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Program Outlook FY 2027**

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POINT OF CONTACT: Janet Frenkil (FHWA)

Sean McMaster
Administrator



U.S. Department of Transportation
Federal Highway Administration

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pavement Association
ADCMS	Advanced Digital Construction Management Systems
ADS	automated driving system
ADT	average daily traffic
AGC	Associated General Contractors of America
AI	artificial intelligence
AID	Accelerated Innovation Deployment
AID-PT	Accelerating the Implementation and Deployment of Pavement Technologies
AMPO	Association of Metropolitan Planning Organizations
AMR	Accelerating Market Readiness
AMRP	Annual Modal Research Plan
APA	American Planning Association
ARTBA	American Road & Transportation Builders Association
ATTAIN	Advanced Transportation Technology and Innovation
AV	automated vehicle
BAA	Broad Agency Announcement
BIM	Building Information Modeling/Better Information Management
BTS	Bureau of Transportation Statistics
C&P Report	<i>Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance Report to Congress</i>
CAV	connected and automated vehicle
CDA	cooperative driving automation
CFR	Code of Federal Regulations
CISA	Cybersecurity and Infrastructure Security Agency
CMF	crash modification factor
DOE	U.S. Department of Energy
DOT	department of transportation
EAR	Exploratory Advanced Research
EDC	Every Day Counts
EPA	U.S. Environmental Protection Agency
FAHP	Federal-Aid Highway Program
FEHRL	Forum of European Highway Research Laboratories
fib	International Federation for Structural Concrete
FHWA	Federal Highway Administration
FLH	Office of Federal Lands Highway

FLMA	Federal land management agency
FMCSA	Federal Motor Carrier Safety Administration
FTA	Federal Transit Administration
FY	fiscal year
GBP	Global Benchmarking Program
GEMS	Geospatial Economic Multimodal System
GPS	Global Positioning System
HCAS	Highway Cost Allocation Study
HDI	Highway Data and Information
HRD	Highway Research and Development Program
HSIP	Highway Safety Improvement Program
IJA	Infrastructure Investment and Jobs Act
ISS	Intersection Safety System
ITE	Institute of Transportation Engineers
ITS	intelligent transportation system
ITS JPO	Intelligent Transportation Systems Joint Program Office
LiDAR	light detection and ranging
LPA	Local Public Agency
LTIP	Long-Term Infrastructure Performance
LTP	Long-Term Pavement Performance
MASH	<i>Manual for Assessing Safety Hardware</i>
MPO	metropolitan planning organization
MUTCD	<i>Manual on Uniform Traffic Control Devices for Streets and Highways</i>
NACo	National Association of Counties
NAPA	National Asphalt Pavement Association
NBIS	National Bridge Inspection Standards
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NHS	National Highway System
NHTSA	National Highway Traffic Safety Administration
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NOFO	Notice of Funding Opportunity
NPMRDS	National Performance Management Research Data Set
NSC	National Safety Council
NSF	National Science Foundation
NTIS	National Tunnel Inspection Standards
PAPAI	Project and Program Action Information
PEL	Planning and Environment Linkages
PIARC	World Road Association

PTF	Pavement Testing Facility
R&D	research and development
R&I	Special Committee on Research and Innovation
R&T	research and technology
RD&T	Research, Development, and Technology
RT&E	Research, Technology, and Education
RTPO	regional transportation planning organization
SBIR	Small Business Innovation Research
SIRC	Strategic Innovation for Revenue Collection
STIC	State Transportation Innovation Council
T2	technology transfer
TFHRC	Turner-Fairbank Highway Research Center
TIDP	Technology and Innovation Deployment Program
TPF	Transportation Pooled Fund
TRB	Transportation Research Board
TRL	Technology Readiness Level
TSMO	Transportation Systems Management and Operations
UAS	unmanned aircraft system
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
UTC	university transportation center
VMT	vehicle miles traveled
Volpe	John A. Volpe National Transportation Center
VPI	virtual public involvement

Executive Summary

The FHWA RD&T program is largely governed and shaped by 23 U.S.C. § 503, which establishes the Highway Research and Development (HRD) Program and Technology and Innovation Deployment Program (TIDP).⁽¹⁾ HRD governs the R&D portion of FHWA's RD&T program. The eligible research areas under HRD include improving highway safety; improving infrastructure integrity; strengthening transportation planning and environmental decisionmaking; and reducing congestion, improving highway operations, and enhancing freight productivity. HRD also provides for conducting exploratory advanced research.

TIDP governs the Technology Transfer (T2) portion of FHWA's RD&T program. All aspects of highway transportation relate to TIDP, including planning, financing, operation, structures, materials, pavements, environment, construction, and the time between project planning and project delivery. Under TIDP, responsibilities include conducting T2 activities for the products, technologies, tools, methods, or other findings from highway R&D activities. The eligible research areas under TIDP include accelerating implementation and deployment.

This AMRP reflects a move toward aligning the FHWA RD&T program with the broad program areas noted in 23 U.S.C. § 503 under HRD and TIDP.^(2,1) The programs are as follows: Improving Highway Safety; Improving Infrastructure Integrity, Resilience, and Practices; Strengthening Transportation Planning, Environment, and Realty Decisionmaking; Reducing Congestion, Improving Operations, and Enhancing Freight Productivity; Accelerating the Implementation and Delivery of New Innovations and Technologies; Accelerating the Discovery of Impactful Solutions; and Crosscutting.

This AMRP captures specific processes, events, and actions that are an intentional part of the program implementation, referred to in this document as “activities.”⁽²⁾ Whether ongoing from prior years or new for FY 2026, the activities are listed and described in the individual AMRP program descriptions in chapters 1 and 2. In addition, the FHWA AMRP describes “initiatives” throughout the document; these initiatives are examples of specific work occurring under a particular activity. The FHWA RD&T program for FY 2026 includes both follow-on and new initiatives and activities that address emerging needs and the four FY 2026–2030 DOT strategic goals: Safety, Infrastructure, Innovation, and Efficiency.

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

The primary goal of the FHWA RD&T program is to conduct RD&T that directly supports the strategic goals of FHWA and USDOT. FHWA's RD&T program identifies and addresses issues of national significance that other research sponsors cannot or will not address, including areas that require higher complexity, higher risk, longer term research, or specific Federal responsibility. The program also supports implementing new requirements under the Infrastructure Investment and Jobs Act (IIJA Public Law 117-58).^(3,4) The FHWA RD&T program's activities produce a clear public benefit, support Federal stewardship roles, meet and address current and emerging needs and challenges, and ensure the coordination of highway RD&T activities.

Through its RD&T programs, FHWA creates efficiencies in the highway and transportation sector and provides information to support policy decisions. The FHWA RD&T program also ensures that critical technical expertise is available in times of crisis or for sensitive matters, including providing technical support during natural disasters, participating in sensitive Federal investigations, and working with other Federal agencies on issues related to national security and defense.

FHWA certifies that the content of this plan does not include duplicative research efforts within the FHWA RD&T program. Through coordination with research partners, FHWA conducts research to maximize value and avoid duplication. FHWA focuses on innovations

with broad applicability that leverage research investments through programs with successful T2.

The FHWA RD&T program covers the entire innovation lifecycle, per 23 U.S.C. § 503(a)(1): setting an agenda, conducting R&D, testing and evaluating technologies, and deploying and evaluating market-ready technologies and innovations.⁽¹⁾ This holistic approach to innovation allows FHWA and DOT to serve as national transportation leaders; thus, FHWA and DOT can provide a strategic approach to shaping the direction of innovation development that supports national interests. By working with stakeholders, this leadership ensures FHWA pursues a future that promotes a safe and efficient transportation system while supporting economic competitiveness for the Nation, leading the way in developing and promoting impactful solutions. The FHWA RD&T program provides the Nation with strategically aligned research and innovation development and deployment, underpinned by world-class technical expertise, relevancy, and influence, to ensure that the public has access to the safest, most reliable, and most resilient infrastructure.

FHWA's Office of RD&T is located at the Turner-Fairbank Highway Research Center (TFHRC), a Federally owned and operated national research facility in McLean, Virginia. TFHRC houses 15 laboratories and support facilities where personnel conduct exploratory and applied research. TFHRC staff administer the majority of FHWA's R&D activities in infrastructure, operations, and safety. Staff in the FHWA offices located at DOT Headquarters primarily conduct or administer research on ITS, policy, planning, and environment. In addition, the FHWA Office of Federal Lands Highway (FLH) works with Federal Lands Management Agencies (FLMAs) and Tribal Governments to deliver quality, durable projects and provide technical expertise in emerging technologies.

Emerging technologies are profoundly altering the transportation system. The development of cooperative and automated transportation technologies is among the most significant advances in recent times. From a technical perspective, data collection technologies, advanced sensors, and AI enable the collection of previously unavailable data and create an opportunity for improved asset management and system resilience. Other emerging technologies, including edge computing and blockchain technologies, improve the system's security and efficiency.

Work surrounding connected and automated vehicles (CAVs) and emerging technologies includes activities that support the application and deployment of technology to improve the ability of State and local transportation agencies to incorporate emerging technologies effectively and safely into operational elements of roadway systems. These initiatives aim to increase the capacity of regional and local transportation organizations.

In addition, FHWA has a long history of successful coordination and communication with both internal partners and external stakeholders through DOT modal administrations. Particularly important is the relationship and coordination between FHWA and the Intelligent Transportation Systems Joint Program Office (ITS JPO). The ITS program plan is established in 23 U.S.C. §§ 512–519.⁽⁵⁾ The ITS research program provides for the research,

development, and operational testing of ITS to solve congestion and safety problems, improve operating efficiencies in transit and commercial vehicles, and reduce the environmental impact of growing travel demand. Each DOT modal administration is responsible for ITS requirements, guidance, and research relevant to that mode.

FHWA leverages long-standing collaborations with State and Federal agencies, academic institutions, and private industry organizations to advance shared goals by coordinating efforts and utilizing the unique capabilities of each. Working within this collaboration framework, FHWA strategically identifies opportunities for collaboration, coordination, and independent research that advance the FHWA and DOT goals. FHWA works closely with the National Academies of Sciences, Engineering, and Medicine's Transportation Research Board (TRB) and with the TRB-sponsored advisory group, the Research and Technology Coordinating Committee, to obtain an outside perspective on the direction of the FHWA RD&T program and identify future opportunities for coordination and collaboration.

FHWA also supports numerous T2 efforts to accelerate the implementation and delivery of new and proven innovations and technologies that result from highway R&D and benefit all aspects of highway transportation. FHWA has traditionally used a multipronged approach to deployment, including direct technical and financial assistance; training; peer exchanges; collaboration with industry groups to disseminate knowledge and information; and evaluation of deployment methods to determine effectiveness, assess needed improvements, and document outcomes.

Key deployment and T2 stakeholders include State DOTs and local agencies, FLMAs, Tribal governments, and industry groups. These stakeholders are often the intended audiences for the research deployment outputs. FHWA staff continue to work directly with State and local agencies and Tribal governments. Local Technical Assistance and Tribal Technical Assistance programs and other deployment initiatives play a critical role in T2 activities with these stakeholders.

FHWA will use a series of successful deployment avenues in FY 2026: EDC, a State-based model for deployment; Accelerated Innovation Deployment (AID Demonstration); Accelerated Market Readiness (AMR); and the State Transportation Innovation Council (STIC), a State-based innovation deployment approach. (See references 6–9.)

RD&T Funding Overview

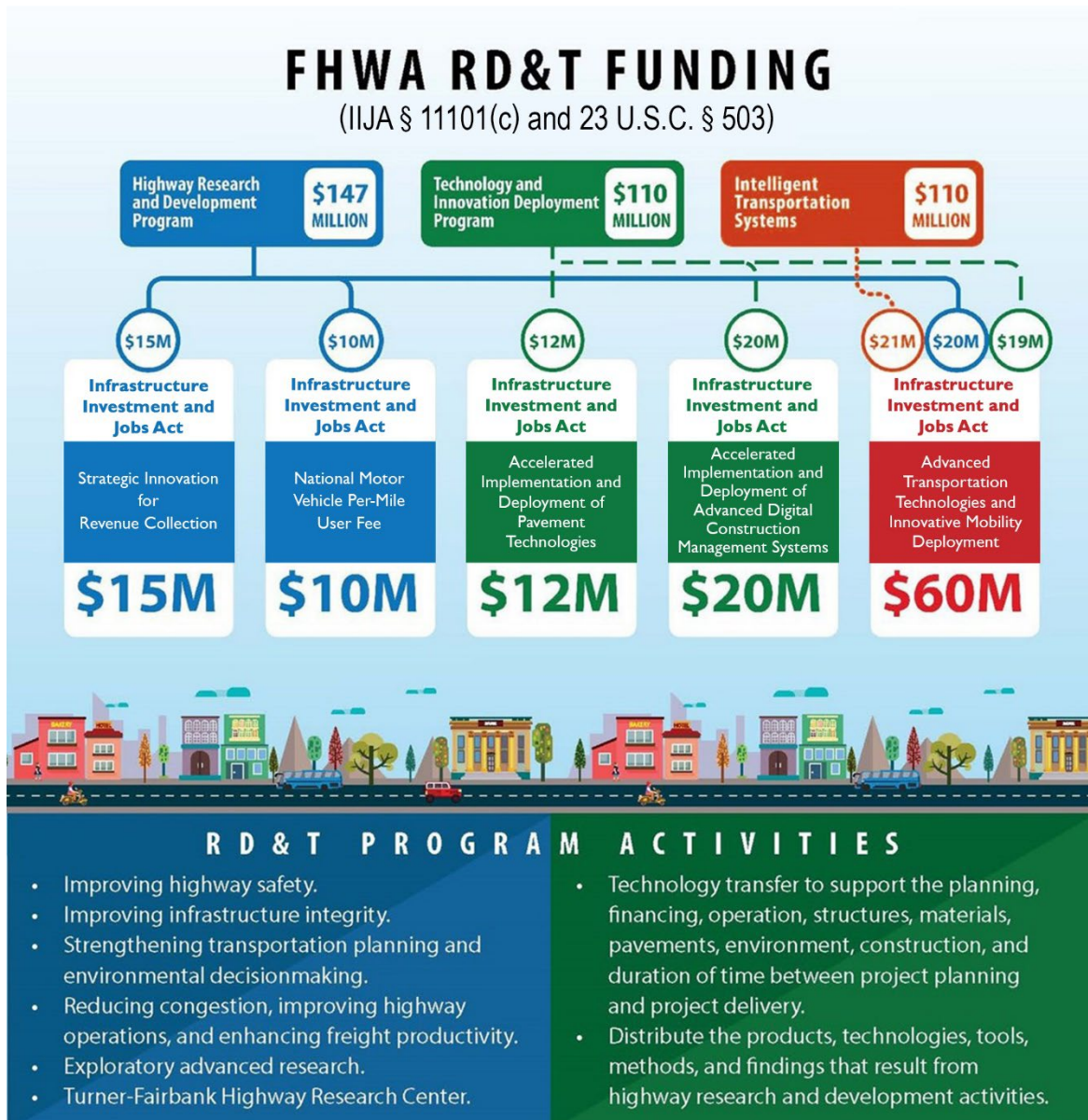
Highway Research and Development Program (HRD) and Technology and Innovation Deployment Program (TIDP) provide funding for FHWA's RD&T program. Under the IIJA, \$147 million, or about 57 percent of FHWA's RD&T funding, is provided annually to HRD.⁽¹⁰⁾ Of the authorized funds for HRD, \$15 million is legislatively set aside annually for the SIRC program, and \$10 million is set aside annually for the National Motor Vehicle Per-Mile User Fee Pilot. In addition, 3.2 percent of the FHWA extramural R&D budget is reserved for awards to small businesses through the Small Business Innovative Research (SBIR) activity. This competitive, awards-based activity encourages domestic small businesses to engage in R&D, addressing high-priority research areas within DOT.

Under the IIJA, \$110 million, or about 43 percent of FHWA's RD&T funding, is provided annually to TIDP.⁽¹⁰⁾ Of the authorized funds for TIDP, \$12 million is legislatively set aside annually for the Accelerated Implementation and Deployment of Pavement Technologies activity, and \$20 million is set aside annually for the Accelerated Implementation and Deployment of ADCMS.^(11,12)

In addition to HRD and TIDP, FHWA RD&T shares some funding, research planning, and research objectives with the USDOT ITS JPO, which has a separate Annual Modal Research Plan (AMRP).⁽²⁾ 23 U.S.C. § 512–519 establishes the ITS program plan with authorized funding of \$110 million annually under the IIJA.^(5,4) ITS JPO coordinates and jointly funds activities with overlapping responsibilities and priorities with the other modal administrations, including FHWA. Each modal administration uses a combination of mode-specific funding and legislatively dedicated ITS funding to accomplish the ITS mission. In addition, some ITS JPO funds supplement FHWA research activities where additional revenues are needed to meet Department program objectives or ensure synchronization with DOT multimodal needs.

The Advanced Transportation Technologies and Innovative Mobility Deployment program, formally known as ATTAIN, is also established in 23 U.S.C. § 503.^(1,13) ATTAIN provides competitive grants to eligible entities to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment. The IIJA provides a legislative set-aside of \$60 million annually for ATTAIN from HRD, TIDP, and ITS funding.⁽⁴⁾

The following diagram shows how the IIJA funds FHWA's RD&T program.^(1,10)



Source: FHWA.⁽¹⁴⁾

Addressing the FY 2026–2030 DOT Strategic Goals

FHWA's RD&T program activities and initiatives improve highway safety, reduce congestion, enhance infrastructure design and construction, invest in impactful solutions, and provide data and analyses to decisionmakers throughout the transportation community. The following sections describe how FHWA's RD&T program supports the draft FY 2026–2030 USDOT strategic goals of Safety, Infrastructure, Innovation, and Efficiency.

Strategic Goal: Safety

Safety is DOT's primary strategic goal. FHWA's RD&T programs address the contributing factors of roadway deaths and serious injuries related to roadway design, construction, and maintenance. The safety program advances a comprehensive Safe System Approach to reduce fatalities and serious injuries by integrating data-driven safety plans, human factors research, and targeted countermeasures for all road users.⁽¹⁵⁾ Key initiatives include improving crash and traffic data systems, developing innovative safety solutions using virtual reality and advanced lighting, prototyping intersection safety technologies, reducing wildlife-vehicle collisions, and updating barrier and roadside hardware standards. The program fosters extensive collaboration with State DOTs, industry, and national organizations to promote the adoption of effective safety practices and technologies nationwide; implement a performance-driven HSIP; foster a scientific, data-driven approach to safety decisionmaking; and reduce fatalities and serious injuries for all users on public roadways.

Highway safety in the infrastructure program is prioritized through various initiatives, including modernizing work zone practices to protect workers and travelers; improving bridge and tunnel inspection practices to ensure structural safety; developing longer lasting materials to reduce failures and repair-related hazards; innovating geotechnical and hydraulic engineering practices to mitigate future natural hazard impacts; providing agencies with integrated decision-support tools that embed safety into infrastructure management; and collaborating with State DOTs and industry to share data, best practices, and safety innovations across the highway network.

FHWA aims to integrate safety into Performance-Based Planning and Programming, helping States and MPOs set, track, and fund safety targets; developing modeling and analysis tools that evaluate crash-related environmental impacts to guide safer project choices; and enhancing resilience research to design and maintain roadways that remain safe during extreme weather, seismic events, and other hazards. The program also prioritizes pedestrian safety by producing guidance, tools, and data to ensure infrastructure planning explicitly addresses the safety needs of all users.

The operations program advances safety through a range of initiatives, including smoothing traffic flow and improving incident response to reduce crashes, implementing the updated Manual of Uniform Traffic Control Devices (MUTCD) to enhance traffic and pedestrian safety, and deploying smart infrastructure technologies like LiDAR-enabled road-user detection to protect pedestrians and work zones.⁽¹⁶⁾ The program also focuses on

safer road weather management, smarter work zone technologies, and public awareness campaigns, alongside traffic incident management efforts that safeguard first responders and minimize secondary crashes. In addition, the program supports freight safety by improving truck parking and optimizing routing, and it conducts research on truck size and weight to prevent infrastructure damage and enhance roadway safety.

FHWA champions the adoption of proven, market-ready safety innovations through the Every Day Counts (EDC) initiative, AID Demonstration activities, and STIC program.^(6,7,9) The AMR program advances transformative innovations by funding pilot demonstrations and evaluations.⁽⁸⁾ In addition, the ATTAIN program funds the deployment of advanced transportation technologies aimed at improving safety, mobility, and system performance.⁽¹³⁾ These efforts accelerate the use of new tools and practices to enhance safety for all users nationwide.

Furthermore, FHWA supports and funds early-stage, high-risk research through the EAR program that aims to develop transformative safety technologies and methods for the highway system. The SBIR program advances commercialization of safety-related innovations by supporting small businesses developing market-ready products that improve transportation safety. FHWA also emphasizes coordination, T2, and stakeholder engagement to accelerate the deployment of safety innovations nationwide.

FHWA supports improved data collection and analysis through the HDI and National Performance Management Research Data Set (NPMRDS) activities, providing critical travel time, traffic, and infrastructure condition data to inform safety and performance management. Global outreach efforts facilitate the adoption of proven international safety innovations. Past efforts focused on topics such as turbo roundabouts and countermeasures to prevent bridge strikes by over-height vehicles, enhancing crash-reduction strategies. In FY 2026, the Global Benchmarking Program (GBP) will conduct a study to evaluate the effectiveness of international safety countermeasures for reducing head-on crashes on high-speed, undivided roads. FHWA's Office of FLH tests innovative materials and technologies tailored for varied environments, including rural and public lands, to improve safety and resilience. These FHWA programs focus on research that targets safe access, safety performance measures, and preparing for CAV integration.

Strategic Goal: Infrastructure

FHWA aims to advance key initiatives that collectively seek to improve highway infrastructure durability, resilience, safety, and cost effectiveness, reducing maintenance disruptions and economic costs while enhancing the transportation system's condition and reliability.

FHWA's research spans multiple infrastructure areas, including construction and project management, geotechnical and hydraulics, long-term infrastructure performance, pavements and materials, structures, and transportation performance and asset management. Efforts to advance digital construction include promoting Building Information Modeling for Infrastructure (BIM) for better data management and

collaboration on open data standards and the ADCMS, which enhances construction safety and efficiency by improving real-time project management and workforce training.⁽¹²⁾ These digital tools enable agencies to manage assets throughout their lifecycle with greater accuracy and responsiveness.

Research also improves geotechnical and hydraulic practices through innovative design and modeling solutions addressing extreme weather and floodplain dynamics. Long Term Infrastructure Performance (LTIP) focuses on leveraging data and AI to enhance highway performance insights, while pavement and material research develops guidelines for durable, low-cost pavements. The accelerated pavement testing lab at TFHRC evaluates novel materials and expands the use of quarry byproducts, alongside developing AI-driven tools for automated pavement distress detection. Structural research updates bridge and tunnel inspection procedures to improve safety and resilience, and asset management develops next-generation performance metrics and tools for lifecycle planning. By advancing risk-based and lifecycle-oriented asset management, FHWA optimizes resource allocation and investment, contributing to safer roads and bridges and reducing costs.

Collaboration is central to FHWA's program success, involving extensive engagement with State DOTs, industry associations, standard-setting bodies, academic researchers, and other Federal agencies. This collaborative network ensures research addresses real-world challenges and integrates varied expertise. State DOTs provide critical support for data collection in LTIP studies, backed by formal coordinators' groups that strengthen collaboration. FHWA also works closely with other DOT modal administrations through established working groups and partners with agencies, such as NIST, USGS, and NOAA, on shared interests. Regular interactions with organizations such as AASHTO, TRB, and various industry groups facilitate the exchange of best practices and technical assistance, fostering innovation and alignment in highway infrastructure research and application.

Strategic Goal: Innovation

FHWA leads the development and deployment of advanced innovations that improve safety, system performance, and operational efficiency. The RD&T portfolio embeds T2 and commercialization pathways early, providing funding and resources to accelerate the transition from breakthroughs to real-world applications.

The safety program drives innovation through a comprehensive Safe System Approach that blends data-driven analytics, human factors research, and emerging technologies to reduce fatalities and serious injuries.⁽¹⁵⁾ Key advancements include the development of new CMFs for treatments such as rapid-flashing beacons, enhanced curve delineation, rumble stripes, and left-turn lanes. A virtual reality tool enables rigorous testing of infrastructure solutions in an environment that allows for experimental control and participant safety. Human Factors Analytics further examines how roadway designs, signage, and ADSs impact driver and pedestrian behavior, informing guidelines for variable message signs and low-level bollard lighting in nighttime conditions.

Innovations in roadside hardware and intersection safety are equally critical. FHWA is prototyping a sensor-based Intersection Safety System (ISS) that detects all road users in real time and provides in-vehicle or roadside alerts to prevent crashes at high-risk junctions. Barrier research, conducted with TRB, has led to new MASH-compliant barrier designs tailored for varied environments, including national parks.⁽¹⁷⁾ Wildlife crossing safety combines infrastructure best practices with detection technology to reduce animal-vehicle collisions. Across all initiatives, collaboration with the HSIP, TPF studies, State DOTs, national partners, and DOT operating administrations accelerates deployment of these market-ready innovations, ensuring that proven countermeasures reach roads nationwide to save lives and enhance roadway safety for all users.

