

The Volpe Center supports FMCSA in two distinct but interrelated modernization initiatives.

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U.S. Department of Transportation
Research and Innovative
Technology Administration
Volpe National Transportation
Systems Center



FMCSA is committed to saving additional lives on our nation's highways. Two new initiatives described in this issue of *Highlights* demonstrate FMCSA's strategy of continuing to use proven methods while developing and implementing new approaches. (Photo by Julie Nixon)

FMCSA—Two Modernizing Safety Initiatives: COMPASS and CSA 2010

Smart Data Drives Motor Carrier Safety

The primary mission of the Federal Motor Carrier Safety Administration (FMCSA) is to reduce crashes, injuries, and fatalities involving large trucks and buses. FMCSA relies on dozens of information technology systems to help achieve its mission. The Volpe Center has played a key role in defining, developing, implementing, and supporting information systems for FMCSA. The Center is therefore well positioned to support FMCSA in two distinct but interrelated modernization initiatives.

First, in FY2003, FMCSA initiated Comprehensive Safety Analysis (CSA) 2010, an ambitious program to realign, strengthen, consolidate, and focus its safety programs and enforcement operations.

Second, FMCSA is designing and implementing COMPASS, a large reengineering and systems modernization project aimed at fully aligning information technology (IT) operations with business practices as well as creating a foundation for subsequent IT enhancements.

Volpe Center's FMCSA Programs

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CSA 2010

A growing body of research and crash data suggest that driver behavior is the predominant and critical contributing factor in fatal crashes. The CSA 2010 initiative aims to shift the focus from enforcing regulations to changing specific unsafe behaviors through new interventions.

This Focus article describes the Volpe Center's role in each of these initiatives and the potential synergy between them.

Comprehensive Safety Analysis (CSA) 2010

CSA 2010 is not a stand-alone initiative but rather a comprehensive safety analysis involving the entire agency in a collaborative effort. The concept behind it is to respond to unsafe behavior before it becomes chronic and habitual, utilizing a range of safety interventions beyond the current enforcement process to increase effectiveness and make better use of resources.

The Volpe Center is part of a technical team developing a new operational model that will employ these new safety improvement tools for drivers and motor carriers. The technical team will also oversee an extensive field test of the new operational model prior to national deployment.

Improving the Odds

Current FMCSA compliance and safety programs focus on the compliance review, an audit-based, labor-intensive enforcement process. A compliance review is an on-site examination of a motor carrier's records and operations to determine whether the carrier meets the safety-fitness standard of the Administration. FMCSA expects that—through education, heightened awareness of safety regulations, and the enforcement effects of compliance reviews—motor carriers will improve the safety of their commercial vehicle operations and ultimately reduce the number and severity of crashes in which they are involved.

Thousands of these reviews are conducted each year, accounting for one of the single greatest resource-consuming activities of FMCSA. With 600,000 trucking companies operating in the United States, FMCSA is able to perform only about 15,000 reviews per year, representing just 2.5 percent of carrier companies. With CSA 2010, FMCSA is shifting from a one-size-fits-all approach to a more targeted, focused method that will be more efficient and effective. Improved efficiency will allow FMCSA to directly address a larger portion of the carrier population. Data derived from roadside inspection programs will determine where inspectors will concentrate their activity.

Building Consensus for Change: Compliance Review Workgroup

The Volpe Center played a lead role in the Compliance Review Workgroup, which was convened as part of FMCSA's effort to improve its ability to ensure the safety and compliance of the motor carrier industry. The workgroup eventually proposed a flexible operational model for FMCSA's safety programs, directed at improving safety performance and minimizing high-risk behavior in the motor carrier industry. The proposed operational model forms the basis of the CSA 2010 initiative.

