



Volpe
National
Transportation
Systems
Center

Volpe Center Highlights

Cambridge, Massachusetts

January 2000

Director's

Notes



Dr. Richard R. John

As economic and technological advances continue to draw the world's nations closer together, the need for understanding the international aspects of transportation and logistics also grows. I am pleased to say that the Volpe Center has responded readily to this new challenge. In recent years, our activities with overseas parties and with non-U.S. sponsors have been increasing. You have read about many of these projects in previous issues of the *Highlights*. I would like to draw your attention to a major example of our international activities that is included in this issue, as well as other significant projects.

In 1998, Hurricane Mitch and other major storms devastated several Central American nations and destroyed many navigation aids (navaids) in key port cities in Honduras and Nicaragua. This destruction caused a severe economic setback and proved to be a major impediment to the recovery effort. Fortunately, the Volpe Center was

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Focus

Volpe Begins Navigation Work on Central America Reconstruction Project (RSPA)

A team from the Center for Navigation (Messrs. Andrew Caporale, Kam Chin, Hector Masmela, David Phinney, and Henry Wychorski) was in Honduras from December 8 to 17, 1999, to begin fieldwork for the Central America Reconstruction Project. The project, commissioned by the U.S. Agency for International Development (USAID), will provide recovery and reconstruction assistance to the region, which is still suffering from the effects of damage caused by Hurricane Mitch in 1998.

Through the Research and Special Programs Administration (RSPA), the Volpe Center will design and establish advanced navigation systems in Honduran and Nicaraguan ports where navigation facilities were destroyed.

In the spirit of sustainable restoration, the new systems will use modern technology based on Differential Global Positioning Systems (DGPS). The new systems will replace traditional visual navigation aids such as buoys, and provide accurate vessel tracking and navigation in harbors and waterways.

The Volpe Center was the logical choice to develop the new systems. The Center for Navigation made history when a commercial vessel was tracked for the first time in the St. Lawrence Seaway using the GPS system



(left to right) Kam Chin, RSPA Administrator Kelley S. Coyner, Hector Masmela, Andrew Caporale, DOT Secretary Rodney E. Slater, Oscar Delgado (Project Engineer), Liana de Cáceres (former Executive Secretary of COCATRAM), David Phinney, Henry Wychorski

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A parcel of land adjacent to the port of Cortés site. The towers in the photo are used for AM radio antennae and are similar to the towers that will be used for the radio beacon transmitters.

that it developed. Recently, the Center for Navigation installed a DGPS system in Panama with the assistance of the Panama Canal Commission and the U.S. Coast Guard (USCG). This system consists of 120 mobile units that communicate with a control center via a shore-based communications network. The mobile units consist of a GPS receiver and antenna, a laptop computer, and another radio antenna for communications with the control center.

During this initial visit to Honduras, the Volpe Center team met with officials from ENP (Empresa Nacional Portuaria), the Honduran national port authority, to review the DGPS-based navigation system design and to select two radio beacon transmitter sites. A third site in Nicaragua, which will serve two separate ports, has yet to be decided. In conjunction with ENP, the Volpe team selected the ports of Cortés and San Lorenzo in Honduras as transmitter sites, and traveled to meet with port officials and harbor pilots to discuss project elements, obtain user requirements, and demonstrate applications of DGPS-based navigation. Volpe engineers now are working with ENP engineers to finalize the design and to begin construction of the two transmitter sites.

During the trip, the team also met with representatives from COCATRAM (Comisión Centroamericana de Transporte Marítimo) to discuss the establishment of a Notice to Mariners system for the ports of Central America. This system, which will be coordinated by the National Imagery and Mapping Agency (NIMA), will provide a database of updated information to marine pilots on navigational aids in place in the ports.

In addition, the Volpe Center team provided technical and logistical support to DOT Secretary Rodney E. Slater and RSPA Administrator Kelley S. Coyner during their visit to Honduras on December 13, 1999, as part of a Transportation and Trade Mission to Central American and Caribbean countries.



