FHWA R&T NOW

A newsletter about research, development, and technology (RD&T) at the U.S. Department of Transportation's (USDOT) Federal Highway Administration (FHWA).

Infrastructure
FHWA Develops Testing Device to Monitor Microplastic Particulates in Runoff

By Jack Youtcheff, Pavement Materials Team Leader, Office of Infrastructure R&D

Since postconsumer waste microplastics are being added to bitumen binders as performance improvers, asphalt grinding during in-place resurfacing can expose communities across the United States to microplastic particulate pollution (Small Business Administration (SBA) n.d.). Additionally, the subsequent liberation of plastic by tire traffic can contaminate runoff water. To help address this concern, FHWA has developed an Autonomous, In-Situ Fugitive Microplastic Detector and Datalogger to test for possible microplastic runoff contamination from asphalt roadwork.

Source: FHWA.
Open frame unit. External pumps supply water, making completion of an integrated pump station possible. This pump station design also makes servicing the unit easy. The control electronics are hidden behind the black breadboard. The unit includes supply and collection reels (reels on bottom) and a Fourier Transform Infrared Spectroscopy device (box on left).[1]

[1] Email interview with project consultant conducted by FHWA staff on November 6, 2023.

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FHWA partners are currently testing the device in a university laboratory. The device automates continuous analysis and monitoring for microplastics entering the water stream and preserves samples. The system captures particles in the waste water and differentiates plastic from rock or other materials. Eventually, this filtration system can potentially be adjusted to look for other unwanted presences, such as tire rubber, in runoff.

According to the project website for phase I of this project, finding uses for recycled plastic is crucial, yet using it in pavement involves systematically spreading the chemical constituents of plastics over large geographic areas. Thus, an innovative technique was needed to assess the concentration of microplastics entering the environment in various size ranges via dust and runoff. When FHWA began to create this device in 2021, continuous monitoring of first-flush aqueous and airborne particulates to measure road wear particles by composition, plastic content, and size were also priorities (FHWA n.d.).

As testing devices evolve and researchers better understand how postconsumer plastic waste enters runoff, the research results may also help improve the safety and efficiency of incorporating recycled plastic into asphalt repairs.

This device is a project of the Small Business Innovation Research (SBIR) Program, which was established by Congress to encourage small-business technological innovation that helps fulfill Federal research and development needs. Additionally, the SBIR Program encourages historically underserved communities to take part in technological innovation and seeks to increase private-sector commercialization of innovations (FHWA 2022).

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Corporate
Virtual Tour Showcases State-of-the-Art Transportation Research Laboratories

By TaMara McCrae, Marketing Specialist, Office of Corporate Research, Technology, and Innovation Management

The future of transportation depends on state-of-the-art research and innovation leading to scientific advances. Cutting-edge transportation research makes infrastructure last longer, helps transportation evolve to be safer and more efficient, protects natural resources, and gets people where they need to go. Every day, this research takes place at Turner-Fairbank Highway Research Center (TFHRC) in McLean, VA—and students, researchers, and scientists in the transportation field around the world are interested. However, it would be impossible for most of these people to physically visit. Thus, FHWA created the TFHRC Virtual Tour so that people around the globe can "visit" TFHRC virtually to see the latest laboratories and equipment there and learn more about the research (FHWA 2023).

The tour includes the following FHWA research laboratories, which are found onsite at TFHRC: Chemistry Laboratory, Federal Outdoor Impact Laboratory (FOIL), Human Factors Laboratory, J. Sterling Jones Hydraulics Research Laboratory, Structures Laboratory, and Saxton Transportation Operation Laboratory (STOL). The tour starts with an external glimpse of the facility, and then users can take a tour from a 365-degree view through each of the six laboratories. The tour provides information about the equipment used and work performed in these spaces.

As virtual visitors "step" inside each laboratory, an introductory video offers an overview of the laboratory's mission. Visitors can continue on an indepth video tour of each laboratory and pause for close-up views and details about key equipment.

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FOIL, where motor vehicle crash tests are conducted to improve scientific understanding of collisions.

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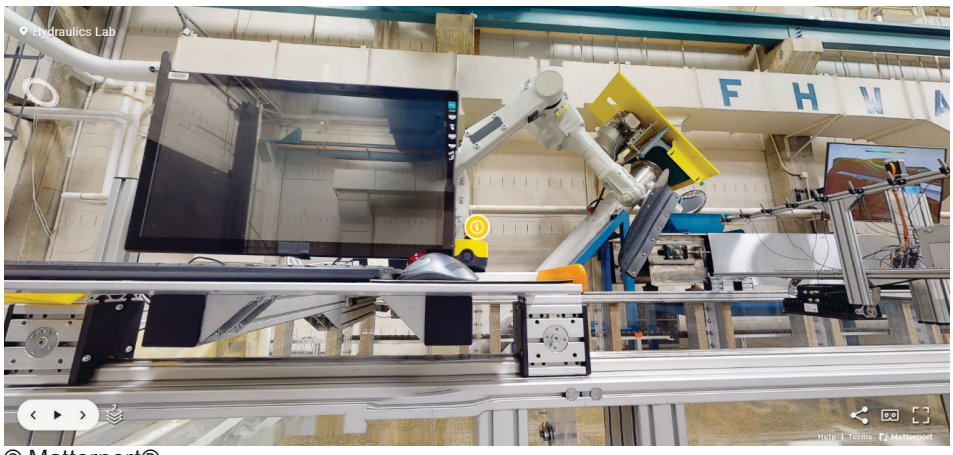
The Chemistry Laboratory, where researchers study the effects of chemical changes on highway structures.