FHWA is transforming how highways are built and maintained by modernizing construction practices and digital delivery. The agency is advancing BIM and other digital tools that break down data silos, improve project coordination, and speed delivery. On the structural side, FHWA's Geotechnical and Hydraulics program is pioneering new methods for designing and maintaining foundations, embankments, drainage systems, and scour-resistant bridges and culverts. The LTIP program expands datasets on pavement and bridge behavior, applying machine learning and AI to generate actionable insights that lead to better lifecycle planning, risk-based asset management, and resilient design. Together, these innovations help extend asset service life, reduce maintenance disruptions, optimize material use, and enhance the condition and reliability of the Nation's highway network.

FHWA's Accelerating Project Delivery initiative is quickening environmental reviews and real-property acquisition through innovative tools and practices, such as the Interagency NEPA & Permitting Collaboration Tool, PEL, and VPI, to reduce project delays, lower costs, and achieve better outcomes.^(18,19,20) Performance-Based Planning and Programming uses data-driven methods and performance measures to help States and MPOs set safety, mobility, and environmental targets; link those targets to long-range plans and improvement programs; and allocate resources more efficiently. The Resilience Transportation Research activity develops methods and training to integrate resilience into planning, design, and asset management, ensuring highways withstand extreme weather and natural disasters.

FHWA's Transportation Systems Management and Operations (TSMO) promotes leveraging real-time data and advanced analytics to proactively manage multimodal transportation networks and alleviate congestion. Initiatives like the Foundation for Successful Operations and Data-Driven Operations Decisionmaking develop robust tools, comprehensive training, and decision-support systems that empower agencies to anticipate traffic patterns, optimize signal operations, and coordinate freeway and surface street networks effectively. Enhanced modeling and simulation platforms incorporating CAV data enable transportation agencies to test and refine operational strategies virtually before real-world implementation. The Implementing Operations Strategies effort promotes dynamic, integrated, and performance-driven system management, addressing work zones, traffic incidents, special events, and adverse weather through a unified operational framework.

Complementing these innovations, FHWA's standard-setting and technology updates elevate safety and efficiency across the national transportation system. The 11th edition of the MUTCD introduces guidelines for experimenting with novel traffic control devices and updates sign standards, supporting practitioners in adapting to emerging needs.⁽¹⁶⁾ Automation and connectivity research pioneers advanced roadway environment management capabilities, combining LiDAR, infrared sensors, and digital infrastructure to enhance pedestrian detection, improve work-zone and emergency responder safety, and facilitate seamless integration of CAV technologies. The Managing Disruptions to Operations program drives innovations in road weather management, including sophisticated winter maintenance decision tools; deploys smarter work-zone technologies; and fosters interoperable incident-data exchanges to improve response and recovery. In addition, Freight Management and Operations efforts deliver cutting-edge freight flow modeling, innovative truck parking solutions, and optimized intermodal connectivity, while the Truck Size and Weight program advances weigh-in-motion monitoring, risk-based bridge strike mitigations, and harmonized permitting systems to safeguard infrastructure and bolster freight mobility across the Nation.

FHWA focuses on rapidly advancing proven and emerging transportation technologies across all facets of highway systems, including planning, construction, materials, and operations. Key initiatives include the EDC program, which promotes deployment of underutilized yet market-ready innovations to improve safety and adaptability; the AID Demonstration activities; and STICs, which offer outreach, peer exchanges, funding, and technical assistance to State and local agencies in support of innovation adoption and deployment.^(6,7,9) The AMR program goal is to move transformative innovations into the marketplace that offer significant improvement over similar, currently available innovations or practices to accelerate project delivery.⁽⁸⁾ There is also an emphasis on ADCMS to enhance project delivery efficiency, real-time evaluation, and safety for workers and the traveling public.⁽¹²⁾ In addition, the ATTAIn program facilitates the deployment of technologies that improve safety, mobility, system performance, and intermodal connectivity.⁽¹³⁾

Alongside deployment efforts, FHWA supports innovative finance strategies to maximize transportation funding efficiency, including exploring new funding mechanisms. Through coordinated collaboration with State DOTs, industry groups, academia, and Federal agencies, FHWA fosters a culture of innovation, accelerating adoption of technologies that save time, optimize resources, and enhance the safety and performance of the Nation's highways.

Strategic Goal: Efficiency

Efficiency in FHWA's RD&T Program is demonstrated through shared responsibility, accelerated project delivery, data-driven decisionmaking, compliance with standards and guidelines, alignment with Federal priorities, and mechanisms for systematically evaluating and communicating research outcomes to stakeholders and the public. These efforts prioritize timely, impactful outcomes, ensuring Federal investments result in tangible improvements.

The safety program supports efficiency through the principles of the Safe System Approach.⁽¹⁵⁾ The program mandates performance-based safety decisionmaking, leveraging real-time operations data, crash modification factors (CMFs) and enhanced safety data systems, and regular reporting and evaluation via the Highway Safety Improvement Program (HSIP) and Safe Streets and Roads for All grants. Human factors analytics and the virtual reality tool testing, along with pilot deployments of ISS and park-specific barriers, incorporate stakeholder feedback and iterative assessment to ensure continuous evidence-based improvements. Collaboration with State DOTs, national partners, and other DOT modal agencies further promotes efficiency by enabling FHWA and its partners to quickly deploy proven countermeasures to meet the latest safety challenges, resulting in measurable safety outcomes.

One of the ways the infrastructure program establishes efficiency is through connecting Federal investments to tangible infrastructure improvements using measurable performance metrics. The program provides advanced performance management tools, decision-support systems, and data analytics, such as long-term infrastructure datasets and AI-driven distress detection, to enable evidence-based planning and maintenance. Standardization efforts like ADCMS and BIM facilitate shared data practices across agencies, enhancing transparency and efficiency.⁽¹²⁾ Compliance is reinforced through adherence to updated National Bridge Inspection Standards (NBIS) and National Tunnel Inspection Systems (NTIS), coupled with required training.^(21,22) Ongoing stakeholder coordination through formal and informal forums supports collaborative oversight, forestalls duplicative research, and promotes the efficient and effective implementation of innovations statewide and nationally.

The operations program's core initiatives include performance measures and oversight, which support the DOT Strategic goal of Efficiency. The Foundation for Successful Operations and Data-Driven Operations Decisionmaking provide clear metrics and decision-support tools for managing traffic and reliability; Implementing Operations Strategies mandates documented guidance, training, and stakeholder outreach for proactive, integrated TSMO practices; the update to the MUTCD enforces compliance with Federal traffic-control standards through practitioner guidelines; the Managing Disruptions Data Exchange framework defines interoperable data-sharing protocols for incidents, work zones, and weather events; Traffic Incident and Events Management uses national training campaigns (e.g., Crash Responder Safety Week) and performance tracking to improve responder safety and clearance times; Freight Management and Operations applies freight-flow data, modeling, and reporting to identify bottlenecks and guide TSMO strategies; and the Truck Size and Weight program standardizes permitting, weigh-in-motion monitoring, and bridge-strike countermeasures to safeguard infrastructure and public safety.⁽¹⁶⁾ Together, these core initiatives support efficiency by facilitating and standardizing the flow of information, metrics, and data through the Nation's complex transportation system.

Furthermore, FHWA incorporates multiple mechanisms to ensure efficient and effective deployment and adoption of innovations. Programs like EDC and STIC are State-based models that identify and deploy proven, yet underutilized, transportation innovations.

These programs facilitate the adoption of new innovations through funding and establishing measurable goals to save time and resources.^(6,9) Competitive programs, such as the AID Demonstration and AMR, require pilot projects to demonstrate tangible outcomes and share lessons learned, fostering transparency, accountability, and efficiency among recipients.^(7,8) The programs also emphasize technical assistance, peer exchanges, and training through Technology Deployment Support to effectively guide agencies and track progress.

Efficiency is embedded in targeted initiatives like the AID-PT and ADCMS, which mandate demonstration projects, adherence to updated guidelines, and performance evaluations focused on enhancing safety, durability, and efficacy.^(11,12) The ATTAIn program funds the integration of advanced technologies with requirements for outcome reporting, ensuring public and agency benefits.⁽¹³⁾ In addition, Innovative Finance efforts promote responsible and efficient management of transportation funds, while ongoing research infrastructure and T2 activities maintain alignment with strategic goals and minimize duplication. Across these efforts, consistent performance metrics, reporting requirements, and collaborative partnerships uphold a culture of efficiency, facilitating the successful implementation of important transportation innovations.

FHWA evaluates research projects thoroughly, coordinates resources to meet priorities, and provides effective oversight of the research budget. The Exploratory Advanced Research (EAR) initiative employs rigorous selection and review processes, involving technical experts from various agencies, to identify and advance high-potential innovations. Similarly, the SBIR program enforces structured project phases and technology readiness assessments to guide innovations toward successful commercialization, maintaining transparency and progress tracking. The program also fosters collaboration and efficiency via its research infrastructure, T2, and partnership activity, which supports the operation of TFHRC and promotes effective stakeholder communication. These efforts are reinforced through annual reporting and the dissemination of research findings, which promote transparency and continual improvement. Coordinating research efforts across agencies and academic institutions helps avoid duplication and align activities with DOT strategic goals, thereby enhancing efficiency throughout the program's innovation pipeline.

The crosscutting programs build efficiency through data-driven performance management and reporting. HDI and NPMRDS activities continually develop and maintain travel, infrastructure, and performance datasets, enabling effective performance analyses by MPOs, States, and FHWA. The program supports the statutorily required biennial C&P Report and the HCAS, ensuring FHWA meets congressional mandates and provides clear, empirical evidence on infrastructure conditions, usage costs, and funding allocations.^(23,24) Global outreach and Federal Lands Highway initiatives further reinforce efficiency by benchmarking international innovations and rigorously testing emerging technologies on public lands, respectively. These activities include formal knowledge exchanges, pilot evaluations of resilient designs and mobility solutions, and performance tracking to verify benefits before wider deployment.

Together, these layered efficiency measures, from shared governance and performance-based metrics to rigorous project evaluations, ensure that FHWA's RD&T investments deliver timely, real, measurable, and effective benefits. By requiring compliance with updated standards, fostering transparent data sharing, and including iterative feedback through pilot programs and stakeholder partnerships, FHWA holds itself and its stakeholders responsible for the successful and efficient deployment of innovations.

Table 1. FY 2026 RD&T Program Funding Details

The FY 2026 RD&T program funding table shows how much funding is dedicated to each RD&T program. It includes the amount of funds for each program in the FY 2026 U.S. President’s budget request and the total amount spent on applied research, T2, facilities, experimental development, and major equipment and R&D equipment. FHWA does not fund basic research but uses most of the funds on technology deployment and applied research.

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)
Improving Highway Safety	Safety Program Delivery	3,207	0	3,207	0	0	0
	Safety Design and Operations	7,585	6,123	1,462	0	0	0
	Safety Data and Analysis	4,243	2,709	1,534	0	0	0
	Human Factors Analytics	1,699	1,699	0	0	0	0
	TOTALS	16,734	10,531	6,203	0	0	0
Improving Infrastructure Integrity, Resilience, and Practices	Construction and Project Management	1,721	514	512	0	695	0
	Geotechnical and Hydraulics	4,133	1,498	1,137	0	1,498	0
	LTIP	6,313	4,031	938	0	1,344	0
	Pavements and Materials	8,414	6,353	0	0	2,061	0
	Structures	10,904	5,286	2,936	0	2,682	0
	Transportation Performance and Asset Management	1,148	0	738	0	410	0
	TOTALS	32,633	17,682	6,261	0	8,690	0

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)
Strengthening Transportation Planning, Environment, and Realty Decisionmaking	Accelerating Project Delivery	3,597	2,792	805	0	0	0
	Performance-Based Planning	2,774	2,125	325	0	324	0
	Modeling and Analysis Tools	2,274	931	910	0	433	0
	Resiliency	1,407	650	325	0	432	0
	Multimodal Connectivity	1,406	1,060	173	0	173	0
	TOTALS	11,458	7,558	2,538	0	1,362	0
Reducing Congestion, Improving Operations, and Enhancing Freight Productivity	TSMO	7,420	6,975	445	0	0	0
	MUTCD	3,434	2,404	687	0	343	0
	Automation and Connectivity	7,540	6,183	603	0	754	0
	Managing Disruptions to Operations	6,330	2,804	788	0	2,738	0
	Freight Management and Operations	2,830	2,462	57	0	311	0
	Truck Size and Weight	920	644	0	0	276	0
	TOTALS	28,474	21,472	2,580	0	4,422	0
Accelerating the Implementation and Delivery of New Innovations and Technologies	EDC	6,036	0	6,036	0	0	0
	STIC Incentive	6,063	0	6,063	0	0	0
	AID	8,036	0	8,036	0	0	0
	AMR	2,705	0	2,705	0	0	0
	Innovative Finance	2,133	1,057	1,076	0	0	0
	AID-PT	12,000	300	8,000	300	2,200	1,200
	Accelerated Implementation and Deployment of ADCMS	20,000	500	3,000	250	250	16,000
	ATTAIN	39,000	31,200	7,800	0	0	0
	Research Infrastructure, Technology Transfer, and Partnerships	5,683	1,491	3,565	0	627	0
	TOTALS	101,656	34,548	46,281	550	3,077	17,200

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)
Accelerating the Discovery of Impactful Solutions	Research Infrastructure, Technology Transfer, and Partnerships	14,876	4,437	8,994	0	1,445	0
	EAR	5,131	5,131	0	0	0	0
	SBIR	3,462	3,462	0	0	0	0
	SIRC	15,000	0	15,000	0	0	0
	National Motor Vehicle Per-Mile User Fee	10,000	10,000	0	0	0	0
	TOTALS	48,469	23,030	23,994	0	1,445	0
Crosscutting	Policy Analysis	4,319	3,608	411	0	300	0
	Global Outreach	726	326	400	0	0	0
	HDI	6,971	5,001	1,836	0	134	0
	NPMRDS	1,800	1,292	474	0	34	0
	Federal Lands Highway	3,760	2,412	1,348	0	0	0
	TOTALS	17,576	12,639	4,469	0	468	0
Administrative Costs	Administrative Costs	9,595	2,745	5,862	0	988	0
Totals		266,595	131,317	98,976	550	18,552	17,200

The AMRP reflects funding as found in the annual President's budget request per 49 U.S.C. Chapter 65 Sec. 6501 Research Planning.⁽²⁵⁾ The enacted numbers will be posted as part of the President's budget request for the ensuing fiscal year.

The administrative costs detailed in table 1 represent 34.7 percent of the total RT&E administrative budget for the estimated FHWA FY 2026 RT&E program. This percentage reflects the proportion of HRD and TIDP in the overall FY 2026 estimated RT&E budget. The overall estimated RT&E administrative budget appears in Exhibit IV-1 ("DOT, FY 2026 Budget - FHWA RT&E Budget Narrative") of the USDOT's *Budget Estimates Fiscal Year 2026: Federal Highway Administration* report.⁽²⁶⁾

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

The following table shows the amount of FY 2026 funds in the President's budget request for each RD&T program for each of the DOT strategic goals.

RD&T Program Name		FY 2026 U.S. President's Budget Request (\$000)	Safety	Infrastructure	Innovation	Efficiency
Improving Highway Safety	Safety Program Delivery	3,207	3,207	0	0	0
	Safety Design and Operations	7,585	7,585	0	0	0
	Safety Data and Analysis	4,243	4,243	0	0	0
	Human Factors Analytics	1,699	1,699	0	0	0
	Totals	16,734	16,734	0	0	0
Improving Infrastructure Integrity, Resilience, and Practices	Construction and Project Management	1,721	413	654	654	0
	Geotechnical and Hydraulics	4,133	537	1,736	1,860	0
	LTIP	6,313	252	1,894	4,167	0
	Pavements and Materials	8,414	505	4,207	3,702	0
	Structures	10,904	2,399	4,907	3,598	0
	Transportation Performance and Asset Management	1,148	103	689	356	0
	Totals	32,633	4,209	14,087	14,337	0
Strengthening Transportation Planning, Environment, and Realty Decisionmaking	Accelerating Project Delivery	3,597	487	325	837	1,948
	Performance-Based Planning and Programming	2,774	841	0	455	1,478
	Modeling and Analysis Tools	2,274	0	227	1,137	910
	Resiliency	1,407	70	704	563	70
	Multimodal Connectivity	1,406	517	567	91	231
	Totals	11,458	1,915	1,823	3,083	4,637

RD&T Program Name		FY 2026 U.S. President's Budget Request (\$000)	Safety	Infrastructure	Innovation	Efficiency
Reducing Congestion, Improving Operations, and Enhancing Freight Productivity	TSMO	7,420	1,410	1,707	3,858	445
	MUTCD	3,434	1,718	1,030	343	343
	Automation and Connectivity	7,540	4,298	0	3,242	0
	Managing Disruptions to Operations	6,330	3,165	526	2,157	482
	Freight Management and Operations	2,830	425	990	1,132	283
	Truck Size and Weight	920	340	451	55	74
	Totals	28,474	11,356	4,704	10,787	1,627
Accelerating the Implementation and Delivery of New Innovations and Technologies	EDC	6,036	1,509	0	4,527	0
	STIC Incentive	6,063	1,516	0	4,547	0
	AID	8,036	2,009	0	6,027	0
	AMR	2,705	676	0	2,029	0
	AID-PT	12,000	360	6,000	5,640	0
	ADCMS	20,000	600	10,000	9,400	0
	ATTAIN	39,000	7,800	7,800	19,500	3,900
	Innovative Finance	2,133	0	0	2,133	0
	Research Infrastructure, Technology Transfer, and Partnerships	5,683	1,370	1,438	1,438	1,437
	Totals	101,656	15,840	25,238	55,241	5,337
Accelerating the Discovery of Impactful Solutions	Research Infrastructure, Technology Transfer, and Partnerships	14,877	3,720	3,017	6,523	1,617
	EAR	5,131	513	513	4,105	0
	SBIR	3,462	346	346	2,770	0
	SIRC	15,000	0	0	15,000	0
	National Motor Vehicle Per-Mile User Fee Pilot	10,000	0	0	10,000	0
	Totals	48,469	4,579	3,876	38,398	1,616

RD&T Program Name		FY 2026 U.S. President's Budget Request (\$000)	Safety	Infrastructure	Innovation	Efficiency
Crosscutting	Policy Analysis	4,319	0	0	3,887	432
	Global Outreach	726	203	182	341	0
	HDI	6,971	1,882	1,394	1,952	1,743
	NPMRDS	1,800	486	360	504	450
	Federal Lands Highway	3,760	412	802	542	2,004
	Totals	17,576	2,983	2,738	7,226	4,629
Administrative Costs	Administrative Costs	9,595	2,399	2,399	2,399	2,398
Totals		266,595	60,015	54,865	131,471	20,244

The AMRP reflects funding as found in the FY 2026 annual President's budget request per 49 U.S.C. Chapter 65 Sec. 6501 Research Planning.⁽²⁵⁾ The current fiscal year-enacted numbers will be posted as part of the President's budget request for the ensuing fiscal year.

The administrative costs detailed in table 2 represent 34.7 percent of the total RT&E administrative budget for the estimated FHWA FY 2026 RT&E program. This percentage reflects the proportion of HRD and TIDP in the overall FY 2026 estimated RT&E budget. The overall estimated RT&E administrative budget appears in Exhibit IV-1 ("DOT, FY 2026 Budget - FHWA RT&E Budget Narrative") of the DOT's *Budget Estimates Fiscal Year 2026: Federal Highway Administration* report.⁽²⁶⁾

Chapter 1—FY 2026 RD&T Programs

Improving Highway Safety (\$16,734,000)

Program Description

FHWA's Improving Highway Safety program supports USDOT's strategic Safety goal by conducting safety research to transform the Nation's transportation system, strengthen transportation agencies' professional capabilities through training, and assist USDOT in applying the Safe System Approach to accelerate the number of lives saved on America's roads.⁽¹⁵⁾ The program also supports the legislated HSIP, which aims to significantly reduce fatalities and serious injuries on all public roads.

This program also advances the safety infrastructure work that overlaps with traffic engineering, roadway geometric design, transportation planning, and system management and operations. The program aims to help stakeholders reduce fatalities and serious injuries on public roadways. Further research into data analysis aims to improve State and local data systems that commonly record crashes, roadway inventory, and traffic volume data. The program also advances research needs among roadway users to better understand human factors and the relationship among all users, infrastructure, and vehicles.

Major Program Objectives

FHWA's Improving Highway Safety program will apply the six principles of the Safe System Approach: deaths and serious injuries are unacceptable, humans make mistakes, humans are vulnerable, responsibility is shared, safety is proactive, and redundancy is crucial.⁽¹⁵⁾ The program focuses on countermeasure development that leverages innovation and cutting-edge technology to protect road users, whether or not those users are in a vehicle. It will also invest in topics such as data-driven analysis and tools, human factors, and improving the technical capacity of transportation practitioners.

Pedestrian safety continues to be a focus of the broader safety program because pedestrian fatalities continue to be at high levels as compared to all other traffic fatalities. Pedestrian safety efforts continue to aim at wider adoption and implementation of proven strategies, countermeasures, and technologies. In FY 2026, FHWA's Human Factors Team will use the recently expanded capability of its virtual reality tool to support and evaluate various pedestrian and bicyclist testing, including evaluating infrastructure-based solutions to improve roadway safety (e.g., by communicating cooperative driving-enabled alerts that are transmitted to pedestrians to enhance pedestrian safety). Further human factors initiatives will assess cooperative driving operations, safety applications, and use cases to understand human behavior effects. New analytics are under development to provide greater focus on how roadway lighting and lighting from guideway bollards along the road edge increase the conspicuity and visibility of pedestrians from a driver's perspective.

Anticipated Program Activities

FHWA's Improving Highway Safety program aims to conduct a range of R&D activities that support the evolving needs of roadway users and advance FHWA's commitment to the Safe System Approach.⁽¹⁵⁾ New work activities will expand detection technologies for all users. Further activities on intersection and roadway departure research will yield more precise factors to evaluate the effectiveness of safety countermeasures. Continued work with FHWA stakeholders in the HSIP and other roadway safety programs will increase the deployment of lifesaving safety countermeasures for roadway users.

The program will also support activities to improve safety for people walking by implementing the Safe System Approach and managing kinetic energy through speed management activities.⁽¹⁵⁾ The ISS prototyping effort will accelerate market-ready technologies that improve the sensing of all road users immediately around an intersection. Additional activities through 2027 will explore prototype development and assessment.

FHWA and the TRB's NCHRP are developing new testing procedures to examine vehicle-side impacts on barriers. FHWA is also updating and developing new barrier designs that are tailored to the specific needs of national parks and will be tested for compliance with safety standards and materials.

FY 2026 Improving Highway Safety activities will focus on Data and Analysis, Safety Design and Operations, and Safety Program Delivery. Initiatives will include the following:

Wildlife crossing safety: Developing infrastructure best practices and wildlife detection technology to reduce wildlife-vehicle collisions.

MASH: Provide technical assistance to AASHTO as the organization updates and modifies its manual to include new vehicle fleet and testing criteria for hardware previously not included.⁽¹⁷⁾

Key FY 2026 FHWA Improving Highway Safety R&T Program Activities.

Activity
Safety Program Delivery (\$3,207,000)
Safety Design and Operations (\$7,585,000)
Safety Data and Analysis (\$4,243,000)
Human Factors Analytics (\$1,699,000)

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

A range of anticipated program outcomes express the breadth of this program.

Safety Program Delivery

The goal of Safety Program Delivery activities is to reduce the number of motor vehicle fatalities and serious injuries on the Nation's roads by providing guidance, policies, tools, and technical assistance to improve roadway safety. FHWA will continue to advance the Safe System Approach and its implementation through the HSIP and other roadway safety programs and efforts.⁽¹⁵⁾ In FY 2026, efforts will build on the FY 2025 activities and ensure alignment with the USDOT priorities and the FHWA strategic plan. The focus will be on advancing the HSIP, proven safety countermeasures, a data-driven approach to safety (centering on intersections, roadway departure, pedestrian safety, and speed management).

Safety Design and Operations

Under the Safety Design and Operations activity, FHWA staff are leading and collaborating on a range of initiatives aimed at improving roadway infrastructure and reducing fatalities and serious injuries for all users. These initiatives span traffic engineering, roadway geometric design, roadside safety, alternative intersection design, transportation planning, system operations and management, speed management, data-driven safety analysis, and infrastructure readiness for vehicle automation and connected technologies.

In FY 2026, FHWA will continue to research and promote the adoption of effective safety countermeasures, in collaboration with State DOTs and local transportation agencies. Emphasis will be placed on identifying how real-time operations data can be leveraged to proactively address safety challenges, close critical information gaps, and support performance-based safety decisionmaking. Research on driver and pedestrian behavior at crosswalks is expected to expand from closed-course to naturalistic environments, enhancing understanding of human interaction with roadway design elements.

In collaboration with the National Park Service, the FHWA Office of FLH will continue to evaluate innovative aesthetic barriers designed to meet the MASH standards for guide rails, bridge rails, and transitions.⁽¹⁷⁾ Additionally, TFHRC is conducting a safety performance evaluation of point-to-point speed safety camera enforcement through pilot testing to assess the effectiveness of automated techniques, which have demonstrated potential to save lives. In FY 2026, this project will develop a technical report on findings of the point-to-point speed safety camera and/or speed safety camera technologies, along with insights and recommendations shared by stakeholders in FY 2025. Also, field data collection and analysis to support evaluation of the safety effectiveness of the point-to-point speed safety camera system in school and work zones will be conducted at selected pilot sites.

