



March 2024

SURFACE TRANSPORTATION

DOT Considers Multiple Factors When Choosing the Volpe Center to Conduct Research

GAO Highlights

Highlights of [GAO-24-106287](#), a report to congressional committees

Why GAO Did This Study

DOT's research activities are critical to its mission of making the nation's transportation system safer and more efficient. In 2020, GAO found that this research may be conducted by the agency's operating administrations, nonfederal research entities, or DOT's Volpe Center. DOT established what is now the Volpe Center in 1970. Its mission is to improve the U.S. transportation system by anticipating emerging issues and advancing technical, operational, and institutional innovations for the public good.

The Infrastructure Investment and Jobs Act includes a provision for GAO to review the surface transportation activities at the Volpe Center. This report describes (1) factors that selected DOT operating administrations consider when choosing the Volpe Center for research or other services, and (2) how much research funding selected DOT operating administrations committed to the Volpe Center compared to other entities in fiscal year 2022, among other objectives.

GAO selected five DOT operating administrations for analysis that have a surface transportation-focused mission, are responsible for duties and initiatives intended to improve the safety of the traveling public, and entered into agreements with the Volpe Center in fiscal year 2022. GAO also reviewed relevant laws and DOT policies; analyzed DOT data; and interviewed officials from DOT, the Volpe Center, and the five selected operating administrations.

View [GAO-24-106287](#). For more information, contact Elizabeth Repko at (202) 512-2834 or repkoe@gao.gov.

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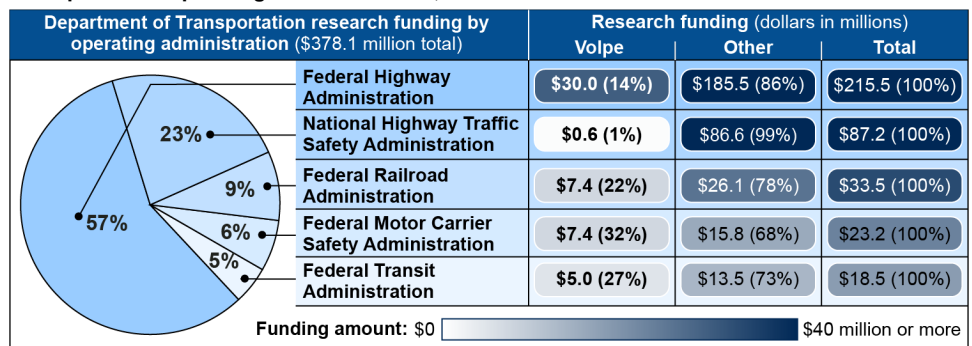
What GAO Found

The U.S. Department of Transportation's (DOT) operating administrations enter into agreements with DOT's John A. Volpe National Transportation Systems Center (Volpe Center) for a variety of services, including research. DOT officials told GAO that they consider multiple factors when choosing the Volpe Center to conduct research or perform other services. These factors include:

- **Expertise.** DOT officials told GAO that they consider the Volpe Center's expertise and institutional knowledge on a topic. For example, the Federal Highway Administration has leveraged the Volpe Center's technical expertise in noise reduction and air quality to create tools for state and regional officials to demonstrate reduced congestion and improved air quality.
- **Nature of the work.** DOT officials told GAO that, because the Volpe Center is a part of the agency, certain issues (e.g., inherently governmental functions) are best addressed by Volpe Center staff. For example, Volpe Center staff have long served as the primary technical resource informing the National Highway Traffic Safety Administration's fuel economy standards rulemaking.
- **Response time.** DOT officials told GAO that the Volpe Center's ability to rapidly respond to agency needs is also a consideration. Volpe Center officials cited the center's recent work to help form the new Joint Office of Energy and Transportation, which involved performing technical reviews of grant applications, as an example of its ability to respond rapidly.

The proportion of research funding committed to the Volpe Center compared to other entities varied across five selected DOT operating administrations in fiscal year 2022 (see figure). Combined, these operating administrations committed a total of \$50.5 million—13 percent of their total fiscal year 2022 research funding—to the Volpe Center. The remaining 87 percent went to other entities such as universities, businesses, and non-profit organizations.

