



# HIGHLIGHTS

Cambridge, Massachusetts

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National Transportation Systems Center



*Richard R. John*  
**Director's Notes**

## A Center for Deployment

As we face the realities of the 21st century – rapidly changing technology, new requirements for security, and continued demands for efficient, cost-effective, and safe transportation – RSPA's Volpe Center fills a vital role. The Center assesses the needs of the transportation community, evaluates research and development in the technology community, and actively assists in deploying systems in innovative and effective ways.

This issue's *Focus* article covers the recent implementation of a Volpe-developed vessel communications and tracking network for the Saint Lawrence Seaway. We take great pride in Volpe's Center for Navigation, which has developed several Global Positioning System-based systems to improve navigation in shipping channels. In 1993, a commercial vessel was tracked for the first time in the Seaway with a GPS-based system developed by the Center. From 1995 through 2000, a Volpe team developed and installed a large-scale system for the Panama Canal based on

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## Focus



*The Volpe Center recently implemented a vessel communications and tracking network for the Saint Lawrence Seaway. The network, based on the automatic identification system, promises improved safety, security, and efficiency throughout the Seaway. Above, the new system in use at the Eisenhower Lock vessel traffic control center in New York. (Photo courtesy of Mr. Kam Chin)*

## Tracking Vessels on the Saint Lawrence Seaway (SLSDC)

When large cargo ships traverse narrow waterways, the careful management and navigation of their passage is critical to maximizing efficiency, safety, and security. The Center for Navigation at the Volpe Center has developed several systems that improve navigation in shipping channels. In December 2000, the Center completed the installation of a state-of-the-art system in the Panama Canal. Subsequently, similar systems were installed in Central American ports to restore navigation capabilities that were destroyed by hurricanes. Building on these successes, the Center designed and implemented a comprehensive vessel communications and tracking network that will identify and track all commercial vessels on the Saint Lawrence Seaway.

The network, based on automatic identification system (AIS) technology, provides signal coverage from Montreal to eastern Lake Erie. The system enables automatic vessel position reporting from vessels equipped with AIS transponders to the Seaway Traffic Management System. In turn, the shoreside AIS network provides vessel traffic services information, such as wind speeds, water levels, visibility conditions, and lock schedules to transiting ships.

The project was developed by the Center for Navigation under the sponsorship of a consortium composed of the Saint Lawrence Seaway Development Corporation, the Canadian St. Lawrence Seaway Management Corporation, The Shipping Federation of Canada, and the Canadian Shipowners Association. The U.S. and Canadian Seaway agencies jointly operate the Seaway's locks and channels, and also provide traffic management for the waterway.

On September 5, 2002, the AIS network was inaugurated on the Seaway with a ceremony at St. Lambert Lock, the entrance to the Seaway at Montreal, Canada. Volpe Center Director Richard R. John, along with Center for Navigation Division Chief Mike Moroney and Division staff Messrs. Kam Chin, David Phinney, and Bryan Long, attended the inauguration. The team from the Center for Navigation gave briefings on the AIS and conducted successful demonstrations of the system's capabilities.

RSPA Administrator Ellen G. Engleman spoke at the ceremony. "AIS will enhance safety, reliability, and security of shipping in the Seaway," she said. "It's a clear example of transportation research and technology meeting today's needs."

Although only a few ships currently have AIS, all ships traveling through the Saint Lawrence Seaway during the next shipping season, which will commence in late March 2003, will be required to carry AIS transponders. Vessels that approach the Seaway without an installed AIS transponder will be equipped with a portable unit for use while traveling through the waterway. The Saint Lawrence Seaway is the first waterway in the western hemisphere to operationally employ AIS technology.