Data and Analysis

Data-driven technologies and decisionmaking are key themes for all FHWA programs, especially for the Improving Highway Safety program. The Data and Analysis activity reflects the emphasis placed on supporting highway infrastructure investment decisionmaking. The main goal of the activity is to advance the use of data analytics and

decision-support tools to enhance roadway safety, with a focus on equipping transportation agencies and infrastructure owners with science-based methods for making informed, lifesaving safety investments. Efforts in FY 2026 will build on the FY 2025 activities and ensure alignment with the new USDOT priorities and the FHWA strategic plan. In FY 2026, continued work on developing CMFs for the safety performance of Rectangular Rapid Flashing Beacons, left-turn lanes, enhanced delineation for curves, alternative rumble stripes, and delineation of fixed objects will focus on data collection and analysis. New CMFs will be initialized for intersection designs that promote pedestrian safety and for reducing roadway departure crashes.

Human Factors Analytics

The Human Factors Analytics activity aims to accomplish the following:

- Identify how human factors may guide safety programs and enable innovative approaches to improving safety.
- Improve the effectiveness of safety countermeasures as well as tools that promote operational efficiency.
- Understand how CAVs can be safely integrated into the Nation's roadway systems by evaluating the human behaviors related to the deployment of cooperative automation.
- Improve roadway designs that meet the needs of all users.
- Understand how people respond to the roadway environment, including signs and markings, emerging vehicle and roadway technology, innovative operational changes, safer streets with improved walkability, and other new roadside innovations.
- Identify how human factors may guide safety programs and enable innovative approaches to improving safety.

This research aims to identify and analyze the factors that contribute to traffic-related fatalities and serious injuries. In FY 2026, the research scope will be broadened to examine emerging safety considerations associated with the deployment of AV technologies and their interaction with existing roadway infrastructure. Planned research activities include an evaluation of how advanced lighting technologies and their interaction with existing roadway infrastructure may improve the nighttime detection and recognition of pedestrians and other nonmotorized road users by both AVs and conventional vehicles. A related study will examine the effectiveness of bollard lighting—low-level lighting fixtures installed in roadways and pathways—in enhancing pedestrian conspicuity during nighttime conditions. Additionally, guidelines for variable message signage during nonrecurring events will incorporate human-response research to explore how this technology can support proactive roadway management and reduce the risk of secondary crashes. Ongoing research will also focus on developing operational guidance for CDA aimed at promoting safe AV operation in environments with pedestrians and other road users. This effort will specifically address how CDA and ISS can enhance safety outcomes during interactions with road users and ADS-equipped vehicles.

Potential Economic or Societal Impacts

The implementation of the Safe System Approach has resulted in dramatic improvements in highway safety around the world.⁽¹⁵⁾ In the Improving Highway Safety program, FHWA uses the Safe System Approach as a guide toward defining the priorities for the whole program. FHWA's view of the safety of the transportation system is broadened through the Safe System Approach, which encompasses working closely with roadway professionals beyond the safety discipline and with agencies and organizations responsible for other aspects of the transportation system to achieve safe roads, safe speeds, safe people, safe vehicles, and better post-crash care. Annually, road deaths claim the lives of close to 40,000 people and cost taxpayers and businesses an estimated \$340 billion dollars. The program continues to deliver significant benefits by saving lives, reducing travel time, and lowering costs for people, employers, and Government agencies.

Potential Progress Toward Achieving Modal Strategic Goals

FHWA's Improving Highway Safety program is well-positioned to advance safety by implementing the Safe System Approach and prioritizing reduction of fatalities and serious injuries through data-driven decisionmaking, performance monitoring, and rapid deployment of proven countermeasures.⁽¹⁵⁾ By leveraging real-time operations data, crash and exposure analytics, and human factors research, the program can accelerate adoption of new effective safety designs. The virtual reality tool and ISS prototyping activities further support evidence-based testing and stakeholder feedback, enabling safer roadway environments before wide-scale deployment.

In terms of infrastructure, the program advances integration across traffic engineering, roadway design, and system operations, aligning safety design with the Safe System principles and updating barrier designs, lighting, and roadside configurations to maximize safety gains.⁽¹⁵⁾ Ongoing collaborations with FHWA, State DOTs, Federal, and national partners, along with the development of new testing procedures, foster more cohesive and efficient infrastructure investments that should yield infrastructure that not only improves safety but also enhances reliability and performance of the overall transportation system, with clearer pathways from research to implementation.

Regarding innovation and efficiency, the program emphasizes accelerated research to implementation, data interoperability, and standardized governance to minimize duplicative research and expedite decisionmaking. By focusing on data analytics, CMFs, decision-support tools, and cross-program coordination, FHWA can achieve the greatest safety impacts, potentially reducing lifecycle costs and improving return on investment. Continued emphasis on human factors, virtual reality-enabled testing, and market-ready technologies positions the agency to rapidly adopt emerging solutions. Overall, these elements collectively bolster progress toward safety; infrastructure resilience; operational innovation; and efficient, evidence-based delivery.

Collaboration Partners

FHWA's Improving Highway Safety program fosters collaboration both internally and externally to develop research activities and exchange information among peer organizations. FHWA manages TPF studies, such as the Traffic Control Devices, Evaluation

of Low-Cost Safety Improvements, Highway Safety Manual Implementation, and Naturalistic Driving studies, working with State DOTs, local agencies, and associations to address research needs to enhance efficient implementation. FHWA staff actively participate in national and international organizations and committees such as PIARC; TRB; AAA Foundation for Traffic Safety; ITE; AASHTO; NSC; and Operation Lifesaver, Inc.

Improving Infrastructure Integrity, Resilience, and Practices (\$32,633,000)

Program Description

FHWA's Improving Infrastructure Integrity, Resilience, and Practices program encompasses a strategically coordinated portfolio of RD&T activities aimed at leading, supporting, and enabling improvements in highway infrastructure integrity, resilience, and practices. The program develops and provides the data, information, and decision-support systems needed to connect Federal transportation investments with measurable improvements in infrastructure performance. The program delivers practical tools, innovative technologies, and evidence-based guidelines that highway owners can use to effectively preserve, manage, and enhance infrastructure performance while addressing evolving user needs.

Major Program Objectives

The overarching objective of FHWA's Improving Infrastructure Integrity, Resilience, and Practices program is to support and enable advances in infrastructure materials, engineering, construction, and management practices to bring about improved infrastructure integrity, longevity, and safety. The program works to achieve the following:

- Modernize infrastructure construction, contracting, and stewardship practices to deliver more durable, resilient assets and safer work zones.
- Improve the performance, safety, and resilience of the Nation's highway infrastructure.
- Innovate and deploy advanced, longer lasting materials to extend infrastructure service life.
- Advance digital delivery to improve efficiency and enable informed, data-driven decisions throughout the infrastructure lifecycle.
- Equip agencies with integrated tools and guidance for effective, lifecycle-based infrastructure management.

The program also focuses on developing and implementing innovative technologies aimed at significantly enhancing the durability, and therefore the long-term safety, of bridges and pavements. By extending the lifespan of these structures and reducing the frequency of repairs or replacements, fewer materials are consumed over time, and fewer disruptions to the traveling public are required. This decreased demand reduces maintenance costs and optimizes materials use, enabling resources to be allocated to other critical projects, improving overall resource availability across the infrastructure network. The program also supports the implementation of the updated NBIS and the NTIS, thereby enhancing the safety of these vital transportation assets.^(21,22) Additionally, FHWA research delivers the critical data and information infrastructure owners need to improve pavement and bridge conditions and provides actionable tools, technologies, and guidance to advance the strategic management of highway infrastructure and system performance.

Anticipated Program Activities

To improve project delivery efficiency, FHWA's Improving Infrastructure Integrity, Resilience, and Practices program supports the digital transformation of highway construction. Progress is being made through collaboration with State DOTs in multiple transportation TPF studies, each involving more than 20 State DOTs, and by funding pilot projects via the ADCMS grant program.⁽¹²⁾ Additionally, FHWA's research and technical assistance efforts are filling key gaps, ensuring a coordinated national approach so the industry can move forward with a unified, rather than fragmented, solution.

In FY 2026, the TFHRC PTF will continue its accelerated pavement testing experiments, with a focus on evaluating the durability and long-term performance of novel materials to support their expedited deployment. The research aims to rapidly assess the long-term performance of these materials, broaden the use of quarry byproducts, and improve AI-driven tools for automated pavement distress detection.

Planned FY 2026 program activities are listed in the following table. These activities encompass projects spanning the technology spectrum from applied research through the deployment of established technologies and address infrastructure lifecycle phases from design onward. Allocation of funding among these activities has been adjusted from prior years based on current needs and priorities.

Key FY 2026 FHWA Improving Infrastructure Integrity, Resilience, and Practices R&T Program Activities.

Activity
Construction and Project Management (\$1,721,000)
Geotechnical and Hydraulics (\$4,133,000)
LTIP (\$6,313,000)
Pavements and Materials (\$8,414,000)
Structures (\$10,904,000)
Transportation Performance and Asset Management (\$1,148,000)

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

Construction and Project Management

FHWA's Construction and Project Management activity's mission is to improve our Nation's transportation system by providing program assistance, advancing innovative technologies, promoting performance management, and evaluating and providing innovation that leads to the successful and efficient delivery of construction projects for the FAHP. The activity advances the digital transformation of construction practices to achieve long-lasting benefits to the Nation's infrastructure.

FHWA has been actively working to advance BIM in the United States. While BIM is often referred to as building information models, it is increasingly recognized as better information management, a holistic approach to managing data across the entire lifecycle of an asset. A BIM approach liberates data from siloed systems, making it easier for automated processes to generate asset information and provide it to anyone who needs it at any time. BIM enables the development of semantically rich digital twins of the physical infrastructure assets and is a foundational component of digital infrastructure. Digital infrastructure augments these digital twins with real-time data occurring on the network (e.g., traffic, work zones, incidents, weather). Digital infrastructure will significantly increase efficiency during project delivery and enhance the reliability of road safety systems by providing more complete and timely roadway infrastructure data. FHWA has worked with the State DOTs to establish and cofund two BIM TPF projects so that States can work together, rather than independently, to advance the state of the practice. In FY 2026, FHWA will continue to closely work with State DOTs and other organizations to advance BIM.

Additionally, FHWA recently joined buildingSMART International and will be engaging with countries and industry to further develop the open data exchange standard, created in the Industry Foundation Classes format, which has been adopted by AASHTO.⁽²⁷⁾

Geotechnical and Hydraulics

The FHWA Geotechnical and Hydraulics programs provide program assistance and technical expertise and support innovative research related to hydrology, highway drainage, culvert and bridge hydraulics, scour, coastal highways, structural and subsurface foundations, geohazards, and ground improvements. The programs also conduct applied research to advance the state of the practice and develop innovative hydraulics and geotechnical solutions for practical transportation challenges.

Activities supporting this mission aim to evaluate the behavior, durability, and engineering properties of soils, rocks, and alternative fills; analyze interactions between natural and built environments; and enhance methods for testing, design, construction, and maintenance practices for roadways, bridge foundations, retaining walls, and embankments. Efforts also include the development of tools for highway drainage systems and the promotion of advanced approaches to hydraulic design of bridges and culverts, including scour mechanics and coastal engineering. Outcomes include new research, datasets, tools and technologies, guidance, and training that support innovation in geotechnical design and construction, site and laboratory characterization, geotechnics of scour and pavements, asset and performance management, and hydrologic modeling for extreme events and floodplain dynamics.

In FY 2026, the FHWA Geotechnical and Hydraulics programs will continue to perform soil and erosion testing services for bridge scour evaluations supporting the scour and hydraulic design of the Francis Scott Key Bridge and America's Bridge Crossing replacement projects; update hydrologic and hydraulic software enhancements; advance NextScour research findings through proposed innovations in scour design and soil erosion resistance; evaluate water film thickness for flexible and rigid pavement systems; engage in

assessing the long-term material durability of buried infrastructure assets; improve the construction and performance monitoring of paved and unpaved road foundations through the evaluation and integration of intelligent compaction systems, innovative materials, and novel quality assurance technologies; and produce high-quality material testing datasets that owners can use to inform risk-based decisions. State DOTs will collaborate with FHWA on several of these projects through FHWA-led TPF studies. Expected outcomes include the adoption and integration of innovative methods and technologies, the development and utilization of comprehensive datasets, and the implementation of advanced practices in geotechnical and hydraulic engineering. These efforts support more efficient design, construction, and management of related infrastructure, ultimately enhancing their durability and improving long-term performance.

Long-Term Infrastructure Performance

In FY 2026, LTIP outputs will include the expansion of datasets documenting highway infrastructure performance and findings derived through analysis of highway infrastructure performance data. Outcomes will include more widespread application of FHWA datasets through machine learning and other AI modeling, accelerating the rate at which findings and insights are generated, and enhancing the understanding of highway infrastructure performance. Application of the knowledge gained will result in better highway infrastructure design, more effective management of highway infrastructure conditions, and ultimately safer and longer lasting roads and bridges.

Pavements and Materials

Pavements and Materials outputs will include research findings and data on material innovations, pavement durability and resilience, proposed specifications and guidelines for material selection and mixture design, guidelines for the use of local materials, approaches for building and maintaining pavements that lead to lower lifecycle cost, improved pavement assessment methods, and guidance for more effective management of pavement performance. Research is ongoing at TFHRC's PTF to assess asphalt additives that can facilitate the responsible use of recycled materials, helping to address the availability of essential materials in pavement construction. The PTF is also using instrumented sections to improve pavement design models and methodologies to extend pavement life. The TFHRC Asphalt Binder and Mixtures Laboratory is studying the feasibility of antioxidants in asphalt pavements to reduce aging and delay rehabilitation needs. The TFHRC Concrete Laboratory is researching novel materials to identify or develop test methods and practices that can assess the long-term performance of admixtures. The TFHRC Chemistry Laboratory is developing a job-mix test for alkali-silica reactivity determination, allowing stakeholders to avoid material combinations that will lead to costly future repairs. Ultimately, this work will contribute to reducing the lifecycle cost and providing improvements in system performance, reliability, and safety.

Structures

Structure outputs will include revised guidelines, training, and systems in support of the updated NBIS and NTIS, as well as proposed guidelines and specifications for innovations in bridge design, preservation, and construction.^(21,22) Outcomes arising from this work will include more effective bridge and tunnel safety inspection practices and more durable and

resilient bridges and structures, thereby contributing to improvements in system performance, reliability, and safety. Research investigating the additive manufacturing of steel structural components will begin to deliver the findings necessary for the deployment of this technology in bridges. The widespread use of ultra-high performance concrete will be enabled through the development of standardized test methods and a material performance assessment framework.

Transportation Performance and Asset Management

The research in Transportation Performance and Asset Management produced next-generation performance measures as well as benefit–cost and tradeoff analysis tools, training, and guidelines. These outputs will contribute to achieving more comprehensive lifecycle planning and support risk analysis that considers system resilience to bring about more effective management of highway system performance. FY 2026 will include implementation activities for these products.

Potential Economic or Societal Impacts

The potential economic and societal impacts of FHWA’s infrastructure research investments are substantial. The improvements in infrastructure condition, performance, resilience, construction, and management enabled by this work will make highways safer and improve system reliability. As a result, the social and economic costs of highway transportation will be reduced.

Potential Progress Toward Achieving Modal Strategic Goals

FHWA’s Improving Infrastructure Integrity, Resilience, and Practices program is positioned to advance the draft FY 2026–2030 USDOT strategic goals by accelerating the adoption of data-driven decisionmaking, digital delivery, and lifecycle-based asset management. By advancing BIM and digital infrastructure, expanding AI-driven analysis, and integrating tools for performance monitoring, the program can improve the durability and resilience of highways, bridges, and pavements while enabling faster, more cost effective project delivery. Strengthened data systems and decision-support capabilities will help agencies target investments where they yield the greatest safety and reliability gains.

The program’s emphasis on implementing the updated NBIS and NTIS, improved materials and construction practices, and better lifecycle management should reduce long-term maintenance needs and extend asset life, thereby enhancing roadway safety and infrastructure performance. The focus on innovative materials, durability testing, and automated distress detection accelerates deployment of safer, longer-lasting solutions. The program’s digital transformation efforts, digital twins, data interoperability, and integrated project delivery support innovation and efficiency by facilitating cross-agency collaboration, efficient and effective governance, and more informed decisionmaking, potentially lowering lifecycle costs and reducing disruption to the traveling public.

Collaboration Partners

FHWA infrastructure leaders and program staff regularly engage with key stakeholders in both formal and informal settings to gather input on challenges and opportunities that the program might address. They collect information on related work undertaken by other organizations, both nationally and internationally. Stakeholders include representatives of individual State DOTs; pertinent committees of AASHTO and TRB; industry organizations (e.g., the American Society of Civil Engineers; NAPA; ACPA; the National Stone, Sand & Gravel Association; the Precast/Prestressed Concrete Institute; the National Steel Bridge Alliance; the Deep Foundations Institute; the International Association of Foundation Drilling; the Geosynthetic Materials Association; AGC; and ARTBA); standard-setting organizations, such as ACI and ASTM International; and university faculty engaged in related work. Peer exchanges and technical feedback group meetings are held to exchange best practices and ascertain stakeholder needs. Participation in TPF projects provides for collaboration with State and industry stakeholders to address shared issues.

State DOTs responsible for the pavements and bridges studied through LTIP research play a crucial role in supporting data collection efforts, making the research possible. In addition, FHWA LTIP staff regularly engage with stakeholders in both formal and informal settings to gather input concerning challenges and opportunities that might be addressed through the program and information on related work undertaken by other organizations, both nationally and internationally. A State coordinators group has been established for each program as a forum to strengthen the collaboration between FHWA and the State DOTs.

FHWA engages with the other DOT modal administrations through the USDOT State of Good Repair working group and activity-specific collaboration. FHWA also collaborates with NIST, FLMAs, USGS, and NOAA on topics of mutual interest and concern. Formal interactions with external stakeholders such as AASHTO, TRB, and industry organizations typically occur at regular intervals (at least annually and as often as quarterly) but are not formally tracked or measured. Ad hoc interactions in the form of technical assistance requests are logged on an internal collaborative platform.

Strengthening Transportation Planning, Environment, and Realty Decisionmaking (\$11,458,000)

Program Description

FHWA's Strengthening Transportation Planning, Environment, and Realty Decisionmaking program will carry out RD&T activities to improve transportation planning, environmental decisionmaking, and right-of-way acquisition processes that will minimize the potential impacts of surface transportation on the environment and reduce costs.

Accelerating Project Delivery

The Accelerating Project Delivery activity supports innovative research programs to address environmental stewardship in planning and project delivery. This activity helps FHWA develop well-informed and environmentally sound transportation projects and initiatives from planning through NEPA implementation, improved coordination and communication between agencies and the public, and capacity-building initiatives for planning and environmental practitioners.⁽²⁸⁾

Accelerating Project Delivery research also supports the development of rulemaking, guidance, and best practices for the real property acquisition, appraisal, relocation, and property management processes.

Performance-Based Planning and Programming

The Performance-Based Planning and Programming activity supports title 23 U.S.C. §§ 134, 135, and 150 and implements title 23 CFR Parts 420 and 450, in which the USDOT is required to work with States and MPOs to encourage continuous improvement and evolution of the metropolitan and statewide transportation planning processes using a performance-based approach. (See references 29–33.) FHWA assists States and MPOs in documenting and meeting performance measures and associated targets related to national highway and transit performance goals. FHWA also provides risk-based stewardship and oversight on performance measures and targets.

The Performance-Based Planning and Programming activity will work with States and MPOs to increase safety, efficiency, and transparency to the public; provide a strategic and data-driven approach to transportation decisionmaking; and ensure agencies implement performance management while efficiently allocating resources, maximizing the return on investments, and achieving desired performance goals. Performance measures and targets are connected through long-range transportation plans and transportation improvement programs developed at the statewide and metropolitan levels. Performance-Based Planning and Programming research will also advance multimodal networks through the development of resources that improve access and mobility. This activity includes ensuring multimodal mobility options while integrating efficient and affordable innovations in transportation plans, programs, and projects.

Modeling and Analysis Tools

The Modeling and Analysis Tools research activity focuses on developing new and refining existing analytical tools. These tools help decisionmakers select highway projects that improve the performance of the Nation's highway system while minimizing the potential impacts of surface transportation on the environment. These tools will enhance transportation planning and decisionmaking in a cost-efficient and environmentally responsible manner. This research supports the opportunity for communities to participate fully in highway project decisionmaking by providing more comprehensive and accurate information about the environmental impacts of highway projects and alternatives being considered for each project.

The research activity aims to provide stakeholders, including States, MPOs, grant recipients, and the public, with tools, data, and a regulatory framework. The research activity also explores and adapts modeling methodologies for transportation planning to allow States and MPOs to better understand their transportation systems. In addition, the activity provides decisionmakers with actionable techniques and tools to better understand how a complex transportation system reacts to investments and policy changes and efficiently makes tradeoffs between performance metrics.

As part of this research activity, models and tools are developed to assess and analyze the potential environmental impacts of highway projects and address congestion caused by the high demand for travel on the highway system. These tools can also be used to analyze corridor and system operations to increase travel-time reliability, manage travel demand, and improve connectivity. This analysis can help promote the adoption of noteworthy multimodal transportation system management and operations practices.

The Resilience Transportation Research Activity

The Resilience Transportation Research Activity focuses on developing and deploying tools, techniques, strategies, and methodologies for assessing the resilience and efficiency of transportation plans, projects, and programs. Addressing the risk of damage and service disruptions and increases in the lifecycle costs of infrastructure caused by weather events and natural hazards is essential in ensuring the continued integrity, safety, and function of the highway system. To better address these risks and vulnerabilities, FHWA will conduct R&D activities to integrate resilience into transportation planning, project development, and design. FHWA will study vulnerabilities of the transportation system to seismic activities and extreme events, including weather, and methods to reduce those vulnerabilities. FHWA will also work with other Federal agencies to better anticipate, prepare for, or adapt to conditions or withstand, respond to, or recover rapidly from disruptions, including the ability to resist hazards or withstand impacts from weather events and natural disasters; to reduce the magnitude or duration of impacts of a disruptive weather event or natural disaster on a project; and to have the absorptive capacity, adaptive capacity, and recoverability to decrease project vulnerability to weather events or other natural disasters. FHWA will conduct R&D activities to better inform decisionmaking regarding economic and environmental effects and tradeoffs.

Multimodal Connectivity

The Multimodal Connectivity activity will promote all modes of infrastructure planning, project development, and networks that address the primary goal of safety, including for pedestrians and Safe Routes to School activities. This activity also supports improving infrastructure integrity, resilience, and other goals to provide access for all people.

Major Program Objectives

FHWA accomplishes this mission through leadership, innovation, oversight, and stewardship that ensures the Nation's roads and highways continue to be among the safest and most technologically sound in the world.

Accelerating Project Delivery

The Accelerating Project Delivery activity supports initiatives and projects to help FHWA improve the environmental review process, coordinate with the public and agencies, and arrive at better environmental outcomes for transportation projects. This effort aims at reducing the potential impact of highway infrastructure and operations on the environment, advancing improvements and efficiencies in environmental analysis, eliminating duplication in NEPA and permitting, reducing the impact of highway runoff on the environment, and improving transportation planning decisionmaking and coordination.

Accelerating Project Delivery research also supports relocation planning, real property acquisition cost estimation, design, transportation planning and environmental project development review, project-related decisionmaking and coordination, and project budgeting and scheduling.

Performance-Based Planning and Programming

Performance-Based Planning and Programming will work with States and MPOs to apply performance management within the transportation planning and programming processes and help them achieve their desired performance outcomes for a multimodal transportation system. Performance-Based Planning and Programming ensures that transportation investment decisions are made (both in long-term planning and short-term programming of projects) based on their ability to meet established targets. This research will support USDOT's and FHWA's strategic goals and promote more informed decisionmaking that improves transportation planning, programming, operations, and coordination.

Performance-Based Planning and Programming will highlight how States and MPOs are working with communities to participate in the project decisionmaking process. This process includes providing information about the environmental impacts of highway projects and alternatives being considered for each project and identifying innovative and effective mitigation strategies. This activity will provide stakeholders at State DOTs, MPOs, and the public with tools, data, and a regulatory framework to protect human health and the environment. FHWA will also explore and adapt modeling methodologies for transportation planning to allow States and MPOs to better understand their transportation systems. FHWA's efforts will also provide decisionmakers with actionable techniques and tools to better understand how a complex transportation system reacts to investments and policy changes and efficiently make trade-offs between performance metrics.

Modeling and Analysis Tools

The Modeling and Analysis Tools research activity supports USDOT's draft strategic goals and policy objectives as follows:

- Reduce the potential impact of highway infrastructure and operations on the environment.
- Advance improvements in environmental analyses and processes and for transportation decisionmaking.
- Support investments that encourage safe, multimodal transportation and strategies to minimize, avoid, or mitigate negative impacts of transportation projects.

