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Committee on Commerce, Science & Transportation

FAST Act Reauthorization: Transportation and Safety Issues
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Chairman Wicker, Ranking Member Cantwell, Members of the Committee, thank you for inviting the Office of the Secretary of Transportation to testify about our work to improve safety and lead innovation in our nation's transportation system, as well as our progress implementing the Fixing America's Surface Transportation (FAST) Act. It is an honor to testify today before this Committee.

Safety

Safety is the U.S. Department of Transportation's (DOT or Department) number one priority, and we are committed to reducing transportation-related fatalities and serious injuries across the transportation system. The Department has adopted a systemic, safety management systems approach that mitigates risks and encourages infrastructure and behavior change through data-driven risk identification, enhancement of standards and programs, and evaluation of effectiveness. In 2018, the Department released an updated strategic plan identifying the goals, objectives, and strategies we will pursue to improvement to safety, infrastructure, and innovation in our nation's transportation system.

This plan highlights the Administration's commitment to the needs of rural America, specifically addressing the need to reduce the disproportionate transportation safety risks faced by rural communities. In 2017, the highway fatality rate on rural roads was more than double the rate on urban roads. The successful execution of a systemic safety approach requires quality information derived from sound analysis to enable the Department, as well as our states and local government partners, to apply a data-driven approach to determine the best solutions to address safety problems.

Safety Data Initiative

Through the Safety Data Initiative (SDI), the Department is seeking to advance our ability to integrate existing Department data with new "big data" sources, use advanced analytics to provide new insights into transportation safety risks, and create data visualizations to help policy makers arrive at safety solutions. We are wrapping up the first phase of the SDI, where we launched a series of pilot projects to seek new ways to find answers to fundamental traffic safety questions.

In the Waze Pilot Project, we leveraged near-real-time private sector data to gain new insights into traffic crashes by applying machine learning techniques to develop crash estimation models. The Waze Pilot Project consists of two case studies exploring state and local applications of the Waze models. We have been working with Tennessee Highway Patrol to integrate Waze data into their existing crash model structure to improve resolution. We are working with the City of Bellevue, Washington to test if Waze data can offer actionable insights that will inform the Bellevue Vison Zero action plan. Beyond the Waze pilot, to make the Department's data more accessible, we worked with the National Highway Traffic Safety Administration (NHTSA) to convert traffic fatality data from their Fatality Analysis Reporting System into interactive visualizations related to speeding and pedestrian safety.

In addition to these pilot projects, the SDI includes the Solving for Safety Visualization Challenge, a multistage, $350,000 national competition in which solvers developed analytical tools, powered by visualizations, to reduce serious crashes on the nation's roads and rails. Fifty-four solvers from universities, the private sector, and other innovative fields submitted proposals, five semi-finalists were selected, and two finalists are developing full working tools. The two finalists are Ford Motor Company and the University of Central Florida.

Roadway Safety Research

The Department's safety research programs have significantly improved the safety of our roadways. FHWA conducts research to identify innovative roadway designs that can save lives. For example, replacing an intersection that uses stop signs or traffic signals with a roundabout can reduce crashes by around 80%.
(https://safety.fhwa.dot.gov/provencountermeasures/roundabouts/ [2])

Federal Highway Administration NHTSA estimates more than 600,000 lives have been saved between 1960 and 2012 through adoption of vehicle safety technologies. The Federal Motor Carrier Safety Administration (FMCSA) estimates that its data driven compliance and enforcement program saves more than 200 lives per year.

Transportation engineers rely on significant amounts of crash data to design and deploy safety counter measures. To continue reducing roadway fatalities, the Department needs more data and better quality data, especially on pedestrians, bicyclists, and motorcyclists. The SDISDI is a step forward in addressing some of the research gaps in our understanding of roadway safety. For example, pedestrian fatalities have increased over the past few years, though it remains difficult to determine if increased exposure (more people out walking) has contributed that increase.

