

**United States Department of Transportation
Annual Modal Research Plan FY 2026
Program Outlook FY 2027**

Intelligent Transportation Systems Joint Program Office (ITS JPO)

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Executive Summary

Mandated by United States Code Title 23 Chapter 5 and subject to provisions outlined in Sections 512-518, the Secretary of Transportation is directed to conduct an ongoing intelligent transportation system (ITS) program to research, develop, and operationally test ITS and provide technical assistance in the nationwide application of ITS as a component of the surface transportation system (23 U.S.C. § 515). To meet that directive, the Intelligent Transportation Systems Joint Program Office (ITS JPO) collaborates across modal administrations to coordinate and plan the U.S. Department of Transportation's (DOT) multimodal ITS technology research program. The ITS JPO improves transportation safety, mobility, efficiency, and enhances productivity through the integration of innovative technologies into the Nation's transportation system. Through these efforts, the ITS JPO ensures the DOT meets key strategic goals on safety, infrastructure, innovation, and efficiency.

The Vision of the ITS JPO is to "Accelerate the use of ITS to transform the way society moves." That vision aligns directly with the Strategic Goals identified in the FY2026-2030 DOT Strategic Plan. Those goals are achieved through leading collaborative and innovative research, development, and implementations of ITS technologies and infrastructure to improve the safety, mobility and accessibility for American Workers and Businesses.

The ITS JPO includes a portfolio of research and technology deployment programs focused on systems and technologies that produce the most effective set of public benefits from transportation's increasing technological transformation. The ITS JPO is responsible for coordinating the ITS Program and multimodal technology research initiatives among all DOT operating administrations: Federal Highway Administration (FHWA); Federal Motor Carrier Safety Administration (FMCSA); Federal Transit Administration (FTA); Federal Railroad Administration (FRA); National Highway Traffic Safety Administration (NHTSA); Maritime Administration (MARAD), Pipeline Hazardous Materials Safety Administration (PHMSA), and the Great Lakes St. Lawrence Seaway Development Corporation (GLS). The ITS JPO partners with the Office of the Assistant Secretary for Technology and Research (OST-R) on research and analysis for key ITS enablers—spectrum access and communications engineering, and advances in positioning, navigation, and technology for ITS services – both of which include a focus on resilient systems and cybersecurity. In addition, close collaboration occurs with industry and academic partners.

By undertaking the research and deployment of advanced and innovative technologies, the ITS JPO serves as the DOT's organizational resource for avoiding duplication ensuring the Department is at the forefront of advancing technology to improve the safety and performance of our Nation's transportation system. The ITS JPO's broad mission is technology neutral, focusing on systems or platforms that meet performance and

interoperability requirements. The ITS JPO continually assesses the feasibility, maturity, and benefits of ITS technologies and approaches, and shepherds transportation solutions from inception to implementation. Program areas within the ITS JPO foster the development and deployment of new technologies and support Departmental efforts on adopting and adapting innovative technologies from other industries to meet the specific needs of the surface transportation system.

The ITS JPO is uniquely positioned within USDOT to facilitate multimodal ITS activities and has organizational relationships with OST-R and FHWA, coordinating with both the FHWA Administrator and OST-R Assistant Secretary. The ITS JPO is a FHWA Office and utilizes FHWA support functions while receiving research portfolio guidance from OST-R. Through its research and deployment activities the ITS JPO serves two distinct roles within the USDOT, as a project lead and a multimodal coordinator, working to enable successful ITS research and technology deployments.

The ITS JPO portfolio is divided into four overarching Program Areas: ITS Deployment Program Area, Automation Program Area, Emerging and Enabling Technologies Program Area and the Accelerating Deployment Program Area. In addition, the ITS JPO works in coordination with FHWA to provide funding for the Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD) program (*otherwise known as Advanced Transportation Technology and Innovation (ATTAIN)*) and with Volpe to provide funding for the Small Business Innovative Research (SBIR) program. Activities within all Program Areas align directly with the Strategic Goals of Safety, Infrastructure, Innovation and Efficiency as identified in the FY 2026-2030 DOT Strategic Plan Framework (table below). ITS JPO initiatives directly enable the Department to achieve many of the applicable Strategic Objectives outlined.

STRATEGIC GOAL

STRATEGIC OBJECTIVE

SAFETY

Reaffirm that safety is the Department's top priority.

- 1.1 Improve aviation safety
- 1.2 Reduce surface transportation-related fatalities and serious injuries
- 1.3 Improve transportation worker safety
- 1.4 Develop improved safety management systems across transportation modes

INFRASTRUCTURE

Invest in high-quality transportation infrastructure capacity to unlock American prosperity.

- 2.1 Accelerate project delivery
- 2.2 Construct projects to expand system capacity
- 2.3 Improve system condition and reliability
- 2.4 Position the U.S. transportation sector for economic competitiveness at home and abroad

INNOVATION

Lead the world by bringing the best of American ingenuity to transportation.

- 3.1 Reduce regulatory burden
- 3.2 Enable transportation technology development and adoption
- 3.3 Invest in transformative technologies

EFFICIENCY

Improve efficiency and accountability across the Department.

- 4.1 Modernize DOT operations

- 1. ITS Deployment Program Area:** The ITS Deployment Program Area works in coordination with multimodal partners to bring publicly and privately sponsored research together to create scalable, replicable, and integrated ITS and other emerging technology deployments. Included within this area are four key programs: the Saving Lives with Connectivity: Accelerating Vehicle-to-Everything (V2X) Deployment (V2X Accelerator Program); the Intersection Safety Systems Program; the Artificial Intelligence for Transportation Planning and Design Initiative and the Rural ITS Deployment Program. Activities align directly with Strategic Objectives 1.2 Reduce surface transportation-related fatalities and series injuries; 1.3 Improve transportation worker safety; 1.4 Develop improved safety management systems across transportation modes; 2.2 Construct projects to expand system capability; 2.3 Improve system condition and reliability; 3.2 Enable transportation technology development and adoption; 3.3 Invest in transformative technologies and 4.1 Modernize DOT operations.
- 2. Automation Program Area:** The Automation Program's collaborative and multimodal research portfolio provides cross-cutting support across the DOT. The Automation Program works to enable the safe and efficient adoption of automated vehicles across

the transportation system. Through close collaboration and monitoring of current industry leaders and academic technology innovators in automation the ITS JPO continues the pursuit of an automation program that will support the safe deployment of an automated future. Although driving automation research has been, to some degree, mainstreamed across the Department's Operating Administrations, research needs continue to evolve alongside the technology. Activities align directly with Strategic Objectives 1.2 Reduce surface transportation-related fatalities and series injuries; 1.3 Improve transportation worker safety; 1.4 Develop improved safety management systems across transportation modes; 2.2 Construct projects to expand system capability; 2.3 Improve system condition and reliability; 3.2 Enable transportation technology development and adoption; 3.3 Invest in transformative technologies and 4.1 Modernize DOT operations.

- 3. Emerging and Enabling Technologies Program Area:** The Emerging and Enabling Technologies Program Area focuses on investigating emerging and evolving transportation systems and technologies that can provide increased or additional public benefits in safety, mobility, and efficiency. As the scale of ITS increases and expands to become part of the broader Internet of Things (IoT) environment (i.e., smart communities), vehicle manufacturers, infrastructure providers, innovators, and entrepreneurs discover new opportunities to use technology and data generated by these new systems. These technological advances, along with new functionality, new applications, new operational concepts, and disruptive innovations, need to be tracked and planned for by the DOT. Current examples of these Emerging and Enabling technologies include Interoperable Connectivity through new advances in wireless communications (including LTE-V2X, the emerging 5G/6G and new Wi-Fi/broadband or satellite variations), digital infrastructure, quantum computing, blockchain, Artificial Intelligence (AI), and others. Activities align directly with Strategic Objectives 1.2 Reduce surface transportation-related fatalities and series injuries; 1.3 Improve transportation worker safety; 1.4 Develop improved safety management systems across transportation modes; 2.1 Construct projects to expand system capability; 2.2 Construct projects to expand system capability; 2.3 Improve system condition and reliability; 3.2 Enable transportation technology development and adoption; 3.3 Invest in transformative technologies and 4.1 Modernize DOT operations.
- 4. Accelerating Deployment Program Area:** As new research products, results, and prototypes evolve into market-ready products, the primary goal of the Accelerating Deployment Program Area is to provide data, research, analysis, technical assistance, and other types of support services that accelerate adoption and at-scale deployment of secure and interoperable ITS technologies. The objectives of the Accelerating Deployment Program Area are: (1) to accelerate the transformation of ITS research and

prototypes into market-ready technologies that are commercially viable and extensively deployed by the transportation community, and (2) to provide the ITS community the tools it needs for successful and interoperable deployment of ITS technologies and systems at scale. The Accelerating Deployment Program includes work in five key areas: Professional Capacity Building (PCB); Deployment Evaluation; Communications and Outreach; ITS Architecture and Standards; and Analysis, Modeling and Simulation. The Program builds evidence-based decision-making capacity both inside and outside of DOT and supports a wide variety of activities to accelerate the deployment of ITS. This work includes providing the ITS stakeholder community with data on the costs, benefits and extent of deployed ITS; technical assistance, training, and professional capacity building; development and support of the online Smart Community Resource Center (SCRC); support for system functionality and interoperability with a focus on evolving the National ITS Reference Architecture, industry-consensus ITS standards and interfaces, and cybersecurity preparedness; enhancing outreach and communication with our stakeholders; and supporting and coordinating analysis modeling and simulation activities within the DOT. Activities align directly with Strategic Objectives 1.2 Reduce surface transportation-related fatalities and series injuries; 1.3 Improve transportation worker safety; 1.4 Develop improved safety management systems across transportation modes; 2.2 Construct projects to expand system capability; 2.3 Improve system condition and reliability; 3.2 Enable transportation technology development and adoption; 3.3 Invest in transformative technologies and 4.1 Modernize DOT operations.

Table 1 - FY 2026 RD&T Program Funding Details

RD&T Program Name	FY 2026 President's Budget Request* (\$000)	Applied (\$000)	Technology Transfer (\$000)	Facilities (\$000)	Experimental Development (\$000)	Major Equipment, R&D Equipment (\$000)
ITS Deployment		\$7,500				
Automation		\$14,000				
Enabling & Emerging Technologies		\$21,500				
Accelerating Deployment		\$26,000	\$9,000			
ATTIMD			\$21,000			
SBIR		\$3,000				
Program Support		\$8,000				
Totals	\$110,000	\$80,000	\$30,000			

The AMRP reflects funding as found in the annual President's budget request per 49 U.S.C. Chapter 65 Sec. 6501 Research Planning. The enacted numbers will be posted as part of the President's budget request for the ensuing fiscal year.

Table 2 - FY 2026 RD&T Program Budget Request by DOT Strategic Goal

RD&T Program Name	FY 2026 President's Budget Request* (\$000)	Safety (\$000)	Infrastructure (\$000)	Innovation (\$000)	Efficiency (\$000)
ITS Deployment		\$2,500		\$5,000	
Automation				\$14,000	
Enabling & Emerging Technologies				\$21,500	
Accelerating Deployment			\$9,000	\$26,000	
ATTIMD			\$21,000		
SBIR				\$3,000	
Program Support					\$8,000
Totals	\$110,000	\$2,500	\$30,000	\$69,500	\$8,000

The AMRP reflects funding as found in the annual President's budget request per 49 U.S.C. Chapter 65 Sec. 6501 Research Planning. The enacted numbers will be posted as part of the President's budget request for the ensuing fiscal year.

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Chapter 1 – FY 2026 RD&T Programs

ITS Deployment (\$7,500)

Program Description:

The ITS Deployment Program Area works in coordination with multimodal partners, including the Office of the Secretary of Transportation (OST), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Federal Motor Carrier Safety Administration (FMCSA), Maritime Administration (MARAD) and the National Highway Traffic Safety Administration (NHTSA) to bring publicly and privately sponsored research together to create scalable, replicable, and integrated ITS and other emerging technology deployments.

Included within the program area are four key programs: Saving Lives with Connectivity: Accelerating Vehicle-to-Everything (V2X) Deployment Program (V2X Accelerator Program); the Intersection Safety Systems Program; the Artificial Intelligence for Transportation Planning and Design Initiative; and the Rural ITS Deployment Program.

V2X Accelerator Program: The USDOT's V2X Accelerator Program's vision is to improve road safety, mobility, and efficiency through the deployment of secure, interoperable V2X technologies. Crucial to this vision is the notion of interoperable connectivity which allows a wide range of in-vehicle, mobile, and roadside devices to communicate ubiquitously, efficiently, and securely in a privacy-protected manner using multiple wireless communications technologies. Interoperable connectivity enables the seamless and interoperable the exchange of wireless information irrespective of the device vendor and communication provider.

Intersection Safety Systems. The USDOT's Intersection Safety Systems program aims to transform intersection safety by incentivizing the innovative application of new and emerging technologies to identify and mitigate unsafe conditions involving vehicles and other road users at intersections. The initiative complements other Federal efforts to improve intersection safety, with the program specifically focused on the use of technology. Further, the intersection environment itself is well-suited to innovative mitigative approaches leveraging, utilizing, and potentially repurposing existing traffic control and support infrastructure.

Artificial Intelligence (AI) for Transportation Planning and Design: The AI for Transportation Planning and Design Initiative aims to enable practitioners to better plan, design, build, and manage streets and networks. The initiative is a multi-phase effort to develop a suite of powerful new decision support tools for State, local, and tribal

transportation agencies that assist in increasing American travelers opportunity to use active and public transportation through infrastructure siting, design, and deployment. The initiative is nested within USDOT's Small Business Innovation Research (SBIR) program. USDOT anticipates funding small businesses for up to three phases of activity. These phases, in their entirety, will propel early-stage concepts out of research and development and into nation-wide products for public and private use. Twelve applicants received awards for Phase 1. Five awards are expected for Phase 2, to be awarded in early FY 2026.

Rural ITS Deployment Program: The Rural ITS Deployment Program will work to improve and enhance our Nations rural roadways and communities by championing the use of ITS technologies that can provide low-cost solutions to critical rural safety, mobility, and productivity challenges. The Program aims to deploy and demonstrate the benefits of ITS in the following potential areas:

- **Safety:** e.g., coordinated emergency response, advanced road monitoring (roadside sensor + vehicle data), high-granularity road and traveler information.
- **Mobility:** e.g., coordinated demand-responsive transportation options for rural population to increase access to medical care, job opportunities and other services; ensuring availability for complete trips that enhance our Nations productivity.
- **Productivity:** e.g., freight-focused road condition/incident data, smart re-routing based on height/weight/trailer configuration, and advanced truck parking services.

