

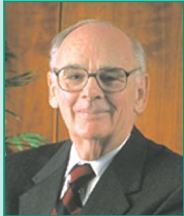


HIGHLIGHTS

Cambridge, Massachusetts

July/August 2003

National Transportation Systems Center



Richard R. John

Director's Notes

"New and revolutionary technologies hold undeniable and exciting possibilities for flight and safety, and keeping pace with advanced technology is the key."

Norman Y. Mineta, Secretary
U.S. Department of Transportation

Supporting the FAA's Goals

Reducing air traffic congestion and ensuring the safety of airline passengers continue to be major priorities for the Federal Aviation Administration (FAA). Aviation delays attributable to air traffic congestion cost passengers, shippers, and the industry \$6.5 billion, not including costs to other sectors of the economy.* Especially after the events of September 11, 2001, air travel must be perceived as safe to encourage people to resume flying for both business and pleasure.

* U.S. DOT Draft Strategic Plan for 2003-2008

Continued on page 11

Inside

New technologies to **enhance train safety**

Research needs for **highway-rail grade crossing safety**

Evaluating the **security of milk and food supply chains**

Environmental and safety compliance in New England

Focus



The Volpe Center's wide range of aviation-related work helps the FAA address passenger mobility and safety in the air and on the ground. (Photograph from Getty Images)

Improving Aviation Mobility and Safety (FAA/NASA)

Among the many challenges facing U.S. aviation, two of the most important are enhancing the efficiency of air-traffic flow and improving the safety of aviation systems. The Volpe Center provides significant support to federal agencies addressing these challenges; this article highlights efforts to reduce en route air traffic congestion and runway accidents.

Congestion Management

Key to reducing en route congestion in the nation's airways is the integration of new technologies and techniques that enable more effective responses to changing conditions, such as congestion, equipment outages, and weather. Recent Volpe upgrades to two sophisticated decision-support tools make considerable contributions in the areas of air traffic management and en route air traffic modeling.

Innovative Features in New ETMS Release Reduce Delays

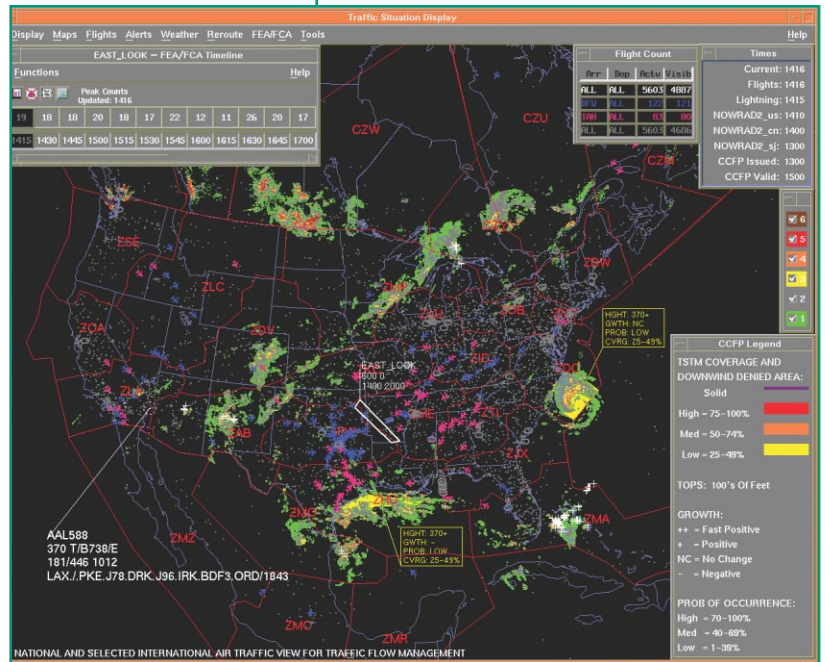
The Enhanced Traffic Management System (ETMS) is an automation system developed and operated by Volpe's Automated Applications Division for the Federal Aviation Administration (FAA) to track, anticipate, and manage the flow of air traffic throughout U.S. airspace. It integrates real-time flight and weather data from multiple sources, presenting information graphically in a highly adaptable format. ETMS Version 7.6, deployed in May 2003 in time for the severe weather season, includes new capabilities for en route congestion management, enhanced collaborative decision making with airlines, and access to improved severe weather forecasts.

