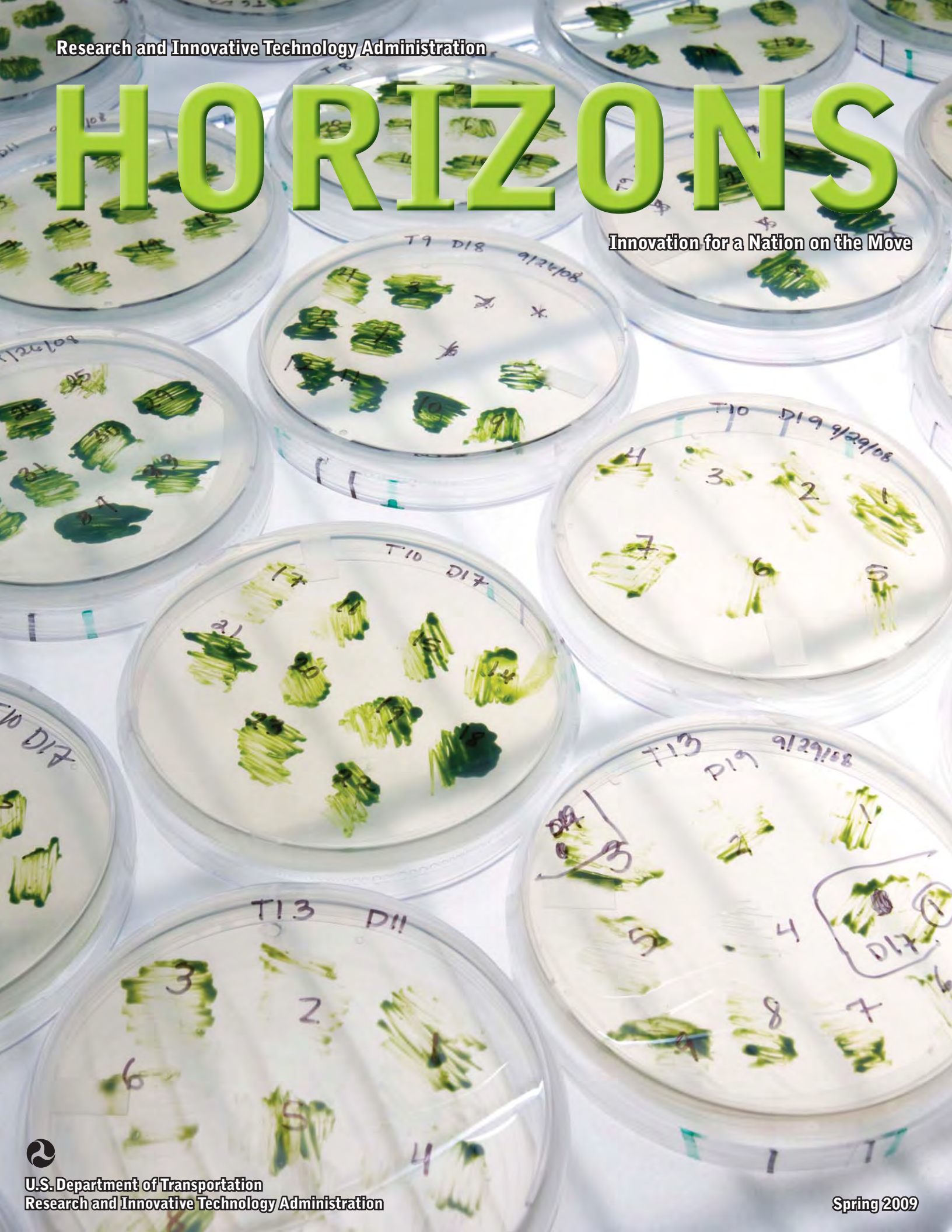


Research and Innovative Technology Administration

# HORIZONS

Innovation for a Nation on the Move



# contents

Spring 2009

## on the frontier

- 1 Connectivity—The Evolving Paradigm for IntelliDrive<sup>SM</sup>

## across the department

- 3 National Transportation Library Lends Critical Support to Recovery-Related Activities
- 4 Research and Development Coordination Initiative for More Effective RD&T Investments
- 4 NextGen Alternative Aviation Fuel Development

## ITS happenings

- 5 Integrated Corridor Management Analysis, Modeling, and Simulation

## university news

- 6 UTC Hosts Conference on “Changing Demographics and the Transportation System”
- 6 UTC Student of the Year Awards

## statistical news

- 7 BTS and Census Bureau Report that American Industry Shipped 13 Billion Tons of Goods in 2007

## new tools & training

- 11 Partnership Produces Unique Rotorcraft Accident Investigation Course

HORIZONS is a publication of the U.S. Department of Transportation, Research and Innovative Technology Administration.

About the cover: From Petri dish to fuel tank—researchers participating in the Commercial Aviation Alternative Fuel Initiative (CAAIFI) are making strides in creating biofuels that could help ease aviation’s reliance on fossil fuels. Cover photo courtesy of Solazyme



USDOT photo

President Obama speaking at USDOT

## in every issue

- 8 Your National Transportation Library
- 9 RITA Happenings
- 10 Technology Transfer
- 12 Check it out at [www.RITA.dot.gov!](http://www.RITA.dot.gov)