Major Program Objectives:

The ITS Deployment Program Area is specially designed to tackle important challenges in the ITS research space that is needed in real-world operations. These challenges are often too large, complex, or risky for any one State or agency to tackle on their own, so ITS JPO takes the lead to provide financial and technical support to awardees to help apply the research in real-world deployments. The ITS JPO plays an important role in addressing challenges where there may be gaps, such as demonstrating safety benefits in areas where markets are currently addressing adequately. Each of the deployment programs has its own detailed goals, but all ITS JPO Deployment programs generally have the following fundamental elements:

- *Apply research to real-world operations.* We help the deployers integrate advanced technology research concepts into practical and effective elements, enhancing existing operational capabilities. These deployers operate large-scale and/or complex deployments in real-world environments and remain in operation beyond federal funding. The solutions must be sustainable and maintainable in the long-term to be practical for others to deploy.
- *Spur high impact integrated ITS deployments nationwide.* We want to assist the transportation industry in tackling the difficult challenges of deploying emerging

technologies and integrated ITS solutions by streamlining and expediting solution development. High impact, replicable, and scalable solutions developed by deployment sites will reduce the cost of future deployments. Deployers serve as replicable models through delivery of detailed project documentation, reference implementations, independent evaluations, software, data, and peer support.

- *Deploy solutions that meet national needs through local deployments.* Focusing on issues of a common interest, we want to help deployers develop solutions that meet the specific local needs but address issues of common interest nationwide.
- *Measure impacts.* We want to verify that the measurement of the impacts and benefits are gathered from real world deployments, beyond results derived from controlled environments or computer-based simulation testbeds. Evaluating deployments, quantifying benefits, and differentiating and assigning impacts associated with ITS help the USDOT evaluate the effectiveness of the research, and planners and engineers more efficiently make the business case for pursuing deployments.
- *Disseminate resources to future deployers.* We want to determine which technologies, strategies, applications, and institutional partnerships demonstrate the most potential to address identified barriers in a variety of communities and built environments. We know from experience that the technical aspects of a project are not often the hardest part, but there is often difficulty fine-tuning the institutional partnerships and inter-agency collaboration. We disseminate lessons learned from replicable solutions developed by deployment sites and their success stories in overcoming project challenges to catalyze additional deployment and give future deployers a head-start on tackling both technical and non-technical issues.

V2X Accelerator Program: Over an 18-month period, starting in Fall 2024, the V2X Accelerator sites began conducting systems engineering activities leading to the design, build, and test of their V2X systems, with the goal to improve road safety, mobility, and efficiency. Each site will demonstrate interoperability among wirelessly connected devices and the surrounding transportation systems throughout their proposed deployment area as a part of comprehensive system testing. Additionally, sites will work with USDOT to develop a plan for conducting a joint inter-site interoperability demonstration in FY2027.

Intersection Safety Systems: The vision of Intersection Safety Systems is to transform intersection safety through the development of one or more innovative intersection safety systems that identify, predict, and mitigate unsafe conditions involving vehicles and non-automobile users in real-time. This program develops multiple prototype Intersection Safety Systems (ISSs) combining sensor fusion and artificial intelligence to identify, predict,

and mitigate unsafe conditions involving vehicles, pedestrians, and other road users in real time.

Artificial Intelligence for Transportation Planning and Design: The Initiative, nested within USDOT's Small Business Innovation Research (SBIR) program anticipates funding small businesses for up to three phases of activity. These phases, in their entirety, will propel early-stage concepts out of research and development and into Nation-wide products for public and private use. Specific objectives include the leveraging of artificial intelligence (AI) to generate and analyze data for planning (multimodal transportation), development of tools that integrate multiple data sources to inform infrastructure decisions and support to small businesses in creating innovative tools that can be deployed in local communities to enhance street safety.

Rural ITS Deployment Program: The Program will champion the integration of both emerging and mature ITS technologies to transform the rural transportation system to strengthen connections in rural communities, offering safe, convenient, and reliable transportation services. Rural deployers are not often equipped to deploy ITS due to limited funding, staff capacity, and institutional experience with implementation of ITS solutions. This Program works to provide the support that will enable ITS deployment in rural areas.

Anticipated Program Activities:

V2X Accelerator Program: Under the V2X Accelerator Program, three sites were awarded funding to advance V2X deployments: Maricopa County (Arizona) Department of Transportation (DOT), Texas A&M Transportation Institute, and the Utah DOT (in coordination with deployment sites in three states – Utah, Colorado, and Wyoming). Each deployment project is expected to be developed in two distinct USDOT-funded phases. In Phase 1, that spans 18 months, the sites will design, build, and test their V2X systems. In Phase 2, that spans 12 months, the sites will operate and evaluate their V2X deployments. Sites are expected to sustain operations for a minimum period of five years after Phase 2 is completed with no supplementary funding from USDOT. These sites will showcase interoperability of V2X technologies, and provide lessons learned and best practices to future deployers across the Nation. In FY26 the sites will complete the design and build of the systems in preparation for testing and demonstration of operational readiness of their systems.

Intersection Safety Systems: In FY26, the program seeks to develop and test initial intersection safety system (ISS) prototypes that can reliably identify, predict, and mitigate unsafe conditions involving vehicles and vulnerable road users in a controlled testbed with public sector partner engagement. Competing teams of ISS innovators will address high-priority intersection safety problems observed in real-world intersections, refine

prediction and mitigation strategies, before judiciously moving into active operations to improve safety.

Artificial Intelligence for Transportation Planning and Design: In FY26 the Initiative expects to award Phase 2 funding to up to five awardees, who will begin developing interactive decision support tools for State, local and tribal transportation agencies. Phase 2 awardees will focus on multimodal data collection, tools, and frameworks. These projects will demonstrate the potential of novel, AI-based data generation and processing methods to produce useful content to assist State, local, and tribal transportation agencies.

Rural ITS Deployment Program: In FY26, the Program will identify highest priority rural safety, mobility and productivity problems and promising ITS technologies, then develop an approach to demonstrate and deploy innovative ITS application concepts, as well as reliable methods to reveal impacts and benefits; and document benefits and lessons learned to reduce barriers to adoption.

**Potential Program Outputs, Outcomes, and Impacts on Technologies and Practices:
*V2X Accelerator Program:***

Outputs/Outcomes/Impacts: Vehicle-to-Everything (V2X) technologies have the potential to reduce the severity and number of vehicle crashes, decrease congestion and travel times and to move people to their destination more reliably and efficiently. The V2X Accelerator sites in Arizona, Texas and Utah will serve as national models to accelerate and spur new deployments of V2X technologies. The sites will promote the deployment of interoperable V2X technologies with the goal of advancing the full lifesaving potential of V2X communication, while ensuring connected technologies communicate securely, in a privacy-protected manner, and without harmful interference across a variety of devices and platforms. The outcomes and results will be shared with agencies and stakeholders across the Nation.

Intersection Safety Systems:

Outputs/Outcomes/Impacts: Intersection Safety Systems will leverage emerging technologies to improve intersection safety at scale in a new way. The program aims to incentivize the development of new, cost-effective, real-time roadway Intersection Safety Systems. This program will fund intersection safety system prototypes using sensor fusion (e.g., visual and thermal cameras, LiDAR, and radar sensors) under various weather and lighting conditions. These systems will be models or algorithms to anticipate potential conflicts and provide enough time for warnings or other real-time countermeasures to avoid traffic collisions. As they mature, these systems will be ready for operational testing and deployment nationwide.

Artificial Intelligence for Transportation Planning and Design:

Outputs/Outcomes/Impacts: The initiative will propel early-stage concepts out of research and development and into nationwide products for public and private use. At the conclusion of the phases, the tools that are developed should be poised for commercialization to serve the needs of a broad cross-section of public, private, academic, and non-profit users through the:

- Development of AI-based tools and platforms that utilize various data sources, including satellite imagery, street-level videography, and computer vision, to assess and improve street infrastructure.
- Creation of interactive maps and visual tools to provide insights into current street usage, traffic patterns, and public mobility.
- Demonstration of proof-of-concept projects through Phase I SBIR awards, with potential for further testing and deployment in subsequent phases.

Rural ITS Deployment Program:

Outputs/Outcomes/Impacts: The Program will ensure ITS solutions are deployed in rural areas by:

- Identifying promising ITS technologies that address rural challenges.
- Providing on-going technical assistance and documentation to deployers to ensure successful deployments.
- Demonstrating how the systems engineering approach can mitigate risks and challenges and improve integration and interoperability.
- Enabling rural deployers to procure, deploy, and operate ITS technology solutions.
- Capturing and documenting rural ITS use cases and lessons learned to reduce barriers to adoption.
- Facilitating peer-to-peer communication for rural deployers.
- Providing opportunities for technical training and capacity building for rural deployers.

Potential Economic or Societal Impacts:

To accelerate the adoption and deployment of ITS nationwide, USDOT coordinates and provides funding to eligible entities to deploy, operate, and showcase integrated, advanced deployments featuring ITS applications that substantially and quantitatively:

- Improve safety and transportation efficiency,
- Enhance traveler mobility,
- Improve the efficiency of goods movement,
- Demonstrate a significant return on (public and private) investment.

Potential Progress Toward Achieving Modal Strategic Goals:

The Strategic Goals of Safety, Infrastructure, Innovation and Efficiency are met through all the activities within the ITS Deployment Program Area. The efforts demonstrate and deploy the use of ITS, innovative infrastructure and other emerging technologies and communication mediums that reduce fatalities and injuries on our nation's roadways, and ensure the safety, mobility, and accessibility of all travelers. Through safety improvements, and efficiencies enabled by them, these efforts build out the conditions that stimulate economic growth, increase productivity, and ensure competitiveness for our Nation.

Collaboration Partners:

The ITS Deployment Program works in coordination with multimodal partners, including the Office of the Secretary of Transportation (OST), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Federal Motor Carrier Safety Administration (FMCSA), National Highway Traffic Safety Administration (NHTSA), and Maritime Administration (MARAD) to bring publicly and privately sponsored research together to create large-scale, replicable, and integrated ITS and other emerging technology deployments. Inter-agency collaboration occurs with the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). In addition, the program includes collaboration with multiple transportation stakeholders for example original equipment manufacturers (OEMs), infrastructure owners and operators (IOOs), Vehicle to everything (V2X) technology companies, ITS America, the American Association of State Highway Transportation Officials (AASHTO), and the Institute of Transportation Engineers (ITE).

Automation **(\$14,000)**

Program Description:

The ITS JPO Automation Program's collaborative and multimodal research portfolio provides cross-cutting support across the USDOT. The ITS JPO's Automaton Program Area directly supports the Department's Innovation Agenda and NHTSA's new Automated Vehicle (AV) Framework. Through research activities and collaboration with modal partners across the USDOT, ITS JPO initiatives support the USDOT by ensuring AVs prioritize safety, unleash innovation, and enable commercial deployments. The Department recognizes that driving automation is one of the major transportation industry trends of this decade. Through close collaboration and monitoring of current industry and academic technology innovators and leaders in automation the ITS JPO continues the pursuit of an automation program that will support the safe deployment of an automated future. Advanced Driver Assistance Systems (ADAS) with automation of lateral or longitudinal controls are widely available in passenger vehicles, although their development and refinement continue. Automated Driving System (ADS)-equipped vehicles are being piloted and deployed in passenger vehicles, commercial motor vehicles, and transit buses. While driving automation research has been, to some degree, mainstreamed across the Department's Operating Administrations, research needs are evolving alongside the technology. The technological and practical challenges of translating research breakthroughs into daily transportation are significant and often are not fully understood at the outset. Many foundational questions around ADS and ADAS cannot be resolved until there is more data available.

As excitement builds around an automated future, we must continue to ask the following:

- How will vehicles with a range of automated driving capabilities interact with one another on the road?
- What are potential impacts on personal mobility, and user costs?
- What physical and digital infrastructure are needed or desirable to facilitate the safe deployment of ADS-equipped vehicles?
- How will driving automation influence the operational characteristics, costs, and structure of the Nation's freight network?
- How can limited deployments and pilots inform long-term policymaking?
- How might ADS-equipped vehicles use communications technologies to improve safe operation as they mature?

The ITS JPO Automation Program Area will continue to coordinate cross-modal research and build on past activities to achieve program objectives. The program will provide a platform for internal USDOT research coordination and exchange, contributing to better outcomes across the Department.

Major Program Objectives:

The ITS JPO Automation Program will promote cross-modal safety, operations, and policy research through:

- ***Business Intelligence and Emerging Issues Assessment:*** What is the current state of the industry? What companies appear to be leading? Which have failed? Where are investments being made? Where is testing most concentrated, in terms of: geography, vehicle types, ADS levels, operating models? New questions and issues can emerge quickly and may need modest short-term investigation.
- ***Research Coordination and Information Exchange:*** Addressing some big questions may require input and collaboration across modal subject areas.
- ***Cross-Modal Research:*** Facilitate the planning and execution of research on topics that span the information needs, capabilities, and interests of multiple operating administrations, as well as topics that are important to USDOT as a whole but may not fit cleanly into the mission of a single agency.

Anticipated Program Activities:

The ITS JPO Automation Program will focus on the following activities, aligned with its major program objectives:

Business Intelligence and Emerging Issues Analysis

- ***Automated Driving System Testing and Deployment Tracking*** – The ITS JPO will continue to provide offices across USDOT with insight into the state and extent of ADS testing and deployment on public roads through industry monitoring and regular internal briefs.
- ***Emerging Issue Analysis*** – ITS JPO will continue to conduct short, targeted studies on emerging issues related to vehicle automation and its potential impacts on/implications for key USDOT priorities.

Research Coordination and Information Exchange

- ***Automation Research Working Group Facilitation and Management*** – ITS JPO will continue to facilitate and manage exchange of information around automated vehicles research across USDOT, including providing a weekly discussion forum and facilitating discussions on topics of cross-modal interest.
- ***Research Product Dissemination*** – ITS JPO will continue to provide a central online library of USDOT automation research publications.
- ***External Engagement*** – the ITS JPO will continue to support Departmental participation in events such as those sponsored by the Transportation Research

Board and facilitate international research exchange through the European Commission-Japan-United States Automation in Road Transportation Working Group.

