Research and Special Programs Administration

the VOLPE center

National Transportation Systems Center

HIGHLIGHTS

Cambridge, Massachusetts Sept/Oct 2002

Richard R. John

Director's Notes

Supporting the Office of Pipeline Safety

The mission of RSPA's Office of Pipeline Safety (OPS) is to ensure the safe, reliable, and environmentally sound operation of the nation's pipeline transportation system. The importance of this mission was recently expressed by RSPA Administrator Ellen G. Engleman: "As overseers of the nation's 2.1 million miles of pipelines, we hold the people's trust to ensure that vital energy resources will be supplied safely." The Volpe Center supports OPS in several capacities.

Information technology has become critical to pipeline safety and security. Currently, a Volpe team is working on a knowledge-based, decision-support system that will allow OPS to leverage its resources to ensure safer pipeline distribution systems. The Center is also developing data analysis and information management strategies to enhance OPS's trend analysis and proactive information management. Advances in

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Incorporating security into **airport terminal design**

Improving the security of international container commerce

Supporting EPA's **Brownfields Initiative**

Focus

The Volpe Center is supporting the FAA in developing Air Tour Management Plans for approximately 50 National Park Service units. The plans will help mitigate or prevent adverse impacts from air tours on natural and cultural resources, visitor experience, and tribal lands. The Volpe team will start working with the FAA, NPS, and other stakeholders in fall/winter 2002 at Haleakala National Park (above) and Hawaii Volcanoes National Park. (Photo courtesy of National Park Service)

Preserving the Quiet of Our National Parks (FAA)

Scenic air tours over National Parks offer unique, often breathtaking views that many visitors feel enhance their park experience. The noise of the aircraft, however, can disturb the peace and quiet for people and wildlife on the ground. Congress passed the National Parks Air Tour Management Act of 2000 to regulate commercial air tour operations over units of the National Park System. The Act, which was initiated by Senator John McCain (R-AZ), requires that all persons operating or intending to operate commercial air tours apply to the Federal Aviation Administration (FAA) for authority to do so. The FAA, with the cooperation of the National Park Service, must develop Air Tour Management Plans (ATMPs) for those National Parks where there are commercial air tours. ATMPs will embody acceptable and effective measures to mitigate or prevent significant adverse impacts from air tours on natural and cultural resources, visitor experiences, and Native American tribal lands. Of the approximately 385 National Park System units in the United States, about 50 are reported to have commercial

air tour operations that may be subject to regulation under the Act. (However, at any time, commercial air tour operators can request an ATMP at any park unit covered by the Act.) The FAA is in the final phase of rulemaking required to begin ATMP development.

Programmatic Phase: Laying the Foundation

Since spring 2001, the Volpe Center has been providing environmental management and technical support to the FAA Western Pacific Region for the ATMP Program. The Volpe team, led by Dr. Paul Valihura of the Environmental Engineering Division, integrates staff from several Volpe divisions. The team recently completed the initial programmatic phase, which developed the foundation for developing and implementing ATMPs. Activities during this phase included:

- Providing consultation on compliance with the National Environmental Policy Act of 1969 (NEPA);
- Developing Implementation Plans and a Program Performance Strategy (a performance-based Implementation Plan with specific milestones);
- Developing a process to address potential impacts on cultural, historic, and prehistoric resources regulated by the Advisory Council on Historic Preservation;
- Developing an ATMP Web site, a brochure, and a training video in cooperation with FAA and NPS;
- Producing a training manual and advisory circulars (updates regarding regulatory compliance); and
- Performing noise measurement and modeling, including the first attempt to develop very low-level noise impact evaluation criteria, which would help determine what constitutes significant adverse impact.

Implementation Phase: A Delicate Balance

To ensure that ATMPs comply with all environmental standards, the Volpe team will develop each ATMP in parallel with an environmental analysis required by NEPA. The Volpe team's activities during the Implementation Phase will include:

- Developing air routes and schedules.
- Providing the technical basis for decision making regarding the potential impacts of air tours on wildlife, visitors, the natural environment, and the cultural environment. Protecting the cultural environment is a unique environmental justice activity. Issues could include potential interference with religious or cultural

A two-stage windscreen and microphone used to monitor noise in Bryce Canyon National Park. (Photo courtesy of Environmental Measurement and Modeling Division)

National Parks Air Tour Management Act of 2000

"This legislation takes a crucial first step toward restoring and preserving natural quiet within many of our nation's natural parks."

