

Director's

Notes



Dr. Richard R. John

On September 22, the Volpe National Transportation Systems Center (Volpe Center) hosted a Department of Transportation (DOT) Seminar on Transportation and Global Climate Change to review recent research on basic issues related to emissions trading and credit for voluntary early action. Speakers included Transportation Deputy Secretary Mortimer L. Downey, Treasury Deputy Assistant Secretary for Economic Policy Robert Cumby, and representatives of Van Ness Feldman, Massachusetts Institute of Technology, the Center for Clean Air Policy, and the Environmental Defense Fund. Approximately 20 participants from key stakeholder groups – including representatives of fuel providers, vehicle manufacturers, vehicle owners and operators, the Department of State, the Commonwealth of Massachusetts, and the State of Illinois discussed areas that may benefit from further study.

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Focus

Joint Warrior Interoperability Demonstration in London, England (USAF AMC & RAF)

The Volpe Center, in partnership with the United Kingdom's Ministry of Defense and the U.S. Air Force, participated in the Joint Warrior Interoperability Demonstration (JWID) from July 12 to 30 in London, England. The Volpe Center demonstrated an application called the North Atlantic Treaty Organization (NATO) Flight Following.

The Volpe Center was asked to demonstrate that it was feasible to enable communication and information sharing among information technology platforms that use different formats. Volpe's developers took parts of four stand-alone computer systems from two countries (one involving aircraft, one involving ground-based vehicles, another involving maintenance, and another involving passengers), and put them into one graphic display. The result is a data fusion device known as *broker*, which can consolidate information over the Internet in simple, graphic, yet secure forms using Windows 95 formats. Mr. Jack Krumm of the Intermodal Logistics Systems Planning and Integration Division is the broker system's principal developer.



Aircraft Information Screen

The Volpe Center negotiated agreements for an international sharing of data between the Air Mobility Command of the U.S. Air Force and the movements unit of the Royal Air Force. The result of this international cooperation was a joint tracking of the strategic airlift of two NATO countries

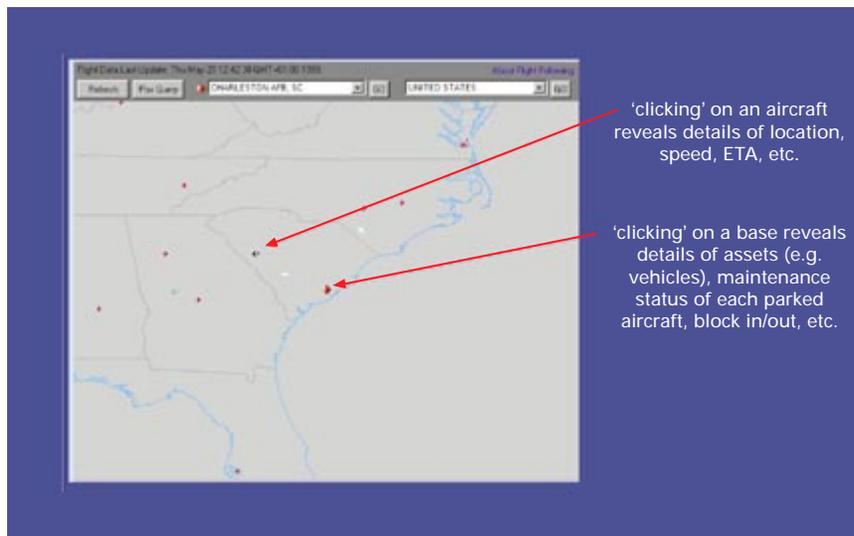
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during an exercise. The demonstration also showed that information could be linked rapidly and cost effectively; as NATO or other nations make joint efforts with the United States, it will be feasible to rapidly integrate transportation systems. The Volpe Center's application was highly praised, and was viewed by representatives from the United Kingdom, Australia, New Zealand, the Netherlands, France, and the United States.



