

**United States Department of Transportation  
Annual Modal Research Plan**

*Federal Motor Carrier Safety Administration*

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## **Executive Summary**

FMCSA carries out a multiyear Motor Carrier Research & Technology (R&T) Program under the authority of 49 U.S.C. § 31108. The R&T Program includes in-house, contract, congressionally mandated, and joint-funded initiatives with other U.S. Department of Transportation (USDOT) organizations, the private sector, and academia. The primary objectives of FMCSA's R&T activities are:

- To identify the causes of accidents, injuries, and fatalities involving commercial motor vehicles (CMVs).
- To research means of reducing the number and severity of accidents, injuries, and fatalities involving CMVs.
- To improve the safety and efficiency of CMVs through technological innovation and improvement.
- To improve technology used by enforcement officers when conducting roadside inspections and compliance reviews to increase efficiency and information transfers.
- To increase the safety and security of hazardous materials transportation.
- To test, develop, or assist in testing and developing any material, invention, patented article, or process related to the R&T Program.
- To facilitate training or education of CMV safety personnel, including training in accident reconstruction and detection of controlled substances or other contraband and stolen cargo or vehicles.
- To develop, administer, communicate, and promote the use of products of research, technology, and technology transfer programs under 49 U.S.C § 31108.

FMCSA's R&T Program follows an annual planning process to streamline its activities and to engage FMCSA program offices in developing long-term R&T priorities. The purpose of this approach is to improve communication among the stakeholders across the Agency and to use objective and uniform investment criteria for R&T project selections on an ongoing basis.

### ***Supporting FMCSA's Safety Mission***

FMCSA's mission is to reduce crashes, injuries, and fatalities involving CMV transportation through education, innovation, regulation, enforcement, financial assistance, partnerships, and full accountability. FMCSA's R&T Program supports FMCSA's safety mission by:

- Providing data, producing statistics, and conducting systematic studies directed toward fuller scientific discovery, knowledge, or understanding, and
- Identifying, testing, and supporting technology transfer activities and deployment of CMV safety technologies.

### ***Strategic Objectives***

FMCSA's R&T Program has established the following strategic objectives:

- **Produce Safer Drivers:** This objective focuses on developing a better understanding of commercial driver behavior as it relates to safety, and understanding and addressing issues related to drivers' fitness for duty. Research conducted in this area informs efforts to develop driver-based safety countermeasures to reduce crashes.
- **Improve Safety of CMVs:** The principal goal of this strategic objective is to improve truck and motorcoach safety through vehicle-based research and the deployment of CMV safety technologies.
- **Produce Safer Carriers:** The principal goals of this strategic objective are to support: (1) the Agency's enforcement of carrier-related Federal Motor Carrier Safety Regulations (FMCSRs), and (2) efforts to improve carrier safety, by applying principles of safety management science from other industries, compiling best management practices, and communicating these best practices to motor carrier managers.
- **Advance Safety through Information-Based Initiatives:** The activities under this objective focus on conducting research that helps to support Agency enforcement efforts. This can be done in several ways: 1) evaluating existing research to highlight areas for additional investigation, 2) investigating the overall business, economic, and technical trends in the CMV industry to understand and respond to their impact on safety, and 3) exploring the feasibility and utility of using multiple measures as a basis for calculating crash statistics and setting safety goals. This strategic objective encompasses **automated commercial vehicle research**, which is a major focus area for the Agency. Planned automated commercial vehicle research projects include:
  - **Cybersecurity best practices for integration/retrofit of telematics and aftermarket electronic systems into heavy vehicles.** In this project, FMCSA will build on the heavy vehicle cyber research already completed by the National Highway Traffic Safety Administration (NHTSA) to more narrowly focus on cyber threats and vulnerabilities associated with the integration and use of aftermarket and telematic systems intended for heavy vehicle application. This project will be conducted jointly with NHTSA.
  - **Research to support highly automated commercial vehicle (HACV) pilot tests.** FMCSA has two projects planned to support HACV pilot testing. The first will describe data sharing for future automated CMV testing and deployment. The second will identify/develop and test new inspection tools to support HACV pilot tests.
  - **Anti-lock braking system (ABS) and electronic stability control (ESC) compliance test tool.** In this project, FMCSA will partner with NHTSA to develop a simple and cost-effective diagnostic tool for CMV ABS systems and ESC systems.
  - **Development of sensor performance guidelines for automated CMV applications.** The goal of this project is to develop performance and maintenance guidelines for add-on sensors that support various levels of automation on CMVs.
  - **Truck platooning research.** FMCSA has a variety of targeted truck platooning research projects planned, specifically regarding truck platoon brake performance

requirements and following distance. FMCSA will collaborate with the Intelligent Transportation Systems Joint Program Office (ITS JPO), NHTSA, and the Federal Highway Administration (FHWA) when conducting truck platoon testing and research.