Map of Honduras showing the ports of Cortés and San Lorenzo



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

Volpe's TMS Team On Site New Year's Eve to Support Y2K Transition (FAA)

In the spirit of One DOT, the Volpe Center supported the delicate Y2K transition of critical aviation computer systems during the New Year's weekend. On New Year's Eve, members of the Automation Applications Division, Telecommunications Division, and contractor staff along with Dr. Richard R. John, Director of the Volpe Center, and Dr. Frank Tung, Deputy Director of the Volpe Center, were on site in Cambridge, Massachusetts, to support the Department's high visibility Y2K transition of the Traffic Management System (TMS).

To demonstrate their confidence in the safety of the U.S. aviation system, DOT Secretary Rodney E. Slater, on-site at the Air Traffic Control System Command Center (ATCSCC) in Herndon, Virginia, spoke via cell phone at

the critical Y2K transition moment to Ms. Jane Garvey, Administrator of the Federal Aviation Administration (FAA), in the sky on a flight from Washington, D.C., to the West Coast. The video of their conversation, featuring Secretary Slater near a TMS computer, was broadcast live to a worldwide television audience. FAA managers reported to Dr. John afterward that they were "ecstatic" with the performance of the Volpe Center's TMS support team during the critical operations.

The Volpe Center developed, and houses and operates the TMS, the principal computer system used at the ATC-SCC. FAA uses TMS to predict, detect, and handle airspace congestion problems. The Volpe Center and the ATC-SCC are connected via high-speed telecommunications.

Volpe Provides Y2K Support to the U.S. Coast Guard (USCG)

During New Year's weekend, the Automation Technology Division, in support of the U.S. Coast Guard (USCG), operated a Y2K Support Center that was established at the Volpe Center using computer networking, video conferencing, and voice communications. The Support Center included on-line information databases (via a secure intranet web connection) on cutter equipment including Y2K status, and a problem tracking and reporting system to support any emergency response actions that might be required. Mr. Paul Bushueff and Mr. Paul Kudarauskas of the Automation Technology Division were on call and staffed the Support Center during the Y2K changeover. The transition went very smoothly and no emergency response actions were required. In preparation for this effort, the Division had supplied the Coast Guard with Y2K reports for six classes of cutters. Approximately 150 reports customized to each ship's unique configuration were sent to the cutters, detailing the status and corrective action of all potentially Y2K sensitive equipment. The Coast Guard was appreciative of the Volpe Center's support and ability to respond in a timely way to inquiries as they arose.

Technical Document Supports NHTSA Biomechanics Research (NHTSA)

A Volpe Center Technical Information Exchange (TIE) Document recently was completed in support of the Volpe Center's research activities to model anthropomorphic crash dummies. Dr. David Jeong, Mr. Peter Kwok, and Mr. Joseph Canha of the Vehicle Crashworthiness Division wrote the TIE document, entitled "Characterization of Viscoelastic Material Behavior from Dynamic Compression Test Data."

The TIE document presents a methodology to describe the mechanical behavior of urethane and neoprene rubber materials under impact conditions. This information was combined with regression analyses to determine material constants, which will be used in finite element models for biomechanics research.

This work and the work described in the next highlight contribute to the Volpe Center's focus on developing anthropomorphic models that can project the extent of injury to the human body from forces that are representative of those that take place in a motor vehicle crash. The overall goal of this work is to reduce injuries and fatalities.

Technical Document Supports NHTSA Crashworthiness Research (NHTSA)

Mr. Larry Simeone of the Vehicle Crashworthiness Division recently issued a Technical Information Exchange (TIE) document outlining the results of a parametric study using the MADYMO software package to the National Highway Traffic Safety Administration's (NHTSA) Office of Research and Development. MADYMO initially was developed to evaluate the collision-related characteristics of automobile interiors. The study, entitled "Parametric MADYMO Simulations of a 1995 Lumina Driver and Passenger during Full Frontal Impacts," involved the simulation of a driver and passenger occupant during a full frontal crash.

Three different sized occupants (a 5th percentile female, a 50th percentile male, and a 95th percentile male) were considered and crash speeds of 10, 20, 25, 30, 35, 40, and 50 miles-per-hour were investigated. Two restraint configurations were studied: occupants restrained by seat belts and air bags, and occupants restrained by air bags only (no seat belts).

