

# WELCOME!

Welcome to the Turner-Fairbank Highway Research Center (TFHRC), the Nation's premier highway research and development facility. Located in McLean, VA, Federal Highway Administration's (FHWA) TFHRC coordinates and conducts an ambitious program of innovative research and development to address the critical needs of the Nation's highway system.

The value of this research is evident in the development of large and small innovations in materials, designs, policies, operations, and safety on the highway system. Deployment of those innovations enables the highway system to move people and freight efficiently and safely, and contributes to the economic success of the United States.

Our research addresses critical knowledge gaps that are not effectively addressed by other highway research sponsors, and we accelerate implementation of technologies to meet current and future highway transportation needs. Our research includes studies on topics such as connected vehicles and vehicle-to-infrastructure communications, policy decisions requiring quality transportation data, incorporation of human factors and the environment into road systems, and many other developments that provide solutions to transportation challenges.

In addition, TFHRC offers opportunities to get involved in the process of developing highway research and deploying technologies and innovations through the Exploratory Advanced Research (EAR) Program and the Small Business Innovation Research (SBIR) program. Through the EAR Program, FHWA identifies and scopes research topics through extensive initial-stage investigations. EAR Program-funded projects are part of a larger research and development cycle designed to move from early stage research through applied research, field-testing, pilot deployment, and adoption. FHWA is committed to transitioning the results of EAR Program-funded research projects and takes an active role in demonstrating results to audiences critical to continuing the research and development cycle.

FHWA's highly competitive SBIR program awards contracts to domestic small businesses to pursue research on and develop innovative solutions to our Nation's transportation challenges. The SBIR program favors research that has the potential for commercialization through products and applications sold to the private sector transportation industry, State departments of transportation, USDOT, or other Federal agencies.

RESEARCH • DEVELOPMENT • TECHNOLOGY

# HISTORY OF TFHRC

**1938:** Congress responded to a growing public need for dedicated highway research by acquiring 235.3 hectares (581 acres) of land in McLean, VA, for a roadway research facility.

**1941:** The beginning of World War II interrupted building construction at the research facility.

**1950:** After the war, funding was limited, and it was not until 1950 that the two original buildings, built on 17.8 hectares (44 acres) of the original purchase, were ready for occupancy. The Bureau of Public Roads moved to the McLean site, which was named the Langley Research Station.

**1960s:** In 1963, the site was renamed the Fairbank Highway Research Station, honoring Herbert S. Fairbank, the former Deputy Commissioner of Research for the Bureau of Public Roads (1944 to 1955). Land from the original site was transferred to the Central Intelligence Agency, the National Park Service, and the State of Virginia. Extensive modifications over the years improved the facilities but could not meet the growing needs of the national highway research and development program. Plans for expansion began in 1967.

**1980s:** In 1980, construction began on a third building. Completed in 1983, this building was dedicated to Francis C. Turner, the first Administrator of the Federal Highway Administration to serve his entire career with the Agency, and the research station was renamed the Turner-Fairbank Highway Research Center. The Turner Building provides 7,432 square meters (80,000 square feet) of state-of-the-art laboratory, office, and support service space.

**Now:** TFHRC now has more than 24 indoor and outdoor laboratories and support facilities. Approximately 300 Federal employees, onsite contract employees, National Research Fellows, visiting researchers, and students are currently engaged in or supporting transportation research at TFHRC.

Turner-Fairbank Highway Research Center  
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<https://highways.dot.gov/research/>

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# TURNER-FAIRBANK HIGHWAY RESEARCH CENTER

Research and Innovative Solutions  
for the Nation's Highway Challenges



U.S. Department of Transportation  
Federal Highway Administration



# INFRASTRUCTURE

RESEARCH & DEVELOPMENT

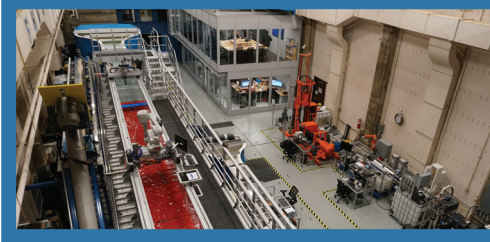
## The Office of Infrastructure

**R&D** engages in forward-looking research that supports safety, durability, resilience, environmental sustainability, and asset management. FHWA's

infrastructure research outcomes stimulate economic growth, productivity, and competitiveness through contributions to improved mobility and accessibility. Highlighted Infrastructure R&D initiatives include:

- Improving the condition of bridges and roads through the advancement of test methods and specifications.
- Delivering projects faster and more efficiently.
- Implementing and enhancing the effectiveness of transportation performance management.
- Advancing understanding of how and why highway pavements and bridges perform as they do.
- Understanding the impact of changes to truck size and weight on the condition of pavements and bridges.
- Improving the sustainability and resilience of highway infrastructure.

The fundamental structure and components of pavements and bridges are quite distinct, but there are research and development needs common to both. The program's approach emphasizes interdisciplinary collaboration, and involvement with counterparts in other FHWA offices and stakeholders throughout the transportation community, to address these needs.



# SAFETY

RESEARCH & DEVELOPMENT

**The Office of Safety R&D** helps reduce highway crashes and related fatalities and injuries by developing and implementing safety innovations through a program of nationally coordinated

research and technology development. The Office of Safety R&D focuses on strategically managing safety, preventing and mitigating roadway departures, improving intersections, protecting pedestrians, and managing speeds.

Featuring state-of-the-art laboratories, Safety R&D provides transportation practitioners with improved safety assessment and decision-support tools, new technologies and designs, and enhanced understanding of the human factors and safety impacts of highway improvements.

Examples of safety assessment and decision-support tools include the Highway Safety Information System, the Evaluation of Low Cost Safety Improvements Pooled Fund Study, and the Interactive Highway Safety Design Model.

Technologies that support highway safety management and design include advanced crash analysis and simulation and highway driving simulators. Access to Naturalistic Driving Study data via the Safety Training and Analysis Center will enable new safety countermeasures. Advanced research focuses on human factors and visibility, intelligent transportation systems, and the feasibility of an integrated active transportation system.



# OPERATIONS

RESEARCH & DEVELOPMENT

## The Office of Operations R&D

conducts research on the application of intelligent transportation systems and other cutting edge technologies to

move people and goods more efficiently and safely, with improved reliability. This research explores concepts and develops prototype technologies and algorithms for optimizing transportation systems, promoting smoother and safer traffic flow, reducing travel times, and decreasing fuel consumption.

Operations R&D's Saxton Transportation Operations Laboratory houses state-of-the-art modeling and simulation tools, intelligent infrastructure, and advanced communication technologies, and operates vehicles with prototype cooperative-automated driving systems to develop and test new transportation concepts.

The Office of Operations R&D also promotes interagency coordination by forging partnerships with other on- and off-road testing facilities throughout the United States, including those operated by the Virginia Department of Transportation, the Department of Homeland Security, the Department of Defense, and others.



RESEARCH • DEVELOPMENT • TECHNOLOGY • INNOVATION • ADVANCEMENT • ANALYSIS