Screen Displaying Location of Various Aircraft



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

Volpe Develops Training Materials for the USPS Hazmat Mail Security Program (USPS)

Mr. Glenn Goulet of the Environmental Engineering Division attended a meeting with the U.S. Postal Service (USPS) at the National Transportation Safety Board (NTSB) headquarters, in Washington, D.C., to outline the progress of the USPS Hazmat Program. Although hazardous materials in the mail has never been the cause or a contributing factor of an air disaster, the NTSB ValuJet report identified undeclared hazardous materials in the mail as a serious potential danger for aviation. This program is the response of USPS to the ValuJet report recommending adequate training for safe handling of hazardous materials. The Volpe Center conducted a needs assessment with USPS Aviation Mail Centers/Facilities (AMC/F) and also developed training materials to educate employees about hazardous materials. Training materials consisted of an overview of hazmat awareness

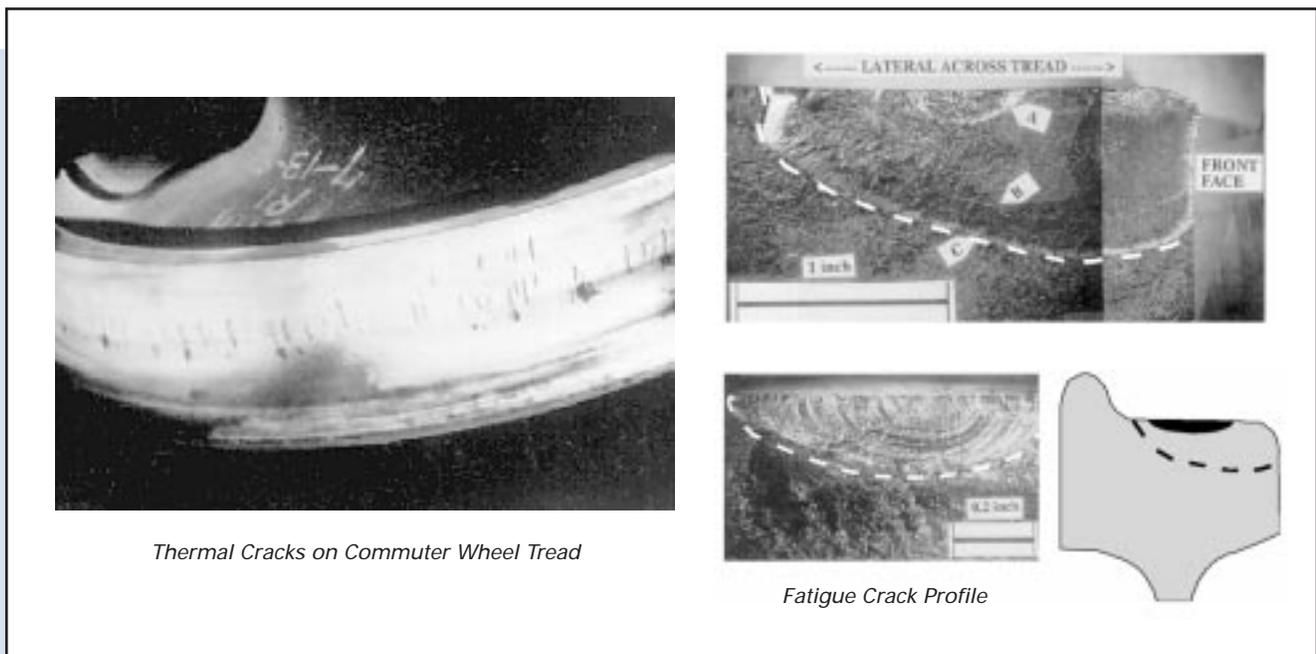
and four modules covering AMC/F awareness, dock/platform and transfer activities, processing and distribution activities, and flight assignment, tendering, and hand-off to airlines. The USPS has over 900,000 employees, transports 41 percent of the world's mail, handles 631 million pieces of mail per day, and accepts mail at over 38,000 post offices. In addition, the USPS has access to 56,000 commercial air flights per day to transport mail. The ultimate goal of the USPS is to ensure that all employees handling hazmat, from acceptance to delivery, have adequate training for safe handling of these materials. To accomplish this, the USPS has committed to training over 350,000 employees over the next 3 years.