This release introduces innovative tools to reduce delays between major airports. The Reroute Advisory Tool automatically generates a list of flights affected by air traffic rerouting to permit faster decision-making by FAA and the airlines about those flights. The upgrade also provides enhanced ability to display, analyze, and share information on areas of airspace congestion. A new technique, Slot Credit Substitution, developed as part of the FAA's Collaborative Decision Making Program (see sidebar), was also implemented. When an airline flight is delayed or canceled, this technique allows the airline's dispatchers to trade its arrival slot for a future "slot credit" that can be used for a later flight; another airline may be authorized to use the traded arrival slot. This will ensure that airport arrival capacity is better utilized during critical, busy times.

Convective weather is a major contributing factor to aviation delays, so accurate weather information is essential. The National Convective Weather Forecast, a one-hour forecast of the location of thunderstorms, is now available to air traffic management specialists through ETMS Version 7.6.

ETMS refinement continues. When congestion or weather limit the number of aircraft in a sector of airspace, the FAA may change the sector boundaries to accommodate traffic in adjacent space. That process is known as "Dynamic Sectorization," and the Volpe team is now developing a new version of ETMS that will handle this important technique.

ETMS is sponsored by the FAA's Air Traffic Systems Development organization for use by traffic flow managers and specialists at the FAA's Air Traffic Control Systems Command Center (ATCSCC), Air Route Traffic Control Centers, select Terminal Radar Approach Control Facilities, select



Air traffic managers interact with ETMS through the Traffic Situation Display (TSD), a graphical display of air traffic, weather, alerts, and statistical information. The TSD screen above shows more than 5,000 flights being tracked over the United States. Managers can click on any flight icon to display flight information, as shown in the lower left corner.

Collaborative Decision Making

Common situational awareness of the national airspace improves aviation efficiency and safety. The FAA's Collaborative Decision Making Program is a government-industry partnership that aims to improve information sharing and collaboration among the airlines and the FAA's air traffic management and control organization.

Air Traffic Control Towers, and other facilities. The Volpe ETMS team is composed of staff from the Automated Applications Division.

SWEPT Upgrade Enhances Congestion Management Planning

The Volpe Center serves as system integrator, technology-transfer agent, and primary developer of the System-Wide Evaluation and Planning Tool (SWEPT), a research and development model of the national air traffic system. Based on real and/or simulated data, the SWEPT prototype is designed for real-time and off-line analysis, planning, monitoring, and evaluation of air traffic management initiatives, procedures, and dynamic flight scenarios. SWEPT enables modeling of en route air traffic. En route modeling plays an important role in congestion management planning, as the FAA can use it to develop and safely evaluate new methods for congestion management. Moreover, projecting future benefits of new methods helps the airline industry to understand what efficiencies can be gained by potential changes.

Sponsored by National Aeronautics and Space Administration (NASA) Ames's Advanced Air Transportation Technology Program and directed by NASA Ames's Automation Concepts Branch, SWEPT is based on the NASA-developed modeling tool FACET, or Future ATM Concepts and Evaluation Tool.

In May 2003, the Volpe Center's SWEPT project team released and installed a new version at the FAA's ATCSCC. In parallel with the upgrade release, the Volpe SWEPT team, led by Mr. James R. Hill of the Automation Applications Division and colleagues at NASA Ames, met with select user representatives at the ATCSCC to review the new release and to collect feedback and suggestions for future developments.

Runway Safety

Although aircraft safety is usually associated with in-flight dangers, a collision of two aircraft on the ground caused by a runway incursion is far more likely than a collision in the air. A runway incursion occurs when an aircraft or ground vehicle inadvertently taxis or drives onto an active runway, presenting a hazard to aircraft that are taking off or landing. Runway incursions have been blamed for several major accidents; accordingly, their elimination has become the FAA's leading safety-enhancement program. The Volpe Center, in support of the FAA's Office of Runway Safety (ARI) is leading the data analysis effort aimed at reducing the number of runway incursions, particularly the more serious incursions. The Volpe Center is also engaged in several other projects to reduce runway incursions, including the development of air traffic systems that depict traffic status on airport surface and approaches in real-time. Two more recent contributions to this effort—runway status lights and human factors issues—are highlighted on the next page.

Runway Status Lights Help Prevent Accidents

The FAA's Runway Status Lights (RWSL) Program will help to prevent the hazards associated with runway incursions by providing a visual warning to pilots and ground-vehicle operators that the runway is not safe to enter. An array of red "stop" lights will be placed at each taxiway and runway intersection. The fully automated lights are controlled by the radar-based RWSL system. The lights reinforce controller commands and act as a safety backup for the controller.