Cross-Modal Research

- *Cooperative Driving Automation (CDA)* – Research to combine vehicle automation and the connectivity together to further improve the efficiency the surface transportation system. The ITS JPO will assess the feasibility of an industry-led small-scale pilot of CDA and then attempt to launch an initial phase of a CDA pilot.
- *Human Factors* – Research to examine how a human can impact and be impacted by the vehicle automation.
- *Advanced Driver Assistance Systems (ADAS)* – Research to better understand the impacts of increasing adoption of ADAS in production vehicles on the transportation system.
- *Commercial Vehicle Automation Research* – Collaborative research across USDOT modes focused on the safe deployment of Automated Driving Systems and Advanced Driver Assistance Systems on commercial motor vehicles.

Potential Program Outputs, Outcomes, and Impacts on Technologies and Practices:

Safety outcomes will include results from driving simulator and field experiments to better understand the human factors issues related to the adoption of automation in varied modes, use cases, and settings. They will also inform understanding safety issues and impacts related to automated vehicle interactions with transportation systems management and operations (TSMO) functions, as well as infrastructure.

Cross-cutting activity outputs will improve information dissemination, identification of emerging needs, and research coordination across internal and external actors.

Potential Economic or Societal Impacts:

The Program's pursuit of research that will lead to the safe deployment of an automated future and work towards making our transportation system safer for all people. This program also is investing in research and innovation to help spur the implementation of a safe automated future with infrastructure connected through technology.

Potential Progress Toward Achieving Modal Strategic Goals:

The USDOT Strategic Goals of Safety, Innovation and Efficiency are met through the activities within the Automation Program Area. This Program Area ensures that the USDOT is on the forefront of automation by providing a platform for internal USDOT research coordination and ensuring the Department is aware of activities occurring within the private sector. Automation and automated vehicles have the potential to revolutionize the nation's transportation network, and it's imperative the Department is informed and is undertaking research activities that ensure automated technologies will improve the

safety, efficiency, and performance of the nation's transportation system. The Program's pursuit of strategically important research ensures the safe deployment of an automated future, making our transportation system safer for all Americans and maintains USDOT leadership within the Automation technology space.

Collaboration Partners:

The ITS JPO will continue to facilitate multimodal automation research in collaboration with the Office of the Secretary, Modal partners, and in support of the Secretary's Innovation Agenda. Through close collaboration and monitoring of current industry and academic technology innovators and leaders in automation the ITS JPO continues the pursuit of an automation program that will support the safe deployment of an automated future.

External partners include stakeholder communities such as Transportation Research Board (TRB) standing committees, the National Cooperative Highway Research Program (NCHRP), the Association of American State Highway and Transportation Officials (AASHTO), and Standards Development Organizations (SDOs), such as SAE International.

By collaborating extensively, the ITS JPO and the USDOT can improve the quality and comprehensiveness of the Automation Program research by providing broad and informed perspectives and subject matter expertise and expand outreach to inform the transportation community regarding Automation Program work products.

Emerging and Enabling Technologies (\$21,500)

Program Description:

The Emerging and Enabling Technologies Program Area focuses on investigating emerging and evolving transportation systems and technologies that can provide increased or additional public benefits in safety, mobility, and efficiency. As the scale of ITS increases and expands to become part of other industry Internet of Things (IoT) environments (i.e., smart communities), vehicle manufacturers, infrastructure providers, innovators, and entrepreneurs discover new opportunities to use technology and the data that will be generated. These technological advances, along with new functionality, new applications, new operational concepts, and disruptive innovations, need to be tracked and planned for by the USDOT. Current examples of these Emerging and Enabling technologies include Interoperable Connectivity through new advances in wireless communications (including LTE-V2X, the emerging 5G/6G and new Wi-Fi/broadband or satellite variations), Digital Infrastructure (DI), quantum computing, blockchain, Artificial Intelligence (AI), and others.

Through the Emerging and Enabling Technologies Program, the USDOT continues to be positioned and engaged as a partner to guide research, development, and technology adoption in a systematic manner. The USDOT recognizes the need to advance the adoption and use of emerging practices and technologies for transportation—particularly, where they play a key role in providing public benefits to Americans. The ITS JPO will coordinate and conduct investigations and exploratory research into emerging technologies across government, academia, and the private sector. This research will provide the USDOT with a significant understanding of the potential benefits and disruptions these technologies could represent to the transportation system. Through multimodal coordination, the ITS JPO works to avoid duplicative ITS work and to enable the efficient allocation of ITS resources.

Major Program Objectives:

The Emerging and Enabling Technologies Program Area focuses on cultivating the next generation of transportation technologies that either change the way we deliver transportation or enhance existing systems, services, and applications. As emerging technologies offer the potential to transform the transportation environment, ITS JPO will evaluate their safety, performance, and suitability for meeting transportation needs, and partner with USDOT modal agencies to accelerate adoption and extend resulting benefits from these technologies across the transportation ecosystem. Additionally, by prioritizing cybersecurity, we can ensure that the benefits of ITS technologies and connectivity are realized without compromising safety and security. The need to effectively secure the nations transportation's critical assets and infrastructure against cyber threats is a shared responsibility of both the public and private sectors. The ITS JPO efforts to address secure interoperability involve coordination across the USDOT with our modal partners to

develop and coordinate multimodal research projects that are central to meet ITS cybersecurity needs. These efforts have included convening and facilitating the transportation ecosystem around shared priorities, facilitating the development of related policies, identifying, and addressing cross-modal issues, sharing best practices and information, and eliminating “silo” activities.

Interoperable Connectivity/ Spectrum: Given the magnitude of impacts that transitioning to the new communications technologies can have on transportation, the ITS JPO proposes the establishment of a focused research initiative. There are four proposed research objectives that will concern the USDOT moving into the future:

A. Analysis and Testing of new wireless communications technologies for safety, interoperability, and security:

- Develop and maintain a set of transportation communications requirements associated with safety and system efficiency against which any new technology can be assessed and tested including cost and lifecycle expenses.
- Test new communications technologies for their suitability for the transportation environment, including testing for safety (e.g., consistent/reliable communications, no unintended consequences from use, etc.), performance (e.g., reliability, latency), interoperability, interference challenges, or other harms to existing operations.

B. Institutional adoption of new wireless communications technologies:

- Assess the ease and costs associated with transitioning to new communications technologies for State, local, tribal, and territorial (SLTT) agencies and work with industry to identify how to enable backward compatibility as well as how to enable software updates as opposed to hardware updates.
- Promote adoption of next generation wireless technologies with SLTT agencies by assisting them in articulating their communications and connectivity needs, identifying the institutional and technical challenges to adoption, analyzing impacts of adoption, and coordinating transition planning from older technologies to new ones.
- Analyze the additional skills/knowledge needed by transportation workers to manage each next generation of communications technologies, equipment, and systems.
- Work with transportation private sector equipment manufacturers and application developers to facilitate transition of safety-critical elements and interoperability.

C. Public sector representation:

- Conduct necessary research and analysis in partnership with modal administrations and stakeholders to gather public sector needs—feed into the

ITS Architecture and Standards Program to translate into requirements and standards.

- Create transportation safety use cases to facilitate the incorporation of transportation safety requirements into each next generation of communications technologies.
- Participate in and leverage existing relationships with US-based globally relevant Standards Development Organizations (SDOs) (e.g., SAE, IEEE) along with international (e.g., ISO, ITU, 3GPP) SDOs to ensure that the transportation needs are represented in each next generation communications systems.

Artificial Intelligence (AI) for Intelligent Transportation Systems (ITS): AI presents a transformational opportunity by offering a more powerful, flexible, and automated approach to analyzing the vast and complex data generated by modern transportation systems, leading to more accurate insights, better predictions, and ultimately, more efficient, safe, and productive transportation networks. Many DOTs have started to implement AI and deploy advanced sensor technologies at targeted ITS applications. It is important to note the limited extent and scope of work, as well as efforts to scale nationwide. The application of AI and transportation is still in a nascent stage, especially at DOTs, and more work is needed to fully understand the implications.

The ITS JPO seeks to implement a comprehensive approach for integrating AI into Intelligent Transportation Systems (ITS) that emphasizes removing barriers to implementation. The AI for ITS program is focusing on research with clear benefits, quantifiable outcomes (efficiency gains, safety improvements, cost savings, productivity improvements), and strong potential for deployment or commercialization.

The program will proactively seek and strengthen industry partnerships and collaborations with State/local agencies. This will be a cornerstone of the AI for ITS program. By adopting a pragmatic, partnership-focused, and value-driven approach, the ITS JPO's AI for ITS program will navigate the potential uncertainties while continuing to advance critical research to enable safe and trustworthy adoption of AI within transportation system.

The AI for ITS program seeks to collaboratively lead research, development, deployment, and evaluation of ITS enabled or transformed by trustworthy AI. The program proposes a multi-pronged approach for research and deployment that encompasses three strategic areas focusing considerably on collaboration and partnerships – with State and local transportation agencies, private sector AI technology developers, representative industry stakeholders. The three strategic areas are: 1) Ensuring safe, secure, and responsible AI, 2) Accelerating broad initial deployment of impactful and scalable AI-enabled ITS, and 3) Fostering nationwide adoption of proven AI-enabled ITS. This approach highlights the importance of the enabling tools and resources needed for safe and responsible AI that are

foundational to all AI for ITS applications and can be addressed outside of any specific deployment. This coordinated and phased approach will help scale AI nationwide.

Multimodal Digital Infrastructure (MDI): Multimodal Digital infrastructure (MDI) provides the foundation upon which ITS operates and the future of intelligent mobility. MDI represents the enabling layer of connectivity, data processing, and analytics that allows ITS to function effectively. It includes the communication networks, data centers, cloud computing, cybersecurity infrastructure, and foundational data as an asset for optimal functionality of ITS. Modern ITS applications rely heavily on the robust performance, security, and interoperability of these digital components. As transportation systems continue to evolve and become increasingly complex and data-driven, the importance of robust MDI will only continue to grow. Research is essential to address the growing complexity, manage massive data volumes, and ensure that this foundational layer can support current needs and future innovations, including widespread deployment of connected and automated vehicles and advances in the application of artificial intelligence, while promoting national goals of safety, efficiency, and economic competitiveness. Without dedicated research into optimizing, securing, and standardizing our transportation digital infrastructure, we risk deploying fragmented, vulnerable, or quickly outdated systems, hindering progress and potentially compromising safety.

Key research questions and opportunities abound in this critical domain, demanding Federal attention and investment include: What are the most effective strategies for securely managing, processing, and sharing the vast amounts of data generated by connected systems in real-time, considering edge, cloud, and hybrid approaches while ensuring privacy? How can we develop resilient, adaptable cybersecurity architectures to protect ITS from evolving threats across public and private systems? Furthermore, how can we establish effective interoperability standards and governance frameworks to enable seamless data exchange across different technologies, jurisdictions, and modes using connectivity, scalable public and private transportation data platforms? Focused research in these areas, through collaboration with our modal partners, will provide the knowledge base needed to guide strategic investments and policy decisions, ensuring the development and use of an intelligent, secure, and efficient transportation system.

Anticipated Program Activities:

The Emerging and Enabling Technologies Program area is focused on the following planned activities:

- **Identify** research needs and opportunities by exploring Federal, State, local, private, and academic research on technologies.

- **Research** and test communications technologies to support transportation connectivity, enabling cooperative ITS and connected and automated transportation.
- **Investigate** future spectrum use models that support transportation safety and system efficiency.
- **Develop** new institutional and technology models to help accelerate adoption of technology innovations.
- **Transfer** technologies from exploratory research to development and deployment when appropriate.

The ITS JPO and its modal partners have been leaders, collaborating on fundamental problems in safety, mobility, productivity, and efficiency by leveraging emerging technologies and next generation communications technologies.

Interoperable Connectivity/ Spectrum: USDOT monitors and assesses wireless technologies and available devices to determine their capabilities to support a wide range of transportation system communications requirements regarding safety, effectiveness, and other capabilities. These technical research and assessment activities provide data-driven inputs to the USDOT policy decision-makers. Currently, ITS JPO has completed the testing associated with the FCC-mandated 4G LTE-V2X technology to meet the deployment and scalability requirements for Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) safety-of-life and public safety systems, which supported the FCC’s final 5.9 GHz report and order published in December 2024. The ITS JPO will begin the technical assessment of 5G New Radio (NR) V2X concepts through analysis of emerging specifications and standards as NR-V2X devices become available for testing. In monitoring these standards developments, the spectrum team is following whether and how the transportation needs, and requirements are being addressed by 5G and working to identify when the standards become stable enough to produce the first working prototypes for 5G New Radio V2X (inclusive of a new emerging capability for 5G New Radio to work as an unlicensed device (5G NRU)). Prototypes built as software defined radios (SDRs) are starting to become available from industry. When available, ITS JPO will acquire devices to conduct laboratory bench testing and (potentially) small-scale field testing to better understand the changes in the device parameters (i.e., modulation, duty cycles, etc.) as well as measure the new waveform under real-world conditions.

In addition, as the US Government and industry begin their focus on 6G, the ITS JPO’s Emerging and Enabling Technologies Program will work with the ITS Standards Program to monitor and assess the changes, challenges, and opportunities associated with 6G. At this time, it appears that a key benefit of 6G includes changes to antenna—in particular,

multi-phased array antenna that allow for multi-function radiofrequency communications, potentially allowing far greater efficiency in the limited spectrum assigned to V2X while also potentially supporting different RF communications and applications simultaneously. These rapid evolutions of communications technologies have the potential to disrupt transportation operations (similar to how early 5G network rollouts disrupted transportation operations at airports) but also have the potential to enhance or transform V2X communications for future, more complex and advanced transportation use cases. As such, there is a need to determine the impacts of these changes before they are put into use.

