U.S. Department of Transportation
Office of the Secretary of Transportation

Assistant Secretary
for Research and Technology

1200 New Jersey, S.E.
Washington, D.C. 20590

TO: Dr. Michael Walsh, Technology Partnerships Office
National Institute of Standards and Technology

FROM: Dr. Kevin Womack, Director for the Office of Research, Development, and Technology

SUBJECT: U.S. DOT's Technology Transfer (T2) Report for FY2015

Every year, the Department of Commerce (DOC) submits a Federal Laboratory T2 Fiscal Year Summary Report to the President and the Congress in accordance with 15 USC 3710(g)(2), summarizing the implementation of technology transfer authorities established by the Technology Transfer Commercialization Act of 2000 (P.L. 106-404) and other legislation. This report summarizes U.S. DOT's information for DOC's Fiscal Year 2015 Summary Report.

Please submit questions pertaining to this report to Santiago Navarro at Santiago.Navarro@dot.gov or 202-366-0849.

Attachment

cc:
Department of Commerce
National Institute of Technology and Standards

U.S. Department of Transportation

Technology Transfer – FY 2015

Office of the Assistant Secretary for Research and Technology

1/31/2016

Introduction

The U.S. Department of Transportation (DOT) is the federal steward of the nation's transportation system. DOT consists of multiple modal Operating Administrations, which carry out mission-related Research, Development and Technology (RD&T) programs in support of the DOT strategic goals: Safety, State of Good Repair, Economic Competitiveness, Quality of Life in Communities, and Environmental Sustainability. In 2004, the Research and Innovative Technology Administration (RITA) was charged by its enabling legislation[1] with coordination of DOT-wide RD&T and technology transfer activities. In the Consolidated Appropriations Act, 2014 (P.L. 113-76), RITA was elevated to the Office of the Secretary and given a new name – the Office of the Assistant Secretary for Research and Technology.

DOT defines technology transfer as the process of transferring and disseminating transportation related scientific information to stakeholders who may apply it for public or private use. DOT's current approach to technology transfer is diverse and unique to each mode of transportation. Each modal Operating Administration conducts mission-specific deployment activities tailored to its mode and type of research. Agency specific technology transfer plans may be found here.

Technology Transfer activities are executed by DOT agencies and their laboratories:

- Federal Aviation Administration (FAA): The FAA's Federal laboratory is the William J. Hughes Technical Center located at the Atlantic City International Airport, New Jersey.
- Federal Highway Administration (FHWA): Turner-Fairbank Highway Research Center (McLean, VA).
- Office of the Assistant Secretary for Research and Technology (OST-R): John A. Volpe National Transportation Systems Center (Volpe Center, Cambridge, MA).
- National Highway Traffic Safety Administration (NHTSA): Vehicle Research and Test Center (VRTC, East Liberty, OH)

[1] P.L 108-426, November 30, 2004 (118 Stat. 2423).

Table 1 Invention Disclosures and Patents

		FY11	FY12	FY13	FY14	FY15
	Invention Disclosure					
1	Number of new inventions disclosed	2	2	13	3	0
	Patents					
2	Number of patent applications filed	2	1	5	0	5
3	Number of patents received	0	4	1	1	1
Enter “0” to report that the agency did not use this mechanism in the reported year. Enter "N/A" to report that data is not available at time of report. Add rows and interpretive notes as needed						

Table 2 Income Bearing Licenses

		FY11	FY12	FY13	FY14	FY15
	Income Bearing Licenses					
4	Number of income bearing licenses	3	2	3	1	2
5	Exclusive licenses	1	0	0	1	0
6	Partially exclusive licenses	0	0	0	0	0
7	Non-exclusive licenses	2	2	3	0	2
FAA licenses are non-exclusive						
	Elapsed Amount time to Grant Licenses					
8	Average (months)	N/A	N/A	N/A	N/A	N/A
9	Minimum (months)	N/A	N/A	N/A	N/A	N/A
10	Maximum (months)	N/A	N/A	N/A	N/A	N/A
Enter “0” to report that the agency did not use this mechanism in the reported year. Enter "N/A" to report that data is not available at time of report. Add rows and interpretive notes as needed						

Table 3 Licensing Income

		FY11	FY12	FY13	FY14	FY15
	Earned Royalty Income					
11	Earned Royalty Income from top 1% of licenses	N/A	N/A	N/A	N/A	N/A
12	Earned Royalty Income from top 5% of licenses	N/A	N/A	N/A	N/A	N/A
13	Earned Royalty Income from top 20% of licenses	N/A	N/A	N/A	N/A	N/A
14	Minimum Earned Royalty Income	N/A	N/A	N/A	N/A	N/A
15	Maximum Earned Royalty Income	N/A	N/A	N/A	N/A	N/A
16	Median Earned Royalty Income	N/A	N/A	N/A	N/A	N/A
	Disposition of Earned Royalty Income (thousands)					
17	Total amount of Earned Royalty Income received	$18.2	$7.4	$8.8	$22.6	11.8
18	Percent of Earned Royalty Income distributed to inventors	35	45	42	32	42
19	Percent of Earned Royalty Income distributed to the agency or laboratory	N/A	N/A	N/A	N/A	58
20	Licenses terminated for cause	N/A	N/A	N/A	N/A	0
Enter “0” to report that the agency did not use this mechanism in the reported year. Enter "N/A" to report that data is not available at time of report. Add rows and interpretive notes as needed						