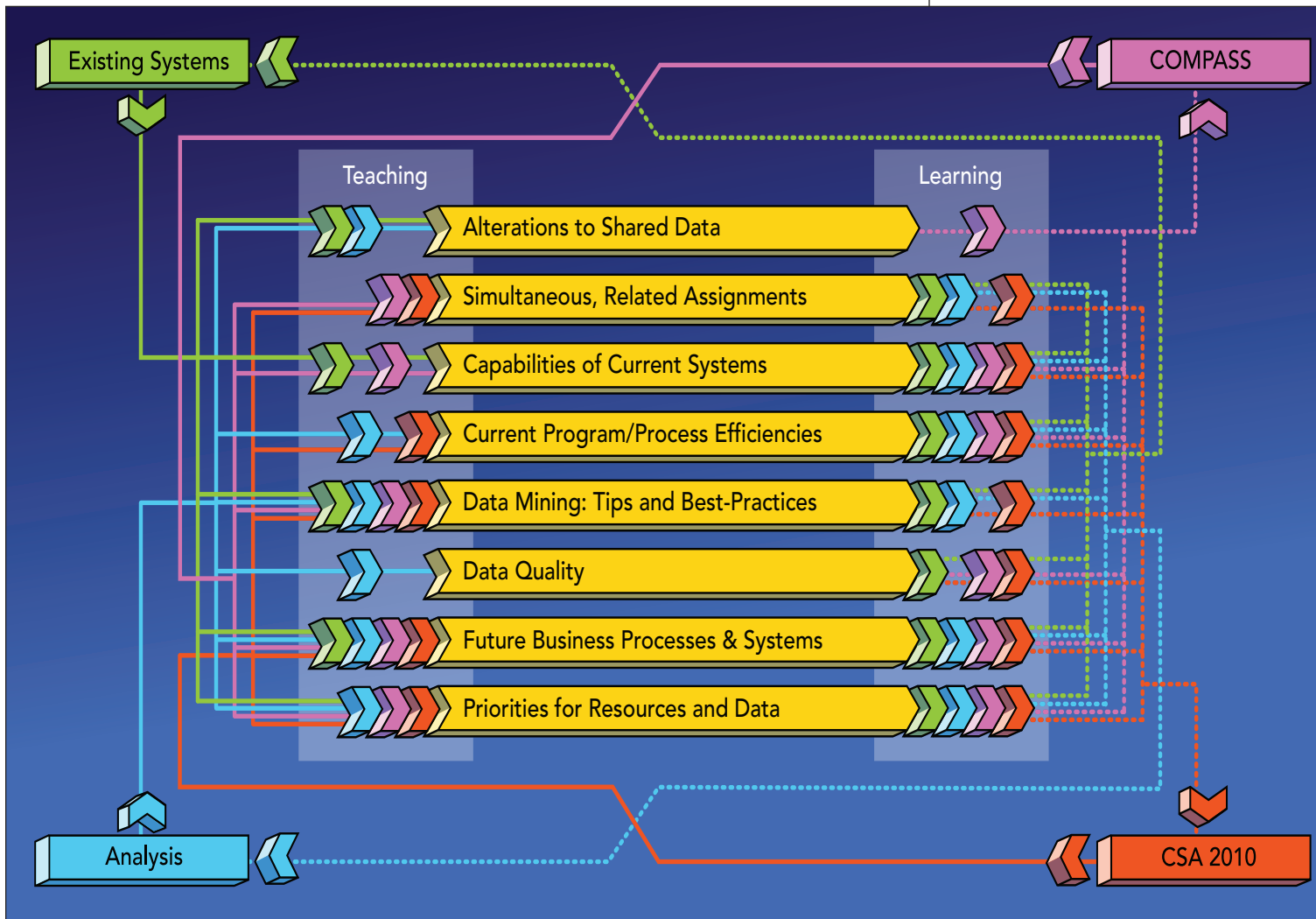
Key elements of this operational model include:

Better Diagnosis of Safety Issues. A new safety measurement system will be introduced to quantify and categorize safety performance such that safety problems can be addressed in a more focused manner. The new safety measurement system for CSA 2010 will differentiate between motor carriers that have problems in the area of fatigued drivers versus problems in vehicle maintenance and then allow for solutions that are more tailored to the safety problem.