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An automated robotic arm in the J. Sterling Jones Hydraulics Research Laboratory, where researchers conduct tests to study how flooding events impact highway infrastructure.

Altogether, the cutting-edge scientific research performed by the six laboratories at TFHRC lays the foundation for a safer and more efficient transportation system of the future—and its new virtual tour offers the world a glimpse inside.

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Source: FHWA.
Construction workers repair a section of the George Washington Memorial Parkway (GWMP) in McLean, VA.

Source: FHWA.
Testing the UHPC overlay at Dead Run Bridge with ASTM C1583 (ASTM International 2020). Cores were drilled through the UHPC overlay and into the parent concrete material: First, a core drill was bolted to the concrete slab. Then, a wet coring method was used. Project requirements for the bond strength of UHPC material were three tests with an average of 350 psi, with no individual test result less than 250 psi. The core shows a failure plane in the parent concrete but not UHPC.[5]

Federal Lands Ultra-High Performance Concrete (UHPC) Keeps Crucial Roadway Open During Bridge Deck Repairs

By Karyn Vandervoort, National Program Manager, I&R Program, Office of FLH

When bridges or overpasses on crucial roadways begin to fail, infrastructure owners and operators must step in to make repairs. Challenges arise when repairs must be made on roadways that cannot, logistically, be shut down for any extended period of construction.

For instance, GWMP is a vital metropolitan roadway that connects Maryland, the District of Columbia, and Northern Virginia (National Park Service 2023). In addition to getting residents where they need to go, GWMP, as part of the National Park System, is a significant tourist destination for the United States. A scenic drive along GWMP offers views of the Washington Monument, Potomac River, Lincoln Memorial, local wildlife, and cherry blossoms.

The section of GWMP from Spout Run Parkway in Arlington, VA, to I–495 in Virginia is a four-lane, divided scenic parkway that also serves as a major commuter route between Northern Virginia and Washington, DC. According to FHWA Civil Engineer Mir Ali, this section has an average annual daily traffic count of 71,000, which translates to approximately 26 million users a year. GWMP is part of the National Highway System and is a designated evacuation route for the District of Columbia. Yet the roadways in the region offer no viable alternatives for detours in some parts of Maryland and to access certain Federal Government buildings.[2]

As part of the North Parkway Rehabilitation project, FHWA's Office of Federal Lands Highway (FLH) was tasked with finding a way to replace existing deck overlays to extend service life on the Dead Run and Turkey Run Bridges along GWMP while keeping the roadway open. To avoid lengthy shutdowns, FLH selected UHPC as the overlay treatment for the deck repair to provide durability. FLH then implemented staged construction to begin UHPC work one lane at a time.[3]

UHPC was also selected because it cured quicker than traditional concretes, making for faster repairs. Structural strength was achieved in just 4 days, with average compressive strength measuring at 18,090 psi. By the sixth day, compressive strength had increased further, to approximately 21,640 psi. This increase highlights UHPC's ability to attain compressive strength notably quicker than conventional concrete, which typically takes 28 days to achieve 4,000 to 5,500 psi. UHPC can be especially useful with bridge-like structures; if a bridge is closed, an agency can potentially have UHPC placed and the road reopened within 5 days.[4]

[2]FHWA staff member; video and email interviews conducted between October 23 and December 2, 2023.
[3,4,5]See footnote 1.

UHPC became commercially available in the United States in 2000. Since then, researchers at FHWA's TFHRC have worked to demonstrate UHPC's capabilities and improve its performance.

According to FHWA's UHPC web page, UHPC is a cementitious composite material composed of a high percentage of discontinuous internal fiber reinforcement. The mechanical properties of UHPC include compressive strength greater than 18.0 ksi (124 MPa) and sustained postcracking tensile strength greater than 0.72 ksi (5 MPa). UHPC has a discontinuous pore structure that reduces liquid ingress, significantly enhancing durability compared to conventional and high-performance concretes (FHWA 2022).

Agencies can even use UHPC to make repairs that would otherwise require a rebuild. But perhaps most impressive is that using UHPC rather than other types of concrete may double the number of years an agency can wait before bridge deck repairs or replacements must be made. In the past, bridge deck work often had to be performed every 10 years. With the use of UHPC, the engineers working on the North Parkway Rehabilitation project expect the next bridge overlays will not be needed for 20 years.[6]

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Source: FHWA.
Contest organizers and 2023 HSIS student contest award winners, from left to right: FHWA's Carol Tan, Zihang Wei (first place, lead author), Abimbola Ogungbire (second place, co-author), Panick Kalambay (second place, lead author), Hamza Bani Khalaf (third place, lead author), and Rosana Correa, International President of the Institute of Transportation Engineers.

Safety
Highway Safety Information System (HSIS) Award Encourages Future Researchers To Delve Into Data

By Carol Tan, Safety Data Analysis Team Leader and Ana Maria Eigen, HSIS Program Manager, Office of Safety and Operations R&D

Safety on roads is complex—and many elements go into ensuring the safety of our highways, from program policy decisions to roadway and traffic design. FHWA operates and maintains HSIS, which contains safety information on basic crash, roadway inventory, and traffic volume files from eight State agencies. The database also includes information about highway intersections, interchanges, and curves/grades. State agencies can use the database to explore and research safety issues on their roads.