NHTSA needs to better understand the true scope of drug-impaired driving. With actual and proposed changes to state and federal law regarding marijuana, it is increasingly important that we address this critical safety issue. No chemical testing exists for drug impaired driving, similar to the blood alcohol test. Having clear standards is critical for law enforcement documenting accidents.

Similarly, it is currently difficult to determine the full impact of distracted driving. Some studies suggest that the number of distraction-related crashes and fatalities is higher than what can be determined by current methods. Moreover, new vehicle technology linking drivers in-vehicle to the Internet continues to expand and evolve at a rapid pace.

FMCSA finished a comprehensive large-truck crash causation study in 2003 to understand the factors that contribute to crashes involving at least one commercial vehicle. Since then, there have been many changes in technology, vehicle safety, driver behavior, and roadway design. FMCSA is interested in conducting a revised crash causation study and is seeking information on the most effective methodology for best collecting crash data.

5.9 GHz Spectrum

The 5.9 GHz band of radio-spectrum (or "Safety Band") is of critical importance to the Department for reducing crashes, injuries, and fatalities, while mitigating congestion. It is uniquely positioned today to support safety applications that could prevent or significantly reduce the severity of vehicle crashes in a manner not available through other existing vehicle technologies. The Safety Band already is used by state transportation departments for vehicle-to-vehicle (V2V) and pedestrian collision avoidance, transit priority, traffic light control, traffic monitoring, travelers' alerts, automatic toll collection, traffic congestion detection, emergency vehicle signal preemption of traffic lights, truck platooning, and electronic inspection of moving trucks through data transmissions with roadside inspection facilities.

The Safety Band also governs numerous systems such as red-light violation warnings, reduced speed zone warnings, curve speed warnings, spot weather-impact warnings and other safety-critical applications. The Safety Band is actively being used today with more than 80 connected vehicle projects in the U.S. alone (54 currently operational). These sites are using all of the different channels to address different safety-related issues. A common path forward is needed to ensure that current deployments can continue without the risk of investment loss and/or jeopardizing the intended safety and mobility benefits.

As technology advances, it is clear that interoperability is central to enabling universal, nationwide and regionwide vehicle-to-everything (V2X) capability and benefits. Promising technology for interoperability between DSRC, CV2X, Bluetooth, and other forms of wireless communications has already emerged, as demonstrated at the recent ITS America Annual Meeting in Washington, D.C.

The Department does not promote any particular technology over another, and we encourage the automotive industry, wireless technology companies, and other innovators to continue developing multiple technologies that leverage the 5.9 GHz band of spectrum for transportation safety benefits. DOT must ensure that use of the Safety Band is protected for traffic safety so that automated light duty vehicles, trucks, motor coaches, rail, transit, and infrastructure and traffic devices across all surface modes can work in the safest possible way. Doing so can help reduce the annual number of 37,000 road deaths and 2.7 million injuries.

Intelligent Transportation Systems

The Intelligent Transportation Systems (ITS) Joint Program Office (JPO) serves as the Department's multi-modal technology research program, working toward improving transportation safety, mobility, and efficiency; and enhancing productivity through the integration of innovative technologies within our nation's transportation system. ITS JPO's efforts address the Department's innovation strategic goal. By undertaking the research and deployment of innovative technologies, ITS JPO ensures the Department remains at the forefront of the latest technological advances.

The ITS JPO is responsible for coordinating the ITS Program and initiatives among all DOT operating administrations. The research builds on and leverages the technology and applications developed across all modes delivering cross-cutting research activities and technology transfer that support the entire Department. The ITS Program is directly aligned with DOT's mission of ensuring the nation has the safest, most efficient and modern transportation system in the world. The program categories undertake the research and deployment of emerging ITS technologies and capabilities to leverage emerging public and private innovations. The program serves as an innovative hub for various aspects of American transportation, from automation and data to new communication systems and cybersecurity.