- **Understanding Limitations for Drivers of Highly Automated, Automated Driving System (ADS)-Equipped CMVs.** This project will help the Agency develop an understanding of human factors challenges for automated commercial vehicle concepts. FMCSA will review research previously completed by NHTSA while conducting this project.
- **Performance testing of brake-by-wire (electronically controlled brake) systems.** In this project, FMCSA will perform testing and gather data to demonstrate the performance of brake-by-wire systems (also known as electronically controlled brake systems) in commercial vehicles. NHTSA will be consulted periodically for guidance throughout the course of this project.

### ***Program Outcomes***

FMCSA's R&T Program develops the knowledge, practices, and technologies needed to solve problems and answer questions that arise in prioritizing enforcement resources and improving the safety of commercial drivers, vehicles, and carriers—and those with whom they share the road. Crashes involving CMVs are extremely costly; in 2014, the estimated costs of all large truck and bus crashes was \$112 billion (FMCSA, 2016 Pocket Guide to Large Truck and Bus Statistics). Even worse than this is the loss of life associated with these crashes. In 2015, there were 4,337 total fatalities in large truck and bus crashes (FMCSA, Large Truck and Bus Crash Facts 2015). In general, research conducted by FMCSA contributes to the development of safety technologies (for use by enforcement and commercial carriers) and recommended best practices to improve driver performance and the safe operation of CMVs, thus contributing to a reduction in crashes. By completing targeted research, FMCSA will:

- Gain a better understanding of the causes and impacts of CMV crashes and inform efforts to develop safety countermeasures to reduce crashes.
- Develop recommended best practices for carriers seeking to improve drivers' health and wellness and overall safety performance using an educational approach.
- Gain a better understanding of the safety impacts associated with the adoption of automated commercial vehicles.
- See continued progress in the development and testing of CMV safety technologies.

Ultimately, FMCSA's R&T efforts will contribute to the Agency's mission of reducing the number and severity of CMV-involved crashes on the Nation's highways, reducing costs to the American public and saving lives.

## Section 1 – Program Descriptions, FY 2018

### FY 2018 RD&T Program Funding Details

RD&T Program Name	FY 2018 Pres. Budget (\$000)	FY 2018 Basic (\$000)	FY 2018 Applied (\$000)	FY 2018 Development (\$000)	FY 2018 Technology (\$000)
<b>FMCSA R&amp;T Program</b>	<b>\$9,073</b>	<b>0</b>	<b>6,142</b>	<b>0</b>	<b>2,931</b>
<i>FMCSA Research and Technology Program Strategic Objective Areas</i>					
• Produce Safer Drivers	3,200	0	1,850	0	1,350
• Improve Safety of CMVs	2,831	0	1,550	0	1,281
• Produce Safer Carriers	1,067	0	1,067	0	0
• Advanced Safety through Information-Based Initiatives	1,150	0	850		300
• Enable and Motivate Internal Excellence	825	0	825	0	0
<b>Totals</b>	<b>\$9,073</b>		<b>6,142</b>		<b>2,931</b>

### FY 2018 RD&T Program Budget Request by Critical Transportation Topic Area

RD&T Program Name	FY 2018 Pres. Budget (\$000)	PROMOTING SAFETY (\$000)	IMPROVING MOBILITY (\$000)	IMPROVING INFRASTRUCTURE (\$000)	PRESERVING THE ENVIRONMENT (\$000)
FMCSA R&T Program	9,073	9,073	0	0	0
<b>Totals</b>	<b>9,073</b>	<b>9,073</b>	<b>0</b>	<b>0</b>	<b>0</b>

### FMCSA Research and Technology Program \$9,073,000

**Program Description:** FMCSA’s R&T Program provides scientific safety research on driver behavior, carrier operations, and technology applications. These contributions have proven critical in identifying enforcement priorities and facilitating technology transfer to the marketplace. Program activities range from developing enhanced enforcement technologies to demonstrating the efficacy of truck drivers getting proper training and rest. These projects provide the underpinnings for empirically answering research questions related to the Departmental goals of safety, innovation, and infrastructure.

