

Volpe Center Honored with 2008 Innovations in American Government Award

The Volpe Center's Global Maritime Domain Awareness Program has been recognized with a prestigious 2008 Innovations in American Government Award by the Harvard Kennedy School's Ash Institute for Democratic Governance and Innovation. The award was presented to the Volpe Center team for its efforts in enhancing levels of safety and economic stability on the global seas. To view a PBS documentary of this year's award recipients, led by the Volpe Center, go to: <http://video.yahoo.com/watch/3707629/10197487>.



Tony Saich and Stephen Goldsmith of the Harvard Kennedy School Ash Institute with the Volpe Center program team. From left to right: Charles Craven, Kam Chin, Tony Saich, David Phinney, Stephen Goldsmith, Henry Wychorski, Brendon Providence, and Rodney Cook. (Photo courtesy of the Ash Institute)

The Maritime Safety and Security Information System (MSSIS) was developed in 2007 by the Volpe Center of the U.S. Department of Transportation's Research and Innovative Technology Administration. Volpe Center staff continually update and improve MSSIS to provide an unprecedented level of visibility into transit and port activity.

The movements of more than 10,000 vessels from over 50 nations are tracked and updated in real time. The program will receive \$100,000 toward dissemination and replication across the country.

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Volpe Center Realigns into Centers of Innovation, Expands Horizons

The Volpe Center plays a unique role in looking across the transportation enterprise and anticipating future transportation issues and challenges to better prepare and inform transportation decision makers. To better focus its vast technological and process innovation competencies on the achievement of U.S. transportation goals and national priorities, the Volpe Center has been restructured into eight Centers of Innovation (COIs).

The COI structure increases the opportunity for research and technology synergy both within and outside the U.S. DOT and enhances the effectiveness of the Volpe Center's crossmodal and multimodal capabilities. The COIs clarify, reinforce, and strengthen the Center's role in applying its technical capabilities to U.S. DOT

Centers of Innovation

- **Multimodal Systems Research and Analysis**
- **Safety Management Systems**
- **Energy and Environmental Systems**
- **Freight Logistics and Transportation Systems**
- **Physical Infrastructure Systems**
- **Communication, Navigation, Surveillance (CNS) and Traffic Management Systems**
- **Human Factors Research and System Applications**
- **Advanced Vehicle and Information Network Systems**

strategic goals and national transportation priorities.

The new structure institutionalizes and strengthens the Center's ability to anticipate future transportation challenges, expand U.S. DOT's horizon, and show how innovation can arise from creative and collaborative use of internal and external assets.

Funded through work agreements with multiple U.S. DOT and non-DOT agencies, the Volpe Center supports all of U.S. DOT's modal administrations and offices, other federal agencies, state and local governments and organizations, foreign governments and entities, and the private sector. An innovative, fee-for-service organization, the Volpe Center is internationally recognized as a center of transportation and logistics expertise.

SafeTrip-21 Transportation Safety Technologies Hit the Streets of Manhattan

The Volpe Center has launched a bold new intelligent transportation systems (ITS) initiative dubbed SafeTrip-21 (*Safe and Efficient Travel Through Innovation and Partnerships for the 21st Century*).

SafeTrip-21 builds upon the U.S. DOT Vehicle Infrastructure Integration (VII) research and leverages technologies currently in wide use, such as cellular phones, GPS, Wifi, Bluetooth, and the Internet, to accelerate the advance of safety and mobility applications. The Volpe Center will assess applications to improve automobile travel and public transit convenience as well as commercial vehicle safety and productivity.

In June 2008, the Volpe Center entered into a cooperative agreement with the California Department of Transportation (Caltrans), establishing the inaugural SafeTrip-21 field test site in the San Francisco Bay area. In this 12-month field test beginning December 2008, travelers will receive transportation information and transmit their own transportation data, creating a real-time, dynamic, wireless data mesh of mobile information—a virtual “web on wheels.”

SafeTrip-21 technologies were unveiled at the 15th ITS World Congress in New York City in November. A New York MTA bus and two rental vehicles were equipped to demonstrate applications for both drivers and transit riders on the streets of Manhattan. Also, key driver and pedestrian applications were show-

cased at a special “Integrated Show,” which included technologies developed worldwide.

Three new SafeTrip-21 partners were also announced at the World Congress:

- **iCone** deploys active road cones to help increase roadway safety by using radar to measure traffic speed.
- **Parking Carma** fields a mobile web-enabled parking application that

allows travelers to find, reserve, and pay for a parking space at a participating “smart” parking lot.

- **I-95 Corridor Coalition** uses vehicle probe data to make it much easier for I-95 travelers to get information about traffic backups, construction information, and other delays.