Aircraft Wake Vortex Bibliography Updated (FAA)

Dr. James Hallock of the Aviation Safety Division has updated the Wake Vortex Bibliography to include abstracts of publications from January to August 1999, in addition to archived entries from international publications. The updated bibliography, accessible via the Volpe Web site (<http://www.volpe.dot.gov/wv/index.html>), includes experimental and theoretical articles relating to the formation, structure, motion, and decay of vortices and their effect on penetrating aircraft. Wake vortices are counter-rotating cylindrical air masses generated when aircraft lift off, and are a potential hazard to parallel runway operations. The primary objective of the Volpe Center's Wake Vortex Program is to assist the Federal Aviation Administration (FAA) in developing systems and procedures to provide the air traffic control system with the information required to maximize traffic flow for existing vortex conditions. This will result in more efficient air traffic management in the terminal airspace.

Volpe Center Staff Member Chairing APTA/PRESS Subcommittee (FRA)

Mr. Jeffrey Gordon of the Structures and Dynamics Division attended the July meeting of the American Public Transit Association Passenger Rail Equipment Safety Standards (APTA/PRESS) Wheel Design Task Group in Philadelphia, Pennsylvania. The Task Group discussed the techniques developed by the Federal Railroad Administration (FRA) and the Volpe Center for estimating residual stresses in commuter car wheels due to service loading. The group is considering replacing the Association of American Railroads' 1983 S-660 Standard, Procedure for the Analytic Evaluation of Locomotive and Freight Car Wheel Designs, with a new standard based on the FRA/Volpe estimating techniques. Mr. Dan Stone, chairman of the Task Group and Chief Metallurgist at the Transportation Technology Center in Pueblo, Colorado, asked Mr. Gordon to chair a new Wheel Design subcommittee formed to develop a draft for the proposed replacement standard. The purpose of the standard will be to assess various wheel designs to determine whether or not they will perform satisfactorily under expected service conditions. The surface cracking, depicted in the figures shown, is an example of what can happen to wheels when performance demands exceed design criteria. As failed wheels pose a threat to passenger safety, the potential for such damage must be avoided.



Volpe Staff Member Receives SNAME Award (USCG)

On September 30, in Baltimore, Maryland, the Council of the Society of Naval Architects and Marine Engineers (SNAME) awarded Mr. Michael Dyer of the Environmental Engineering Division the 1999 Vice Admiral E.L. Cochrane Award for the best paper presented to a Section of the Society. Mr. Dyer presented the paper "Hazard and Risk in the New England Fishing Fleet" at the October 1998 meeting of the New England Section. The paper summarized work performed for the Coast Guard Marine Safety and Environmental Protection Group's (G-M) Prevention Through People program. Fishing is one of the most dangerous occupations in the United States, and the reduction of serious fishing vessel accidents and crew fatalities at sea is one of G-M's top priorities. Mr. Dyer's detailed risk assessment of accidents in the New England fleet over a 5-year period characterizes hazards, accident types, and outcomes (deaths, injuries, and vessel losses). To develop future safety program strategies, Coast Guard decision-makers will use this report and Mr. Dyer's corollary report on risk management initiatives.

Volpe Center Successfully Tests Aircraft Target Identification System at DFW (FAA)

Mr. Stephen Nuzzi of the Airport Surface Division scheduled and supported a prototype test installation of the Aircraft Target Identification System (ATIDS) at the Dallas/Fort Worth International Airport (DFW) using the FAA's William J. Hughes Technical Center CONVAIR test aircraft. ATIDS is a sensor system that not only locates aircraft or ground vehicles on the runways and taxiways out of the line of sight of the primary sensors but also displays an aircraft's flight identification. The Volpe Center's Airport Surface Division provides technical and management support to the FAA's Airport Surface Integrated Products Team for surveillance and weather on its Runway Incursion Reduction Program (RIRP). The objective of this high-priority program is to prevent aircraft and surface vehicle incursions on airport runways and taxiways by tracking aircraft using multilateralization and aircraft interrogation; ATIDS is one of the program's major efforts. Aircraft testing using the ATIDS has occurred at DFW during periods of low airport activity to verify complete sensor coverage over the entire east side of the airport.

In addition to the FAA RIRP team evaluation, Mr. Steven Young and Ms. Denise Jones of the National Aeronautics and Space Administration (NASA) Langley Research Center are assessing the DFW test site's readiness for NASA's Technology Demonstration in August 2000.