Research Funding Committed to the Volpe Center and Other Entities by Five Department of Transportation Operating Administrations, Fiscal Year 2022



Source: GAO analysis of Department of Transportation data. | GAO-24-106287

DOT operating administrations manage their respective research portfolios. According to DOT officials, each operating administration's distribution of research funding is driven by its mission and role, the scope of individual projects, and the factors described above.

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Abbreviations

DOT	Department of Transportation
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Rail Administration
FTA	Federal Transit Administration
IAA	Intra-agency agreement
NHTSA	National Highway Traffic Safety Administration
OST-R	Office of the Assistant Secretary for Research and Technology

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March 14, 2024

The Honorable Maria Cantwell
Chairman
The Honorable Ted Cruz
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Sam Graves
Chairman
The Honorable Rick Larsen
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

The U.S. Department of Transportation's (DOT) research activities are critical to its mission of making the nation's transportation system safer and more efficient. Individual DOT operating administrations, such as the Federal Highway Administration, manage their own research portfolios. This research may be conducted by the operating administrations, other federal or nonfederal research entities, or by DOT's John A. Volpe National Transportation Systems Center (Volpe Center). DOT established the Volpe Center in 1970 to help address pressing national transportation issues and to improve the nation's transportation system by anticipating emerging issues and advancing technical, operational, and institutional innovations for the public good.¹

The Infrastructure Investment and Jobs Act includes a provision for GAO to review the surface transportation activities at the Volpe Center.² This report describes (1) how DOT uses the Volpe Center's services to support selected surface transportation operating administrations; (2) factors that selected DOT operating administrations consider when choosing the Volpe Center for research or other services; and (3) how much research funding selected DOT operating administrations

¹The Electronics Research Center (now Volpe Center) was authorized as a part of NASA in 1964. In 1970, the center and its facilities were transferred to DOT and DOT renamed it the Transportation Systems Center. In 1990, the center was renamed in honor of the second U.S. Secretary of Transportation and Governor of Massachusetts, John A. Volpe.

²Infrastructure Investment and Jobs Act, Pub. L. 117-58, § 25023(b), 135 Stat. 429, 879 (2021).

committed to the Volpe Center compared to other entities in fiscal year 2022.³

To describe how DOT uses the Volpe Center's services to support its surface transportation operating administrations, we reviewed DOT policies related to working with the Volpe Center and laws affecting Volpe Center operations. We interviewed officials from the Volpe Center and five of DOT's nine operating administrations that we selected for inclusion in our review. These included: the Federal Highway Administration (FHWA), the Federal Railroad Administration (FRA), the Federal Transit Administration (FTA), the Federal Motor Carrier Safety Administration (FMCSA), and the National Highway Traffic Safety Administration (NHTSA). We selected these five administrations for our review because each (1) has a surface transportation-focused mission, (2) is responsible for duties and initiatives intended to improve the safety of the traveling public, and (3) entered into agreements with the Volpe Center in fiscal year 2022.

To describe the factors that selected DOT operating administrations consider when choosing the Volpe Center for surface transportation research or other services, we reviewed DOT policies and guidance for choosing and entering into intra-agency agreements (IAAs) with the Volpe Center.⁴ We also interviewed officials from the five selected DOT operating administrations to understand what factors they consider when determining whether to choose the Volpe Center or another entity to conduct research activities.

To describe how much funding selected DOT operating administrations committed to the Volpe Center and other entities in fiscal year 2022, we

³At the time of this review, fiscal year 2022 was the most recent year for which the data were available.

⁴In the DOT context, an IAA is an agreement whereby a DOT operating administration obtains or provides needed supplies or services from, to, or through, another DOT operating administration or DOT entity (such as the Volpe Center) in exchange for payment or reimbursement. An IAA with the Volpe Center serves as a binding agreement and describes the work to be performed by the Volpe Center. DOT officials told us that each operating administration's research activities vary in scope, funding, and performance period.

collected, analyzed, and summarized DOT funding data.⁵ We asked the selected operating administrations to assign one of five categories to each of the vendors in the data—Volpe Center, government, university, non-profit, and business—which allowed for the identification of funds that had been committed to entities in each category to conduct research in fiscal year 2022. We determined that the funding and entity data that DOT provided were sufficiently reliable for the purpose of describing how much research funding each of the selected operating administrations committed to the Volpe Center relative to other entities.