-Sen. John McCain, upon introducing the legislation

activities of Native Americans—for example, low-flying aircraft over a tribal ceremony. Another unique activity will be considering the definition of a park unit's soundscape, i.e., the natural sounds commonly heard in a given location.

- Participating in public outreach/information efforts. ATMPs will be developed through a public process that allows agencies, organizations, Native American tribes, affected air tour operators, and the general public to comment on the plans.
- Noise measurement, modeling, and analysis supporting the development of ATMPs and associated NEPA documentation.

Acadia National Park, Maine
(Photo courtesy of National Park Service)

Volpe: The Right Team for the Job

The ATMP process will involve many stakeholders and interested parties. The Volpe team will help the FAA strike the appropriate balance between: responding to visitor demand for air tours, considering tour operators' livelihoods, and protecting natural and cultural resources. Volpe's multidisciplinary team integrates the necessary expertise in aviation, information technology, environmental engineering, NEPA compliance, environmental measurement and modeling, and public participation. The Volpe team includes Division Chief Phil Mattson, Dr. Paul Valihura, Dr. Amishi Joshi, Ms. Michelle Morris, Mr. Paul Zebe, Ms. Jennifer Papazian, and Mr. Jose Mantilla, all of the Environmental Engineering Division; Ms. Ann DiMare of the Aviation Safety Division; Division Chief Gregg Fleming, Ms. Cynthia Lee, Mr. Christopher Roof, Dr. John McDonald, and Dr. Brian Kim, all of the Environmental Measurement and Modeling Division; Mr. David Damm-Luhr, Acting Chief of the Planning and Policy Analysis Division; and Ms. Jessica Paddock of EG&G Technical Services (a Volpe contractor).

FAA, NPS, and Volpe will work together to enable air tours to operate without significantly impacting natural and cultural resources, visitor experience, and tribal lands.

Safety

Supporting the Technical Pipeline Safety Committee (RSPA)

One of RSPA's strategic goals is to protect the public and the environment from risks caused by the transport of hazardous materials in pipelines. RSPA's Office of Pipeline Safety (OPS) is developing a proposed gas pipeline integrity management rule, which will be the culmination of a seven-year investigation of ways to improve the safety, security, and reliability of natural gas transmission lines in a cost-effective manner. This rule also will address the trend of increasing population density in formerly rural areas containing pipelines; associated construction can increase threats of damage to pipelines.

On July 18, 2002, Dr. Piyali Talukdar of the Economic and Industry Analysis Division participated in a meeting of the Technical Pipeline Safety Advisory Committee sponsored by OPS. The Committee provides DOT with a peer review of proposed pipeline safety regulations to ensure the technical feasibility, reasonableness, cost effectiveness, and practicability of regulations promulgated by OPS. Dr. Talukdar presented a brief overview of the energy impact statement she recently developed for the proposed OPS rule. Addressing the Committee, RSPA Administrator Ellen G. Engleman indicated the importance she places on the proposed pipeline integrity management rules and thanked all the committee members and the public for working with OPS. The Volpe Center also performed a peer review of the Interstate Natural Gas Association of America's consumer cost-effects study of the proposed regulation.

RSPA's pipeline integrity management rules will help ensure the highest level of safety while enabling the pipeline infrastructure to serve the vital energy needs of the economy.

Supporting Telecommunications Infrastructure Modernization (FAA)

The number and complexity of systems in the Federal Aviation Administration (FAA) that rely on telecommunications is rapidly increasing. In addition, the agency must upgrade or replace discrete systems as leases expire and FAA-owned systems become obsolete. In 1996, the FAA initiated a plan to replace its leased and owned telecommunications assets beginning in 2002. The FAA Telecommunications Infrastructure (FTI) Program was created to develop and provide fully integrated service support to FAA telecommunications customers, meeting the agency's future communications requirements in an integrated, comprehensive, and cost-effective manner. For more than two years, the Volpe Center has provided technical analyses, database development, and engineering support to the FTI Program. Volpe's role is a natural extension of nearly two decades of support to FAA's telecommunications business processes.

Volpe has supported FAA's telecommunications business processes for nearly 20 years.