**Program Objectives:** FMCSA's R&T Program contributes to: 1) the development of expertise, ideas, and tools to advance the state-of-the-art in commercial motor vehicle safety on the Nation's highways and 2) the development and evaluation of future Agency policies, programs, and methodologies. FMCSA's R&T Program has established the following strategic objectives:

- **Produce Safer Drivers:** This objective focuses on developing a better understanding of commercial driver behavior as it relates to safety, and understanding and addressing issues related to drivers' fitness for duty. Fitness-for-duty issues include alertness, health, training, and qualification. Initiatives under this objective also focus on the enforcement of commercial credentials, driving rules, and State practices for handling information about commercial drivers, and supporting the transition of past research to deployed systems such as smart truck parking apps and work zone warning systems.
- **Improve Safety of CMVs:** The principal goal of this strategic objective is to improve truck and motorcoach safety through vehicle-based research and the deployment of CMV safety technologies. Initiatives under this objective focus on: (1) testing, evaluating, and deploying advanced intelligent vehicle safety technologies and other onboard safety technologies and (2) developing new data and information to improve occupant protection and overall vehicle safety.
- **Produce Safer Carriers:** The principal goals of this strategic objective are to support: (1) the Agency's enforcement of carrier-related FMCSRs and (2) efforts to improve carrier safety, by applying principles of safety management science from other industries, compiling best management practices, and communicating these best practices to motor carrier managers. Initiatives focus on improving carrier compliance investigations, enabling better performance practices for carriers and shippers, supporting carrier enforcement, and continuing the development and deployment of the Innovative Technology Deployment (ITD) Grant Program, a component of the FMCSA's High Priority Grant Program. The ITD Grant Program provides funding for States to deploy, support, and maintain CMV information systems and networks. This program is FMCSA's key mechanism for transferring proven enforcement technologies into operational systems for the States. Examples of ITD deployment efforts include the targeting of unsafe motor carriers on the highways using infra-red thermal brake detecting cameras (to identify unsafe brakes) and license plate and USDOT number reading cameras to identify non-compliant trucks at highway speeds. Our State partners are also using the ITD Grant Program to further refine and deploy safety systems for fleets such as work zone warning systems for CMV drivers.
- **Advance Safety through Information-Based Initiatives:** The strategies and activities under this objective focus on conducting research to support Agency enforcement activities. This can be done in several ways: 1) evaluating existing research to highlight areas for additional investigation; 2) investigating the overall business, economic, and technical trends in the CMV industry to understand and respond to their impact on safety; and 3) exploring the feasibility and utility of using multiple measures as a basis for calculating crash statistics and setting safety goals.

**Anticipated Program Activities:** In FY 2018, FMCSA's R&T Program will continue to support FMCSA's safety mission by:

- **Producing safer drivers.** The Agency will pursue research to gain a better understanding of the causes and impacts of driver health and wellness issues and unsafe driving behaviors. Using recently published recommendations from the National Academy of Sciences (NAS) as a basis, FMCSA will tailor comprehensive research projects to better understand the causes of crashes and the best methods for fatigue prevention. Research findings will equip the Agency to develop effective tools for the promotion of driver wellness and safety and the prevention of unsafe behaviors. Several related FY 2018 research and technology projects (planned) include:
  1. An evaluation of the effectiveness of the North American Fatigue Management Program.
  2. As recommended by the Transportation Research Board's (TRB's) Research Analysis Committee, conduct a research effort to integrate and analyze existing data on truck and bus crashes to provide a better understanding of the factors that increase/reduce crash risk.
  3. Ongoing execution of the Military Under-21 CMV Driver Pilot Program, as required by the Fixing America's Surface Transportation Act (FAST Act).
- **Improving safety of CMVs.** Through a variety of planned R&T projects, the Agency will continue to investigate CMV safety technologies aimed at improving CMV safety performance. Examples of related FY 2018 R&T projects include:
  1. Development of a research roadmap to ensure that automated CMV technology development/testing is safe, especially when tests are conducted on public highways, and to fund research related to FMCSRs that will be impacted by the adoption of automated commercial vehicles, as identified by past research.
  2. Development and pilot testing of a dynamic onboard brake assessment technology to transfer CMV brake performance data using wireless roadside inspection technology.
- **Producing safer carriers.** In FY 2018, the Agency will seek to improve carrier safety performance and enforcement by researching carrier programs and continuing to support the management and execution of the ITD Program. Some related FY 2018 R&T projects include:
  1. An identification and assessment of the best practices regarding programs that trucking companies have implemented to improve CMV driver health and fitness.
- **Advancing safety through information-based initiatives.** FMCSA will continue to conduct research to inform and support Agency policy decisions, with an end goal of improving CMV driver and carrier safety on the highways. Several related FY 2018 research projects include:
  1. Development of recommendations for new North American Standard inspection procedures for heavy trucks and buses fueled by natural gas.