FHWA established the annual HSIS Excellence in Safety Data Award to encourage students to use quality data to solve future transportation problems. FHWA is pleased to announce the winning HSIS Excellence in Highway Safety Data Award papers.

First place went to Wei Zihang (Texas A&M University) for "Equitable Traffic Crash Prediction Framework To Support Safety Improvement Grants Allocation."

[6]See footnote 1.

Second place went to Panick Kalambay (University of North Carolina at Charlotte) for "Vehicle Crashes on Highway Segments With a Rail Grade Crossing: Insights Into the Key Risk Factors in North Carolina."

Third place went to Bani Khala Hamza (Cleveland State University) for "Use Probabilistic Reasoning Approach on Road Familiarity, Distracted Driving, At-Fault, and Crash Injury Severity in Work Zone Crashes."

The contest was established to encourage future safety professionals to use high-quality transportation safety data for decisionmaking. The data contest is key to promoting HSIS's data dissemination and analysis capabilities.

Infrastructure
Long-Term Infrastructure Performance (LTIP) Student Contest Encourages Professionals To Use Data Wisely

By Deborah Walker and Shrinivas Bhide, Senior Research Engineers, Office of Infrastructure R&D

Today, more than ever, the transportation industry is challenged with collecting, cataloging, storing, analyzing, and using vast amounts of data.

Thus, FHWA created the LTIP Student Data Analysis Contest to encourage future transportation experts to use data wisely, as the future of transportation depends on harnessing the vast amounts of data the industry continues to harvest.

The contest encourages college students to use pavement or bridge performance data to study the various factors affecting pavement or bridge lifecycles and develop technical papers to document their research (FHWA 2022). Students must use data from LTBP InfoBridge™ and/or LTPP InfoPave™, information management systems, to investigate topics that advance pavement or bridge performance (FHWA n.d.a, n.d.b).

FHWA is pleased to announce the winning papers from the 2023 contest as follows:

First place (bridge) went to Lawrencia Akuffo from Rowan University for "Quantification of the Correlation Between Bridge Skew Angle and Deterioration Rate." Faculty sponsor: Dr. Adriana Trias Blanco.

First place (pavement) went to Bingyan Cui, Xiao Chen, and Zhe Wan from Rutgers University for "Predicting Asphalt Pavement Deterioration Under Climate Change Uncertainty Using Bayesian Neural Network." Corresponding author: Hao Wang.

Second place (pavement) went to Jian Liu, Daodao Zhou, and Fangyu Liu from Virginia Polytechnic Institute and State University for "Accelerated Balanced Asphalt Mix Design Based on Machine Learning and Non-Dominated Sorting Genetic Algorithm-II (NSGA II)." Faculty sponsor: Dr. Linbing Wang.

The winners will be recognized during the January 2024 Transportation Research Board (TRB) Annual Meeting at the Long Term Bridge Performance Program Lectern Session 2197 on Monday, January 8. The first-place bridge winner will present at this session. The two pavement winners will present their winning papers at the Performance Analysis Workshop 5012 on Thursday, January 11.

Congratulations to the winners, and thank you to everyone who participated! The 2024 LTIP Student Data Analysis Contest is underway, and papers are due August 1, 2024.

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Corporate
Secretary Buttigieg Opens New Pavement Testing Facility (PTF) at TFHRC

By Daniel Shine, Team Director, Office of Corporate Research, Technology, and Innovation Management

Roads don't last forever—but making roads last longer can save everyone a lot of money. The work performed by the new FHWA PTF will support pavement resiliency and sustainability.

U.S. Secretary of Transportation Pete Buttigieg led the ribbon-cutting ceremony for the new PTF at TFHRC in McLean, VA, on October 30, 2023.

During his visit to TFHRC, Secretary Buttigieg toured the Mobile Asphalt Technology Center, Mobile Concrete Technology Center, Structures Laboratory, J. Sterling Jones Hydraulics Research Laboratory, STOL, and the FOIL, meeting with FHWA officials and other Federal staff. Secretary Buttigieg also attended an onsite FOIL crash test.

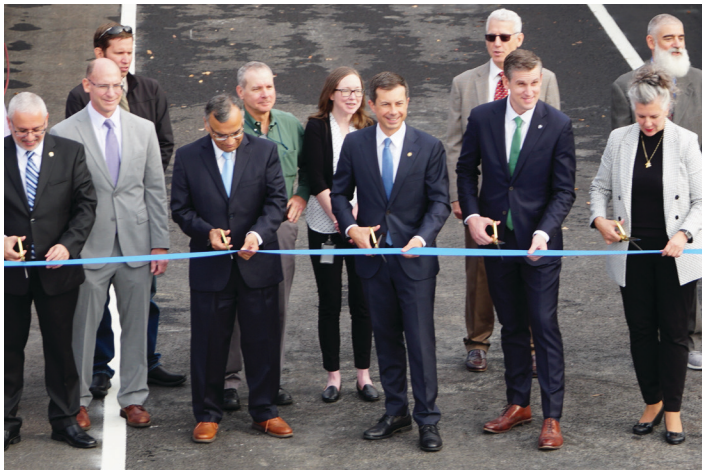
FHWA Associate Administrator for RD&T and Director of TFHRC Dr. Kelly Regal hosted the Secretary.