Since 1983, the FAA's Telecommunications Information Management System (TIMS) has been the foundation of ordering, tracking, and paying for telecommunications services. Developed and operated by the Volpe Center, TIMS automates the non-real-time management of acquisition, inventory, and billing processes associated with the FAA's telecommunications assets. It allows FAA personnel to collect, organize, and report telecommunications equipment information using a suite of desktop tools that access an integrated database.

The Volpe Center's TIMS team worked with the FTI Program office to support solicitation of bids and selection of a contractor to implement the FTI. Volpe's activities included participating on the FTI engineering team in preparation of the solicitation and in evaluation of proposals, and developing requirements and prototype software for changes to TIMS that will support the FTI telecommunications business processes.

Air traffic control is one of the many critical FAA systems that depend on telecommunications.

Recently, Harris Corporation was awarded the 15-year contract worth up to $3.5 billion to supply telecommunications services to the FAA. Harris, acting as FTI systems integrator and prime contractor, is leading a team of telecommunications companies consisting of BellSouth Corporation; Qwest Communications International, Inc.; SBC Communications, Inc.; Sprint; and Verizon Communications as well as Raytheon Technical Services Company. The Harris team will consolidate the Leased Inter-facility National Air Space Communications System, Data Multiplexing Network, Bandwidth Manager, and the National Aviation Data Interchange Network into an integrated telecommunications infrastructure. Under FAA direction, the team will replace more than 35,000 circuits, upgrade switching and routing services, improve network monitoring and control, implement a state-of-the-art security system, and provide network-engineering services.

TIMS staff will now begin working with the FAA and the Harris Corporation to specify detailed requirements and interfaces between TIMS and the contractor's business systems. In addition, TIMS will play a major role in the transition of the FAA's current telecommunication services and circuit accounts to the new contractor.

Volpe Staff Member Provides Expert Testimony on Rail Structural Integrity (NTSB)

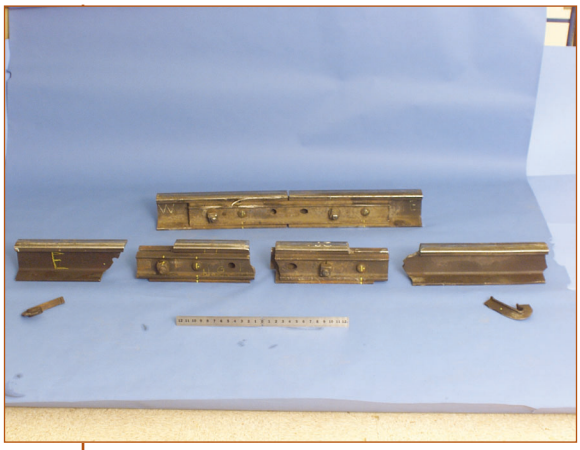
On July 15, 2002, Dr. David Jeong of the Vehicle Crashworthiness Division testified as an expert witness in a public hearing convened by the National Transportation Safety Board (NTSB). The purpose of the hearing was to examine the safety issues surrounding the train derailment that occurred on January 18, 2002, in Minot, North Dakota, and subsequent release of anhydrous ammonia, a hazardous material that is used as a farm fertilizer. Dr. Jeong's testimony focused on certain aspects of the Volpe Center's research on rail integrity that were relevant to the NTSB investigation of the derailment.

Volpe's research supports the Federal Railroad Administration's Track Systems Research Program. The Program develops engineering analysis

Track Systems Research Program

Volpe supports this Federal Railroad Administration program, which works to minimize the risk of train derailment.

tools and conducts analytical and experimental investigations to assess the likelihood that track defects will cause a train derailment. Results of these studies promote railroad safety and economic efficiency by enabling track engineers to target inspection and maintenance resources based on actual track performance. Specifically, the Program looks at rail integrity, track structural mechanics, track inspection tools, and vehicle-track interaction. Railroad rails are joined together either by welding or by joint bars that are bolted into the rail ends. The Minot derailment involved broken or fractured joint bars, and Dr. Jeong's testimony focused on the analysis of dynamic impact loads and the fatigue life of joint bars.