We conducted this performance audit from September 2022 to March 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Department of Transportation Research

DOT's Office of the Assistant Secretary for Research and Technology (OST-R) coordinates, facilitates, and reviews research activities, while each operating administration manages its own research portfolio.⁶ OST-R provides guidance to the agency's operating administrations regarding the prioritization of their research activities. In developing this guidance, OST-R relies on two strategic plans: the DOT Strategic Plan⁷ and the DOT Research, Development, and Technology Strategic Plan.⁸ OST-R works to ensure that DOT is producing unbiased research, improving

⁵We asked the Volpe Center to provide data on its sources of funding for specific activities in fiscal year 2022, such as research. However, the Volpe Center told us that they track funding by agreement and each agreement may fund many activities, including research. We then asked the five selected DOT operating administrations to instead provide data on research obligations, which they provided.

⁶GAO, *Transportation Research: Additional Actions Could Improve DOT's Internal Collaboration and Reliability of Information on Research Activities*, [GAO-20-622](#) (Washington, D.C.: Aug. 10, 2020).

⁷The Fiscal Year 2022-2026 DOT Strategic Plan establishes long-term department strategic goals and provides detailed objectives for each.

⁸The 5-year U.S. DOT Research, Development, and Technology Strategic Plan describes DOT's research priorities.

overall research products, and identifying opportunities for research to be applied across the agency.

Each DOT operating administration focuses on specific transportation issues tied to their individual missions—such as highway safety or transit—and directs research activities to provide insight into specific problems in those areas. The agency’s operating administrations are required to develop annual plans describing the following fiscal year’s planned research at a program level, along with the major objectives of the program and the activities the operating administration plans to carry out under each program.⁹ OST-R also uses the process of creating these annual plans to communicate DOT’s overall research priorities to the operating administrations, reduce potential duplication, and identify potential areas for research collaboration.

In addition to directly conducting research, DOT operating administrations can provide funding to federal and nonfederal entities to conduct research. DOT operating administrations also fund research with the agency’s internal resource—the Volpe Center—using IAAs. They may also commit funding to other entities such as universities and businesses through contracts, cooperative agreements, and grants.¹⁰

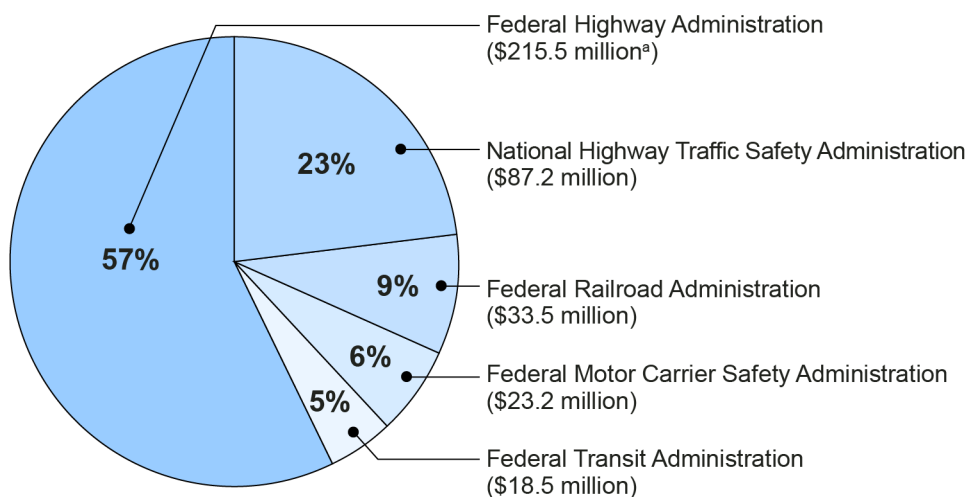
In fiscal year 2022, the selected operating administrations committed \$378.1 million to either the Volpe Center or other entities to conduct research. Of these five DOT operating administrations—FHWA, FMSCA, FRA, FTA, and NHTSA—more than half of this funding (\$215.5 million)

⁹Under 49 U.S.C. § 6501, each DOT operating administration and joint program office is required to submit an Annual Modal Research Plan to the Assistant Secretary for Research and Technology each year for review and approval. The annual modal research plans must provide a plan for the upcoming fiscal year and a detailed outlook for the fiscal year thereafter.