Table 4 Cooperative Research and Development Agreements

		FY11	FY12	FY13	FY14	FY15
	CRADAs					
21	Number of Active CRADAs	25	29	40	51	48
22	Number of newly executed CRADAs	8	12	8	10	9
23	Active CRADAs with small businesses involvement	8	12	8	10	11
24	Number of small businesses involved in active CRADAs	0	3	3	5	10
	Traditional CRADAs					
25	Active traditional CRADAs	0	3	3	7	48
26	Newly executed traditional CRADAs	0	0	0	2	9

	Non-traditional CRADAs					
27	Active non-traditional CRADAs	0	0	0	0	0
28	Newly executed non-traditional CRADAs	0	0	0	0	0

Enter “0” to report that the agency did not use this mechanism in the reported year. Enter "N/A" to report that data is not available at time of report. Add rows and interpretive notes as needed

Table 5 Other Performance Measures Deemed Important by the Agency

		FY11	FY12	FY13	FY14	FY15
	Others					
4	Collaborative Relationships	39	14	26	30	35
5						
6						
7						

Enter “0” to report that the agency did not use this mechanism in the reported year. Enter "N/A" to report that data is not available at time of report. Add rows and interpretive notes as needed

Efforts to Streamline Technology Transfer Operations

DOT is increasing coordination between Operating Administrations (OA) through the designation of identified technology transfer points of contact from each OA R&D program. These efforts are already providing enhanced efficiencies in the collection of intellectual property (IP) and T2 information necessary for the completion of the annual Technology Transfer Performance Report submitted to the Department of Commerce. Other efforts for streamlining its operations include:

- increasing its federal laboratory participation in Lab-to-Market directives through the development of a website that will improve public awareness and access to information on the Department’s technology transfer operations;
- developing training materials to assist R&D personnel to incorporate various technology transfer best practices into their research programs (technology transfer primer document developed and under review for publication for the transportation community);

- developing a new Departmental intellectual property policy, which will include streamlined procedures for the submission and review of potential invention disclosures, as well as improving total effectiveness and reductions in cost;
- preparing simplified model agreements for use or adoption by the OAs and/or the Department's federal laboratories to reduce resources and time spent on negotiation; and
- entering an agreement with a third party intermediary for further improving the visibility of the Department's research facilities and equipment, its research capabilities, and the technologies available for licensing.

1. From Research to Reality, Volpe Brings Side Guards to Large Trucks

When trucks with high ground clearances strike vulnerable road users, such as bicyclists and pedestrians, those users can fall into exposed space between the front and rear wheels and suffer fatal crushing injuries. Side guards physically cover that exposed space.

Volpe's National Transportation Systems Center (Volpe) research coalesced years of international analysis on side guards. The United Kingdom, for instance, enacted a side guard requirement in the 1980s. After the requirement was implemented, bicyclist fatalities decreased 61 percent, and pedestrian fatalities decreased 20 percent for side impacts with large trucks. Through presentations at conferences and consultations with elected officials and transportation agencies, Volpe is helping bring side guards to the United States.

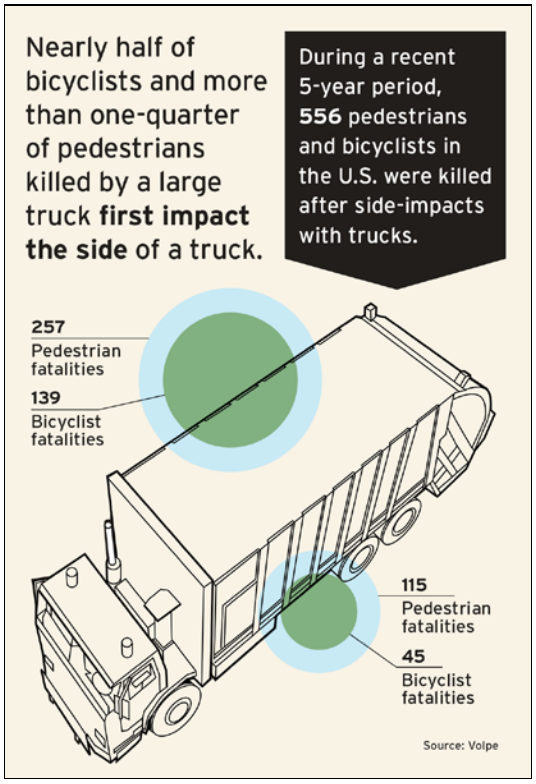


Figure 1 Truck side-impact fatalities.

In 2014, the City of Boston asked Volpe to help expand on its truck side guard pilot—which was informed by Volpe research—and to craft the nation's first side guard ordinance for private truck fleets. The ordinance took effect in May 2015. At the same time, the neighboring City of Cambridge asked Volpe to recommend side guard specifications for its municipal trucks.