Noting that the existing 30 MHz of spectrum in the 5.9 GHz band is likely not enough to support even the existing V2X applications and services, the ITS JPO's Emerging and Enabling Technologies Program has coordinated with the ITS Architecture and Standards Programs to assess the capability of using unlicensed and licensed spectrum to achieve V2X benefits for transportation. The Next Generation Wireless Communications program developed an Interoperable Connectivity Test Strategy to look at the key performance characteristics associated with outside the 30 MHz spectrum technologies such as 5G cellular (also referred to as Uu), 5G Multi-Access Edge Computing (MEC) and unlicensed Wi-Fi. In FY25 the ITS JPO started testing 5G cellular and 5G MEC solutions to begin performance characterization of 5G cellular and 5G MEC for use across several ITS use cases. In FY26, the ITS JPO will continue this testing by focusing on the interoperability of 5G and 5G MEC technology solutions and how they can be integrated with LTE-V2X technology and be interoperable. New efforts in FY26 are expected to include: (1) beginning the analysis of 5G New Radio V2X capabilities, ideally based on measurement of waveforms using prototype devices or software defined radios (SDR) and beginning development of the RF model to support, laboratory testing and, ultimately, real-world field-testing, and (2) coordinate with the ITS Standards Program to monitor the emerging 6G concepts. In addition, the ITS JPO will work with OST-R to identify whether other spectrum could be made available in conjunction with the National Telecommunications and Information Administration (NTIA) and the White House's new National Spectrum Strategy initiative (3) start to explore the performance of unlicensed wireless technologies in ITS use cases.

To support this work, in FY25 the program began the process of conducting Interoperability Test Events with State and local deployment agencies that are utilizing V2X technologies by conducting an event in Cheyenne, WY to explore interoperability issues in Traveler Information Messages (TIM). ITS JPO expects to continue interoperability test events in FY26 focusing on signalized intersection and pedestrian use cases. These tests have focused on LTE-V2X interoperability, however limited 5G and 5G MEC tests were successfully accomplished in Wyoming and 5G testing is expected to expand in future tests. The goals of this testing are to validate interoperable approaches to deploying these

technologies and if interoperability issues are found, to identify ways of supporting interoperability and working with the relevant SDOs to document those interoperable solutions.

Artificial Intelligence for ITS: Activities in FY26 shall support the development, execution, and review of projects related to and/or focused on the application of artificial intelligence for intelligent transportation systems. Through collaborative efforts with our modal partners, the work will be used to assist ITS JPO in prioritizing research and development investment in transportation. In addition to the AI activities noted in the ITS Deployment Program Area, the ITS JPO proposes work in three other strategic areas:

- Deploying impactful and scalable AI: This strategy addresses the activities needed for demonstrating value, providing a return on investment and the requirements for the scalable deployment of AI for ITS in high-value use cases through Innovation Challenges, proofs of concepts, prototype demonstrations, pilot deployments, and full-scale demonstrations.
- Ensuring safe, secure, and responsible AI: This strategy addresses developing AI resources to support planning for deployment of responsible AI, facilitating cybersecurity and resilience, improving functionality interoperability and integration with legacy systems. Proposed work includes continuing testing, evaluation, validation, and verification of AI systems, developing resources to address the AI for ITS risk management functions (govern, map, measure, and manage), and implementing comprehensive AI data initiatives addressing AI risk management and data.
- Fostering nationwide adoption of proven AI-enabled ITS: This strategy would offer foundational AI resources tailored to the needs and issues within transportation and ITS. Proposed work includes creating decentralized, peer-to-peer knowledge transfer; facilitating collaboration between the industry and IOOs; engaging with and assessing stakeholder needs; and sharing best practices, data, tools, and resources.

Multimodal Digital Infrastructure: In every area of transportation, we are seeing rapidly increasing amounts of data available from infrastructures of all types with a clear opportunity to optimize outcomes. In FY26, the ITS JPO will collaborate with its modal partners, through a Multimodal Digital Infrastructure Technical Working Group, to develop a multimodal transportation digital infrastructure Strategic Plan outlining key priorities and activities. ITS JPO will work with modal partners to continue to conduct various research projects and provide recommendations for strategic investments in MDI guided by the ITS reference architecture, based on standards, secured robustly, and planned with the future needs of an increasingly connected and automated transportation system in mind.

Important efforts include:

- Establish DOT Leadership in Multimodal Digital Infrastructure. The ITS JPO is working to position USDOT as a thought leader in transportation digital infrastructure. Creating consistent and clear messaging about MDI initiatives and building strong partnerships with external stakeholders and government entities.
- Establishing a Unified Multimodal Digital Infrastructure Framework. The ITS JPO is working to create a coordinated, standardized approach to digital infrastructure across the USDOT. This will ensure alignment between internal departments and external stakeholders, and develop clear governance and implementation guidelines.
- Enlisting internal and external stakeholders to identify and discuss digital infrastructure framework elements from policy, institutional, and technical perspectives to envision and develop initial prototype concepts and undertake initial assessments. In February 2025 the ITS JPO convened an ITS Multimodal DI Strategic Meeting with partners from across the Department – including OST, FHWA, FMCSA, FTA, FRA, MARAD and NHTSA. The meeting brought together stakeholders to discuss the challenges, opportunities, needs and strategies for ensuring MDI collaboration across USDOT.
- Developing comprehensive development and deployment plan that recognizes the interdependencies MDI has with all other ITS technical focus areas, described through functional and physical relationships. In FY26 the ITS JPO will finalize and share with internal stakeholders the initial Multimodal DI Program Plan.

Potential Program Outputs, Outcomes, and Impacts on Technologies and Practices:

Interoperable Connectivity/ Spectrum: The primary outcome of the interoperable connectivity with wireless communications research is two-fold: confirm suitability and safety for SLTT agencies, vehicle manufacturers, and citizens in adoption of the new technologies; and to continuously advance effective, secure, cost-effective, and available communications solutions for meeting transportation needs, including spectrum availability. Outputs of research include lessons learned from previous deployments, for example through the work of the program it is now known that the transportation environment introduces unique requirements for telecommunications; for instance, users and equipment move at high speeds—over 80 miles per hour, which has effects on the basic safety message signals and transmissions. Because the communications are used for safety, there are additional requirements associated with the high frequency and high reliability of the signals. Another is that any viable communication technology needs to scale to allow hundreds of nearby devices to communicate without causing channel congestion.

Impacts that will help future wireless communications include the understanding that the telecommunications industry evolves at a rate that is dramatically different from the deployment of these technologies in SLTT transportation system operations. The replacement cycle within the telecommunications industry is typically 18-24 months whereas the replacement cycle within transportation system operations is typically 10-15 years. This difference impacts how transportation agencies decide to invest in and procure communications and connectivity in both the near term as well as in their longer-term investment planning.

Artificial Intelligence for ITS: After completing the planned activities in FY25, the ITS JPO will have a research and deployment plan that prioritizes AI for ITS research and development by adopting a pragmatic, partnership-focused, and value-driven approach, the ITS JPO's AI for ITS program can navigate the potential uncertainties while continuing to advance critical research to enable safe and trustworthy adoption of AI within the transportation system. The planned efforts plan to deliver the following: initiate a phased demonstration approach for AI through innovation challenges, proofs of concepts, pilot deployments, and full scale demonstrations; the continued testing, evaluation, validation, and verification of AI systems; development of resources to address the AI for ITS risk management functions (govern, map, measure, and manage); implementation of a comprehensive AI data initiative addressing AI risk management; creation of a decentralized, peer-to-peer knowledge transfer; facilitation of collaboration between the industry and IOOs; engagement with and assessing stakeholder needs; and the sharing of best practices, data, tools, and resources.

Multimodal Digital Infrastructure: The coordination activities conducted in FY26 will align ITS JPO messaging and resources to efficiently support the advancement of multimodal digital infrastructure technologies and solutions and ensure that broader long-term trends are accounted for in outreach efforts. This will also ensure that projects are not duplicative or at cross-purposes, enabling consistent, efficient support of deployers and other stakeholders and maximizing the impact of said support.

The technical reports being developed will consolidate available resources and information on MDI, advancing industry awareness and understanding of the multimodal digital infrastructure concept and establishing USDOT as a prime source for multimodal digital infrastructure resources. These resources will provide insight into the benefits and costs of multimodal digital infrastructure deployments, providing greater clarity to deployers, highlighting solutions with the greatest return on investment, and providing quantitative measures to illustrate near-term potential of investment in multimodal digital infrastructure.

Potential Economic or Societal Impacts:

In order to ensure economic strength and global competitiveness, the US needs to stay at the forefront of producing innovations and new emerging technologies (such as communications advances, AI and DI), and to verify that the learning resulting from this work is captured as US-based intellectual property, which typically is incorporated into standards. The testing and analysis of interoperable wireless connectivity technologies translates into leading-edge knowledge about translating communications for a rapidly moving, highly variable transportation environment; and further positions the US to take a lead role in creating or enhancing standards, harmonizing technologies, ensuring open global markets for the transportation industry. The data collected through testing will become publicly available, allowing researchers and innovators to continue to advance the transportation communications technologies. These communications, combined with advances in data will enhance the beneficial impacts that emerge through roadway digital infrastructure.

Potential Progress Toward Achieving Modal Strategic Goals:

The USDOT Strategic Goals of Safety, Infrastructure, Innovation and Efficiency are each met through the activities within the Emerging and Enabling Technologies Program Area. Specific work with AI enables the USDOT to meet their Innovation strategic objective of investing in transformative technologies through the promotion of beneficial uses of AI. Secure interoperable communications technologies have become a critical tool in delivering safe, secure, and efficient operations of transportation systems across the nation. Artificial intelligence is playing in an increasingly larger role in all aspects of transportation and has the promise to improve our nation's transportation system. High quality roadways enabled by digital infrastructure and other core assets provide leading and innovative transportation options to all users are essential for robust economic activity.

Collaboration Partners:

The Emerging and Enabling Technologies Program Area engages with private sector, academia, and governments around the world. Efforts related to questions associated with whether new communications technologies can reliably support interoperable, safety-critical applications, provide crash avoidance, and facilitate safe integration of automated vehicles and infrastructure require broad collaboration with stakeholders. Chipset and vehicle manufacturers are working on prototypes to prove out the concept while experts are working to design performance-based test procedures that demonstrate the capabilities as well as the gaps that still need to be addressed. Partners within the USDOT include FHWA, the Office of the Assistant Secretary for Research and Technology (OST-R), and others. Additional partners include the Federal Communications Commission (FCC) and National Telecommunications and Information Administration (NTIA), among others.

The ITS JPO continues to support a USDOT AI Community of Practice/Working group co-led by the ITS JPO, Highly Automated Systems Safety Center of Excellence (HASS COE), and

FHWA Office of Research, Development and Technology. In addition, an AI for ITS program team has formed for collaborative development of an AI for ITS Program Plan. This effort maintains considerable with industry efforts and research committees including TRB committees, and ISO Technical Committee 204 Working Group 20 Artificial Intelligence and Big Data.

Accelerating Deployment (\$35,000)

Program Description:

As new research products, results, and prototypes evolve into market-ready products, the primary goal of the Accelerating Deployment Program Area is to provide data, research, analysis, technical assistance, and other types of support services to accelerate adoption and at-scale deployment of secure, and interoperable ITS technologies. The objectives of the Accelerating Deployment Program Area are: (1) to accelerate the transformation of ITS research and prototypes into market-ready technologies that are commercially viable and extensively deployed by the transportation community, and (2) to provide the ITS community the tools it needs for successful and interoperable deployment of ITS technologies and systems at scale. The Program area directly supports advancing ITS research and deployment activities through the full ITS deployment lifecycle – from initial deployment planning through to actual deployment and eventual assessment – in coordination with other stakeholders at the Federal, State, regional, and local levels.

The Accelerating Deployment Program Area provides a wide variety of resources and services to assist the ITS community of practice, including:

- Knowledge transfer, technical assistance, training, and extensive interaction opportunities between and among ITS deployers.
- Extensive data on ITS benefits, costs, and levels of deployment, to support data-driven and evidence-based deployment decision-making in general and business case development in particular.
- Communication and education support to facilitate awareness, understanding, acceptance, adoption, and deployment of ITS technologies across stakeholder groups and to ensure that effective partnerships are fostered and maintained at various levels – executive, program, and projects.
- Support for the development and use of ITS-related standards and architectures to confirm the replicability, scalability, and interoperability of ITS deployments.
- Support and coordination of ITS analysis, modeling, and simulation activities.

The Accelerating Deployment Program Area includes five (5) individual Programs:

- ITS Professional Capacity Building (PCB) Program
- Deployment Evaluation Program
- Communication and Outreach Program
- ITS Architecture and Standards Program
- Analysis, Modeling, and Simulation Program

ITS Professional Capacity Building (PCB) Program: The ITS PCB Program supports activities that deliver multimodal ITS learning opportunities to transportation professionals by providing ITS trainings and webinars, fostering cohorts, and providing technical assistance to agencies deploying ITS technologies.

The ITS PCB Program delivers trainings on a variety of ITS and emerging transportation technology topics. In collaboration with modal partners and the National Highway Institute (NHI), trainings are currently being offered on a variety of topics including ITS Basics, ITS and Safety, Systems Engineering, ITS Standards and Architecture, Cybersecurity, and Vehicle-to-Everything (V2X). Trainings are delivered through in-person events as well as web-based trainings (WBTs). The ITS PCB Program will continue to develop and deliver existing trainings and develop new trainings on emerging topics such V2X, artificial intelligence (AI), Data Management, and other topics.

The ITS JPO is also providing a variety of technical assistance resources including webinars, peer exchanges, micro-learning videos, fact sheets, technical primers, and other materials to share ITS knowledge and lessons learned. In addition, the ITS PCB Program is also working with the Turner-Fairbank Highway Research Center (TFHRC) to develop open-source tools to assist V2X deployers and providing an Equipment Loan and Help Desk Program that provides practitioners with access to V2X and other ITS equipment, as well as provides help desk capabilities.

To further assist the transportation community, the ITS JPO is making technical assistance resources available through the Smart Community Resource Center (SCRC) – an online tool to connect States, Tribal governments, and local communities with resources that can be used to develop ITS and smart community transportation programs.

The ITS PCB Program also offers Early Deployer Technical Assistance Cohorts. These cohorts enable communities of practice among active early deployers who opt-in to work iteratively and collaboratively with each other and the USDOT to make their projects successful while incrementally producing detailed documentation and shared software and data that the broader ITS community can use to deploy their own state-of-the-practice, interoperable solutions. In 2023, the ITS JPO launched the Accelerating V2X Cohort, a cohort of over 30 public agencies actively deploying V2X technologies. As of June 2025, the cohort currently consists of over 60 public agencies. The cohort meets monthly to share lessons learned and best practices while encouraging interoperable deployments of V2X technologies.