The Volpe Center is excited about SafeTrip-21 and the development of these technologies in the coming year.



SafeTrip-21 technology on display at the ITS World Congress on the streets of Manhattan. This New York MTA Orion IV low-floor, hybrid electric bus was equipped to demonstrate how SafeTrip-21 uses available technologies to bring the future of travel to the United States today. (Photo courtesy of University of California Partners for Advanced Transit and Highways)

Volpe Center Highlights Goes Electronic!

Please enjoy this edition of *Highlights*—the first edition to be sent entirely in an electronic format.

The Volpe Center is committed to improving the environment and enabling the public good. If you have not yet done so, please take a moment to visit our website at <http://www.volpe.dot.gov/info/src/highlights/subscribe.html> and enter your email address to ensure you receive future editions of *Highlights* directly to your email.

Volpe Center Leads Gulf Coast Transportation Recovery Planning



San Antonio, TX, September 10, 2008—Water is loaded onto buses in preparation for Hurricane Ike. The reception center for evacuees was a staging area for buses and supplies. (Photo courtesy of FEMA)

On the morning of September 13, 2008, Hurricane Ike made landfall near Galveston Bay, devastating Gulf Coast communities from Texas to Mississippi. Many were still recovering from the effects of Hurricanes Dolly, Gustav, Katrina, and Rita.

The Volpe Center assisted the Federal Emergency Management Agency

(FEMA) in Austin, Texas, with the federal response to Hurricane Ike. The Volpe Center's unique, multimodal expertise enables it to play a key role in coordinating U.S. DOT's involvement in long-term recovery. Volpe Center planners serve as intermediaries and facilitators between DOT and FEMA, as well as among DOT and other participating federal, state, and local agencies.

The Volpe Center team interfaced with U.S. DOT and regional modal offices to assess transportation impacts and issues that might affect the long-term recovery or viability of affected areas. The Volpe Center continues to provide support to the State of Texas and affected communities in their recovery.

FEMA established its long-term community recovery support function, Emergency Support Function 14 (ESF #14), in 2004 as part of the interagency National Response Plan. The Volpe Center serves as U.S. DOT's national coordinator on long-term community recovery. When FEMA activated ESF #14 in Texas, the Volpe Center provided an on-site team to coordinate information and assess the long-term impacts of Hurricane Ike on Texas's transportation system.

As the lead in FEMA's ESF #14 Transportation and Infrastructure group and the Regional Emergency Transportation Representative (RETREP) for U.S. DOT Regions I and II, the Volpe Center has become an integral part of the overall DOT emergency response and recovery planning capability.

High-Tech Wireless Communication for Transportation

The Volpe Center brought together leaders from the private sector, academia, and government to explore how advanced telecommunications technologies might be leveraged to achieve measurable reductions in vehicle crashes and congestion.

A new report, *Advanced Wireless Communication for the Transportation Sector*, summarizes this successful roundtable that brought together 40 leading experts in the field of wireless communications. The report reveals that significant opportunities exist to make use of expertise in wireless communications and related technologies. The new language of technology—including

wiki collaboration, mash-ups, and Mobile Ad Hoc Networks, or MANETs—represents challenges, but more importantly, potential opportunities for growth.

Harnessing and rapidly deploying these emerging communications technologies will lead to fewer crashes on our roadways and result in overall improvements in the performance of the transportation system. Such efforts will also result in improved situational awareness, including dynamic rerouting, signal timing and synchronization based on real-time data, and evolving traffic and weather conditions. Electronic tolling and fees for all modes of transit can

be enabled through existing technologies as well as through development of mobile electronic devices. Finally, bridges, roads, rails, and other critical

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infrastructure can be monitored remotely, leading to improved operations of the nation's transportation enterprise.

Volpe Center Assists New York Tri-State Emergency Operations and Planning

The Volpe Center is supporting four stakeholder agencies in the New York City tri-state region in developing a Security Cooperation and Emergency Operations Plan (SCEOP) for regional surface transportation. The 12-month project will address emergency operations and planning for events such as major transportation accidents and disruptions, public health emergencies, major technology failures, terrorism, severe weather, and evacuations.

The four stakeholders are New York Metropolitan Transit Authority (NY MTA), New Jersey Transit, Connecticut DOT, and the Port Authority of New York and New Jersey (PANYNJ). The PANYNJ is acting on behalf of the four agencies as the conduit for Department of Homeland Security funding and is responsible for

overall project management.

The Volpe Center will begin with an assessment of each agency's existing and planned security and emergency operations to distill vital information about each agency's full spectrum of existing and planned security and emergency operations. Next, Volpe Center staff will perform an examination of best practices from around the globe of security and regional emergency management coordination. Finally, a gap analysis of these inputs will yield individual agency SCEOPs and a Regional SCEOP.