New York City also asked Volpe to study and develop a pilot truck side guard program for its largest-in-the-nation municipal truck fleet. In June 2015, New York unanimously passed a Volpe-advised law requiring side guards on 10,000 city-owned and regulated trucks by 2024. The City has further leveraged the technology transfer by successfully soliciting the first vehicle procurement bids from major truck OEMs in North America to include integrated side guards. This demonstrates a milestone for Volpe's T2 effort by influencing the multinational automotive

sector. With New York's truck fleet fully equipped with side guards, the city can expect to see several lives saved and dozens of serious injuries avoided per year.

In fall 2015, Volpe started to support the City of San Francisco's Vision Zero safety program to eliminate traffic deaths within one decade. Volpe and the City are working to identify regulatory or voluntary partnerships with local and state agencies, as well as with the manufacturing sector, to promote a robust side guard market and to accelerate this technology transfer in California. Additional Volpe consultations with the cities of Chicago, Seattle, Albany, and Washington, D.C. are expected to catalyze further nationwide adoption.

Figure 2 Side guards help keep pedestrians and bicyclists from falling between axles. Source: City of Boston.

Volpe's Truck Side Guards Resource Page is available at: https://www.volpe.dot.gov/our-work/truck-side-guards-resource-page.

2. A Quantitative Non-destructive Residual Stress Assessment Tool for Pipelines

DOT's Pipeline and Hazardous Materials Safety Administration's (PHMSA) SBIR Phase 1 and 2 funding led to the development of the eStress™ system, which measures the pipe wall internal stresses within a damaged area, allowing operators to thoroughly inspect and analyze at-risk areas before failures occur. A key advantage of the eStress™ system is that through wall stress measurements can be taken while a pipeline is in service, which allows direct measurement of the complex stress state of the dented materials under operating conditions.

Through PHMSA's participation in the SBIR Program, Generation 2 Materials Technology, LLC, demonstrated this powerful new nondestructive evaluation system for analyzing through-thickness residual stresses in mechanical damaged areas of steel pipelines. The system is designed to help pipeline operators find problem areas before serious damage occurs. High levels of tensile stress are the fundamental driver for dangerous corrosion and cracking in pipelines, which can be identified and mitigated proactively.

The current 64- sensor array design can evaluate approximately one square foot in less than two minutes. It is also envisioned that the eStress™ system could be installed permanently along high consequence areas or other areas of concern for monitoring the dynamic stresses that come from transportation, operation, pigging, nearby industry/citizens, etc. Visit PHMSA project site for more information: https://primis.phmsa.dot.gov/matrix/PrjHome.rdm?prj=441

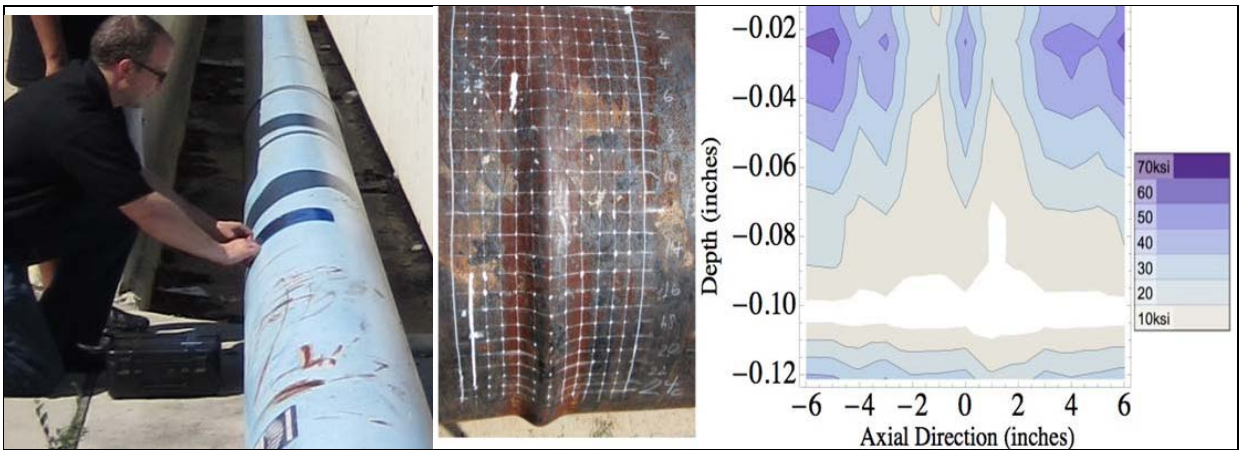


Figure 3 Courtesy from Generation 2 Materials Technology, LLC

3. UL Adopts Microscale Combustion Calorimeter (MCC)[2]

Underwriters Laboratories (UL) recently adopted the FAA-patented Microscale Combustion Calorimeter (MCC), which was developed by Rich Lyon and Rich Walters of the Fire Safety Branch, to verify that manufactured materials are compliant with the UL 94 flammability test standard. Many components in building materials and consumer products are required to meet the UL 94 flammability standard, and the material manufacturers are required to demonstrate each lot is compliant with the standard. Rather than conducting a UL 94 flammability test, which requires a large sample bar, a MCC test requiring a very small sample – as small as several milligrams – may be used to demonstrate continued compliance of the manufactured material.