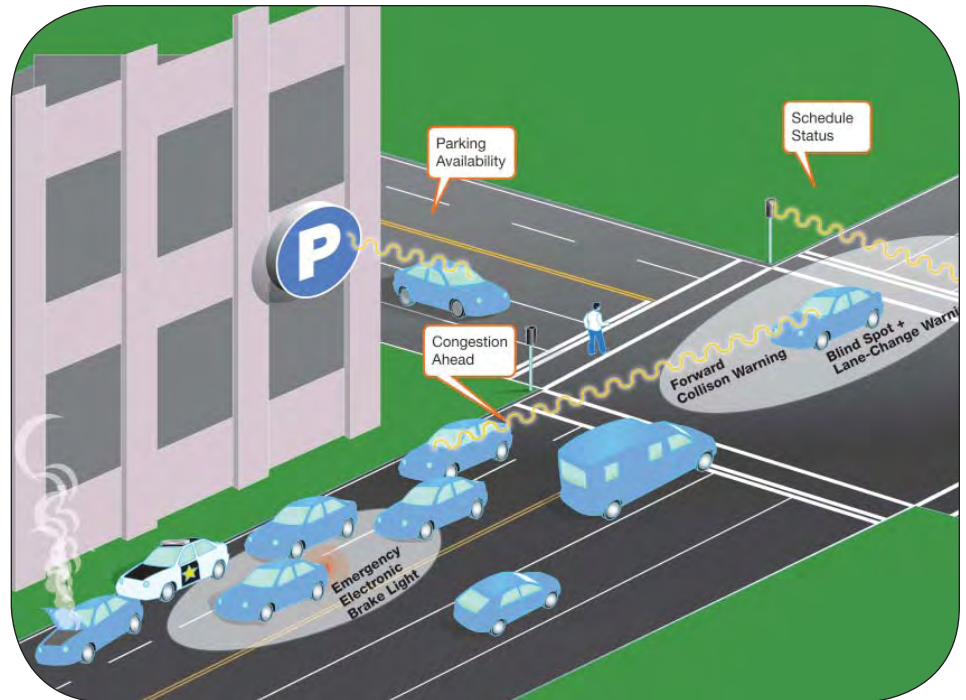


## Connectivity—The Evolving Paradigm for IntelliDrive<sup>SM</sup>

In January 2009, the U.S. Department of Transportation (USDOT) launched “IntelliDrive<sup>SM</sup>,” rebranding what was formerly referred to in the intelligent transportation systems community as Vehicle-Infrastructure Integration. The IntelliDrive program is focused on enabling a surface transportation system in which vehicles do not crash and road operators and travelers have the information they need about travel conditions. IntelliDrive will establish an information backbone for the transportation system that will immediately support applications to enhance safety and mobility and, ultimately, enable the vision of a crashless, information-rich surface transportation system. IntelliDrive will also support applications to enhance livable communities, environmental stewardship, and traveler convenience and choices.

### Safety Applications to Reduce Crashes and Save Lives

IntelliDrive safety applications present promising solutions for alleviating the tragic social and economic impacts of the nation’s crash fatality and injury rates—41,000 fatalities and 2.49 million injuries in 2007. Some experts estimate that up to 15 percent of crashes in the United States might be avoided if drivers were alerted to hazards before encountering unexpected conditions. Providing drivers with timely alerts about hazards, as was demonstrated in the Japanese SmartWay project, has shown to be up to 80 percent effective in reducing traffic crashes at certain traffic safety “hot spots” in Japan.



The IntelliDrive system would rely on an active safety system that involves sensing and messaging not only between vehicles, but between vehicles and outside elements.

IntelliDrive safety alerts increase drivers’ situational awareness, which increases reaction times. Even last-second warnings can give drivers enough time to brake, or perhaps even steer around a vehicle ahead of them. Some of these active safety features include:

- **Signal and Stop Sign Violation Warning**—Drivers who are at risk of violating a red signal light or a stop sign receive a graphical and audible warning from on-board equipment (OBE).
- **Curve Speed Warning**—Drivers are warned by the system to slow down if their vehicle’s speed is higher than recommended for the curve.
- **Collision Warning**—IntelliDrive provides audio and visual warn-

ings to drivers who are approaching a slowed or stopped object too rapidly, or following a vehicle too closely. Likewise, if a vehicle traveling ahead suddenly decelerates, the driver behind is notified to ensure his or her awareness, even if visibility is limited by weather conditions or obstructed by large vehicles. The system also warns drivers of impending side or rear-impact collisions, or when they are about to drift out of their lane.

### DSRC Remains the Approach for Active Safety

The technology behind active safety systems involves sensing and messaging between vehicles, or between vehicles and infrastructure elements. On-board equipment alerts drivers instantly when sen-

sors detect a hazard. The hazard message must be delivered instantly so that the vehicle can generate a timely alert, and, to protect privacy rights, messages must be secure and anonymous. At present, Dedicated Short-Range Communications (DSRC) remains the only available technology that meets the extremely fast transmission (“low latency”) and security requirements of active safety applications. By comparison, when we wait for signals to synchronize on our cell phones and computers, we experience relatively high latency.



Eventually, it is likely that a new technology may emerge that will improve on DSRC as the most practical platform for active safety applications. When that happens, the challenge will be to plan an orderly transition to the newer technology—a common phenomenon in the information technology industry.

### Connectivity Now: Focus on Market-Ready Technologies

As IntelliDrive continues to work toward a safer future with DSRC-based vehicle-vehicle and vehicle-infrastructure integration, a parallel effort to deliver mobility benefits using market-ready wireless consumer electronics technologies is under way.

DOT launched the SafeTrip-21 Initiative last year to leverage existing and emerging mobile communications and navigation technologies. This year, SafeTrip-21 will conduct two pilot test projects in the San Francisco Bay area: Networked Traveler and Mobile Millennium. Partners include the University of California/Berkeley, based at the California Center for Innovative

Transportation; Nokia/NAVTECH; and the California Department of Transportation. In addition, DOT is partnering with the I-95 Corridor Coalition through a SafeTrip-21 project to display real-time travel information in airports and shopping malls, and to evaluate the consumer benefits of real-time travel information.

**Networked Traveler** systems, which will be pilot tested in the San Francisco Bay Area this year, deliver information directly to consumers in practical and personalized formats—via cell phone, desktop, laptop, handheld computers and mobile Internet devices, and in-vehicle after-market devices. Like a social networking site, users personally customize the types of information they want to receive, such as:

*Tell Me About The Route*—Real-time information about a specific travel route:

- Route choice (choose the most eco-friendly, or the fastest route)
- Traffic (avoid areas of high traffic congestion, take alternate routes, delay travel)
- Travel times (determine which is quicker—driving or public transit)
- Road condition alerts (speed zone information, work zones, upcoming intersections, hazard alerts)
- Transit planning (transit schedule and GPS-based current transit status)
- Personal notification of your bus stop or bus transfer point.

*Watch Out for Me*—Safety alerts (to make road users aware of each other).

- Collision avoidance
- Vehicle distress signals (alerts other drivers that help is needed)

- Pedestrian alerts (notifies drivers of pedestrians in their path; allows pedestrians to tell the traffic signal that they need more time to cross the road).