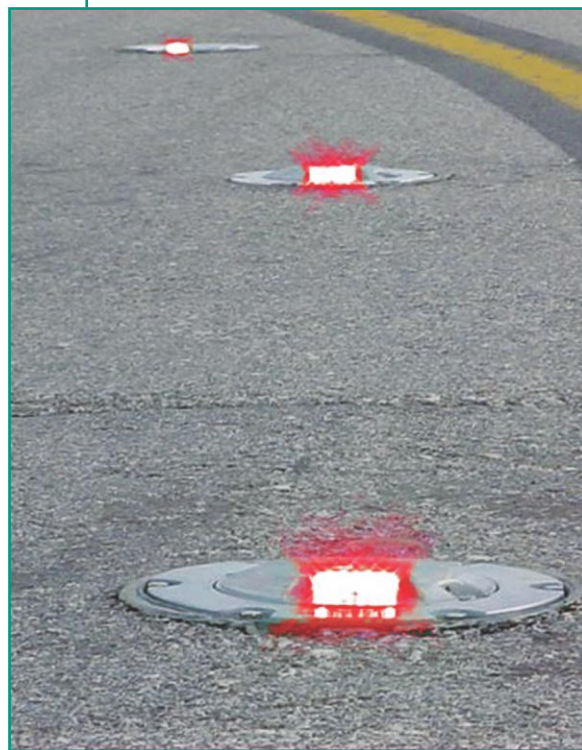
The Volpe Center RWSL team is involved in the development, testing, evaluation, and deployment of runway status lights. In May 2003, the Volpe team successfully completed the acquisition, integration, and demonstration of test instrumentation; the test equipment will be shipped to the San Diego airport, where an evaluation of the runway status lights software will be conducted. After the software evaluation, the prototype light system will be installed and an operational evaluation will be performed. The Volpe team consists of Mr. Vincent Orlando and Ms. Sarasina Suljoadikusumo of the Airport Surface Division.

Human Factors Issues Are Critical to Runway Safety

The Volpe Center's Operator Performance and Safety Analysis Division has been supporting the FAA's Runway Safety Office in several areas, including the analysis of incident data, the development of a method for categorizing the severity of runway incursions, and the development of educational materials for pilots and controllers on preventing runway incursions.

In June 2003, Dr. Daniel J. Hannon of the Division spoke at the FAA's Eastern Region's Runway Safety Summit in New York City. The focus of Dr. Hannon's presentation was human factors in runway safety. Results of recent data analysis were presented along with demonstrations of human factors issues critical for runway safety. Human factors issues are associated with pilots, controllers, and vehicle operators.

Dr. Kim Cardosi of the Division was the keynote speaker at the Southern Region's Runway Safety Summit held in May 2003 in Miami, Florida. Dr. Cardosi presented results of recent data analysis and suggested potential remedies for the runway incursion problem to an international audience of pilots and controllers.



When surveillance data indicate that the runway ahead of an aircraft in position for takeoff is occupied, or shortly will be occupied, the runway status lights at that takeoff position are illuminated.



Volpe Rail Expert Testifies at House Subcommittee Hearing (FRA)

In support of the Federal Railroad Administration (FRA), Mr. David Tyrell of Volpe's Structures and Dynamics Division recently testified before the Railroad Subcommittee of the House Transportation and Infrastructure Committee. The purpose of the hearing, held on June 10, 2003, was to evaluate new technologies being developed to enhance the operational safety of freight and passenger trains. Mr. Tyrell accompanied Ms. Jo Strang, Deputy Associate Director for Railroad Development, FRA, who read a prepared statement.

Mr. Tyrell answered questions on rail equipment crashworthiness, including questions on the application of seatbelts to intercity and commuter rail systems, the influence of federal regulations on equipment weight, and impact testing of rail equipment. He showed videos of the rail equipment tests that have been conducted to date at the Transportation Technology Center in Pueblo, Colorado. During the hearing, subcommittee members expressed an interest in observing the next test, planned for October 2003. These tests have been conducted according to specifications developed by Mr. Tyrell and other members of the Structures and Dynamics Division. The results of Volpe research on rail equipment crashworthiness have been used to 1) develop the crashworthiness requirements for Amtrak's high-speed trainset; 2) develop the FRA's Passenger Equipment Safety Standards; and 3) draft revisions and additions to current FRA locomotive crashworthiness regulations.

Determining Research Needs for Highway-Rail Grade Crossing Safety (FRA)

Ms. Anya A. Carroll of the Railroad Systems Division and Principal Investigator of the Highway-Rail Grade Crossing Safety Research Program, hosted the Research Needs Workshop during June 3-5, 2003, in Cambridge, Massachusetts. The workshop, sponsored by the Federal Railroad Administration (FRA) Office of Research and Development, brought together railroad industry experts from Canada and the United States. Its purpose was to provide the FRA and all the U.S. DOT modes with a current status of research in the area of highway-rail grade crossing safety and to share this information with Canadian colleagues from both Transport Canada and the Direction 2006 Research Program. Based on a review of the FRA's Five-Year Strategic Plan and Transport Canada's Research



The interaction of the colliding cab car and locomotive recorded during the passenger rail train-to-train impact tests conducted at the FRA Transportation Technology Center in Pueblo, Colorado in January 2002.