Movement of the Office of the Assistant Secretary for Research and Technology

With the passage of the Consolidated Appropriations Act, 2019 (P.L. 116-6; February 15, 2019), the Office of the Assistant Secretary for Research and Technology (OST-R) has been moved into the Office of the Under Secretary of Transportation for Policy (S-3). This transfer reinforces alignment of research and technology programs and evidence-based data collections with priorities of the *DOT Strategic Plan* analysis.

OST-R directly addresses the Secretary's innovation priority goals and indirectly impacts the achievement of the Secretary's safety and infrastructure goals, by working across all operating administrations (OAs) to ensure that research investments are directly aligned with Department priorities. OST-R programs identify synergies, gaps, and opportunities to apply research cross-modally, which prevents the duplication of research efforts and waste of federal resources.

OST-R coordinates, facilitates, and reviews the Department's research and development programs and activities; coordinates and develops positioning, navigation, and timing (PNT) technology; maintains PNT policy, coordination, and spectrum management; and oversees and provides direction to the Bureau of Transportation Statistics, the Intelligent Transportation Systems Joint Program Office, the University Transportation Centers program, the Volpe National Transportation Systems Center (Cambridge, MA), and the Transportation Safety Institute (Oklahoma City, OK).

OST-R's mission is expanded to establish a comprehensive, Department-wide, research review and approval process. This enhanced oversight role, beginning in FY 2019, ensures that

Operating Administrations' research portfolios are aligned with Secretarial priorities, comply with statutory mandates, and make effective and efficient use of the Department's research funds. OST-R is also DOT's primary facilitator of T2, or "technology transfer," maximizing the impact of Federal research investments by accelerating the deployment of new technologies and practices.

Accelerating Project Delivery

Our nation's economy relies on an infrastructure system that can deliver people and goods efficiently and on-time. As economic growth places increasing demands on our infrastructure systems, the growing state of disrepair poses threat to that growth. In 1933, ground was broken on the Golden Gate Bridge, which opened just 4 years later. Since then, layers of federal bureaucracy and regulatory red-tape have placed countless obstacles to delivering transformative transportation projects. For some projects, the environmental review process can take more than 10 years to complete. We can do better. By improving the efficiency of the environmental review and permitting processes, we can accelerate project delivery and achieve better outcomes for communities and the environment.

One of the Department's strategic goals is to invest in infrastructure to ensure safety, mobility, and accessibility and to stimulate economic growth, productivity, and competitiveness for American workers and businesses. We seek to achieve this goal through strategies described in our strategic plan, including streamlining the environmental review process to deliver transportation projects, both large and small, more quickly and efficiently to provide timely benefits to users while safeguarding our communities and maintaining a healthy environment.

Currently, the environmental review process can be complex, inconsistent, and difficult for project sponsors to navigate. Protection of the environment and safeguarding of our communities is of critical importance, and can be achieved more effectively, thereby resulting in reducing project delays and costs, and realizing benefits of critical infrastructure projects sooner. We appreciate the tools that have been provided in past transportation authorizations. The Department implemented all project delivery rules required by the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the FAST Act, except for a pending final rule implementing the FAST Act pilot to authorize states with National Environmental Policy Act (NEPA) assignment to substitute state environmental laws and regulations for NEPA.[1

Through its Infrastructure Permitting Improvement Center, the Department continues to take other actions that further the MAP-21 and FAST Act provisions, implement the One Federal Decision requirement under Executive Order 13807 and associated Memorandum of Understanding, and otherwise improve the project delivery process through increasing transparency and accountability, expanding early coordination with agencies and stakeholders, and increasing information sharing and coordination among the lead, cooperating, and participating agencies. The Department is reviewing and updating its policies and guidance with these objectives in mind, so we make better and more timely decisions, thereby being able to

deliver critical infrastructure with associated benefits to the public in a more efficient and cost-effective manner, and while continuing to protect communities and the environment.

