

# VOLPE HIGHLIGHTS

## Volpe Center Delivers Comprehensive Assessment on the Marine Transportation System

Waterborne international freight is extremely important to the U.S. economy, with imports and exports together accounting for about 20% to 25% of the nation's Gross Domestic Product. The [U.S. Committee on the Marine Transportation System \(CMTS\)](#) is an interagency group representing over one dozen U.S. Government departments and agencies with maritime responsibilities. One of the five priority areas for CMTS is to assess the resilience and reliability of the MTS to natural or manmade events that may impede its effectiveness.



Shown above, the Canmar Pride.

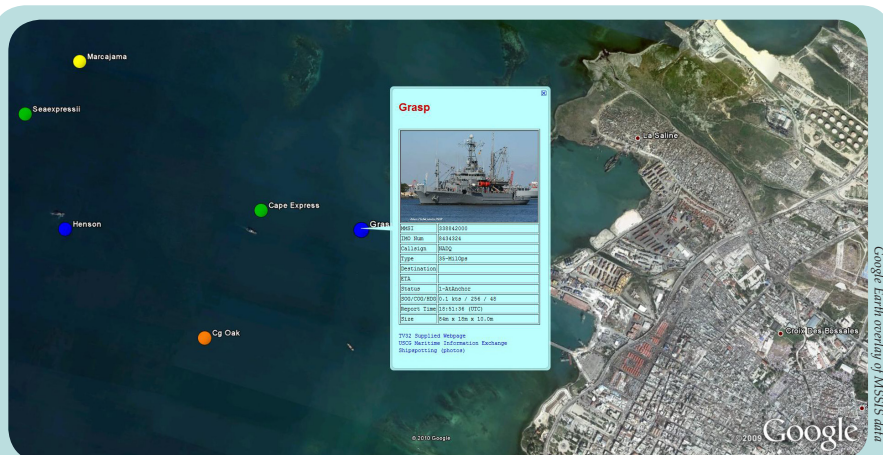
In support of CMTS, with sponsorship from the U.S. Army Corps of Engineers, Dr. Bahar Barami of the Volpe Center Freight Logistics and Transportation Systems Center of Innovation recently delivered a comprehensive "Assessment of MTS Challenges." The final report describes an assessment of the MTS functions and conditions, threats to its continued operations and vulnerabilities that make the threats more likely to materialize. It applies a risk and resiliency analysis framework that was developed specifically for the assessment. The report also evaluates the inherent elements within the system which can mitigate the consequences of the MTS risk factors. It also identifies technology deployment and policy solutions that would enhance MTS sustainability and resiliency.

The final report includes a summary and six separate task reports that assessed the MTS risks arising from infrastructure and capacity constraints and trade and economic challenges, as well as safety, security, environmental and institutional constraints. Two additional Volpe Center reports were also included in the final "Assessment of MTS Challenges:" a study on Short Sea Shipping conducted for the Office of Naval Research and a Benefit Cost Analysis of Electronic Navigation Charts prepared for the National Oceanic and Atmospheric Administration.

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## Assisting Department of Defense in Haitian Relief Efforts



A screenshot from MSSIS, displaying details for a commercial ship inbound to Haiti.

In the aftermath of Haiti's devastating earthquake, the arrival details for ships delivering supplies are critical to relief organizations. With the support of the Volpe Center's Maritime Safety and Security Information System (MSSIS) team, the U.S. Department of Defense has ensured that deployed Naval Co-operation and Guidance for Shipping (NCAGS) personnel have continuous access to real-time data for the commercial ships arriving in Haiti. NCAGS in turn passes on this information to other organizations engaged in the relief effort, enabling them to accelerate distribution of their supplies. The MSSIS team is part of the Freight Logistics and Transportation Systems Center of Innovation. More information is available at <https://mssis.volpe.dot.gov>.