Railroad rails are joined together either by welding or by joint bars that are bolted into the rail ends. This photo shows intact and broken joint bars. (Photo courtesy of NTSB)

Analyzing Driver Distraction (NHTSA)

As part of the Volpe Center's ongoing technical support to the DOT's Intelligent Vehicle Initiative (IVI) program, Drs. David Yang and Lawrence Barr of the Accident Prevention Division recently completed an analysis of the eye-glance behavior and driving performance of drivers during distracting events. The primary purpose of the IVI program is to accelerate the development and deployment of advanced crash avoidance systems. This Volpe study provides a better understanding of the relationship between driver distraction and driver behavior. Results from this study will contribute to the development of countermeasures that will minimize driving distraction and reduce the number and severity of vehicle crashes.

A technical memorandum co-authored by Drs. Yang and Barr, titled "Phase II Results: Eye Glance Behavior and Driving Performance during Distracting Events," was submitted to the National Highway Traffic Safety Administration in May 2002. The study examined the relationship of driver distraction to eye-glance behavior and driver performance of truck drivers. The Volpe team analyzed existing naturalistic driving databases containing video clips of truck drivers. Although based on a limited set of data, results from the eye-glance analysis provide a better understanding of the relationship between different types of distraction activities and eye-glance behavior.

The Volpe study provides a better understanding of the relationship between driver distraction and driver behavior.

Homeland Security

Updating Planning and Design Guidelines for Airport Terminal Facilities (FAA)

In September 2001, Volpe staff were in the process of updating guidance for airport terminal planning and design in support of the Federal Aviation Administration's (FAA) Office of Airports. In response to the events of September 11, 2001, this ongoing work was significantly modified. In addition to updating the existing planning guidance, the Volpe team is greatly expanding the security-related material that will be included in the new guidance document. Because security-related protocols and parameters have been changing so rapidly, the Volpe Center, under the direction of project manager Mr. Zale Anis of the Service and Operations Assessment Division, is organizing a series of workshops to solicit industry feedback on related design issues as they evolve.

The first workshop, which focused on the facility and operational impacts of checked-baggage screening in ticketing lobbies, was held June 26, 2002, at FAA Headquarters in Washington, D.C. The morning program consisted of a series of presentations on operational and planning experiences encountered thus far with lobby screening. The afternoon was devoted to open discussion assessing the potential for changes in facility requirements as well as the possible development of more flexible planning techniques to accommodate those changes. Subsequent workshops may address passenger screening as well as integrated checked-baggage screening, which would integrate checked-baggage screening into the airline baggage system. Integrated screening would be conducted in the outbound baggage room rather than in the ticketing lobby. A second workshop is planned for spring 2003.

A series of Volpe workshops will provide security-related input to airport terminal planning and design guidance. The first workshop focused on impacts of screening checked baggage in ticketing lobbies. (Photo courtesy of Getty Images)

Intermodal Freight Efficiency and Security

Mr. Ken Troup of the Intermodal Logistics Systems Planning and Integration Division attended the annual conference of the National Cargo Security Council in Scottsdale, Arizona, on June 14 and 15, 2002. The conference, "Securing Assets in the Global Supply Chain," included many transportation security officials, from both industry and government. Mr. Troup gave a presentation at a workshop session titled "Distribution and Transportation 101."

His remarks dealt with security issues in the supply chain, particularly since September 11, 2001. He discussed supply chain management work performed by the Volpe Center and other agencies for the Department of Defense (including Operation Safe Commerce, see below), as well as several DOT-sponsored projects underway at U.S. ports or border crossings that demonstrate the importance of federal government and transportation industry cooperation in improving security without adversely affecting freight movement efficiency.

Cooperation between the federal government and the transportation industry is key to improving security without adversely affecting freight movement efficiency.

Operation Safe Commerce (CTTSO/TSWG)

Key federal, state, and private entities are working together to construct a prototype of a secure international trade corridor. Operation Safe Commerce aims to develop a model for improved security and mobility of shipments of containerized freight, while maintaining open borders and facilitating international commerce. Under the sponsorship of the Combating Terrorism Technology Support Office/Technical Support Working Group (CTTSO/TSWG), the Volpe Center is supporting the Department of Defense, U.S. Coast Guard, U.S. Marshals Service, and U.S. Customs Service in this innovative public-private partnership. Other public partners include the U.S. Attorneys Offices for Vermont and New Hampshire, and the State of New Hampshire Governor's Office. The Center executed Phase I of Operation Safe Commerce, in which a single cargo container was tracked, and its security monitored, during shipment from Central Europe to the United States.