Non-Traditional and Emerging Transportation Technology Council

The Department also needs to adapt so state, local, and private sector abilities to deliver innovative transportation projects are not harmed by the same challenges facing traditional transportation modes. At South by Southwest in March, Secretary Chao announced the creation of the Non-Traditional and Emerging Transportation Technology (NETT) Council, an internal deliberative body at the Department tasked with identifying and resolving jurisdictional and regulatory gaps that may impede the deployment of new technology, such as tunneling, hyperloop, autonomous vehicles, and other innovations.

Each of the Department's operating administrations has its own traditional jurisdiction over certain environmental and regulatory approvals. New technologies may not always fit precisely into the Department's existing regulatory structure, potentially resulting in a slower pace of transportation innovation.

Inventors and investors approach the Department to obtain necessary safety authorizations, permits, and funding and often face uncertainty about how to coordinate with the Department. The NETT Council will address these challenges by ensuring that the traditional modal silos at DOT do not impede the deployment of new technology. Furthermore, it will give project sponsors a single point of access to discuss plans and proposals.

The NETT Council represents a major step forward for the Department in reducing regulatory burdens and paving the way for emerging technologies in the transportation industry. The Council held its first formal meeting on March 14, 2019 and is currently working through non-traditional tunneling and hyperloop projects. The Council is set to have four meetings this year with additional meetings scheduled when appropriate.

Build America Bureau

In addition to supporting the development emerging technologies, the Department continues its work through several financing and grant programs to pursue its strategic goal to invest in infrastructure to ensure safety, mobility and accessibility and to stimulate economic growth.

The Department provides low cost, flexible loans and allocates tax exempt Private Activity Bonds (PAB) to finance transportation infrastructure projects through the Build America Bureau (Bureau). During this Administration, more than $25 billion worth of transportation projects have been financed using over $12 billion in loans and PAB allocations nationwide. The Bureau has recently increased its outreach efforts particularly to project sponsors who are not familiar with these programs to provide technical assistance and increase the level and scope of support we can provide early in the planning process. The Bureau is also focused on diversifying our portfolio by removing costly barriers to small or rural borrowers, providing credit subsidy for

small and medium sized freight railroads and broadening the scope of project types and asset classes eligible for Bureau credit.

Infrastructure For Rebuilding America (INFRA) Grants

The Nationally Significant Freight and Highways Projects program—which we refer to as the INFRA grants program—is a critical source of funding for larger scale projects which generate economic, mobility, and safety benefits. Since 2016, this program has awarded $2.3 billion to 54 projects across the country, unlocking $11.8 billion in total investment. It remains a very popular program; the Department received nearly 200 applications requesting nearly $9.8 billion in funding in response to the fiscal year (FY) 2019 solicitation. Approximately $856 million is available for award, and the Department plans to notify Congress of its proposed selections soon.

The INFRA program selection criteria advance critical Administration goals such as supporting economic vitality, increasing non-federal leverage, rewarding innovation, and incentivizing performance and accountability among federal grant recipients. Each project is evaluated according to these criteria, and these assessments support Departmental investment decisions. The FY 2020 budget proposal—which requested an additional $1 billion in appropriated funding to supplement the FY 2020 amount authorized in the FAST Act—reflects the Administration's high opinion of the program's track record and future potential.

Better Utilizing Investments to Leverage Development (BUILD) Grants

Since enactment of the FAST Act, the Department awarded 173 projects with significant local or regional impact under the TIGER/BUILD program including 133 road, transit, rail, and maritime projects awarded under this Administration. Combined, these projects represent a $2.5 billion investment in surface transportation projects across the country. To ensure the Department appropriately addresses rural transportation needs, the Department awarded a greater share of TIGER and BUILD funding in the past two rounds to projects to projects in rural areas than in urban areas.

The merit-based, competitive nature of the TIGER/BUILD program allows the Department to award projects that most align with selection criteria, including safety, economic competitiveness, state of good repair, environmental sustainability, and quality of life in order to impact the communities in which they are located. Investments under this program complement other transportation investment by supporting projects identified by local communities as those that best reflect their needs.