The benefit of using the MCC is reduced cost, time and waste associated with molding plastic sample bars, and discarding the unused or unburned samples. The MCC also provides a more quantitative output – heat release rate signature – and significantly reduces the quantity of combustion products release during UL 94 testing. The MCC has become a common test method used by fire researchers since its development and application in many FAA fire research papers, and adoption as ASTM standard D7309. In recent years it has become a quality control tool, as evidenced by the recent UL application, and previous use by the Boeing Company.

Figure 4 Microscale Combustion Calorimeter[3]

[2] "The Center News", Vol 51, No. 17, Wed. April 29 2015, Page 2
[3] FAA Federal Laboratory Consortium Planner Submission, 2015

4. FHWA Provides Incentives to States to Field Test Research Results

The FHWA State Transportation Innovation Council (STIC) Incentive program provides resources to help States and local highway agencies make innovations standard practice in their States.

A STIC is an established group of representatives from various levels of the highway community in each State tasked with comprehensively and strategically considering sources of innovation. The STIC puts the State in the driver's seat to select the innovations that best fit unique program needs and quickly put those innovations into practice.

Launched in September 2013, the STIC Incentive Program offers technical assistance and up to $100,000 per STIC per year to support the costs of standardizing innovative practices in a State transportation agency or other public sector STIC stakeholder.

The Colorado STIC, for example, plans to utilize STIC Incentive program funds to conduct training to accelerate construction site revegetation to reduce life cycle costs and environmental reliability. The New Mexico STIC is utilizing incentive funds to create a digital experience and other educational materials on the use of Diverging Diamond Interchanges, an alternative intersection design proven to save lives, reduce delays, and lower costs when compared to traditional intersection designs.

In federal fiscal year 2014, 36 States received a total of $3.5 million in STIC Incentive funds to advance the use of innovations such as 3D modeling, high friction surface treatments, design-build contracting, and diverging diamond interchange design into standard practice across the State. Several of the innovations are part of the FHWA's Every Day Counts initiative, which selects proven, market-ready innovations and provides technical assistance to accelerate their deployment. The STIC Incentives program had established 49 STICs by end of FY2015 and is expected to continue in FY 2016 and beyond.

http://www.fhwa.dot.gov/stic/

https://www.fhwa.dot.gov/innovation/everydaycounts/.

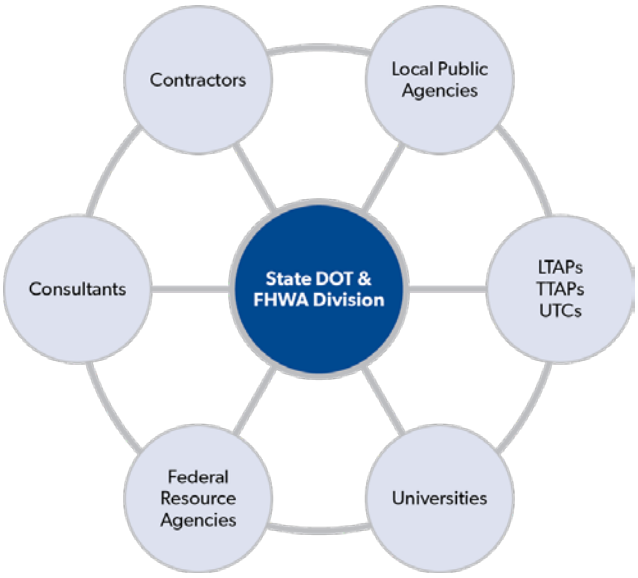


Figure 5 STIC Network

5. Wake Turbulence Analysis Leads to Increased Airport Efficiency

For 40 years, Volpe has collected and analyzed aircraft wake turbulence data at airports, providing the FAA with recommended changes to improve terminal air traffic safety and increase efficiency. Volpe engineers provide critical analyses to help the FAA achieve operational changes, among them enabling aircraft to land on closely spaced parallel runways (CSPRs) under instrument approaches, as well as revision of the single runway wake turbulence separation minima.

The FAA has achieved several significant milestones through Volpe's support, including approval of the Safety Risk Management Document for Wake Turbulence Mitigation for Arrivals–Procedural (WTMA–P) for Philadelphia International and Detroit Metropolitan Wayne County airports. This procedure enables airports to use dependent dual-arrival traffic streams on CSPRs with reduced diagonal separation under instrument conditions, where previously the two runways had to be treated as a single runway in less than good visual weather conditions.

Additionally, the FAA developed Wake Turbulence Recategorization, or RECAT, which revises aircraft single runway spacing defined in the early implementation of RECAT I. This new wake turbulence separation minima integrates RECAT with earlier CSPR solutions developed under the framework of wake separation specified in 7110.65, and others; further reducing separations for certain aircraft pairs since the first RECAT implementation.