*Smart Parking*—Up-to-the-minute information about parking availability.

In the **Mobile Millennium** project, consumers volunteer to download free software to their GPS-enabled cell phones that will send anonymous speed and location readings to servers. The data will be integrated into traffic models that produce an estimate of traffic flow and then relayed back to the mobile phones and posted on line at <http://traffic.berkeley.edu>. Researchers expect to have 10,000 volunteer participants by April 2009.

Under another SafeTrip-21 initiative, starting this summer, the I-95 Corridor Coalition will post real-time travel information online, in airports and shopping malls, and at Interstate welcome centers to deliver consumers the information they need to make better travel choices.

- Online, interactive maps will enable travelers to assess traffic conditions within and between major metro areas at a glance. For example, travelers driving from Washington, DC, to New York will be able to see any major incidents delaying travel on their route.
- At Baltimore-Washington International Thurgood Marshall Airport, kiosks and the airport’s web site will offer travelers access to real-time information on ground transportation options to and from the airport. Information about driving times, public transportation options and status, taxis, shuttle vans, and airport bus services will enable travelers to choose the

*(continued on p. 13)*

## National Transportation Library Lends Critical Support to Recovery-Related Activities

The American Recovery and Reinvestment Act of 2009 (ARRA)—an unprecedented effort to jumpstart our economy, create or save millions of jobs, and put a down payment on addressing long-neglected challenges—was signed into law by President Barack Obama on Feb. 17, 2009. Two weeks later, on Mar. 3, 2009, President Obama and Vice President Joe Biden visited USDOT headquarters in Washington, D.C., to release \$26.6 billion from the ARRA to states and local transportation authorities to repair and build highways, roads, and bridges. Both actions triggered a flurry of public inquiries to USDOT that is not expected to let up for some time. The Office of the Secretary of Transportation has turned to RITA for help in mak-

ing sure that all inquiring members of the public are provided with the information they seek.

By acting as the single point of contact and communication with the public on ARRA activities related to transportation, RITA's National Transportation Library (NTL) is now supporting all of the USDOT's modal agencies. To begin, NTL staff created a vital FAQ web page about USDOT recovery efforts. Next, all emails and phone calls from the public regarding transportation-related stimulus and recovery measures were routed to the NTL's Reference Service Team, which now handles all such calls. ARRA-related inquiries received by the team range from questions about state certifications and rules for funding grants, to ques-

tions about how to acquire funding or contracts for various businesses. NTL has added additional full-time staff to meet public demand answers and assistance, having long prided itself on its ability to respond to most inquiries within 24 hours.

NTL will be mobilized as long as necessary to provide answers to callers who are looking to play a role in advancing the ARRA's goals. For more information on Recovery activities at US DOT, including weekly updates, go to: <http://www.dot.gov/recovery/>. 🌐



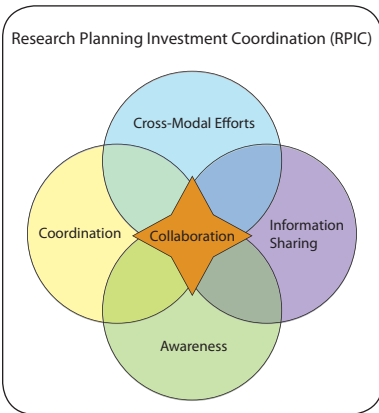
USDOT photo

President Barack Obama, joined by Vice President Joe Biden and U.S. Transportation Secretary Ray LaHood, on Mar. 3, 2009, released \$26.6 billion from the American Recovery and Reinvestment Act (ARRA) to states and local transportation authorities to repair and build highways, roads, and bridges.



# Research and Development Coordination Initiative for More Effective RD&T Investments

The U.S. Department of Transportation's (USDOT) current research, development and technology (RD&T) projects will be responsible for much of what transportation will look like tomorrow. In addition to developing the next generation of airplanes, passenger vehicles, trains, ships, and trucks, they are pioneering safety innovations and finding new ways to extend the life of our aging but critical roads, bridges, airports, and other infrastructure. RD&T is also easing the way for our nation's transition to alternative fuels, such as hydrogen, while offering benefits to our economy, environment, and national security.



Just as the stakes for extracting clear and measurable benefit from our investment in transportation research have never seemed higher, RITA has been leading the development of an ambitious pilot coordina-

tion initiative within USDOT to manage and measure the performance of the \$1 billion USDOT invests in RD&T each year. The initiative, aptly called Research, Planning, and Investment Coordination (RPIC), promises to ensure visibility and transparency by integrating USDOT's budget and planning processes, leveraging research investments, and eliminating redundancy.

As initially envisioned by Congress when it created the agency in 2004, RITA's Office of RD&T is leading the coordination and collaboration of the Department's R&D programs.<sup>1</sup>

RITA's coordination and facilitation activities for RPIC are done in conjunction with the USDOT RD&T Planning Team, comprising the Associate Administrators for Research from each Operating Administration (OA), and the USDOT RD&T Planning Council, which is made up of the Administrators from each OA. The RD&T Planning Team identifies opportunities for crossmodal coordination and collaboration to eliminate redundant investments.

<sup>1</sup> In 2005 the Secretary signed DOT Order 120.39A creating two research governing bodies – the RD&T Planning Council and the RD&T Planning Team.

*(continued on p. 15)*

## NextGen Alternative Aviation Fuel Development

By 2025, U.S. air traffic is predicted to have more than doubled compared to current levels, and our present air traffic control system will not be able to manage this growth. The solution? All eyes are looking to the Next Generation Air Traffic System (NextGen), a transformation of both our National Airspace System and system of airports that uses the latest technologies to ensure that future safety, capacity, and environmental needs are met.

The NextGen vision was developed by the Federal Aviation Administration (FAA) Joint Planning and Development Office, which facilitates interagency cooperation, and will be realized through coordinated efforts of the Departments of Defense, Homeland Security, and Commerce, as well as the U.S. Department of Transportation (USDOT), the National Aeronautics

and Space Administration, and the White House Office of Science and Technology Policy.