Deployment Evaluation Program (DEP): This Program addresses a spectrum of stakeholder needs through the full ITS deployment lifecycle and provides information to assist communities with making evidence-based decisions on ITS investment, deployment, and performance assessment. The DEP:

- Provides extensive data on ITS benefits, costs, and best practices/lessons learned.
- Surveys and analyzes public sector ITS deployment patterns.
- Develops decision support resources; and
- Provides technical assistance, knowledge transfer, and training.

The DEP also develops a variety of products to facilitate knowledge transfer and technical assistance. Examples of resources that are developed and posted on the Deployment Evaluation website:

- A fully searchable ITS Benefits, Costs, and Lessons Learned map
- An innovative and lauded “ITS for Pedestrian Safety” data story
- New Benefits, Costs, and Lessons Learned database entries
- New data visualizations, including ITS infographics, interactive cost plot and interactive data visualizations
- New Executive Briefings
- “Program Introduction and Summary” videos and “How-To” videos; and
- “Spotlight” Web pages with curated content on the benefits of ITS for roadway safety and about the specific benefits of V2X

Communications and Outreach: This Program provides updates to ITS stakeholders, maintains the ITS JPO website, and develops communications channels, including social media, email messaging, meeting planning, website development, trade shows, publications and speaking engagements. It also provides communications support for any ITS JPO-funded research project. This includes presentations, articles, and fact sheets about connected vehicle, automated vehicle and all other ITS activities. These materials are used to educate the public and provide stakeholders with the tools they need to promote deployment of ITS technology. The program also provides communications and outreach support for the V2X deployment campaign and other vehicle policy initiatives sponsored by the OST. A goal of the program is to ensure that the technical research conducted by ITS JPO is easily accessible and understood by stakeholders and the general public through the development of easy-to-understand content that is in plain English.

ITS Architecture and Standards: This Program provides a reference system architecture along with voluntary technical standards, tools, and deployment support. These efforts guide safe, secure, efficient, and interoperable deployment of infrastructure, connected, and automated ITS technologies. The Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) provides a common framework for researching, planning, defining, and integrating intelligent transportation systems. It is an evolving reference that reflects the contributions of a broad cross-section of the ITS community (transportation practitioners, systems engineers, system developers, technology specialists, consultants, etc.). ARC-IT includes artifacts that answer concerns relevant to a

large variety of stakeholders and provides tools intended for transportation planners, regional architects, and systems engineers to conceive of and develop regional architectures, and scope and develop projects. Tools include:

- Regional Architecture Development for Intelligent Transportation (RAD-IT) focuses in on regional planning and the development of Operations Concepts, the high-level enterprise and physical views. It requires an understanding of the stakeholder community and the ITS services that are provided and planned for in the region. RAD-IT is a software application that supports the development of regional and project ITS architectures using ARC-IT as a starting point. RAD-IT assists transportation planners and system integrators, both in the public and private sectors.
- The Systems Engineering Tool for Intelligent Transportation (SET-IT) picks up where RAD-IT leaves off. SET-IT is project-focused and ideally applied to individual project deployments with scope constrained by project definitions specified in the regional architecture. SET-IT is a graphical tool, provides the user with visual feedback and tools necessary to manipulate service package physical and enterprise diagrams, develop communications stack templates, specify standards at all protocol layers, and export that information in a variety of forms and formats.
- SHARE-IT is a repository designed for the exchange of architecture-related products that illustrate new concepts, show a usage pattern that other ARC-IT users may wish to replicate, or leverage some other ITS-related activity. SHARE-IT may include SET-IT projects produced for USDOT initiatives for example. SHARE-IT projects are attributed to their developer and may be removed at any time.
- Architecture Structure Query – ASQ-IT is the next big tool. ASQ-IT is a service that will give users the ability to ask structured but intuitive questions of ARC-IT.

ITS Standards and Data Specifications – There are hundreds of standards used across all different types of transportation, such as vehicle safety standards, road and pavement standards, and rail standards. *ITS standards* define how ITS systems, products, and components can interconnect, exchange information, and interact to deliver services within a transportation network. The use of standards gives transportation agencies confidence that components from different manufacturers will work together, without removing the incentive for designers and manufacturers to compete to provide products that are more efficient or offer more features. ITS standards allow both like and different ITS devices and equipment to *exchange* and *interpret* data directly through a common communications interface. This exchange and recognition of data can take place between devices located within a *single system* or between devices operating in *different systems*. ITS standards cover different "communications layers" in their description of how data is communicated between the relevant transportation systems. These layers start with the description of

how bits of data are combined and transmitted and extend to the meaning of the entire message sent over the communications path. ITS standards specify consistency and compatibility of the interconnects and interfaces, both hardware and software, within an advanced transportation system. The ability of different ITS devices and components to exchange and interpret data directly through a common communications interface, and to use the exchanged data to operate together effectively, is called interoperability. Interoperability is key to achieving the full potential of ITS. Focus areas for ITS standards and data specifications include:

- NTCIP - ITS center and field standards via the National Transportation Communications for ITS (Intelligent Transportation Systems) Protocol.
- V2X – Communication and functional standards to ensure interoperability between V2X devices, such as vehicles, on-board units, infrastructure, and other users.
- Public Transit and Multimodal Travel – Data structure and standards for public transportation, and demand responsive travel to meet needs of all transportation users.
- Operational disruption data specifications – Operational disruptions contribute significantly to the performance of the transportation system. This focus area supports the development of necessary data specifications to communicate with all users the status of incidents, road weather, work zones, or other special events that contribute a reduction in system capacity.
- Commercial vehicle, freight, and port – Data, standards, and architecture requirements ensuring products/commodities are delivered safely and efficiently from origin to destination. This involves multiple transportation modes, the technology and processes used to initiate the shipment and delivery of goods, and the freight data transferred throughout the trip.

Cybersecurity is a serious and ongoing challenge for the transportation sector. Cyber threats to transportation systems can impact national security, public safety, and the national economy. Integrating advanced technology into our transportation system introduces significant cybersecurity challenges. As we integrated and rely on connectivity, digital infrastructure, automation, and AI the elements of the system become prime targets for data breaches, system hijacking, and even nation-state threats. Cybersecurity is no longer an optional add-on but a fundamental requirement that must be embedded into the design and operation of our transportation system. Ensuring the security of these critical systems is paramount for maintaining public trust, guaranteeing operational resilience, and safeguarding national security. Researching implementing cyber resistant and resilient systems will need to be conducted that will need to include how our stakeholders build cybersecurity foundational capabilities to monitor, detect, respond, coordinate, and recover from cyber-attacks. Additional research will need to be conducted to advance

transportation's capabilities to communicate and coordinate with the cybersecurity community to coordinate cyber activities and coordinate responses. The research will facilitate integrating cybersecurity controls, protocols, and practices into our transportation systems to establish a robust cybersecurity foundation that can be expanded as system capabilities advance. The ITS JPO works across the USDOT modes to develop and coordinate research focused on cyber vulnerabilities from an integrated, multimodal transportation perspective. This role includes defining shared priorities, analyzing and developing policy options, and identifying and addressing cross-modal cyber issues, in addition to sharing implementation practices and information. Efforts include:

- *Tools and Resources* – Examples include Cybersecurity Language for Procurement of Intelligent Transportation Systems; Cybersecurity Best Practices; Application of NIST Cybersecurity Framework; Cybersecurity Reference Guides and Tools
- *Standards* – Updates to ITS standards to reflect cybersecurity requirements
- *Training* – Partnering with the ITS JPO's PCB program, developing the workforce development training.

Analysis Modeling and Simulation: The AMS Program is a suite of tools and technologies that can be used to improve the current practices in understanding, analyzing, planning, designing, and evaluating the ITS implementation. The AMS Program supports a variety of areas including FHWA's Traffic Analysis Tool Program, Connected Automated Vehicle AMS Program, Office of Planning, Office of Policy, Office of Infrastructure, and others. In addition, other modal partners such as NHTSA and FMCSA also have some AMS related activities.

The AMS Program focuses on AMS activities that have ITS components. The current goals are to develop an AMS Program Plan and to coordinate all the AMS-related activities pertinent to ITS across the whole department.

Major Program Objectives:

The objectives of the Accelerating Deployment Program Area are to provide the research, analyses, products, tools, and services to enable more rapid, secure, and interoperable deployment of ITS technologies and services to maximize benefits to the public. The intent is to define and improve evidence-based decision making, collaboration, harmonization, standardization, education, and communication mechanisms to encourage investment in, and deployment of ITS; to develop comprehensive training and analytic tools that allow deployers to understand the financial and operational benefits and costs of new technologies and systems; to maintain data repositories and the Code Hub, and to establish the tools that deployers can use to help make more informed investment and planning decisions regarding ITS deployment. AMS activities related to ITS will be coordinated across the department, and the AMS Program Plan will provide a structured approach.

Anticipated Program Activities:***ITS Professional Capacity Building (PCB) Activities FY 2026:***

One of the ITS JPO's PCB teams' primary objectives is to promote technology transfer and education to accelerate deployment of ITS research and technologies. The ITS PCB Program will continue coordinating with Federal program offices, educational organizations, and professional associations, and active State, regional, and local public agencies, and continue reaching out to build the community. In FY26, the ITS PCB Program will continue delivering multimodal ITS learning opportunities and providing technical assistance resources to practitioners through:

1. Smart Community Resource Center (SCRC)
2. Webinars
3. In-Person Trainings and Workshops (e.g., ITS State Chapter Trainings; Rural ITS Outreach Workshops)
4. Online Training Modules (e.g., web-based trainings and ITS microlearning videos)
5. Peer Exchanges
6. Technical Assistance (e.g., Accelerating V2X Cohort, Equipment Loan Program, Connected and Automated Vehicle (CAV) Help Desk)

In FY26, the ITS PCB Program will provide support with the continued build out of the Smart Community Resource Center (SCRC) – making more resources readily available to practitioners as they advance ITS to address challenges in their communities. The ITS PCB Program will also expand its training and peer exchange offerings for both the internal and external stakeholders with a focus on developing delivering resources in V2X, artificial intelligence (AI), digital infrastructure, and other topics. The ITS PCB Program will also continue to facilitate the Accelerating V2X Cohort, develop V2X materials, enhance open-source V2X tools, and expand its Equipment Loan and Help Desk capabilities to meet the needs of V2X deployers.

The ITS PCB Program seeks to provide training and educational products augment Department priorities. Safety is always a topic intertwined with most or all ITS PCB products. Many of the ITS applications also promote strategies that reduce congestion. The training and education products also focus on technologies and applications that improve transportation system operations.

Deployment Evaluation Program Activities FY 2026:

Benefits/Costs Databases: The Deployment Evaluation Program will continue to develop content for the benefits/costs/lessons learned databases, as well as develop new infographics, data visualizations, cost plots, case studies, and videos and experiment with innovative ways to present cost/benefit data to the public. This would include:

- Obtaining ITS deployment benefit, costs, and best practices data from new sources.

- Working with the ITS PCB Program to provide technical assistance to deployers related to evaluation planning, business case development, and evaluation design.
- Addressing ITS benefit and cost data gaps.
- Continuing to develop compelling data visualization products and decision-making and planning tools to support ITS stakeholders in their efforts to make evidence-based decisions about ITS investments at all stages of the ITS deployment lifecycle.
- Supporting the V2X Accelerator Program sites in conducting their self-evaluations.

Strategic Priorities: The Deployment Evaluation Program is continuing its long-term effort to provide data-driven and evidence-based products and services to the ITS stakeholder community. The Deployment Evaluation Program’s strategic priorities are:

- Addressing stakeholder needs related to the foundational elements of successful ITS deployment and the full ITS deployment lifecycle.
- Developing visually appealing and engaging products and tools to (1) serve as a launch point for more engagement with the data, thereby enabling successful, effective, and interoperable ITS deployments and (2) demonstrate that ITS deployment is a sound investment.
- Taking maximum advantage of existing data assets for evidence-based decision support for the ITS community; and
- Providing resources and tools to support effective and meaningful evaluations of ITS deployments, pre- and post-investment.

Communication and Outreach Activities FY 2026:

Event Planning: This task will be used provide program support for major events where USDOT will have a major presence. This includes large events such as the ITS America Conference and Expo (April 2026). By participating in these events, USDOT is able to connect with non-traditional stakeholders that are outside of the ITS community. This additional outreach will help USDOT to develop new partnership relationships with technology firms and advocacy groups.

Intersection Safety Systems: The communications and outreach team will continue to provide strategic communications support, graphic design, social media and other services for the Intersection Safety Systems.

Interoperable Connectivity/V2X Deployment: The communications and outreach team will support ITS JPO outreach and communications efforts related to the deployment of V2X and connected vehicle technology. In FY26 the team expects to continue to provide webinar support, graphics, social media, and technical writing services.

ITS Architecture and Standards Activities FY 2026:

In FY26, architecture and standards activities will include continued evolution in the content of the ITS reference system architecture and ITS standards, along with continued efforts to adapt and leverage interoperable security best practices to benefit the unique requirements of ITS. This evolution will reflect advances in key technologies emerging within the ITS marketplace, including vehicle automation, alternative connectivity services, and new information and communication technologies (ICT) such as 5G, computing, advanced analytics, and data governance. Activities will identify and fill-in gaps and support the implementation of best practices across ITS deployments. Cooperating internationally, further work will be undertaken to specify access controls for ITS environments for effective cybersecurity; and to develop and evolve voluntary technical standards and candidate system architectures to support the secure communication of road signage and regulatory information to automated and connected vehicles (i.e., digital infrastructure and message authentication). Interface standards to support V2X and cooperative automation are underway and will be continued. Standards for improved connectivity services, including those needed for On Board Units (OBUs), Roadside Units (RSU) as well as the interoperable broadcast of traffic signal phase and timing (SPaT) information, are expected to be evolved to address validation of initial guidance along with initial analyses to support improving security of legacy ITS infrastructure equipment installations. Work will also be conducted to develop interoperable guidance that deployment agencies and the connected vehicle community can utilize to enable the safe and interoperable deployment of work zone data nationwide. Efforts building off the successful Work Zone Data Exchange and Connected Work Zones to advance the development of data specifications supporting operational disruptions including new data specifications or specification extensions including road weather, work zones, or other special events that contribute a reduction in system capacity. Additionally, efforts to support cybersecurity preparedness and resilience continue with ITS JPO led efforts or ITS JPO supported efforts by our modal partners.

