

**U.S. HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON RESEARCH & TECHNOLOGY
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY**

HEARING CHARTER

Bumper to Bumper: The Need for a National Surface Transportation Research Agenda

Thursday, July 11, 2019

2:00 p.m. – 4:00 p.m.

2318 Rayburn House Office Building

PURPOSE

On Thursday, July 11, 2019, the Subcommittee on Research and Technology of the Committee on Science, Space, and Technology will hold a hearing titled, “*Bumper to Bumper: The Need for a National Surface Transportation Research Agenda.*” The purpose of this hearing is to review the Department of Transportation’s surface transportation research, development, and demonstration and technology transfer activities, examine implementation of research provisions of the 2015 *Fixing America’s Surface Transportation Act of 2015* (“FAST Act”) and explore the need for a long-term national surface transportation research agenda.

WITNESSES

- **Mr. Tim Henkel**, Chair, Research and Technology Coordinating Committee, Transportation Research Board and Assistant Commissioner, Modal Planning and Program Management, Minnesota Department of Transportation
- **Mr. Brian Ness**, Director, Idaho Transportation Department and Chair, American Association of State Highway and Transportation Officials Special Committee on Research and Innovation
- **Dr. Henry Liu**, Director, Center for Connected and Automated Transportation and Professor, Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor
- **Dr. Darcy Bullock**, Director, Joint Transportation Research Program and Lyles Family Professor, Department of Civil Engineering, Purdue University

OVERARCHING QUESTIONS

- How has the Department of Transportation (DOT) implemented the policies and programs mandated in the 2015 FAST Act, specifically as they relate to research, development and technology (RD&T)? What changes or improvements to RD&T programs and policies, if any, should Congress consider for reauthorization of the FAST Act?

- How has DOT coordinated across the modal operating administrations and with research partners in setting priorities and implementing its RD&T programs? How has DOT worked with states to help test and deploy technologies developed through DOT programs?
- How are short-term and applied research needs balanced with long-term research investments required for future innovation?
- Is there a need for a long-term (20+ year) national surface transportation research strategy? How might such a strategy help guide the development of technologies that will address safety, security, congestion, emissions reduction, and other important goals well into the future?

Long Term Research Vision

Today, the U.S. population, at 329 million, is double the population of 1956 when construction of the National Highway System began. With projections of more than 400 million people living in the U.S. by 2050, the current costs of outdated infrastructure – the direct economic costs as well as the costs associated with safety, congestion, and environmental impacts – will continue to worsen if nothing changes. Research has played a key role in the development of today’s technology that is helping improve how we move people and commerce. However, there is still much research to be addressed as needs for the built environment change and the impacts of climate change increase across the nation. These vary from more resilient building materials to behavioral studies related to adoption of new transportation technologies. The Department of Transportation does operate under a 5-year research, development, and technology (RD&T) strategic plan¹. However, a long-term vision for surface transportation research could help guide solutions to existing challenges and ensure adequate planning and connectivity for the future.

Department of Transportation Research

The U.S. Department of Transportation (DOT) oversees 11 operating administrations that cover air, land, and seafaring transportation. The primary offices that carry out significant surface transportation RD&T activities include the Office of the Assistant Secretary for Research and Technology (OST-R), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), National Highway Traffic Safety Administration (NHTSA), Federal Railroad Administration (FRA).

¹ <https://www.transportation.gov/sites/dot.gov/files/docs/USDOT-RD%26T-Strategic-Plan-Final-011117.pdf>

The Federal-aid Highway Program, public transportation programs and related research are authorized under the surface transportation law (often referred to as the highway bill). The 5-year FAST Act is the most recent surface transportation law. Authorization of major research programs is found under Title VI, the Innovation title. The FAST Act also authorizes transportation of hazardous materials, safety, freight and rail activities. The FAST Act provides about \$45 billion per year for highway programs and \$12 billion per year for public transportation programs. Just under \$700 million of that goes to research programs.

FAST Act programs are funded through allocations from the Highway Trust Fund (HTF) which receives gas tax revenues, and through the appropriations process. The HTF does not receive enough in gas tax receipts to cover all of the program expenditures authorized in the FAST Act. Since 2008, Congress has appropriated almost \$144 billion to make up for HTF shortfalls.² This appropriation is technically a transfer to the HTF. RD&T programs are funded through both the HTF and annual appropriations.

Office of the Assistant Secretary for Research and Technology (OST-R)

The Office of the Assistant Secretary for Research and Technology (OST-R) is under the Office of the Secretary of Transportation. OST-R is responsible for research coordination, technology transfer, and statistics activities across the department. OST-R receives annual appropriations and was funded at \$8.5 million in FY19.

OST-R oversees six major program components: the Office of Research, Development and Technology (RDT) (appropriated funds) which administers several programs, including the University Transportation Centers (UTC) Program (HTF funded); Intelligent Transportation System-Joint Program Office Program (ITS-JPO) (HTF funded); Bureau of Transportation Statistics (BTS) (HTF funded); Positioning, Navigation, and Timing and Spectrum Management (PNT) (appropriated funds); Transportation Safety Institute (fee-for-service); and Volpe National Transportation Systems Center (fee-for-service).