United States Department of Transportation
Federal Railroad Administration - Office of
Research and Development

**Highway-Rail
Grade Crossing
Safety Research
Needs Workshop**

John A. Volpe National
Transportation Systems Center
55 Broadway
Cambridge, MA 02142

June 3 - 5, 2003

The Volpe Center hosted the Highway-Rail Grade Crossing Safety Research Needs Workshop.

Program, and through intermodal and stakeholder consensus, workshop participants formulated and prioritized an updated set of research needs related to technology, methodology, and hardware to decrease crossing collisions and fatalities. These research needs will be formally documented for use in revisiting the 1994 U.S. DOT Crossing Safety Action Plan and to aid in the future planning of resources for research funding in the highway-rail grade crossing safety arena.



Evaluating the Security of Milk and Food Supply Chains (TSWG)

The goal of effective supply chain management is to ensure that each link provides adequate security without adversely affecting the movement of shipments to their final destinations. This can be particularly important for commodities such as food and milk, which may be vulnerable to terrorist attacks that could pose severe public-health and economic impacts. In support of two projects sponsored by the Technical Support Working Group (TSWG), teams led by the Volpe Center will closely analyze supply chains, identify vulnerabilities, propose and demonstrate improvements, and evaluate the effectiveness of demonstration technologies and business practices. TSWG, an interagency group whose mission is to provide for rapid research and development of counterterrorism technology, is managed by the Department of Defense (DoD) Combating Terrorism Technology Support Office.

Assessing the security of milk transport in the United States will start with supply chain analyses performed in states located in four geographic areas of the country: the Northeast Region (Massachusetts), the Central Region (Wisconsin), the Southeast Region (Florida), and the Pacific Region (California). Ms. Dawn Lopez Johnson of Volpe's Intermodal Logistics Systems Planning and Integration Division recently led both the Northeast and the Central fluid Grade-A milk supply chain analyses. The analyses included a review of security measures in place during transport within and between the following supply chain nodes: dairy farms, transfer and/or receiving stations, processing plants, central distribution (warehouses), and retail facilities. In addition, the team reviewed existing security practices at tanker truck facilities and truck washing operations. Volpe team members include Mr. Joseph Koziol of the Technology Applications and Deployment Division and Mr. Robert Hoaglund of the Infrastructure Protection and Operations Division. The Volpe team was assisted by



The Volpe-led team will examine the transport of milk from its origin at the dairy farm to its final retail facility destination.

Mr. Randall E. Arbaugh of the U.S. Food and Drug Administration (FDA). After conducting all four regional analyses, the team will summarize—and recommend enhancements to—existing security practices, procedures, and equipment in the Grade-A fluid milk supply chain. These recommendations will be evaluated for ease of use and practicality during the demonstration phase of this project.

The Center is also conducting a project to improve the security of the DoD food supply chain. This project will analyze the movement of food and food supplies from U.S. suppliers and distributors to U.S. military forces in Europe, Japan, Korea, Southwest Asia, and other locations. An end-to-end supply chain analysis will be conducted in the first phase to identify and define each of the elements in the supply chain for each selected theater of operation, to assess existing security and cargo management practices, to identify vulnerabilities in the supply chain, and to recommend improvements to business practices and technologies. The Volpe team of Messrs. Kenneth Troup of the Intermodal Logistics Systems Planning and Integration Division, Alex Blumenstiel of the Aviation Safety Division, and Joseph Koziol of the Technology Applications and Deployment Division completed facility reviews at commercial food distribution centers and port facilities on the East and West Coasts and will be visiting distribution centers and military food service operations in four Persian Gulf countries and Europe. Based on these reviews and the identification of supply chain vulnerabilities, Volpe will coordinate with the suppliers, carriers, and government agencies involved to develop plans for, and then conduct, a demonstration of supply chain security improvements.

Volpe Hosts IEEE Conference on Technologies for Homeland Security

In collaboration with the Institute of Electrical and Electronic Engineers (IEEE), the Massachusetts Port Authority, and other professional groups, the Volpe Center co-sponsored and hosted the 2003 Spring IEEE Conference on Technologies for Homeland Security on May 7 and 8, 2003. This two-day conference, the third in an IEEE series, provided a forum on requirements, technologies, operations, and funding for technology development and opportunities in the marketplace, focusing on security to protect aviation and other key transportation system elements. More than 220 technology innovators, venture capitalists, government officials, military procurement officers, system integrators, and business development professionals attended the conference. Volpe Center staff presented the following papers.