The Volpe team achieved three objectives for Phase I: definition of the supply chain of a single container, demonstration of available technologies for tracking and monitoring the container's integrity and contents, and recommendations for improvements to the security of international container commerce. In June and July of 2002, the Center submitted draft reports documenting Phase I results.

The Volpe team consisted of Messrs. Joseph Koziol, Graham Watson, David Crawford, and Ms. Deidre Carrigan of the Technology Applications and Deployment Division; Messrs. Charles McCarthy, Robert Hoaglund, and John Wojtowicz of the Infrastructure Protection and Operations Division, and Messrs. Bob Baxter, Don Delk, and Alan Kauffman of Computer Science Corporation (a Volpe contractor).

CTTSO/TSWG is an interagency group whose mission is to provide for rapid research, development, and prototyping of new technology for the National Research and Development Program for Combating Terrorism.

The Port of Montreal, Canada, was one of the trans-shipment points of the demonstration supply chain evaluated in Operation Safe Commerce. (Photo courtesy of Mr. Joseph Koziol)

Human & Natural Environment

Brownfields Environmental Assessments (EPA)

The nation's landscape is littered with "brownfields," vacant or underused industrial and commercial facilities whose redevelopment is often complicated by real or perceived environmental contamination. Because lenders, investors, and developers fear that involvement with these sites may make them liable for cleaning up contamination they did not create, they are more attracted to developing sites in pristine areas called "greenfields." The neglected brownfields can create safety and health risks for residents, drive up unemployment, and degrade communities.

The Volpe team was required to assess the entire 21-acre brownfields site in Bellingham, Massachusetts, most of which is undeveloped. The size and complexity of the site required several visits. (Photo courtesy of Mr. Christopher Zevitas)

The Environmental Protection Agency's (EPA) Brownfields Initiative promotes the cleanup and sustainable redevelopment of brownfields. The Volpe Center is supporting EPA Region 1 in conducting environmental site assessments at a number of brownfield sites in New England, most recently in Bellingham, Massachusetts. Beginning in June 2002, Mr. Christopher Zevitas, Ms. Michelle Morris, and Mr. Ryan Cummings, all of the Environmental Engineering Division, performed site reconnaissance inspections at the Pearl Street Mill site. The inspections were conducted to document conditions and history relating to the presence of hazardous substances and petroleum products at the site. Located on the Charles River, the Pearl Street Mill site was originally a textile mill dating to the late 19th century. More recently, the site housed a variety of light industry and businesses. In 1999 the site was condemned for occupancy permit violations and was eventually acquired by the Town of Bellingham for nonpayment of taxes. The town is seeking to reuse the site to fill a critical need for senior housing.

The Pearl Street Mill buildings comprise about 75,000 sq ft. (Photo courtesy of Mr. Christopher Zevitas)

Redevelopment of the site is complicated by environmental contamination resulting from the presence of a variety of hazardous materials and waste. Future site activities will involve a detailed site investigation that will include the collection and analysis of soil and groundwater samples to determine the nature and extent of the contamination.

Volpe's environmental assessment and remediation work began in the 1990s with support to the Federal Aviation Admistration (FAA) at a contaminated site in Maine. The Center now supports similar work for a number of FAA regions, including the FAA Technical Center. Building on this sucess, Volpe has implemented several projects for the EPA, including Brownfields assessment work in Region 1.

Awards

- *Air Traffic Control Quarterly* recently published a special issue—*Air Traffic Management 2001, Vol. 10, No. 2*— focusing on the Fourth USA/Europe Seminar on Air Traffic Management Research and Development, held in December 2001. This issue is comprised of the papers that were voted the "best" in each of the five topical areas: human factors, decision support tools, metrics/weather/environment, optimal traffic flow and safety. A paper by Dr. Kim Cardosi of the Operator Performance and Safety Analysis Division was voted best in the human factors safety area. "Operational Errors in Air Traffic Control Towers in Surface Operations" focuses on the causes and remedies of controller errors in air traffic control towers. Almost 200 papers were submitted for participation in the seminar, 72 of which were accepted.

- Dr. Michelle Yeh of the Operator Performance and Safety Analysis Division received the American Psychological Association's (APA) George E. Briggs Dissertation Award for her thesis titled "Attention and Trust Biases in Augmented Reality: Examining the Effects of Image Realism, Interactivity, and the Presentation of Cueing Symbology." Dr. Yeh gave a special address on the dissertation at the annual APA meeting in Chicago, Illinois on August 24, 2002.