*At the Saint Lawrence Seaway AIS inaugural event in Montreal on September 5, 2002, RSPA Administrator Ellen G. Engleman emphasized the importance of AIS in increasing maritime situation awareness. Also shown: Albert Jacquez (right), Administrator, Saint Lawrence Seaway Development Corporation; Richard Le Hir (left), President, The Shipping Federation of Canada. (Photo courtesy of Mr. Kam Chin)*

Since 1959, the Great Lakes St. Lawrence Seaway System has been a vital waterborne transportation link for moving goods between the heartland of North America and international markets. The Seaway System, 2,038 nautical miles in length, encompasses the St. Lawrence River and the 5 Great Lakes, and extends from the Gulf of St. Lawrence at the Atlantic Ocean to the western end of Lake Superior at the twin ports of Duluth, Minnesota, and Superior, Wisconsin. Each navigation season, more than 2,000 commercial vessel transits are made through the Seaway System's locks to call on major U.S. and Canadian ports. The St. Lawrence Seaway is co-managed by the U.S. and Canadian Seaway agencies.

### The Saint Lawrence Seaway

AIS uses Global Positioning System (GPS) technology and VHF digital radio transceivers to share vital marine navigation data from ship-to-ship, shore-to ship, and ship-to-shore in real time. Using the AIS communications protocol, vessels equipped with a transponder can be tracked by the three Seaway Vessel Traffic Control Centers (TCCs), which in turn transmit information back to the ships. All System traffic is thus aware of the exact location of any vessels in their vicinity, in any kind of weather. In addition, the TCCs transmit data such as lock order turn, water levels, current and wind speed and direction, and Seaway alerts or advisories, which can be accessed instantly via an onboard laptop computer. The information is displayed on a virtual map of the Seaway, which changes as the data change.

### How Does AIS Work?

Instant information about other vessels, such as type, size, position, course, and speed, greatly increases the margin of safety for crews in inclement weather and enhances environmental safety. In a time of heightened security concerns, AIS offers law enforcement officials a much-needed tool for responding more quickly and effectively in any emergency. System administrators will be able to schedule inspections and services in a more timely manner, effect better speed control, and schedule lockages and vessel tie-ups more efficiently. And industry will see improved traffic and fleet management as transit times are reduced and ships save on fuel.

### How Will AIS Improve Safety, Efficiency, and Security?

Source: [www.greatlakes-seaway.com](http://www.greatlakes-seaway.com)



### ***Supporting Fire Life Safety (FAA)***

The Volpe Center is providing fire protection engineering expertise to the Fire Life Safety Program of the Federal Aviation Administration's (FAA) Headquarters, Western Pacific, Eastern, New England, and Southern Regions. This effort is part of the Center's support of FAA's Environmental, Energy, and Safety Division. The prime objective of the Fire Life Safety Program is to ensure that all Air Traffic Control Towers owned or operated by the FAA are in compliance with federal codes established cooperatively by the FAA, Office of the Secretary of Transportation, and the Occupational Safety and Health Administration. The Center provides engineering, design, and field testing and construction support in the areas of fire-detection and alarm systems, structural fire protection, automatic sprinklers, emergency egress, and compliance with the Americans with Disabilities Act.

The Volpe team, led by Mr. Steve Losier of the Environmental Engineering Division and Mr. Mark Gentile of the Technology Applications and Deployment Division and supported by Hughes Associates, Inc. (a Volpe contractor), has conducted code-compliance evaluations at air traffic control towers in Worcester, Massachusetts; Myrtle Beach, South Carolina; North Myrtle Beach, South Carolina; and Tucson, Arizona. In September 2002, the team submitted final compliance evaluation reports to FAA. The Volpe Center will continue to provide engineering, design, and field support services to various FAA Regions in support of the Fire Life Safety Program.

### ***Fostering International Information Exchange***

With the continued growth of information technology, computer applications, system complexity, and performance demands in the aerospace arena, human-computer interaction has become a key factor in the development of aerospace systems. The bi-annual international conference on Engineering Human-Computer Interaction in Aeronautics (HCI-Aero) provides an international forum for the exchange of current research and issues in the development and operation of human-computer systems across the aeronautics domain, including flight



*A Volpe team conducted evaluations of code compliance at four air traffic control towers including this tower in North Myrtle Beach, South Carolina. (Photo courtesy of Mr. Mark Gentile)*

operations, maintenance, unmanned aerial vehicles, and air traffic controls. From October 23 through 25, 2002, the Volpe Center and the Massachusetts Institute of Technology co-hosted HCI-Aero 2002 at the Volpe Center. The HCI-Aero Conferences of the European Institute of Cognitive Sciences originated in Toulouse, France, and have been held bi-annually since 1986, alternating between Europe and North America since 1998.

