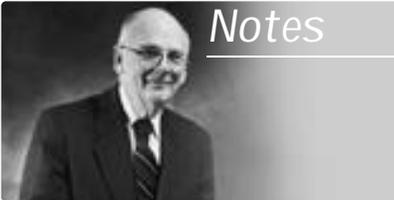
November-December 1999

## FOCUS

### **Volpe Center Provides Worldwide Engineering and Installation Support for USAF NAS System Upgrades (USAF)**

### Director's

### Notes



Dr. Richard R. John

**I**nnovation will be essential for meeting the Nation's transportation goals in the 21st century.

To help sustain a climate for innovation, the Volpe Center held a conference for Secretary Rodney R. Slater June 24 and 25 on the Spirit of Innovation in Transportation. This conference brought together nearly 400 leaders from the transportation and technology communities to initiate an innovation strategy that moves technology forward from ideas to implementation.

Throughout the Spirit of Innovation conference, participants emphasized three factors that are vital for our future success. First and foremost, America needs an educated and motivated *transportation workforce*. Next, we need to renew our commitment to *long-term, enabling research*. And, finally, we must continue to pursue *collaboration and partnership* among all levels of government, industry, labor, and in the education and research communities.

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**R**ecently, Messieurs Erik Ferland and Philip King of the Airport Surface Division traveled to Royal Air Force bases Mildenhall and Lakenheath in Suffolk County, United Kingdom and conducted site surveys in preparation for significant upgrades of four major national airspace systems for the Department of Defense (DoD). The surveys, which took three weeks, were completed and the Site Survey Reports are now being prepared. Each site survey report identifies the set of critical success factors necessary to begin the equipment upgrade implementation process. The reports document in detail the civil engineering and communications requirements needed to support the installation of National Airspace System (NAS) equipment and address integration issues raised by any of the participating agencies and host base organizations.



Voice Communication Switching System (VCSS/ETVS)

The site surveys are part of a much larger interdivisional Volpe team effort in support of the United States Air Force (USAF) NAS Program. The Airport Surface Division leads the project and participants include Messieurs Erik Ferland, Peter Kennett, Philip King, Paul Poirier, Angelo Rallo, and Ms. Linda Tang of that division; Messieurs Antonino D'Eramo and Mark Raney of the Environmental Engineering Division; and Mr. Stephen Creaghan of the Operations Assessment Division.

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*DoD Advanced Automation System (DAAS/STARS)*



*Digital Airport Surveillance Radar (DASR)*

The project is in its initial phase and the site surveys conducted in the United Kingdom are the first of many to be conducted at up to 90 USAF bases worldwide. This project is a major multi-year effort for the Volpe Center with site surveys scheduled through 2001, and equipment deliveries and installations scheduled through 2007.

This Volpe team is providing this engineering and installation support to the U.S. Air Force Electronic Systems Center National Airspace Systems Office (GAA). GAA is responsible for national airspace implementation for the DoD. Volpe Center staff are conducting site surveys and site preparation for the installation of the following four major systems:

- DoD Advanced Automation System (DAAS/STARS) – This system provides Terminal Controllers Workstations to controllers in radar approach control facilities (RAPCONs) and Tower Display Workstations to controllers in air traffic control towers (ATCTs). Each STARS installation will be tailored to the specific needs and size for a particular site, from the smallest tower to the largest and most complex combination of towers and approach facilities.
- Voice Communications Switching System (VCSS/ETVS) – This is the new voice switching system for ground-to-ground and air-to-ground communications in ATCTs and RAPCON facilities.
- Digital Voice Recording System (DVRS) – This system replaces current magnetic tape legal voice recording systems with digital technology.
- Digital Airport Surveillance Radar (DASR) – This replaces the existing analog GPN-20 radar. The DASR is substantially more reliable and maintainable than the GPN-20. It provides 6 levels of weather data and improved filtering of moving ground targets and requires only 1 equipment rack at the RAPCON versus the 2 for the GPN-20.

The project is a prime example of the Center's ability to work across divisions to capture the skills required to fulfill a mission. The project is led by Mr. Stephen Creaghan of the Operations Assessment Division, who was presented with a Volpe Center Peer Leadership Award at the Volpe Center Awards Ceremony in December for his leadership of this project.



**Promote public health and safety by working toward the elimination of transportation-related deaths, injuries, and property damage.**

### ***Volpe Center Participation Brings Human Factors Expertise to International Civil Aviation Conference (FAA)***

On October 20 to 21, Dr. Kim Cardosi, who is an internationally known expert in air traffic control human factors, served as a key advisor to the United States delegation to the International Civil Aviation Organization (ICAO) in Montreal, Quebec, Canada. Dr. Cardosi presented her work on controller-pilot voice communications, and provided general human factors guidance at the meeting of the Automatic Dependent Surveillance Panel on required communication performance. She described her analysis of the time required for transmission of time-critical air traffic control messages for the panel. Her paper "Time Required for Transmission of Time-Critical Air Traffic Control Messages" was published as a Volpe Center/Federal Aviation Administration report, and it was also published in the *International Journal of Aviation Psychology*. The paper

examines the time required for an air traffic control specialist to successfully transmit a message containing a maneuver required for traffic avoidance to a pilot in an en route environment. Time required is measured from the beginning of the controller's message to the end of the pilot's correct acknowledgement.