Automated Driving System (ADS) Demonstration Grants

The Consolidated Appropriations Act, 2018 (P.L. 115-141, March 23, 2018) provided $60,000,000 for an Automated Driving System (ADS) Demonstration Grants Program to test the safe integration of ADS on our Nation's roadways. The three goals of the ADS program are:

- **Safety:** Fund projects that demonstrate how challenges to the safe integration of ADS into the Nation's on-road transportation system can be addressed.
- **Data for Safety Analysis and Rulemaking:** Ensure significant data gathering and sharing of project data with the Department and the public throughout the project.
- **Collaboration:** Create collaborative environments that harness the collective expertise, ingenuity, and knowledge of multiple stakeholders.

Each demonstration must focus on the research and development of automation and ADS technology, include a physical demonstration, include near-real-time gathering and sharing of relevant and required data with the Department throughout the project, include user interfaces are accessible to users with varied abilities, and address how the demonstration can be scaled to be applicable across the nation.

The Department issued a Notice of Funding Opportunity on December 21, 2018 with applications closing on March 21, 2019. We expect to announce awardees in the coming weeks.

Automated Driving Systems

The development and deployment of automated vehicle-related technology is moving rapidly, and this pace is only expected to accelerate over the next decade. Historically, human error has been a factor in 94% of fatal crashes, which automated technology could help address. Automation is expected to bring many other benefits as well—such as increased independence for people with disabilities and older Americans, better delivery times, and more efficient movement of goods—making the whole economy more productive.

On October 4, 2018, the Department released "Preparing for the Future of Transportation: AV 3.0." AV 3.0 advances DOT's commitment to supporting the safe integration of automation into the broad multimodal surface transportation system. It also reiterates approaches to safety that were established in prior guidance, provides new multi modal safety guidance, and outlines a process for working with the Department as this new technology evolves. Fourteen companies have publicly released Voluntary Safety Self-Assessments to communicate their approaches to incorporating safety into the design and testing of automated driving systems.

DOT is partnering with the Department of Labor, the Department of Commerce, and the Department of Health and Human Services to conduct an analysis of known and emerging workforce impacts and operational safety issues for commercial drivers introduced by implementation of automation technology over time. We held an event on March 20, 2019, to receive stakeholder input into the development of the study and an accompanying report to Congress, expected summer 2019. With this study, our goal is to provide reliable information to policy makers and the public, to help our nation prepare so that we all benefit from the introduction of new technologies.

Despite its promise and the progress that has been made, automated vehicle technology is still in its early stages of development. The public has concerns about the safety and security of this

new technology. These concerns must be addressed, because without public acceptance, we know automated technology will never reach its full potential. The promise and safety of automated vehicles is only possible through open public-private participation and active community engagement.

Safety Applications of Unmanned Aircraft Systems

Another front of rapid innovation is in Unmanned Aircraft Systems (UAS), commonly known as drones. The Department has seen progress in UAS uses in recent years, particularly for safety applications. UAS are particularly useful for tasks that are time consuming, dangerous, or infeasible for people to perform manually. In agriculture, manned aircraft are used for crop-spraying and remote-sensing. UAS can fly lower, more precisely, and at a lower cost than manned aircraft, broadening the potential uses of aircraft in agriculture potentially reducing farmworker exposure to safety risks.

UAS carry distance, altitude, and frequency advantages over existing pipeline inspection methods. UAS could offer real-time, precise, and high-definition data that would be cost-prohibitive to collect with manned aircraft or on-the-ground inspectors. Certain companies in the rail industry, are trialing UAS beyond visual line-of-sight for inspections in select areas. UAS can ease inspection of traditionally hard-to-reach areas on bridges and may also protect rail workers from manual track inspection risks.

Thank you for your time today, and I am pleased to answer your questions.

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[1] This final rule is anticipated to be published this summer.