> "What you see here represents several years of planning and implementation. Federal and State partners, designers, and stakeholders will use the outcome of this research to build more durable, sustainable, economical, and environmentally friendly road surfaces. There is no durable material research as sophisticated and innovative as this," said Dr. Regal.

Buttigieg discussed the landmark Bipartisan Infrastructure Law and critical work performed by FHWA in ensuring the effective use of funds (U.S. Congress 2021). His speech emphasized efficiency and the prudent use of taxpayer funds, offering examples of work performed by USDOT.

> "We're investing $1.2 trillion in the infrastructure that we're going to count on for years and decades to come. The proportions of this bill are so massive that it's hard to get our head around it," said Buttigieg. "Part of what I think about is if we could make that $1.2 trillion go 1 percent further—just 1 percent. If we got all of that to just be 1 percent more efficient or have 1 percent greater longevity, that equates…to about $10 billion worth of value."

Buttigieg mentioned that investment in road and bridge pavement is "the single largest chunk of that historically large infrastructure law."



Source: FHWA.
U.S. Secretary of Transportation Pete Buttigieg cuts the ribbon, marking the opening of the new TFHRC PTF.

Source: FHWA.
Secretary of Transportation Pete Buttigieg meets with FHWA officials and other staff during his tour of the TFHRC facilities.

> "A $10 billion piece of legislation in itself would be national news. And yet, we could quietly deliver that amount of value, which means that many more communities could get their bridge or their airport or their road fixed just by being a little more efficient with what we've got."

Before cutting the ribbon on PTF, Buttigieg said, "You don't have to be an infrastructure buff or a pavement nerd to see how the 300 embedded sensors here and the data that's going to come from them can make a lot of people better off, whether they realize it every day or not."

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Corporate
Exploratory Advanced Research (EAR) Program Fulfills Need for Long-Term, High-Potential Research

David Kuehn, Team Director/Program Manager, Office of Corporate Research, Technology, and Innovation Management

Building the highways of the future requires long-term, higher risk, high-potential research. FHWA's EAR Program fulfills this need. From 2007 to 2023, the EAR Program awarded 108 research projects to teams at a multitude of public and private organizations.

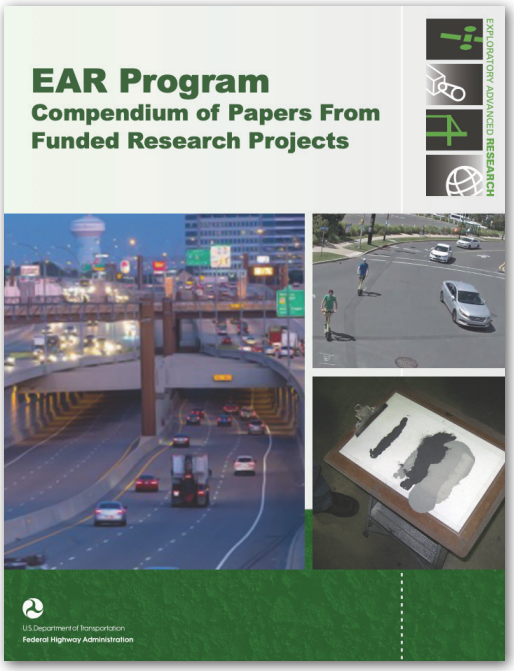
The program will soon publish a new *EAR Program Compendium of Papers From Funded Research Projects*, which lists some current projects and where researchers have presented or published their findings in the past year. The following studies are highlights of some of the research projects that will be found in that compendium.[7]

The EAR Program recently funded three computer vision projects, including the Deep InSight: Deep Extraction of Driver State from Naturalistic Driving Dataset. For this project, the research team created a driver state estimation platform. This platform increased the capacity to analyze large human driving behavior datasets (FHWA 2022).

On the artificial intelligence front, the EAR Program funded multiple projects, including Cooperative Perception and Control for Freeway Traffic System Operations. This project makes use of cooperative perception and cooperative control to advance next-generation Traffic System Management and Operations technologies (FHWA 2023).

Taking a multidisciplinary approach, Using Behavioral Economics to Better Understand Managed Lane Choice analyzed decisionmaking in light of knowledge gained from the fields of psychology and economics. The project focused on human decisionmaking in a transportation context. Viewing decisions made by the traveler through the lens of behavioral economics could lead to the development of better models for informing transportation planning policy (FHWA 2020a).

Protecting the vehicle user from unauthorized third-party cyber intrusions is a growing concern in today's Internet of Things. The research project Decentralized Vehicle Credential Management System Based on Consortium Blockchain, focused on using blockchain technology to enhance vehicle-to-vehicle communications security via wireless protocols (FHWA n.d.).



Source: FHWA.

Single-use plastics are choking the world's oceans and littering the land. The research project Improving the Compatibility of Waste Plastic and Asphalt Binder via Theoretically Justified Identification of Compatible Blends provides foundational research for solving the omnipresent problem of throwaway plastics in the environment. The research team is creating a computational model that can discern which plastics are compatible with which asphalt binders, turning an environmental concern into a precious construction resource (FHWA 2021).

Accommodating automated and manually driven vehicles that share the same roads is an important area of research since the two technologies will be contemporaneous for decades to come. The research project Augmented Reality for Control of Reservation-Based Intersections with Mixed Autonomous Non-Autonomous Flows explored a smart intersection concept involving time reservations for fully automated vehicles and communicated commands for manually driven vehicles (FHWA 2020b).