The panel discussion, in which Dr. Cardosi participated, centered on exactly how system response time should be defined and measured. "System response time" of an air-ground data link system is the time required for a message to get from an air traffic controller to a pilot, or vice versa, not using voice. This time is a critical element in considering whether or not a given system could be used to transmit messages of a given level of urgency. That is, only a system that is very quick could be used to transmit urgent messages requiring an immediate response.

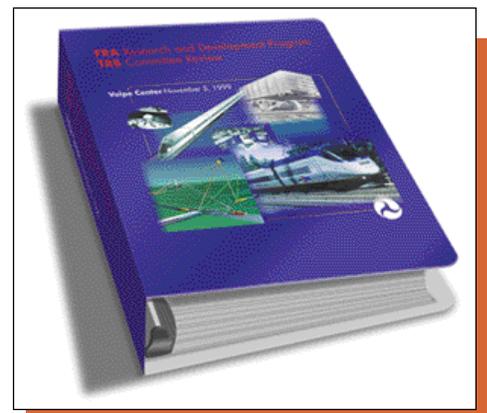
Some discussants maintained that this time should be defined as the time required for a message to get from one port, either the aircraft or the air traffic control facility, to the other. The position of the United States and other countries, for which Dr. Cardosi argued, was that this time should also include the time required for the controller or pilot to compose the message and the time required for the receiver to read and respond to the message. Therefore, a well-designed system that is easy to use would minimize the time required to send a message and thus maximize the efficiency of the data-link system. A poorly designed interface would lead to errors and would require more time to use. By not including the time required for humans to use the system, system response time would be severely underestimated, and could lead to an inappropriate use of the system and erroneous data being fed into collision-risk modeling.

By the end of the meeting, the consensus was that the human response time should be included in the system response time, and that more emphasis on human factors should be included in future efforts.

Dr. Cardosi's position reflects the emphasis of the Volpe Center's Operator Performance and Safety Analysis Division where the focus is on the relationship between human behavior and transportation safety and the importance of the interaction between people and systems. This requires a detailed scientific understanding of human perception and an understanding of how humans interact. More information on the Volpe Center's human factors work can be found at [www.volpe.dot.gov/opsad](http://www.volpe.dot.gov/opsad).

### ***Volpe Center's FRA R&D Work Reviewed by the Transportation Research Board (FRA)***

On November 5, the Volpe Center hosted the Transportation Research Board's (TRB) Fourth Annual Review Meeting of the Federal Railroad Administration's (FRA) Research and Development Program, encompassing both the Safety-Related Railroad Research and Development Program and



the Next Generation High-Speed Rail Program. The meeting was chaired by Joseph M. Sussman, JR East Professor and Professor of Civil and Environmental Engineering and Engineering Systems at the Massachusetts Institute of Technology. The group was welcomed by Richard R. John, Director of the Volpe Center. Steven Ditmeyer, Director of the FRA's Office of Research and Development presented the status of the FRA Research and Development Program, and Robert Ricci, Director of the Volpe Center's Office of Safety and Security, presented an overview of Volpe Center support to the FRA. The program goal, as stated by Mr. Ricci, is to support the FRA, Office of Railroad Development, in conducting research, development, testing, and evaluation projects focused on FRA's safety mission while enhancing the railroad system as a significant national transportation resource. Members of the Structures and Dynamics Division, the High-Speed Ground Transportation Division, the Operator Performance and Safety Analysis Division, and the Accident Prevention Division presented the research and development work being performed at the Volpe Center to the members of the Committee for Review of the FRA Research and Development Program. The depth and extent of the Volpe Center's work encompasses supporting the FRA in rulemaking and enforcement activities, Railroad Safety Advisory Committees activities, and developing new technologies and processes for safety enhancement. The TRB Committee expressed satisfaction with the presentation and with the Volpe Center's work. The Volpe Center supports TRB's mission, which is to promote innovation and progress in transportation through research.

### ***Volpe Center Hosts International Meeting on Aviation Data Standards (FAA)***

During October 26 to 28, the Volpe Center hosted an Aviation Data Standards Meeting of the Commercial Aviation Safety Team/International Civil Aviation Organization (CAST/ICAO) Common Taxonomy Team. The team has an international composition of government and industry aviation stakeholders. Participants included representatives of EUROCONTROL, civil aviation agencies of France, United Kingdom, Canada, and the United States, European Commission, ICAO, Air Force Safety Center, the Volpe Center, Air Line Pilots Association, Boeing, and Pratt & Whitney. The team is developing and proposing data standards for aviation information so that data can be aggregated and compared across international systems. This is intended to increase the quality and quantity of information available for analysis of aviation operations. Current standards in development include phases of flight, human causal factors, events, and aircraft identification. The team is also exploring the need for international aviation data registry to store, publish, and download such standards over the Internet. Some of the Volpe Center's work for FAA's Office of System Safety will be endorsed and published through this team. Volpe Center participants included Mr. Richard Jordan, Automation Technology Division, Dr. James Hallock, Chief, Aviation Safety Division, and Mr. Jan Popiel, Volpe Center contractor. The team plans to meet again in February 2000 in Montreal where they will continue to exchange and refine draft standards in development.