At USDOT, a major component of the FAA's NextGen implementation plan is the rapid advancement of technologies that will mitigate the impact of aviation on the environment. A priority focus is the development of alternative aviation fuels, and RITA's Volpe National

Transportation Systems Center in Cambridge, MA, has been fully engaged in this endeavor. In 2008, the Volpe Center supported two main



*(continued on p. 13)*

## Integrated Corridor Management Analysis, Modeling, and Simulation

The U.S. Department of Transportation (USDOT) launched the 5-year, multimodal Integrated Corridor Management (ICM) initiative in 2005 to help mitigate bottlenecks, manage congestion, and empower travelers to make more informed travel choices through actionable information. In 2006, the USDOT selected 8 Pioneer Sites to partner with and define their concepts of operations and requirements for the ICM initiative. The Pioneer Sites include Oakland and San Diego, CA; Dallas, Houston and San Antonio, TX; Montgomery County, MD; Seattle, WA; and Minneapolis, MN.

Transportation corridor operators and managers can employ an array of ICM strategies to improve the movement of people and goods. With so many choices, agencies are interested in analyzing the potential benefits of the various approaches to help them decide on specific ICM strategies to implement. The USDOT developed the ICM analysis, modeling, and simulation (AMS) methodology, which combines elements of existing models to support comprehensive assessment of ICM strategies not available today



FHWA photo

With ICM, the various partner agencies manage the transportation corridor as a system rather than the traditional approach of managing individual assets.

through any single tool. The AMS approach enables corridor managers to:

- Select and apply the most effective ICM strategies,
- Invest with confidence, and
- Continually improve implementation of ICM strategies.

In order to validate the AMS approach, Interstate 880 (I-880) in the San Francisco Bay Area was selected to serve as a test corridor. Using historical data, analysts examined the potential implications of specific sample ICM strategies under a variety of conditions along the corridor.

Preliminary results from AMS of the test corridor suggest:

- ICM will help reduce congestion and improve productivity of the nation's transportation corridors.
- Benefits of ICM strategies appear to be greatest under conditions of traffic congestion due to heavy demand and/or incidents.

- Dynamically applying ICM strategies in combination across a corridor reduced congestion and improved the overall productivity of the transportation system.

In late 2008, the USDOT selected three of the eight ICM Pioneer Sites to conduct AMS on their proposed integrated corridor management systems. The selected sites—**Dallas, Texas; Minneapolis, Minnesota; and San Diego, California**—have the data, modeling and simulation tools and well-described ICMS needed to support analysis and are in the process of developing experimental plans. They are currently developing AMS experimental plans and evaluating the highway, arterial and transit data available to support AMS and ICM decision support systems. The analysis should be completed by the summer of 2009.

For more information on AMS or the USDOT ICM Initiative, please visit: <http://www.its.dot.gov/icms/index.htm>.



FHWA photo

The USDOT has selected Pioneer Sites to apply analysis, modeling, and simulation (AMS) methodology on those sites' proposed integrated corridor management systems. Highway, arterial, and transit data are being analyzed to support AMS efforts.

## UTC Hosts Conference on “Changing Demographics and the Transportation System”

In October 2008, RITA’s University Transportation Centers (UTC) program, along with the Transportation Research Board (TRB), hosted its third annual Spotlight Conference, on “The Impact of Changing Demographics on the Transportation System” in Washington, D.C. Conference speakers addressed some of the diverse demographic changes that are likely to affect the U.S. transportation system over the coming decades, including issues related to our aging population, changes in ethnicity, shifts in the rural/urban/suburban/exurban population balance and their effect on mobility and transportation safety, and workforce issues associated with changing demographics.

Topics addressed at presentations during the two-day meeting included:

- Immigration Internally and from Abroad:
    - Immigrants and Travel Behavior: A Tale of Migration, Mobility and Assimilation
    - Immigration Trends in the U.S.: Implications for Travel Demand, Transportation Systems, and Public Policy
  - Gender Differences:
    - Does Gender Matter? Changes, Choices and Consequences for Transportation Policy
    - The Mobility and Safety of Older Women in 2030
  - Aging and Demographic Transition:
    - Safe Mobility of Older People
    - Disruptive Demographics: Anticipating New Demands of Aging on Tomorrow’s Transportation System
  - Changing Racial and Ethnic Mix:
    - Disaggregating Race and Ethnicity: Toward a Better Understanding of the Social Impacts of Transport Decisions
    - Demographics Matter: Travel Demand, Options and Characteristics Among Minority Populations
- Paper sessions were also held on Aging and Demographic Transition; Immigration Internally and from Abroad; and Changing Racial and Ethnic Mix, and Gender Differences.
- As with all Spotlight Conferences, TRB will develop and publish a

*(continued on p. 14)*

## UTC Student of the Year Awards

The 2009 winter meeting of the Transportation Research Board (TRB) marked the 18<sup>th</sup> Annual Outstanding Student of the Year Awards ceremony, sponsored by USDOT. This year, 53 students from USDOT-sponsored University Transportation Centers (UTC) were honored at the banquet.

The student awards are held in conjunction with the Council of University Transportation Centers (CUTC) awards banquet each year. Each year at the annual winter meeting of TRB, USDOT honors the most outstanding student from each participating UTC for his/her achievements and promise for future contributions to the transportation field. Students of the year are selected based on their accomplishments in such areas



as technical merit and research, academic performance, professionalism, and leadership.

The Research and Innovative Technology Administration (RITA)

administers the UTC program, with funding from the Federal Highway Administration and the Federal Transit Administration. This year, continuing the tradition of One DOT, the Department also honored a student from the Air Transportation Centers of Excellence, sponsored by the Federal Aviation Administration. 🌀



## BTS and Census Bureau Report that American Industry Shipped 13 Billion Tons of Goods in 2007

American industry shipped 13 billion tons of goods valued at almost \$12 trillion in 2007, according to preliminary numbers from the 2007 Commodity Flow Survey (CFS) released in December by the Bureau of Transportation Statistics in partnership with the U.S. Department of Commerce's Census Bureau.

The preliminary CFS numbers show that trucks moved manufactured goods and raw materials in 2007 amounting to about 9 billion tons in shipments valued at \$8.4 trillion. These totals represent more than two-thirds of the value and weight of freight shipped in the United States.

Based on ton-miles, a measure derived by multiplying weight by distance shipped, rail and trucking accounted for 37 and 40 percent, respectively, of freight being transported in 2007.