- “Promise and Challenges for Transportation Security Applications of Remote Sensing Unmanned Aerial Vehicle Systems” by Dr. Aviva Brecher, Office of Environmental Preservation and Systems Modernization, and Mr. Kevin Clark, Surveillance and Assessment Division.



The Volpe team is analyzing each element in the supply chain. Above, a cargo container is offloaded from a cargo ship to a truck.

- “NAS Information Security and New Challenges” by Mr. Kevin Harnett, Infrastructure Protection and Operations Division.
- “Department of State - Security Enhancement Program” by Mr. David Lecraw, Infrastructure Protection and Operations Division.
- “Cyber Security 101 - Best Practices” by Mr. David Sawin, Infrastructure Protection and Operations Division.



Supporting Environmental and Safety Compliance (FAA)

The Volpe Center’s Environmental Engineering Division is supporting various environmental and safety compliance programs for the Federal Aviation Administration (FAA) in New England. These programs include the Environmental Cleanup Program, responsible for the identification, assessment, cleanup, and closure of contaminated properties; the Fuel Storage Tank Program, which addresses spill prevention, maintenance, and testing of containment systems, as well as the removal and replacement of non-compliant or leaking tanks; and the Fire Life Safety Program, under which facilities such as air traffic control towers are upgraded to comply with fire protection and emergency egress standards.

Over the past several years, Division staff—led by Mr. Christopher Zevitas—have managed significant environmental cleanup and site closure efforts at air route surveillance radar (ARSR) sites located in Bucks Harbor, Maine and St. Albans, Vermont. More recently, Ms. Michelle Morris oversaw the completion of abatement, demolition, and environmental restoration activities at a former remote transmitter/receiver site in New Bedford, Massachusetts. Site investigation plans have also been developed for additional ARSR and similar sites located in Caribou, Bucks Harbor, and Skowhegan, Maine; and Cummington and North Truro, Massachusetts. Sitework will be underway at the Caribou and Bucks Harbor sites this fall and will include advancement of soil borings; installation of groundwater monitoring wells; and sampling and analysis of soil, air, and groundwater. Suspected site contaminants include petroleum products associated with leaking underground storage tanks (USTs), asbestos-containing materials, polychlorinated biphenyls, lead-based paint, herbicides, metals, and other hazardous materials associated with current and previous site uses by the FAA and the Department of Defense.

Mr. William Halloran and Mr. Ryan Cummings recently supervised the removal and replacement of an underground fuel-storage tank at a critical air traffic control facility at Bradley International Airport in Windsor



The Volpe Center will perform site investigations at a former military base in North Truro, Massachusetts that is now occupied by an FAA air route surveillance radar facility (at right).

Locks, Connecticut. Ms. Patricia Carnes is also leading an effort to develop electronic hand-held tank compliance inspection tools for FAA, while Mr. Mark Gentile of the Technology Applications and Deployment Division is managing fire life safety upgrades at the Worcester Regional Airport's air traffic control tower in Worcester, Massachusetts.

In a related Volpe project, Mr. Steve Losier of the Environmental Engineering Division coordinates the production and distribution of *The Bridge* newsletter for FAA headquarters Airway Facilities, Environmental, Energy and Safety Division (AFZ-800). *The Bridge* is a quarterly publication that AFZ-800 has used since 1996 to emphasize priorities and to communicate news on progress, lessons learned, and policy changes. A recent issue features the cleanup of contamination at the William J. Hughes Technical Center in Atlantic City, New Jersey, a former Naval Air Station and FAA's sole Superfund site. Other articles address fire life safety upgrades to air traffic control towers in Alaska, a photovoltaic hybrid power system at a remote navigation facility in Wyoming, and an environmentally friendly de-icer for snow removal applications.