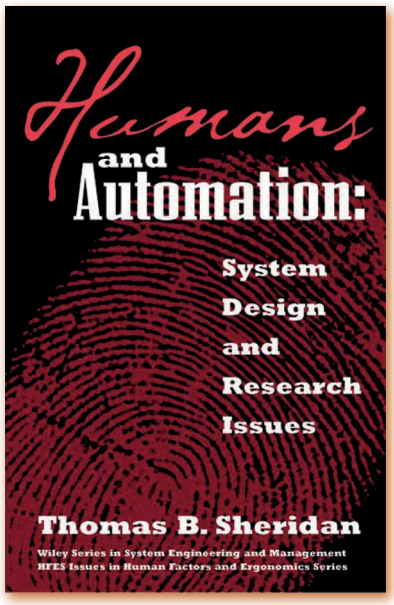
Published & Presented

- Dr. Tom Sheridan of the Operator Performance and Safety Analysis Division has completed a new book, "Humans and Automation: System Design and Research Issues." The book introduces system designers and engineers to the relations between human operators or users and the ever-increasing automation in transportation (aviation, rail, and highway), communication, manufacturing and chemical process, health care, and other fields. It provides an historical context for human factors and automation and describes how the two domains interact to ensure a system in which the human and machine operate with efficiency and safety. The book was co-published by John Wiley & Sons, Inc. and the Human Factors and Ergonomics Society, and is available from either organization.

- Dr. Wassim Najm of the Accident Prevention Division gave a presentation on estimating the safety benefits of crash avoidance systems at the National Intelligent Vehicle Initiative (IVI) meeting held in Washington, D.C., on May 15 and 16, 2002. His talk covered the DOT's efforts to estimate the safety benefits of crash warning and advisory systems, including safety-benefit measures; the challenge in projecting these measures for non-deployed systems; and the DOT's approach to dealing with this challenge. He also summarized DOT's efforts,

Operator Performance and Safety Analysis Division

This Volpe division resolves problems across all transportation modes by analyzing the relationship between human behavior and transportation safety and productivity.



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past and present, to develop safety-benefit estimates for selected systems, and described ongoing Volpe Center research to support the benefits-estimation effort. NHTSA's Office of Vehicle Safety Research sponsors Volpe's work.

- Dr. Eugene Gilbo of the Automation Applications Division participated in the O'Hare Delay Task Force (ODTF), which was created in June 2001 by the FAA and the City of Chicago. The purpose of the ODTF was to identify a comprehensive set of alternatives to reduce delays at Chicago O'Hare International Airport and to examine the merit of each alternative. The Task Force included a wide spectrum of local and national stakeholder representatives. Dr. Gilbo participated at the request of the FAA; his contribution is directly related to Volpe's work for the FAA Collaborative Decision Making program. On June 21, 2002, the Task Force issued a final technical report. The report describes 82 delay-reduction alternatives identified by the ODTF Working Groups, and summarizes the technical analysis and benefits of each delay-reduction alternative. Dr. Gilbo presented a delay-reduction alternative that was included in the report as "Improved Processing Rate Procedures" to increase the airfield efficiency by optimizing runway use.

- Ms. Suzanne Sloan of the Planning and Policy Analysis Division gave a presentation at the ITS New York Annual Meeting on June 7, 2002, to approximately 100 local practitioners of intelligent transportation systems (ITS). Ms. Sloan explained how the DOT's ITS Professional Capacity Building (PCB) Program can help them meet the new federal requirements for implementing a regional ITS architecture. Ms. Sloan made the presentation at the request of Mr. Ron Giguere, PCB Program Coordinator.

- On June 7, 2002, the Motor Carrier Safety Assessment Division delivered a final report titled "Intrastate Motor Carrier Safety Assessment System: Feasibility and Recommended Approach" to the Federal Motor Carrier Safety Administration (FMCSA). The report was written by Acting Division Chief Donald Wright, Mr. Krishna Jain, and Mr. David Madsen. Over the past several years, Volpe has developed, maintained, and improved SafeStat, an automated analysis system that determines the safety status of individual interstate motor carriers for national FMCSA safety improvement programs. The FMCSA requested that the Division expand the safety assessment capability to intrastate carriers using a SafeStat-like approach. This study focused on three states, Connecticut, Kentucky, and Oregon, which have been supplying FMCSA with intrastate carrier safety data. The results of the study demonstrated that intrastate data could produce meaningful SafeStat assessments using data available at the federal level. Connecticut has already successfully integrated its "Intrastate SafeStat" results with state operations data, and Utah, Texas, and Arizona have inquired about obtaining the system.