Volpe Center Completes Implementation of Year 2000 Compliant Traffic Management System (FAA)

During the last week in July, the Volpe Center completed the replacement of existing Y2K non-compliant hardware and software with new Y2K compliant hardware and software at the Volpe Center Traffic Management System (TMS) hubsite and at over 80 operational field sites, including the FAA Air Traffic Control System Command Center, major Air Traffic field sites, several Department of Defense sites, and sites in Canada and London. The Center also played a key role in field site implementation and coordination, training over 1,100 FAA traffic management staff in transitioning to the new system. Benefits of the new system include improved reliability, processing speed, and the ability to use industry-standard technology. Ten years ago, the Volpe Center developed TMS for the FAA to improve how the limited capacity of the national airspace is used. TMS is a real-time operational computer system that predicts, detects, and handles air traffic congestion problems and continues to be one of the Volpe Center's most technologically innovative programs. Staff at the Center, where the hardware and software are maintained, continue to work closely with the FAA's Air Traffic organization to improve the system.

Draft Standard on Identifying Aircraft Published on FAA Web Site (FAA)

On August 12, the FAA published a draft standard identifying aircraft on the FAA's internal Web site for review and comment by participating international stakeholders. The draft standard was developed with support from Mr. Richard Jordan of the Automation Technology Division and Mr. Jan Popiel, CSC contractor, for the FAA Office of System Safety. This draft standard calls for identifying aircraft through a combination of make, model, and serial number, and it could support a variety of governmental and business functions including registration of aircraft and aviation safety analysis. Related data definitions and business rules were also published for comment. After the comment period, the standard will be reviewed and considered for finalization by the Commercial Aviation Safety Team/International Civil Aviation Organization Common Taxonomy Working Group.

Volpe Center Co-Sponsors Study of Human Factors in Air Traffic Control Systems in the FAA and Eurocontrol (FAA)

Three students from the Hogeschool van Amsterdam, in Amsterdam, the Netherlands, under the direction of Professor Amar Choudry, Dean of the School of Avionics at the Hogeschool Van Amsterdam, and sponsored by the Volpe Center, MIT Lincoln Labs, and the University of Massachusetts-Lowell (UMASS-Lowell), recently completed a 12-week summer research study as part of the Industrial-Academic Collaborative Studies Project. The results of the study entitled, "A Comparative Study of Existing and Proposed FAA and Eurocontrol Computer-Human Interfaces for En Route Air Traffic Control" were presented at MIT Lincoln Labs and formed the basis for the students' bachelor theses. The research points out inconsistent human factors used by both Eurocontrol and the FAA within a variety of air traffic control systems and makes recommendations for resolution. Eurocontrol is responsible for aircraft above 30,000 feet in European airspace.

As part of their study, the students examined traffic management in the United States and how it can be mapped in European traffic management. Mr. Patrick Krolak of the Automation Applications Division arranged for the students to attend UMASS-Lowell and along with Mr. Richard Wright of the Office of Traffic and Operations Management, served as mentor and reviewed the students' theses. The paper was later presented to Eurocontrol. Professor Choudry, Mr. Krolak, and Ms. Maria Picardi of MIT Lincoln Labs are writing a paper based on the visit; this paper will be presented to the American Air Traffic Controllers Association on human factors research. Messrs. Wright and Krolak and Ms. Picardi received certificates of appreciation from the Hogeschool van Amsterdam for supervising the Industrial-Academic Collaborative Studies Project.

Volpe Appointed to SafeFlight 21 Steering Committee Cost/Benefit Subgroup (FAA)

The FAA has appointed Dr. James L. Poage of the Operations Assessment Division to membership in the SafeFlight 21 Cost/Benefit Subgroup of the SafeFlight 21 Steering Committee. SafeFlight 21 is a FAA effort to develop enhanced capabilities for Free Flight, based on evolving Communications, Navigation and Surveillance technologies. SafeFlight 21 will provide in-cockpit display of traffic, weather, and terrain information for pilots, and will provide improved flight data for controllers. The Steering Committee will make recommendations to the Free Flight Select Committee, a joint government/industry committee providing direction for Free Flight, including SafeFlight 21. The SafeFlight 21 Cost/Benefit Subgroup will analyze the trade-off between the differing levels of capability and the various architecture and technology options within SafeFlight 21. Dr. Poage will be the lead for the Performance Metric Subteam, one of four functional subteams.