### ***Volpe Center Staff Recognized by FAA for Work on the Collaborative Decision-Making Program (FAA)***

Recently, Mr. Charles Keegan, Director of the Federal Aviation Administration's (FAA) Free Flight Phase 1 Program Office, presented special recognition award plaques at a Collaborative Decision Making (CDM) Workgroup meeting to a distinguished group of Federal and industry staff, whom he referred to as "The CDM Pioneers." These key people have been critical to the success of the CDM Program. Volpe Center team members who received awards included Mr. Rick Oiesen of the Volpe Center's Automation Applications Division and Volpe contractors Mr. Ken Howard and Ms. Melia Stefanescu. The CDM Program is the FAA's high-priority initiative to provide improved operational service through sharing of information between the airlines and the FAA's Air Traffic organization.

### ***Long-Term Collaborative Research with Cracow University of Technology Continues (FRA)***

For the last 15 years the Volpe Center has been involved in collaborative research with staff from the Computational Mechanics Department at the Cracow University of Technology in Cracow, Poland. This long-term collaboration began in 1984 when Professor Janusz Orkisz came to the Volpe Center as a visiting research scientist. Following this, a joint scientific and technology exchange agreement to foster common research was developed between

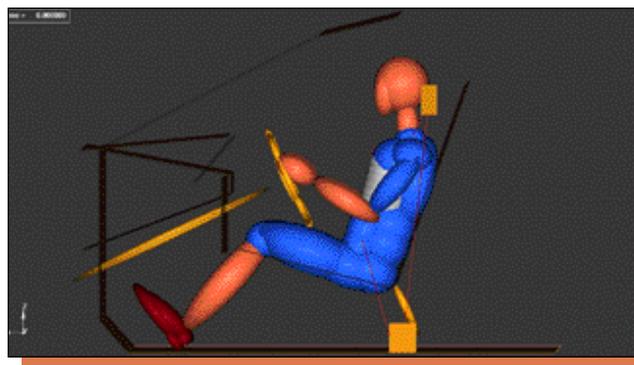
the U.S. and Polish governments. This arrangement continued until the collapse of the Soviet Union, after which the cooperation continued in a much freer political climate. During the summer of 1999, Dr. Orkisz and his students, Mr. Andrzej Skrzat and Mr. Witold Cecot, spent 3 months in residence at the Volpe Center working side by side with the Center's staff.

The researchers from Cracow work closely with Mr. Jeffrey Gordon of the Structures and Dynamics Division, providing an international perspective to the Center's work in support of the Federal Railroad Administration (FRA). Research topics include the development of analytical, numerical, and experimental methods for the purpose of estimating residual stresses in railroad components. Residual stresses, those stresses locked in a body after removal of all external loads, are known to contribute to premature failure of components in service. Their recent research has been geared toward estimating residual stresses in railroad wheels and rail due to manufacturing processes and in-service loading.

Professor Orkisz made significant progress on development of an adaptive approach to the solution of residual stress analysis. The adaptive technique will provide improved capabilities for solving complex three-dimensional problems. He also completed a formal review of the state-of-the-art in experimental non-destructive means of measuring the axial force in continuous welded railroad rail. This effort included recommendations for experimental trials using specific measurement techniques. Mr. Skrzat's research efforts consisted of reconstructing residual stresses in railroad wheels from destructive saw-cut test data. Mr. Cecot is developing a technique to estimate residual stresses in railroad rail due to roller straightening (the final stage of the rail manufacturing process).

### ***Volpe Center's Crashworthiness Research Shows Potential Applicability to NASA's Work on Aviation Safety (NHTSA)***

Mr. George Neat, Chief of the Vehicle Crashworthiness Division, participated in a meeting at the National Aeronautics and Space Administration (NASA) Langley Research Center in Hampton, Virginia on Thursday, October 14. The purpose of the meeting was to explore work opportunities in support of NASA's aviation safety program. Mr. Neat described the occupant protection studies performed by his division in support of the National Highway Traffic Safety Administration (NHTSA). He suggested that experience in lumped parameter modeling using Mathematical Dynamic Models (MADYMO) could be applied to aircraft passenger survivor studies conducted by NASA. Experience gained in evaluating injuries to motor vehicle drivers and passengers in crash scenarios has already been transferred to studies being conducted for seat configuration and restraint systems in trains. The advantage of this modeling methodology is that it could be developed fairly quickly and could result in new recommendations for seatbelts and/or airbags for use in aircraft. This has the potential for saving lives by increasing survivability in aircraft crash scenarios. The crosscutting nature of the crashworthiness research exemplifies the broad range of potential applicability for the Center's work.