Multiple mode shipments using more than one type of transportation were second to trucking in shipment value, at \$1.9 trillion for a 16 percent share, but carried only 627 million tons or 5 percent by weight. For shipments using multiple modes, parcel, U.S. Postal Service or courier carried the most by value (\$1.6 trillion) but truck-rail combination carried the most weight (213 million tons).

The rail mode was the second most-used mode by weight, carrying 1.9 billion tons of freight for a 15 percent share but only \$388 billion or 3 percent of goods by value. When each individual mode's portion of multiple mode shipments is redistributed to components of individual modal shipments, rail generated the most ton-miles totaling almost 1.5 trillion.

Shipments totaling 7.1 billion tons, or more than half of the total weight of all shipments captured by the CFS, moved less than 50 miles, while shipments traveling less than 250 miles represented more than half the value recorded in the 2007 CFS.

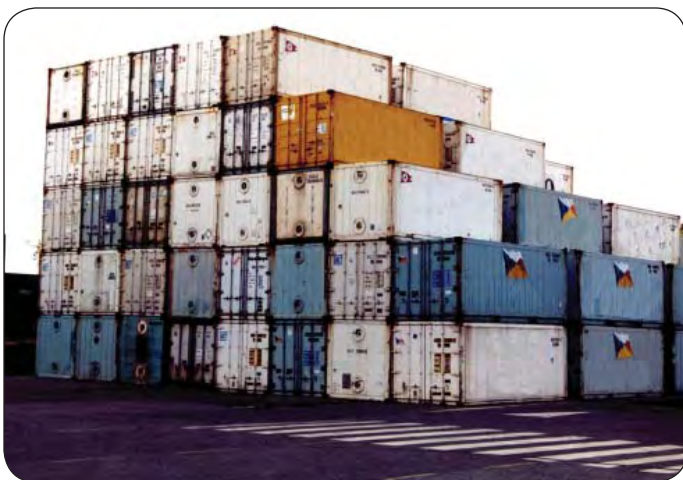
Smaller shipments traveled longer distances on average. Shipments

of less than 50 pounds traveled an average of 716 miles while shipments of 50 to 99 pounds traveled an average of 395 miles. More than 70 percent of total shipment value captured by the 2007 CFS is represented by shipments weighing over 1,000 pounds. More than 92 percent of the tons are represented by shipments of more than 10,000 pounds.

Estimates of shipment characteristics by industry are included in the CFS for the first time. The preliminary estimates show the manufacturing industry shipped 5.4 billion tons of commodities valued at \$5.4 trillion and generated 1.5 trillion ton-miles in 2007, the largest contribution of any industry sector. The two commodities generating the most value in the 2007 CFS were electronic and office equipment and mixed freight. The commodity category with the most tonnage was gravel and crushed stone.

The CFS is the primary source of national and state-level data on domestic freight shipments by American establishments in mining, manufacturing, wholesale, auxiliaries, and selected retail industries. The CFS is a shipper-based survey and is conducted every 5 years as part of the Economic Census.

Final data will be available in December 2009. 🔄



USDOT photo

Preliminary numbers from the 2007 Commodity Flow Survey show that, when measured by weight, trucking and rail were the most used modes of freight transportation.

## your national transportation library

### Transportation Tools, Tips, and Resources

RITA's National Transportation Library (NTL) is a digital library with a mandate to facilitate and increase the availability of information that supports transportation policy, research, operations, and technology transfer activities.

The NTL offers a variety of tools to help you find these types of information, so why not start out at the NTL home page at <http://ntl.bts.gov/> and explore some of the possibilities? Below are just a few of the tools you can find at the NTL:

**Frequently Asked Questions:** The NTL produces and maintains the US DOT's Frequently Asked Questions (FAQs) web page. This web page provides detailed answers to the questions most frequently asked by our customers. These questions and answers are most easily accessed at: [www.dot.gov](http://www.dot.gov)—simply click on the FAQ link you'll see on the US DOT home page.

**Transportation Research Information Service (TRIS) Online**, a collaborative product of the Transportation Research Board and NTL, is a specialized transportation database that contains over 500,000 records of published transportation research including technical reports, books, conference proceedings and journal articles in the transportation disciplines of planning, finance, design and construction, materials, environmental issues, safety and human factors and operations for the modes of highways, transit, railroads, maritime and aviation. Currently there are almost 24,000 TRIS records with links to electronic copies of the full-text. TRIS Online is available free to the public on our "Information Resources and Tools" web page at <http://ntl.bts.gov/tools/index.html#tools>

**Sources of Information in Transportation (SIT)** is a collection of topical bibliographies, each divided into the following sections: basic references, statistical sources, standards, periodicals, conference proceedings, indexing/abstracting databases, dictionaries and glossaries, and electronic resources. Each bibliographic reference is annotated and contains links to additional information or the resource where appropriate. SIT a produce of the Special Libraries Association Transportation Division and is available free to the public on our "Information Resources and Tools" web page at <http://ntl.bts.gov/tools/index.html#tools>

**TranStats** is an online database for disseminating intermodal transportation data in a format suitable for analysis. The free public website at <http://www.transtats.bts.gov> allows users to search for transportation data sets, explore data, and download specific data from tables. It is most useful for Bureau of Transportation Statistics' data on airlines, border crossings, and ferries.

**NTL's Integrated Search** provides an in-tandem search of the NTL Digital Repository (full-text digital resources and digitized documents) and TRIS Online. The NTL Digital Repository includes statistical, technical, research, and policy documents provided by federal, state, local, tribal, and other government agencies and can be searched full text. The NTL Integrated Search is available free to the public on our "Information Resources and Tools" web page at <http://ntl.bts.gov/tools/index.html#tools>

**Custom Google Search Tools:** This Google-powered search engine enables targeted searching of specific websites (e.g., all state DOT websites). Transportation librarians created the custom searches, which are all accessible through the NTL (<http://ntl.bts.gov/tools/statedot.html>).