[7]FHWA staff member; video and email interviews conducted between October 23 and December 2, 2023.

Traffic congestion from nonrecurring causes like accidents and bad weather is difficult to mitigate. The research project Predictive Real-Time Traffic Management in Large-Scale Networks Using Model Based Artificial Intelligence addresses this problem by fusing AI-based prediction strategies with operational strategies. The goal of the research team is twofold. First, predict nonrecurrent traffic conditions in large-scale networks up to 30 minutes before an incident is reported. Second, recommend operational management strategies to mitigate the impact of the incident (FHWA 2022).

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TFHRC Trivia

Q: Who is TFHRC named for?

FRANCIS TURNER


Source: FHWA.

From his first Bureau of Public Roads (BPR) position as a junior highway engineer to his final position as FHWA administrator (1969–72), Francis "Frank" Turner committed his professional career to developing the Nation's roadways.

In his first major assignment in 1943, he expedited the completion of the 1,390-mile Alaska Highway and helped the Canadian and Provincial Governments organize highway maintenance activities.

Mr. Turner played an indispensable role in the conceptualization and creation of the Interstate Highway System. Beginning in 1954, when he served as the executive secretary to the President's Advisory Committee on a National Highway Program, he spent his career superintending the Interstate Highway System's construction. From 1969 until his retirement in 1972, he was the only lifelong FHWA employee to serve as the agency's administrator.

HERBERT FAIRBANK


Source: FHWA.

Herbert Fairbank was an important and widely recognized intellectual architect of the Nation's highway system during his lifelong career at BPR—the forerunner to FHWA.

Mr. Fairbank began his career at the BPR in 1910, becoming the right-hand "concept man" of the legendary BPR Chief Thomas H. MacDonald. After conducting pioneering statewide highway planning surveys in the 1930s, he authored the seminal 1939 report Toll Roads and Free Roads that laid the groundwork for our current Interstate Highway System.

FHWA Presenters at the TRB 103rd Annual Meeting

January 7–11, 2024

Please refer to the official TRB program for any changes and the most recent information.

Office of Infrastructure Research and Development (R&D)

By Jean Nehme, Director, and Nadarajah Sivaneswaran, Technical Director, Office of Infrastructure R&D

Federal Perspective of Pavement Resilience

January 7, 9 a.m.–12 p.m.
Convention Center, 207A

Session presented by Amir Golalipour (amir.golalipour@dot.gov) as part of a workshop titled Pavement Resilience: Effects of Extreme Flooding and Wildfire Events on Pavement Systems—Local, State, and Federal Experiences.

The goal of the workshop is to summarize agency experiences, lessons learned, successes, and the current state of knowledge for designing resilient pavements and helping to move this knowledge into practice.

Structural Design Guidance for UHPC

January 9, 10:15 a.m.–12 p.m.
Convention Center, 204AB

Presentation by Benjamin Graybeal (benjamin.graybeal@dot.gov) and Rafic Helou (rafic.helou@dot.gov).

UHPC offers mechanical and durability properties that facilitate the development of new solutions to pressing transportation infrastructure challenges. In recent years, surging interest in this technology indicated a need for formal, U.S.-based structural design guidance. The American Association of Highway and Transportation Officials' Committee on Bridges and Structures has voted to publish the recently developed Guide Specification on Structural Design With UHPC. With the publication of this guide, opportunities to design and construct UHPC bridge girders, piles, columns, overlays, rehabilitation solutions, and other components are becoming a reality. This presentation will introduce the forthcoming guide and discuss supporting context, focusing on the extensive research completed by FHWA and others.

Building Better Asphalt Pavements

January 10, 8–9:45 a.m.
Convention Center, Hall A

Presentation by Hoda Azari (hoda.azari@dot.gov).

This presentation is about using nondestructive evaluation technologies to assess asphalt density after construction.

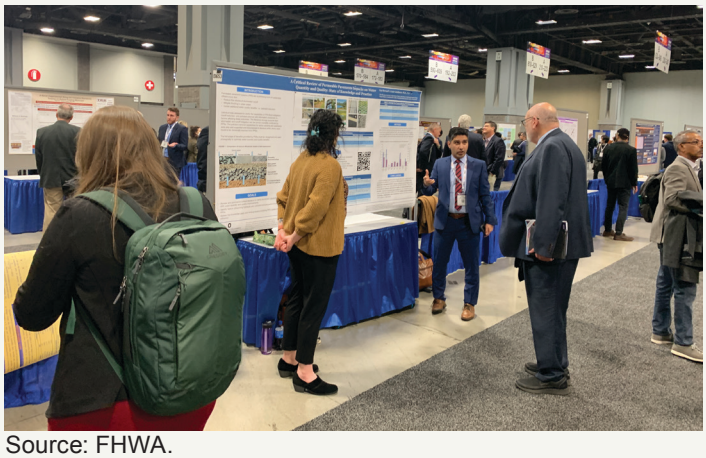
Roadway Digital Infrastructure (RDI) Strategy Workshop

January 11, 9 a.m.–12 p.m.
Convention Center, Salon C

John Corbin is presiding over this workshop.