¹⁰Two of the types of federal financial assistance are grants and cooperative agreements. These are used when the principal purpose of the relationship is to transfer a thing of value to a recipient to accomplish a public purpose of support or stimulation authorized by federal law, and not for the direct benefit or use of the federal government. 31 U.S.C. §§ 6304, 6305. A grant agreement is used when no substantial involvement is anticipated between the agency and the recipient during performance of the contemplated activity. 31 U.S.C. §§ 6304. A cooperative agreement is used when substantial involvement is anticipated between the executive agency and the recipient during performance of the contemplated activity. 31 U.S.C. § 6305. A contract is generally used when the principal purpose is to acquire property or services for the direct benefit or use of the United States Government. 31 U.S.C. § 6303.

was from FHWA in fiscal year 2022 (see fig. 1).¹¹ The other four operating administrations' research obligations ranged from \$18.5 million to \$87.2 million in fiscal year 2022.

Figure 1: Total Research Funding Committed by Selected Department of Transportation Operating Administrations to the Volpe Center or Other Entities, Fiscal Year 2022



Source: GAO analysis of Department of Transportation data. | GAO-24-106287

^aThis amount does not include \$27.5 million in research funding that was obligated to State departments of transportation through a different financial management system.

The Volpe Center

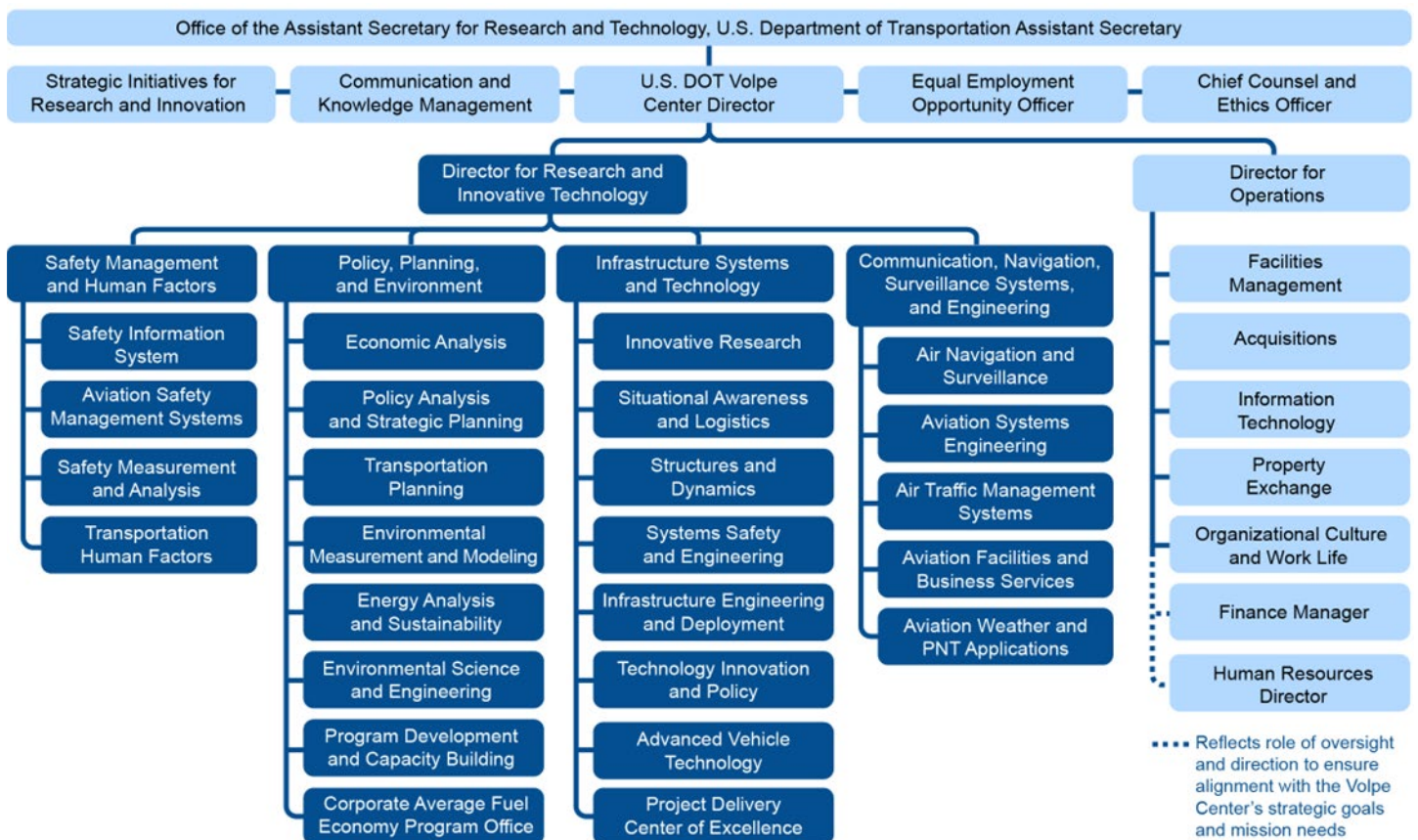
DOT's Volpe Center serves as a federal resource positioned to provide multidisciplinary, multimodal transportation expertise on behalf of DOT's operating administrations, the Office of the Secretary of Transportation, other federal agencies, state and local governments, academia, and industry. OST-R oversees the Volpe Center. While OST-R coordinates, facilitates, and reviews of all of DOT's research programs, the Volpe Center plays a key role when research involves collaboration across modal administrations. As we previously reported, Volpe Center officials told us that they often connect operating administrations with similar