Enhancing existing tools will improve the accuracy and reliability of impact assessments. This improvement will provide decisionmakers with the best available information to guide future infrastructure investment decisions for proposed highway projects. By incorporating advanced computational concepts and the latest scientific information, these models and analytical tools can be used to conduct analyses faster and produce more accurate results. Accurate predictions of these impacts are critical to engaging the community, understanding the local environment, avoiding costly legal challenges, and supporting innovative infrastructure investments that are vital to the economic growth of the Nation.

Modeling and analytical tools play a critical role in helping State DOTs, MPOs, and other stakeholders demonstrate that proposed highway projects are selected based on sound analysis and compliance. Advancing and implementing innovative tools and methodologies will enable more efficient and comprehensive evaluations to support informed infrastructure planning and decisionmaking.

The Resilience Transportation Research Activity

The Resilience Transportation Research Activity objectives include the following:

- Developing and deploying tools and methods, promoting best practices, and developing and delivering training to help decisionmakers incorporate these best practices into plans, projects, and programs.
- Conducting training and technical assistance for State DOTs and MPOs.
- Conducting research on best practices, usage, behavior, and stakeholder needs.
- Exploring opportunities to use highway right-of-way to reduce costs that are consistent with operational and safety concerns.

The Resilience Transportation Research Activity directly supports several of the program objectives included in 23 U.S.C. § 503, including studying the vulnerabilities of the transportation system to seismic activities and extreme events and methods to reduce those vulnerabilities; improving transportation planning decisionmaking and coordination; reducing the potential impact of highway infrastructure and operations on the environment; and advancing improvements in environmental analyses and processes for transportation decisionmaking.⁽¹⁾

Multimodal Connectivity

Multimodal Connectivity research will improve outcomes in multimodal planning and project development by ensuring safe and efficient mobility choices. This Multimodal Connectivity research will also devise strategies for implementing connected active transportation networks that address mobility innovations using emerging technology such as micromobility, shared mobility, and automation. This research will help ensure comprehensive multimodal planning, design, and programming to facilitate project delivery outcomes. It will assist partner agencies by providing concise and clear tools, data, methods, performance measures, and other information to maximize economic development and improve the quality of life for all users through strategic highway investments.

Anticipated Program Activities

FHWA is working with States, MPOs, and RTPOs to develop and use datasets to measure the level of access by surface transportation modes to important destinations. In FY 2026, FHWA will develop research synthesis products on access analysis methods and facilitate information exchange between the participants to advance the state of the practice.

Key FY 2026 FHWA Strengthening Transportation Planning, Environment, and Realty Decisionmaking R&T Program Activities.

Activity
Accelerating Project Delivery (\$3,597,000)
Performance-Based Planning and Programming (\$2,774,000)
Modeling and Analysis Tools (\$2,274,000)
The Resilience Transportation Research Activity (\$1,407,000)
Multimodal Connectivity (\$1,406,000)

Accelerating Project Delivery

The Accelerating Project Delivery activity will address the evolving environmental policy landscape. FHWA will continue to promote existing successful practices, such as the national liaison program, the PAPAI system, Programmatic Agreements, NEPA Assignment, PEL, and public involvement promising practices.^(18,19) FHWA continues to support research and outreach related to real property acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act.⁽³⁴⁾ FHWA will continue to provide funding for the Center for Environmental Excellence by AASHTO and provide updates on regulation, policy, and guidance.

Performance-Based Planning and Programming

Performance-Based Planning and Programming will support and distribute State and MPO best practices for making investment decisions based on a data-driven performance-based planning and programming approach and estimate the economic benefits and other cost-saving options. The activity will monitor the effectiveness of performance-based planning and programming at the State and regional levels and coordinate with key stakeholders to ensure consistent monitoring and documentation of performance measures and targets. FHWA will apply analytical tools and data resources in the transportation planning decisionmaking process and work with States and MPOs to identify notable practices.

Performance-based planning and programming includes partnering with transportation agencies to develop and deploy best practices, case studies, and other capacity-building activities that support enhanced small, rural, and mid-sized communities and regions. FHWA will provide stakeholders with technical assistance by developing training essentials, peer reviews, peer exchanges, workshops, virtual forums, and other mediums that promote planning best practices. This activity will identify innovative visualization methods to analyze, map, present, and report information to transportation practitioners, elected officials, and the public. The research will evaluate planning needs in partnership with key stakeholders and identify opportunities and risks associated with existing procedures to support the continuing, cooperative, and comprehensive planning process.

FHWA will also collaborate with key entities (domestic and international) to market emerging products and technologies to meet planning research needs.

Modeling and Analysis Tools

As part of the Modeling and Analysis Tools activity, FHWA will develop and deploy state-of-the-art models and analytical tools to improve data collection methods. A review of the noise model's acoustical assumptions to enhance the noise impact analysis is underway. A research effort is also underway to identify and evaluate innovative strategies and assess their effectiveness in reducing noise impacts. Tools to assist State DOTs, MPOs, and other stakeholders in assessing impacts at the community level in the near-road environment may also be developed.

The Resilience Transportation Research Activity

The Resilience Transportation Research Activity will work with State DOTs and others to improve processes, tools, and methods through developmental applied research and demonstration projects for incorporating weather event and natural disaster resilience. FHWA will provide continued support, training, and technical assistance on extreme weather event and natural disaster resilience for highway planning, design, construction, operations and maintenance, and asset management. Support will be provided to innovative and alternative rights-of-way that align with highway operations and safety requirements.

Multimodal Connectivity

The Multimodal Connectivity activity will promote connectivity practices and share resources vital to advancing mobility, access, and safety for pedestrians. This activity will further assist with implementing priority research items coming from an assessment of needs in these areas. Other research projects that will support this activity include a task focused on ensuring the development of new and innovative pedestrian facilities. Multimodal Connectivity will provide for the administration of the NHS official record and geographic information system database to facilitate National Highway Performance Program eligibility determination and NHS performance tracking.⁽³⁵⁾ FHWA will conduct research and develop resources related to the economic impacts of shared micromobility systems.

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

Accelerating Project Delivery

Accelerating Project Delivery will support the development of environmental and real property acquisition regulation and policy, reauthorization implementation, project development tools, and collaboration on programs and studies that promote environmental and real property acquisition stewardship in project development. FHWA will continue to help State DOTs and project stakeholders achieve well-informed environmental outcomes using tools such as Programmatic Agreements, PEL (a collaborative approach to bridging project phases), PAPAI (an online tool that helps FHWA monitor project progress), public involvement, the Environment Discipline Support System, and NEPA Assignment support.^(18,19,20) This activity will fund national liaison initiatives with other Federal agencies to improve cross-agency efficiency and collaboration. This activity will also support the development of tools for accelerating real property acquisition, appraisal, and relocation initiatives. Finally, Accelerating Project Delivery will support partnerships, such as the Center for Environmental Excellence, with the private sector, research organizations, and State and local governments on research topics such as stormwater permitting, Endangered Species Act compliance, and historic preservation.⁽³⁶⁾

Performance-Based Planning and Programming

Performance-Based Planning and Programming research will undertake the following:

- Offer capacity-building opportunities that plan for and prioritize investments and accelerate project delivery.

- Promote and maintain a highway infrastructure asset system in a state of good repair.
- Update tools, technologies, and guidance to further performance-based planning.
- Improve connectivity, safety, and convenience for all users, including those in rural areas.

Additionally, FHWA will consider how various factors, such as revenue constraints, demographic trends, economic shifts, or technological innovation, can affect a State or region and its transportation system performance.

Modeling and Analysis Tools

Modeling and Analysis Tools will be delivered to transportation stakeholders (State DOTs and MPOs) and the public in a variety of ways, such as conferences, workshops, webinars, training courses, peer exchanges, and social media postings. Documents such as research reports, case studies, model sensitivity and validation analyses, and technical guidance will be posted online and marketed at industry events. Research results will also support regulation, guidance, and policy updates.

This research will develop data-driven tools and methodologies to evaluate and demonstrate adequate environmental protection. State DOTs, MPOs, and other stakeholders can use the new and refined analytical tools, data, and other research products to assess impacts and the highway system's performance and support evidence-based decisionmaking. These new tools can take advantage of technological advancements and use the latest scientific information to improve accuracy.

With accurate and timely information, States and MPOs can better engage the communities they serve. The effectiveness of mitigation strategies is complex to evaluate and difficult to quantify. Mitigation of air quality impacts and abatement of noise impacts is important to ensure that noise and air quality levels are within the standards established in law. The research will develop tools to measure the amount of air quality improvement and noise-level reduction from existing standards and future air quality improvement and noise abatement strategies. The tools can also be used to identify and assess effective strategies to alleviate impacts on communities near major corridors.

The Resilience Transportation Research Activity

Expected activity outputs and outcomes include new collaboration with State DOTs and others to improve resilience processes, tools, and methods and the development and delivery of technical assistance and resilience.

Multimodal Connectivity

As Multimodal Connectivity increases in importance in network planning, FHWA will disseminate examples, case studies, and technical assistance resources through topical newsletters, web portals, and other communications channels. Multimodal Connectivity will promote the rebalancing of multimodal investments to address safe and efficient mobility. The economic benefits of highways and scenic byways, particularly in rural communities, will be identified. Outcomes include an increase in affordable mode choice

and more multimodal trips. Improvements in network access analysis will reflect all users' needs for comfort, safety, and mobility to access desired destinations efficiently.

Potential Economic or Societal Impacts

Accelerating Project Delivery

Accelerating Project Delivery supports research activities that improve public involvement and the environmental decisionmaking process for transportation projects, leading to better community coordination and, ultimately, better community outcomes. FHWA developed case studies and fact sheets for VPI, which enhance and broaden the reach of public engagement efforts, including considerations and strategies for engagement.⁽²⁰⁾ This approach makes participation more convenient, affordable, and enjoyable. When used in combination with traditional public involvement strategies, virtual tools provide increased transparency and access to transportation planning activities and project development and decisionmaking processes.

Performance-Based Planning and Programming

Performance-Based Planning and Programming supports research activities that ensure transportation agencies around the country are demonstrating how cooperation across agencies can enhance transportation planning. The transportation system's performance affects public policy concerns, such as safety, environmental resource consumption, resilience, land use, urban growth, economic development, and security. Transportation planning recognizes the critical links between transportation needs and other societal goals. It includes strategies for operating, managing, maintaining, and financing the transportation system to advance an area's long-term goals and the regional community's shared vision for the future. This approach focuses on bringing together various entities to support shared goals in transportation planning, such as congestion management, safety, freight, and commerce. Performance-Based Planning and Programming activities enhance decisionmaking, reduce travel time, lower costs through shared resources, and help agencies achieve greater outcomes through effective collaboration.

Modeling and Analysis Tools

The regulatory models for air quality and noise analyses can be complex and difficult to use. FHWA's research aims to develop and update tools and methods to simplify the models to analyze impacts and evaluate strategies to better serve public needs. In addition, models need to be updated to reflect the most current data and the most up-to-date modeling techniques. This research will ensure that States and MPOs have models that reflect the most recent information and best state-of-the-practice techniques to comply with laws and to assess system performance as accurately as possible.

The Resilience Transportation Research Activity

Deployment and implementation of the research tools and techniques under the Resilience Transportation Research Activity will help States and communities anticipate and adapt their infrastructure to account for the future challenges of extreme natural events. This research would include the implementation of alternative uses of the highway right-of-way.

Multimodal Connectivity

The Multimodal Connectivity activity will promote multimodal investments and identify the economic benefits of highways and scenic byways. Outcomes include an increase in affordable mode choice and more multimodal trips. Improvements in network access analysis will reflect all users' needs for comfort, safety, and efficient mobility to desired destinations.

Potential Progress Toward Achieving Modal Strategic Goals

FHWA's Strengthening Transportation Planning, Environment, and Realty Decisionmaking program advances the draft FY 2026–2030 USDOT strategic goals by modernizing environmental decisionmaking and real property processes. By refining the environmental review process, the program aims to accelerate project delivery while supporting real property acquisition, resulting in stronger environmental outcomes for transportation projects while minimizing delays.

The program advances safety, infrastructure reliability, and innovation through Performance-Based Planning and Programming and data-driven decisionmaking. These tools are supported by advanced modeling and analysis tools and resilience research that forecast and optimize environmental and system performance for safer, more durable infrastructure in the face of extreme natural events. The program's emphasis on multimodal connectivity and ongoing collaboration with States, MPOs, and non-Federal partners fosters innovation and efficiency by integrating mobility options into planning and delivery, expanding safety, increasing network efficiency, and reducing lifecycle costs.

Collaboration Partners

Accelerating Project Delivery

Accelerating Project Delivery involves collaboration with Federal partners, State DOTs, nongovernmental entities, and public stakeholders. Volpe provides valuable support to FHWA by developing products and workshops on a variety of topics and assisting with public stakeholder engagement. FHWA maintains agreements with agencies that oversee Federal environmental programs, including the Advisory Council on Historic Preservation, the National Marine Fisheries Service, USACE, the U.S. Coast Guard, EPA, and the U.S. Fish and Wildlife Service.

Performance-Based Planning and Programming

Under Performance-Based Planning and Programming, FHWA will collaborate with key stakeholders in formal and informal settings to gather input on planning and environmental opportunities and challenges. Key stakeholders include State DOTs, MPOs, RTPOs, pertinent AASHTO planning committees, AMPO, National Association of Regional Councils, National Association of Development Organizations, NACo, TRB, universities engaged in planning and environment-related work, and professional organizations such as APA. Interactions with professional research organizations will occur at regular intervals (as often as quarterly). FHWA will also collaborate with nongovernment groups to support planning and environmental decisionmaking.

Modeling and Analysis Tools

FHWA collaborates with stakeholders to share noteworthy practices and accelerate the adoption of innovations and technologies. Collaboration on modeling research regularly involves engaging with key stakeholders in both formal and informal settings to gather input concerning challenges and opportunities that might be addressed and information on work undertaken by other organizations, both nationally and internationally. FHWA routinely works across internal offices and other modal administrations within USDOT, including Volpe. FHWA also routinely engages stakeholders, including representatives of individual State DOTs, MPOs, regional planning agencies, pertinent AASHTO committees, AMPO, TRB, universities engaged in related work, and professional organizations such as ITE and APA. Interactions with AASHTO, AMPO, TRB, and professional organizations generally occur at regular intervals (at least annually and as often as quarterly). Other Federal agencies, including EPA and other nongovernment groups, partner and contribute to modeling research through both formal (interagency agreements) and informal (workshops, modeling staff workgroups) arrangements.

The Resilience Transportation Research Activity

Collaboration involves engagement with key stakeholders in both formal and informal settings to gather input concerning research challenges and opportunities that might be addressed through the activity, as well as information on work undertaken by other organizations, both nationally and internationally. Primary stakeholders include representatives of individual State DOTs and MPOs, FLMA, pertinent AASHTO committees, and TRB. Interactions with AASHTO, TRB, and professional organizations generally occur at regular intervals (at least annually and as often as quarterly) but are not formally tracked or measured. In addition, resilience research is conducted in coordination and partnership with several other FHWA program offices. Nongovernmental groups also collaborate with this program. AASHTO provides a stakeholder perspective and collaborates on research projects.

Multimodal Connectivity

FHWA regularly collaborates with internal DOT working groups to address matters related to pedestrian initiatives, micromobility, human environment, economic development, VPI, planning stakeholders, Safe Routes to School, National Scenic Byways, and transportation alternatives.⁽²⁰⁾ Collaboration with nongovernment groups on this research will include AASHTO; TRB; universities (particularly UTCs) that engage in related work; professional organizations such as ITE, the National Association of City Transportation Officials, and APA; and advocacy organizations such as the National Scenic Byway Foundation, Scenic America, and Safe Routes Partnership. Interactions with these organizations and key external stakeholders, such as State DOTs, Tribes, MPOs, and other regional planning agencies, will help gather critical input concerning challenges, opportunities, and lessons learned from existing multimodal planning efforts undertaken by other organizations and inform how the program research can best address current needs.

Reducing Congestion, Improving Operations, and Enhancing Freight Productivity (\$28,474,000)

Program Description

The United States has invested billions of dollars in building its existing transportation infrastructure. The transportation system is the economic engine of America; effective operations ensure the safe and efficient movement of people and goods to achieve a strong return on investment from U.S. infrastructure spending. TSMO promotes the mobility and safety of all modes, manages congestion, minimizes disruptions, and enhances travel reliability and freight productivity. The transportation system must be actively operated to identify deficiencies and opportunities that maximize the value of investments and provide safe and reliable travel to the public. Operational strategies improve the reliability of goods movement by incorporating accurate, real-time, and localized data on the conditions and operation of the freight transportation network. R&D for FHWA's Reducing Congestion, Improving Operations, and Enhancing Freight Productivity program results in innovative technologies and processes, leading to systemwide improvements in how FHWA, along with State and local agencies, manages and improves the efficiency and reliability of the NHS.

This program enables the efficient movement of people and goods across the transportation system using operational strategies that increase productivity and energy efficiency. These efforts also support safety by smoothing traffic flow, mitigating disruptions, providing consistent motorist guidance and information about current conditions, and enabling travel choices.

Major Program Objectives

FHWA's Reducing Congestion, Improving Operations, and Enhancing Freight Productivity program invests in research, implementation, and institutional capacity building with active management techniques and advanced integration of emerging technologies to improve mobility, reliability, safety, and freight movement. By increasing the capabilities and capacity of State and local transportation agencies to manage and operate the multimodal transportation system effectively, those State and local agencies can implement more holistic approaches to addressing congestion issues and maximize their existing transportation network infrastructure and technology investments. This effort results in enhanced safety and mobility for all users, reduced fuel consumption, and economic improvement through improved and reliable passenger and freight movement.

Anticipated Program Activities

Program activities require research and specialized attention to comprehend the opportunities and challenges presented by advanced technologies, such as CAVs; understand the operational impacts of nonrecurring event disruptions to develop predictive and real-time decision-support systems that facilitate proactive operations; provide tools to determine the best approaches to address traffic problems and support multimodal solutions; help the U.S. freight industry meet the growth in demand in a safe,

responsible, and effective way; and build the capability and capacity for operating agencies to optimize safety and system performance through outreach strategies, such as capability maturity models, development of procedures and guidance, and T2.

Key FY 2026 FHWA Reducing Congestion, Improving Operations, and Enhancing Freight Operations R&T Program Activities.

Activity
TSMO (\$7,420,000)
MUTCD ⁽¹⁶⁾ (\$3,434,000)
Automation and Connectivity (\$7,540,000)
Managing Disruptions to Operations (\$6,330,000)
Freight Management and Operations (\$2,830,000)
Truck Size and Weight (\$920,000)

Transportation Systems Management and Operations

TSMO includes several categories that continue the development of outreach and training materials and conduct targeted outreach and T2 to advance the state of the practice and improve the capabilities of agencies for planning, developing, and delivering TSMO activities. FHWA's data-driven operations decisionmaking effort provides data and technical resources to increase understanding of system travel conditions and advance performance measures and management. This effort enhances tools and decision-support systems for operational or tactical and executive or organizational TSMO decisions by adding functionality for emerging technologies. Advancing operational strategies develops the capabilities, tools, guidance, and outreach to enable more proactive, dynamic, integrated, and performance-driven management and operations. Improving modeling, analysis, and simulation processes and tools enhances the application of advanced operational strategies to integrate the operation of the freeway and surface street networks to promote safe and efficient movement of all modes.

Manual on Uniform Traffic Control Devices for Streets and Highways

To meet the requirements of Section 11129 of the IIJA, activities will focus on implementing and administering updates to the 11th edition of the MUTCD.^(3,16) This effort involves issuing outreach and training materials, practitioner guidelines for experimentation with new traffic control devices and applications, and an updated Standard Highway Signs publication.⁽³⁷⁾ Support will also be provided for two TPF studies of traffic control devices and pedestrian and bicycle transportation.

Automation and Connectivity

ADSs/Roadway Integration initiatives will be advanced through the development of new strategies and capabilities that stakeholders can apply to collectively understand how to move forward to address challenges to safe and effective integration. Activities include expanding stakeholder collaboration and establishing roadway environment management capabilities focused on ADS/Roadway Integration, including access to and exchange of data through roadway digital infrastructure, the roadway assets that support and accommodate

ADS operation by communicating digital rules of the road, and interoperable transportation connectivity. Analysis, modeling, and simulation tools will be advanced by collecting and disseminating new and existing datasets of on-road observations and experimental data on the behavior of AVs in traffic for future integration into microsimulation programs and analytical processes. Smart infrastructure functions for CDA, designed to improve pedestrian safety and improve the safety of work zones and emergency responders, will be simulated and demonstrated on closed-course facilities. An independent evaluation of benefits will be conducted. The capability to fuse input from various infrastructure-based sensors, including infrared cameras and LiDAR, will be assessed to improve road user detection. Finally, work will continue on a “toolbox” of materials for use by infrastructure owners and operators to plan for the modernization of their transportation management system, including insights into decision-support subsystems, developing concepts of operation, and preparing for transitions from legacy systems.

Managing Disruptions to Operations

Several initiatives are being conducted as part of the Managing Disruptions to Operations activity, broken down into four program areas: Road Weather Management, Work Zone Management, Traffic Incident and Events Management, and the Managing Disruptions to the Operations Data Exchange Framework and Strategic Plan. Road Weather Management activities support the safety and mobility of travelers during adverse road weather conditions through the development and deployment of innovative decision-support technologies, solutions, and strategies and provide outreach to help advance the state of the practice. The Road Weather Management activity is actively involved in winter maintenance and operations advancements, road weather traffic modeling and simulation, public awareness outreach campaigns, and adverse weather scenario testing for ADS.

Work Zone Management activities support the development and deployment of solutions and strategies that enable agencies to incrementally and continuously improve work zone management that minimizes delays and maintains the safety of all road users. The Work Zone Management program is actively engaged in regulatory oversight and outreach (23 CFR 630, Subparts J and K), smarter work zone technology deployments, work zone safety grants, and stakeholder engagement and outreach, such as the National Work Zone Awareness Week campaign.⁽³⁸⁾

The Traffic Incident and Events Management program area seeks to improve the safety of first responders and the reliability of travel through efficient incident response and recovery and national training and outreach. The Traffic Incident and Events Management area is actively involved in public outreach campaigns, such as Crash Responder Safety Week and the advancement of crash responder technologies and tools that save lives and provide timely post-crash care. The Planned Special Events area actively supports transportation agencies that are involved in planned events, such as inaugurations, concerts, and sporting events, by providing them with tools, strategies, and technical support to aid them in their planning and operations before, during, and after large-scale events that impact transportation safety and mobility. The Managing Disruptions to Operations Data Exchange framework aims to provide agencies with vehicle-to-everything

interoperability of systems through the standardized use of disruptive event data, similar to what has been achieved through the Work Zone Data Exchange and the Weather Data Environment.

Freight Management and Operations

Key initiatives under Freight Management and Operations support activities of States, MPOs, local governments, ports, intermodal facility operators, and the freight transportation industry to strengthen economic competitiveness and improve the safety, security, efficiency, and resiliency of multimodal freight transportation. Freight commodity flow data, models, visualization tools, and performance data support State freight planning and identification of supply chain bottlenecks, infrastructure investment needs, and TSMO strategies to address freight bottlenecks and support reliable freight transportation. Improvements to truck parking allow drivers to take hours-of-service breaks in safe locations, reducing driver fatigue and avoiding truck parking in hazardous locations along roadway shoulders. Innovative freight corridors support the provision of technologies and infrastructure to improve the mobility and reliability of freight movement between major centers of trade.

Freight technology deployment is also used in optimizing freight intermodal connections with ports and other freight facilities. State, MPO, and local government assistance with freight and land-use planning supports the compatible development of freight-related facilities and economic development. Urban and suburban freight mobility addresses urban freight and last-mile solutions for shippers and carriers delivering goods in congested urban areas. Gateways and border-crossing practices, such as wait-time technologies, facilitate the safe, secure, and efficient flow of goods at borders and trade gateways. These freight transportation strategies all support State, regional, and local economic development.

Truck Size and Weight

The Truck Size and Weight program provides consistent vehicle size and weight standards for interstate commerce and an enforcement process by each State to minimize infrastructure impact and help maintain pavement and bridge conditions. Harmonization and automation of State oversized/overweight permitting systems support efficient interstate movement of freight. Bridge strike research focuses on a risk-based, data-driven approach to implementing bridge strike countermeasures, oversized vehicle routing procedures, and driver education to prevent or reduce the consequences of bridge and tunnel strikes by oversized trucks. Pilot/escort vehicle operations help protect infrastructure and improve the safety of oversized load movements. Resilience is supported by expediting the permitting and routing of vehicles involved in emergency response and recovery.

The FHWA Truck Size and Weight Research Plan includes the deployment of weigh-in-motion for efficient monitoring of truck weights and analyzing infrastructure impacts. Other initiatives may include the development of enhanced bridge deterioration models that can account for impacts of alternative truck configurations, the development of more accurate models that States and others can use to identify impacts of heavy trucks on pavements, analysis of truck types, and safety impact assessments.

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

Program outputs for all the activities in the previous section will include research, review, analysis, and management of existing data; enhanced data and models that facilitate performance-based, data-driven analysis and decisionmaking; and tools and organizational support, including training materials and case studies to support stakeholders. The outcomes of all activities will foster the coordination and collaboration necessary to move toward implementing roadway investments that support the program while providing new capabilities and strategies to improve safety and contribute to infrastructure preservation. The impacts will improve the reliability of travel and freight movement; provide an overall smarter, cleaner, and safer transportation network for all users; and provide resources that permit States and other stakeholders to incorporate freight infrastructure improvement projects into transportation program delivery.