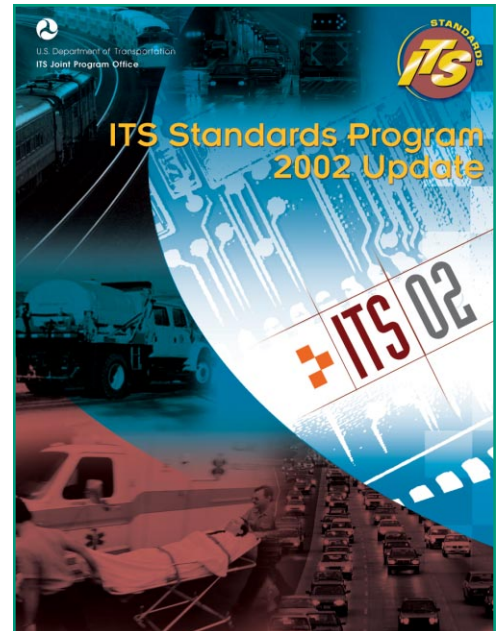
Awards

- Ms. Lynn Murray, Chief, Communications and Technology Outreach Division, received the Award for Federal Representative of the Year from the Federal Laboratory Consortium (FLC) for Technology Transfer. FLC is the nationwide network of federal laboratories that provides a forum to develop strategies and opportunities for linking the laboratory technologies and expertise with the marketplace. The award is given to the FLC representative who has made the most significant contribution to the FLC program in the past year. It was presented at the FLC national meeting in Tucson, Arizona on May 7, 2003. Ms. Murray serves as both an FLC Executive Board member and Chair of the FLC Education and Training Committee.
- Ms. Karen Van Dyke, of the Center for Navigation, was named a Fellow at the Institute of Navigation's (ION) 59th Annual Awards Program held on June 24, 2003. Election to Fellow Membership recognizes the distinguished contribution of ION members to the advancement of the technology and management of the science of navigation. Ms. Van Dyke received the Fellow Membership for her outstanding contributions to the civil applications of the Global Positioning System (GPS) and for her role in ensuring the safe incorporation of GPS into the National Airspace System. The Institute of Navigation is a non-profit professional society dedicated to the advancement of the art and science of navigation.



Papers & Presentations

- As part of the Volpe Center's ongoing support to the DOT's ITS Standards Program, the Planning and Policy Analysis Division recently published a report summarizing the Program's progress over the past 36 months. The report, "ITS Standards Program 2002 Update," produced by a Volpe team led by Mr. Gerry Flood of the Division, is available on the ITS Standards Web site at www.its-standards.net and on the U.S. DOT's ITS Electronic Document Library at www.its.dot.gov/itsweb/welcome.htm.
- In May 2003, the Volpe Center submitted the final report, "Cape Cod National Seashore Alternative Transportation Systems Long-Range Planning Study." The Volpe team, led by Mr. Terrence Sheehan of the Service and Operations Assessment Division, collaborated with the National Park Service (NPS) Cape Cod National Seashore and with various regional stakeholders to develop this 25-year plan for alternative transportation to, from, and within the NPS Cape Cod National Seashore. This planning effort builds on current plans and proposals, and also focuses on needed partnering opportunities, and operational and capital improvements to improve mobility in and around Outer Cape Cod.
- Dr. Andrew Kish, Structures and Dynamics Division, presented "Effects of Track Maintenance on Track Buckling Potential" at the specialist technical session of the International Heavy Haul Association (IHHA) Conference held May 4-9, 2003, in Dallas, Texas. Dr. Kish's paper dealt with results of a joint Volpe/Amtrak test under the Federal Railroad Administration's Track Systems Research Program to evaluate the influences of certain railroad track maintenance practices on potential risks associated with high temperature-induced forces causing track instability events, possibly leading to catastrophic derailments.
- In support of the National Highway Traffic Safety Administration's (NHTSA) Corporate Average Fuel Economy Program, Ms. Nicole Rossbach and Mr. Jose Mantilla of the Environmental Engineering Division, and Mr. Kevin Green of the Transportation Strategic Planning and Analysis Office, reviewed the outlook for light-duty diesel engines and hybrid electric vehicles. Ms. Rossbach and Mr. Green presented the group's findings at the Government/Industry Meeting of the Society of Automotive Engineers, held May 12-14, 2003, in Washington, D.C.
- At the 13th Annual Meeting of the Intelligent Transportation Society of America held in Minneapolis, Minnesota, May 19-22, 2003, Ms. Margaret Petrella of the Economic and Industry Analysis Division presented a paper comparing customer response to online Advanced Traveler Information Systems (ATIS) in Seattle and Los Angeles. Ms. Jane Lappin, also of the Division, spoke on the subject of customer response to ATIS and organized a panel of Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) associate administrators, with senior transportation managers from the United Kingdom and Japan, to address the future direction of the transportation research agenda.
- Mr. Seamus McGovern, of Volpe's Airport Surface Division, and Mr. Kam Chin, from the Volpe Center for Navigation, attended the 3rd Integrated Communications, Navigation, and Surveillance (ICNS) Conference & Workshop. The event, sponsored by the National Aeronautics and Space Administration (NASA) Glenn Research Center, was held May 19-22, 2003, in Annapolis, Maryland. Messrs. McGovern and Chin presented the technical paper, "Development of a Vehicle Independent Surveillance Data Collection System," for publication in the proceedings journal.