*MADYMO Model of Motor Vehicle Driver*

### ***Demonstration of Prototype Communication Tool to Private Industry and Academia (FRA)***

On November 4, Dr. Jordan Multer and Dr. Donald Sussman of the Operator Performance and Safety Analysis Division and Mr. Nicolas Oriol of MIT demonstrated a prototype communication tool for railroad roadway workers and a railroad dispatcher simulator to Dr. Noriaki Yoshikai and Ms. Yukai Tsuji of Nippon Telegraph and Telephone Corporation and Dr. Ichiri Masaku of MIT. This work is part of a research program to investigate the effects of information technology on safety in high-speed rail operations for the FRA. Previous work has focused on decision support aids and supervisory train control systems in the locomotive cab. Current efforts are directed at evaluating the safety implications of data link on railroad dispatching and roadway worker communications.

The prototype communication tool consists of software developed by Mr. Oriol on a personal desktop organizer with a cell phone modem. The software will enable roadway workers to obtain real-time information about train location without contacting the railroad dispatcher over voice radio. This tool will enable roadway workers to obtain more accurate information about current railroad operations while decreasing the communication load on the railroad dispatcher. Another feature that is being developed is the ability to request track authority. The goal of this project is to identify safety implications and determine what issues must be addressed as data link tools are developed for railroad operating staff.

### ***Presentation on Realistic Radio Communications for Air Transport Training (FAA)***

Recently, Dr. Judith Bürki-Cohen of the Operator Performance and Safety Analysis Division presented preliminary results of an investigation of the requirement for realistic radio communications simulation for airline pilot training in the simulator during the Realistic Training session of the Society of Automotive Engineers (SAE) World Aviation Congress in San Francisco. A literature review indicated that the simulation of realistic radio communications is important both for training and evaluation of pilots in the simulator. Preliminary results of a survey showed that instructor/evaluators concur with this finding. The same survey, however, showed that during flight simulations, radio communications are mainly simulated by the instructors, which increases instructor workload and reduces radio communications (and thus pilot workload) to less than actual. An overview of technologies that could support an automated presentation of realistic radio communications was also presented. Volpe was invited to give the same presentation to the plenary session of the SAE G-10 Committee for Aerospace Behavioral Engineering Technology next January in Melbourne, Florida. This work is done in collaboration with NASA Ames.

### ***Full-Scale Crash Test of Commuter Rail Car (FRA)***

On November 16, over 100 industry professionals attended the full-scale crash test of a commuter rail car at the Transportation Technology Center (TTC) in Pueblo, Colorado. Mr. Steven Ditmeyer, Director of the Federal Railroad Administration (FRA), Office of Research and Development, delivered the welcoming address and introduced the speakers including Ms. Jolene Molitoris, Administrator of the FRA and Mr. Mortimer Downey, Deputy



*Full-scale Crash Test of Commuter Rail Car*

Secretary of the Department of Transportation. Dr. Tom Tsai of the FRA, Office of Research and Development and Robert Ricci, Director of the Volpe Center's Office of Safety and Security were also in attendance. Members of the Volpe Center staff who participated in directing and conducting the tests included Herbert Weinstock, recently retired Chief of the Structures and Dynamics Division, Ms. Kristine Severson and Mr. David Tyrell of the above Division.

Following the opening remarks, there was a technical presentation on the pre-test analysis and test parameters, followed by the test itself. Ms. Severson presented the Volpe Center's analysis approach to the full-scale testing, describing the different computer models used to estimate the test results. In the test, an adapted commuter car, fitted with special seating and instrumented Anthropometric Test Devices (dummies), traveling at approximately 35 miles per hour, crashed into the rigid wall resulting in about 3 to 4 feet of crush. The forces and accelerations experienced by these dummies were measured and 200 channels of data collected. In addition, high-speed video cameras recorded the dynamic response of the seats and dummies. Among the important objectives established by the FRA and the Volpe Center in conducting this full-scale test are validating existing computer models and developing methods for improved crashworthiness of cab and coach cars. The Volpe Center will compare the test data results with the modeling results. Of primary interest is the force-crush characteristic, the deceleration time history, the maximum loads at the seat supports, and the dummy injury criteria. These data will assist the Center in fine-tuning the single car computer models and developing the two-car model that will be used to estimate the results of the two-car crash test planned for March 2000.

#### ***Presentations at the American Society of Mechanical Engineers Conference (FRA and NHTSA)***

Several Volpe staff members presented papers at the 1999 American Society of Mechanical Engineers (ASME) International Mechanical Engineering Congress & Exposition that was held in Nashville, Tennessee, from November 15 to 19. Mr. David Tyrell and Mr. Eloy Martinez of the Structures and Dynamics Division presented papers based on Volpe Center research performed for the Federal Railroad Administration. Mr. Martinez presented a technical paper entitled "Crashworthiness Studies of Typical Wide Nose Locomotive Short Hoods," co-authored by Mr. Tyrell, Mr. Martinez, and Dr. Tomasz Wierzbicki, Professor of Applied Mechanics, Impact & Crashworthiness Laboratory at the Massachusetts Institute of Technology. Mr. Tyrell presented a technical paper entitled, "Simulation of an Oblique Collision of a Locomotive and an Intermodal Container," co-authored by Mr. Tyrell, Ms. Kristine Severson, and Mr. Brian Marquis of the Volpe Center's Structures and Dynamics Division, and Dr. A. Benjamin Perlman, Department of Mechanical Engineering, Tufts University.