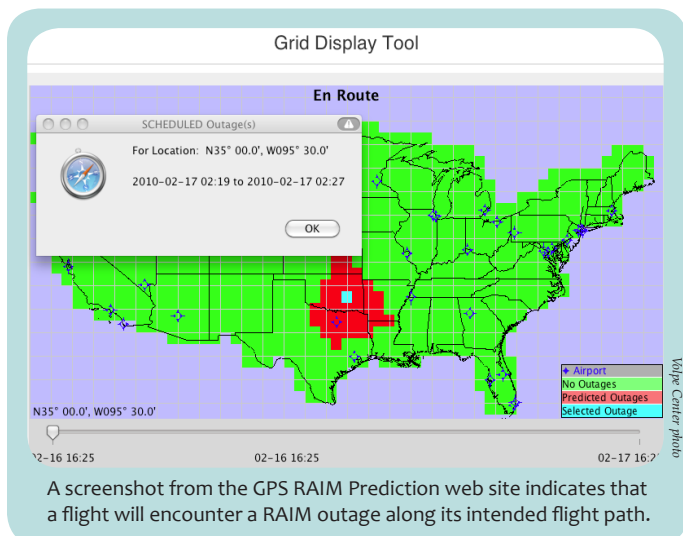
## Predicting GPS RAIM Outages to Support NextGen Flight Planning

When pilots rely solely on GPS satellites for Area Navigation (RNAV), flight planners need to confirm ahead of time that the pilots will have adequate GPS signal integrity, or Receiver Autonomous Integrity Monitoring (RAIM) availability, from takeoff until landing. The Federal Aviation Administration (FAA) issued [Advisory Circular 90-100A](#) to formally establish the practice of performing pre-departure integrity checks. Last year, the FAA came to the Volpe Center to build a compliance tool so that carriers, in particular smaller airlines, were not burdened with costly upgrades.

*Receiver Autonomous Integrity Monitoring (RAIM) is a technology that assesses GPS integrity. For this project, RAIM data is used to forecast GPS integrity, facilitating the use of RNAV.*

In July 2009, the Volpe Center project team successfully launched the [GPS RAIM Prediction web site](#), a set of web-based tools that the FAA provides free of charge to enable compliance with the standard. On any given day, flight managers submit about 25,000 flight plans through the site's eXtensible Markup Language (XML) interface to check predicted RAIM availability along planned routes. The site also provides a map display and a flight planning form for users who lack the means to develop an XML client, and includes warnings to indicate predicted outages, so flight managers can adjust flight plans as necessary.

In just eight months, the [GPS RAIM Prediction web site](#) has responded to over 5 million queries. The Volpe Center project team has monitored and modified the site to handle the high volume and is assisting in transferring operations from the Volpe Communications, Navigation, and Surveillance and Traffic Management Systems Center of Innovation to a 24-hour monitoring team at the FAA William J. Hughes Technical Center in Atlantic City. The cost-effective, rapid development of this tool supports the near-term implementation of RNAV, a key component of [NextGen](#) that reduces fuel use, shortens flight times and mitigates airspace congestion.



A screenshot from the GPS RAIM Prediction web site indicates that a flight will encounter a RAIM outage along its intended flight path.

## Volpe Develops Cost Allocation Methodology for Amtrak Routes



Amtrak's Acela high speed Boston-New York service.

In December 2009, the Federal Railroad Administration (FRA) issued a Report to Congress entitled "Methodology for Determining the Avoidable and Fully Allocated Costs of Amtrak Routes." The profitability of passenger rail service in the U.S. has been a controversial subject since Congress created Amtrak in 1970. A major problem has been the perception that Amtrak's accounting systems were not sufficiently accurate to track and allocate the costs of each of its more than forty passenger rail routes. To help resolve this issue, Congress authorized the Secretary of Transportation "to retain a consultant ... to develop ... a methodology for determining the avoidable and fully allocated costs of each Amtrak route." FRA requested that the Volpe Center undertake this effort.

The Volpe Center's Multimodal Research and Analysis Center of Innovation assembled a team which worked closely with Amtrak's staff to review its cost accounting system and determine how to develop and implement a revised method for determining both avoidable and fully allocated costs for each route. "Avoidable costs" are defined as estimated cost savings that would occur if a single Amtrak route were eliminated, and "fully allocated costs" are defined as that portion of the total costs that best represents an equitable share for a single route.