- Mr. William Lyons of the Planning and Policy Analysis Division participated in a workshop on "Benchmarking Transport Policy" at the invitation of the European Commission (EC) Directorate-General for Transport and Energy. The EC is the administrative body of the European Union. The workshop, held June 10-11, 2002, in Brussels, Belgium, was part of the EC's Benchmarking European Sustainable

Collaborative Decision Making

Collaborative Decision Making is the high-priority initiative of the FAA and airlines to provide improved operational service through sharing of information between the airlines and the FAA's air traffic management and control organization.

SafeStat assesses motor carriers for safety and makes the results available online.

Transport project. Workshop participants assessed the use of benchmarking in the development, implementation, and evaluation of transportation policy and provided recommendations to the EC on the development of benchmarking to assist in the implementation of sustainable transport policies in Europe. Mr. Lyons presented "The U.S. Framework for Transportation Policy: The Role of Benchmarking."

- On June 26, 2002, Dr. James Carroll of the Center for Navigation presented a paper at the Royal Institute of Navigation in London, UK, at a meeting titled "When GPS Fails – What Happens?" Dr. Carroll's presentation discussed the Volpe Center's vulnerability assessment of the global positioning system (GPS). The issues raised by the Volpe vulnerability assessment have particular relevance to satellite navigation users in Europe.

GPS uses a minimum of 24 satellites and ground receivers to track movement for navigation. (Illustrated by Norris S. Padmore)

- Mr. Gregg Fleming and Dr. Judith Rochat of the Environmental Measurement and Modeling Division participated in the Transportation Research Board's Summer Workshop on Transportation Related Noise and Vibration, held in Austin, Texas, July 7-10, 2002. Mr. Fleming chaired the Committee on Transportation Related Noise. Dr. Rochat chaired the Subcommittee on Highway Noise and presented the paper "FHWA's Traffic Noise Model Validation Study: Phase 1 Results." The Volpe Center supports the Federal Highway Administration (FHWA), Office of Natural Environment, in the development of the FHWA's Traffic Noise Model, a computer model for the design of highway noise barriers.

Noise barriers reduce the sound that enters a community from a busy highway. (Photo courtesy of Environmental Measurement and Modeling Division)

- The Volpe Center supports the U.S. Coast Guard Research and Development Center by assessing onboard ballast water treatment systems, whose purpose is to prevent the discharge of aquatic nuisance species into coastal waters. On July 11, 2002, the project team, led by Mr. Michael Dyer of the Technology Applications and Deployment Division, delivered the draft report "Assessment of Matson M/V R.J. Pfeiffer Alternative Ballast Water Treatment System" to the sponsor. (The R.J. Pfeiffer is a container ship.) The report includes a full engineering assessment of the experimental onboard treatment system, its interface with the ship, and a review of the biological measurements of the system's effectiveness.

Director's Notes

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remote management, wireless computing, open systems, and Internet technology now make many key pipeline facilities, such as control centers, more vulnerable to cyber attack. Accordingly, the Center has identified near-term technology that can effectively enhance deterrence, detection, response, and recovery.

Other pipeline safety work has included analytical and technical support, including cost-benefit analyses related to regulatory changes and background studies on safety issues.

Certain geographic areas are more vulnerable to pipeline incidents; such areas may include highly populated areas, recently populated areas, commercially navigable waterways, and areas containing drinking water sources. Through its Integrity Management Program, OPS is developing rules to validate pipe integrity in high-consequence areas where a pipeline failure could seriously affect the public or the environment.

An important resource in the rulemaking process is the Technical Pipeline Safety Advisory Committee, which provides the DOT with peer reviews of proposed pipeline safety standards and serves as a sounding board for discussing pipeline safety policy issues as well as legislative initiatives. In July, at the request of OPS, Volpe staff participated in a Committee meeting regarding the gas pipeline integrity rulemaking. (See page 3 of this issue of *Highlights*.)

The Center will continue to support RSPA as needed to help ensure the safety and security of our nation's vital energy resources.

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