Mr. Joseph Canha of the Vehicle Crashworthiness Division presented a paper at the Applied Mechanics Section under the Symposium of Transportation – Biomechanics and Occupant Protection Section. The paper was entitled "The Effects of Common Misuses of a Child Safety Seat in an Automobile Crash." The paper described the consequences of the most common misuses of child safety seats using computer simulations. It was determined that even a very small amount of slack in the vehicle safety belt securing the child safety seat to the vehicle seat would result in injury levels to the child occupant that are well beyond the National Highway Traffic Safety Administration recommended threshold values.

#### ***Volpe Staff Member Participates in EUROCONTROL Automatic Dependent Surveillance Workshop (FAA)***

Mr. Janis Vilcans of the Surveillance and Sensors Division attended the Automatic Dependent Surveillance (ADS) Workshop organized by EUROCONTROL in Malaga, Spain, from November 8 to 11. The ADS Workshop discussed the "Way Ahead for ADS," including the topic of early use of ADS-Broadcast (ADS-B), and sought to build consensus on and commitment to the ADS strategic objectives. An objective of the EUROCONTROL ADS Program is to determine if ADS, as either sole means or in conjunction with other surveillance sources, can meet the current and future surveillance requirements of the Air Traffic Control System.

The Volpe Center is supporting the Federal Aviation Administration's National Airspace System Architecture Modernization activities that incorporate ADS-B based surveillance. The Volpe Center is also supporting the development of the functional specification, transition planning, concept validation, and risk minimization for the nine Safe Flight 21 Operational Enhancements. Success in this program may lead to early ADS-B operational deployment in the continental United States. The Surveillance and Sensors Division staff has developed the Surveillance Vision Plan, the Safe Flight 21 Functional Specification, and is working on formulation of the ADS-B operational concept as well as addressing ADS-B deployment issues that include schedule, procedures, National Airspace System integration, and avionics issues.

### **Report on Switching Operations Fatalities Published (FRA)**

In November, the Volpe Center published the Switching Operations Fatality Analysis (SOFA) Working Group's final report that contains findings and recommendations for preventing fatalities that occur among railroad employees involved in switching operations. The report documents a two-year effort by a working group of railroad industry representatives who analyzed why switching accidents happen. The Working Group consists of representatives from the Volpe Center, FRA, Association of American Railroads, United Transportation Union, Brotherhood of Locomotive Engineers, American Short Line, and Regional Railroad Association. As the Volpe Center representative in this group, Mr. David Skinner of the Operator Performance and Safety Division provided human factors support to help understand the underlying causes of each accident and identify trends across accidents. Formed at the request of the FRA, the Working Group based its findings on a review of 76 recent fatalities that occurred over a 6 1/2-year period. The working group made safety recommendations that addressed communications procedures within and between work crews, job safety briefings, work crew movement on the track and between cars and training for staff with less than one year of service.

### **Volpe Center Hosts Visit from Dr. Oliver McGee, Deputy Assistant Secretary for Transportation Technology Policy**

On November 15, the Volpe Center hosted a visit from Dr. Oliver McGee, Deputy Assistant Secretary for Transportation Technology Policy. During his visit, a series of briefings and discussions with Volpe Center management and staff were held. Major agenda items included a demonstration of the Federal Aviation Administration's Traffic Management System by Mr. Richard Wright, Office of Traffic and Operations Management; presentation and demonstration of the Panama Canal Communications, Tracking, and Navigation System by Mr. Mike Moroney, Center for Navigation; and a presentation on aircraft noise analysis by Mr. Gregg Fleming, Safety and Environmental Technology Division.

The conference generated a number of "ideas for action" that will serve as a framework for the Department's strategy to sustain a climate for transportation innovation in the next century. These ideas are summarized in the conference proceedings, *Ideas for Action*, now available on the Center's Web site. In particular, the Department will expand its leadership role in fostering an innovation environment through the following actions:

First, the Department will promote technology diffusion and the development of an educated workforce by encouraging the Department's field offices and University Transportation Centers to bring together transportation users and technology developers to support lifelong learning in transportation organizations.

Next, DOT will increase efforts to steer and guide long-term research in government, industry, and academia by directing researchers' attention to the Nation's transportation needs and challenges.

The Department will speed the absorption of information technology in transportation by working across the government and with industry to provide a necessary framework of communication standards, data definitions, and frequency allocation.