¹¹DOT officials said that the \$215.5 million reported here does not include \$27.5 million in research funding that was obligated to State departments of transportation in fiscal year 2022 through a different financial management system. Added together, the FHWA research funding total would be \$243.0 million for fiscal year 2022.

research interests to ensure funding and staff resources are used efficiently and to potentially reduce duplication.¹²

The Volpe Center employs approximately 600 federal staff and about 400 contractors. It is organized into divisions under four technical centers: Safety Management and Human Factors; Policy, Planning, and Environment; Infrastructure Systems and Technology; and Communication, Navigation, Surveillance Systems, and Engineering (see fig. 2).

Figure 2: Organizational Chart for the Department of Transportation’s John A. Volpe National Transportation Systems Center, as of January 2024

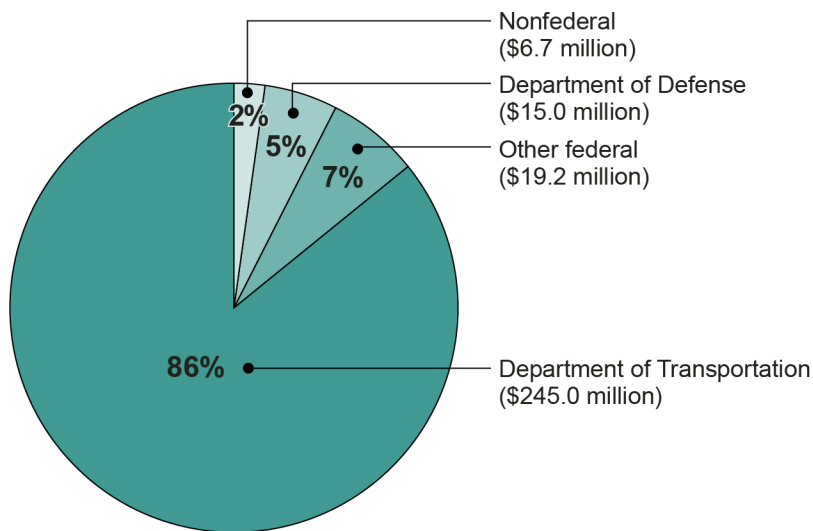


Source: GAO presentation of Volpe Center information. | GAO-24-106287

¹²We previously examined how DOT avoids duplication in their research efforts through a variety of practices, see [GAO-20-622](#).

All work conducted by the Volpe Center is done on a fee-for-service, cost reimbursable basis and is completely funded by either federal or nonfederal project sponsors.¹³ In fiscal year 2022, 86 percent (\$245.0 million) of the \$285.9 million in total new funding provided to the Volpe Center came from DOT (see fig. 3).