2. Creation of a permanent, secure data repository for de-identified data collected during FMCSA R&T studies.
3. Development of requirements for updating the Safety and Fitness Electronic Records (SAFER) system to ensure reliable, high-quality data sharing between the States and FMCSA.

**Expected Program Outcomes:**

By completing targeted research in FY 2018, FMCSA will:

- Gain a better understanding of the causes and impacts of CMV crashes and inform efforts to develop safety countermeasures to reduce crashes.
- Develop recommended best practices for carriers seeking to improve drivers’ health and wellness and overall safety performance using an educational approach.
- Gain a better understanding of the safety impacts associated with the adoption of automated commercial vehicles.
- See continued progress in the development and testing of CMV safety technologies, such as dynamic onboard brake assessment.

Ultimately, FMCSA’s R&T efforts will contribute to the Agency’s mission of reducing the number and severity of CMV-involved crashes on the Nation’s highways, reducing costs to the American public and saving lives.

**Collaboration Partners:**

	<b>Name of Collaboration Partner(s)</b>
FMCSA Research and Technology Program	<p><b><u>INTERNAL:</u> NHTSA, FHWA, ITS JPO</b></p> <p>In FY 2018, FMCSA will continue to collaborate with other modes to identify common research needs and streamline existing and planned research efforts.</p> <p>Automated vehicle research is a common theme across the Department. In FY 2018, FMCSA will work closely with NHTSA, FHWA, and the ITS JPO to develop targeted research related to automated and connected CMVs, emphasizing the safety impacts of these emerging technologies.</p> <p>Also with the ITS JPO and FHWA, FMCSA will support the demonstration and testing of braking and other critical safety systems to ensure safe truck platoons. Key operational guidelines and best practices in terms of vehicle components and configurations that maximize safety will be the products of this work and available to States and trucking fleets interested in truck platooning. Regarding interoperability, FMCSA will support the ITS JPO in its efforts to incorporate all modal stakeholder needs while developing and evolving the integrated National ITS Architecture and software tools</p>



to support large-scale, interoperable deployment of ITS, connected vehicle, and connected automation technology.

On the topic of crash avoidance, FMCSA will collaborate with NHTSA on research related to heavy vehicles (e.g., ESC). FMCSA will continue to collaborate with NHTSA and FHWA on speeding-related issues (the three agencies have an intermodal speed team that meets periodically to share project information and occasionally to collaborate on joint projects).

Finally, FMCSA will support FHWA on a variety of other research efforts in the following areas:

- Emerging technology.
- Connected/automated vehicles.
- Enterprise data (e.g., integrating connected vehicle data into transportation management systems).
- Accelerating deployment.

**Anticipated Benefits of Collaboration:**

FMCSA often cites research conducted by other modes in support of recommended changes to standards, justifications for new research, etc. FMCSA will continue to benefit from research conducted by NHTSA, the ITS JPO, and FHWA.

**EXTERNAL: The National Transportation Safety Board (NTSB), TRB, NAS, the Committee on National Statistics (CNSTAT), and the National Institute of Occupational Safety and Health (NIOSH)**

FMCSA regularly receives, reviews, and responds to safety-related CMV driver, carrier, and vehicle research and policy recommendations from the NTSB and the TRB Truck and Bus Safety Committee. FMCSA will continue to evaluate recommendations from these organizations as received and adjust the research and technology agenda as needed. FMCSA recently established a Research Analysis Committee at TRB to: a) assist the Agency in refining its research methodologies; b) assist in identifying and utilizing current research in the transportation and related communities; and c) promote the familiarity and availability of FMCSA research activities throughout the stakeholder community. FMCSA will continue to fund that committee in FY 2018.