Finally, DOT will continue to foster innovation in the transportation community by leading a series of sessions at the 79th Annual Meeting of the Transportation Research Board. On January 10, the Department will lead a special two-part session, facilitated by Secretary Slater and the modal administrators, on "Innovations for Transportation Excellence in the 21st Century." In addition, the Volpe Center is assisting in planning and organizing four sessions as a follow-up to topics covered at the Spirit of Innovation conference:

- **Nanotechnology:** The session entitled "Microelectromechanical Systems (MEMS) Applications in Transportation," will focus on how MEMS and nanotechnologies will facilitate one another.
- **Cybertechnology:** "Transportation Implications of Next-Generation Cybertechnology" will describe how the capabilities of information and communication technologies are likely to evolve over the next decade.

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## Report on Testing of Low-Cost Airport Surface Detection Equipment at Milwaukee Airport Submitted to FAA (FAA)

The final version of the "Y2K Validation Results Report for the Airport Surface Detection Equipment at Milwaukee International Airport" was delivered to the FAA on November 19. This report is the result of intensive three-week Y2K testing of the FAA designated safety-critical Low-Cost Airport Surface Detection Equipment (ASDE-X) prototype radar system at the General Mitchell International Airport in Milwaukee, Wisconsin.

The comprehensive testing was conducted by Mr. Seamus McGovern of the Airport Surface Division along with the airport's technical staff and included multiple date changes on two processors, and testing of the radars' operation, software, user interfaces, and cold start-up. The operating system for all the computers was identified and compared against available manufacturer data. The report, containing all issues, analysis, results, and conclusions has been reviewed by the FAA.



**Protect and enhance communities and the natural environment affected by transportation.**

### Volpe Center Completes Work on FAA ESIS Web Site and Deploys Additional ESIS Modules (FAA)

On October 1, under the technical direction of Ms. Patricia Carnes of the Environmental Engineering Division, the Volpe Center deployed the FAA's *Environmental and Safety*

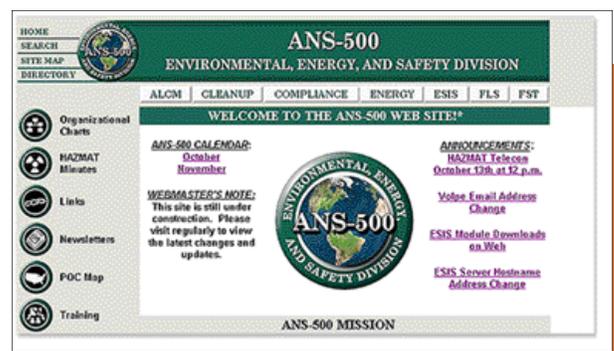
*Information System (ESIS) Software Download Web site for ANS-500 (Airway Facilities). ESIS is made up of 5 software modules used by national and regional Airway Facilities personnel to manage the high volumes of critical data needed to comply with Federal, state, and local regulations relating to occupational safety and health, energy conservation, and industrial pollution. The Web site allows the user to view a description of each software module; download the software; print installation instructions, user manuals, and a user ID request form; and email the ESIS help desk located at Volpe. The Web site also includes hyperlinks to the FAA, DOT, and ANS-500 Web sites.*

Along with the Web site, the Volpe Center also deployed two new ESIS modules; *LaunchPad* and the *Compliance Management System (CMS)*, and upgraded three existing modules to incorporate the login and security access for the new database structure. *LaunchPad* displays a universal login screen to access one or more ESIS modules and has a hyperlink to the ESIS setup application. *CMS* replaces the *Safety and Environmental Assessment Management Software (SEAMS)* module with added functionality and upgraded Graphical User Interface standards. The other four ESIS applications are the *Energy Management Reporting System* (also developed by Volpe), *Fuel Storage Tanks*, *Fire Life Safety*, and *Safety/Asbestos*.

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- **Education/Workforce:** "Innovative Tools for Identifying and Delivering Training," will showcase various new training technologies, including Web-based distance learning and advanced simulation techniques.
- **Vehicles and Fuels:** Among the issues discussed at the session on "21st Century Policies to Foster Innovation in Vehicles, Fuels, and Systems" will be emissions trading and emissions-reduction credits as methods for reducing U.S. greenhouse gas emissions.

These actions are important steps in an ongoing process in the Department—one that will ensure a climate for innovation that accelerates the adoption of new technologies and new ideas in our transportation system.



ESIS Software Download Web site

### ***Presentation at "Preservation of the Natural Quiet" Workshop (FAA)***

On November 3, Mr. Gregg Fleming of the Safety and Environmental Technology Division visited Columbus, Ohio to participate in a Workshop on "Preservation of the Natural Quiet" which was co-sponsored by the Acoustical Society of America, Technical Committee on Noise, and the Federal Interagency Committee on Aviation Noise. Mr. Fleming presented a paper entitled "Guidelines for the Measurement and Assessment of Low-level Ambient Noise." Mr. Fleming's work is part of the Volpe Center's support to the FAA in the development and maintenance of the Integrated Noise Model, a computer model for airport noise prediction and analysis.