Results indicated that slightly lower head and chest injuries occurred when the occupants did not wear seat belts. These results, however, came at the cost of significantly higher injuries to the lower extremities. The implication of these results is that overall harm to the occupant is increased when seat belts are not used.

Additionally, the smaller occupants regularly recorded lower injury levels than the larger occupants. These lower injury levels were partially a result of the seating position of the occupants. The smaller occupants were seated closer to the vehicle impact surfaces thereby engaging the safety restraints sooner (and at a lower velocity) than the larger occupants. In addition, the larger occupants had a higher kinetic energy because of their larger mass. The results of this parametric analysis are being used in systems studies to evaluate techniques for reducing injuries and fatalities in automobile accidents in the future.

Study Completed on Highway Vehicle Crossing Path Collisions (NHTSA)

Dr. Wassim Najm, Mr. Marco daSilva, and Mr. John Smith of the Accident Prevention Division, in conjunction with Dr. David Smith of the National Highway Traffic Safety Administration's (NHTSA) Office of Vehicle Safety Research, recently completed a preliminary study of highway vehicle crossing path collisions entitled "Analysis of Crossing Path Crashes." The study provides a better understanding of crash avoidance opportunities using intelligent vehicle safety systems. The results of this study will help guide DOT in setting research priorities for vehicle-based crash countermeasures under the Intelligent Vehicle Initiative (IVI) Program.

Crossing path collisions involve one vehicle cutting across the path of another, both initially traveling from either perpendicular or opposite directions. Using the 1998 General Estimates System (GES) crash database, this study determined the frequency, manner, and location of the 1.72 million police-reported crossing path collisions that occurred in the United States in 1998. The collisions then were divided into five major scenarios based on vehicle movements prior to the collision. In addition, the study identifies the primary causes of these collisions by analyzing a total of 498 crashes from the Crashworthiness Data System database, and statistically describes major crash contributing factors using the 1998 GES. Crossing path collision statistics were obtained for the following four vehicle platforms: light/passenger vehicles, trucks, buses, and emergency vehicles.

Volpe Staff Attend Rail Safety Meetings in Beijing, China, and Contribute to International Rail Defect Research Effort (FRA)

Mr. Robert Ricci, Director of the Office of Safety and Security, and Dr. David Jeong of the Vehicle Crashworthiness Division represented the Federal Railroad Administration (FRA) at the 5th Meeting of the UIC/WEC (Union Internationale des Chemis de Fer/World Executive Council) Joint Research Projects' Rail Defect Management Steering Group. This meeting was held in Beijing, China, from December 13 to 14, 1999. As a result of this meeting, the FRA and the Volpe Center will have a more active role in joint research projects with this international group.

The objective of the Steering Group's Rail Defect Management Program is to implement and develop technologies and management techniques to manage rail flows. The focus of the conference was to develop closer interaction between rail operators (users of the technology) and the rail industry (producers of the technology). Dr. Jeong briefed the steering group on the FRA/Volpe Center Rail Integrity Research Program, which includes an analytical model developed to predict the growth rate of a type of internal rail defect commonly encountered in North America. The steering group requested that the FRA and the Volpe Center assist in this project, specifically with regard to the modeling of rail defects. The Center will conduct analyses correlating the laboratory tests with analytical and/or computational models.

In addition, Mr. Ricci and Dr. Jeong attended a three-day technical conference on track technology that was held after the steering group meeting. The conference was sponsored by the UIC and the Chinese Railways, and was attended by more than 130 representatives from various railway organizations throughout the world. Their Chinese colleagues also hosted Mr. Ricci and Dr. Jeong for a visit to the Chinese Academy of Railway Sciences Test Center, which provides a similar function to that provided in the United States by the Transportation Technology Center in Pueblo, Colorado.