Program efforts will continue to be informed by extensive collaboration with stakeholder groups and Standards Development Organizations (SDO) to assure that products that are developed meet stakeholder needs in broadly acceptable way to facilitate voluntary deployments. Additional projects involve continued work with the MDODE and WzDX.

- *Architecture* – The ITS Reference Architecture will stand up the next version of ARC-IT, expand use of ASQ-IT tool, and continue to add reference models to SHARE-IT. Additionally, the Architecture team expect to continue to deliver technical support to all USDOT research projects and industry deployments.
- *Standards* – Considerable efforts will be applied to support the V2X and CAV standards efforts in FY26 as the USDOT accelerates in approach for connected interoperability. In addition, expect to achieve draft specifications for operational

disruptions, implement recommendations from national multimodal data and specifications working groups, develop next generation of NTCIP standards development, and, lastly, complete updated program plans for all standards focus areas.

- *Cybersecurity* – Efforts are expected to continue supporting the development of core tools and resources, additional ITS control sets, and training.

Analysis Modeling and Simulation Activities FY 2026:

The AMS Program has two major goals in FY26: 1) to update the ITS JPO AMS Program Plan, and 2) to continue supporting and coordinating the AMS activities across the department.

Specific activities planned for FY26 are presented below:

- ITS JPO AMS Program Plan Development. Currently, AMS is included in the ITS JPO Automation Program as one of topic areas. There is an existing project initiated in 2025 and managed by the ITS JPO Automation Program manager. The effort to develop, update and refine an ITS JPO AMS Program Plan has been going on for a while as part of this project. With that, the goal of FY26 is to continue to refine the AMS program plan incorporating recent changes.
- Support and coordination of the AMS projects conducted by modal partners. ITS JPO currently sponsors more than 20 projects and will continue to support these efforts while coordinating the scopes and results sharing so that the gaps and overlaps can be minimized. A list of representative activities is presented here:
 - Emerging Data Cleaning and Fusion for Traffic Model Calibration
 - Advanced Driver Assistance Systems Microsimulation Model Development and Validation
 - Acquiring Baseline and ADAS-equipped Commercial Heavy Freight Driving Performance Datasets
 - Integrate CARMA platform into the HDS (Highway Driving Simulator) - Software Architecture Implementation
 - CDASim (Cooperative Driving Automation Simulation)

Potential Program Outputs, Outcomes, and Impacts on Technologies and Practices:

The Accelerating Deployment program area cuts across all aspects the ITS JPO's research agenda and supports all the programs in the ITS JPO. The Accelerating Deployment Program supports a variety of efforts related to evidence-based decision making and focuses on questions of investment choices, value, and awareness of technologies and their application in the real world. The program also supports efforts to provide technical assistance to ITS deployers through knowledge and technology transfer efforts. It also

includes initiatives to prepare the current and future workforce by providing training and collaborating with partners.

ITS Professional Capacity Building (PCB) Program: Training and educating current and future transportation professionals is an ongoing task that lends it efforts to ever-changing outputs, outcomes, and impacts as the users change and the technologies and systems evolve. In FY26, the ITS PCB Program continues to be focused on providing technical support to help agencies successful advance the deployment of ITS and emerging transportation technologies. FY26 outcomes aim to increase the scope and reach of the ITS PCB Program, meaning more practitioners are aware of technical resources and educated on a wider ITS topics, once again leading to improved ITS products or transportation operations. The ITS PCB Program will advance the development of the Smart Community Resource Center (SCRC) by compiling and making key USDOT resources readily available to deployers. The addition of new courses, as well as the conversion of existing courses, workshops and training materials to an online delivery format will make the training resources available to the larger transportation workforce community. New trainings will be developed for V2X, cybersecurity, and other emerging topics. The ITS PCB Program is also updating its website to make it easier for users to discover and access available trainings.

Deployment Evaluation Program:

Outputs include:

- Benefits, costs, and lessons learned databases, online and available to the public 24/7. The databases are constantly updated with recent publicly available evaluation data and are fully searchable.
- ITS Deployment Tracking Survey Data Repository, where raw data and survey instruments for every ITS Deployment Tracking Survey since 1999 are online and available to the public for download 24/7.
- Decision Support Resources site, where the Program provides data visualizations and infographics, interactive cost data plots, and a Return on Investment (ROI) Best Practices Guide with sample use cases.
- Executive Briefings and case studies developed annually and posted on the website.

Outcomes: Outcomes of this program include providing the data resources, tools, and analytics to support data - driven and evidence- based ITS deployment investment. Making these data available to anyone, anywhere in the world, is another key outcome of this Program. The Deployment Evaluation Program's efforts to support ongoing Department-wide activities that will accommodate innovation in evidence-based decision-making is another positive outcome that can result in:

- A focus on data-driven support for stakeholders that addresses the full lifecycle of ITS deployment to accelerate and improve stakeholder investment in ITS technologies, applications, and services.
- Assistance for stakeholders that will help them to make better quantitative and qualitative decisions about investing in and deploying ITS - from pre-deployment/investment planning through to performance measure setting, data collection and management, evaluation, and transfer of results and best practices.

Impacts: The Deployment Evaluation Program's long-term impact will be to accelerate the deployment of ITS technologies that work to improve the Nation's safety in a measurable way.

Communications and Outreach Program: Outputs, outcomes and impacts in FY26 will increase the profile of the ITS JPO and the dissemination of the ITS knowledge. Examples include establishing USDOT's booth presence at the large events, coordinating public outreach, and ensuring ITS JPO programs communication and outreach needs are effectively met.

ITS Architecture and Standards Program: Expected outcomes of the architecture and standards-related efforts include continued success of effective, interoperable, secure and safe ITS deployments due to the availability of an evolving reference system architecture and software toolsets, updated to accommodate additional automation-related services; new and enhanced ITS standards that support greater security; and enhanced cybersecurity practices; along with deployment support to developers of regional and project architectures. New and updated standards products will support secure evolution of legacy ITS equipment, standardized ITS connectivity equipment (including roadside units as well as interoperable Signal Phase and Timing (SPaT) broadcast services) along with additional cooperative automation standards content. The existing family of ITS standards will be further updated to meet evolving needs, the architecture reference will be updated to reflect appropriate uses of evolving 5G and other ICT standards. These interoperability standards and toolsets will enable more secure, safer, and interoperable deployments across the Nation (and North America). They further provide the world with leading-edge standards that can be adopted by other Nations and help enable harmonization for ITS technologies in a manner that opens global markets to American transportation technology manufacturers. A desired outcome of the interoperable security work is to support the efforts of the broad stakeholder community in their implementation of, secure nationally interoperable ITS systems that enable broad access to the safety and mobility benefits of ITS while remaining resilient to quickly address threats and attacks, minimizing any disruptions to services and system performance. The development of standards for these technologies must be accelerated in order to support these modes and ensure that all travelers' needs are addressed to ensure that everyone is included and has

equal opportunities to take advantage of these new technologies. For the development of these standards to be successful and meet the needs of the end users, application developers and consumers must communicate and coordinate efforts in a sustained manner. Lastly, by researching and analyzing the complete process through which goods flow in the supply chain, the ASC program can identify areas that can benefit from the development of ITS standards. The integration of ITS technology, data, and standardization can help to align the freight supply chain with the goals of the soon to be updated National Freight Strategic Plan (NFSP).

Analysis Modeling and Simulation Program: The ITS JPO AMS Program serves as a focal point for all the ITS related AMS activities for better coordination and collaboration towards a unified vision. An outcome is development a comprehensive AMS program plan (or roadmap), focused on ITS, to guide the AMS stakeholders and their efforts across USDOT. This single program vision would help improve AMS tools and models by incorporating advanced emerging technologies in ITS (e.g., ADS and CDA) and then to be able to provide the necessary AMS tools and guidance so public agencies can make the best possible transportation investment decisions.

Potential Economic or Societal Impacts:

The potential socio-economic impact of the Accelerating Deployment Program Area are: (1) the positive economic value that accrues as ITS investment funding is spent and with a good return on investment and (2) the positive socio-economic impact of improvements in peoples' safety and mobility (and improvements in a Nationwide economic competitiveness) as businesses and citizens experience reduced traffic congestion and improved road safety, and as associated improvements in quality of life and economic development are realized.

The goals of the Accelerating Deployment Program Area are to (1) provide research, analytics, data resources, and services that support adoption and deployment of ITS technologies, (2) improve the rate of transformation of ITS research and prototypes into market-ready technologies that are commercially viable and adopted by the transportation community, and (3) provide the tools needed for interoperable deployment of ITS technologies and systems across the Nation. These three goals can have a tremendous societal and economic impact leading to more secure, safe, and interoperable deployments at scale thereby increasing the confidence and rate of adoption of ITS technologies. Additionally, as a result of harmonization and interoperability work and research, the marketplace for these technologies will broaden the marketplace both domestically and internationally, allowing US vendors to maintain competitiveness in foreign markets.

Potential Progress Toward Achieving Modal Strategic Goals:

The USDOT Strategic Goals of Safety, Infrastructure, Innovation and Efficiency are met through all the activities within the Accelerating Deployment Program Area. The Accelerating Deployment Program Area is a crosscutting program that provides the tools and resources that ITS Deployers need to successfully deliver the safest, most efficient transportation system. The Accelerating Deployment Program serves critical multimodal USDOT efforts supporting the innovative deployment of ITS and emerging transportation solutions through knowledge, training, standardization, and evaluation efforts.

Collaboration Partners:

Each of the elements of the Accelerating Deployment Program Area are crosscutting and, as such, have at their core the objective of reaching out to all types of stakeholders across all modes. To guarantee that these stakeholders and communities of practice are given necessary data, knowledge sharing, and technology sharing support, the Program works in partnership with the USDOT surface modes, professional associations, universities, State, regional and local public agencies, standards development organizations, and others to engage the broad technical and organizational expertise needed to accelerate ITS deployment. Stakeholder cooperation includes activities via associations such as AASHTO as well as with individual State, local, tribal, and territorial (SLTT) ITS deployers. Extensive cooperation is conducted with other ITS JPO Programs as well.

Cooperation and coordination also occur with other Federal program offices, educational organizations, and professional associations who act as a sounding board from which the Accelerating Deployment Program area receives information on ITS community needs related to supporting ITS deployment and serve as distribution channels through which the ITS JPO disseminates various products and services.

Within USDOT collaboration extends to modal partners with ITS interests as well as security, policy, research, and international programs organizations in the Office of the Secretary of Transportation (OST). Intergovernmental Federal cooperation includes the Department of Homeland Security and NIST via direct relationships and well as participation in standards coordination activities of the National Security Council.

The ITS Architecture and Standards Program and their broad stakeholder groups of researchers, deployers, industry and academia to assure that standards products meet security needs, and the reference architecture appropriately encompasses cybersecurity. International cooperation opportunities are leveraged when beneficial to US interests via intergovernmental cooperation as well as cooperation via SDOs. Creating, maintaining, and expanding effective partnerships will remain a critical component of the Program's strategy.

Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD) /Advanced Transportation Technology and Innovation (ATTAIN) Program (\$21,000)

Program Description:

The ATTIMD is statutorily required in the Infrastructure Investment and Jobs Act (IIJA) Section 13006, 23 U.S.C. 503(c)(4). The ATTIMD grants are managed by FHWA and the ITS JPO contributes a mandated percentage of funding through FHWA to annually satisfy the requirement.

The USDOT provides a total of \$60,000,000 for ATTIMD, with \$39,000,000 coming from FHWA and \$21,000,000 from the ITS JPO.

The language provided here duplicates the language provided in the FHWA AMRP for consistency.

The Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD) Program is intended to provide funding for eligible entities to develop model deployment sites for large scale implementation and operation of technologies in various geographic regions. As the program is aimed at the rapid deployment of advanced technologies, limited expenditures for infrastructure construction is anticipated in grant application. The stated purpose is to reduce costs and increase return on investments; deliver increased mobility; enhance transportation system operations; improve safety; improve collection and dissemination of real-time information; monitor transportation assets; deliver economic benefits; and accelerate deployment of connected and automated vehicle technologies. Successful proposals will contain quantifiable system performance objectives, use innovative technologies and strategies, and a plan for long term operation and maintenance of the deployed technologies. The U.S. Department of Transportation (USDOT) encourages partnering among the private sector, public agencies, research institutions, technology leaders, and other transportation stakeholders.

Major Program Objectives:

The USDOT's vision for the ATTIMD initiative is the deployment of advanced technologies and related strategies to address issues and challenges in safety, mobility, efficiency, system performance, intermodal connectivity and infrastructure return on investment that are confronted by transportation systems owners and operators. The advanced technologies are integrated into the routine functions of the location or jurisdiction and play a critical role in helping agencies and the public address their challenges. Management systems within transportation and across other sectors (e.g., human services, energy, and logistics) share information and data to communicate among agencies and with the public.

These management systems provide benefits by maximizing efficiencies based on the intelligent management of assets and the sharing of information using integrated technology solutions. USDOT shares the advanced technology solutions and the lessons learned from their deployment with other locations, scaled in scope and size, to increase successful deployments and provide widespread benefits to the public and agencies.

Anticipated Program Activities:

In FY26, the ATTIMD program will request proposals for new grant awards, completed the awards under the previous solicitation, and managed the existing grant awards made through the formerly named Advanced Transportation and Congestion Management Technologies (ATCMTD). Additionally, the program published the ATCMTD annual report as mandated by the FAST Act.

Key FY26 ATTIMD Program Activities.

Activity	Period of Performance
Selection of FY26 grant awards and timely implementation of projects.	2026
Continue award of FY26 grants and manage FY16-25 projects.	On-Going
Publish ATCMTD annual report as mandated by the FAST Act.	2026

Potential Program Outputs, Outcomes, and Impacts on Technologies and Practices:

Outcomes: The ATTIMD Initiative will develop model deployment sites for large scale installation and operation of advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment. Each ATTIMD project will consist of model technology deployments to help demonstrate how emerging transportation technologies, data, and their applications can be effectively deployed and integrated with existing systems to provide access to essential services and other destinations.