**The Transportation Research Thesaurus (TRT)** is an internationally used set of standard, or controlled, terms for transportation concepts, topics, and methods which, in addition to keywords, are used to search and retrieve information. First created as an NCHRP project, the TRT can also be used to organize websites and catalog data sets. The TRT is available free to the public on our "Information Resources and Tools" web page at <http://ntl.bts.gov/tools/index.html#tools>

**Transportation Libraries Catalog (TLCat)** TLCat is a national union catalog of transportation libraries. Over 36 transportation library collections from key state DOTs, university libraries, and Federal libraries in transportation are included. TLCat is available free to the public on our "Information Resources and Tools" web page at <http://ntl.bts.gov/tools/index.html#tools>

If, after you have completed your online search, you need further assistance finding information, please contact NTL's reference staff at Ask-A-Librarian (<http://ntl.custhelp.com/cgi-bin/ntl.cfg/php/enduser/ask.php>) or 1-800-853-1351 for assistance.



### New Director at the Helm of the Transportation Safety Institute

RITA has announced the hiring of the first new Director of its Oklahoma City-based Transportation Safety Institute (TSI) in 10 years. John Phillips, former Chief of Ground Safety for the United States Air Force (USAF), assumed leadership of TSI in September 2008.

In his previous position, Phillips led the overall ground mishap prevention program for USAF operations and personnel worldwide. He oversaw ground safety policy, plans, programs, and standards development and implementation for over 800,000 military and civilian personnel.

It was through his USAF safety work that Phillips first learned about TSI—as a customer. “I was always

impressed by the quality of TSI’s training, its excellent customer service, and overall professionalism,” he said. “When the opportunity presented itself to join TSI, I knew I wanted to be part of its great team.”

Phillips held numerous previous assignments at USAF, including chief of safety, environment, and health; chief of range safety; chief of ground



TSI photo

John Phillips, Director, RITA’s Transportation Safety Institute

*(continued on p. 14)*

### Centers of Innovation Define Sharpened Volpe Center Focus

The Volpe National Transportation Systems 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).

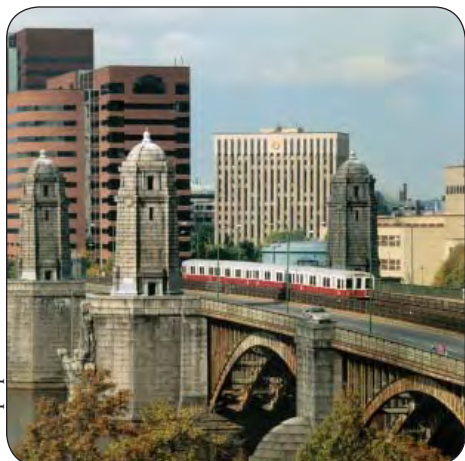
- Multimodal Systems Research and Analysis
- Safety Management Systems
- Environmental and Energy Systems
- Freight Logistics and Transportation Systems
- Physical Infrastructure Systems
- Communication, Navigation, Surveillance (CNS) and Traffic Management Systems
- Human Factors Research and System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

The Centers of Innovation complement the intent and spirit of the Norman Y. Mineta Research and Special Programs Improvement Act with their focus on cross cutting transportation, research, education, innovation, and other multimodal issues. The COI structure increases the opportunity for research and technology synergy both within and outside the USDOT and en-

hances 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 USDOT strategic goals and national transportation priorities.

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

Funded through work agreements with multiple USDOT and non-DOT agencies, the Volpe Center supports all of USDOT’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. 🔄



Volpe photo

Volpe National Transportation Systems Center headquarters, Cambridge, MA

## State-of-the-Art Vehicle Safety Systems Move to Field Testing

RITA's Volpe National Transportation Systems 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.



Volpe photo

The Integrated Vehicle-Based Safety Systems project seeks to accelerate the introduction and commercialization of vehicle-based crash warning systems.

IVBSS is a cooperative effort by an industry team led by the University of Michigan Transportation Research Institute and the USDOT. The team includes the National Highway Traffic Safety Administration, the Federal Motor Carrier Safety Administration, and RITA's Intelligent Transportation Systems Joint Program Office.

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, and boost product marketability.

The Volpe Center team worked closely with USDOT 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 photo



### Partnership Produces Unique Rotorcraft Accident Investigation Course

**R**ITA's Transportation Safety Institute (TSI) recently achieved a milestone when they conducted a newly developed Rotorcraft Accident Investigation Course in Oklahoma City, OK. The course is designed to provide government accident investigators with the specific technical skills required to conduct thorough and comprehensive rotorcraft investigations. The course is 8 days in length and covers the entire spectrum of helicopter operations.

The national helicopter accident rate is at an all time high. In fact, the National Transportation Safety Board currently lists "Improve Emergency Medical Helicopter Operations" at the top of their "Most Wanted" list. "This course is designed to improve helicopter safety and help drive the national accident rate down," said Ricki Thorpe, TSI course developer and manager. "A revision and update to this course could not be timelier."

The key to the value and effectiveness of the course is a cooperative partnership that involves bringing together multiple federal agencies, private industry, and local government. On the federal side, the course boasts instructors and presenters from the Federal Aviation Administration, the National Transportation Safety Board, the Department of Defense, the Department of Interior, and TSI. Private industry brings invaluable experience and expertise to the table as well, with senior investigators from various hands-on local and state organizations. Local support and participation includes the Channel 4 News Chopper, Oklahoma City Police Department Aviation Division, Oklahoma University Medi-Flight, and the Oklahoma State Metro Technical Institute. This partnership and the collective expertise and resources it provides render the course a premier training and qualification event worthy of international note.

The course is fast paced, beginning day one with a comprehensive review of rotorcraft flight characteristics and aerodynamics. Follow-on training days include in-depth helicopter systems review, hazards unique to rotorcraft flight, multiple helicopter accident



Students become familiarized with various helicopter types during TSI's hands-on Rotorcraft Accident Investigation Course

cases, and actual hands-on experience with several local helicopters landing at our training facility. The aggressive schedule is deemed necessary by TSI to produce qualified and well-rounded accident investigators. TSI has invested tremendous commitment into this new safety training tool—because the only good thing that comes from accidents is lessons learned to prevent future ones.