Volpe participants included Center Director Richard R. John; Dr. Donald Sussman, Chief of the Operator Performance and Safety Analysis Division; and Dr. Divya C. Chandra of the Operator Performance and Safety Analysis Division. Dr. Sussman served as co-chair of a paper session on training, and Dr. Chandra presented "Human Factors Evaluation of Electronic Flight Bags" at a paper session on procedures and documents.

*An important function of the Volpe Center is enabling collaboration among members of the transportation community.*



### ***Helping to Secure Ports Worldwide (CTTSO/TSWG)***

In August 2002, the aircraft carrier *USS JFK* returned from Operation Enduring Freedom in the Middle East. Its journey home included a stop at Naval Station Norfolk, Virginia, to disembark air wing personnel. A new vessel-tracking system developed by the Volpe Center helped ensure that the *JFK* was well protected in the Naval Station harbor.

Volpe is developing the Vessel Identification and Positioning System (VIPS) for the Technical Support Working Group of the Department of Defense's (DoD) Combating Terrorism Technology Support Office. VIPS tracks vessels in harbors and ports to protect U.S.-flagged ships. The state-of-the-art system is one of several actions taken by the DoD in response to the terrorist attack on the *USS Cole* in October 2000.

VIPS employs Differential Global Positioning System technology in specially designed transponders. Security operations and force protection units can track all VIPS-equipped vessels in real time on a geographic display. Before any local service vessel can approach a U.S.-flagged vessel, it is boarded and inspected by an explosive-detection team. If that inspection is satisfactory, a VIPS transponder is installed on that vessel so it too can be monitored. The Office of the Commander-in-Chief of the U.S. Atlantic Fleet uses VIPS to improve the effectiveness of Navy Protection Forces operations.



*USS JFK approaches the pier at Naval Station Norfolk, the first U.S. facility to incorporate VIPS into harbor protection. VIPS is scheduled for overseas deployment in late 2002. (Photo courtesy of U.S. Navy)*

Naval Station Norfolk is the first U.S. facility to incorporate VIPS in harbor protection procedures. VIPS was first demonstrated at the Naval Station on August 1, 2002, with the arrival of the *USS JFK*. In attendance at the demonstration were Rear Admiral David Architzel, the Commander of the Navy Mid-Atlantic Region; representatives of the Naval Operations Antiterrorism/Force Protection Division; and representatives of the U.S. Coast Guard Atlantic Area Command. Prior to the demonstration, the Volpe VIPS team conducted a progress review of the system. The Volpe team consists of project lead Mr. Henry Wychorski and Messrs. David Phinney, Daniel Nim, McCharles Craven, and Thomas Cantwell, all of the Center for Navigation, and Mr. John Wojtowicz of the Infrastructure Protection and Operations Division. VIPS is scheduled for overseas deployment in the coming months.

### ***Supporting Strategic Arms Reduction (DTRA)***

The Volpe Center provides railroad technical expertise to the Defense Threat Reduction Agency (DTRA) in its mission under the Strategic Arms Reduction Treaties I and II, which require the transfer, storage, and elimination of nuclear weapons throughout the former Soviet Union. Volpe supports the transport of warheads, missiles, fuel, and chemicals via special railcars to various sites in Russia.

Throughout 2002, the Volpe team of Mr. Ross Gill of the Railroad Systems Division and Mr. Jack Krumm of the Intermodal Logistics Systems Planning and Integration Division traveled to Bryansk, Russia, as part of this effort. Mr. Gill and Mr. Krumm recently inspected and approved engineering work at a railcar elimination facility in Bryansk, assisting the DTRA team with setup and on-site inspection of newly constructed Russian facilities to break down railcar launch systems that formerly supported missiles. The final acceptance was conducted in mid-September.

From August 24 to 28, 2002, Mr. Gill joined a DTRA team in Zlatoust, Russia, to evaluate and inspect the final section of 6 kilometers of refurbished track. With the final acceptance of the track, 40 SS-N20 missiles will be transported for elimination beginning this fall. The rate of elimination is 10 missiles per year under Russian environmental laws. Volpe Center support of this program is expected to continue through 2009.