RDI is foundational to optimizing our national transportation system. Establishing and supporting this infrastructure will require both a clear vision and a collaborative effort from public and private sector partners throughout the transportation ecosystem. This workshop will provide a first look at FHWA and national partner organizational strategies for nationwide RDI and launch a strategic research agenda to guide that collaboration. Leaders from TRB, USDOT, and national partner organizations will engage with participants to confirm priority activities for 2024 and determine next steps. The following are FHWA sessions within this workshop:

- USDOT Integrated Multimodal Systems of Systems Architecture: Alasdair Cain (alasdair.cain@dot.gov).
- FHWA RDI Strategy Summary: John Harding (john.harding@dot.gov).
- Creating a Robust National Data Exchange Layer for Managing Disruptions: Todd Peterson (todd.peterson@dot.gov).
- Better Information Modeling and Enterprise Data Systems: Katherine Petros (katherine.petros@dot.gov).
- Establishing the Foundation for Architecture and Data Principles: Robert Sheehan (robert.sheehan@dot.gov).
- National Interoperable Connectivity: Govind Vadakpat (g.vadakpat@dot.gov).


Source: FHWA.

Sustainability Aspects of Flexible Pavement Binders from an International Perspective

January 11, 9 a.m.–12 p.m.
Convention Center, 201

This workshop is moderated by Amir Golalipour (amir.golalipour@dot.gov).

Sustainability is broad and encompasses the needs of the present without compromising the needs of the future. Pavement binder programs and activities that facilitate balanced decisionmaking among environmental, economic, and social values support the triple bottom line of sustainability. To assess these pillars, a lifecycle approach must be considered. This workshop will provide an updated overview of and exchange about activities and international developments on this topic.

Edge Effect in Dielectric Profiling of Cylindrical Hot-Mix Asphalt Specimens Using Time of Flight Method

January 10, 8–9:45 a.m.
Convention Center, Hall A

Paper by Hoda Azari (hoda.azari@dot.gov).

Long-Term Bridge Performance (LTBP) Program

January 8, 3:45–5:30 p.m.
Convention Center, 206

Shri Bhide (shrinivas.bhide@dot.gov) is presiding.

The LTIP team is holding an LTBP session titled LTBP Program. Following are the formal presentations in this session:

- LTBP Program Updates:
  Rob Zobel (robert.zobel@dot.gov).
- Accelerated Bridge Performance Testing:
  Rob Zobel (robert.zobel@dot.gov).
- InfoBridge™—What's New:
  Shri Bhide (shri.bhide@dot.gov).

Office of Safety and Operations R&D

By James Pol, Technical Director, and Carl Anderson, Technical Director, Safety and Operations R&D

Effects of Truck Platoon Signing and Characteristics on Light Vehicle Driver Behavior

January 8, 3:45–5:30 p.m.
Convention Center, Hall A

Presentation by Michelle Arnold (michelle.arnold@dot.gov).

The results of the experiment Effects of Signing and Characteristics of Partially Automated Truck Platooning on Light Vehicle Driver Behavior will be presented. This presentation should be of interest to agency leadership, transportation engineers and researchers, and others who share an interest in promoting safe and efficient traffic flow.

The Federal Role in Supporting Safe Research, Development, and Implementation of Artificial Intelligence in Transportation

January 8, 8–9:45 a.m.
Convention Center, 150B

Presentation by David Kuehn (david.kuehn@dot.gov).

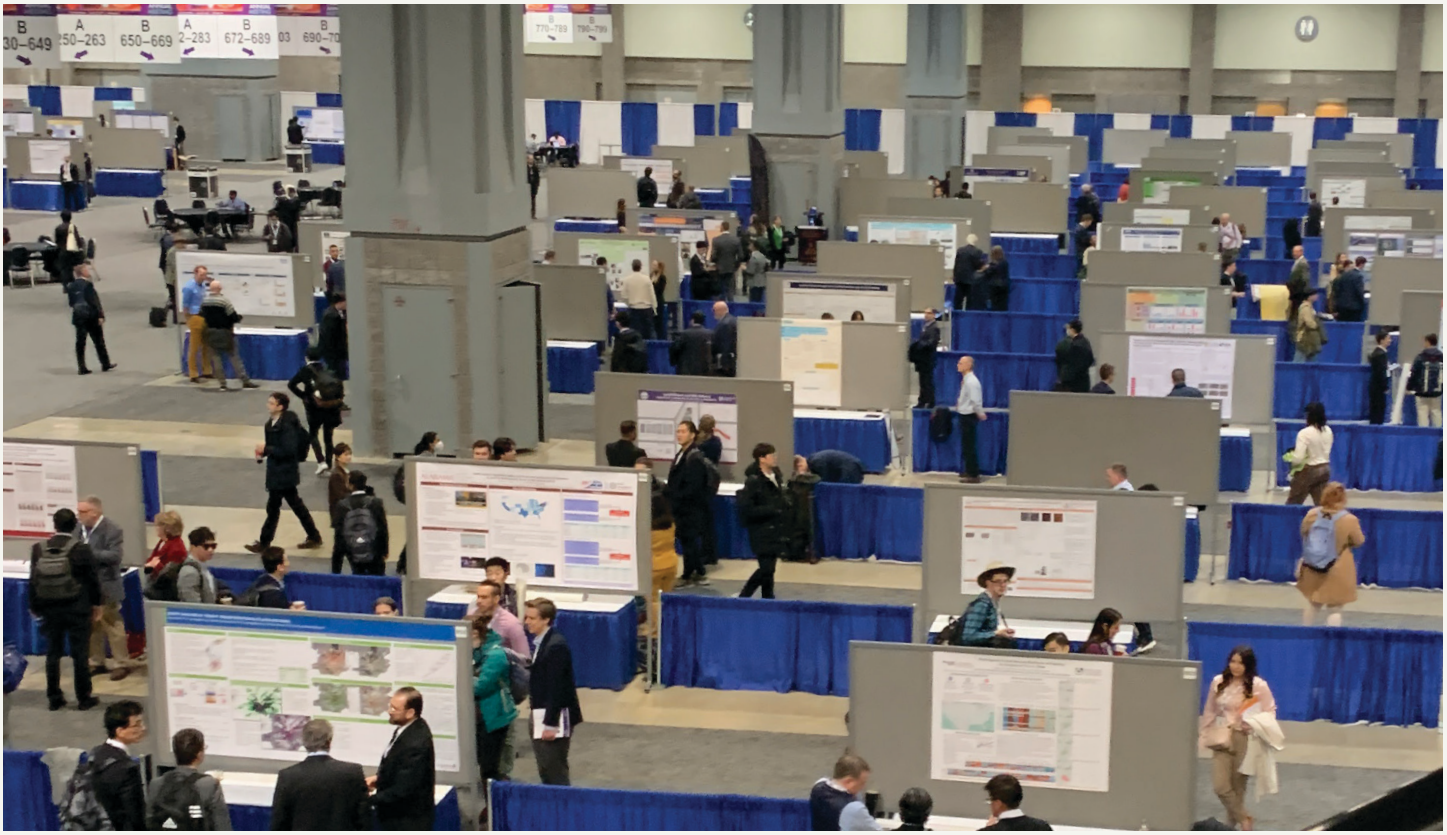
The presentation will provide background on Federal research and use of artificial intelligence (AI) in transportation, all of government activities toward promoting safe use of AI, and considerations on future benefits and cautions.