Potential Economic or Societal Impacts

The need continues to grow for a transportation system that provides travel options for the effective movement of people and goods that will mitigate congestion impacts on urban areas, support access to jobs, and allow for increasing freight transportation. As consumer technologies (e.g., smartphones, applications, GPS) progress, the traveling public expects that transportation agencies will find creative ways to apply these advances to improve the travel experience.

Automation and Connectivity research activities continue to address the challenges of integrating vehicles with ADS into the road infrastructure system and taking advantage of connectivity to improve the highway transportation system's safety and efficiency. Developing an understanding and strategy to initiate the deployment of roadway digital infrastructure to support ADS and transportation operations data needs and extend the exchange of information along transcontinental corridors to advance system performance capabilities is essential. Maintaining and updating the MUTCD promptly is necessary to reflect the current and forthcoming needs of practitioners and road users and to accommodate ADS.⁽¹⁶⁾ Managing Disruptions to Operations activities improves resilience and organizational preparedness to deal with nonrecurring events and associated disruptions to transportation operations.

The Freight Management and Operations activities seek to improve the transportation system's roads, bridges, truck parking facilities, freight intermodal connectors, and technologies to support safe and efficient goods movement. The truck size and weight activities provide the U.S. Congress, States, and other stakeholders with information to create safe and efficient interstate freight movement on the NHS.

Potential Progress Toward Achieving Modal Strategic Goals

FHWA's Reducing Congestion, Improving Operations, and Enhancing Freight Productivity program advances draft FY 2026–2030 USDOT strategic goals by deploying data-driven, multimodal operations strategies that enhance real-time traffic management, incident response, and freight movement. By integrating advanced automation and connectivity, improving modeling and simulation, and updating traffic control standards, the program can manage traffic flow, reduce nonrecurring disruptions, and enhance predictability for

both passenger and freight travel. The result is safer roadways, fewer bottlenecks, and more reliable travel times, while enabling more efficient use of existing roadway capacity and reducing fuel consumption. The program drives innovation and efficiency by advancing ADS/roadway integration and roadway digital infrastructure, with real-time decision support, data sharing, and multimodal and freight-focused initiatives supporting comprehensive congestion management and smarter investment decisions.

Collaboration Partners

Both internal and external partners play a valuable role in helping to identify research needs and emerging issues, guiding the form and focus of outreach and technical assistance efforts to share the research results and encourage their implementation, and providing real-world feedback on implementation results. FHWA, in collaboration with the ITS JPO, other USDOT modes, State and local public agencies, academia, industry, and other surface transportation stakeholders, continues R&D efforts. FHWA gains input from external partners through conference sessions and discussions (e.g., TRB, ITE, and AASHTO annual conferences); technical committees and working groups (e.g., TRB committees and AASHTO subcommittees); technical project panels; reviews of partner research reports and plans; and workshops and technical assistance to States, MPOs, and regional agencies. Internally, collaboration occurs on key topics of mutual interest through joint review of research products and research ideas, participation in project panels, and periodic coordination meetings.

Accelerating the Implementation and Delivery of New Innovations and Technologies (\$101,656,000)

Program Description

FHWA's Accelerating the Implementation and Delivery of New Innovations and Technologies encompasses a variety of initiatives and activities that seek to address all aspects of highway transportation, including planning, financing, operation, structures, materials, pavements, environment, construction, and the duration between project planning and project delivery.

Within this program, FHWA supports numerous T2 efforts to accelerate the implementation and delivery of new innovations and technologies that result from highway R&D and that benefit all aspects of highway transportation. FHWA will continue to use a series of successful deployment vehicles in FY 2026, including the following:

- EDC, a State-based model for deploying market-ready but underused technologies that make the transportation system adaptable and safer for all.⁽⁶⁾
- AID Demonstration, a competitive grant activity.⁽⁷⁾
- AMR, a competitive program that accelerates innovations into the marketplace by funding pilot demonstrations and evaluations.⁽⁸⁾
- STIC, an activity that facilitates a culture of innovation deployment in State DOTs.^(9,39)

FHWA will also continue to work directly with State and local agencies to provide technical assistance and deployment initiatives. FHWA will provide Technology Deployment Support activities, including, but not limited to, technical assistance; peer exchanges; innovation/T2; and training in the use of tools and decisionmaking processes that assist divisions, States, and local and other transportation partners in effectively implementing surface transportation programs, projects, and policies.

These activities are supported by FHWA's work to uncover and expand the use of innovative finance strategies such as debt financing and private investment to increase the efficiency of current and future cashflow and investment. Furthermore, the AID Demonstration activity enables the piloting of transportation innovation in all aspects of highway transportation, including planning, financing, operation, structures, materials, pavements, environment, and construction.⁽⁷⁾

Accelerating the Implementation and Delivery of New Innovations and Technologies also includes initiatives directed at accelerating the implementation and deployment of pavement technologies through the AID-PT program; accelerated implementation and deployment of advanced digital construction management systems through the ADCMS program; and deploying advanced technologies and related strategies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.^(11,12) FHWA is also working to develop and deploy Innovative Finance tools to maximize the ability of States to leverage Federal capital, attract new

sources of funds to transportation investment, accelerate project completion dates, and more effectively use existing funds.

Major Program Objectives

Accelerating the Implementation and Delivery of New Innovations and Technologies in FY 2026 includes the anticipated launch of the eighth cycle of EDC (EDC-8).⁽⁶⁾ The EDC program promotes a portfolio of proven, market-ready, and transformative innovations that are adaptable and safer for all.

Planning for the eighth cycle of EDC began in FY 2025 with announcements of the EDC-8 portfolio expected in FY 2026.⁽⁶⁾ The AID Demonstration and STIC Incentive activities will continue to complement EDC by providing additional resources to help the surface transportation community accelerate the adoption and standardization of innovative technologies.^(7,39,6) FHWA will disseminate information on previously awarded AMR projects as they are completed and award a new group of projects resulting from the multiyear BAA that was issued in October 2024.^(8,40)

The AID-PT activity coordinates with FHWA Pavement and Materials R&D and the LTPP program to provide a coordinated approach to implement research, deploy tools and technologies, and provide guidance to support updated policies.⁽¹¹⁾ The AID-PT activity focuses on improving the safety, durability, innovation, and cost effectiveness of highway pavements and the materials from which highway infrastructure is constructed. The AID-PT activity serves as the implementation and deployment mechanism for innovations from the Pavement and Materials and LTPP research activities.

The primary goal of the ADCMS activity is to transform State DOTs and LPAs by promoting, implementing, deploying, demonstrating, showcasing, supporting, and documenting the application of ADCMS practices, performance, and benefits.⁽¹²⁾ ADCMS are digital technologies and processes for managing construction and engineering activities, including systems for infrastructure planning and coordination; design; construction; maintenance, modernization, and management; and asset management, including hardware, mobile devices, software, Internet of Things, and personnel. ADCMS also includes developing and supporting systems to enhance and share data across an asset's lifecycle and between organizational silos, also referred to as maximizing interoperability. Secondary goals include improving the quality and real-time evaluation of construction projects, increasing the availability of technology training and workforce development to build the capabilities of sponsors, and enhancing the safety of workers and the traveling public.

In addition to the previously mentioned initiatives, the vision for the Advanced Transportation Technologies and Innovative Mobility Deployment, also known as the ATTAIN program (title 23 U.S.C. § 503(c)(4)) includes providing grants to eligible entities to deploy, install, and operate advanced technologies and related strategies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.^(13,1) These advanced technologies will be integrated into the routine functions of the location or jurisdiction and play a critical role in helping agencies and the public address their challenges.

Anticipated Program Activities

Planned activities for the FY 2026 FHWA Accelerating the Implementation and Delivery of New Innovations and Technologies are listed in the following table. These activities will include demonstration grants to State and local transportation agencies, as well as direct and indirect assistance to implement new innovations and technologies.

Key FY 2026 FHWA Accelerating the Implementation and Delivery of New Innovations and Technologies R&T Program Activities.

Activity
EDC ⁽⁶⁾ (\$6,036,000)
STIC Incentive ^(9,39) (\$6,063,000)
AID ⁽⁷⁾ (\$8,036,000)
AMR ⁽⁸⁾ (\$2,705,000)
AID-PT ⁽¹¹⁾ (\$12,000,000)
Accelerated Implementation and Deployment of ADCMS ⁽¹²⁾ (\$20,000,000)
ATTAIN ⁽¹³⁾ (\$39,000,000)
Innovative Finance (\$2,133,000)
Research Infrastructure, Technology Transfer, and Partnerships (\$5,683,000)

Every Day Counts

EDC activities essentially constitute an agencywide T2 effort.⁽⁶⁾ FHWA offices provide subject matter expertise to form deployment teams that support the implementation of the innovations commensurate with the desired level of adoption or implementation of each State. The State and local highway agencies are the primary beneficiaries of EDC. Other outputs include, but are not limited to, supporting education materials, case studies, and other products.

State Transportation Innovation Council Incentive

The FHWA STIC Incentive activity provides resources to help foster a culture of innovation.^(9,39) Through the activity, funding up to \$125,000 per State per Federal fiscal year is made available to support or offset the costs of standardizing innovative practices in a State transportation agency or other public sector stakeholder.

Accelerated Innovation Deployment Demonstration

The AID Demonstration activity provides funding to support the pilot/demonstration of project innovations.⁽⁷⁾

Accelerating Market Readiness

AMR is intended to stimulate and spur the advancement of emerging and transformative innovations in the transportation industry by testing and evaluating them in their intended operational environments to further their market readiness for wider adoption and use.⁽⁸⁾

Accelerating the Implementation and Deployment of Pavement Technologies

The AID-PT activity will advance strategies for innovative approaches to improving the quality of paving mixtures and provide tools and information to quantify long-life pavement strategies.⁽¹¹⁾ Performance tests to better characterize the durability of materials and pavements will continue to be deployed and implemented. Implementation activities include providing education and guidance on the use of new tests, support for demonstration and shadow projects (where new technologies are used alongside existing technologies), and other information-sharing opportunities such as peer exchanges and workshops.

Accelerated Implementation and Deployment of Advanced Digital Construction Management Systems

Accelerated Implementation and Deployment of ADCMS aims to ensure that highway construction uses best practices and leverages advanced digital techniques to accelerate project delivery, encourage implementation of innovations, and increase the safety and efficiency of highway construction.⁽¹²⁾

Advanced Transportation Technology and Innovation

ATTAIN will provide grants to eligible entities to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.⁽¹³⁾ USDOT will share the technology solutions and the lessons learned from the ATTAIN projects with other locations to increase successful deployments and provide widespread benefits to the public and agencies.

Innovative Finance

Innovative Finance provides funding for tools, expertise, and technical assistance that help the transportation community explore and implement innovative strategies for delivering costly, complex infrastructure projects.

Research Infrastructure, Technology Transfer, and Partnerships

The Research Infrastructure, Technology Transfer, and Partnerships activity will identify best practices, formulate strategies, and engage transportation stakeholders in technology and innovation delivery. This activity will support T2 across the entirety of the FHWA R&T program. The activity will also identify, coordinate, and manage strategies related to intellectual property.

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

The *EDC-7 Summit Summary and Baseline Report* summarizes each current innovation and documents the national implementation goals and associated impacts for each innovation.⁽⁴¹⁾ The key output and performance indicator of the AID Demonstration activities is the award of project grants and the further sharing of benefits and lessons learned by the awardees.⁽⁷⁾ The AMR activities promote market readiness of the innovations through pilot demonstrations and evaluations, thereby creating more incentive for the widespread adoption of these technologies.⁽⁸⁾ The STIC Incentive activity's outputs include delivering job aids and technical resources, training and education materials (e.g., webinars and workshops), and peer-to-peer information exchanges.^(9,39) Each STIC self-defines the outcome being sought by implementing the innovations and monitoring performance to ensure those outcomes are met. By setting goals, the STIC communicates the expected outcome and results from innovation deployment and encourages successful implementation. The ultimate benefit of each of these complementary efforts is the advancement of a culture of innovation and the adoption of tools and technologies that can save time, use resources more effectively, and enhance safety.

The outputs from the AID-PT activity will include demonstration projects, dissemination of information related to these projects, documentation of emerging technologies and best practices, and the delivery of training activities, including workshops and webinars.⁽¹¹⁾ Additionally, technical assistance will be provided to support implementation at the State and local levels. Anticipated successful outcomes include enhanced training for practitioners, incorporation of innovative technologies and practices through updates to specifications, and expanded use of trial and demonstration projects to validate performance. The expected long-term impacts of these activities are the development and deployment of pavements that are more durable, safer, and cost effective, ultimately improving the performance of the Nation's transportation infrastructure.

FHWA will prioritize the dissemination of technology solutions and the lessons learned from the R&D projects across the highway transportation sector. This effort aims to facilitate successful deployments and deliver broad benefits to both transportation agencies and the traveling public. The activities will focus on advancing outcomes that accelerate the evaluation, deployment, and implementation of innovative technologies and practices throughout the highway system.

Potential Economic or Societal Impacts

Benefits achieved will include accelerating the implementation and adoption of innovations and technologies that improve the highway transportation system. For instance, the adoption of advanced digital techniques will accelerate project delivery and increase the safety and efficiency of highway construction. An additional benefit will be increased engagement through the use of VPI tools in project development and the promotion of strategies aimed at helping State and local agencies identify, train, and place workers in the contractors' workforce to deliver projects.⁽²⁰⁾

Progress advanced through the implementation efforts will outlive the award of individual projects in each program. The solicitation vehicles and communication strategies for promoting these activities will include references and evaluation criteria based on USDOT priorities and strategic goals, which align with the Administration's priorities. FHWA will further ensure that the selection of grant recipients represents distinct geographic areas of the United States, including urban and rural areas.

Potential Progress Toward Achieving Modal Strategic Goals

FHWA's Accelerating the Implementation and Delivery of New Innovations and Technologies program advances the draft FY 2026–2030 USDOT strategic goals by facilitating the adoption of market-ready technologies and processes through targeted technical assistance and specialized deployment vehicles. By shortening the gap between R&D and on-the-ground practice, this program can reduce project delivery times, while improving construction quality, and yielding more durable, cost effective infrastructure. Its emphasis on innovative financing and advanced digital construction management and pavement technologies supports the efficient use of funding, potentially lowering lifecycle costs and strengthening resilience.

With a broad scope that spans pavement material, digital construction tools, ADS, and intermodal connectivity, the program promotes cross-cutting innovations and accelerates their identification and adoption across the country through information-sharing, training, and partnerships. Overall, the program supports safety, infrastructure reliability, and greater efficiency, while fostering an innovation-driven culture within the transportation system.

Collaboration Partners

Stakeholders for EDC include State DOTs, local governments, Tribes, FLMAs, USACE, private industry, AASHTO, ARTBA, American Council of Engineering Companies, and AGC.⁽⁶⁾ These stakeholders provide input to support FHWA's identification and selection of a new collection of EDC innovations every 2 years. This collaboration continued in FY 2025 with preliminary planning for EDC-8, which is anticipated to launch in FY 2026. The broader the transportation industry represented by the individual STICs, the greater the opportunity to comprehensively and strategically advance innovation.⁽³⁹⁾

FHWA collaborates with ACPA, NAPA, and standard-setting organizations such as ACI and ASTM International. FHWA also encourages the participation of the academic/research community. For instance, stakeholders for the AMR program include entities eligible to apply for project awards (e.g., State DOTs, academic institutions, and the private sector) and State, local, and Tribal transportation agencies as the AMR technologies move into more widespread practice.⁽⁸⁾ For programs providing grants, public and stakeholder input is considered in developing the NOFO. USDOT facilitates a cohort of grant recipients to share implementation lessons learned.

Accelerating the Discovery of Impactful Solutions (\$48,469,000)

Program Description

FHWA's Accelerating the Discovery of Impactful Solutions program supports strategic investment in transportation infrastructure, safety, operations, planning, policy, and innovation development and deployment. The program monitors legislative developments, helps coordinate the R&T budget allocation, maintains TFHRC, organizes strategic R&T investment, and provides research communications. At TFHRC, staff conducts R&D activities in the areas of infrastructure, operations, and safety. Research in ITS, policy, innovative finance, planning, and the environment is conducted or administered by FHWA offices located at USDOT Headquarters. FHWA engages in R&D to leverage the capabilities of TFHRC to develop technologies and innovations of national importance; develop potentially significant solutions to improve the durability, efficiency, environmental impact, productivity, and safety aspects of highway and intermodal transportation systems; and support research on nonmarket-ready technologies in consultation with public and private entities.

Exploratory Advanced Research

The EAR activity is the only funding specifically addressing the need for longer term, higher risk research in highway transportation. EAR funding directly impacts the supply of potential technologies and processes necessary for continued industry innovation to meet the challenges of improving the safety, operation, and resilience of the U.S. highway system for years to come. The EAR activity applies proven open and deliberative processes to engage experts within and outside USDOT to identify potential research topics among new discoveries in science and technology that may address the current and emerging needs of the highway transportation industry. By leveraging the capabilities of TFHRC, the EAR activity brings new capacity in emerging areas to the facility.

Small Business Innovation Research

The SBIR program is a highly competitive, awards-based activity encouraging domestic small businesses to engage in R&D that addresses 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. 15 U.S.C. § 638 establishes that 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 each year.⁽⁴²⁾

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

FHWA is also supporting two activities codified in the IIJA that aim to address the challenge of the decline in revenues contributing to the Highway Trust Fund.^(3,43) Through the SIRC and the National Motor Vehicle Per-Mile User Fee Pilot activities, FHWA will identify new solutions and opportunities for revenue collection that may enable the country to adequately fund investments in highway infrastructure into the future, despite emerging

challenges and new mobility options. SIRC will provide grants to States and local agencies. The pilot will focus on changing from a fuel-consumption tax to a mileage-based contribution to the Highway Trust Fund.

Major Program Objectives

FHWA's Accelerating the Discovery of Impactful Solutions program will provide leadership, coordination, and support in the administration of the FHWA R&T program to help accomplish the draft FY 2026–2030 USDOT strategic goals. To accomplish these goals, the program will continue to foster and promote enhanced coordination of highway research among all stakeholders; communicate, publish, market, and disseminate research results to appropriate audiences; coordinate strategic resource allocation; and conduct R&T program evaluations.

Research Infrastructure, Technology Transfer, and Partnerships

The Research Infrastructure, Technology Transfer, and Partnerships activity will maintain and support the operation of TFHRC and the R&T program. The highway R&D relating to emerging highway technology that occurs at TFHRC focuses on addressing research gaps not addressed by FHWA's partners. This activity also supports critical partnerships with other research organizations to ensure that FHWA's R&T efforts are coordinated to address critical needs. Additionally, this program supports research communication efforts to ensure that partners, stakeholders, and the public are aware of research investments and innovations. Finally, this activity assists in the legislative and budget development process related to the R&T program.

Exploratory Advanced Research

The EAR activity conducts investigations across disciplines and program areas to identify topics where a U.S. Government investment has the potential for transformative results. The EAR activity regularly screens results from its portfolio of active research projects and vigorously supports efforts to transition results that demonstrate high potential impact to applied research programs. Throughout and across activity processes, FHWA engages experts inside and outside the Federal Government to ensure efforts reflect the most recent advances in science and technology, fulfill the needs of the U.S. highway industry, and benefit all travelers.

Small Business Innovation Research

The objective of the SBIR activity is to encourage small businesses to engage in R&D that has the potential for commercialization and meets Federal R&D objectives. The SBIR activity is uniquely positioned to support both the interests of FHWA and small businesses. In this respect, the SBIR activity aims to provide essential funding to small businesses with the goal of commercializing products that align with FHWA and the draft FY 2026–2030 USDOT strategic goals.

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

These two revenue-collection programs, codified in the IIJA, aim to identify innovative and operationally successful solutions to ensure that the country has dedicated and sufficient funding mechanisms for highway infrastructure investment in the future.⁽³⁾

Anticipated Program Activities

The activities within FHWA's Accelerating the Discovery of Impactful Solutions program will support T2 across the entirety of the FHWA R&T program; conduct program evaluations; provide research communications and publication services; maintain critical corporate partnerships; and support TFHRC.

Key FY 2026 FHWA Accelerating the Discovery of Impactful Solutions R&T Program Activities.

Activity
Research Infrastructure, Technology Transfer, and Partnerships (\$14,877,000)
EAR (\$5,131,000)
SBIR (\$3,462,000)
SIRC (\$15,000,000)
National Motor Vehicle Per-Mile User Fee Pilot (\$10,000,000)

Research Infrastructure, Technology Transfer, and Partnerships

In FY 2026, the Research Infrastructure, Technology Transfer, and Partnerships activity will continue to conduct program evaluations, provide research communications and publication services, maintain critical corporate partnerships, and support TFHRC.

Exploratory Advanced Research

The EAR activity will continue to conduct initial-stage investigations; support early-stage, extramural and intramural research through open solicitations; partner with other agencies; focus on placement of postdoctoral researchers in FHWA; and work to actively transition research results toward transformative changes in transportation practice. One area of potential focus starting in FY 2026 is research on the potential use of digital twins to advance highway transportation safety and reliability, which could indicate research leading to improvements in construction quality, worker safety, management of assets, or traffic operations and roadside safety systems.

Small Business Innovation Research

SBIR will participate in the annual solicitation of topics and support current Phase I, II, and IIB projects. Additionally, the FHWA SBIR activity will continue with the TRL Assessments throughout Phase II and IIB projects.

Strategic Innovation for Revenue Collection

The SIRC activity will provide grants to State DOTs, local agencies, or MPOs to demonstrate user-based alternative revenue mechanisms to maintain the long-term solvency of the

Highway Trust Fund.⁽⁴³⁾ The annually awarded grants will be for projects designed to test innovative ways to replace or supplement the Federal gas tax.

National Motor Vehicle Per-Mile User Fee Pilot

As part of the National Motor Vehicle Per-Mile User Fee Pilot, the Secretary of Transportation, in coordination with the Secretary of the Treasury, will test the design, acceptance, implementation, and financial benefits of a national motor vehicle per-mile user fee intended to restore and maintain the long-term solvency of the Highway Trust Fund.⁽⁴³⁾ As part of the pilot, a public awareness campaign will also be carried out.

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

FHWA's Accelerating the Discovery of Impactful Solutions program will deliver a variety of products and services that benefit the entirety of the FHWA RD&T program and advance the mission and goals of FHWA and USDOT. This program will facilitate information sharing with critical research partners by providing access to essential research publications, supporting research communications efforts, and maintaining research databases that provide access to legacy materials and new research products. Additionally, this program will provide the necessary technical support and access to facilities for the FHWA RD&T staff to ensure that strategic and innovative solutions are being developed and deployed to the network of transportation partners.

This program includes investing in core research infrastructure at TFHRC to ensure that critical experimental and analytical tools are available to successfully achieve the FHWA RD&T program's objectives. The development of new research capabilities allows FHWA to investigate and advance emerging technologies to the benefit of the Nation's highway transportation system. In addition, this program operates and maintains the FHWA Research Library, which provides technical research and publication resources to FHWA researchers. Finally, this program ensures that all research efforts are coordinated and communicated with FHWA's research partners, creating a record of research ideas that reduce duplication and strategically investing FHWA's research funds where they are needed most.

Exploratory Advanced Research

EAR seeks to demonstrate the potentially transformative nature of advances in basic science and technology for addressing transportation research priorities. The program then proactively seeks transition partners that can continue to mature the research results toward practice-ready products.

The EAR activity outputs include the proof of concept of new research methods, the development of data or analytic tools, and the spread of knowledge of both advances and impediments. Midterm outcomes include continued and broadening investment in R&D, leading to systems or processes ready for pilot applications and public testing. Longer term impacts can be seen in broad changes to practice that establish measurable improvements in highway system safety and reliability.

Small Business Innovation Research

Through the SBIR activity, FHWA aims to advance technologies and make problem-solving innovations available to the end user. To achieve that goal, FHWA will identify the most promising new innovations and advance Phase I and Phase II projects that have a clear path to commercialization and focus on market-driven needs. This activity creates a win-win-win opportunity for the Federal Government, small businesses, and the traveling public. The Federal Government advances its strategic goals by investing in promising innovations; small businesses benefit from the ability to pursue a good idea through Federal seed funding and, if successful, the sale of their innovative products and solutions; and the public benefits from innovations in the marketplace that enhance the travel experience.

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

USDOT will facilitate sharing lessons learned among SIRC grant recipients and with other jurisdictions through required reporting.

Potential Economic or Societal Impacts

FHWA's Accelerating the Discovery of Impactful Solutions program aims to ensure that highway innovation serves to advance the economic competitiveness of the country and provides transportation options for all road users through investment in R&D. Additionally, the program will coordinate and disseminate critical research results with partners and stakeholders to ensure that solutions are making an impact in the real world.

Exploratory Advanced Research

The EAR program holds significant potential for both economic and societal benefits through its early-stage research on the use of AI for next-generation traffic safety systems, which could greatly enhance public safety and reduce fatalities. Additionally, the program's research on applying AI and other emerging technologies to inspection and asset management aims to increase the reliability and longevity of the highway system, supporting economic competitiveness by minimizing disruptions and improving infrastructure efficiency. Together, these advancements promise to create safer, more dependable transportation networks that benefit both society and the economy.