From "Auditor" to "Safety Improvement Specialist." Ways to improve safety are evolving, from relying on penalties to identifying unsafe behavior before it becomes chronic. The new focus will be on education and intervention. This means that the role of field inspector will change from that of auditor and penalizer to that of safety improvement specialist. The best test of any safety initiative is whether participants decrease their crashes, and a goal of CSA 2010 is to find creative ways to persuade trucking companies and operators to operate more safely.

Strict Enforcement When All Else Fails. While CSA 2010 is focused on safety improvement, the operational model will also incorporate a formal determination of a carrier's overall safety fitness that considers safety performance, regulatory compliance, and

The Volpe Center's work on CSA 2010 and COMPASS builds on the work we have done in developing and maintaining existing systems as well as ongoing analysis of FMCSA data. The interrelationship and synergy between these groups facilitates discussions on key issues that are relevant to FMCSA. This shared institutional knowledge benefits each program.





Road conditions and weather can create challenges for motor vehicle drivers. (©istockphoto.com)

safety management. Carriers that are determined to be “unfit” will have their operations suspended.

In summary, the CSA 2010 operational model measures safety and compliance, determines safety fitness, recommends and applies interventions, and tracks and evaluates safety improvements for FMCSA-regulated entities. It comprises statutes, regulations, policies, automated systems, operational procedures, and personnel associated with compliance and enforcement processes—FMCSA employees, state partners, industry, and the public. The model is envisioned as an integrated approach to achieving motor carrier safety.

FMCSA COMPASS

The Volpe Center is also supporting FMCSA in a massive effort known as COMPASS, aimed at modernizing the agency’s IT processes. COMPASS represents a technology strategy—a total decision about the way that data will be made available. FMCSA recognizes that older technology must be updated or replaced and that the current system architecture, which consists of multiple stand-alone databases requiring numerous user IDs and passwords, must be redesigned to make it more streamlined, cohesive, and accessible.

COMPASS will improve the public’s access to data and will provide easier access for FMCSA staff as well. FMCSA plans to retire and replace existing systems and to transition the organization to a fully service-oriented architecture Web-based environment. A key component of this architecture will be an enterprise Web portal, where all the existing systems will be redesigned and accessible.

A long-term goal of COMPASS is business transformation. COMPASS will improve the delivery of services, responding dynamically to evolving business requirements and more tightly integrating and aligning business processes with IT systems.

FMCSA Web Portal

The Web portal will be a crucial element of FMCSA’s IT modernization, functioning as a single, integrated point of access to the agency’s content, applications, and processes both internally and externally. It will present timely, accurate data from diverse sources.

It will also help FMCSA field workers to operate more efficiently both individually and collaboratively.

The Web portal will have the ability to handle thousands of user requests. It will also facilitate communication between FMCSA, carriers, other industry partners, and the general public.

The Volpe Center's Role

FMCSA has evolved over time, with many of its systems and databases responding to the changing needs of the agency. As new architecture is developed, existing systems will be incorporated. The Volpe Center is playing a key role in adapting and coding current systems to interface with COMPASS. To date, four of the existing systems—the Motor Carrier Management Information System (MCMIS), the Enforcement Management Information System (EMIS), the Data Challenge System (DataQs), and the Licensing and Insurance System (L&I)—have been recoded and transferred to the new system (see sidebar).

The current strategy consists of a phased approach in which existing systems will be adapted with a “wraparound” that will initially make them accessible through the new portal system. Eventually, these older systems will be replaced and incorporated into the new architecture. Volpe will continue to be the host for all of these new systems and will hopefully be named the provider for maintaining the new systems code.