	<p>Separately, FMCSA has commissioned NAS and CNSTAT to conduct expert panel reviews of existing FMCSA programs and research methodologies. FMCSA will continue to collaborate with NAS and CNSTAT on future research initiatives as needed.</p> <p>Finally, FMCSA and NIOSH have joint interests related to CMV driver health. In FY 2018, FMCSA will continue its collaboration with NIOSH on a joint effort to conduct a longitudinal study of CMV driver health and wellness, to understand the health implications of long-term CMV driving.</p> <p><b>Anticipated Benefits of Collaboration:</b> Collaborating with external partners will enable FMCSA to update and enhance its research and technology program by implementing recommendations, leveraging complementary research activities, and including stakeholder input in setting strategic research objectives.</p>
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**How Program meets Statutory Requirements:**

FMCSA’s R&T Program meets the requirements outlined in 49 U.S.C. § 31108, which requires the Secretary of Transportation to establish and carry out a motor carrier research and technology program. In FY 2018, FMCSA’s R&T Program will continue to fund numerous R&T projects mandated in the FAST Act.

**Describe how public and stakeholder input have been utilized in the development of this research program:**

FMCSA has internal and external mechanisms to help assess the utility of the R&T Program:

- Research and technology projects are reviewed by FMCSA’s Research Executive Board, comprised of members from across the Agency.
- Each product has a customer or benefactor who provides input and evaluation.

FMCSA collaborates closely with product end-users including other USDOT modes such as FHWA and NHTSA. FMCSA also works closely with external customers to ensure that the Agency’s R&T portfolio addresses current needs in the transportation safety environment. In FY 2015, FMCSA commissioned NAS and CNSTAT to conduct a panel study on methodological approaches to understanding driver fatigue. The NAS/CNSTAT panel experts reviewed the existing literature/research and developed a set of 13 recommendations for improved commercial driver fatigue research (published in March 2016). FMCSA is working to incorporate these recommendations into its research plans over the next several years.

In FY 2016, FMCSA commissioned the establishment of an expert Research Analysis Committee at TRB to advise the Agency on the development of its research portfolio. The Research Analysis Committee submitted its first letter report to the Agency in March of 2017. This letter report details the Committee’s initial recommendations for improving the

Agency's research portfolio. FMCSA will take these recommendations under advisement in FY 2018. The Agency will continue to utilize the TRB Research Analysis Committee to enhance its research program and maximize stakeholder input.

Finally, FMCSA provides regular briefings, webinars, and public forums for industry representatives, safety advocates, congressional staff, and the transportation research community, providing opportunities for feedback and research ideas.

## **Section 2 - Program Descriptions, FY 2019**

### **FMCSA Research and Technology Program**

#### **Program Description:**

FMCSA's R&T Program provides scientific safety research on driver behavior, carrier operations, and technology applications. These contributions have proven critical in identifying Agency enforcement priorities and facilitating technology transfer to the marketplace. Program activities range from developing enhanced enforcement technologies and demonstrating the efficacy of truck drivers getting proper training and rest. These projects provide the underpinnings for empirically answering research questions related to the Departmental goals of safety, innovation, and infrastructure.

#### **Program Objectives:**

FMCSA's R&T Program contributes to: 1) the development of expertise, ideas, and tools to advance the state-of-the-art in commercial motor vehicle safety on the Nation's highways and 2) the development and evaluation of future Agency policies, programs, and methodologies. FMCSA's R&T Program has established the following strategic objectives:

- **Produce Safer Drivers:** This objective focuses on developing a better understanding of commercial driver behavior as it relates to safety and understanding and addressing issues related to drivers' fitness for duty. Fitness-for-duty issues include alertness, health, training, and qualification. Initiatives also focus on the enforcement of commercial credentials and driving rules and State practices for handling information about commercial drivers.
- **Improve Safety of CMVs:** The principal goal of this strategic objective is to improve truck and motorcoach safety through vehicle-based research and the deployment of CMV safety technologies. Initiatives under this objective focus on: (1) testing, evaluating, and deploying intelligent connected, semi-automated driver-assist vehicle safety technologies and other onboard safety technologies and (2) developing new data and information to improve occupant protection and overall vehicle safety.
- **Produce Safer Carriers:** The principal goals of this strategic objective are to support: (1) the Agency's enforcement of carrier-related FMCSRs and (2) efforts to improve carrier safety, by applying principles of safety management science from other industries, compiling best management practices, and communicating these best practices to motor carrier managers. Initiatives under this objective focus on improving

carrier compliance investigations, enabling better performance practices for carriers and shippers, continuing the development and deployment of the ITD Grant Program, and supporting carrier enforcement.

- **Advance Safety through Information-Based Initiatives:** The strategies and activities under this objective focus on conducting research that helps to support Agency enforcement activities. This can be done in several ways: 1) evaluating existing research to highlight areas for additional investigation; 2) investigating the overall business, economic, and technical trends in the CMV industry to understand and respond to their impact on safety; and 3) exploring the feasibility and utility of using multiple measures as a basis for calculating crash statistics and setting safety goals.