- Dr. Faris Bandak, of the Vehicle Crashworthiness Division, serves on the North Atlantic Treaty Organization (NATO) Research & Technology Organization (RTO) Human Effects Panel that sponsored an international conference on “Personal Protection: Biomechanical Issues and Associated Physio-Pathological Risks,” held in Koblenz, Germany, May 19-23, 2003. Dr. Bandak served as one of the Technical Evaluators responsible for evaluating the proceedings and making recommendations to NATO RTO on the effectiveness of the research from a military mission perspective. Dr. Qing Zhou, of EG&G Technical Services, presented a paper, “Development and Validation of the Head-Neck Finite Element Model of THOR - A Tool for the Study of Neck Injuries Related to Head Supported Mass.” Dr. Hailing Yu, of EG&G Technical Services, was the lead author on this paper that was co-authored by Mr. George Neat, Vehicle Crashworthiness Division Chief, Mr. Frank DiMasi and Dr. Bandak, also of the Division, and Drs. Marisol Medri and Qing Zhou of EG&G Technical Services.
- On June 17, 2003, in support of several Volpe Center security initiatives, Mr. Michael Dinning, Acting Deputy Director, Office of Environmental Protection and Systems Modernization, participated in the Annual Security Conference of the National Defense Industrial Association in Washington, D.C. He presented “Dual Benefits of a Systems Approach to Transportation Security.”
- Mr. Eric Boeker, of the Environmental Measurement and Modeling Division, presented the paper “Development of a Multi-Modal Noise Model” at the 2003 Noise-Con Conference held in Cleveland, Ohio during June 22-25, 2003. Mr. Gregg Fleming, Division Chief, co-authored the paper. The Volpe Center is supporting the development of a variety of computer models pertaining to aircraft noise and highway noise.
- Mr. Jonathan Koopmann, Accident Prevention Division, presented a paper titled “Characterizing the Capability of a Rear-End Crash Avoidance System,” at the Society of Automotive Engineers Future Transportation Technology Conference, held in Costa Mesa, California, June 23-25, 2003. The paper discusses the methodology used to characterize the performance of a vehicle equipped with a radar-based system that helps drivers avoid rear-end collisions.
- Dr. Eugene Gilbo, of the Automation Applications Division, participated in the 5th USA/Europe Air Traffic Management (ATM) R&D Seminar held in Budapest, Hungary, June 23-27, 2003. The seminar was jointly organized and sponsored by the FAA and Eurocontrol. Dr. Gilbo presented a paper titled, “Arrival/Departure Capacity Tradeoff Optimization: a Case Study at the St. Louis Lambert International Airport (STL).” The paper describes the results of the first onsite testing and evaluation of the prototype Arrival/Departure Tradeoff Tool, developed at the Volpe Center as part of ongoing research and development for the Federal Aviation Administration. The tool and its optimization technique provide a decision support to ATM specialists for optimizing utilization of airport capacity and selecting the best arrival/departure strategies during periods of congestion at airports.
- The Volpe Center’s Accident Prevention Division, in conjunction with the NHTSA’s Office of Advanced Safety Research, has published four reports that address crash-problem definition and analysis. This work supports the U.S. DOT’s Intelligent Vehicle Initiative (IVI), which develops and deploys effective crash-avoidance systems on light vehicles, heavy trucks, transit buses, and specialty vehicles. “Analysis of Light Vehicle Crashes and Pre-Crash Scenarios Based on the 2000 General Estimates System,” was published in February 2003 and authored by Messrs. Wassim G. Najm, Basav Sen of EG&G Technical Services, Inc., (a Volpe contractor), and John D. Smith, and Ms. Brittany N. Campbell. The study divided the more than 6 million

Director’s Notes

Continued from page 1

In this issue of Highlights we describe some recent milestones and significant contributions made by the Volpe Center to reduce air traffic congestion and to improve air travel safety.

The Focus article describes a new release of the Enhanced Traffic Management System (ETMS), which helps the FAA to manage the flow of air traffic. ETMS was developed by the Volpe Center and first released in 1988. For the first time, air traffic controllers had the ability to see what was going on in the entire national airspace, not just the sector that they were responsible for. This early release resulted from prior Volpe theoretical work and limited implementation of support tools for FAA’s central flow facility in the 1970s. These efforts brought an understanding of traffic flow and the principles of flow management. With each successive release, ETMS has become more sophisticated and has included more functionality that helps to control the nation’s airspace. ETMS displays air traffic and weather, predicts the demands for airports and sectors, provides tools for air traffic management, enables the implementation of traffic rerouting strategies for hazardous weather avoidance, and enables collaborative decision making among FAA and the airlines. The result is smoother flow management, fewer delays, improved safety, and a better flying experience.