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

Volpe Supports Alaska Hovercraft Demonstration Project (USPS)

Dr. Paul Valihura of the Environmental Engineering Division chaired a meeting of the Hovercraft Resolution Committee in Bethel, Alaska during the week of August 7. This Committee is made up of representatives from state and federal regulatory agencies, eight villages, the Association of Council Presidents, and the City of Bethel. It addressed Hovercraft operational and procedural concerns that could affect Native Americans and other residents of the Kuskokwin Delta of Alaska such as selecting landing sites and travel paths that are minimally intrusive to the inhabitants' subsistence activities. The United States Postal Service (USPS) has proposed a 2-year demonstration program to transport by-pass and non-priority mail by Hovercraft on a

year-round basis on the Delta. The Volpe Center is supporting the USPS by providing environmental support to this demonstration program.

Volpe Staff Participates in Aircraft Noise Meeting in London, England (FAA)

Mr. Gregg Fleming of the Safety and Environmental Technology Division participated in a meeting of a Working Group of Committee A-21 on Aircraft Noise of the Society of Automotive Engineers (SAE) held in London, England from August 9 to 12. This Group is responsible for reviewing and updating SAE Standards 1751 and 1906 that pertain to prediction of ground attenuation of aircraft noise. These standards will be reflected in a future update of the FAA's Integrated Noise Model, a computer model for airport noise prediction and analysis developed and maintained by the Volpe Center.

Volpe Experts Participate in Airport Noise Measurement Meetings at Grand Canyon (FAA)

During the week of August 15, Mr. Gregg Fleming and Mr. David Senzig, both of the Safety and Environmental Technology Division, participated in technical discussions with a panel of experts, including Mr. Thomas Connor, Chief, Noise Division, FAA Office of Environment and Energy; Mr. Robert Arnsperger, Superintendent, Grand Canyon National Park; and Dr. Sheila Widnall, Institute Professor, MIT at Grand Canyon National Park in Arizona. The group determined the scope of noise measurements to be performed in September for the validation of three computer models: the Integrated Noise Model (INM), developed by the Volpe Center; a derivative of NOISEMAP, developed by the U.S. Air Force; and NODSS – Noise Over Flight Decision Support System, developed by the National Park Service. A Blue Ribbon Panel chaired by Dr. Widnall will review the results of the validation. The Volpe Center is supporting the FAA by providing expertise in the development and maintenance of the INM, a computer model for airport noise prediction and analysis.



Grand Canyon-Noise Measurement Equipment

Economic Growth and Trade



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

Lease Information Management System Deployed (FAA)

In mid-August, Mr. Bob Stouffer and Ms. Phalla Keo, both of the Logistics and Strategic Management Division, working with FAA real estate and budget personnel, deployed the Lease Information Management System (LIMS) Version 1.0 for use by FAA headquarters and regional offices. The Volpe Center developed LIMS to support the Airway Facilities Financial Management Division's duty to fund land and space acquisitions (including leases and purchases) and disposals. Version 1.0 incorporates approved changes and enhancements from the earlier prototype. This Web-enabled application operates over the FAA's intranet and is accessible to any FAA-authorized person with a desktop computer. Using a standard browser, the application provides data entry and query capability, seven standard reports, and two special budget estimation reports for the 5-year budget call process. The budget call process produces funding requests for submission to Congress.

Through the reports and data displays, LIMS also provides immediate access for FAA staff to the terms and conditions of each lease, easement, or owned property record. The ability to recall and research this data will improve the response to internal and external requests for information. The FAA owns property valued at approximately \$2 billion and manages approximately 3,300 non-GSA leases for facilities, land sites, buildings, easements, and rights-of-way.

Presentation at NAWBO-Sponsored SBIR Conference (OST)

Ms. Lynn Murray of the Communications and Technology Outreach Division was a featured speaker at the Third Annual Small Business Innovation Research (SBIR) Conference held August 20 and 21 at California State University – Fullerton in Garden Grove, California. The National Association of Women Business Owners (NAWBO) of Orange County sponsored the conference. Ms. Murray, in support of the Department's Office of Small and Disadvantaged Business Utilization, spoke on the opportunities for small business firms in transportation research and development and, more specifically, on the opportunities through the SBIR program and the Innovations Deserving Exploratory Analysis (IDEA) program. The SBIR program is a research and development program mandated by Congress with the purpose of developing technological innovations using the high level of expertise in the small business community throughout the United States. The IDEA program, sponsored by the Transportation Research Board and funded primarily by FHWA, FRA, FTA, and NHTSA, offers four separate but integrated programs that encourage investigation of innovative but untested concepts offering the potential for technological breakthroughs in transportation.