***Advance the Nation's vital security interests by ensuring that the transportation system is secure and available for defense mobility and that our borders are safe from illegal intrusion.***

### ***The 54th Annual NDTA Transportation and Logistics Forum and Exposition Held in Alaska***

The Volpe Center is the Executive Agent for the National Defense and Transportation Association's (NDTA) Transportation Technology Subcommittee. This subcommittee provides a forum and sounding board for the national defense transportation industry, including senior level personnel in organizations that sponsor programs at the Volpe Center. Ms. Karen Cronin, Director of the Office of Information and Logistics Management, is the Volpe Center representative to the Business Practices Committee and the Technology Subcommittee.

The Volpe Center's role as a participant in working committees and subcommittees within the NDTA is key to understanding the interests of the Defense Transportation System and their effect on the entire national transportation system. Attendance at NDTA forums is a critical activity in maintaining and

initiating contact with current and potential sponsors of work within the Department of Defense and to remain informed concerning defense and national transportation issues.

Ms. Karen Cronin along with Dr. Frank Hassler, Director of the Office of Strategic Programs and Resource Planning; Mr. Edward Herger, Chief of the Intermodal Logistics Systems Planning and Integration Division; Mr. Bob Stouffer of the Logistic and Strategic Management Division; and Mr. Kenneth Troup of the Intermodal Logistics Systems Planning and Integration Division attended the NDTA Forum held in Anchorage, Alaska, on October 2 to 6. Lt. Gen John M. (Mike) McDuffie was the keynote speaker, and General Charles T. Robertson, Jr., USAF, Commander-in-Chief, United States Transportation Command and Commander of the Air Mobility Command spoke at the Military Awards Ceremony. During this 4-day meeting, there were many opportunities for the beneficial exchange of ideas and knowledge about future trends in defense logistics and transportation functions.

The NDTA is an educational, non-profit, worldwide organization, equipped to combine the transportation industry's manpower and skills with the expertise of those in government and the military to achieve the mutual objective of a strong and responsive transportation capability. The purpose of this meeting was to bring together members of the transportation community from government and industry to discuss national transportation issues and policies that affect military transportation. This year's theme, "Global Challenges and Changes," acknowledges the challenges of a changing world environment driven by acquisitions and mergers, technological advances and an unprecedented increase in global alliances. Three panel discussions concentrated on examining the changing environment, the need for manpower with new and different skill levels, and the challenges of implementing necessary new business practices within the Defense Transportation System.

### ***UK Workshop Held in Response to Critical Need for Explosive Detection Techniques (FAA)***

During the week of October 18, Dr. John Hobbs of the Safety and Environmental Technology Division, and a nationally recognized expert in the field of explosive detection, visited Ascot, Berkshire, United Kingdom. The purpose of his visit was to participate in the Fourth Workshop of the Ad Hoc Group of Specialists on the

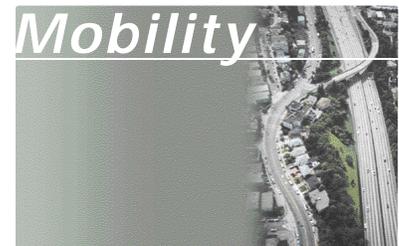
Detection of Explosives of the International Civil Aviation Organization. Dr. Hobbs presented the paper, "Use of Solvent for the Removal of Explosives Particles from Surfaces," which he co-authored with Mr. Edward Conde of the Safety and Environmental Technology Division. The workshop was in response to the critical need for explosive detection techniques, bomb countermeasures and security procedures. The Volpe Center is supporting the FAA by studying techniques for detecting explosives and flammable liquids concealed on airline passengers. Commercial systems have been in use for some time — metal detectors satisfy operational requirements for the detection of weapons on passengers, and various types of radiation equipment have been used for the inspection of baggage. However, detection systems for explosives and flammable liquids concealed on a person remain to be developed.

***Volpe Center Provides Engineering Support to Army's Watercraft Program (US ARMY TACOM)***

Recently, Mr. Rod Cook, Mr. Mark Gentile, and Mr. Mike Buonopane, all of the Environmental Engineering Division, participated in an In-Process Review for the watercraft program at the Army's Tank-automotive and Armament Command (TACOM) in Warren, Michigan. Mr. Gentile gave a briefing on the Halon replacement project that included the feasibility and testing of alternative agents, the first installations and acceptance, and the schedule for production installations. The approximately 50 participants included Colonel Cannon, Force Projection Program Manager, the Watercraft Program Office, Combined Arms Command (CASCOM), Combat Equipment Base North Atlantic, 7th Transportation Group, Army Material Command, and Army Forces Command (FORSCOM). The Volpe Center has been supporting the Army's watercraft program since 1993. The nature of the work entails marine engineering and logistics support for the life-cycle management of Army watercraft and causeway systems. The support also includes mechanical, electrical, and environmental engineering for the elimination of ozone depleting substances and preventing pollution from Army vessels.