RECAT was implemented at Hartsfield-Jackson Atlanta International Airport, where it had a very positive impact. The new standards allow tighter arrival and departure sequences, resulting in improved flight efficiency as well as surface movements—especially during peak operation periods. As a result, Delta Airlines has reported a range of 0.5–2 minute shorter taxi times for departures, and 0.5–1 minute shorter descent times for arriving aircraft. Delta estimates annual operational cost savings of $14.8 to $38.1 million.

Volpe has collected, processed, and analyzed wake turbulence data to support various FAA and NextGen objectives, as exemplified by RECAT and WTMA–P.

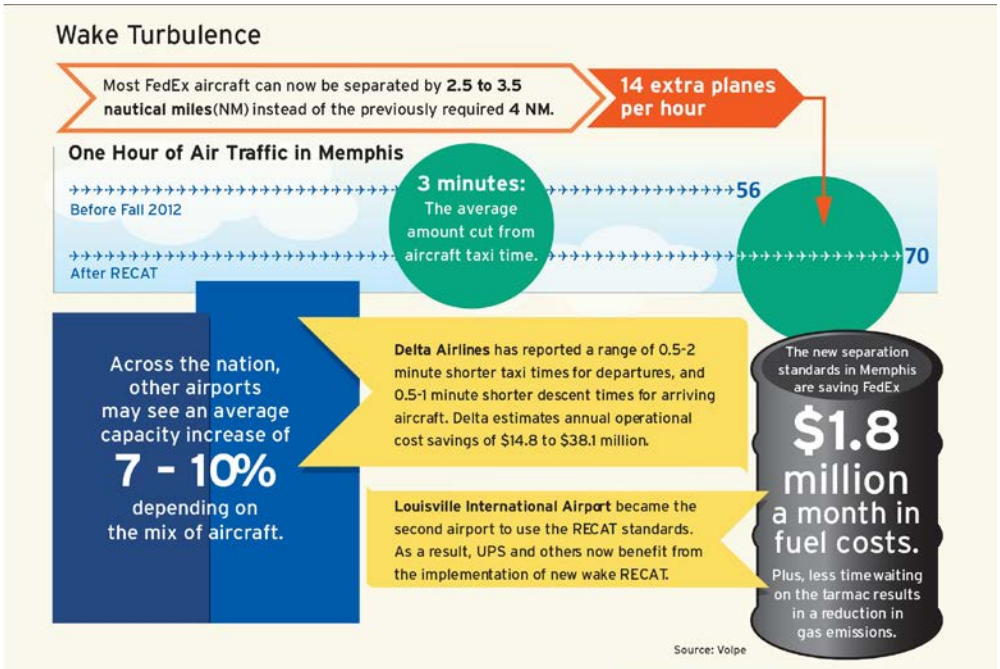


Figure 6 Increased airport efficiency with Volpe wake turbulence analysis.

6. FHWA Provides Incentives to States to Deploy Innovations

The FHWA launched the Accelerated Innovation Deployment (AID) Demonstration program in February 2014 to offset the risks associated with deployment of an innovation on a project. Approximately $30 million in incentive funding is available through the program to implement an innovation in any aspect of highway transportation including planning, financing, operation, structures, materials, pavements, environment, and construction on any project eligible for Federal assistance.

Applications are accepted on a rolling basis from State DOTs, federal land management agencies, and tribal governments. Metropolitan planning organizations and local governments may also apply as sub-recipients through their State DOT. The full cost of the innovation in a project may be awarded up to the maximum amount of $1,000,000. As of the start of FY 2015, 29 projects had received AID Demonstration awards totaling over $20 million.

For example, the Minnesota DOT and the City of St. James received an AID Accelerated Demonstration Program grant to construct two mini-roundabouts that will be the first on the state highway system, the first for the City of St. James, and the first in a constrained urban setting. The mini-roundabouts are part of an urban reconstruction project on State Highway 4 and will replace signals at both intersections.

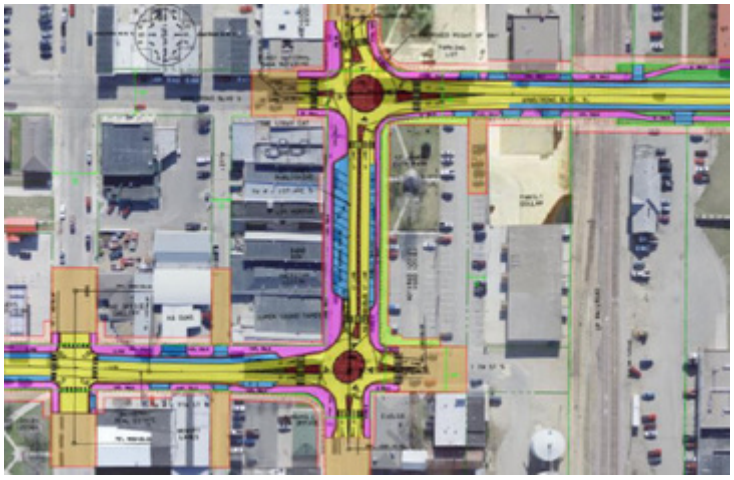


Figure 7 The reconstruction layout for Highway 4 in St. James, Minnesota, shows the future location of the mini-roundabouts. Credit: MN DOT

The primary benefit to innovative intersection designs such as mini-roundabouts are enhanced safety performance through fewer or less severe crashes, but operational improvements have also been found, through overall reduced delay and less time spent stopped at red lights. Improved safety and reduced congestion can also provide direct and indirect economic benefits to businesses and communities located near the intersections.