Small Business Innovation Research

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. Small businesses often struggle to establish themselves in the 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 risks.

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

The SIRC activity is a competitive grant program. FHWA will ensure that the selection of grant recipients represents distinct geographic areas of the United States. A National Motor Vehicle Per-Mile User Fee Pilot test will gather test data from all 50 States and the territories of Washington, DC, and Puerto Rico. The test report will provide data and information on the viability and economic efficiency of a mileage-based user fee solution. While mileage-based user fees have the potential to restore and maintain the long-term solvency of the Highway Trust Fund, Congress wants proof that mileage-based user fees are cost effective, acceptable, and support the Highway Trust Fund.⁽⁴³⁾

Potential Progress Made Toward Achieving Strategic Goals

This program will support goals by investing in and supporting FHWA's critical R&D activities. Additionally, the program will ensure that research results are appropriately coordinated and delivered to FHWA's partners and stakeholders.

Exploratory Advanced Research

Through open solicitations and partnering with other agencies, such as NSF, the EAR activity accelerates U.S. competitiveness in science and technology and demonstrates the potential for improving transportation for all people.

Small Business Innovation Research

The SBIR activity provides opportunities to support all the draft FY 2026–2030 USDOT strategic goals. The selection of topics and projects is driven by the opportunity to advance the Department's goals. In particular, the SBIR activity transforms through investment in innovations that can improve safety, advance economic strength, and develop organizational excellence.

Collaboration Partners

This program will continue to support critical research partnerships by coordinating research program information with TRB, the AASHTO R&I, and international stakeholders. FHWA will engage the academic research community, including UTCs, and contribute to the NCHRP to align and advance research activities. Finally, the program will work closely with State and local stakeholders, particularly through the TPF Program, to synchronize research agendas and priorities.

Exploratory Advanced Research

The EAR activity regularly works with technical experts from across USDOT (BTS, FMCSA, Federal Aviation Administration, FTA, ITS JPO, NHTSA, and the Highly Automated Systems Safety Center of Excellence) and other agencies to participate in scoping activities by serving on technical review panels for EAR activity investments, technical working groups reviewing ongoing EAR-funded research, and TRL Assessment panels that provide input into the transition of results. Additionally, the EAR activity and the NSF Computer Science and Engineering Directorate work together through a memorandum of understanding, leveraging expertise across different research communities on critical transportation research issues.

The EAR activity also coordinates with the U.S. Department of Defense, DOE, the National Aeronautics and Space Administration laboratories, the U.S. Department of Commerce's NIST, and the U.S. Department of Homeland Security on specific research topics with potential joint benefits. Finally, the EAR activity works closely with UTCs and other leading research universities in scouting new topics, conducting research, and transitioning results. The activity also specifically engages State and local agencies and private industry when assessing the potential for research results to transition to practice.

Small Business Innovation Research

The FHWA SBIR activity is coordinated internally within USDOT, and methods and practices are shared with other modes through Volpe, which administers the SBIR activities for USDOT.

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

USDOT will collaborate with stakeholders regarding the SIRC and National Motor Vehicle Per-Mile User Fee Pilot activities through participation in relevant national trade association meetings and independent peer exchanges.

Crosscutting **(\$17,576,000)**

Program Description

FHWA's Crosscutting program involves a distinct set of programs that support all the draft FY 2026–2030 USDOT strategic goals and the objectives of the other seven programs outlined in this AMRP. Crosscutting includes RD&T activities in Policy Analysis, Global Outreach, HDI, NPMRDS, Federal Lands Highway, and Emerging/Corporate Needs. Crosscutting also allows FHWA to provide special focus each year on legislative mandates, administration priorities, and certain emerging RD&T issues that the Agency would like to accelerate through increased investment.

Major Program Objectives

Policy Analysis

The primary objective of FHWA's Policy Analysis research is to provide both internal and external decisionmakers with empirically based assessments of future transportation investment needs, emerging trends and shifts in travel behavior, and economic analysis on the impact of policy changes. Policy Analysis examines the potential for Federal policies and strategies to address those needs in a manner consistent with FHWA's strategic priorities. Studies focus on the emerging transportation technologies and innovative practices and explore transportation options to optimize the performance and conditions of transportation networks and leverage their contributions to the Nation's economy.

Global Outreach

The Global Outreach activity seeks out and adapts foreign innovations related to strategic priorities—such as safety, mobility, innovative practices and technologies, and greater efficiency—that could significantly improve safety on U.S. highways and performance of highway transportation services. The GBP initiative identifies and adapts existing foreign innovations that could significantly improve highways and highway transportation services in the United States in response to specifically identified challenges. The Binational Relations initiatives facilitate knowledge exchange on priority subjects with various countries by leveraging binational government-to-government relationships. The Multinational Relations initiatives span a wide range of program and research activities, working with entities such as PIARC, FEHRL, fib, and buildingSMART International. All three programs seek out innovations that can be deployed to improve the safety, efficiency, mobility, and performance of the Nation's transportation system.

Highway Data Information and National Performance Management Research Data Set

HDI and the NPMRDS activities focus on enabling an effective and streamlined delivery of the FAHP. HDI's fuel and highway data ensure the apportionment of Federal funds is carried out per the legislation. HDI's highway inventory, including local roads, enables effective transportation performance management and the national modeling of infrastructure resilience. HDI's National Household Travel Survey supports multiple USDOT strategic goals in areas of safety, performance management, and planning and meets legislative mandates to support State DOTs and local MPOs in their decisionmaking with data covering

cross-jurisdictional travel, travel purpose, and travel modes.⁽⁴⁴⁾ HDI's 500-Series data include fuel consumption, fuel tax revenue, vehicle registration data, licensed driver data, and highway finance data, enabling investment, condition, and performance analysis and evaluation. HDI's effort in data gathering, analysis, and forecasting methods focuses on big data and big data analytics to reveal new cost effective and efficient ways of doing business at USDOT and FHWA with State DOTs, MPOs, and other entities and enterprises. More informative and revealing data are gathered through these new approaches, and more relevant information is extracted while making the data program more efficient. The NPMRDS offers information that enables FHWA and all State DOTs to conduct transportation performance management activities by gathering and providing travel-time data to all State DOTs and MPOs, covering all NHS roadways throughout the year. The 5-minute interval travel time data of the NPMRDS also enables analysis and other research activities on travel reliability, speed, safety, and various performance measures.

Federal Lands Highway and Emerging/Corporate Needs

FHWA's Federal Lands Highway and Emerging/Corporate Needs activities touch on all programs. These RD&T activities contribute to a safer transportation network for motorists and communities, and consider wildlife, while also supporting infrastructure that underpins economic stability in rural America. Leveraging the unique incubator role of public lands through the Office of FLH, these efforts also advance the testing of innovative infrastructure designs and the implementation of durable, resilient solutions that can withstand extreme natural events. In addition, these RD&T activities support improved planning that will provide better access to the highway transportation system. These activities will further enhance transportation traveler information systems to promote reliable access to highways, public lands, and natural resources.

Anticipated Program Activities

FHWA's Crosscutting program supports the Performance Management Data Support Program through all HDI and NPMRDS activities. FHWA will continue to develop, update, use, and maintain datasets and data analysis tools to assist MPOs, States, and local agencies carrying out performance management analyses. This program is anticipated to be funded annually per legislative specification up to \$10 million.

This program also supports research and publication of the biennial C&P Report.⁽²³⁾ FHWA is currently modifying its policy analysis models to address the expansion of the legislatively required scope of the report to include conditions and performance of ITS, resiliency needs, and tunnel needs. FHWA expects to expand its use of machine learning and AI techniques to advance the modeling enhancements rapidly and economically from the research stage to deployment.

Additionally, the program supports the statutorily mandated HCAS.⁽²⁴⁾ FHWA, in coordination with State DOTs, is carrying out an HCAS to determine the direct costs of highway use by various types of users (vehicles with different dimensions, weights, number of axles, and other specifications).

FHWA's Crosscutting program encompasses a broad range of research initiatives conducted on public lands, serving as a platform for piloting, testing, monitoring, and exploring. In this context, the Federal Lands Highway Research Program plays a critical role in advancing key FHWA priorities. The program supports the development of longer lasting pavements, bridges, and roadside hardware, while also providing a testing ground for transportation elements that directly impact motorists, often in rural settings on low traffic volume roadways, such as wildlife crossings, infrastructure resilience, recreational travel forecasting, ADS, efficient project delivery, and emergency response capabilities. The Office of FLH cochairs the Innovation and Research Council, which brings FLMAs together to discuss, seek advice, and participate in transportation research and innovation deployment activities that benefit public lands.

Planned activities for the FY 2026 FHWA Crosscutting program are listed in the following table. These activities will include R&D initiatives as well as T2 initiatives.

Key FY 2026 FHWA Crosscutting R&T Program Activities.

Activity
Policy Analysis (\$4,319,000)
Global Outreach (\$726,000)
HDI (\$6,971,000)
NPMRDS (\$1,800,000)
Federal Lands Highway (\$3,760,000)

Policy Analysis

FHWA Policy Analysis research focuses on identifying policy needs, gaps, and unintended outcomes of current and future investment decisions, emerging issues, and strategic priorities through system-level policy research, the development of analytical tools, and analysis of potential policy alternatives that advance the Administration's goals and objectives.

Global Outreach

FHWA's Global Outreach activities focus on three main initiatives: the GBP, Binational Relations, and Multinational Relations. The GBP initiative identifies and adapts existing foreign innovations that could significantly improve highways and highway transportation services in the United States in response to specifically identified challenges. The Binational Relations programs facilitate knowledge exchange on priority subjects with a variety of countries by leveraging binational government-to-government relationships. The Multinational Relations span a wide range of program and research activities, working with entities such as PIARC. All the international programs seek out innovative technologies and

best practices that can be deployed to improve the United States' transportation safety, efficiency, and mobility. As Safety is FHWA's number one strategic goal, nearly all the RD&T programs impact safety. Global outreach is a valuable tool in identifying, accessing, evaluating, and implementing proven international innovations to address safety challenges. A new study titled "Innovative Safety Approaches to Reduce Head-on Crashes" will investigate and identify proven countermeasures, emerging practices, and technologies used in other countries to reduce head-on crashes on high-speed, undivided roads.

Additionally, FHWA is supporting an international pooled fund project on motorcycle safety to evaluate existing motorcycle protection systems (Infrastructure) and traffic management safety aspects to identify best practices for improving rider safety. The insights gained from this project will inform U.S. practices and contribute to the global understanding of effective motorcycle protection and traffic management strategies.

Global outreach also supports FHWA's priorities on infrastructure investment to ensure safety and mobility. For example, bridge strikes are one of the leading causes of damage to bridges and resulting disruption to traffic. Oversized trucks, or the inadvertently raised portions of cargo such as dump beds or crane booms, frequently strike bridges and tunnels, causing considerable damage to infrastructure, traffic delays, and rerouting of traffic to remove the truck and repair damage. After a review of best practices globally in the prevention of bridge and tunnel strikes, a GBP study team visited the United Kingdom, Ireland, and the Netherlands. During FY 2026, the study team will be disseminating a range of effective countermeasures observed in these countries.

In FY 2026, exchanges with South Korea will address priority technical issues such as pedestrian safety, BIM, lifecycle assessment, and bridge monitoring and maintenance. FHWA will continue to gain insights from Switzerland into recent technologies to strengthen concrete bridges, especially posttensioning durability and ultra-high performance concrete. Activities with the Netherlands will address asset management, and exchanges with Japan will focus a range of technical areas related to improving the safety, durability, and operation of bridges, including seismic issues.

FHWA actively seeks to learn about and disseminate existing best practices and successful efforts on safety, including from other countries. The Agency will continue to work with counterparts to improve the safety and durability of bridges, learn about successful programs to reduce traffic fatalities, improve the effectiveness of road infrastructure resistance to severe events, and continue the effectiveness and efficiency of border planning, among other topics.

FHWA's HDI activity is crosscutting and multifaceted, supporting all FHWA R&T activities and the delivery of the FAHP. The HDI activity consists of initiatives to develop and improve data methods and guidelines and collect, process, analyze, model, visualize, and disseminate data and information by working with States, local transportation agencies, private businesses, and research communities. The HDI data ranges from licensed vehicle operators; registered vehicles; fuel consumption; local, State, and Federal highway

financing covering both revenue and expenditures; roadway infrastructure inventory and condition; and travel and traffic flow and demands to travel behavior.

National Performance Management Research Data Set

FHWA provides access to the NPMRDS to enable State DOTs and other agencies to carry out transportation performance management activities. This program collects travel-time data covering all NHS roadways throughout the year with a 5-minute interval, enabling travel reliability, speed, safety, and other performance measures to be quantitatively assessed and evaluated.

Federal Lands Highway

The Federal Lands Highway RD&T activities support FHWA's partnership with FLMA's and Tribes and seek to implement innovative transportation solutions that provide access to and through public lands. These RD&T activities support improved safety and mobility for public road users, typically non-NHS transportation networks with low ADT. However, large public land holdings are also accessible by Federal roads and adjacent non-Federal networks that rival or are included in the NHS system and have remarkable ADT, such as the Blue Ridge Parkway and the George Washington Memorial Parkway. The Federal Lands Highway RD&T program leverages the variety of landscapes, geography, and environmental conditions of public lands to provide a low-risk setting for testing emerging technologies. These remote areas serve as ideal testing grounds for AVs and UASs, which are evaluated for mobility, safety, and operational reliability and efficiency. Additionally, Earth-to-space communication technologies are assessed in backcountry construction zones where GPS signals are limited or unavailable. Ruggedized computer tablets and digital mapping instruments are also tested to ensure precision in machine-guided construction applications. Federal Lands Highway will develop innovative technologies to streamline project delivery, improve operational efficiency, and enhance lifecycle monitoring, cost management, and data visualization. These efforts will promote transparency, foster collaboration, and ensure Federal transportation investments align with optimized performance and user needs.

Emerging/Corporate Needs

Within FHWA's Crosscutting program, funds are available for Emerging/Corporate Needs that address the Administration's policy directives and strategic initiatives, accelerate RD&T activities, conduct legislative mandates, encourage cross-discipline and multimodal RD&T, and advance policies that will usher in a golden age of transportation. These initiatives focus on safe access and prioritizing the safety of all users. Emerging/Corporate Needs will also conduct RD&T initiatives to prepare for the widespread integration of CAVs on highways.

In FY 2026 and FY 2027, FHWA will complete the development of safety analysis approaches, performance measures, and case studies. Work will also continue on developing methods for reducing data collection costs for all users of the transportation system. Further research into policy impacts will consider the benefits and model the effects of implementing Emerging/Corporate Needs and policy choices.

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

Policy Analysis

The primary outcome of FY 2026 Policy Analysis research efforts will be improvements to the range and scope of analytical capabilities to support data-driven policy decisionmaking. FHWA will begin to fully incorporate the GEMS model into the analysis framework to support the 27th C&P Report, using it to analyze the impacts of transportation options and alternative policies on different types of communities.⁽²³⁾ A new National Infrastructure Investment Needs Portfolio Program initiative will capture and combine public Transportation Asset Management Plan inventories in a format and at a scale that is assessable at the national level and will include assets, their condition, and their investment forecasts from 10-year financial plans.

The Highway Economic Requirements System and National Bridge Investment Analysis System models will be upgraded to support the addition of more robust analyses in the 27th C&P Report, due to Congress in FY 2027, in particular, to model resiliency and tunnel needs.^(45,46,23) Economic analyses will be conducted for both proposed significant rulemaking agencywide and to improve tools to support the benefit–cost analysis needs for competitive grants. The HCAS’s analytical framework, which forms the scope of the study, will be established with implementation support from a TPF project.⁽²⁴⁾ Over the course of the study, the HCAS will develop the evaluation principles or criteria for setting future Federal highway user fee options to recommend to Congress, aiding in finding a reasonable solution to the solvency of the Highway Trust Fund.⁽⁴³⁾ Research and bid-tab data that support the National Highway Construction Cost Index will be used to further the Agency’s understanding of cost drivers of construction industry inflation and regional variations in construction cost.⁽⁴⁷⁾ The products resulting from Policy Analysis research are used to support USDOT priority programs.

Global Outreach

Outputs from Global Outreach activities will be in the form of successful exchanges with foreign counterparts, reports, guidelines, and other information tools, such as webinars, videos, articles, and fact sheets. Global Outreach outcomes accelerate changes that improve the safety and effectiveness of the U.S. highway system; increase the number of available solutions through innovations already proven abroad; and successfully promote U.S. training, approaches, standards, and technologies to foreign counterparts through technical exchanges. Information obtained from Global Outreach saves research dollars by capturing mature and cutting-edge technologies, policies, and practices; improves the safety, mobility, efficiency, and effectiveness of the U.S. highway system; and supports U.S. interests.

In FY 2026, the GBP will support studies with expertise and funding to accelerate early implementation activities, which will focus on international practices. Other activities will share global innovations for designing, constructing, and maintaining roadways to improve infrastructure resilience to extreme natural events. The goal is to strengthen U.S. roadway infrastructure, ensuring continued mobility, safety, and efficiency. A dedicated study will examine countermeasures for head-on crashes on high-speed, undivided roads, focusing on

international strategies such as rumble strips, barriers, and passing lanes and their effectiveness. A cybersecurity study will assess vulnerabilities in modernized highway systems and identify mitigation strategies based on international experience to enhance U.S. transportation system security.

In FY 2026, the GBP will initiate two new studies focused on program and Administration priorities and continue binational collaborations. These collaborative efforts include the long-standing U.S.–Korea Roads Workshop, which addresses evolving shared priorities. Planned exchanges with Switzerland and Japan will focus on bridge innovations, while those with the Netherlands will address flood resilience, aging infrastructure, and asset management. Border planning and coordination efforts will also continue. Collectively, these activities aim to advance safety, infrastructure innovation and best practices, and other national transportation priorities.

Highway Data Information and National Performance Management Research Data Set

The HDI and the NPMRDS activities will continue to deliver two key categories of outputs. The first output category includes the following:

- Developing, improving, and deploying methods and guidelines for using private passive data instead of traditional, limited transportation data collection. Deliverables include enhanced processing tools for 500-Series data reporting, Highway Performance Monitoring System, traffic, and travel behavior data to support a better user experience and technical capability.⁽⁴⁸⁾
- Exploring potential cost effective and quality data methods to gather micromobility travel data.
- Developing an automated micromobility monitoring station record file generator to improve data quality, user experience, and program efficiency.
- Exploring potential mechanisms to collaborate with industries and nongovernmental entities for data sharing in vehicle operations and infrastructure inventory areas.
- Continuing to deploy the updated *Traffic Monitoring Guide* to State DOTs and MPOs through workshops and webinars.⁽⁴⁹⁾
- Updating *A Guide to Reporting Highway Statistics* to deploy to State and local agencies.⁽⁵⁰⁾
- Working with State agency stakeholders (i.e., pilot States) to gather and assess information that will be used to develop new and enhanced requirements for States to assemble and submit to FHWA unprocessed vehicle identification numbers and other vehicle registration-related and licensed-driver data for future implementation.
- Initiating recurring studies in response to a new IIJA-related mandate to evaluate and report to Congress on the model used to estimate fuel use in vehicles traveling on recreational trails and backcountry terrain.⁽³⁾

The second output category encompasses the following data and information:

- Motor fuel—Distribution, consumption, highway funding, and system users (registered vehicles and licensed drivers).
- Highway performance and monitoring—Infrastructure inventory, geometrics, travel demand, conditions, and performance.
- Traffic—Volume, classification, weight, travel time, VMT, and reliability.
- Nonmotorized transportation—Specifications for data formats and geospatial templates for bicyclists, pedestrians, e-scooterists, and e-bicyclists.
- Future national travel demand—Projected trends in VMT.
- National travel behavior and origin-destination—Enhances data collection, processing, and reporting for Federal, State, and local agencies, improving quality and timeliness.

Federal Lands Highway and Emerging/Corporate Needs

The Federal Lands Highway and Emerging/Corporate Needs activities within FHWA's Crosscutting program will deliver a variety of products and services that benefit the entirety of the FHWA RD&T program and advance the mission and goals of FHWA and USDOT. For example, to reduce the number of fatalities and serious injuries on highways and public lands, FHWA will develop and implement roadside hardware, detection systems, and countermeasures that support safety for multimodal users of the transportation system.

The Office of FLH supports the broader transportation community by providing access to experimental products, advanced materials, and innovative techniques. Investing in durable infrastructure products significantly reduces the need for frequent rehabilitation, which enhances mobility in rural America by improving access to recreational opportunities on public lands, vital economic resources, and minimizing repeated construction in remote areas. Simultaneously, the Office of FLH trains its engineers and construction personnel through hands-on, experiential learning. This approach maximizes the return on investment in training and cultivates a knowledgeable, highly effective workforce of engineering professionals.

The Office of FLH is advancing research to develop real-time decisionmaking tools to identify at-risk culverts on U.S. Forest Service lands, reducing road overtopping, ecological damage, and debris flow caused by wildfires. A companion model will predict precipitation events and infrastructure vulnerability due to flooding. Other research will develop a slope attenuator to reduce rockfall hazards, train UAS pilots for terrain mapping and digital models, and install instruments in bridge beams to monitor corrosion from saltwater. Additionally, the Office of FLH will launch a pilot project for ultra-high performance concrete on marine bridges to extend service life. The use of experimental AV shuttles in National Parks will enhance modal choice, test GPS-void areas, create job opportunities, and reduce congestion. FHWA will continue supporting the development of datasets for transportation access pilots.

A resource has been developed to identify and describe current capabilities, best practices, and future data and analysis needs for quantifying the safety-performance effects of multiple safety treatments implemented by agencies. FHWA will complete work on safety analysis methods, performance measures, and case studies to support informed decisionmaking. Efforts will also focus on reducing data collection costs, consistent with the user categories defined in IIJA Section 11206(a).⁽³⁾ Additional work will include a primer on operational considerations for a safe transportation system that serves all users. Further research will explore policy impacts, including the benefits of implementation and modeling of expected outcomes.

Potential Economic or Societal Impacts

Policy Analysis

Measuring economic and community impacts, including community and family-related effects, is a key focus of FHWA Policy Analysis research. The data will be updated and enhanced to ensure the model reflects the most current economic conditions and labor market data in its projections of highway investment impacts on direct, indirect, and induced employment. The USAGE-Hwy model will be modified to predict the impacts of alternative investment levels, including the IIJA, on private investments, employment, and productivity at the national and sectoral level.⁽³⁾ The GEMS model facilitates the evaluation of modal transportation options and alternative policy impacts.

Policy Analysis research also supports research on the impact of investment on macroeconomic indicators, such as gross domestic product, employment, and wages, and on the refinement and application of benefit–cost analysis tools for developing future investment scenarios and predicting the impacts of alternative policies and regulatory initiatives. The HCAS required by the IIJA will explore distributive effects from a revenue and taxation perspective and analyze the user, agency, and community costs of highway investments relative to the vehicles responsible for generating these costs.^(24,3)

Global Outreach

Global Outreach is valuable in identifying, accessing, evaluating, and implementing proven international innovations to address challenges. Activities currently underway include studies and information exchanges with PIARC on issues related to infrastructure, such as improved bridge inspection and maintenance approaches and functional properties of pavements. Activities also include participation in an international pooled fund project on motorcycle safety. In addition, improvements in bridge and roadway technologies and best practices that are learned through international exchanges can improve the safety and extend the life of facilities.

Highway Data Information and National Performance Management Research Data Set

The HDI and NPMRDS activities produce supply and demand data. The supply side includes the infrastructure, vehicles, and drivers, with the demand data covering traffic flows for both goods and people. The data serve as the foundation for the FAHP and offer data to the entire transportation community. The data enable the assessment of program and policy effectiveness and the efficiencies of various FAHPs. Due to the data program, travel among megaregions and between work and leisure among various demographic groups can be

analyzed. In addition, private businesses of all sizes, academia, and myriad research entities are also using the HDI data to support their business decisionmaking, promoting economic growth. HDI's travel behavior data are the only publicly available data covering travel behavior and travel needs. The NPMRDS data enable FHWA to conduct transportation performance management activities for the NHS roadways. The travel-time data collected for all NHS roadways offers quality, consistent data to all State DOTs and MPOs, promoting consistency in FHWA's transportation performance management program.

Federal Lands Highway and Emerging/Corporate Needs

The Federal Lands Highway and Emerging/Corporate Needs activities will promote safety, including reduced collisions with wildlife and improved design elements to promote safe access to transportation. Additionally, increased durability of assets will extend the lifecycle and reduce the need for rehabilitation and replacement at inflated costs for materials. Using improved planning models will result in a wiser investment of limited funds for the right projects at the right time with the right fix and will improve the economic business plans for State DOTs and FLMA stakeholders. Further, improving the efficient flow of freight and travelers on public highways and within public lands will reduce congestion and provide access to resources. Increased use and awareness of new innovations and technology will provide for improved workforce development and improve the design of projects for greater overall durability.

Connected multimodal vehicle network improvements will provide additional economic and social benefits.

Potential Progress Made Toward Achieving Strategic Goals

Policy Analysis

Policy Analysis research supports progress toward strategic goals both directly and indirectly. Analytical models developed as part of Policy Analysis research directly support key USDOT performance outcomes for strengthening the economy. Indirect research and analysis provide the framework, research, and models to understand the potential impacts of policies and emerging trends on the Administration's priorities.