*VIPS, developed by the Volpe Center, tracks vessels in harbors and ports to protect U.S.-flagged ships.*



*Russian crews remove track at the entrance to a Ministry of Defense Facility near the City of Bryansk, Russia. A Volpe team examined rail construction and inspected missile launch cars destined for elimination at this facility. (Photo courtesy of Mr. Ross Gill)*

### ***Volpe Supports Deployment of Watercraft Program Subsystems (U.S. Army)***

The U.S. Army's Force Projection strategy requires rapid movement of cargo from ship to shore. Cargo movement is especially challenging where ports are unavailable or inadequate. The Volpe Center provides engineering and programmatic services to the Modular Causeway Systems (MCS) Program. The MCS is composed of a series of standardized components that join together in various configurations to build floating piers, floating offshore platforms for discharging cargo from a ship, and powered ferries for transporting vehicles and containers ashore.

On August 26, 2002, two MCS subsystems were officially released for unrestricted use: the Roll-on/Roll-off Discharge Facility and the Floating Causeway. Both subsystems had been under development for 12 years. "Material release" is a process used by the Army to ensure that all equipment soldiers will use has been determined to be safe, maintainable, and supportable. In support of the material release process, the Volpe team performed tests and participated in operational demonstrations of all four MCS subsystems: Roll-on/Roll-off Discharge Facility, Floating Causeway, Warping Tug, and Causeway Ferry. The latter two subsystems are scheduled for material release in 2003. The Volpe team also developed training programs and logistics support data, and will participate in the deployment of all four MCS subsystems to the U.S. Army's 7th Transportation Group in Fort Eustis, Virginia.

The Volpe team consists of Mr. Christopher Murray, Ms. Julia Devine, Mr. Bob Pray, and team leader Mr. Michael Buonopane, all of the Technology Applications and Deployment Division. This effort is sponsored by the U.S. Army's Program Executive Office, Combat Service and Combat Service Support, Program Manager - Force Projection, Army Watercraft Systems Office.



*The Roll-on/Roll-off Discharge Facility is a floating platform that provides a roadway between a ship's ramp and a powered ferry. (Photo courtesy of Mr. Michael Buonopane)*

### ***Volpe Team Evaluates Cargo Tracking Project (U.S. Customs Service)***

In response to widespread concern that cargo containers could be exploited to smuggle terrorists and/or weapons, the U.S. Customs Service is taking a proactive role in making the maritime trade environment more secure while maintaining efficiency. U.S. Customs is working with ports that send high volumes of container traffic into the United States, as well as the governments in these locations. For example, U.S. Customs and the Canada Customs and Revenue Agency have assigned inspectors to key ports in each other's countries to inspect and clear containers prior to their crossing the U.S.–Canada border.

In a U.S. Customs pilot program at Vancouver, British Columbia, a U.S.–Canada customs team determines which U.S.-bound containers are high risk, inspects the chosen containers, and affixes electronic seals to those containers. Electronic seals transmit information stored in the seal by short-range radio to a receiver. If the seal has not been opened or tampered with, U.S. Customs can allow it to enter the United States without a second inspection at the border. Although mechanical seals can also serve that purpose, electronic seals can be used to automate and streamline the process to keep traffic and commerce flowing at the border.

The Volpe Center team, consisting of Mr. Kenneth Troup and Ms. Nancy Cooney of the Intermodal Logistics Systems Planning and Integration Division and Mr. Charles McCarthy of the Infrastructure Protection and Operations Division, evaluated the electronic seals pilot project. On September 18, 2002, the team submitted a report to the Applied Technology Division at the U.S. Customs Service in Washington, D.C., making recommendations to improve the existing Vancouver-to-United States pilot, to expand the project to the ports of Montreal and Halifax, and to develop the longer term capability to integrate electronic seals data into U.S. Customs information management systems.