FHWA encourages the use of AID Demonstration funds to promote the deployment of the EDC innovations, including but not limited to innovative intersection designs, which provide ways of improving the work of highway planning, design, construction and operation.

For more examples of AID Demonstration grants stories, visit:
http://www.fhwa.dot.gov/accelerating/grants

7. Researching and Delivering New Methods to Save Lives

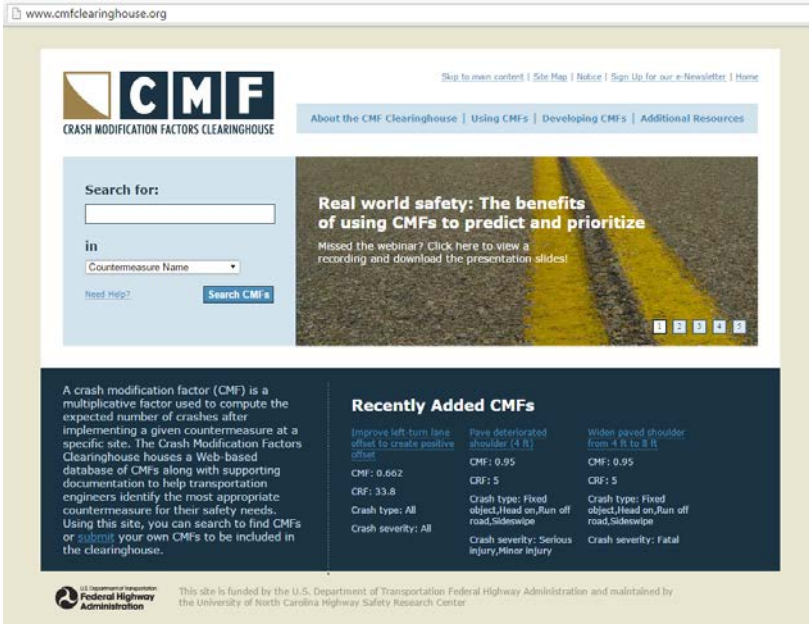
Saving lives is the USDOT's primary mission, and the FHWA and its partners conduct scientific research and deploy innovative safety measures with the potential for reducing crashes and improving the safety of the Nation's roads.

One of FHWA's research and technology efforts to save lives involves crash modification factors (CMFs). A CMF is an estimate of the change in crashes expected after the implementation of a safety countermeasure. When used properly, CMFs can help transportation engineers identify and apply the most appropriate countermeasures for increasing roadway safety. Combined with crash cost data and project cost information, CMFs can help transportation engineers compare the benefit-to-cost ratio of multiple countermeasures and then choose the most appropriate CMF for a given situation.

The FHWA has developed information on CMFs and made it available to State and local agencies to assist with highway safety planning. The CMF Clearinghouse, a free online database introduced in 2009 and accessible at www.cmfclearinghouse.org, details the varying quality and reliability of CMFs available to transportation professionals.

The Clearinghouse houses a Web-based database of over 5,000 CMFs along with supporting documentation to help transportation engineers identify the most appropriate countermeasure for their safety needs. Many of the CMFs were developed through FHWA-led transportation pooled fund studies and research projects conducted at the FHWA's Turner-Fairbank Highway Research Center, a federally-owned research facility in McLean, VA, but knowledge gaps and opportunities still exist to continue developing new CMFs.

The FHWA also conducts webinars and web-based courses on using and developing CMFs. The Clearinghouse team is developing a new feature that enables users to compare CMFs. They can select up to 4 CMFs and compare them to identify the one best suited to their needs.



http://www.cmfclearinghouse.org/

8. FAA Dedicates Runway Pavement Testing Facility[4]

The Federal Aviation Administration (FAA) today dedicated its new National Airport Pavement & Materials Research Center at the William J. Hughes Technical Center at Egg Harbor Township, N.J. The research center is a unique facility that allows FAA engineers to use a custom-designed vehicle simulator to test asphalt and other pavement materials at very high tire pressures and temperatures. Airport pavement temperatures can reach 140 to 150 degrees Fahrenheit as far north as New York City. Tire pressure ranges from 220 to 250 pounds per square inch on new generation aircraft like the Boeing 787 and Airbus 350. The vehicle simulator has an automated heating system that allows engineers to replicate and analyze the damage that heavy commercial jets can cause to the top asphalt layer when runways are hot. The vehicle was designed to simulate the behavior and weight of aircraft tires, and can show how repetitive aircraft operations affect pavement.