The Center is also hosting and maintaining FMCSA data required for the new systems and supporting the installation of almost two dozen new servers. In addition, the Center runs a help desk. The Volpe Center Help Desk focuses on the support of the FMCSA systems for federal partners only. With the new system will come a new database approach. The new “enterprise database” will incorporate the data warehouse technology.

Business-Process Modernization

COMPASS and CSA 2010 share the goal of optimizing FMCSA resources and providing a broader range of enforcement interventions. Both are ultimately concerned with business-process reengineering. CSA 2010 is aimed at changing the agency's focus from the enforcement of regulations to identifying and decreasing specific unsafe behaviors, thus targeting available resources in the most effective manner. Although the initial focus of COMPASS is on supporting the current model by updating the system architecture, its ultimate goal is a total business transformation, whereby IT operations and business processes are fully aligned. One of its key goals is to support the CSA 2010 business strategies and operational model.

The Volpe Center understands the interdependence of these two approaches and is well positioned to be part of the creative dialogue between all of the partners in the transformation. Center staff have long-term experience in addressing requirements for enforcement and safety improvements as well as in building an IT infrastructure to support these needs. ■

FMCSA Legacy Systems Recoded for COMPASS

- EMIS is used to monitor, track, and store information related to FMCSA enforcement actions—specifically, data associated with notifying the carrier, monitoring the carrier's response, and determining whether further compliance action is required.
- MCMIS captures data from field offices. With more than ten million records, it is a source of FMCSA inspection, crash, compliance review, safety audit, and registration data.
- L&I provides licensing and insurance information regarding authorized for-hire motor carriers.

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SAFETY

Volpe Center Continues Railroad Tank Car Structural Integrity Research

Rail transportation of hazardous materials in the United States is recognized as the safest method of moving large quantities of chemicals over long distances. Recent statistics show that the rail industry's safety performance as a whole is improving. In particular, the vast majority of hazardous materials shipped by rail tank car arrive safely and without incident. In general, the railroads have an outstanding record in moving shipments of hazardous materials safely.



Railroad tank cars are designed to carry liquefied loads, petroleum products, liquid chemicals, and gasses. FRA and industry are working together to ensure railroad tank car safety. The Volpe Center's work on safety enhancements supports this effort. This modern tank car is owned by Union Tank Car Company.

The continued safe transport of hazardous materials is a key concern of the Federal Railroad Administration (FRA). The Volpe Center provides technical support to the FRA's Office of Research and Development in safety matters regarding the transportation of hazardous materials by railroad tank cars. Research is conducted to support FRA/industry efforts in resolving problems related to metal fatigue and fracture in the current rail tank car fleet, the structural behavior of rail tank cars under potential collision and derailment scenarios, and improving the standards and procedures for future rail car designs.

Since November 2006, the Volpe Center (for FRA), Dow Chemical Company, Union Pacific Railroad, and the Union Tank Car Company have been collaborat-

ing on a high-priority, joint government/industry effort—the Next-Generation Rail Tank Car (NGRTC) Project—to design a rail tank car that will meet or exceed performance requirements while improving safety and security. This includes full-scale impact tests to evaluate the crashworthiness of rail tank cars under accident-loading conditions. The results from the tests will be used to support a Notice for Proposed Rulemaking (NPRM) developed by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and FRA in the creation of the new regulations. The results from the tests will also be used by the NGRTC Project team to develop new tank car designs. FRA signed a Memorandum of Cooperation in January 2007 with the sponsors of the NGRTC Project, to share research information.

On April 26, 2007, a full-scale shell-impact test was conducted on a rail tank car donated by Dow at the Transportation Technology Center (TTC) in Pueblo, Colorado. In this context, shell impact means that the rail tank car is impacted at the side by another rail car. The test was conducted at an impact speed of 14 miles per hour, and resulted in a 9-inch-deep dent. On July 11, another full-scale shell impact test on a railroad tank car designed to carry chlorine was successfully completed at the TTC. This second test resulted in rupture of the tank car shell.