More recently, the Center began working with the FAA and the National Aeronautics and Space Administration (NASA) to develop modeling tools for en route congestion management. This issue of Highlights describes a new release of a decision-support tool being developed, the System-Wide Evaluation and Planning Tool (SWEPT). As SWEPT evolves, data

Continued on back page

light-vehicle crashes reported in 2000 into nine major crash types that, in turn, were separated into 56 specific and dominant pre-crash scenarios denoting vehicle movements and critical events immediately prior to a crash. The other three reports, co-authored by these same authors along with Mr. Marco P. daSilva of the Accident Prevention Division, separately analyzed pedestrian, pedalcyclist, and lane-change crashes to enable the development of concepts, functional requirements, performance guidelines, and test procedures, as well as the safety assessment of potential crash-avoidance systems.

- In June, as part of the Volpe Center's ongoing technical support to the IVI program, Dr. David Yang of the Accident Prevention Division published a report titled "2003 Status Report on Transit Intelligent Vehicle Initiative Studies." This report provides an overview of studies in the transit IVI area. The FTA will use this report to introduce advanced transit vehicle technologies to transit agencies. Co-authors are Mr. Brian Cronin, FTA; Mr. Neil Meltzer, Accident Prevention Division; and Ms. Margaret Zirker, Cambridge Systematics, Inc., (a Volpe contractor).
- Under the DOT IVI program, the Volpe Center is evaluating the effectiveness of a Drowsy Driver Warning System (DDWS) for NHTSA and the Federal Motor Carrier Safety Administration (FMCSA). Data to evaluate the DDWS will be collected in a field operational test (FOT). The Center was requested to recommend an experimental design for the FOT and to solicit external reviews. Drs. Stephen Popkin, Bruce Wilson, and Heidi Howarth researched experimental designs used in previous IVI FOTs, developed design assessment criteria, assessed six design options, identified a strong candidate experimental design, and summarized their findings in a technical information exchange document.
- Mr. Robert Hoaglund, CPP of the Infrastructure Protection and Operations Division gave a presentation at the Annual Meeting of the National Cargo Security Council held June 9-10, 2003, in Nashville, Tennessee. His presentation, "The Development of a Security Action Plan for Cargo Security and Antiterrorism," described the risk analysis approach to operations, physical, and information systems security in a maritime port environment. Preliminary best security practices from the forthcoming International Cargo Industry Best Security Practices Report concluded the presentation. Mr. Hoaglund is supporting the Combating Terrorism Technology Support Office (CTTSO)/Technology Support Working Group (TSWG) and other government agencies by conducting several foreign and domestic supply chain and port security surveys concerning counter-proliferation of weapons of mass destruction.
- At the invitation of Knowledge Platform VERDI in Rotterdam, the Netherlands, Mr. William Lyons of Volpe's Planning and Policy Analysis Division gave a presentation on May 20, 2003, on "Capacity Building for Transportation Planning in the United States." Platform VERDI is an organization of Dutch local and regional transportation authorities sponsored by the Dutch Ministry of Transport. Mr. Lyons was working on assignment at the Dutch Ministry's Transport Research Centre under its collaborative agreement with the Volpe Center. The agreement provides for exchanges of staff between the two national transportation research centers to provide technical assistance on priority topics of mutual interest. The two centers collaborate on a broad range of topics, including capacity building for transportation planning, operator fatigue and alertness, and public-private roles in funding and operating national passenger railroads.

Director's Notes

Continued from page 11

from ETMS will interface with SWEPT to create a platform for more advanced traffic flow management.

The Focus article also discusses a portion of the Center's significant work on preventing runway incursion, on-ground collisions of planes and/or ground vehicles. The largest aviation disaster in history (at Tenerife, Spain) resulted from a runway incursion. Volpe's ongoing work supporting the FAA's efforts to provide air traffic controllers with seamless surveillance coverage of airport surfaces and approaches can have a significant impact on preventing incursions. This issue discusses two more recent projects—developing runway status light systems and examining the human factors involved in runway incursions.

This issue also features our work supporting the FAA's Environmental Safety and Compliance Program, which involves identifying and remediating suspect facilities such as underground storage tanks, old radio transmitters, and radar equipment.

We are proud of all the work that the Volpe Center has performed for the FAA over more than thirty years. We are committed to helping the FAA achieve its strategic goals, and to supporting DOT Secretary Mineta's vision of safer, simpler, and smarter transportation solutions.

**Volpe National Transportation
Systems Center**

55 Broadway
Cambridge, MA 02142-1093

FOR MORE INFORMATION

Call: 617.494.2224

Fax: 617.494.2370

e-mail: MurrayL@volpe.dot.gov

<http://www.volpe.dot.gov>