In the pilot program, the data transmitted by the electronic seals was limited to seal number and tamper indication. In an expanded program, more data could be transmitted and the receiver could be permanently mounted at the border crossing, allowing the seal data to be automatically read and retransmitted by computer to a database or monitoring station. The system could automatically alert a U.S. Customs inspector of tampering, eliminating the need to physically examine each seal. Targeting and inspecting certain containers before they reach the U.S. border can help improve security while facilitating commerce.



*Offloading containers at Vancouver container terminal. The Volpe Center is supporting U.S. Customs in its efforts to make global shipping more secure. (Photo courtesy of Mr. Charles McCarthy)*





### **Supporting Alternative Transportation Systems in National Parks (FHWA)**

In cooperation with the Federal Highway Administration, Federal Lands Highway Core Business Unit, the Volpe Center supports a comprehensive program of the National Park Service aimed at developing and implementing alternative transportation systems that may help reduce air and noise pollution in the National Parks. One project studies impacts of vehicular traffic on park air and noise quality. As part of this project, the team is examining the Ford "Th!nk" vehicle, a zero-emission electric vehicle being used by some park rangers, maintenance staff, and park volunteers. The overall project goal is to model and predict park air and noise quality improvements that might be achieved through the substitution of more fuel-efficient, quieter vehicles, and/or alternative transportation solutions.

From August 22 to 28, Ms. Nancy Garrity and Messrs. Michael Lau, George Noel, and Clay Reheman of the Environmental Measurement and Modeling Division visited Yosemite National Park in California. The Volpe team performed noise measurements of the battery-powered "Th!nk" vehicle and a diesel-powered park shuttle bus. They also recorded visitor vehicle information for an emissions database; additional visitor vehicle data will be collected from Point Reyes National Seashore and Joshua Tree National Park, both in California. The team will use this data to complete Visitor Vehicular Impact Studies at the Parks.



*At Yosemite National Park, a Volpe team conducted noise measurements on a zero-emission Ford "Th!nk" vehicle. The measuring device is just to the right of the vehicle. (Photo courtesy of Ms. Nancy Garrity)*

## Awards

- On August 5, 2002, two Volpe staff members received Group Superior Accomplishment Awards from the manager of the Federal Aviation Administration's Flight Standards Certification and Surveillance Division.
  - Ms. Regina Houston, Aviation Safety Division, received the award in acknowledgement of her contributions as a member of the National Program Guidelines Surveillance and Evaluation Program Workgroup. The workgroup developed software and work instructions to introduce system safety and risk management procedures to particular air carriers.

- Mr. David Tamaro, Aviation Safety Division, received the award in acknowledgement of his contributions as a member of the Safety Performance Analysis System/Air Transportation Oversight System (ATOS) Integration Panel. The panel developed the requirements for data presentations to meet the needs of the ATOS Certificate Management Office managers, principal inspectors, and analysts.
- Ms. Lynn Murray, Chief of the Communications and Technology Outreach Division, recently accepted an award from the Federal Laboratory Consortium for Technology Transfer. Ms. Murray received the 2002 Northeast Region Regional Coordinators Excellence Award for her significant contributions to the region's technology transfer efforts.
- Ms. Karen Van Dyke of the Center for Navigation, as a member of the Civil-Related Interagency Global Positioning System (GPS) Executive Board Project Team, shared the Team of the Quarter Award from the GPS Joint Program Office. On September 6, 2002, U.S. Air Force Colonel Doug Loverro, who heads the GPS Joint Program Office, presented the award. The team was honored for demonstrating the significant benefits to civil and military safety-of-life applications of GPS that will result from better understanding the failure modes of current and future GPS signals and developing the capability to provide sufficient, worldwide monitoring of the signals.