FAA engineers will move the Heavy Vehicle Simulator-Airfields (HVS-A) by remote control between four outdoor pavement test strips and two strips inside a new building, to allow for testing in a controlled environment. The new center will enable the FAA to research environmentally-friendly airport pavement materials such as warm-mix and recycled asphalt pavements. The FAA's goal is to expand the use of "greener" materials, and pavement materials that can be modified to enhance pavement durability, workability and strength. This will reduce the costs of initial construction, maintenance, and provide a longer pavement life. The FAA has not recommended the use of environmentally-friendly airport pavement materials yet because research on the effects of aircraft tire pressure and heavy gear loads on green airport pavement materials has been limited. Construction of the test facility was completed in May 2015.

Figure 8 Officials dedicate new $8 million National Airport Pavement and Materials Research Center and Safety Building at the William J. Hughes Technical Center[5]

Figure 9 Heavy Vehicle Simulator - Airfields [6]

[4] http://www.faa.gov/news/updates/?newsid=83606
[5] Photo Credit - http://www.pressofatlanticcity.com/communities/eht/faa-tech-center-open/
[6] FAA Federal Laboratory Consortium Planner Submission, 2015

9. UAS integration into the National Airspace System (NAS)

The safe integration of Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS) is critical to the FAA. Processing and analysis to provide actionable information to clients across a wide range of civilian industries are critical to the nation. 16 of the FAA's 38 active Cooperative Research and Development Agreements (CRDAs) in FY 2015 relate to UAS/NAS integration. These agreement's bodies of work include, for example, research to allow operations within a structured volume of airspace and aerial data gathering.

On May 6 2015, the FAA announced the UAS Focus Area Pathfinders initiative[7], a partnership with industry to explore the next steps in unmanned aircraft operations beyond the type of operations the agency proposed in the draft small unmanned aircraft systems (UAS) rule it published in February. To date, four companies (CACI, Inc., Burlington Northern Santa Fe (BNSF) Railway, PrecisionHawk USA, Inc., and Cable News Network, Inc.) work with FAA federal laboratories under CRDAs to further Pathfinder initiatives. Railway monitoring is a recent highlight of FAA's work with BNSF under 16-CRDA-0309.[8]

Figure 10 Pathfinder's first commercial BVLOS operation takes wing

Insitu Inc., an unmanned aircraft systems (UAS) manufacturer, successfully conducted the first civil commercial beyond visual line of sight (BVLOS) operation in the continental United States on October 25, 2015, near Vaughn, NM.

The event was part of a week-long series of flights with BNSF Railway designed to show how UAS technology can be a powerful addition in the effort to further enhance railway safety and infrastructure inspection. The flight was part of the agency's Pathfinder program, an initiative to develop UAS regulations in collaboration with industry that was announced in May.

[7] http://www.faa.gov/uas/legislative_programs/pathfinders/
[8] https://my.faa.gov/focus/articles/2015/11/AVS_Flyer__UAS_Pathf.html

10. Advanced Metallic Fuselage Structure[9]

The aircraft industry is striving to reduce fabrication, operational and maintenance costs by introducing advanced materials, construction methods and production technologies. In light of the B787 and A350 advanced construction and increased competition from composite materials industry, the metallic material industry has made significant strides at unprecedented rates in developing new metallic alloys and material manufacturing process that are competitive with composites in terms of cost and performance. With the introduction of new technologies, however, data and information is often lacking to allow for a comprehensive assessment of long-term safety concerns. Regulators and industry need to work together in preparation for their application and certification. Data is necessary to assess continued relevance of existing regulations and to develop additional safety standards and regulatory guidance if needed to maintain the current level of safety afforded by the existing airworthiness standards. For this new effort, the FAA will be collaborating with industry to assess durability and damage tolerance of EMST including unitized welded structure, new metallic alloys (Aluminum Lithium), and hybrid construction, as shown in the Figure below.