Outputs: Each grantee is required to submit a report that that describes:

- Deployment and operational costs of the project compared to the benefits and savings the project provides; and
- How the project has met the original expectations projected in the deployment plan submitted with the application, such as-
 - Data on how the project has helped reduce traffic crashes, congestion, costs, and other benefits of the deployed systems.
 - Data on the effect of measuring and improving transportation system performance through the deployment of advanced technologies.

- The effectiveness of providing real-time integrated traffic, transit, and multimodal transportation information to the public to make informed travel decisions; and
- Lessons learned and recommendations for future deployment strategies to optimize transportation mobility, efficiency, multimodal system performance, and payment system performance.

Impacts: Grants may be awarded for various types of deployments, but it is anticipated that each will have one or more of the following impacts:

- Reduced traffic-related fatalities and injuries.
- Reduced traffic congestion and improved travel time reliability.
- Optimized multimodal system performance.
- Improved access to transportation alternatives.
- Improved integration of payment systems.
- Provided the public with access to real-time integrated traffic, transit, and multimodal transportation information to make informed travel decisions.
- Provided cost savings to transportation agencies, businesses, and the traveling public; or
- Provided other benefits to transportation users and the general public.

Potential Economic or Societal Impacts:

Potential economic and societal impacts will be achieved individually by each of the ATTIMD grantees. Examples of impacts will include the improvement of mobility and goods; improvement of the durability and life of transportation infrastructure, reduction in costs and improved returns on investment; reductions in the severity of traffic crashes; increases to safety, improved use of real-time data, and broad economic benefits related to reductions in delays, improvement of system performance and efficient and reliable movement of goods and services for all Americans.

Potential Progress Toward Achieving Modal Strategic Goals:

Since 2017 the ATTIMD (formally ATCMTD) Program has provided grants to eligible entities to deploy, install, and operate advanced transportation technologies that enable the USDOT to meet goals related improving safety, infrastructure, innovation, and efficiency.

Collaboration Partners:

ATTIMD is not a research program, rather it is a discretionary grant program established in the Infrastructure Investment and Jobs Act, however, public and stakeholder input is considered in the development of the annual Notice of Funding Opportunity (NOFO).

To be selected for an ATTIMD award, an applicant must be an eligible applicant. Eligible applicants are State or local governments, transit agencies, metropolitan planning organizations (MPO) or other political subdivisions of a State or local government (such as publicly owned toll or port authorities), or a multijurisdictional group or consortia of research institutions or academic institutions. Partnership with the private sector or public agencies, including multimodal and multijurisdictional entities, research institutions, organizations representing transportation and technology leaders, or other transportation stakeholders, is encouraged.

Typically, a consortium is a meaningful arrangement with all members involved in planning the overall direction of the group's activities and participating in most aspects of the group; the consortium is a long-term relationship intended to last the full life of the grant. Any application submitted by a sole research or academic institution and that is not part of a consortium will not be considered for selection.

USDOT encourages partnerships with the private sector or public agencies, including multimodal and multijurisdictional entities, research institutions, organizations representing transportation and technology leaders, or other transportation stakeholders.

Numerous ATTIMD awardees include non-governmental partners that traditionally have provided non-Federal matching funds in the form of technical services, hardware, and software.

Program partners (both government and non-government), benefits derived from partnerships, and partner contributions are summarized in the table below.

Benefits of Partnership and Partner Contributions to FHWA ATTIMD Program.

Partner Organization	User Perspective on Needs	Industry Perspective	Standard / Goal Setting	Field Trials	Deployment	Research Collaboration	Specialized Expertise or Capabilities	Donation of Material or Services	Funding	Stakeholder Advice	Education and Awareness
ATTIMD partners are the individual grant recipients (benefits of partnerships are identified in IIJA Section 13006 and 23 U.S.C. 503(c)(4)). Benefits of partnership and partner contributions are detailed in IIJA-mandated Secretary's report.					X				X		

Small Business Innovation Research (SBIR) (\$3,000)

Program Description:

The SBIR program is administered by the Volpe Transportation Center and managed by the FHWA with funding from the ITS JPO. The SBIR activity is a highly competitive, awards-based activity that encourages domestic small businesses to engage in research and development (R&D) addressing high-priority research areas within USDOT. SBIR favors research that has the potential for commercialization through products and applications sold to the private sector transportation industry, State DOTs, USDOT, or other Federal agencies. Funding amounts for SBIR activities are established by law, as noted in the Defense Reauthorization Act (Sec. 5102(a)(1)). Each year, Federal agencies with extramural R&D budgets at the Department level that exceed \$100 million are required to allocate 3.2 percent of their R&D budget to these programs.

The SBIR Program Office publishes one or two solicitations each fiscal year for proposals on specific research topics of interest to USDOT operating administrations.

Major Program Objectives:

The objective of the SBIR Program is to encourage small businesses to engage in research and development (R&D) that has the potential for commercialization and meets Federal R&D objectives. The SBIR program is uniquely positioned to support both the interests of the USDOT as well as the small business. In this respect, the SBIR programs aims to provide essential funding to small businesses with aim toward commercialization of products that align with ITS JPO, FHWA and Departmental Strategic goals. Given that the SBIR program is available to all ITS JPO and FHWA RD&T programs, all USDOT Strategic goals are supported as a result.

The SBIR program offers unique services to the small businesses to aid in their technical and commercial development. Specifically, the SBIR program offers a Commercialization Assistance Program to provide consulting services to the SBIR participants to help conduct market research, commercialization plans, and other services. In addition, in FY26 the SBIR program will continue with a Technology Readiness Level (TRL) assessment program to help the Small Businesses conduct an independent assessment of the technological status of the innovations developed through the SBIR program.

Anticipated Program Activities:

In FY26, the Small Business Innovation Research program will participate in the annual solicitation of topics and support current Phase I, II, and IIB projects. Additionally, the SBIR program will continue with the Technology Readiness Level (TRL) Assessments throughout Phase II and IIB projects.

Key FY26 SBIR Program Activities

Activity	Period of Performance
Technology Readiness Level (TRL) Assessments	2026
Annual Solicitation of Topics	2026

In FY26, the Small Business Innovation Research program will participate in the annual solicitation of topics and support current Phase I, II, and IIB projects. Additionally, the SBIR program will continue with the Technology Readiness Level (TRL) Assessments throughout Phase II and IIB projects.

Potential Program Outputs, Outcomes, and Impacts on Technologies and Practices:

USDOT strives to advance technologies and make problem-solving innovations available to the end user. The SBIR Program will work towards accomplishing this by identifying the most promising new innovations, advancing Phase I and Phase II projects that have a clear path to commercialization, and focusing on market-driven needs. This creates a win-win-win opportunity for the Federal Government, the small business, and the traveling public.

Potential Economic or Societal Impacts:

The SBIR activity provides economic opportunities for domestic small businesses by providing seed funding to invest in the development of innovations that will benefit the traveling public. It is often difficult for small businesses to establish themselves in the crowded transportation R&D market because of the high startup costs and the lack of nontechnical resources such as commercialization support and business services. The SBIR activity offers critical support in these areas and provides dedicated funding streams to alleviate some of the initial risk.

Potential Progress Toward Achieving Modal Strategic Goals:

The SBIR activity provides opportunities to support all the USDOT Strategic Goals. The selection of topics and projects is driven by the opportunity to advance the Department's goals of safety, infrastructure, innovation, and efficiency.

Collaboration Partners:

The SBIR program is coordinated internally within USDOT, and methods and practices are shared with other modes through the Volpe center, which administers the SBIR programs for USDOT.

Chapter 2 – FY 2027 RD&T Programs

The AMRP FY2027 outlook year chapter in the annual plan is not developed in alignment with the Presidents' budget request of the same year due to the AMRP development schedule per 49 U.S.C. 6501 Research Plan.

ITS Deployment

Program Description:

The ITS Deployment Program Area works in coordination with multimodal partners, including the Office of the Secretary of Transportation (OST), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA); National Highway Traffic Safety Administration (NHTSA); Maritime Administration (MARAD), and Pipeline Hazardous Materials Safety Administration (PHMSA) to bring publicly and privately sponsored research together to create large-scale, replicable, and integrated ITS and other emerging technology deployments.

Included within the program area are four key program areas: the Saving Lives with Connectivity: Accelerating Vehicle-to-Everything (V2X) Deployment (V2X Accelerator Program); the Intersection Safety Systems Program; the Artificial Intelligence for Transportation Planning and Design Initiative; and the Rural ITS Deployment Program.

V2X Accelerator Program. The USDOT's V2X Accelerator Program's vision is to improve road safety, mobility, and efficiency through the deployment of secure, interoperable V2X technologies. Crucial to this vision is the notion of interoperable connectivity – that is, a wide range of in-vehicle, mobile, and roadside devices can communicate ubiquitously, efficiently, and securely in a privacy-protected manner using multiple wireless communications technologies, irrespective of the device vendor, and communication provider, provided that all shared information and equipment have valid security certificates, issued by an SCMS provider. Three sites were awarded funding: Maricopa County (Arizona) Department of Transportation (DOT), Texas A&M Transportation Institute and the Utah DOT (in coordination with deployment sites in three states – Utah, Colorado, and Wyoming). Each deployment project is expected to be developed in two distinct USDOT-funded phases. In Phase 1, that spans 18 months, the sites will design, build, and test their V2X systems. In Phase 2, that spans 12 months, the sites will operate and evaluate their V2X deployments. Sites are expected to sustain operations for a minimum period of five years after Phase 2 is completed with no supplementary funding from USDOT.

Intersection Safety Systems. The USDOT's Intersection Safety Systems aim to transform intersection safety by incentivizing the innovative application of new and emerging technologies to identify and mitigate unsafe conditions involving vehicles and vulnerable road users at intersections. The initiative complements other Federal efforts to improve

intersection safety, with the program specifically focused on the use of technology. Further, the intersection environment itself is well-suited to innovative mitigative approaches leveraging, utilizing, and potentially repurposing existing traffic control and support infrastructure.

Artificial Intelligence for Transportation Planning and Design. The aim of this initiative is to develop an interactive decision support tool for State and local transportation agencies where users can make queries or input boundary conditions that dynamically generate maps and other visualizations that reflect insights, answer questions, and help improve safety. The solutions aim to enable practitioners to better plan, design, build, manage, and evaluate infrastructure and operational strategies that increase people's opportunity to use active and public transportation, while facilitating safe and efficient freight and vehicular travel as well.

Rural ITS Deployment Program. The Rural ITS Deployment Program will work to improve and enhance our Nations rural roadways and communities by championing the use of ITS technologies that can provide low-cost solutions to critical rural safety, mobility, and productivity challenges. The Program aims to deploy and demonstrate the benefits of ITS in the following potential areas:

- **Safety:** e.g., coordinated emergency response, advanced road monitoring (roadside sensors + vehicle data), high-granularity road and traveler information.
- **Mobility:** e.g., coordinated demand-responsive transportation options for rural population access to medical care, job opportunities and other services; ensuring availability for complete trips that enhance our Nations productivity.
- **Productivity:** e.g., freight-focused road condition/incident data, smart re-routing based on height/weight/trailer configuration, and advanced truck parking services.

Major Program Objectives:

The ITS Deployment Program Area is specially designed to tackle an important challenge in the ITS research space that is needed in real-world operations. These challenges are often too large for any one State or agency to tackle on their own, so we take the lead as USDOT to provide financial and technical support to awardees to help apply the research in real-world deployments. Each of the deployment programs has its own detailed goals, but all ITS JPO Deployment programs generally have the following fundamental elements:

- *Apply research to real-world operations:* We help the deployers integrate advanced technology research concepts into practical and effective elements, enhancing existing operational capabilities. These deployers operate large-scale deployments in real-world environments and remain in operation beyond Federal funding. The solutions must be sustainable and maintainable in the long-term to be practical for others to deploy.

- *Spur high impact integrated ITS deployments nationwide:* We want to assist the transportation industry in tackling the difficult challenge of deploying emerging technologies and integrated ITS solutions by streamlining and expediting solution development through local deployments. High impact, replicable, integrated solutions developed deployment sites will reduce the cost of future deployments. Deployers serve as replicable models through detailed project documentation including systems engineering and open data and software.
- *Deploy solutions that meet local needs.* We want to help deployers develop and deploy solutions that meet needs identified by their local communities, often through the planning process. We don't want to deploy technology for technology's sake, but instead help communities achieve safety, and mobility goals they've identified.
- *Measure impacts.* We want to verify that the measurement of the impacts and benefits are gathered from real world deployments, rather than an isolated test bed or a computer-based simulation testbed. Differentiating and finding these benefits and identifying what can be attributed to these technologies is an important component of the activity. We know that many planners and engineers need this type of information to make the business case for pursuing a deployment.
- *Disseminate resources to future deployers.* We want to determine which technologies, strategies, applications, and institutional partnerships demonstrate the most potential to address identified barriers in a variety of communities and built environments. We know from experience that the technical aspects of a project are not often the hardest part, but there is often difficulty fine-tuning the institutional partnerships and inter-agency collaboration. We disseminate lessons learned from replicable solutions developed by deployment sites and their success stories in overcoming project challenges to catalyze additional deployment and give future deployers a head-start on tackling both technical and non-technical issues.

Anticipated Program Activities:

V2X Accelerator Sites: In FY27 the V2X Accelerator Sites that successfully demonstrate their V2X systems perform both safely and as designed, will advance to Phase 2. In this phase, over a 12-month period, the sites will operate their systems, collect data, and evaluate the impacts of their deployments. In addition, the sites will conduct joint inter-site interoperability demonstrations. Sites will provide over-the-road evidence of successful and secure communications as well as the effective operation of ITS applications among roadside equipment, in-vehicle, and mobile devices.

Intersection Safety Systems: In FY27 the program seeks to refine an Intersection Safety System prototype by deploying tailored systems based on the prototype in multiple real-world intersections.

Artificial Intelligence for Transportation Planning and Design: In FY27 the Initiative will have concluded Phase 2. The Department will evaluate the results and consider whether to move forward with a Phase 3.

Rural ITS Deployment Program: In FY27 the Program will identify highest priority rural safety, mobility and productivity problems and promising ITS technologies, then develop, deploy, test innovative ITS application concepts, as well as reliable methods to reveal impacts and benefits; and document benefits and lessons learned to reduce barriers to adoption.