Complete Streets Treatment Combinations and Safety Analysis Needs Assessment

January 8, 10:15 a.m.–12 p.m.
Convention Center, Hall A

Presentation by In-Kyu Lim (in-kyu.lim@dot.gov).

This paper provides an assessment of available crash modification factors (CMFs) for quantifying the safety performance effects of these treatments and treatment combinations. The research results advance understanding of current capabilities for conducting safety performance analysis of Complete Streets with CMFs.


Source: FHWA.

A Comparative Sensitivity Analysis on Intersection Crash Prediction Models by Control Type: Highway Safety Manual Approach

January 9, 6–7:30 p.m.
Convention Center, Hall A

Presentation by In-Kyu Lim (in-kyu.lim@dot.gov).

This paper presents a comprehensive and indepth investigation into the comparative safety of different intersection control types, specifically signalized intersections and minor road stop-controlled intersections across different facility types.

Application of Cooperative Driving Automation for Improved Interaction Between Automated Trucks and Emergency Vehicles: A Proof of Concept Development and Testing

January 9, 7:30–10 p.m.
Marriot Marquis, Chinatown
January 10, 8 a.m.–12 p.m.
Marriot Marquis, Marquis Salon 10

Presentation by Pavle Bujanovic (pavle.bujanovic@dot.gov) and FHWA partners.

This presentation will provide an update on work with commercial motor vehicles and emergency response vehicles.

Cooperative Driving Automation (CDA): Are We Ready to Deploy?

January 10, 1–4 p.m.
Convention Center, 302

Sudhakar Nallamothu (s.nallamothu@dot.gov) is presiding.

FHWA's CDA Program seeks to accelerate the deployment of connected and automated vehicles (CAV) and CDA technologies through research. This research seeks to identify gaps, provide inputs to reference architecture and standards development, and work with stakeholders to develop a deployment plan. These TRB engagement events are opportunities to influence the CAV and CDA technology development and deployment road map and explore potential collaborations.

USDOT's Cooperative Driving Automation (CDA) Freeway Applications (title is tentative)

January 10, 3:45–5:30 p.m.
Convention Center, Salon C

Presentation by Pavle Bujanovic (pavle.bujanovic@dot.gov) and FHWA partners about results of the Integrated Highway Prototype project.

Source: FHWA.

FHWA Research Update: TCD Committee (ACP55) meeting

January 8, 8:00 a.m.–12:00 p.m.
Marriott Marquis, Marquis Salon 12
Presentation by Laura Mero (laura.mero@dot.gov).

CDASim

January 10, 8 a.m.–12 p.m.
Marriott Marquis Salons 7 and 8
Presentation by Danielle Chou (danielle.chou@dot.gov) and the Leidos team.

CDA is an emerging technology that has the potential to transform existing transportation systems. To better understand the performance nuances and impacts of CDA, FHWA has created CDASim, an open-source cosimulation environment that integrates multiple open-source simulators and the FHWA CARMA℠ ecosystem to achieve end-to-end assessments in fully simulated environments. At the TRB committee meeting, the presentation will share updates about the CDASim tool and discuss how it is being used.

Distributed Testing—Virtual Open Innovation Collaborative Environment for Safety (VOICES)

January 10, 8 a.m.–12 p.m.
Marriott Marquis Salons 7 and 8
Presentation by Danielle Chou (danielle.chou@dot.gov) and FHWA partners at the University of California, Los Angeles (UCLA).

FHWA will introduce the topic of collaborative, distributed testing and how it can be leveraged to advance research and the deployment of emerging connected transportation applications and discuss FHWA research conducted in this area. FHWA research partners from UCLA will elaborate on the test experience by talking about their participation in the VOICES Pilots 1 and 2, focusing on what has been and can potentially be learned from this research.