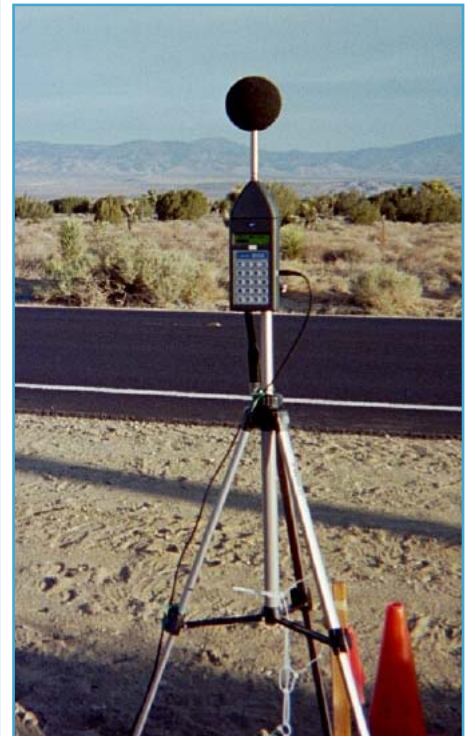
*Volpe staff received Group Superior Accomplishment Awards from FAA.*

## Papers & Presentations

- The Volpe Center co-sponsored, with the American Society of Civil Engineers, the 7th International Conference on Applications of Advanced Technology in Transportation, held in Cambridge, Massachusetts, August 5 through 7, 2002. Center Director Richard R. John was a keynote speaker, and Mr. Gary Ritter of the Service and Operations Assessment Division, was a chief organizer and host of the event. Several Volpe staff members presented at the conference.
- Dr. Aviva Brecher, Office of Environmental Preservation and Systems Modernization, organized, chaired, and moderated the session "Remote Sensing." The Volpe Center supports RSPA in shaping and advancing the R&D agenda of the DOT/NASA program on transportation applications of remote sensing technologies.
- Mr. Michael Buonapane, Technology Applications and Deployment Division, presented the paper "Modular Causeway Systems - Hitting the Beach with the U.S. Army." The Center's support to the U.S. Army's Program Executive Office, Combat Service and Combat Service Support, Program Manager - Force Projection includes engineering support to Modular Causeway Systems.

*Volpe presenters covered topics ranging from transportation applications of remote sensing, to alternative fuel vehicles, to environmentally safe fire-suppression systems for watercraft.*

- Mr. William Chernicoff, Advanced Vehicle Technologies Division, moderated the session "Delay, Timing and Control" and presented the paper "Strategy for Implementation of Alternate Fuel Vehicles." In cooperation with the Federal Highway Administration, the Center supports the National Park Service program, aimed at developing alternative transportation systems for the National Parks.
- Mr. Mark Gentile, Technology Applications and Deployment Division, presented the paper "Halon Alternative, A Shipboard Retrofit Experience." The Center's support to the U.S. Army's Program Executive Office, Combat Service and Combat Service Support, Program Manager - Force Projection includes retrofitting environmentally safe fire-suppression systems on watercraft.
- Ms. Cynthia Lee, Environmental Measurement and Modeling Division, presented the paper "Development of Aircraft Noise Impact Criteria in the National Parks." The Center assists the Federal Aviation Administration by providing environmental management support to the FAA's Air Tour Management Plan Program.
- Mr. Arthur Flores of the Environmental Measurement and Modeling Division participated in the 16th International Conference on Alcohol, Drugs and Traffic Safety, held in Montreal, Canada, on August 5 and 6, 2002. He presented the paper "Breath Alcohol Concentration and Breath Temperature." The Volpe Center supports the National Highway Traffic Safety Administration, Office of Research and Traffic Records, by conducting studies of techniques for measuring alcohol on breath and in blood. The studies include evaluation of breath-alcohol testing procedures and practices of state law-enforcement agencies.
- Dr. James Hallock, Chief of the Aviation Safety Division, co-authored an article that appears in the July-August 2002 issue of the *Journal of Aircraft* (Vol. 39, No. 4) published by the American Institute of Aeronautics and Astronautics. The article is titled "Wake Turbulence Limits on Paired Approaches to Parallel Runways." Aircraft wake turbulence considerations currently restrict the use of parallel runways less than 2,500 feet apart. The article shows that wake turbulence is not a factor if there are appropriate limits on allowed longitudinal aircraft pair spacing and/or allowed crosswinds. The tradeoffs are assessed by modeling and by examining wake data collected by the Volpe Center at O'Hare and Dallas/Ft. Worth airports.
- The Volpe Center supports the Defense Threat Reduction Agency (DTRA) Biological Defense Initiative (BDI). The project team, consisting of Mr. Walter Gazda, of the Economic and Industry Analysis Division, and Mr. Paul Zebe and Ms. Nicole Rossbach, both of the Environmental Engineering Division, submitted two reports to DTRA on August 30, 2002. "DOT Technology Resources for the BDI" describes DOT activities of potential interest to the BDI, including implementation of Intelligent Transportation Systems for surveillance and freight management, as well as Operation Safe Commerce, a public-private partnership to create a prototype of a secure international trade corridor. "Preliminary Identification of Required Additions to Transportation Data (Draft)" describes DOT data on transportation infrastructure, networks, and flows.