University Transportation Centers (UTC) Program

OST-R receives an allocation from the FHWA to fund the UTC program. The FAST Act authorized \$77,500,000 for the program in FY19. The UTC program is a competitive grant program for colleges and universities and is the primary mid- to long-term surface transportation R&D program at DOT. Grants last for the duration of the surface transportation authorization act

² Kirk, Robert. S and Mallet, William J., "Highway and Public Transit Funding Issues," Congressional Research Service, June 4, 2019.

<https://www.crs.gov/Reports/IF10495?source=search&guid=7cf4cfb47224411192b98921e383eac9&index=2>

and a new competition starts for all centers after each reauthorization. The role of UTCs is to advance transportation expertise and technology through education, research, and technology transfer, to provide a transportation knowledge base outside of DOT, and to address workforce needs.

Under the FAST Act, all UTCs are a consortia of institutions of higher education. Each UTC must address one of six research priorities under the Secretary's Five-Year research and development strategic plan which are outlined in law, including 1) improving mobility of people and goods; 2) reducing congestion; 3) promoting safety; 4) improving the durability and extending the life of transportation infrastructure; 5) preserving the environment; and 6) preserving the existing transportation system.

The FAST Act authorized five National UTCs, 10 regional UTCs, and up to 20 Tier 1 UTCs. One of the regional UTCs must focus its research in the field of comprehensive transportation safety, congestion, connected vehicles, connected infrastructure, and autonomous vehicles. The FY18 appropriations provided \$15 million in funding for the creation of two new national UTCs, one on congestion research and one on infrastructure. Grant recipients in each category of UTC must provide a match to the federal funding. This match generally comes from state funding.

Federal Highway Administration (FHWA) Research

In addition to the three HTF-funded programs administered by OST-R, the FHWA also carries out highway related research at the Turner-Fairbank Highway Research Center in McLean, Virginia and funds research projects carried out by states. As required under the FAST Act, the FHWA administers and funds four major research programs:

- Highway Research and Development Program. – This program is funded at \$125 million in FY19. One of the programs under this program is the Exploratory Advanced Research (EAR) Program, which focuses on longer-term, higher risk research. The program did not receive a line-item authorization in either of the most recent surface transportation bills. TRB has recommended that FHWA do more in the area of long-term research projects.
- Technology and Innovation Deployment Program, funded at \$67.5 million in FY19. – Under this program, the FAST Act authorized \$60 million per year for the new Advanced Transportation and Congestion Management Technologies Deployment (ATCTMD). This program is funded from funds set aside for the Highway Research and Development Program and the Intelligent Transportation Systems Program.
- Training and Education, funded at \$24 million in FY19.
- Intelligent Transportation Systems Program, funded at \$100 million in FY19. This is the second largest research account at FHWA and focuses largely on connected and autonomous vehicle research. FHWA is required to consult with other relevant modal administrations in carrying out this program.

State Planning and Research (SP&R)

The Federal-aid highway program, funded by the HTF (and transfers), allocates funding to states for highway construction, bridges, safety improvements, freight, congestion mitigation and air quality improvement, and transportation planning. Two percent of a state's Federal-aid highway allocation is set-aside for planning. Of that two percent, 25% must be used for research. Total annual SP&R funding for all states was \$200 million in 2018.³ States carry out "pooled fund" projects with other states and partners to leverage these funds. State DOTs focus heavily on applied research to address immediate transportation challenges. UTCs partner with states on research and generally receive the matching funds required for the UTC program from SP&R funds.

Federal Transit Administration (FTA)

The FTA carries out and administers public transportation research funds provided under the FAST Act. Out of the Mass Transit Account of the HTF, Public Transportation Innovation receives \$28 million annually and Technical Assistance and Workforce Development receives \$9 million annually.

Federal Research Partners

The Transportation Research Board (TRB) is an organization within the National Academies and carries out many Congressionally mandated and agency sponsored cooperative transportation research programs. These programs include the National Cooperative Highway Research Program, Transit Cooperative Research Program, Airport Cooperative Research Program, Behavioral Traffic Safety Cooperative Research Program, National Cooperative Freight Research Program, Hazardous Materials Cooperative Research Program, and the National Cooperative Rail Research Program.

TRB also carries out assessments of agency programs, including through the Research and Technology Coordinating Council (RTCC), which reviews the highway research, development, and deployment efforts of the FHWA. In 1987, Congress also authorized TRB to carry out a five-year applied research program called the Strategic Highway Research Program to improve highway performance, durability, safety, and efficiency. The program was reauthorized from 2006 through 2015, but was not reauthorized under the FAST Act.

³ Transportation Research Board. <http://www.trb.org/ResearchFunding/StateDepartmentofTransportation.aspx>