Recent Publications

About Exploratory Advanced Research (EAR)

Date: December 19, 2023
Publication No.: FHWA-HRT-24-031

Saxton Transportation Operations Laboratory Research Tools to Advance Cooperative Driving Automation (CDA) Research

Date: December 19, 2023
Publication No.: FHWA-HRT-24-034

Long-Term Bridge Performance (LTBP) Newsletter

Date: December 19, 2023
Publication No.: FHWA-HRT-24-039

Cooperative Driving Automation (CDA) Applications for Port Drayage

Date: December 18, 2023
Publication No.: FHWA-HRT-24-023

Cooperative Automation Driving System (C-ADS) with Road Weather Management (RWM) with a Lane Closure

Date: December 18, 2023
Publication No.: FHWA-HRT-24-022

Fast Lane: Exploring Human Behavior - December 2023

Date: December 14, 2023
Publication No.: FHWA-HRT-24-040

Office of Corporate Research, Technology, and Innovation Management (HRTM)

Date: December 14, 2023
Publication No.: FHWA-HRT-24-015

Physically Informed Data-Driven Methods for Greatly Enhancing the Use of Heterogeneous Supplementary Cementitious Materials in Transportation Infrastructure

Date: December 8, 2023
Publication No.: FHWA-HRT-23-048

Complete Streets - Safety Analysis

Date: December 1, 2023
Publication No.: not available (N/A)

Federal Highway Administration Vulnerable Road User Research Plan

Date: November 16, 2023
Publication No.: N/A

Sidewalk Mapping for Pedestrian Navigation Workshop

Date: October 31, 2023
Publication No.: FHWA-HRT-23-084

Transportation Pooled Fund (TPF) - Quarterly Update: August 2023

Date: October 31, 2023
Publication No.: FHWA-HRT-23-112

Development of Crash Modification Factors for Bicycle Treatments at Intersections

Date: October 31, 2023
Publication No.: FHWA-HRT-23-020

Structural Design with Ultra-High Performance Concrete

Date: October 30, 2023
Publication No.: FHWA-HRT-23-077

Availability, Feasibility, and Reliability of Available Nondestructive Evaluation (NDE) Technologies for Detecting and Locating Buried Utilities

Date: October 30, 2023
Publication No.: FHWA-HRT-23-037

Decision Support Methods and Tools for Traffic Management Systems

Date: October 24, 2023
Publication No.: FHWA-HRT-23-071

Portland Limestone Cement

Date: October 18, 2023
Publication No.: FHWA-HRT-23-104

Review of Traffic Management Systems - Current Practice

Date: October 11, 2023
Publication No.: FHWA-HRT-23-051

Cooperative Perception and Control for Traffic System Operations

Date: October 2, 2023
Publication No.: FHWA-HRT-23-105

Next-Generation Pavement Performance Measures

Date: September 26, 2023
Publication No.: FHWA-HRT-23-076

Next-Generation Transportation Asset Management Methodology

Date: September 26, 2023
Publication No.: FHWA-HRT-23-075

Development of Crash Modification Factors for Wrong-Way Driving Treatments

Date: September 15, 2023
Publication No.: FHWA-HRT-22-112

TPF Excellence Awards Program

Date: September 13, 2023
Publication No.: FHWA-HRT-22-099

Transportation Pooled Fund Program - International Partnership

Date: September 13, 2023
Publication No.: FHWA-HRT-23-074

Transportation Pooled Fund Program

Date: September 13, 2023
Publication No.: FHWA-HRT-21-031

Physically Informed Data-Driven Methods for Greatly Enhancing the Use of Heterogeneous Supplementary Cementitious Materials in Transportation Infrastructure

Date posted: September 5, 2023
Publication no.: FHWA-HRT-23-040

Developing Crash Modification Factors for Mini Roundabouts

Date posted: September 1, 2023
Publication no.: FHWA-HRT-23-019

Developing Crash Modification Factors for Separated Bicycle Lanes

Date posted: August 31 2023
Publication no.: FHWA-HRT-23-078

FHWA Federal-Aid Division State Planning and Research Subpart B (SPR-B) Program

Date posted: August 17, 2023
Publication no.: FHWA-HRT-23-050

TFHRC VIRTUAL TOUR PREMIERES AT TRB EXHIBIT BOOTH #841

Visit Labs Through an All-New Online Experience

See TFHRC like you have never seen it before—from your computer or smartphone!

By launching the virtual tour this winter, FHWA invites you to a close-up look at 6 of the 15 cutting-edge laboratories that are helping to move the needle on transportation innovation and research.

While on the virtual tour, you can open touchpoints to learn more about the labs, equipment, and groundbreaking studies researchers are actively engaged in.

You can check out the virtual tour at the FHWA TFHRC booth during the TRB 2024 Annual Meeting exhibit hall hours or by visiting https://highways.dot.gov/research.

FHWA R&T NOW

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FHWA R&T Now is available online at: https://highways.dot.gov/research/publications/RTNow.

Please forward this newsletter to others who might find it interesting or useful.

LINKS

TFHRC: https://highways.dot.gov/research

FHWA Resource Center: https://www.fhwa.dot.gov/resourcecenter

National Highway Institute: https://www.nhi.fhwa.dot.gov/home.aspx

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FHWA-HRT-24-021

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