Detailed data will be analyzed by FRA, Volpe Center staff, and contractors, not only to improve tank cars but also to verify and validate analysis tools under development for the project. With the assistance of this ongoing research, FRA, in conjunction with PHMSA, is working to develop new hazardous material tank car safety standards. The target date for a prototype next-generation tank car is April 2008, with the first cars entering service in 2010.

The Volpe Center team was led by Dr. David Jeong and included Mr. Michael Carolan, Ms. Karina Jacobsen, Mr. Jeffrey Gordon, Mr. Mathew Lyons, Mr. Philip Mallon, Dr. Benjamin Perlman, Ms. Michelle Priante, Mr. Brandon Talamini, Ms. Yim Tang, and Mr. David Tyrell, all of the Structures and Dynamics Division, and Dr. Hailing Yu of CASE, LLC, a Volpe Center contractor. ■

ENVIRONMENTAL STEWARDSHIP

Great Lakes Dry Cargo “Sweepings” Policy Changes

For 75 years or more, vessels carrying bulk dry cargo on the Great Lakes have washed overboard any residues of cargo thought to be non-toxic and non-hazardous. The residues include iron ore, limestone, and coal. The residues can create risks of slipping and injury for the crew and can also possibly contaminate other cargos. These “dry cargo residue” or “cargo sweeping” discharges eliminate unsafe conditions

A digital sonar scanner and sample-gathering machine were used to determine the presence and properties of dry cargo residues in the Great Lakes. (Photos by Ryan Cummings)



on the vessel without requiring alternatives that could involve time delays or added cost. Current environmental statutes, if strictly enforced, would prohibit these discharges. However, under an “interim enforcement policy,” discharges of dry cargo residue are permitted in defined areas of the Great Lakes.

In 2004, Congress authorized the United States Coast Guard to replace the current enforcement policy with new regulations for these incidental discharges and required the Coast Guard to begin the environmental assessment necessary to develop new regulations. The Volpe Center supports the Coast Guard in developing a viable strategy to assess the impacts of the proposed regulations and alternatives on the existing environment as well as to project how these actions may cumulatively impact that environment.

To this end, the Volpe Center assisted the Coast Guard in its activities in Lake Erie and Lake Michigan. The Volpe Center task was to characterize the physical, chemical, and biological properties of the dry cargo residues and begin analyzing their impact on the Great Lakes. Mr. Ryan Cummings of the Environmental Engineering Division was part of a scientific team that participated in sonar mapping and sediment sampling of the affected areas to determine the scope of the problem. The sediment sampling results appeared very promising in locating discharged dry cargo residue.

The Volpe Center’s contribution supports the Coast Guard in its efforts to regulate the practice of dry sweeping based on reliable environmental-impact information. ■

PUBLISHED AND PRESENTED

Future of Air Traffic Management. At the International Symposium Enhanced Solutions for Aircraft and Vehicle Surveillance (ESAVS) 2007 in Bonn, Germany, from March 6–7, 2007, Mr. Dominic Castaldo of the Advanced Communication, Navigation, and Surveillance Technologies Division presented “Multilateration, an Emerging All-Purpose Surveillance Technology.” The conference was hosted by the German Federal Ministry of Transport, Building, and Urban Affairs and was the first of its kind addressing enhanced airspace surveillance, navigation technologies, and airport management systems on a worldwide level.

Volpe Center’s Rail Equipment Research. Several Volpe Center staff members presented papers in the technical sessions on rail transportation at the American Society of Mechanical Engineers (ASME)/Institute of Electrical and Electronics Engineers (IEEE) Joint Rail Conference in Pueblo, Colorado, from March 13–16, 2007. The papers reflect Volpe Center expertise in the areas of rail equipment crash-energy management, gage-widening, and metal fatigue of railroad joint bars. The papers are listed below and will be available in the conference proceedings (<http://www.asme.org>) and on the Volpe Center website (<http://www.volpe.dot.gov/sdd/pubs.html>).