**Anticipated Program Activities:**

FMCSA will continue to pursue research as it relates to the four identified strategic objectives (produce safer drivers; improve safety of commercial motor vehicles; produce safer carriers; advance safety through information-based initiatives). In FY 2019, FMCSA’s R&T Program will continue to support FMCSA’s safety mission by conducting R&T projects designed to: 1) improve understanding of the causes and safety impacts of commercial driver fatigue, 2) develop and implement commercial motor vehicle safety technologies to improve drivers’ safety performance, 3) support Agency enforcement efforts, 4) develop roadside technologies to streamline inspection processes and target high-risk carriers, and 5) carry out any congressionally mandated work.

**Expected Program Outcomes:**

- **Produce Safer Drivers:** In FY 2019, research findings related to driver health and wellness issues will equip the Agency to develop effective tools for the promotion of driver wellness and the prevention of unsafe behaviors.
- **Improve Safety of CMVs:** The Agency will gain a better understanding of the safety impacts associated with the adoption/use of cutting edge CMV safety technologies. Through Small Business Innovation Research projects, the Agency will also see continued progress in the development, testing, and potential commercialization of CMV safety technologies.
- **Produce Safer Carriers:** Research and technology projects conducted in FY 2019 will provide the Agency with improved enforcement and inspection tools, a better understanding of the effectiveness of existing CMV safety technologies, and knowledge and insights regarding the safety impacts of newly developed CMV technologies.
- **Advance Safety through Information-Based Initiatives:** Findings from FY 2019 research and technology projects will inform and support FMCSA programs and enforcement initiatives. Areas of focus will be determined based on Agency needs.

**Collaboration Partners:**

Program Name	Name of Collaboration Partner(s)
FMCSA R&T Program	<u>INTERNAL</u> : NHTSA, FHWA, ITS JPO

	<p>FMCSA will continue to collaborate with NHTSA, FHWA, and the ITS JPO in the testing and evaluation of safe automated commercial vehicle applications. FMCSA, in partnership with the modes listed above, will make progress on its research roadmap concerning HACVs in the areas of:</p> <ol style="list-style-type: none"> <li>1. Driver alertness, re-engagement, and vigilance in HACVs at SAE Levels 1-4.</li> <li>2. Sensor diagnostic and operational readiness.</li> <li>3. Failure mode analysis of HACV applications and scenarios through both truck simulation and on test tracks.</li> <li>4. Data collection and sharing among the USDOT modes from different highly automated vehicle and HACV on-road testing activities and pilots.</li> </ol> <p><b>Anticipated Benefits of Collaboration:</b> Benefits of the internal collaboration noted above will produce best practices and guidelines on the safe testing and operation of automated commercial vehicles.</p> <p><b><u>EXTERNAL: NTSB, TRB, NAS, CNSTAT, and NIOSH</u></b></p> <p>FMCSA will continue to execute a R&amp;T Program that incorporates recommendations from the NAS, TRB, and CNSTAT.</p> <p><b>Anticipated Benefits of Collaboration:</b> Through collaboration with external partners, FMCSA will deliver sound, peer-reviewed motor carrier safety research findings that inform stakeholders and policy makers.</p>
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**How Program meets statutory requirements:**

FMCSA’s R&T Program meets the requirements outlined in 49 U.S.C. § 31108, which requires the Secretary of Transportation to establish and carry out a motor carrier research and technology program. In FY 2019, FMCSA’s R&T Program will continue to fund numerous R&T projects mandated in the FAST Act.

**Describe how public and stakeholder input have been, or will be, utilized in the development of this research program:**

FMCSA has internal and external mechanisms to help assess the utility of the R&T Program:

- Research and technology projects are reviewed by FMCSA’s Research Executive Board, comprised of members from across the Agency.
- Each product has a customer or benefactor who provides input and evaluation.

FMCSA collaborates closely with product end-users including other USDOT modes such as FHWA and NHTSA. FMCSA also works closely with external customers to ensure that the Agency’s R&T portfolio addresses current needs in the transportation safety environment.

These include the Office of Management and Budget, the U.S. Department of Energy, the Government Accountability Office, State enforcement agencies, NTSB, TRB, NAS, and CNSTAT. FMCSA provides regular briefings, webinars, and public forums for industry representatives, safety advocates, congressional staff, and the transportation research community. FMCSA will continue to utilize the Research Analysis Committee established at TRB to enhance the Agency's research program and maximize stakeholder input.