The plan documents will detail the requirements for systems capabilities; asset management; shared situational awareness; and tactics, techniques and procedures to coordinate regional resources

and response to major events. The program goal is to develop documents that help leaders in the New York City Tri-State region mitigate event impacts ranging from delays and disruptions to loss of life.



Emergency response exercises are an integral part of emergency preparedness.

Volpe Center Report on Transportation in an Age of Volatile Oil Prices

The Volpe Center recently developed a critical report on the volatility of global oil prices and their effect on the national transportation enterprise for Paul Brubaker, Administrator of the Research and Innovative Technology Administration.

Oil prices have been highly volatile for the past three decades. Recently, however, they have been akin to a roller-

coaster ride, nearly tripling from about \$50 per barrel in early 2007 to nearly \$140 per barrel in mid-July 2008 and back to around \$45 per barrel by December 2008. Oil price forecasts show these wide variations for the near term as well.

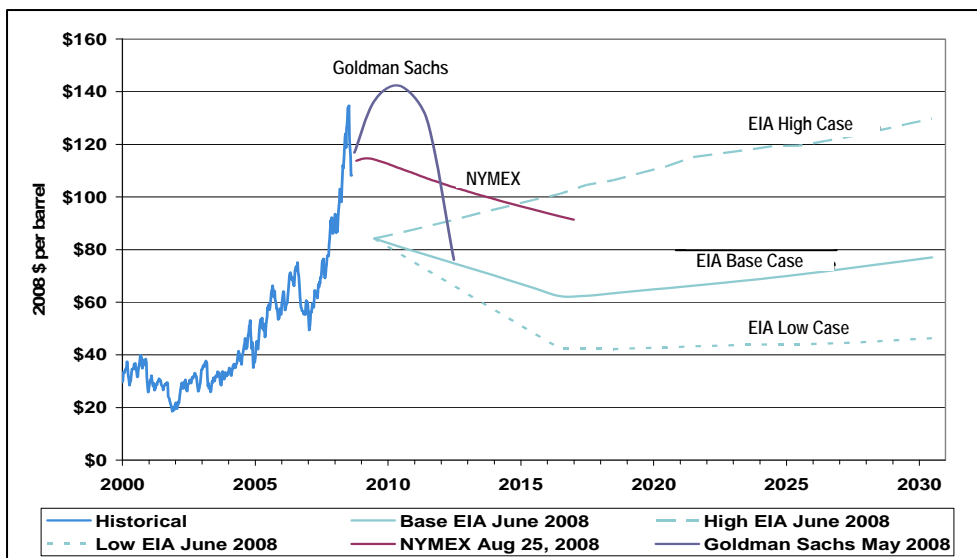
The graph below shows oil price volatility since 2000 as well as projections of future prices through 2030. The Energy Information Administration (EIA) pro-

vides these projections of future prices, which vary significantly based on model assumptions.

OPEC and countries with national oil companies control most of the world's oil reserves. Given the political volatility of some of the oil-rich countries, many plausible scenarios exist in which civil or political unrest might seriously disrupt oil supply. America holds only about 2 percent of world oil reserves. All these issues factor into the EIA cases.

Over the past year, Americans have reacted to high fuel prices by driving less and using public transit more. Motor vehicle miles traveled appreciably declined after continuously increasing for nearly four decades. Additionally, logistic chains in most industries are being shortened and in some cases manufacturing facilities are being relocated back to the U.S. from abroad. Profits for freight modes decreased with higher fuel costs; as a result, nearly 1,000 trucking companies went bankrupt in the first quarter of 2008 alone.

The report developed by the Volpe Center is helping to shape discussion of the future of the transportation enterprise in the United States.



Sources: EIA, "World Crude Oil Prices: Weekly," August 28, 2008; EIA, *Annual Energy Outlook 2008*, June 2008; New York Mercantile Exchange, August 25, 2008; news reports on Goldman Sachs announcement, May 2008

Mitigating the Effects of Aircraft Wake Turbulence Enhances Global Air Safety

The Volpe Center supports the Federal Aviation Administration (FAA) in the research and development of procedures that mitigate the effects of aircraft-wake-avoidance operating requirements while increasing airport operational safety. Volpe Center staff collects, analyzes, and interprets aircraft wake and related meteorological and flight trajectory data in order to demonstrate the safety and effectiveness of proposed new aircraft and flight procedures.