Policy Analysis research activities will continue to be tailored to support priority initiatives that advance the Administration's policy agenda to achieve a golden age of transportation.

Global Outreach

The GBP supports study teams with both implementation expertise and funding to accelerate early implementation activities. A GBP study currently in the implementation stage focuses on preventing bridge strikes by over-height and over-dimension vehicles, which are among the leading causes of bridge damage and account for 13 percent of bridge failures.⁽⁵¹⁾ Due to the scale, safety impact, and nationwide relevance of this issue, the study has strong potential to advance U.S. practices by identifying effective international solutions and facilitating their adoption by States and local agencies. In addition, while considerable research exists on planning for extreme natural events and disasters, limited research is available on engineering and construction strategies that enhance infrastructure resilience. This GBP study will help fill that gap by examining global best

practices for designing, building, and maintaining roadways that can withstand harsher conditions, extreme events, and related stressors. Binational exchanges will continue to support infrastructure resilience to severe weather, particularly flooding, and seek out and disseminate innovative technologies and best practices in the durability and performance of bridges and other highway assets. These efforts will also contribute to achieving national safety goals.

Highway Data Information and National Performance Management Research Data Set

The HDI activity has continuously enabled the FAHP by providing timely, accurate data. On an annual basis, the HDI data ensure accurate Federal-aid apportionment of Federal funds per the legislative requirements; enable performance management, including both performance target setting and progress measurement covering safety, travel time reliability, and pavement conditions; and promote data program efficiency among all stakeholders through a strategy of “collecting once and using often.” In addition, HDI has been making incremental efficiency and effectiveness improvements in data collection, analysis, and applications in Federal, State, and local governments and private sectors. NPMRDS data gathering has been timely, which allows continuous delivery of data and tools to FHWA, State DOTs, and MPOs, meeting all transportation performance management program needs on schedule. The activity will be continued with an emphasis on making data usage more user-friendly.

Federal Lands Highway and Emerging/Corporate Needs

The breadth of Federal Lands Highway and Emerging/Corporate Needs activities ensures that all the draft FY 2026–2030 USDOT strategic goals are being addressed.

The Office of FLH is at the forefront of implementing innovative technologies and solutions that can be customized to meet the unique needs of roadways managed by FLMA, whether in remote areas or urban centers. The geographic isolation of public lands, combined with the urban challenges faced by metropolitan areas, offers unique locations for testing new materials and technologies in a low-risk setting. These remote locations also present opportunities to explore advancements in congestion mitigation, parking management, ITS, and automotive technologies, including AVs, delivery systems, and multipassenger shuttles.

Research activities may be used to develop standards and policies to ensure the safe and adequate accommodation of all users of the transportation system.

Collaboration Partners

Key collaboration partners include State DOTs, MPOs, AASHTO, the AASHTO Research Advisory Committee, AASHTO R&I, NCHRP, NSC, TRB, NACo, AMPO, ARTBA, the American Public Transportation Association, ITE, the American Trucking Associations, the American Association of Retired Persons, AAA Foundation for Traffic Safety, Internal Revenue Service, Federation of Tax Administrators, International Fuel Tax Association, Energy Information Administration, American Association of Motor Vehicle Administrators, and International Bridge, Tunnel and Turnpike Association. Additional partners include other industry organizations, research institutes, and institutions of higher education.

Within USDOT, FHWA collaborates with the Office of the Secretary of Transportation, BTS, the Federal Railroad Administration, FTA, NHTSA, FMCSA, and the Maritime Administration. FHWA also collaborates with the FLMAs, DOE, and the U.S. Department of Labor.

Internationally, FHWA collaborates with PIARC, FEHRL, fib, and buildingSMART International. Binational relationships currently include Japan, South Korea, the Netherlands, Switzerland, Chile, Australia, Canada, and Mexico. New relationships with Germany and the United Kingdom are also being explored.

Chapter 2—FY 2027 RD&T Programs

The AMRP FY 2027 outlook year chapter in the annual plan is not developed in alignment with the President's budget request of the same year due to the AMRP development schedule per 49 U.S.C. 6501 Research Plan.^(2,25)

Improving Highway Safety

Program Description

FHWA's Improving Highway Safety program supports the USDOT strategic Safety goal and conducts safety research to transform the Nation's transportation system, strengthen transportation agencies' capabilities through training, and assist USDOT's stakeholders in applying the Safe System Approach to accelerate the number of lives saved on our roads.⁽¹⁵⁾ The program also supports the legislated HSIP, which aims to significantly reduce fatalities and serious injuries on all public roads.

This program also advances the safety infrastructure work that overlaps traffic engineering, roadway geometric design, transportation planning, and system management and operations. The program aims to help stakeholders reduce fatalities and serious injuries on all public roadways. Further research into data analysis aims to improve State and local safety data systems that commonly record and analyze crashes, roadway inventory, and traffic volume data. The program also strives to better understand human factors and the relationship among all users, infrastructure, and vehicles.

Major Program Objectives

In FY 2027, the program will continue developing new research, information that may inform policy, technical assistance, and stakeholder engagement to advance the Safe System Approach.⁽¹⁵⁾ The program will continue research through TPF studies to engage State DOTs, other locality stakeholders, and industry associations to define new safety countermeasures and greater precision expressions for such tools. Work with the NCHRP will identify new research activities of interest to the States that can be readily deployed and help reduce the effects of crashes on communities.

Anticipated Program Activities

Key FY 2027 FHWA Improving Highway Safety R&T Program Activities.

Activity
Safety Program Delivery
Safety Design and Operations
Safety Data and Analysis
Human Factors Analytics

FHWA's Improving Highway Safety program also supports research activities to improve safety for people walking, which will help to prioritize research on roadway designs and the development of safety countermeasures to minimize fatalities and serious injuries. The program aims to achieve its objectives for FY 2027 through the following activities.

Safety Program Delivery

The Safety Program Delivery activity will continue to assess State safety performance targets, including the evaluation of States' overall compliance with HSIP requirements. Technical assistance will be provided to State and local agencies to support effective HSIP implementation, including guidance on Strategic Highway Safety Plans, Safety Performance Management, High-Risk Rural Roads, the Model Inventory of Roadway Elements, and the Railway-Highway Grade Crossing Safety Improvement Program. Additionally, pilot deployments focused on automated speed management will inform future guidelines following evaluation, while the Intersection Safety Challenge will deliver validated applications and sensing technologies to enhance intersection safety.

Safety Design and Operations

The Safety Design and Operations activity will promote certain infrastructure-oriented safety treatments and strategies based on proven effectiveness and benefits to encourage widespread implementation by State, Tribal, and local transportation agencies to reduce serious injuries and fatalities on the Nation's highways. This activity will collaborate with agencies as they design and operate roadways to fully integrate the needs of all users, accommodate human error, and minimize injury severity.

Safety Data and Analysis

The Data and Analysis activity will continue to promote and enhance State and local safety data necessary to make data-driven decisions. The leading resource for analyzing crash factors over time will be revised in favor of a new architecture that will allow researchers to apply multiple safety datasets at once. In addition, the Data and Analysis activity will complete novel data analytics approaches on pedestrian safety that could help overcome certain cost-prohibitive data collection methods. New data collection techniques explored through research may enable updates to data collection guidelines.

CMFs for curb extensions, narrow-width rumble strips, and wide-width pavement markings will enable more refined safety analyses. Novel pedestrian analytics will continue to explore new analysis methodologies, such as interrupted time series and novel datasets, including synthetic data, such as realistic artificial data. The CMF Clearinghouse will continue to provide users with a searchable database of CMFs, a star-quality rating system to indicate the reliability of each CMF, and details about the CMF and study that produced it.

Human Factors Analytics

The Human Factors Analytics activity will continue empirical research with human participants in studies using the Highway Driving Simulator, the virtual reality tool, field research vehicles, and the Human Factors Laboratory's Sign Laboratory. The work will help promote better and safer traffic control devices, increase pedestrian and bicyclist safety, and facilitate and accelerate the safe integration of emerging ADS technology into the Nation's roadway system in a safe and acceptable manner for all roadway users.

The Federal Lands Highway activity also supports safety activities and initiatives by implementing and transferring technology of recently completed safety research and continuing safety research for all users in public lands and Tribal communities. Examples of safety research on public lands include MASH testing for bridge railing systems, speed management safety in FLMA gateway communities, and innovative solutions to mitigate road edge rutting.⁽¹⁷⁾

FY 2027 safety research activities include safety countermeasures for low-volume and rural roads and low-cost and highly effective measures to reduce run-off-road crashes. Pedestrian safety, especially in "gateway communities" to public lands, will result in improved safety for tourists who are walking and bicycling.

Improving Infrastructure Integrity, Resilience, and Practices

Program Description

FHWA's Improving Infrastructure Integrity, Resilience, and Practices program is a coordinated set of RD&T activities focused on leading, supporting, and enabling improvements in highway infrastructure integrity, resilience, and practices. The program provides the data, information, and systems required to link Federal transportation investments to improvements in system performance. Additionally, the program delivers tools, technologies, information, and guidelines that highway owners can apply to maintain and improve infrastructure integrity effectively and meet user needs.

Major Program Objectives

The overarching objective of this program is to support and enable advances in infrastructure materials, engineering, construction, and management practices to improve infrastructure integrity, longevity, safety, and resiliency. The program works to achieve the following:

- Transform infrastructure construction, contracting, and stewardship practices to efficiently achieve long-lasting, resilient infrastructure and safer construction work zones.
- Support and enable improved infrastructure resilience.
- Develop more durable materials.
- Develop and provide guidelines and tools to support the comprehensive management of infrastructure throughout its entire lifecycle.

The program also includes the development and delivery of significant technologies to substantially improve the durability (and ultimately the performance and safety) of pavements and bridges. The program also supports the implementation of the updated NBIS and NTIS, thereby ensuring the safety of this critical highway infrastructure.^(21,22) Additionally, FHWA research is delivering the data and information infrastructure owners need to effectively manage pavement and bridge conditions and providing tools, technologies, and guidance to advance the effective management of highway infrastructure and system performance.

Anticipated Program Activities

Key FY 2027 FHWA Improving Infrastructure Integrity, Resilience, and Practices R&T Program Activities.

Activity
Construction and Project Management
Geotechnical and Hydraulics
LTIP
Pavements and Materials
Structures
Transportation Performance and Asset Management

Construction and Project Management

Construction and Project Management research will pursue advances in construction and contract administration practices for more efficient construction, more effective contract administration, and improved safety for both the construction workforce and the traveling public.

Geotechnical and Hydraulics

Research in Geotechnical and Hydraulics will develop technical knowledge and advance state-of-the-art engineering technologies and practices to enable more resilient and cost effective highway infrastructure.

Long-Term Infrastructure Performance

LTIP research will continue collecting data on both pavement and bridge performance, broaden access to highway infrastructure performance and related data, and deliver findings and insights derived through analysis of highway infrastructure performance data.

Pavements and Materials

Pavements and Materials research will continue to explore innovations in materials, test methods, the use of nontraditional materials, approaches for building and maintaining pavements that lead to lower lifecycle cost, improved methods to assess pavements, and guidance for more effective management of pavement performance. The research will be conducted from the nanoscale up to full scale to assess the durability of emerging technologies and identify opportunities for improved guidelines and specifications for the pavements and materials community.

Structures

Structures research will continue to support the updated NBIS and NTIS implementation and pursue innovations in bridge design, preservation, and construction to bring about more durable and cost effective highway structures.^(21,22)

Transportation Performance and Asset Management

In FY 2027, research in Transportation Performance and Asset Management will continue to pursue advances to bring about more effective risk-based management of highway system performance.

The FLH activities will support FHWA's Office of Infrastructure in the areas of lifecycle extension and durable products, such as long-lasting pavement materials and mix designs for durable concrete and asphalt or other innovations like factoring wildlife into design considerations. Similarly, the FLH will advance a bridge lifecycle analysis model to predict asset (structures) deterioration rates to help prioritize projects based on urgency and funding available for its FLMA partners. Additionally, the FLH activities will support the development of an asset management prediction model to forecast at-risk culverts for the U.S. Forest Service, such at-risk culverts are affected by extreme natural events, which increase debris-flow damage to undersized culverts. Lastly, FLMA maturity assessments will provide guidance for accelerating risk-based transportation asset management.

Strengthening Transportation Planning, Environment, and Realty Decisionmaking

Program Description

In FY 2027, FHWA's Strengthening Transportation Planning, Environment, and Realty Decisionmaking program will continue to carry out research to improve and minimize the cost of transportation planning and environmental decisionmaking processes and minimize the potential impact of surface transportation on the environment. This program supports many of the draft FY 2026–2030 USDOT strategic goals.

Accelerating Project Delivery

In FY 2027, the Accelerating Project Delivery activity will continue to help FHWA develop well-informed and environmentally sound transportation projects and programs. The activity will support FHWA's implementation of NEPA and related environmental requirements through improved coordination and communication between Federal and State agencies, the public, and other stakeholders.⁽²⁸⁾ In addition, this activity will promote capacity building for environmental practitioners, planning integration, real property acquisition, environmental processes, and information dissemination.

Performance-Based Planning and Programming

In FY 2027, Performance-Based Planning will continue to provide a strategic and data-driven approach to transportation decisionmaking that allows agencies to advance transportation planning and performance management. FHWA will work with States and MPOs to update their measures and targets through long-range transportation plans and transportation improvement programs.

Modeling and Analysis Tools

For FY 2027, the Modeling and Analysis Tools research will continue to focus on developing and deploying new and refined analytical tools. These tools will improve efficiencies and accuracy in support of the delivery of highway projects, in consideration of the traveling public's needs, and reduce adverse impacts on adjacent communities. FHWA will also continue researching new data sources to ensure necessary analyses remain up to date and protect the environment. The research activity will assess innovative and effective mitigation and abatement strategies to alleviate impacts on communities near major corridors. The research program will support the draft FY 2026–2030 USDOT strategic goals of Safety, Innovation, and Efficiency.

The Resilience Transportation Research Activity

The FY 2027 Resilience research activity will continue with the same main goals as in FY 2026: the development and deployment of tools, techniques, strategies, and methodologies for assessing resilience and the efficiency of transportation plans, projects, and programs. These efforts will continue to focus on improving resilience in postdisaster decisionmaking and institutionalizing planning and engineering best practices into standard practices at State DOTs. The Resilience Transportation Research Activity will also emphasize tool development, technical assistance, and training to better assist State DOTs and MPOs.

Multimodal Connectivity

The goals of the FY 2027 Multimodal Connectivity activity are to implement a connected multimodal transportation system that provides travelers with improved, innovative mobility options; facilitates economic revitalization; and lowers the number of pedestrian fatalities and serious injuries. Multimodal Connectivity activities will also support mobility innovation, active transportation, planning, community impact assessment, and economic development research.

Major Program Objectives

Accelerating Project Delivery

The Accelerating Project Delivery activity builds tools and collaborates on studies to improve project delivery while ensuring sound environmental stewardship and robust public participation in the project development process and compliant real property acquisition. This activity aligns with the objectives of reducing the potential impact of highway infrastructure and operations on the environment, advancing environmental analysis improvements, reducing highway runoff's impact on the environment, and improving transportation planning decisionmaking and coordination.

Performance-Based Planning and Programming

The Performance-Based Planning and Programming activity will allow communities to fully participate in the highway planning and project decisionmaking process by providing information about the anticipated environmental impacts of highway projects and alternatives being considered for each project during the planning process. This effort will provide States, MPOs, and the public with tools, data, and the regulatory framework to protect human health and the environment. Exploring and adapting modeling methodologies for transportation planning also allows States and MPOs to better understand their transportation systems and provide decisionmakers with actionable techniques and tools to better understand how a complex transportation system reacts to investments and policy changes and efficiently make tradeoffs between performance metrics.

Modeling and Analysis Tools

The objective of the Modeling and Analysis Tools research activity is to identify, develop, and deploy technologies, tools, analysis methods, and performance management approaches. The goal is to effectively, accurately, and efficiently analyze the impacts of projects on the environment and communities so that transportation projects will be delivered efficiently while maintaining a healthy environment, safeguarding communities, and stimulating economic growth.

The Resilience Transportation Research Activity

Consistent with the objectives of this activity in FY 2026 and operational and safety concerns, the objectives for FY 2027 include the following:

- Developing and deploying tools and methods, promoting best practices, and developing and delivering training to help decisionmakers incorporate resilience into transportation plans, projects, and programs.
- Conducting training and technical assistance to State DOTs and MPOs.
- Conducting research on best practices, usage, behavior, and stakeholder needs.
- Exploring opportunities to use highway right-of-way to reduce costs that are consistent with operational and safety concerns.

Multimodal Connectivity

The Multimodal Connectivity activity will promote policy that supports the delivery of a nationally connected multimodal transportation system that is safe and facilitates economic growth. The research will help transportation agencies build capacity to support and implement travel that is safe and convenient for all transportation system users. This program will support economic growth and improve multimodal mobility options for all users.

Anticipated Program Activities

The Strengthening Transportation Planning, Environment, and Realty Decisionmaking research program will support the upcoming FY 2026 Study on Stormwater Best Management Practices. FHWA, in coordination with the EPA, has formally offered to enter into an agreement with TRB to conduct the study, which will continue in FY 2027.

This program also supports the Transportation Access Pilot Program.⁽³⁾ FHWA will provide requested datasets to States, MPOs, and RTPOs and collaborate to evaluate transportation system changes. In FY 2027, FHWA will prepare a Report to Congress on the pilot's outcomes, including an assessment of the feasibility of regularly producing and distributing these datasets nationally.

Key FY 2027 FHWA Strengthening Transportation Planning, Environment, and Realty Decisionmaking R&T Program Activities.

Activity
Accelerating Project Delivery
Performance-Based Planning and Programming
Modeling and Analysis Tools
The Resilience Transportation Research Activity
Multimodal Connectivity

Accelerating Project Delivery

In FY 2027, FHWA anticipates developing new activities to meet requirements under the IIJA and the evolving environmental policy landscape.⁽³⁾ FHWA expects a heightened need for research and outreach related to planning and compliant real property acquisition. In FY 2027, FHWA will continue to promote existing successful practices such as PEL, enhancements to Programmatic Agreements, promising practices for meaningful public involvement, VPI, programmatic approaches, NEPA Assignment and audit support, Eco-Logical, resource agency liaison program support, and the Environment Discipline Support System.^(19,20,18) The Accelerating Project Delivery activity will support regulation, policy, and guidance updates, particularly as the Council on Environmental Quality and other Federal agencies update their regulations.

Performance-Based Planning and Programming

In FY 2027, the Performance-Based Planning and Programming activity will continue to support the new planning requirements under the IIJA and continue to work with States and MPOs to maintain their data/data-driven plans, studies, and priorities and evaluate the effectiveness of their planned transportation improvements.⁽³⁾ This research will further the ability of States and MPOs to achieve their desired performance outcomes and evaluate and recommend strategies, projects, and programs to transportation decisionmakers based on anticipated systemwide impacts and goals. The Performance-Based Planning and Programming activity will support regulation, policy, and guidance updates, including housing coordination, human capital/workforce, resilience, travel demand data and modeling, safety, freight, and more.

Modeling and Analysis Tools

In FY 2027, the Modeling and Analysis Tools research activity will continue to develop and deploy state-of-the-art models, tools, and data-collection methods to support infrastructure investment decisionmaking, highway project development, and the environmental review process. Research products, such as analytical tools and models that are completed, will be delivered to transportation stakeholders (State DOTs and MPOs) and the public in a variety of ways, such as conferences, workshops, webinars, training courses, and peer exchanges. Documents, such as research reports, case studies, model sensitivity and validation analyses, and technical guidance, will be posted online and marketed at industry events.

The Resilience Transportation Research Activity

In FY 2027, the Resilience Transportation Research Activity expects to build new and expanded collaboration with State DOTs and others to accomplish the following:

- Institutionalize hydraulic best practices standard design manuals.
- Implement resilience improvements such as natural infrastructure.
- Continue improving processes, tools, and methods through developmental and applied research and demonstration projects to incorporate resilience.
- Update and enhance technical assistance on resilience for all stages of highway planning, design, construction, operations, maintenance, and asset management.

The research will also continue to explore opportunities and support the deployment of alternative uses of the highway right-of-way. In addition, the Resilience Transportation Research Activity will research and support the implementation of highway construction and materials that reduce environmental impacts and maximize material efficiency and recycling.

Multimodal Connectivity

In FY 2027, Multimodal Connectivity activities are expected to support a connected multimodal network that integrates safe and efficient mobility options for all users. The activities will further advance transportation, promote economic revitalization, integrate emerging mobility technology systems in transportation planning and project development, and promote the rebalancing of multimodal investments to benefit all users.

In addition, the Office of FLH notes that transportation systems are critical to maintaining and improving the livelihoods of Tribes, who face increased risks from extreme natural events and undeveloped safety countermeasures for motorists and pedestrians. The Office of Tribal Transportation within the Office of FLH supports its Tribal partners with the development of prototype, customized asset management models. Models have applicability to Tribes and the owners and operators of public lands. The Vulnerability Assessment and Adaptation Framework will assess the vulnerability of each Tribe's transportation infrastructure, such as culverts and bridges, by evaluating their exposure, sensitivity, and adaptive capacity in the face of natural hazards such as flooding and wildfires. This assessment will allow Tribal transportation departments to identify, analyze, and prioritize adaptation options, substantively informing their transportation decisions for the right fix within budget constraints. Safety countermeasures, such as roadside lighting, visible crosswalks, and separated walkways will reduce the growing number of fatalities and serious injury crashes.

Reducing Congestion, Improving Operations, and Enhancing Freight Productivity

Program Description

The United States has invested billions of dollars in building its existing transportation infrastructure; however, when these facilities are operated suboptimally, congestion and the efficient movement of people and goods may be compromised, resulting in impacts on the economy and quality of life. The operation of transportation facilities needs to be monitored and actively managed to ensure the facilities function at the highest level of safety and efficiency to maximize the value of investments. Implementing operations strategies that enhance the capabilities of State and local agencies to incorporate and make better decisions through access to more accurate, real-time, and localized data helps attain safety and mobility operational objectives and enhances the operation of the freight transportation network. R&D for FHWA's Reducing Congestion, Improving Operations, and Enhancing Freight Productivity program results in innovative technologies and processes leading to systemwide improvements in how FHWA, along with State and local agencies, manages and improves the efficiency and reliability of the NHS.

The program supports the draft FY 2026–2030 USDOT strategic goals by enabling the efficient movement of people and goods across the transportation system using operational strategies that reduce both wasted productivity and wasted energy consumption. These efforts also support safety by smoothing traffic flow, mitigating disruptions, providing consistent motorist guidance and information about current conditions, and enabling travel choices and safer streets.

Major Program Objectives

The program invests in topics such as operations strategies to improve mobility, active management techniques to increase operational resilience and safety, advanced integration of emerging technologies, and freight mobility to enhance the movement of goods and support economic competitiveness. By empowering State and local transportation agencies to manage and operate the multimodal transportation system effectively, those agencies are able to develop a more holistic approach to addressing congestion issues and maximize their existing transportation network infrastructure and technology investments. This effort results in enhanced safety and options for all users, expanded mobility services, and economic improvement through improved and reliable passenger and freight movement.

Anticipated Program Activities

FHWA's Reducing Congestion, Improving Operations, and Enhancing Freight Operations program supports several strategic activities, including the following:

- Providing operational strategies and enabling processes and tools to balance supply and demand on the Nation's transportation system, providing an improved multimodal travel experience to users across the complete trip.
- Advancing next-generation management strategies to optimize freeway and arterial networks.

- Optimizing the way transportation management systems are built, operated, and maintained.
- Integrating, scaling, and supporting proven operations strategies through strategic partnerships, tools, and business models so the strategies are more widely adopted and contribute to operational goals and successes.
- Promoting the use of processes and tools to enhance cybersecurity, traffic analysis, asset management, and operational planning.

The program also supports the Cybersecurity Tool and works with CISA on its adoption. FHWA is collaborating with the Transportation Security Administration and CISA. Initiatives and resources are coordinated through a memorandum of understanding for providing a method to assist transportation authorities in identifying, detecting, protecting against, responding to, and recovering from cyber incidents.

Key FY 2027 FHWA Reducing Congestion, Improving Operations, and Enhancing Freight Operations R&T Program Activities.

Activity
TSMO
MUTCD ⁽¹⁶⁾
Automation and Connectivity
Managing Disruptions to Operations
Freight Management and Operations
Truck Size and Weight

Transportation Systems Management and Operations

The key FY 2027 activities will continue to promote the implementation of effective operations strategies and institutional capacity building of transportation systems through the development and delivery of case studies, technical resources, and training materials and by conducting targeted outreach and T2 to advance the state of the practice and improve State and local transportation agency capabilities for developing and delivering TSMO activities. Tools and decision-support systems for operational/tactical and executive/organizational TSMO decisions will be enhanced by adding functionality for emerging technologies. Implementing operation strategies will continue through the development of capabilities, tools, guidance, and outreach to enable more proactive, dynamic, integrated, and performance-driven management and operations to advance the adoption of solutions and strategies.