*Volpe's environmental management support to the FAA's Air Tour Management Program includes noise monitoring in National Parks. (Photo courtesy of Environmental Measurement and Modeling Division)*

- During August 19-22, 2002, Ms. Cynthia Lee and Dr. Judith Rochat of the Environmental Measurement and Modeling Division participated in the 2002 International Congress and Exposition on Noise Control Engineering in Dearborn, Michigan. Ms. Lee presented the paper "General Health Effects of Transportation Noise" (co-authored with Division Chief Gregg Fleming). Dr. Rochat chaired the panel "Tire/Road Noise" and presented the paper "Long-Term, Multiple Pavement Type, Tire/Road Noise Study."
- On September 17, 2002, at the request of his Federal Transit Administration (FTA) sponsor, Mr. Robert Casey of the Service and Operations Assessment Division attended the e-Safety Congress in Lyon, France. Mr. Casey presented the paper "Enhanced Safety Through Advanced Transit Traveler Information," developed for the FTA. Several examples of real-time information provided by transit agencies in the United States were included in the presentation (see illustration). The meeting was sponsored by ERTICO, a public-private partnership for the implementation of Intelligent Transportation Systems and services in Europe.
- In December 2002, Ms. Beth Deysher and Mr. Jon Ohman from the Motor Carrier Safety Assessment Division, with assistance from Mr. Leon Parkin of EG&G Technical Services, Inc. (a Volpe contractor), completed a Report to Congress, "Implementation of the Revised Civil Penalties Resulting from Violations of Federal Motor Carrier Safety Regulations," for the Federal Motor Carrier Safety Administration (FMCSA). The analysis used FMCSA enforcement data to assess implementation by the FMCSA of selected revised penalties placed on carriers for violating FMCSA safety regulations.
- Volpe Center staff participated in the 2002 Environmental Railroad Conference in Urbana, Illinois, from October 8 through 10, 2002. Dr. Amishi Joshi presented the paper "Environmental Review of the U.S. Maglev Program," which was co-authored by Dr. Paul Valihura. The paper informs the railroad community about the Maglev project and describes the associated potential environmental impacts. The Volpe Center supports the Federal Railroad Administration's Magnetic Levitation Transportation Technology Deployment Program in all aspects of environmental compliance.



*In Portland, Oregon potential riders can use the Internet to see the locations of streetcars and plan travel accordingly.*

## Director's Notes

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differential GPS (DGPS), which produces highly accurate location data. Recent Volpe efforts in small ports in Honduras and Nicaragua replaced traditional visual navigation aids, such as buoys, with mobile DGPS units that enable navigation in ports and in narrow approach channels during all types of weather. Although they vary in scale, these systems have had similar impacts, including more accurate scheduling, shorter transit time, and lower shipping costs. Such systems can also offer significant safety and security benefits, as they increase maritime situation awareness.

Our staff has found that technologies developed to facilitate operations can also help protect facilities and people. For example, a Volpe team recently implemented the Vessel Identification and Positioning System (VIPS) for the Technical Support Working Group of the DoD's Combating Terrorism Technology Support Office. (See page 5 in this issue of *Highlights*.)

Employing navigation technologies developed by the Center to track commercial ships traversing the Panama Canal and the Saint Lawrence Seaway, VIPS is used by the U.S. military to monitor and protect U.S.-flagged ships in domestic and foreign ports. The evolution of these "dual-purpose" technologies is a prime example of Volpe's success as a catalyst and facilitator of innovation.