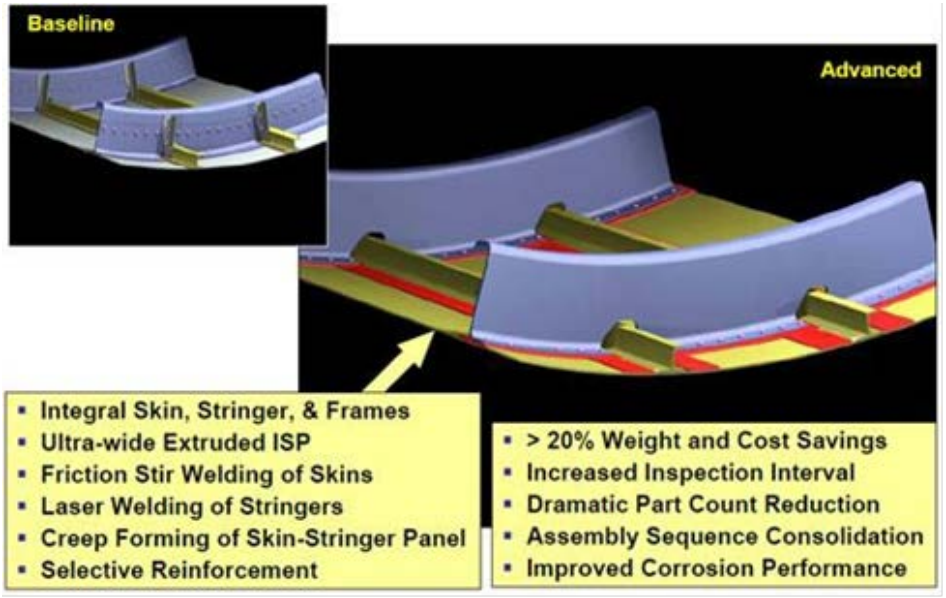


Figure 11 Advanced Metallic Fuselage Structure

A five-year Cooperative Research and Development Agreement (CRDA; 15-CRDA-0310) between the FAA's William J. Hughes Technical Center federal laboratory and ALCOA was signed in August 2015. The purpose of this collaborative effort is to obtain full-scale fuselage panel test data to demonstrate how fuselage concepts utilizing EMST improve the durability and damage tolerance, compared to the current baseline aluminum fuselage structures using the unique capabilities of the FAA's Full-Scale Aircraft Structural Test Evaluation and Research (FASTER) facility.

[9] FY15 R&D Annual Review V2

11. SeaVision Shines Light on the Global Seas

SeaVision is an evolving maritime domain awareness (MDA) tool originally developed by Volpe for the U.S. Naval Forces Africa (NAVAF). SeaVision was created to help countries on the western coast of Africa improve vessel traffic management and navigation safety; increase maritime situational awareness and security; reduce illegal fishing, illicit trading, human smuggling, and piracy; provide improved data for search-and-rescue operations; facilitate commerce, and enable disaster recovery efforts.

SeaVision displays Automatic Identification System (AIS) data from the Volpe-developed Maritime Safety and Security Information System (MSSIS) network on a Google map. AIS allows the automatic exchange of real-time ship-to-ship, ship-to-shore, and shore-to-ship vessel information, which includes information pertaining to vessel identity, characteristics, position, course, speed, and heading. It provides a historical and current view of MSSIS data that can be used to analyze vessel movements.

In 2015, SeaVision was used in three naval exercises including participation from 23 African countries and their respective Maritime Operation Centers (MOCs). On behalf of the U.S. Africa Command, Volpe recently hosted its second annual on-site and multi-week MDA Administrator and Technician Training Workshop. This workshop was purposed with training African government officials on SeaVision and additional MDA tools with the goal of "training-the-trainer" for in-country system sustainment.

As such, SeaVision is making a difference: Cabo Verde recently noted a significant improvement in the fight against illegal maritime activities after joining the system. The Cabo Verdean maritime police—in collaboration with the Senegalese MOC—were able to identify and interdict a foreign-flagged vessel illegally fishing both on and near the respective borders of each country, within their territorial waters.

Because SeaVision provides unclassified data, it is readily available to other countries, and its use has now spread well beyond Africa. Many countries use SeaVision to track vessel movements within their exclusive economic zones and waterways, and the system has enabled maritime safety and security professionals around the world to better track, analyze, and monitor vessel movements.

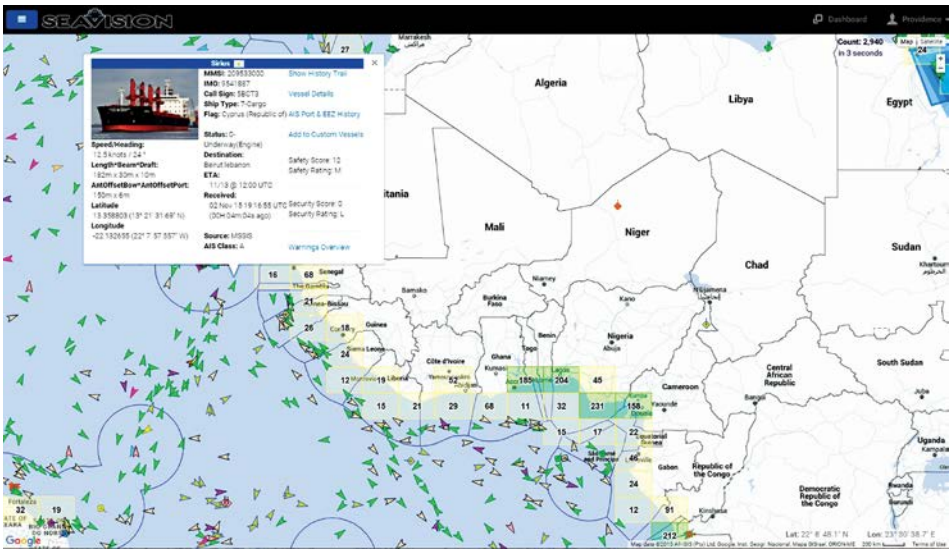


Figure 12 SeaVision enables users to view and track vessels on a map, anywhere in the world. Source: Volpe.