Manual on Uniform Traffic Control Devices

Research undertaken will be related to preparing for future editions of the MUTCD and revisions to the 11th edition, training on MUTCD use, and outreach on the future of the MUTCD.⁽¹⁶⁾

Automation and Connectivity

Planned activities will continue R&D efforts from prior years with the intent to foster the coordination and collaboration necessary to move toward implementing roadway investments that support ADS–roadway integration; support the interoperable deployment of connectivity; identify coordinated public and private roadway digital infrastructure deployment strategies; provide new modeling capabilities that accurately reflect the impact of the deployment of ADS-equipped vehicles in traffic; and develop, test, and validate CDA capabilities for TSMO strategies.

Managing Disruptions to Operations

In FY 2027, FHWA will continue to actively research, develop, and deploy projects in road weather management, work zone management, traffic incident and events management, and nonrecurring event data framework management. Together, these efforts support the draft FY 2026–2030 USDOT strategic goals and help deliver better traveler choices, improved safety and mobility, and resilient infrastructure.

Freight Management and Operations

Activities will continue to enhance freight-focused performance and mobility measurement tools to understand trends and needs for improvement to the freight transportation system. Truck parking work focuses on facility development to support traffic safety and freight efficiencies and an updated Jason’s Law Survey and Assessment to evaluate the supply and demand for parking facilities for commercial motor vehicles engaged in interstate transportation.⁽⁵²⁾ Freight intermodal connector work focuses on TSMO strategies to improve the safety, capacity, efficiency, reliability, and performance of goods movement to and from intermodal facilities such as ports.

Truck Size and Weight

The truck size and weight research implementation plan will continue to guide research toward understanding the effect that alternative vehicle configurations would have on safety, pavement, bridge, traffic operations, and economic activity. FHWA will continue to produce resources for freight vehicle size and weight analysis and support harmonization and automation of State permitting systems. FHWA is collaborating with stakeholders in the United States and internationally on studies to prevent bridge strikes by trucks and will establish a framework for collecting bridge strike data and use that data to develop countermeasures.

Additionally, FLH is working with the National Park Service to evaluate innovative ways to capitalize on emerging technologies, such as mobile devices and big data, to help answer key transportation and visitor questions related to travel demand patterns, congestion management, and other transportation analytics. The Integrating Emerging Traveler Data Collection Methods research project includes introducing new methods of capturing traveler data in rural and remote areas, absent a GPS satellite connection (wireless network/wireless technology). Cell panels help collect and transmit data that were previously unachievable without satellite access. Data captures will inform decisionmaking for identifying projects that reduce congestion in internal (parking lots) and external (gateways) areas of national parks.

Accelerating the Implementation and Delivery of New Innovations and Technologies

Program Description

FHWA's Accelerating the Implementation and Delivery of New Innovations and Technologies program encompasses a variety of initiatives and activities that seek to address all aspects of highway transportation, including planning, financing, operation, structures, materials, pavements, environment, construction, and the time between project planning and project delivery.

Within this program, FHWA supports numerous T2 efforts to accelerate the implementation and delivery of new innovations and technologies that result from highway R&D and that benefit all aspects of highway transportation. FHWA will continue to use a series of successful deployment vehicles in FY 2027, including the following:

- EDC, a State-based model for deploying market-ready but underused technologies that make the transportation system adaptable and safer for all.⁽⁶⁾
- AID Demonstration, a competitive grant program.⁽⁷⁾
- AMR, an activity to accelerate market readiness of emerging technologies in the transportation industry.⁽⁸⁾
- STIC, an activity that facilitates a State-based innovation deployment approach.^(9,39)

FHWA will also continue to work directly with State and local agencies to provide technical assistance and deployment initiatives. FHWA will provide Technology Deployment Support activities, including, but not limited to, technical assistance; peer exchanges; innovation/T2; and training in the use of tools and decisionmaking processes that assist divisions, States, and local and other transportation partners in effectively implementing surface transportation programs, projects, and policies.

Accelerating the Implementation and Delivery of New Innovations and Technologies also includes initiatives directed at AID-PT and Accelerated Implementation and Deployment of ADCMS, as well as deploying advanced technologies and related strategies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.^(11,12) FHWA is also working to develop and deploy innovative finance tools to maximize the ability of States to leverage Federal capital, attract new sources of funds to transportation investment, accelerate project completion dates, and use existing funds more effectively.

Major Program Objectives

Every Day Counts

Accelerating the Implementation and Delivery of New Innovations and Technologies in FY 2027 includes deployment activities supported by EDC-8, which will facilitate the adoption of innovative technologies by the surface transportation community.⁽⁶⁾ The AID Demonstration (through issuance of a new, multiyear NOFO) and STIC Incentive activities will continue to complement EDC (and other innovations) by providing additional resources to help the surface transportation community accelerate the adoption and standardization of innovative technologies in their programs.^(7,9,39) FHWA will disseminate information on previously awarded AMR projects while soliciting a new group of projects through a BAA.⁽⁸⁾

Accelerating the Implementation and Deployment of Pavement Technologies

The AID-PT program works in coordination with FHWA's Pavement and Materials R&D and LTPP to ensure a unified approach to implementing research, deploying technologies, and supporting updated policies.⁽¹¹⁾ This activity focuses on enhancing the safety, durability, and cost effectiveness of highway pavements and the materials used in highway infrastructure. AID-PT functions as the primary mechanism for implementing and deploying innovations developed through Pavement and Materials and LTPP research.

Advanced Digital Construction Management Systems

The primary goal of the ADCMS activity is to support State DOTs and LPAs in adopting and applying ADCMS practices by promoting, implementing, deploying, demonstrating, showcasing, and documenting their performance and benefits.⁽¹²⁾ ADCMS refers to digital technologies and processes used to manage construction and engineering activities, including infrastructure planning, design, construction, maintenance, modernization, and asset management. These systems encompass hardware, mobile devices, software, Internet of Things technologies, and personnel.

ADCMS also involves developing and supporting systems that improve data sharing across an asset's lifecycle and between organizational units, with an emphasis on enhancing interoperability.⁽¹²⁾ Secondary goals include improving the quality and real-time assessment of construction projects, expanding access to technology training and workforce development, and enhancing safety for workers and the traveling public.

Advanced Transportation Technology and Innovation

In addition to the previously mentioned initiatives, the vision for the ATTAIN activity (23 U.S.C. § 503(c)(4)) includes providing grants to eligible entities to deploy, install, and operate advanced technologies and related strategies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.^(13,1) These advanced technologies will be integrated into the routine functions of the location or jurisdiction and play a critical role in helping agencies and the public address their challenges.

Anticipated Program Activities

Planned activities for the FY 2027 FHWA Accelerating the Implementation and Delivery of New Innovations and Technologies program are listed in the following table. These activities will include demonstration grants to State and local transportation agencies and direct and indirect assistance to implement new innovations and technologies.

Key FY 2027 FHWA Accelerating the Implementation and Delivery of New Innovations and Technologies R&T Program Activities.

Activity
EDC ⁽⁶⁾
STIC Incentive ^(9,39)
AID Demonstration ⁽⁷⁾
AMR ⁽⁸⁾
AID-PT ⁽¹¹⁾
Accelerated Implementation and Deployment of ADCMS ⁽¹²⁾
ATTAIN ⁽¹³⁾
Innovative Finance
Research Infrastructure, Technology Transfer, and Partnerships

Every Day Counts

EDC activities essentially constitute an agencywide T2 effort. FHWA offices provide subject matter expertise to form deployment teams that support the implementation of the innovations commensurate with the desired level of adoption or implementation of each State.⁽⁶⁾ The State and local highway agencies are the primary beneficiaries of EDC. Anticipated activities for FY 2027 include the continuation of EDC-8 deployment-related efforts.

State Transportation Innovation Council Incentive

The FHWA STIC Incentive activity provides resources to help foster a culture of innovation and make innovations standard practice in the States.^(9,39) Through the activity, funding up to \$125,000 per State per Federal fiscal year is made available to support or offset the costs of standardizing innovative practices in a State transportation agency or another public sector stakeholder.

Accelerated Innovation Deployment Demonstration

The AID Demonstration activity provides funding to support the pilot/demonstration of project innovations.⁽⁷⁾ As the multiyear NOFO for the AID Demonstration will expire at the end of FY 2026, a new multiyear NOFO will be initiated to continue the program activities.

Accelerating Market Readiness

The AMR activity is intended to stimulate and spur the advancement of emerging and transformative innovations in the transportation industry by matching these innovations to the transportation organizations interested in testing and evaluating them.⁽⁸⁾

Accelerating the Implementation and Deployment of Pavement Technologies

The AID-PT activity will advance strategies for innovative approaches to improve the quality of paving mixtures and provide tools and information to develop and quantify the benefits of long-life pavement strategies.⁽¹¹⁾ Performance tests to better characterize the durability of materials and pavements will continue to be deployed and implemented. Implementation activities include providing education and guidance on the use of new tests, supporting demonstration and shadow projects (where new technologies are used alongside existing technologies), supporting the implementation and deployment of innovations emerging from Pavement and Materials and LTPP research efforts, and providing other information-sharing opportunities such as peer exchanges and workshops.

Accelerated Implementation and Deployment of Advanced Digital Construction Management Systems

Accelerated Implementation and Deployment of ADCMS will ensure that highway construction is using best practices and leveraging advanced digital techniques to accelerate project delivery, encourage implementation of innovations, and increase the safety and efficiency of highway construction.⁽¹²⁾ The initiative aims to create and assist the Digital Delivery Stakeholder Group, which will provide support to important external stakeholders. The group will convene regularly to synchronize and exchange information on the activities of different groups. ADCMS will also support pooled-fund efforts that advance ADCMS goals and support FHWA Workforce Development activities related to deploying digital practices within the highway industry.

The initiative will further support FHWA Work Zone Safety activities related to deploying digital practices within the highway industry, BIM implementation/R&D activities based on *Advancing BIM for Infrastructure National Strategic Roadmap* priority activities, and EDC activities related to the deployment of digital practices within the highway industry.^(53,6) ADCMS will support project sponsors in advancing their UAS initiatives by continuing efforts begun under EDC-5 and providing funding to State DOTs and LPAs to advance ADCMS goals and objectives.⁽¹²⁾ The initial NOFO in FY 2024 made awards to 10 State DOTs. The NOFO in FY 2025 resulted in awards made to 8 State DOTs. As of July 2025, the next NOFO is anticipated to be published in FY 2026.

Advanced Transportation Technology and Innovation

ATTAIN will provide grants to eligible entities to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.⁽¹³⁾ USDOT will share the technology solutions and the lessons learned from the ATTAIN projects with other locations to increase successful deployments and provide widespread benefits to the public and agencies.

Innovative Finance

Innovative Finance includes funding for the FHWA Center for Innovative Finance Support, which provides tools, expertise, and financing to help the transportation community explore and implement innovative strategies to deliver costly and complex infrastructure projects. The FHWA Office of the Chief Financial Officer assists State DOTs in implementing

new financial systems to ensure the capability to effectively implement innovative financing strategies while accurately accounting for matching non-Federal funds, toll credits, Grant Anticipation Revenue Vehicles or GARVEE bond interest, and debt servicing.

Research Infrastructure, Technology Transfer, and Partnerships

The Research Infrastructure, Technology Transfer, and Partnerships activity will identify best practices, formulate strategies, and engage transportation stakeholders in technology and innovation delivery. This activity will support T2 across the entirety of the FHWA R&T program. The activity will also identify, coordinate, and manage strategies related to intellectual property.

Partnerships

The Center for Innovative Finance Support utilizes partnerships through the Office of FLH and the Build America Center, which is FHWA's Center for Excellence for project finance. These initiatives include tools to assist municipalities, Tribal Governments, MPOs, and State DOTs to maximize innovative finance and value-capture strategies to further their transportation programs.

Accelerating the Discovery of Impactful Solutions

Program Description

FHWA's Accelerating the Discovery of Impactful Solutions program supports the strategic investment in transportation infrastructure, safety, operations, planning, policy, and innovation development and deployment. The program monitors legislative developments, helps coordinate the R&T budget allocation, maintains TFHRC, organizes strategic R&T investment, and provides research communications.

Exploratory Advanced Research

The EAR activity is the only funding specifically addressing the need for longer term, higher risk research in highway transportation. EAR funding directly impacts the supply of potential technologies and processes necessary for continued industry innovation to meet the challenges of improving the safety, operation, and resilience of the U.S. highway system for years to come. The EAR activity applies proven open and deliberative processes to engage experts within and outside USDOT to identify potential research topics among new discoveries in science and technology that may address the current and emerging needs of the highway transportation industry. By leveraging the capabilities of TFHRC, EAR brings new capacity in emerging areas to the Center.

Small Business Innovation Research

SBIR is a highly competitive, awards-based activity that encourages domestic small businesses to engage in 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. 15 U.S.C. § 638 establishes that Federal agencies with extramural R&D budgets at the department level that exceed \$100 million allocate 3.2 percent of their R&D budget to these programs each year.⁽⁴²⁾

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

FHWA is also supporting two programs codified in the IIJA that aim to address the decline in revenues that contribute to the Highway Trust Fund.^(3,43) Through the SIRC and the National Motor Vehicle Per-Mile User Fee Pilot activities, FHWA will identify new solutions and opportunities for revenue collection that may enable the country to adequately fund investments in highway infrastructure into the future, despite emerging challenges and new mobility options. SIRC will provide grants to States and local agencies.

Major Program Objectives

FHWA's Accelerating the Discovery of Impactful Solutions program will provide leadership, coordination, and support in the administration of the FHWA R&T program to help accomplish the draft FY 2026–2030 USDOT strategic goals. To accomplish these goals, the program will continue to foster and promote enhanced coordination of highway research among all stakeholders; communicate, publish, and disseminate research results to appropriate audiences; coordinate strategic resource allocation; and conduct R&T program evaluations.

Research Infrastructure, Technology Transfer, and Partnerships

The Research Infrastructure, Technology Transfer, and Partnerships activity will maintain and support the operation of TFHRC and the R&T program. The highway R&D relating to emerging highway technology at TFHRC focuses on addressing research gaps not addressed by FHWA's partners. This activity also supports critical partnerships with other research organizations to ensure that FHWA's R&T efforts are coordinated and address critical needs. Additionally, this program supports research communications efforts to ensure that partners, stakeholders, and the public are aware of FHWA's research investments and innovations. Finally, this activity aids in the legislative and budget development process related to the R&T program.

Exploratory Advanced Research

The EAR activity conducts investigations across disciplines and program areas to identify topics where a Government investment has the potential for transformative results. EAR regularly screens results from its portfolio of active research projects and vigorously supports efforts to transition results that demonstrate high potential impact to applied research programs. Throughout and across activity processes, FHWA engages experts inside and outside government to ensure efforts reflecting the most recent advances in science and technology are well-targeted to the needs of the U.S. highway industry and benefit all travelers.

Small Business Innovation Research

The objective of the SBIR activity is to encourage small businesses to engage in R&D that has the potential for commercialization and meets Federal R&D objectives. SBIR is uniquely positioned to support the interests of FHWA as well as small businesses. In this respect, the SBIR activity aims to provide essential funding to small businesses with the goal of commercializing products that align with FHWA and draft FY 2026–2030 USDOT strategic goals.

Strategic Innovation for Revenue Collection and National Motor Vehicle Per-Mile User Fee Pilot

These two revenue collection programs, codified in the IIJA, aim to identify innovative and operationally successful solutions to ensure that the country has dedicated and sufficient funding mechanisms for highway infrastructure investment in the future.⁽³⁾

Anticipated Program Activities

Key FY 2027 FHWA Accelerating the Discovery of Impactful Solutions R&T Program Activities.

Activity
Research Infrastructure, Technology Transfer, and Partnerships
EAR
SBIR
SIRC
National Motor Vehicle Per-Mile User Fee Pilot

Research Infrastructure, Technology Transfer, and Partnerships

The Research Infrastructure, Technology Transfer, and Partnerships activity will conduct program evaluations; provide research communications and publication services; maintain critical corporate partnerships; and support TFHRC.

Exploratory Advanced Research

The EAR activity conducts initial-stage investigations; supports early-stage, extramural research and intramural research through open solicitations, partnering with other agencies, and placement of postdoctoral researchers in FHWA; and actively works to transition research results toward transformative changes in transportation practice.

Small Business Innovation Research

The SBIR activity is a highly competitive, awards-based program encouraging domestic small businesses to engage in 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.

Strategic Innovation for Revenue Collection

The SIRC activity will provide grants to State DOTs, local agencies, or MPOs to demonstrate user-based alternative revenue mechanisms that can potentially maintain the long-term solvency of the Highway Trust Fund.⁽⁴³⁾ The annually awarded grants will be for projects designed to test innovative ways to replace or supplement the Federal gas tax.

National Motor Vehicle Per-Mile User Fee Pilot

The National Motor Vehicle Per-Mile User Fee Pilot activity will establish a Federal System Funding Alternative Advisory Board, demonstrate a national motor vehicle per-mile user fee, and carry out a public awareness campaign regarding a national motor vehicle per-mile user fee. The Secretary of Transportation, in coordination with the Secretary of the Treasury, will test the design, acceptance, implementation, and financial feasibility of a national motor vehicle per-mile user fee designed to restore and maintain the long-term solvency of the Highway Trust Fund.⁽⁴³⁾

Crosscutting

Program Description

FHWA's Crosscutting RD&T program involves activities that support all the draft FY 2026–2030 USDOT strategic goals and the objectives of the other six programs outlined in this AMRP. Crosscutting involves RD&T activities in Policy Analysis, Global Outreach, HDI, NPMRDS, and Federal Lands Highway. The program also allows FHWA to provide special focus each year on legislative mandates, administration priorities, and certain emerging RD&T issues that the Agency would like to accelerate through increased investment.

Major Program Objectives

Policy Analysis

The primary objective of FHWA's Policy Analysis research is to provide decisionmakers with empirically based assessments of emerging trends and future transportation investment needs, emerging trends and shifts in travel behavior, and economic analysis on the impact of policy changes. Policy Analysis examines the potential for Federal policies and strategies to address those needs in a manner consistent with FHWA's strategic priorities. Policy Analysis research is system and user centric. Studies focus on the potential impacts of emerging transportation technologies and explore transportation options to optimize the performance and conditions of transportation networks and leverage their contributions to the Nation's economy. Studies focus on transportation policy options that mitigate undesired impacts and create opportunities to optimize the condition and performance of the system.

Global Outreach

The Global Outreach activity seeks out and adapts foreign innovations that could significantly improve U.S. highways and highway transportation services. The GBP initiative identifies and adapts existing foreign innovations that could significantly improve highways and highway transportation services in the United States in response to specifically identified challenges. The Binational Relations initiatives facilitate knowledge exchange with a variety of countries by leveraging binational government-to-government relationships. The Multinational Relations initiatives span a wide range of program and research activities, working with entities such as PIARC. All the international programs seek out innovative technologies and best practices that can be deployed to improve U.S. transportation safety, efficiency, and mobility. Global Outreach is an important method to influence global standards and recommended practices, advance the economic competitiveness of the U.S. transportation industry, and identify safe and innovative technologies to deliver a world-class transportation system.

Highway Data and Information

HDI activities are aimed at supporting the effective and efficient delivery of the FAHP. HDI's motor fuel and highway data are critical for ensuring the accurate apportionment of Federal funds in accordance with legislative requirements. HDI's 500-Series data include information and statistics on motor fuel distribution/consumption, fuel tax revenue, registered vehicles, licensed drivers, and highway infrastructure funding activities, all of

which enable investment, condition, and performance analysis and evaluation. HDI's comprehensive highway inventory, including data on local roads, supports national infrastructure resilience modeling and emergency evacuation analyses for events such as hurricanes and other natural disasters. HDI also focuses on advancing data collection, analysis, and forecasting using big data and analytics, enabling USDOT, FHWA, State DOTs, MPOs, and other stakeholders to adopt more transformative and cost effective business practices. These modern methods result in more informative, relevant, and actionable data while improving the operational longevity of the data program.

The NPMRDS program provides critical travel-time data to FHWA, State DOTs, and MPOs, supporting transportation performance management across the NHS. Collected in 5-minute intervals year-round, the data enables robust analysis of travel reliability, speed, safety, and related performance measures.

FHWA's FLH and Emerging/Corporate Needs activities support multiple agency goals and programs. These RD&T efforts promote a safe and resilient transportation network for users and consider wildlife crossings on public roads. These activities include initiatives to improve infrastructure design and deploy durable materials capable of withstanding extreme weather impacting public lands. These activities also enhance transportation planning to expand access and deliver traveler information systems that support more reliable and informed travel on highways and within public lands.

FHWA's Crosscutting program supports the Performance Management Data Support Program as outlined in IIJA Section 13003, primarily through HDI and NPMRDS activities. These efforts ensure the collection, analysis, and delivery of high-quality data needed for transportation performance management across the NHS. FHWA will continue to develop, use, and maintain datasets and data analysis tools to assist MPOs, States, and the Agency in carrying out performance management analyses. This program also supports research and publication of the biennial C&P Report.⁽²³⁾ FHWA will expand the required scope of the existing biennial C&P Report to include conditions and performance of ITS, resilience needs, and tunnel needs. Additionally, the program supports the HCAS.⁽²⁴⁾ FHWA, in coordination with State DOTs, will continue to carry out an HCAS to determine the direct costs of highway use by various types of users (vehicles with different dimensions, weights, number of axles, and other specifications).

Planned Activities for the FY 2027 FHWA Crosscutting program are listed in the following table. These activities will include R&D initiatives as well as T2 initiatives.

Key FY 2027 FHWA Crosscutting R&T Program Activities.

Activity
Policy Analysis
Global Outreach
HDI
NPMRDS
Federal Lands Highway
Emerging/Corporate Needs

Policy Analysis

FHWA Policy Analysis research focuses on developing analytical tools and studies identifying current and emerging issues with national implications from a systemwide perspective. One new FY 2027 initiative will be implementing recommendations to streamline the C&P Report.⁽²³⁾ Through the identification of proven AI agents, a pilot initiative to test the viability of using agentic AI to support economic analysis will be explored. Building on the development of a National Infrastructure Investment Needs Inventory, a retrospective analysis on the impact of Federal-aid investments will be initiated. A separate project will explore the feasibility of transitioning from a static to an adaptive regulatory framework, replacing one-time yes/no decisions with a series of partial sequential decisions informed by monitoring and review.

Global Outreach

FHWA's Global Outreach activities focus on three main elements: Global Benchmarking, Binational Relations, and Multinational Relations. The GBP initiative seeks out and adapts existing foreign innovations that could significantly improve highways and highway transportation services in the United States in response to specifically identified challenges. Binational Relations initiatives facilitate knowledge exchange with a variety of countries by leveraging binational government-to-government relationships. Multinational Relations initiatives span a wide range of program and research activities, working with entities such as PIARC.

Highway Data and Information

FHWA's HDI activity is crosscutting and multifaceted, supporting all FHWA R&T activities and the delivery of the FAHP. The HDI activity consists of initiatives to develop and improve data methods and guidelines and collect, process, analyze, model, visualize, and disseminate data and information by working with States, local transportation agencies, private businesses, and research communities. The HDI program will continue to promote the philosophy and approaches of collecting data once, which will be shared and used by all entities, including local, State, and Federal agencies and the public, to improve data program efficiency.

National Performance Management Research Data Set

The NPMRDS program enables FHWA to conduct transportation performance management activities by gathering and providing travel-time data to all State DOTs and MPOs covering all the NHS roadways throughout the year. The 5-minute interval travel-time data enables analysis and evaluations of travel reliability, speed, safety, and various performance measures.

Federal Lands Highway

The FLH activities support FHWA's partnership with FLMAs and Tribes and seek to implement innovative transportation solutions that provide access to and through public lands. These RD&T activities support improved safety and mobility for users of public roads, which typically are non-NHS transportation networks with low ADT. However, large public land holdings are also accessible by roads and adjacent networks that rival or are included in the NHS system and have remarkable ADT, such as the Blue Ridge Parkway and the George Washington Memorial Parkway. The Federal Lands Highway RD&T program leverages the varied landscapes, geography, and environmental conditions of public lands to provide an accessible, low-risk environment for testing emerging technologies. These remote areas serve as ideal testing grounds for AVs, which are evaluated for mobility, safety, and operational efficiency. Additionally, Earth-to-space communication technologies are assessed in backcountry construction zones where GPS signals are limited or unavailable. Ruggedized computer tablets and digital mapping instruments are also tested to ensure precision in machine-guided construction applications.

Emerging/Corporate Needs

Within FHWA's Crosscutting program, funds are available for Emerging/Corporate Needs that address new initiatives, accelerate RD&T activities, conduct legislative mandates, encourage cross-discipline and multimodal RD&T, and highlight Administration priorities. Initiatives that focus on safe access for all users who need to use the transportation network will be advanced in this program. Emerging/Corporate Needs will also conduct RD&T initiatives to prepare for the widespread integration of CAVs on the highways and transition to a new highway revenue-generation model beyond the gas tax.

FY 2027 initiatives will continue with a safety analysis approach for all users. Further research into policy impacts will consider the benefits and model the effects of implementation.

In FY 2027, initiatives like the Performance Management Data Support Program (IIJA Section 13003) and Center of Excellence on New Mobility and Automated Vehicles (IIJA Section 13006I) will continue.⁽³⁾

For more information on USDOT's research, see <https://researchhub.bts.gov/search>.⁽⁵⁴⁾

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Additional information about DOT Research can be found at <https://researchhub.bts.gov/search>⁽⁵⁴⁾