"Comparison of International Transportation R&D Expenditures and Priorities" Report Publication (OST)

U.S. Department of Transportation Deputy Secretary Mortimer L. Downey authorized the publication of the white paper, "Comparison of International Transportation R&D Expenditures and Priorities," which will be distributed in October 1999. This paper summarizes expenditures in total research and development (R&D) as well as transportation R&D, major transportation-related research projects, and national efforts to bolster "key" or "critical" technologies in the Group of Seven countries (United States, Canada, Japan, United Kingdom, Germany, France, and Italy). The paper was co-authored by Mr. Mark Safford of the Transportation Strategic Planning and Analysis Division and Dr. Kanti Prasad of the Infrastructure Protection and Operations Division. Mr. Safford and Dr. Prasad are currently researching additional countries (including Argentina, Australia, Brazil, China, India, Korea, Mexico, the Netherlands, Spain, and Sweden) for inclusion in the second edition of this paper. This work is part of a series of papers on transportation research and technology that the Volpe Center is preparing for the National Science and Technology Council.

Photo Courtesy of Panama Canal Commission

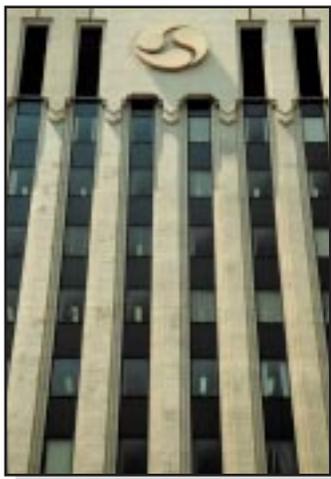


Advance the Nation's vital security interests by ensuring that the transportation system is secure and available for defense mobility and that our borders are safe from illegal intrusion.

Tool Room Manager Application Software Delivered to U.S. Air Force (USAF AMC)

Under the technical leadership of Mr. Ken McGillvary of the Intermodal and Logistics Systems Planning and Integration Division, the Volpe Center delivered Tool Room Manager (TRM) application software to support the Air Mobility Command (AMC) of the U.S. Air Force. The TRM application accomplishes over-

sight and management of unique and specialized tools used in the repair of strategic airlift aircraft. Developed and documented by the Volpe Center, the TRM application and documentation were delivered in mid-July to AMC's lead technology base, Dover Air Force Base in Delaware. Mr. McGillvary organized stress testing of the software, and updated the application and its supporting documentation as necessary in response to this testing. Having successfully implemented the updated TRM application at Dover, the Volpe Center is now conducting a "roll out" of the application to the Defense Information Services Agency who will operate and maintain the Volpe-developed application.



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This meeting was part of a response to an October 1997 plan proposed by the Administration to address the challenges of climate change. Among other things, the plan called for the use of market-based mechanisms such as emissions trading, and for a means to ensure that companies receive credit for voluntary, early reductions of greenhouse gases to help meet this challenge.

The concept of credit for early emission reductions is relatively new to many transportation interests, as is the concept of emissions trading. On the other hand, many researchers are confident that market-based mechanisms could significantly reduce the cost to society of reducing greenhouse gas emissions. For example, the Administration's analysis of the economic impacts of greenhouse gas reduction predicts that, under an intersectoral and international trading regime, the market price of permits to emit greenhouse gases would likely be equivalent to about 4 to 6 cents per gallon of gasoline – much less expensive than many transportation emission reduction strategies.

Electric utilities in the United States have solid experience with emissions trading, having applied it successfully to the management of sulfur dioxide emissions. This emissions trading program is viewed as a possible model for managing carbon dioxide emissions. The sulfur permit trading program is, however, a domestic program with only one sector. Important issues may arise if and when such a program crosses national and sectoral boundaries. For example, might the emissions trading be handled by upstream fuel suppliers, or downstream fuel users, or perhaps by vehicle manufacturers?

Information gained from this conference will help shape the Department's work in these areas over the next few years, and will be a foundation for future exchanges with the range of stakeholders interested in transportation and global climate change. Later this year, Volpe Center staff will prepare separate white papers on emission trading and credit for voluntary early action.