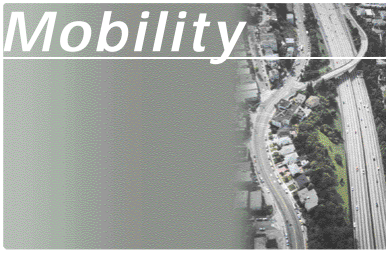
Study Completed in Support of Intelligent Vehicle Initiative (FHWA)

As part of the Volpe Center's technical support to the Federal Highway Administration's (FHWA) Intelligent Vehicle Initiative (IVI) Program, Mr. Larry Barr, Dr. Wassim Najm, and Mr. John Smith of the Accident Prevention Division recently completed a comprehensive study of highway vehicle run-off-road crashes, rear-end collisions, lane change collisions, and crossing path collisions. Statistics were obtained for light/passenger vehicles, trucks, buses, and emergency vehicles. The study, entitled "Crash Problem Definition for the Intelligent Vehicle Initiative," is the first study in which detailed statistical descriptions of the major crash types have been provided for each of the four vehicle platforms defined in the IVI Program. The study provides a better understanding of crash avoidance opportunities using intelligent vehicle safety systems.

The study used the 1998 General Estimates System (GES) crash database to determine the frequency and location of each major crash type, describe the vehicle platform involvement in each crash scenario, and identify the dominant contributing factors by vehicle platform in each crash type. In addition, vehicle pre-crash movements are statistically described for each of the four major crash scenarios. In 1998, approximately 1.79 million rear-end collisions (accounting for 28 percent of all police-reported crashes), 1.72 million crossing path collisions (27 percent), 0.94 million run-off-road crashes (15 percent), and 0.61 million lane change collisions (10 percent) occurred in the United States.

This study provides valuable information for defining the functional requirements of potential collision avoidance system concepts and for estimating countermeasure effectiveness and safety benefits. Finally, the results of this study will help guide DOT in prioritizing future research efforts on vehicle-based crash countermeasures under the IVI Program.

Mobility



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

Volpe Staff Member Chairs Session at Pecora 14 Land Satellite Information Conference (RSPA)

Dr. Aviva Brecher of the Transportation Strategic Planning and Analysis Office chaired a session on "Applications of Remote Sensing to Transportation" at the Pecora 14 Land Satellite Information Conference held in Denver, Colorado, from December 6 to 10, 1999. The conference, "Demonstrating the Value of Satellite Imagery," was sponsored by DOT, National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS), Environmental Protection Agency (EPA), and other federal agencies and professional organizations.

The conference featured an entire track on "Applications of Remote Sensing to Transportation" organized by the Transportation Research Board (TRB), as well as a training workshop for state and local transportation officials on "Advances in Remote Sensing and Data Capture Technologies for Transportation Applications." In addition, participants from the Research and Special Programs Administration (RSPA) and the Federal Highway Administration (FHWA) discussed the new DOT Research and Technology Applications Program and the DOT/NASA strategic partnership that will apply existing commercial remote sensing products to critical multi-modal transportation needs and that will develop new transportation technologies. For more information on the status of the Remote Sensing Transportation Applications Program, go to <http://scitech.dot.gov>.

Weather Issues and Needs Presented at Surface Transportation Symposium (FRA)

On December 1, 1999, Mr. Michael Rossetti of the Transportation Strategic Planning and Analysis Office presented "Weather Issues and Needs for Railroads" at the Symposium on Weather Information for Surface Transportation in Silver Spring, Maryland. The symposium was co-sponsored by the National Oceanic and Atmospheric Administration's (NOAA) Office of the Federal Coordinator for Meteorology and the Federal Highway Administration (FHWA). The goal of the symposium was to establish national needs and requirements for applying weather information to surface transportation. Briefings and panel discussions were held to aid participants in understanding the relevant overall weather information issues and needs for surface transportation decision-making activities.

Volpe Participates in ITS America Frequency Spectrum Workshop (FTA)

Mr. Joseph LoVecchio of the Telecommunications Division delivered a presentation on transit industry needs for Dedicated Short Range Communications (DSRC) for Intelligent Transportation Systems (ITS) applications at ITS America's 5.9 GHz Stakeholders Workshop held from December 16 to 17, 1999, in Washington, D.C. More than 60 representatives from the telecommunications industry, the Federal Highway Administration (FHWA), the ITS Joint Program Office (JPO), and JPO support contractors were in attendance.