TSI delivers safety, security, and environmental training for all modes of transportation, and its courses can be tailored to the needs of public and private agencies world-wide. To learn more about TSI visit [www.tsi.dot.gov](http://www.tsi.dot.gov) or call 800-858-2107. 🌐

TSI photo

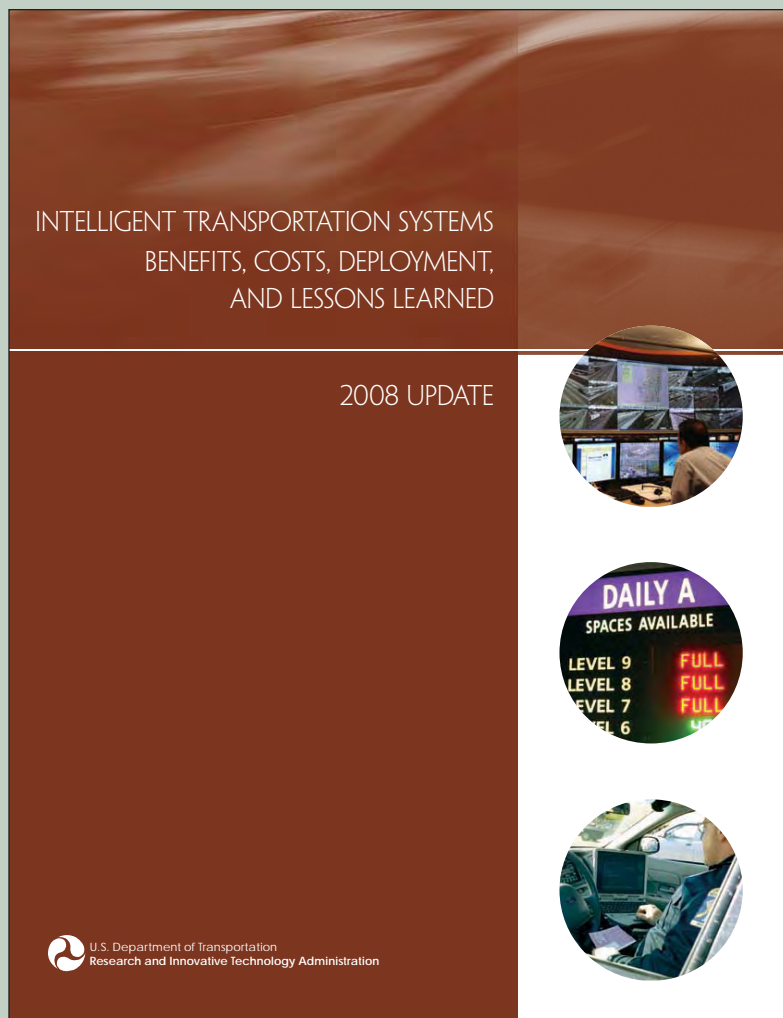
check it out at [www.rita.dot.gov](http://www.rita.dot.gov)!



## Intelligent Transportation Systems Benefits, Costs, Deployment and Lessons Learned

Intelligent Transportation Systems (ITS) provide a proven set of strategies for addressing the challenges of assuring safety and reducing congestion, while accommodating the growth in transit ridership and freight movement. ITS improves transportation safety and mobility, and enhances productivity through the use of advanced communications, sensors, and information processing technologies encompassing a broad range of wireless and wireline communications-based information and electronics. When integrated into the transportation system's infrastructure, and into vehicles themselves, these technologies relieve congestion, improve safety, and enhance American productivity.

This report presents information on the performance of deployed ITS, as well as information on the costs, deployment levels, and lessons learned regarding ITS deployment and operations. The report, and the collection of four Web-based resources upon which it is based, have been developed by the U.S. DOT's ITS Joint Program Office (JPO) to support informed decision making regarding ITS deployment.  
[http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS\\_TE/14412.htm](http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/14412.htm)





## Connectivity—The Evolving Paradigm for IntelliDrive<sup>SM</sup>

(continued from p. 2)

ground transportation options that will work best for them.

- Large-screen displays of travel time information at Tyson's Corner shopping mall in Northern Virginia, and at Interstate welcome centers in Virginia will help travelers plan their trips.


### The Federal Role: Parallels With Internet Development

If the challenges facing the IntelliDrive evolution seem daunting, it is useful to look back over the past 20 years and consider the early development and evolution of the Internet. In its early years, many also raised questions about the Internet's ability to provide reliability, security, privacy, scalability, ubiquitous coverage, and so forth. Despite it all, the Internet rapidly developed into a worldwide communications system that broadly meets users' needs—consistently, predictably, and cost-effectively. Early developers may not have imagined the system's scalability, or its widespread use in everyday life. The key to the Internet's success was development based on the Internet Protocol Suite (commonly known as TCP/IP). Although the Internet Protocol Suite resulted from work sponsored by the Defense Advanced Research Projects Agency (DARPA) in the early 1970s, many organizations and individuals contributed to its development over time. Today the Internet is a "network of networks" that consists of

millions of private and public, academic, business, and government networks without a need for public infrastructure or a central source of operations and maintenance support.

The Internet analogy provides an example of the role of government in similar initiatives. No single entity could develop the Internet. Likewise no single entity can develop IntelliDrive. The federal government has a role in working with industry and standards development organizations to establish the framework of protocols necessary for IntelliDrive connectivity. The federal government also plays an important role in fostering industry oversight mechanisms and the establishment of necessary legal protections and safety requirements, as well as in providing seed funding for innovative research efforts. Ultimately, the market will determine how the system is deployed and what services are provided. Advances in information technology over the last half century portend an exciting future and tremendous opportunities for IntelliDrive.

For the latest information about the program, please refer to the following IntelliDrive websites at <http://www.intelldriveusa.org/> or <http://www.its.dot.gov/intelldrive/>.

IntelliDrive<sup>SM</sup> is a registered service mark of the USDOT, Intelligent Transportation Systems/Joint Program Office. 

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## NextGen Alternative Aviation Fuel Development

(continued from p. 4)

alternative aviation fuel initiatives: the *Commercial Aviation Alternative Fuels Initiative (CAAFI)* and the *Alternative Aviation Fuel X PRIZE Roadmap*.

CAAFI was established to enhance energy security and environmental sustainability for aviation by exploring the potential use of alternative fuels. CAAFI, through regular summits, workshops, panel meetings, publications, and its website (<http://www.caafi.org/>), provides a forum for the U.S. commercial aviation community to engage the emerging alternative fuels industry and to work together, share and collect needed data, and motivate and direct research on aviation alternative fuels. CAAFI is aimed at promoting the development of alternative fuel options that offer equivalent levels of safety and compare favorably with petroleum-based jet fuel on cost and environmental bases, with the specific goal

of enhancing the security of energy supply. The Volpe Center provided CAAFI with several leading alternative aviation fuel experts and extensive workshop logistics support.