Several major issues needed to be resolved as part of the methodology development process. For example, there are certain shared operational and corporate costs such as "maintenance of way," "capital costs" and "general and administrative" costs that cannot be easily apportioned to individual trains or routes. Amtrak also has several major ancillary businesses such as commuter rail services and real estate ventures whose costs also needed to be properly allocated. This new methodology is being integrated into a new Amtrak Performance Tracking cost accounting system and as a result the costs of individual routes can be assessed much more accurately than in the past.



## Interagency Workshops on Affordable Housing and Transit Underway



Photo courtesy of FTA

FTA Deputy Administrator McMillan, FTA Regional Administrator Richard Doyle, MBTA Director of Planning/Development Joseph Cosgrove and Massachusetts Department of Transportation CEO Jeff Mullan took a tour of Boston's Fairmount/Indigo urban rail line. The rail line is a local and national innovation, exemplifying the interagency collaboration necessary to successfully implement transit-oriented development.

The average American family spends 60 percent of its income on housing and transportation. In some auto-dependent neighborhoods, households spend nearly as much on transportation as on housing. One solution to making housing and transportation more affordable is to expand housing opportunities adjacent to transit.

Although the concept of transit-oriented development is not new, U.S. Department of Transportation Secretary Ray LaHood's focus on livable communities has translated to support for new livability initiatives. The [Partnership for Sustainable Communities](#) was created in recognition of the need for successful interagency collaboration between their agencies by Secretary LaHood, Department of Housing and Urban Development (HUD) Secretary Shaun Donovan and Environmental Protection Agency (EPA) Administrator Lisa Jackson.

In support of the Partnership and its subgroup, the Interagency Working Group on Affordable Housing and Transit, Volpe Center staff are working with Federal Transit Administration (FTA) and HUD staff to conduct a series of webinar workshops to facilitate information exchange and improve the coordination and delivery of joint projects

and services. These workshops bring together over 175 regional and headquarter staff from the FTA, Federal Highway Administration, HUD and the EPA. Case studies of transit-oriented development from four different regions offered insights into best practices for collaboration with not only other local transportation, housing and land use agencies but also critical partners such as non-governmental organizations and community associations. [Boston's Fairmount/Indigo urban rail line](#) was the subject of a case study. The project involves innovative collaboration between the FTA and HUD regional offices on transit oriented development, the EPA regional office on brownfield reclamation, the Massachusetts Bay Transit Authority, the City of Boston and local development and advocacy organizations. Recently, William Lyons and Angel Williams of the Volpe Center's Multimodal Systems Research and Analysis Center of Innovation accompanied FTA Deputy Administrator Therese McMillan and Katherine Mattice, FTA Office of Budget and Policy, on a tour of the Fairmount Corridor.

## Support to Alternative Fuels Initiative Earns Sustainability Award

At the first ever U.S. DOT Sustainable Achievement Awards Ceremony, a team comprised of FAA and Volpe Center contributors received an award in Alternative Fuels/Fuels Conservation. The award recognizes the support of the team to advancing research and evaluation of alternative aviation fuels through the Commercial Aviation Alternative Fuels Initiative (CAAFI), a multi-sector research, development and deployment coalition. The Volpe Center's Environmental and Energy Systems Center of Innovation support to CAAFI has included developing stakeholder participation, developing evaluative tools, making presentations to aviation and fuels communities and coordinating logistics for the CAAFI annual meeting.

## U.S. DOT Deputy Administrators Visit the Volpe Center

Volpe Center Director Robert Johns hosted a visit by RITA Deputy Administrator Robert Bertini, Federal Transit Administration (FTA) Deputy Administrator Therese McMillan and Federal Highway Administration (FHWA) Deputy Administrator Greg Nadeau. The visiting officials received briefings on the Volpe Center's capabilities and work in livability, transportation planning and policy, environmental sustainability, environmental measurement and modeling, global maritime domain awareness and NextGen aviation systems. An overview of the Volpe Center's support to FHWA and FTA was also presented. U.S. Deputy Secretary of Transportation John Porcari also participated by videoconference in part of the technical discussions.