ITS improves the safety and efficiency of surface transportation of people, vehicles, and goods. Telecommunications is a key component of ITS. As part of the Federal Transit Administration's (FTA) Advanced Public Transportation Systems Program, the Volpe Center provides technical support to FTA on telecommunications technology and electromagnetic spectrum issues. One recent spectrum development is the proposed allocation of the 5.9 GHz band for DSRC in ITS applications.

Mr. LoVecchio's presentation discussed transit industry use of DSRC, and transit interest in and support of the development of ITS standards for the new 5.9GHz band. Industry representatives stressed the need for timely development of standards if interoperable equipment is to be developed at the new frequency. Additionally, stakeholders discussed the need for active DOT involvement in standards development.



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

Airport Noise, Air Quality Highlighted at International Meetings (FAA)

From November 30 to December 3, 1999, Mr. Gregg Fleming of the Safety and Environmental Technology Division visited London, England, to participate in the Society of Automotive Engineers' (SAE) A-21 Committee on Aircraft Noise. At this meeting, he delivered presentations in support of the Federal Aviation Administration's (FAA) Office of Environment and Energy. These presentations related to the Division's expertise in the development and maintenance of the Integrated Noise Model (INM), a computer model for airport noise prediction and analysis.

In addition, Mr. Fleming and Dr. Roger Wayson of the Safety and Environmental Technology Division participated on December 2, 1999, in technical discussions at Gatwick Airport on aviation-related exhaust emissions, air-quality measurements, and monitoring in the United States and Europe. Participants at this meeting included representatives from the FAA; the Universities of Manchester and Greenwich; the National Aerospace Laboratory of the Netherlands; the Zurich Airport; and the British, Swiss, and Swedish governments. This meeting represented an initial effort to promote international cooperation and exchange of information on the topic of aviation-related air quality issues.

Dedication Held for Renovated TSC Child Care Center

On December 7, 1999, Dr. Richard R. John, Director of the Volpe Center, hosted a dedication of the recently renovated TSC Child Care Center. Ms. Kelley S. Coyner, Administrator of the Research and Special Programs Administration (RSPA), gave the keynote speech. In her remarks, Ms. Coyner thanked the individuals involved in completing the renovations and congratulated all those responsible for helping the Child Care Center achieve accreditation last spring from the National Association for the Education of Young Children (NAEYC). Renovations to the Child Care Center included installing new carpeting, painting all walls, building a ceramic tile wall in the preschool room, stripping and refinishing all wooden furniture, and purchasing new kitchen appliances and white boards for the children's art work. After her remarks, Ms. Coyner cut the ribbon, which was made by preschoolers. The preschoolers then sang two songs to close the festivities. In attendance at the dedication were members of the TSC Child Care Board of Directors, a number of TSC Child Care parents, some Volpe executive managers, and most of the Child Care Center's children.

The TSC Child Care Center, founded in 1987 by a team of federal and on-site contractors, offers quality and affordable child care services to the Volpe Center community and employees of local businesses. In the spring of 1998, the NAEYC granted accreditation to the TSC Child Care Center. Receiving NAEYC accreditation represents the epitome of excellence for child care centers. In fact, only 5 percent of early childhood programs nationwide have received accreditation.



Cutting the ribbon at the TSC Child Care Center dedication

Chamber of Commerce Honors Volpe Staff

Ms. Lynn Murray, Chief of the Communications and Technology Outreach Division, was honored at a December 8, 1999 meeting of the Cambridge Chamber of Commerce's Community Outreach Committee. Through Ms. Murray's initiative and leadership, the Committee has accomplished some remarkable projects since its founding in 1995:

- A Cambridge-based Social Audit (1996) that detailed what the business community contributes in terms of philanthropic, civic, and volunteer activities and that chronicled best practices;
- The first ever Volunteer Forum (1998) to increase community outreach and volunteerism within the business community, which was attended by the Superintendent of Schools, the Mayor, city councilors, and representatives of more than 100 Cambridge businesses;
- An ongoing Computer Donations Program (1999) based upon the federal model to benefit local schools.

Dr. Frank Hassler, Director of the Office of Strategic Programs and Resource Planning, acting on behalf of the Director of the Volpe Center, participated in the award ceremonies and the presentation of a plaque and letter of commendation from the Chairman of the Board, and the President and CEO of the Chamber.