- “Performance Efficiency of a Crash Energy Management System,” by Mr. Michael Carolan, Mr. David Tyrell, and Dr. Benjamin Perlman, all of the Structures and Dynamics Division. JRCICE2007-40064.
- “Crash Energy Management Crush Zone Designs: Features, Functions, and Forms,” by Ms. Michelle Priante of the Structures and Dynamics Division and Mr. Eloy

Martinez of the Federal Railroad Administration. JRCICE2007-40051.

- “Implications of the Redefined Gage-Widening Projection Parameter for the Deployable Spent Axle Gage Restraint Measurement System,” by Dr. Theodore Sussmann and Mr. John Choros, both of the Structures and Dynamics Division, and Ms. Sung Lee of the Federal Railroad Administration’s Office of Research and Development. JRCICE2007-40098.
- “Estimation of the Fatigue Life of Railroad Joint Bars,” by Mr. Brandon Talamini, Mr. Jeffrey Gordon, and Dr. David Jeong, all of the Structures and Dynamics Division. JRCICE2007-40065.
- “Prevention of Derailments Due to Concrete Tie Rail Seat Deterioration,” by Mr. John Choros, Mr. Brian Marquis, and Mr. Michael N. Coltman, all of the Structures and Dynamics Division. JRCICE2007-40096.

Regulatory Impacts on Ports. For the Coast Guard’s Office of Standards Evaluation and Development, several Volpe Center staff members developed the report *Estimating Economic Impacts of Regulatory Changes to U.S. Port Operations*. The report describes a framework for estimating the changes to port costs, handling time, and reliability due to potential regulations imposed by the Coast Guard, as mandated by the Office of Management and Budget (OMB). The report was a multidivisional effort, with contributions from Mr. Lee Biernbaum and Dr. Don Pickrell of the Economic and Industry Analysis Division, Mr. Walter Gazda of the Advanced Safety Technology Division, Mr. Michael Dyer and Ms. Deirdre Morrissey of the Marine Systems Division, and guidance from Ms. Anne Aylward of the Service and Operations Planning Division.

Pre-Crash Scenario Safety Systems. In conjunction with the National Highway Traffic Safety Administration, in support of the Integrated Vehicle-Based Safety Systems initiative, under the Intelligent Transportation Systems program, Dr. Wassim Najm and Mr. John D. Smith of the Advanced Safety Technology Division published *Development of Crash Imminent Test Scenarios for Integrated Vehicle-Based Safety Systems*, DOT-VNTSC- NHTSA-07-01; DOT-HS 801 757. This report identifies crash-imminent test scenarios for integrated vehicle-based safety systems that alert the driver of a light vehicle or a heavy truck to an impending rear-end, lane change, or run-off-road crash. <http://www.itsa.org/itsa/files/pdf/IVBSS%20Crash%20Imminent%20Test%20Scenario%20Report%20-%20DOT%20HS%20810%20757.pdf>

Surveillance Broadcast Technologies. In support of the Federal Aviation Administration’s Office of Surveillance and Broadcast Services (SBS), Mr. Dominic Castaldo of the Advanced Communication, Navigation, and Surveillance Technologies Division presented “Surveillance and Broadcast Services” at “Safety in the Air,” an implementation-focused event organized by Société Internationale Télécommuniqué Aéronautique (SITA), in San Jose, Costa Rica, from April 11–14, 2007. SITA is attempting to become the regional provider for Automatic Dependent Surveillance-Broadcast (ADS-B) technologies.