The Volpe Center Wake Turbulence Program builds on over a decade of project experience:

- San Francisco Airport (SFO)—Volpe Center collected and analyzed aircraft wake and related data for 250,000 approaches, leading to the development of the Simultaneous Offset Instrument Approach (SOIA) procedure now in use at SFO during low-visibility conditions.
- St. Louis Airport (STL)—Volpe Center evaluated a simultaneous approach/landing procedure on closely spaced parallel runways

over a three-year period. The procedure was approved in 2007 and led to approval of similar procedures at Boston, Philadelphia, Cleveland, and Seattle airports in 2008.

- St. Louis (STL), Houston (IAH), and Frankfurt, Germany (FRA)—Volpe Center collected extensive departure data to evaluate lessening restrictions on departures behind heavy aircraft by taking advantage of the wind speed and direction. The FAA now has an approved program to develop a system, Wake Turbulence

Mitigated Departures (WTMD), for installation at 10 U.S. airports.

The Volpe Center participates in key industry working groups to develop procedures to enhance the safety of air travel. Volpe Center staff participated in two international working groups examining safety issues related to new jumbo aircraft. One working group studied the Airbus A380 and the other focused on the Boeing 747. The groups examined appropriate separation of aircraft based on their generation of and susceptibility to wakes.



Volpe Center wake instrumentation during a landing at Lambert – St. Louis International Airport (STL).

Climate Change and Energy Strategy Paper Aids Chicago Regional Planners

The Volpe Center has developed a *Climate Change and Energy Action Strategy Paper* to assist the Chicago Metropolitan Agency for Planning (CMAP) in achieving its approved GOTO2040 Regional Vision.

indicators to use in detailed evaluation of scenarios to achieve the Regional 2040 Vision.

The Volpe Center's research resulted in the development of action strategy papers that help planners and decision-

The Volpe Center's recent papers focus on climate change and energy, goods movement, public-private partnerships and security/emergency management. The climate change and energy strategy paper is posted on the CMAP website, and the others will be posted later.

Volpe Center staff are currently developing strategy papers on:

- Alternative fuels and vehicle technologies
- Interregional transportation

The Climate Change and Energy Action Strategy Paper is available at the CMAP website at:

<http://www.goto2040.org/ideazone/default.aspx?id=11454>

The Volpe Center has researched industry best practices to help construct scenarios and distinct sets of actions that can be taken in the Chicago region to address issues identified in the CMAP vision document. Volpe Center staff will also develop transportation performance

makers in the Chicago region as they work to achieve the Regional Vision. The strategy papers distill research findings, industry best practices, and innovative approaches of peer organizations and guide CMAP in tailoring the findings to its unique regional situation.

Finally, the Volpe Center is designing a framework for evaluating large capital projects, which will include a design and evaluation process, an applicable best practices summary, and detailed evaluation measures to ensure selected projects support the Regional 2040 Vision.

Volpe Center Evaluates State-of-the-Art Vehicle Safety Systems

The Volpe Center serves as the independent evaluator of the Integrated Vehicle-Based Safety Systems (IVBSS) project, the first large-scale initiative for both light vehicle and heavy truck platforms focused on safety system integration. IVBSS technologies warn drivers in crash-imminent situations, helping to prevent rear-end, lane-change, and road-departure crashes.

IVBSS is a cooperative effort by an industry team led by the University of Michigan Transportation Research Institute and the U.S. DOT. The team includes the National Highway Traffic Safety Administration (NHTSA), the Federal Motor Carrier Safety Administration (FMCSA), and the Research and Innovative Technology Administration Intelligent Transportation Systems Joint Program Office (RITA JPO).

The IVBSS research initiative seeks to accelerate the introduction and commercialization of integrated vehicle-based crash warning systems for light vehicles and heavy trucks. The objective is to assess potential safety benefits and driver acceptance of the integrated safety systems. These integrated systems are expected to prevent conflicting warnings, reduce false alarms, enhance consumer and fleet operator acceptance,



IVBSS car prototype set-up for verification test. (Photo by Volpe Center team member Ryan Harrington)

and boost product marketability.

The Volpe Center team worked closely with U.S. DOT and industry team members and provided expert input to the IVBSS program, including:

- IVBSS system design and functionality.
- Verification of test procedures for track and public road tests for cars and trucks.
- Test-track and public road verification testing of prototype IVBSS on both cars and trucks.
- Evaluation of verification test results.
- Recommended system performance enhancements prior to the field trials.

Based on test results, the project will proceed with large field operational tests (FOTs) of IVBSS-equipped light vehicles and heavy trucks in 2009.

The Volpe Center team prepared an independent evaluation plan for IVBSS based on data to be collected in the FOTs in 2009, developed data mining algorithms, and devised analytical techniques to forecast the safety benefits likely to accrue from widespread national IVBSS deployment.

Volpe Center Highlights

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