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

Volpe Acquisition Division Excels in Electronic Commerce

The Volpe Center has achieved a significant presence in the area of electronic commerce (EC), one that sets the standard for other procurement automation efforts within DOT. The Acquisition Division has developed intranet- and Internet-based systems to serve the needs of their contracting and vendor communities. These systems have generated significant cost and administrative savings, and are considered a DOT EC best practice.

The Acquisition Division Intranet (ADNet) system supports the Internet EC initiatives, and provides useful information for Volpe project initiators and contract managers. The ADNet system is hosted on an internal web server within the Volpe Local Area Network. Its features include:

- Simultaneous posting of solicitation notices and procurement documents to the Volpe Acquisition Internet site, the Commerce Business Daily Network (CBDNet) web site, and the General Services Administration Electronic Posting System (EPS) used throughout DOT;
- Instantaneous posting of solicitations, amendments, and bidders mailing lists to the Volpe Acquisition Internet site;
- Centralized repository or archive of solicitation materials, contracts, and user guides;
- Automated record of solicitation activity (statistics).

The ADNet system has two groups of users: general users and administrative users. General users are any users within the Volpe community. They can view and/or download notices, solicitations, amendments, mailing lists, and ADNet activity statistics. General users also have access to useful guides on processing of procurements and using major contracts (i.e., on-site support service contracts and OMNI (Multiple Contractor Resource Base). These documents are publicly available. If they are current, procurements also will be available on the Acquisition Division's Internet site. If the procurement has been awarded, ADNet serves as an archive for these materials. Administrative users have a unique username and password, which provides them with more extensive privileges. These privileges include the ability to publish notices, solicitations, amendments, and bidders mailing lists, and send e-mail notifications to bidders mailing list registrants.

To provide a snapshot of Volpe Center acquisition activity, ADNet includes statistics on EC use, purchase card data, contract administration activity, process times, obligation activity, procurement preference program goals, and other statistics. The site provides specialists with Volpe-specific procurement guidance, forms, templates, how-to guides, topical areas, and all federal and DOT procurement guidance.

Additionally, the Volpe vendor community is served by www.volpe.dot.gov/procure/index.html, the Volpe Internet web site, which includes the search and registration features of their on-line posting service. All requirements in excess of \$25,000 are posted here. Volpe also posts special notices of interest to the general public and Volpe customers. For example, an invitation to the June 1999 Volpe Center Women-owned Business Showcase was posted on the site.

Recently, the Volpe Center implemented Compusearch's PRISM system as its automated procurement system. Initial feedback suggests that the system will be implemented successfully once the transition period is over and all legacy contracts have been entered into the system. FARA (Federal Acquisition Regulations Automated), the contract generation module of the PRISM suite, also is being implemented. FARA requires significant maintenance on contract checklists. The Volpe Center has completed a significant number of these checklists for cost-type contracts and multiple award contracts, which could be shared with other PRISM users.

The Volpe Center relies on its EC systems for all information dissemination and does not provide hardcopies of policies to its specialists or hardcopies of solicitations to its vendors. The cost savings were more than \$60,000 for fiscal year 1999. Combined with the documented satisfaction of users and vendors, this savings suggests that the Volpe Center's EC systems are exceeding the requirements of its customers and are an exceptional asset to the organization.

The Volpe Center used the services of its on-site automated data processing (ADP) support contractor (W.T. Chen) to develop its web site and ADnet capability. Total contractor costs to design, build, and maintain the live site and ADnet have totaled \$107,000 since it was implemented 3 years ago. Volpe acquisition staff now can maintain the site almost exclusively because of the ADnet capability. Accordingly, future contractor costs for support will be minimal.