Survey of Current Aircraft Flight Dynamic Models. Dr. Seamus M. McGovern of the Position, Navigation, and Timing Systems Engineering Division presented “Survey of



The Volpe Center recently produced a report on the economic impact of regulatory changes on U.S. port operations. (©istockphoto.com)

Contemporary Aircraft Flight Dynamics Models for Use in Airspace Simulation” at the Society of Photo-Optical Instrumentation Engineers Defense & Security Symposium/2007 Modeling and Simulation for Military Operations II Conference in Orlando, Florida, on April 11. The paper is coauthored by Mr. Seth Cohen of the Position, Navigation, and Timing Systems Engineering Division and reviews state-of-the-art flight dynamic models, including high-fidelity, commercial, and government models.



GPS IN CIVILIAN USE. On behalf of RITA, the Volpe Center leads the national Positioning, Navigation, and Timing (PNT) architecture effort intended to provide more effective and efficient PNT capabilities post-2025. Reliable PNT services are essential elements of the national transportation critical infrastructure, and involve multiple technologies that support multimodal systems safety operations requirements and other applications. (©istockphoto.com)

Meeting Growing Security Needs. Ms. Karen Van Dyke of the Advanced Surveillance and Communications Division and Maj. Shawn Brennan (USAF) of the National Security Space Office presented “National PNT Architecture Study—Interim Results” at the Institute of Navigation (ION) 63rd Annual Meeting in Cambridge, Massachusetts, from April 23–25, 2007. For civilian and defense applications, the US must continue to maintain and improve the Global Positioning System (GPS) effort. The National Positioning, Navigation, and Timing (PNT) architecture project, due to present its final recommendations later this year, has been evaluating alternative combinations of global (space- and non-space-based) and regional PNT solutions, PNT augmentations, and autonomous PNT capabilities. This effort is being conducted in conjunction with the Assistant Secretary of Defense for Networks and Information Integration (ASD (NII)) and the US Department of Transportation Research and Innovative Technology Administration (RITA) to represent the military and civilian communities, respectively.

Conference Addresses Aeronautical Information Systems. Mr. Kevin Harnett of the Infrastructure Protection and Operations Division and Mr. Vince Rakauskas of CSC, a Volpe subcontractor, presented “Air Force and Civil Secure Airborne Networks Research Plans for Aircraft Data Networks (ADNs)” at the 7th Integrated Communications, Navigation, and Surveillance (ICNS) Conference in Herndon, Virginia, from May 1–3, 2007. The

conference, jointly sponsored by government and industry, addresses research and development of integrated CNS technologies for advanced aeronautical digital information systems and applications supporting national and global air transportation systems. http://spacecom.grc.nasa.gov/icnsconf/docs/2007/Session_D/05-Harnett.pdf

Volpe Center Presents Research Results. The Society of Automotive Engineers (SAE) Government/Industry Meeting brings together the leading authorities from government, industry, and academia to explore the regulation, legislation, and technical issues impacting the future, including energy conservation, the environment, and safety. In Washington, DC, from May 14–16, Volpe Center experts were asked to discuss their work relating to event data recorders and vehicle-to-vehicle frontal-collision compatibility.

- Mr. Marco daSilva of the Advanced Safety Technology Division presented “Engineering Analysis of Event Data Recorder (EDR) Data in National Highway Traffic Safety Administration’s (NHTSA’s) National Automotive Sampling System (NASS) Crashworthiness Data System (CDS) Database.”
- Dr. John Brewer of the Advanced Safety Technology Division presented “Preliminary Estimates of Benefits in Front-Front Vehicle Compatibility.” ■

A New Role for Dr. Curt Tompkins

Volpe Center Director, 2005–2007

The Volpe Center's Director, Dr. Curt Tompkins, has accepted a new role as Director of the University Transportation Centers (UTC) program, which is part of the U.S. Department of Transportation's Research and Innovative Technology Administration (RITA). UTC's mission is to advance U.S. technology and expertise in the many disciplines comprising transportation through the mechanisms of education, research, and technology transfer at university-based centers of excellence. Curt's background as a faculty member, college dean, and university president for 35 years, together with his recent immersion in transportation issues, make him uniquely qualified for this leadership position.