Automation

Program Description:

The ITS JPO Automation Program's collaborative and multimodal research portfolio provides cross-cutting support across the USDOT. The ITS JPO's Automaton Program Area directly supports the Department's Innovation Agenda and NHTSA's new Automated Vehicle (AV) Framework. Through research activities and collaboration with modal partners across the USDOT, ITS JPO initiatives support the USDOT by ensuring AVs prioritize safety, unleash innovation, and enable commercial deployments. Driving automation is one of the major transportation industry trends of this decade. Through close collaboration and monitoring of current industry and academic technology innovators and leaders in automation, the ITS JPO continues the pursuit of an automation program that will support the safe deployment of an automated future. Advanced Driver Assistance Systems (ADAS) with automation of lateral or longitudinal controls are widely available in passenger vehicles, although their development and refinement continue. Automated Driving System (ADS)-equipped vehicles are being piloted in passenger vehicles, commercial motor vehicles, and transit buses. While driving automation research has been, to some degree, mainstreamed across the Department's Operating Administrations, research needs are evolving alongside the technology. The technological and practical challenges of translating research breakthroughs into daily transportation are significant and often are not fully understood at the outset. Many foundational questions around ADS and ADAS cannot be resolved until more and better data are available.

Major Program Objectives:

Automation is a key component of the ITS JPO's Strategic Plan. Research in FY27 will continue to support the Federal role in automation by funding cross-modal research to facilitate the planning and execution of research on topics that span the information needs, capabilities, and interests of multiple operating administrations, as well as topics that are important to USDOT as a whole but may not fit cleanly into the mission of a single agency.

Anticipated Program Activities:

Building on the FY26 research, the Automation Program Area will continue to coordinate automated vehicle cross-modal research in the following:

- Business Intelligence and Emerging Issues Analysis on Automated Driving System Testing and Deployment Tracking and Emerging Issue Analysis
- Research Coordination and Information Exchange through Automation Research Working Group Facilitation and Management, Research Product Dissemination, and External Engagement.
- Cross-Modal Research on Cooperative Driving Automation (CDA), Human Factors, Advanced Driver Assistance Systems (ADAS), Commercial Vehicle Automation

Research, and Vulnerable Road User Safety. In particular, an industry-led small-scale pilot of CDA will continue to expand technological and geographical scopes.

Emerging and Enabling Technologies

Program Description:

The Emerging and Enabling Technologies Program Area focuses on cultivating the next generation of transportation systems. As the scale of Intelligent Transportation Systems (ITS) increases and expands to become part of other industry internet of things (IoT) environments (i.e., smart cities), vehicle manufacturers, infrastructure providers, innovators, and entrepreneurs discover new opportunities to use technology and the data that will be generated. These technological advances, along with new functionality, new applications, new operational concepts, and disruptive innovations, need to be tracked and planned for by the USDOT. Current examples of these Emerging and Enabling technologies include Interoperable Connectivity through V2X Communications (including the emerging 5G variations), digital infrastructure, quantum computing, blockchain, Artificial Intelligence (AI), and others.

The USDOT will be positioned and engaged as a partner to guide research, development, and technology adoption in a systematic manner. The USDOT recognizes the need to advance the adoption and use of emerging practices and technologies for transportation—particularly, where they play a key role in providing public benefits to Americans. The ITS JPO will coordinate and conduct investigations and exploratory research into emerging technologies across government, academia, and the private sector. This research will provide the USDOT with a significant understanding of the potential benefits and disruptions these technologies could represent to the transportation system. Through multimodal coordination, the ITS JPO works to avoid duplicative ITS work and to enable the efficient allocation of ITS resources.

Major Program Objectives:

Interoperable Connectivity/ Spectrum: This research program focuses on advancing the next generation of transportation systems. As emerging technologies offer the potential to enter the transportation environment, ITS JPO will evaluate their fit in meeting transportation needs and work with agency modes to extend resulting benefits from these technologies across the transportation system.

Given the magnitude of impacts that transitioning to the next generation communications can have on transportation, the ITS JPO proposes the establishment of a focused research initiative. Proposed research objectives will continue to guide the program into the future, (1) institutional adoption of next generation communication technologies, (2) safety and security framework development, and (3) public sector representation change.

Artificial Intelligence (AI) for Intelligent Transportation Systems (ITS): The ITS JPO seeks to understand the landscape of how AI in transportation is currently being leveraged, and how potential investment in the future can help address transportation challenges. Through collaborative efforts with our modal partners, the work will be used to assist ITS

JPO in prioritizing research and development investment in transportation. The program expects to continue work in all three strategic areas: 1) Ensuring safe, secure, and responsible AI, 2) Accelerating broad initial deployment of impactful and scalable AI-enabled ITS, and 3) Foster nationwide adoption of proven AI-enabled ITS.

Multimodal Digital Infrastructure (MDI): Once the majority of the foundational work is completed in FY26, the ITS JPO will work with modal partners to shift the focus on piloting MDI Strategies in collaboration with the Infrastructure Owners/Operators (IOOs) and other stakeholders. Use cases to address will be identified through various stakeholder engagement efforts and the identified topics will be formulated as actual projects with ITS JPO sponsorship.

Anticipated Program Activities:

Interoperable Connectivity/ Spectrum: In FY27 the USDOT will continue to monitor and assesses wireless technologies and available devices to determine their capabilities to support a wide range of transportation system communications requirements regarding safety, effectiveness, and other capabilities. These technical research and assessment activities provide data-driven inputs to the USDOT policy decision-makers. The ITS JPO will continue looking at technology neutral approaches to support fair market competition, understand the liability implications, consider privacy, and impacts on the workforce.

Artificial Intelligence for ITS: In FY27 the program expects to continue work in all three strategic areas. Efforts should continue for validation and verification, evaluation, standards, risk, and knowledge and technology transfer.

Multimodal Digital Infrastructure: In FY27 the ITS JPO will focus on implementing the developed MDI Strategies. In doing so, we will attempt to better address the following specific items:

- Increased need to communicate with a variety of digital devices (machines)
- New availability of digital information from a variety of devices
- New need to provide digital services as an agency
- Evolving private sector infrastructure and services overlapping with traditional IOO scope
- Increasingly complex set of interactions between private and public sector infrastructures

Specific research topics will be identified and formulated as actual projects which will then be conducted with ITS JPO funds.

Accelerating Deployment

Program Description:

As new research products, results, and prototypes evolve into market-ready products, the primary goal of the Accelerating Deployment Program Area is to provide data, research, analysis, and technical assistance and support services to accelerate adoption and at-scale deployment of secure, and interoperable ITS technologies. The objectives of the Accelerating Deployment Program Area are: (1) to accelerate the transformation of ITS research and prototypes into market-ready technologies that are commercially viable and deployed by the transportation community, and (2) to provide the ITS community the tools it needs for successful and interoperable deployment of ITS technologies and systems at scale. The Program area directly supports advancing ITS research and deployment activities through the full ITS deployment lifecycle - from initial deployment planning through to actual deployment and eventual assessment - in coordination with other stakeholders at the Federal, State, regional, and local levels.

The Accelerating Deployment Program Area includes work in five key areas:

- ITS Professional Capacity Building
- Deployment Evaluation
- Communication and Outreach
- ITS Architecture and Standards
- Analysis, Modeling, and Simulation (AMS)

Major Program Objectives:

The objectives of the Accelerating Deployment Program Area are to provide the research, analytics, products, tools, security, and services to enable more rapid, interoperable deployment of ITS technologies and services to maximize public benefits. The intent is to define and improve evidence-based decision making, collaboration, harmonization, standardization, and communication mechanisms and targets to encourage public and private investment in ITS; to develop comprehensive training and analytic tools that allow deployers to understand the financial and operational benefits and costs of new technologies and systems; and to establish the tools that deployers can use to help make more informed investment and planning decisions regarding ITS deployment.

Anticipated Program Activities:

ITS Professional Capacity Building (PCB) Activities FY 2027. The ITS PCB Program area will continue to expand its in-person and web-based training offerings for both the internal and external transportation workforce. Expanding the offerings available will reach a broader audience including student, rural, and tribal audiences. The Smart Community Resource Center (SCRC) will continue to be enhanced and new materials, including open-source tools, will be developed to assist practitioners in advancing ITS technologies to

address transportation challenges in their communities. The ITS PCB Program will continue to facilitate cohorts and peer exchanges to share best practices and foster information exchange. Finally, the program will continue to collaborate with partners to develop materials that can be used to advance ITS learning in the classroom.

Deployment Evaluation Activities FY 2027. The Deployment Evaluation Program will continue to improve the operation and content of the benefits/costs/lessons learned databases and experiment with new, innovative ways to present these data to the public. This would include continuing to create and develop compelling data products and decision-making and planning tools to support ITS stakeholders in their efforts to make evidence-based decisions about ITS investments at all stages of the ITS deployment lifecycle.

The Deployment Evaluation Program will also continue its long-term strategic effort to provide data-driven and evidence-based products and services to the ITS stakeholder community and continue to address a full spectrum of stakeholder needs related to the foundational elements of successful ITS deployment and the full ITS deployment lifecycle.

Communication and Outreach Activities FY 2027. The ITS JPO will continue outreach activities, as well as lead and support high visibility in-person meetings and events.

ITS Architecture and Standards Activities FY 2027. ITS Architecture and Standards Program activities will include continued evolution in the content of the ITS reference system architecture and ITS standards. Interoperable security efforts will provide the tools for widespread implementation to provide the capabilities for deployers to assure that ITS deployments remain secure. Work will ensure ITS JPO is advancing standards into interoperable operations for deployment testing. Cybersecurity control sets and resources will be integrated into the National ITS Reference Architecture.

Analysis Modeling and Simulation Activities FY 2027. The ITS JPO AMS Program will continue to support and coordinate AMS activities with the ITS focus. In particular, ITS JPO will collaborate with FHWA (Traffic Analysis Tool Program, Connected Automated Vehicle AMS Program, Office of Planning, Office of Policy, Office of Safety, and Office of Infrastructure), NHTSA, and FMCSA as appropriate. In the end, the main target is to improve the AMS capabilities, tools, and technologies in understanding, analyzing, planning, designing, and evaluating the ITS implementation.

Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD) /Advanced Transportation Technology and Innovation (ATTAIN) Program

Program Description:

The ATTIMD is statutorily required in the Infrastructure Investment and Jobs Act, Section 13006, 23 U.S.C. 503(c)(4). The ATTIMD grants are managed by FHWA and the ITS JPO contributes a mandated percentage of funding through FHWA to annually satisfy the requirement. The language provided here duplicates the language provided in the FHWA AMRP for consistency.

The Advanced Transportation Technologies and Innovative Mobility Deployment Initiative (ATTIMD) Program is intended to provide funding for eligible entities to develop model deployment sites for large scale implementation and operation of technologies in various geographic regions. As the program is aimed at the rapid deployment of advanced technologies, limited expenditures for infrastructure construction is anticipated in grant application. The stated purpose is to reduce costs and increase return on investments; deliver increased mobility; enhance transportation system operations; improve safety; improve collection and dissemination of real-time information; monitor transportation assets; deliver economic benefits; and accelerate deployment of connected and automated vehicle technologies. Successful proposals will contain quantifiable system performance objectives, use innovative technologies and strategies, and a plan for long term operation and maintenance of the deployed technologies. The USDOT encourages partnering among the private sector, public agencies, research institutions, technology leaders, and other transportation stakeholders.

Major Program Objectives:

The USDOT's vision for the ATTIMD initiative is the deployment of advanced technologies and related strategies to address issues and challenges to safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment that are confronted by transportation systems owners and operators. The advanced technologies are integrated into the routine functions of the location or jurisdiction and play a critical role in helping agencies and the public address their challenges. Management systems within transportation and across other sectors (e.g., human services, energy, and logistics) share information and data to communicate among agencies and with the public. These management systems provide benefits by maximizing efficiencies based on the intelligent management of assets and the sharing of information using integrated technology solutions. USDOT shares the advanced technology solutions and the lessons learned from their deployment with other locations, scaled in scope and size, to increase successful deployments and provide widespread benefits to the public and agencies.

Anticipated Program Activities:

In FY27, the ATTIMD program will request proposals for new grant awards, complete the awards under the previous solicitation, and manage the existing grant awards.

Additionally, the program will publish the ATTIMD annual report as mandated by law.

Small Business Innovation Research (SBIR)

Program Description:

The SBIR program is administered by the Volpe Transportation Center and managed by the FHWA with funding from the ITS JPO. The SBIR activity is a highly competitive, awards-based activity that encourages domestic small businesses to engage in research and development (R&D) addressing high-priority research areas within USDOT. SBIR favors research that has the potential for commercialization through products and applications sold to the private sector transportation industry, State DOTs, USDOT, or other Federal agencies. Funding amounts for SBIR activities are established by law, as noted in the Defense Reauthorization Act (Sec. 5102(a)(1)). Each year, Federal agencies with extramural R&D budgets at the Department level that exceed \$100 million are required to allocate 3.2 percent of their R&D budget to these programs.

Major Program Objectives:

To encourage small businesses to engage in R&D that has the potential for commercialization and meets Federal R&D objectives. The SBIR program is uniquely positioned to support both the interests of USDOT as well as the small business. In this respect, the SBIR programs aims to provide essential funding to small businesses with aim toward commercialization of products that align with ITS JPO, FHWA and Departmental Strategic goals. Given that the SBIR program is available to all ITS JPO and FHWA RD&T programs, all USDOT Strategic goals are supported as a result.

The SBIR program offers unique services to the small businesses to aid in their technical and commercial development. Specifically, the SBIR program offers a Commercialization Assistance Program to provide consulting services to the SBIR participants to help conduct market research, commercialization plans, and other services. In addition, in FY25 the SBIR program will continue with a Technology Readiness Level (TRL) assessment program to help the Small Businesses conduct an independent assessment of the technological status of the innovations developed through the SBIR program.

Anticipated Program Activities:

In FY27, the SBIR program will participate in the annual solicitation of topics and support current Phase I, II, and IIB projects. Additionally, the SBIR program will continue with the Technology Readiness Level (TRL) Assessments at the end of Phase II.

Additional information about DOT Research can be found at <https://researchhub.bts.gov/search>