Panama Canal Capacity Scheduling Work Applies Across Transportation Systems

At the Massachusetts Institute of Technology (MIT), Dr. Leon C. Hsu recently completed a thesis entitled "The Bottleneck Phenomenon in Scheduling of Transportation Systems." The thesis addresses critical issues in optimization of flow in any transportation system. Under the leadership of Dr. Dimitris J. Bertsimas, Boeing Professor of Operations Research at MIT, this work was started under contract to the Volpe Center to support the Panama Canal project, and shows specific solutions to scheduling ship, tugboat, and other resources simultaneously in the Panama Canal. The Volpe Center, realizing the potential significance of this work, continued to sponsor the study beyond the project parameters. This sponsorship has resulted in the development of algorithms



(left to right) Dr. Eugene Gilbo, Mr. Richard Wright, Dr. Dimitris J. Bertsimas, Dr. Richard R. John

that can be used to support the Center's work on the U.S. Air Traffic Control system and presents a solution to the problem of multiple airport scheduling.

Recently, Dr. Bertsimas visited the Volpe Center to deliver a copy of Dr. Hsu's thesis. He was greeted by Dr. Richard R. John, Director of the Volpe Center; Mr. Richard Wright of the Office of Traffic and Operations Management; and Dr. Eugene Gilbo of the Automation Applications Division.

This collaborative effort demonstrates how the Volpe Center has been able to take advantage of the proximity of MIT, and how collegial relationships have been established with MIT to sponsor and encourage work that will contribute to the Center's research areas. This research then can be used innovatively to support the Center's strategic goals.

DOT SBIR Program Uses Electronic Commerce (OST)

The DOT Small Business Innovation Research (SBIR) Program, which is managed by the Volpe Center's Mr. Joseph Henebury of the Communications and Technology Outreach Division, will break ground in fiscal year 2000 by accepting proposals electronically. These proposals are due on May 1, 2000. Small businesses, however, still will retain the option of submitting their proposals in hard copy, which will need to be postmarked by May 1, 2000. As of 1999, the SBIR solicitation became available in electronic form only on the Internet. This resulted in significant cost savings as it eliminated the need to print and mail more than 15,000 booklets annually. Electronic acceptance of proposals also is expected to yield cost savings.

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able to respond. On short notice, the Center for Navigation demonstrated a system using Differential Global Positioning System (DGPS) satellite-based navigation that could be deployed rapidly to replace the lost nav aids and restore vessel traffic. The U.S. Agency for International Development (USAID) subsequently asked the Center for Navigation to set up similar systems in key ports as part of the Central America Reconstruction Project. As you will read in this issue, the team has made its initial site visit and the process is well underway.

There are other international projects at the Volpe Center as well. We established a multidivisional team to help upgrade the National Airspace System (NAS) at U.S. Air Force bases in the United States and overseas. Australia and several European nations have asked Ms. Karen Van Dyke of the Center for Navigation to assist them in taking advantage of GPS navigational capabilities. The Center for Navigation also spearheaded the implementation of an Enhanced Vessel Traffic Management System for the Panama Canal. Mr. John Krumm of the Intermodal Logistics Systems Planning and Integration Division is assisting the United Kingdom Ministry of Defence in incorporating "broker technology" improvements to automated logistics systems. The Volpe Center originally developed this technology for the U.S. Air Force. Mr. Ross Gill of the Advanced Vehicle Technology Division has made a number of trips to the former Soviet Union to inspect the ability of their railroad system to transport nuclear weapons to disposal sites as part of arms reduction agreements with the United States.

The Volpe Center also has been involved in several important long-term international activities. Since 1984, the Center has participated in collaborative research with the Cracow University of Technology in Poland. This research has focused on the measurement of residual stress in railroad track and wheels. Mr. William Lyons of the Service Assessment Division was instrumental in forging a 1998 Memorandum of Understanding (MOU) between the Center and the Dutch Transport Research Center (TRC) in Rotterdam, Netherlands, for the exchange of information and technical assistance. Mr. Mark Safford of the Transportation Strategic Planning and Analysis Office has been supporting a North American Free Trade Agreement (NAFTA) Working Group on Transportation Science and Technology since 1996. His efforts helped lead to a 1998 "Initial Five-Year Plan for Increased Cooperation in the Field of North American Transportation Technologies," which was signed by Canada, Mexico, and the United States.

This is only a sample of the Volpe Center's many international projects and activities. For more information on international activities, please visit our web site at <http://www.volpe.dot.gov>.





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