Dr. Tompkins led the Volpe Center to a renewed focus on improving business processes and providing cost-effective services to our customers.

During his nearly three years at the Volpe Center, Curt made important contributions to both the Center and to RITA, our parent organization. In early 2005, shortly after he began his tenure, the Research and Special Programs Administration (RSPA) was dissolved when the Research and Innovative Technology Administration (RITA) was chartered. The Volpe Center was able to assist the new RITA administration in many significant initiatives, including contributing to DOT's Transportation Research, Development, and Technology Strategic Plan 2006–2010, published in November 2006.

Curt provided leadership to the Center in articulating its strategic framework. Within this framework, the goals are to contribute to solving U.S. DOT's key challenges, influence the direction of the nation's transportation enterprise, ensure a sustainable business model, and continuously develop the Center's human capital. This framework, in addition to unifying the Center's disparate transportation work, has also provided the fundamental groundwork for another of Curt's initiatives—the establishment of an annual business plan for the Center. This initiative is part of a renewed focus to improve business processes and provide cost-effective services to our customers.

These are just a few examples of Curt's leadership. He connected with each and every staff member. In his farewell to the Center, he expressed his appreciation for the Center's staff: "What I cherish most about my nearly three years at the Center is the people. For over 37 years, the Center's people have made the organization successful. They are a wonderful group of mission-driven human beings, and I shall miss them very much." He will be missed, as well.

Volpe Center Highlights

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The “Crash Energy Management” design uses zones of controlled crush; collision energy is absorbed by a series of components and distributed to unoccupied areas of a train.

Awards

Volpe Center Staff Receive Federal Laboratory Consortium Award

On May 17th the Volpe Center was presented with an Award for Excellence in Technology Transfer for the **Development of Crash Energy Management Passenger Rail Equipment for Federal Railroad Administration (FRA)** at the FLC (Federal Laboratory Consortium for Technology Transfer) annual meeting in Arlington, Texas. The award is presented by the Federal Laboratory Consortium to federal laboratories that have developed innovative technology and successfully transferred this technology to the public domain. The FLC is the nationwide network of over 200 federal laboratories that provides the forum to develop strategies and opportunities for linking laboratory mission technologies and expertise with the marketplace. This is the first time that a project from the Volpe Center has received this award and the first such award for the Department of Transportation in over a decade.

Since 1989, the Volpe Center has been performing in-depth studies to determine effective strategies for improved structural crashworthiness and occupant protection. Cab car-led passenger trains present a particularly challenging situation because the lead car traditionally bears the brunt of a crash. One solution that better preserves occupied spaces in the trains is Crash Energy Management (CEM). The CEM design uses zones of controlled crush; collision energy is absorbed by a series of components and distributed to unoccupied areas of the train rather than decimating the first car, as is characteristic of current equipment. A CEM Working Group was formed, including government engineers and participants from the rail industry, and a detailed technical specification was developed in just over four months. A full-scale crash test in Pueblo, Colorado, in March 2006 was pronounced “nearly perfect.” In May 2006, Metrolink, the Los Angeles commuter railroad, awarded a contract to Rotem, part of the Hyundai group of companies, to produce equipment incorporating the CEM technology. The Volpe Center continues to work with Metrolink to ensure that the supplier meets the requirements. New equipment with the CEM features is expected to be in service in 2009. ■



The Volpe Center team members from the Structures and Dynamics Division who received the award are pictured above: Ms. Michelle Priante, Ms. Karina Jacobsen, Dr. Benjamin Perlman, Mr. David Tyrell (team leader), Mr. Michael Carolan, Ms. Kristine Severson-Green, and Mr. Daniel Parent. Federal Railroad Administration team members are: Ms. Jo Strang, Mr. Grady Cothen, Mr. Eloy Martinez (formerly of the Volpe Center, also pictured above), Dr. Thomas Tsai, Mr. Gunars Spons, Mr. Charlie Bielitz, and Ms. Cindy Gross.