Figure 3: Sources of Funding Received by the Department of Transportation’s Volpe Center, Fiscal Year 2022



Source: GAO analysis of Volpe Center data. | GAO-24-106287

Through project-specific IAAs, DOT operating administrations provide funding to the Volpe Center to conduct transportation-related services, including research. In each individual IAA, the sponsoring DOT operating administration documents the specific tasks and deliverables for the Volpe Center to complete. As of November 2022, DOT had a total of 322 active IAAs it had entered into with the Volpe Center for research and other services since 2018. Of these, the five selected operating administrations had a total of 164 active IAAs with the Volpe Center (see table 1). The number of active IAAs between these operating administrations and the Volpe Center ranged from seven (NHTSA) to 87 (FHWA). The value of individual IAAs between the Volpe Center and the

¹³The Volpe Center is authorized to conduct business through a Transportation Systems Center Working Capital Fund (49 U.S.C. § 328). DOT Order 5000.6B establishes standard practices for the management of all sponsor-funded Volpe Center projects.

selected operating administrations that were active as of November 2022 ranged widely.¹⁴

Table 1: Number of Active Intra-Agency Agreements Between the Department of Transportation and the Volpe Center, as of November 2022

Operating administration	Active intra-agency agreements with the Volpe Center
Federal Highway Administration	87
Federal Motor Carrier Safety Administration	18
Federal Railroad Administration	25
Federal Transit Administration	27
National Highway Traffic Safety Administration	7
All other Department of Transportation ^a	158
TOTAL	322

Source: GAO analysis of Volpe Center data. | GAO-24-106287

^aThese IAAs were entered into by other parts of the Department of Transportation that were outside the scope of this review, such as the Federal Aviation Administration, the Maritime Administration, the Pipeline and Hazardous Material Safety Administration, and the Office of the Secretary of Transportation.

Selected DOT Operating Administrations Use the Volpe Center for an Array of Services Including Research

The Volpe Center provides DOT operating administrations with a variety of multi-disciplinary services, including research, that help them meet their missions and address complex transportation issues. DOT operating administration officials told us that these services include (1) inherently governmental functions, (2) programmatic support, and (3) specific research services.

Inherently Governmental Functions

Officials from four of the five selected operating administrations¹⁵ said the Volpe Center’s status as an internal DOT entity allows it to support a range of inherently governmental functions that a nonfederal entity could

¹⁴FHWA had the two IAAs with the highest and lowest values as of November 2022 with values of \$19.4 million and \$36,000, respectively.

¹⁵We asked each of the five selected operating administrations to describe the range of services that the Volpe Center provides them. Four cited inherently governmental functions and the fifth did not state whether inherently governmental functions are or are not a service that the Volpe Center provides to their operating administration.

not perform.¹⁶ They said that these inherently governmental functions include projects that involve regulatory support, policy changes, rapid agency response, or a combination of these activities.¹⁷ Examples include:

- **Fuel economy standards.** The Volpe Center serves as the primary technical resource for NHTSA's Corporate Average Fuel Economy standards program, which regulates how far vehicles must be able to travel on a gallon of fuel, according to Volpe Center officials. NHTSA partners with the Volpe Center's fuel economy division to manage and implement all aspects of the program and Volpe Center staff provide key technical support throughout the federal rulemaking process. For example, to assist NHTSA's evaluation of potential changes to fuel economy standards, Volpe Center staff developed a modeling system that estimates how manufacturers could apply additional fuel-saving technologies in response to the introduction of more stringent standards.¹⁸
- **Motor carrier insurance requirements.** According to an IAA between the Volpe Center and FMCSA, the Volpe Center has also supported FMCSA's regular Congressional update on the minimum levels of insurance coverage that motor carriers¹⁹ must maintain.²⁰ Every 4 years, FMCSA is required to report to Congress on the appropriateness of (1) the current minimum financial responsibility requirements for motor carriers of property and passengers and, (2) the current bond and insurance requirements for freight forwarders

¹⁶An inherently governmental function is, as a matter of policy, a function that is so intimately related to the public interest as to mandate performance by Government employees. An inherently governmental function includes activities requiring either the exercise of discretion in applying Government authority, or the making of value judgments in making decisions for the Government. 48 C.F.R. § 2.101.

¹⁷DOT officials told us that inherently governmental functions can also include pre-decisional activities associated with research program awards and privileged or proprietary information that is part of technical oversight or assessment of active, agency-funded research.

¹⁸Specifically, this modeling system projected how different levels of fuel economy standards would affect vehicle costs and fuel economy levels, vehicle sales volumes and fleet turnover, national-scale automotive manufacturing employment, highway travel, fatalities, and fuel consumption, as well as carbon dioxide and other emissions.