Volpe Center photo

From left to right: RITA Deputy Administrator Robert Bertini, FHWA Deputy Administrator Greg Nadeau, FTA Deputy Administrator Therese McMillan and Volpe Center Director Robert Johns.

# Transition from Space Race Launched Transportation Systems Center



NASA courtesy of hushimages.org

The Apollo 11 mission, the first manned lunar mission, launches from the Kennedy Space Center, Florida on July 16, 1969.

Today, the Volpe Center is a Federal Center of Excellence and home to world renowned multidisciplinary expertise in all modes of transportation. Since 1970, the Volpe Center's work on behalf of U.S. DOT, other Federal, state and local organizations, international entities and the private sector has always reflected pressing national needs and priorities. The Volpe Center has responded to major transportation challenges, including the need to modernize air traffic flow management systems, address critical multimodal safety issues, develop sophisticated logistics and communications systems for national initiatives overseas, respond to energy crises and strengthen global maritime domain awareness.

The Cambridge, Massachusetts-based Federal organization has always been about transportation – but in the beginning, it was all about space transportation. NASA's **Electronics Research Center (ERC)** was a major part of the plan to bolster America's space exploration program and support the Cold War struggle. In an effort to solidify NASA's in-house electronics expertise, ERC opened its doors in September 1964 – five years before Apollo 11 lifted off and American Neil Armstrong set foot on the moon. Located in the midst of a leading U.S. technology hub, NASA reports that the ERC was just as important a NASA field center as the Langley Research Center or the Marshall Space Flight Center. By 1968, the agency planned for ERC to employ over 2000 Federal employees.

In December 1969, the ERC was thrust in to the middle of political controversy when President Nixon announced its closure as part of major shift in the nation's space policy and deep cuts in the Federal budget. By this time, however, an appreciation had developed for the unique Federal technical expertise and perspective that had

been assembled in Cambridge. In an effort to preserve the intellectual foundation that been established, then-Secretary of Transportation and former Governor of Massachusetts John Volpe and members of the New England Congressional delegation teamed with others in a bi-partisan effort to preserve this national resource. The thinking at the time was that the nation was facing unprecedented transportation challenges and ERC's technical expertise could be applied to complex multimodal issues ranging from mass transit to air traffic flow and safety.

In a March 1970 memorandum to the President, the Science Advisor to the President and the Director of the Bureau of the Budget advised that the transfer of ERC to the U.S. DOT would both strengthen transportation R&D planning and support the responsibilities of the Office of the Secretary of Transportation to assure coordinating and managing authority for intermodal and cross modal activities.

On July 1, 1970, the ERC facility was transferred to the U.S. DOT for \$1 and became the nation's multimodal Transportation Systems Center, or TSC. Because the transfer occurred during a period of austere budgets, U.S. DOT's newest asset was established as a unique fee-for-service organization reporting to the Assistant Secretary for Systems Development and Technology.

*This is the first in a series of stories honoring the Volpe Center's 40th anniversary of Federal service to the Nation. The next story will highlight the Volpe Center's successful transition to a hub of multimodal transportation research, analysis and engineering, with special emphasis on its groundbreaking work during its first decade - the 1970s.*



## Volpe Center Information

617.494.2224 or [askvolpe@dot.gov](mailto:askvolpe@dot.gov)

Visit the Volpe Center at: [www.volpe.dot.gov](http://www.volpe.dot.gov)

Volpe Center contributors to this issue:

Dr. Bahar Barami, Ellen Bell, Noah Berger, Joyce Chen, Kam Chin, Robert Dorer, Christopher Dufresne, Dr. Richard John, Alison Kruger, Dr. Kristin Lewis, William Lyons, Ronald Mauri, Mark Safford, Diane Wells, Angel Williams



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