***"Ideas for Action" Proceedings of the Volpe Center's Spirit of Innovation in Transportation Conference Published***

Ms. Annalynn Lacombe of the Transportation Strategic Planning and Analysis Office has completed the proceedings of the Spirit of Innovation in Transportation conference held at the Volpe Center on June 24 and 25, 1999. The main topics and results of the conference are described in the Director's Notes on the lead page of this issue of Highlights. The conference proceedings, *Ideas for Action*, highlight the role played by key participants such as Rodney E. Slater, Secretary of Transportation, William M. Daley, Secretary of Commerce, and John P. Podesta, White House, Chief of Staff, as well as academic and industry leaders and innovators. The proceedings capture the overriding objectives of the conference:



***Ensure that the transportation system is accessible, integrated and efficient, and offers flexibility of choices.***



- Identifying how we can use technology to meet our transportation challenges,
- Initiating a strategy and framework for innovation that moves technology forward from ideas to implementation, and
- Creating a climate for innovation that speeds the absorption of new technologies.

*Ideas for Action* is a first step in an ongoing collaborative process with the transportation and technology communities. It is hoped that the proceedings will stimulate the exchange of ideas on the innovation process. The proceedings are available on the conference Web site at <http://www.volpe.dot.gov/spirit/index.html>, and the site features an opportunity for Innovation Feedback where transportation professionals can communicate with each other through focused chat sessions and through an on-line forum.

## ***Economic Growth and Trade***



***Advance America's economic growth and competitiveness domestically and internationally through efficient and flexible transportation.***

### ***DOT's First "Transportation Research and Education Plan" in Support of One of Secretary Slater's Goals***

In collaboration with the different modal agencies of the Department of Transportation (DOT), Dr. Peter Manning of the Transportation Strategic Planning and Analysis Office completed a preliminary draft of DOT's first "Transportation Research and Education Plan." He coordinated the efforts of a departmental team that is providing technical support, and is now incorporating their responses to the initial draft. The plan's framework and conclusions will support Secretary of Transportation Rodney R. Slater in achieving one of his goals as Secretary — building and enhancing the role of learning throughout and beyond the transportation community.

The plan examines Federal transportation research and education initiatives at the higher education level. It serves as a compilation of current activities and provides insights into new, innovative educational techniques, as well as a framework for future opportunities. In highlighting the benefits of the transportation learning enterprise, the plan challenges educators, administrators, and those supporters who are not part of the academic network. The plan is structured around five major issues: building departmental resources in this area, providing targeted investments, supporting innovative mechanisms, developing better sharing between and within the transportation learning community, and enhancing public/private partnerships.

### ***Coast Guard R&D Center Seeks Volpe Center Expertise to Develop New Multiple Award Contracts Program***

The Coast Guard Research & Development Center at Groton, Connecticut, is developing its first multiple award contracts program. In the spirit of ONE DOT, it reached out to the Volpe Center for their considerable expertise in this area. On October 5, three Coast Guard contract specialists, the R&D Center Procurement Attorney, and the lead technical person at the R&D Center involved in developing the multiple award RFP, visited with Volpe Center OMNI specialists at the Center. OMNI is the Volpe Center's Multi-Contractor Resource Base acquisition system and is a prototype for other Federal agencies seeking to streamline and strengthen their own procedures.

Staff from the Volpe Center's Acquisition Division and the Program Development and Resource Management Division participated in the meeting. Mr. Ed Wirtanen discussed the overall approach to OMNI along with the purpose and meaning of some of the innovative and unique clauses and provisions developed by the Volpe Center. Mr. Jerry Luke provided information on how the cost and price analyses of proposals were conducted. Mr. Orin Cook explained how the OMNI III program operates, and Ms. Beth Segal provided specific guidance on how task orders under the OMNI III contracts were competed and awarded. Mr. Bob Robinson explained the instructions for submitting technical proposals in the OMNI III RFPs.

### ***Volpe Center Playing Key Role in Aviation Delay Reduction (FAA)***

DOT Secretary Slater has directed that flight delay reduction should be a key FY2000 goal for the FAA's Air Traffic organization. The Volpe Center's Traffic Management System (TMS) team is directly supporting Secretary Slater's goal by assuming a leadership role in several new tasks related to flight delay reduction. TMS is the real-time, operational computer system developed by the Volpe Center that the FAA uses to predict, detect, and handle airspace congestion problems.

The new work requires adding new algorithms to TMS to reduce airspace sector congestion, and developing enhancements to the Traffic Situation Display, the user interface to the TMS. Recently, staff from the Automation Applications Division gave a demonstration of the sector congestion tool to Mr. Jack Kies, Director of the FAA's Air Traffic Control System Command Center located in Herndon, Virginia. On October 15, the Volpe Center provided a revised version of the sector congestion tool to Command Center staff to elicit further comments. The new tools will enhance staff communications between the FAA's Command Center and Air Traffic Control field sites and provide a common situational awareness between facilities to improve decision-making.





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**In This Issue...** Volpe Center provides worldwide engineering and installation support for USAF NAS system upgrades.