Most recently, CAAFI representatives took part in a flight test organized by CAAFI sponsors—Continental Airlines, Boeing, General Electric, and others. During the test, a 50 percent blend of hydrotreated renewable jet (HRJ) fuel, derived from jatropha plant stock and algae feedstock, powered one of two engines on a Continental 737-800.

Also during FY 2008, the Volpe Center led efforts to bring the X PRIZE model of innovative technology development to the area of alternative aviation fuels by establishing a working relationship with the X PRIZE Foundation of Los Angeles, CA, that will culminate in

the Alternative Aviation Fuel/PRIZE Roadmap. (The mission of the X PRIZE Foundation is to bring about radical breakthroughs for the benefit of humanity—creating and managing prizes that drive innovators to solve some of the greatest challenges facing the world

today.) With the project Roadmap set to be in place by October 2009, this initiative will offer substantial financial and public relations incentives to industry and academic participants to develop a viable, environmentally friendly alternative to aviation fossil fuel. 🌱

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## UTC Hosts Conference

*(continued from p. 6)*

final report of results from the event, an “E-Circular” that will be distributed throughout government, academic and private sector transportation communities in both hard copy and in a web-based format through TRB’s Transportation Research Information Service, which is hosted online by RITA at <http://ntlsearch.bts.gov/tris/index.do?&d=tr>.

The report will focus on demographic research activities being conducted by the UTCs, as well as how that research supports USDOT initiatives and enhances the movement of people. Specifically, the report will serve as an information base of USDOT-supported universities conducting demographic-related research, development, and technology for use by USDOT and other U.S. government agencies, the academic community, and private sector.

The October conference was the third in the recently established UTC Spotlight Conference series, which was first instituted in 2006 with a conference called “Radio Frequency Identification Technologies in Transportation.” As with the first two Spotlight Conferences, the purpose of this event was to allow university researchers, transportation industry representatives, state and local DOTs and other government agencies, exposure to the breadth of university work in a particular area and, more importantly, inform USDOT of the insight and innovations being realized. The 2007 conference topic was “Freight Transportation: Congestion and System Performance.” Upcoming Spotlights will focus on Infrastructure Preservation and Management (2009) and Transportation and the Environment (2010). 🌱

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## New Director at the Transportation Safety Institute

*(continued from p. 9)*

safety; manager of USAF operational risk management; chief of USAF safety plans/policy. Early in his career, he flew helicopters for the U.S. Army. He is a Certified Safety Professional, has a Master of Science degree in Industrial Safety Management, and is a graduate of Harvard University’s Kennedy School of Government Senior Executive Fellows Program and the Federal Executive Institute’s Leadership for a Democratic Society Course. Of all the awards and citations he has received, Phillips is proudest of his two Air Force Civilian Meritorious Service medals.

TSI is a Federal cost recovery agency that develops and provides safety, security, and environmental training and services for both public and private sector customers worldwide. TSI conducts approximately 600 technical and management courses annually, training nearly 20,000 students each year in aviation, traffic, transit, rail, highway, motor carrier, and other specialty areas. Mr. Phillips provides leadership for TSI’s 50 full-time personnel and over 300 associate staff members with an annual operating budget of over \$10 million. 🌱

## Research and Development Coordination Initiative

(continued from p. 4)

RPIC will enhance the Department's RD&T operational capabilities while at the same time improving its strategic and annual planning. Specific areas for improvement include:

- Ensure research investments are consistent with our National transportation goals
- Create visibility and transparency
- Enhance coordination and collaboration
- Identify duplication
- Strengthen accountability
- Measure performance.

In April 2008, after much hard work, the RD&T Planning Team came to an agreement on the RPIC mission, objectives, and processes, soon after the RPIC pilot was underway. The RPIC pilot has developed standard ways to capture information about RD&T activities. This includes data categories, functional software, instructions for reporting data as well as the collection of data using the FY09 budget submissions.

In August 2008, the RD&T Planning Team made further improvement to the RPIC processes and developed a list of RPIC pilot findings and recommendations. The findings urged implementation of the RPIC initiative, signaling recognition that the processes developed to date:

- Ensure *visibility and transparency* of R&D funds through a jointly constructed shared knowledge framework creating an enterprise view of RD&T across DOT goals and priorities.
- Ensure *greater consistency in format and content* from an aligned process and IT support for wide-scale implementation to collect and analyze data.
- *Provide better information aggregation* and important additional knowledge about DOT RD&T to include context of programs.
- Ensure *strengthened accountability* for RD&T through collaboration and participatory decision-making.

The RD&T Planning Team produced recommendations that RITA and the RPIC initiative:

- Look beyond planning level budget information for share/exchange across the OAs.

- Provide software and database support/resources for enhanced integration, analysis and dissemination of the RD&T information.
- Build a better understanding of RD&T across DOT through the development of a more robust, flexible knowledge framework that looks deeper across guiding principles.
- Provide evidence that our research is of value and leading to innovation.

In September 2008, the RD&T Planning Council adopted the findings and recommendations presented by the Planning Team. The RPIC initiative will be further developed in the coming year by reaching milestones that include:

- Development of a blueprint for automation capability (0–3 months)
- Capture and analysis of FY 2010 current services budget (0–3 months)
- Adaptation/modification of the current knowledge framework (0–3 months)
- Review of different approaches/methodologies for evaluating RD&T programs(0–3 months)
- Completion of a prototype automation tool (3–6 months)
- Analysis of FY 2009 enacted funds against planning level information (3–6 months).

Striving to reach these goals by Spring 2009, the Department should start benefitting from the RPIC initiative through budget and planning processes yielding even higher levels of coordination and cooperation.

Continued refinement of RPIC will allow the development of automated tools to make this enterprise view of RD&T investment even more user friendly for senior decision makers. RPIC will ultimately provide USDOT, its stakeholders, and the American people with new visibility to ensure that tight transportation research dollars are leveraged to the maximum extent possible. 🌀