¹⁹Motor carriers include large commercial truck, moving, and bus companies, corporations, and other entities that provide motor vehicle transportation for compensation. 49 U.S.C. § 13102.

²⁰The Moving Ahead for Progress in the 21st Century Act, Pub. L. No. 112-141, § 32104, 126 Stat. 405, 780 (2015).

Programmatic Support

and brokers. The Volpe Center is assisting FMCSA by updating the analysis conducted in its 2013 Financial Responsibility for Commercial Motor Carriers report, which served as the input to FMCSA's 2014 report to Congress, with current data.

Officials from all five of the selected operating administrations told us that the Volpe Center also provides them with programmatic support services. Examples include:

- **Transportation planning capacity building.** According to an IAA between the Volpe Center and FHWA, the Volpe Center has provided programmatic support to the FHWA Office of Planning since fiscal year 2003. The Volpe Center has helped the Office of Planning deliver technical assistance, disseminate information, training, and other services to leaders and technical staff at the state level, as well as metropolitan, rural, and tribal communities. For example, the Volpe Center supports the Office of Planning's Transportation Planning Capacity Building Program by planning, coordinating, and facilitating peer-based events for transportation professionals to share experiences and lessons learned around specific planning-related topics, such as the federal environmental review process.
- **Transit asset management.** According to the statement of work in the related IAA, the Volpe Center provides programmatic support to FTA's Office of Budget and Policy in the office's implementation of its Transit Asset Management Program.²¹ In 2016, FTA published a final rule requiring all recipients of federal funding that own, operate, or manage public transportation capital assets to establish Transit Asset Management plans.²² These plans must include an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the state of good repair of their assets. Transit agencies that receive financial assistance under 49 U.S.C. Chapter 53 must submit an annual data and narrative report to FTA's National Transit Database.²³ The statement of work tasks the Volpe Center with analyzing the data that transit agencies report to the National Transit Database and developing communications products, such as

²¹Transit Asset Management (TAM) is a strategic and systematic practice of procuring, operating, inspecting, maintaining, rehabilitating, and replacing transit capital assets to manage their performance, risks, and costs over their life cycles, for the purpose of providing safe, cost-effective, and reliable public transportation. 49 C.F.R. § 625.5.

²²Transit Asset Management; National Transit Database, 81 Fed. Reg. 48,890 (July 26, 2016) (codified at 49 C.F.R. pts. 625, 630).

²³49 C.F.R. § 625.55.

Specific Research Services

reports and fact sheets, for internal and external use. The Volpe Center is also tasked with engaging transit agency stakeholders to gather and analyze information related to understanding how, in practice, transit agencies measure asset performance and use investment scenarios. The Volpe Center is then to summarize themes and lessons learned from transit agency stakeholders to position FTA to make Transit Asset Management program improvements.

Officials from four of the five selected operating administrations told us that the Volpe Center performs specific research functions to support their research goals.²⁴ According to Volpe Center officials, the Volpe Center conducts only a small amount of work that could be narrowly defined as “research and development” as compared to its inherently governmental and programmatic support services.²⁵ These officials told us that most of the Volpe Center’s research is related to human factors and safety. Examples include:

- **Grade crossing safety.** According to the IAA’s statement of work, the Volpe Center supports FRA’s Office of Research, Development, and Technology with highway-rail grade crossing safety research which aims to examine new technology prototypes, systems, and components, as well as education and enforcement initiatives that have the potential to improve the safety at grade crossings (see fig. 4). As part of this support, Volpe Center staff demonstrate and evaluate innovative safety treatments and technology transfer initiatives from other modes of transport. This research is intended to allow for the development of techniques or technologies that reduce violations of traffic control devices that may lead to incidents and casualties and supports the development of FRA regulations and industry standards.

²⁴We asked each of the five selected operating administrations to describe the range of services that the Volpe Center provides them. Four cited specific research services and the fifth did not state whether or not the Volpe Center provides these services to their operating administration.

²⁵Research and development conduct is defined as creative and systematic work undertaken to increase the stock of knowledge—including knowledge of people, culture, and society—and to devise new applications using available knowledge.

Figure 4: Federal Rail Administrator Simulator Located at the Volpe Center for Human Factors Research



Source: Volpe Center. | GAO-24-106287

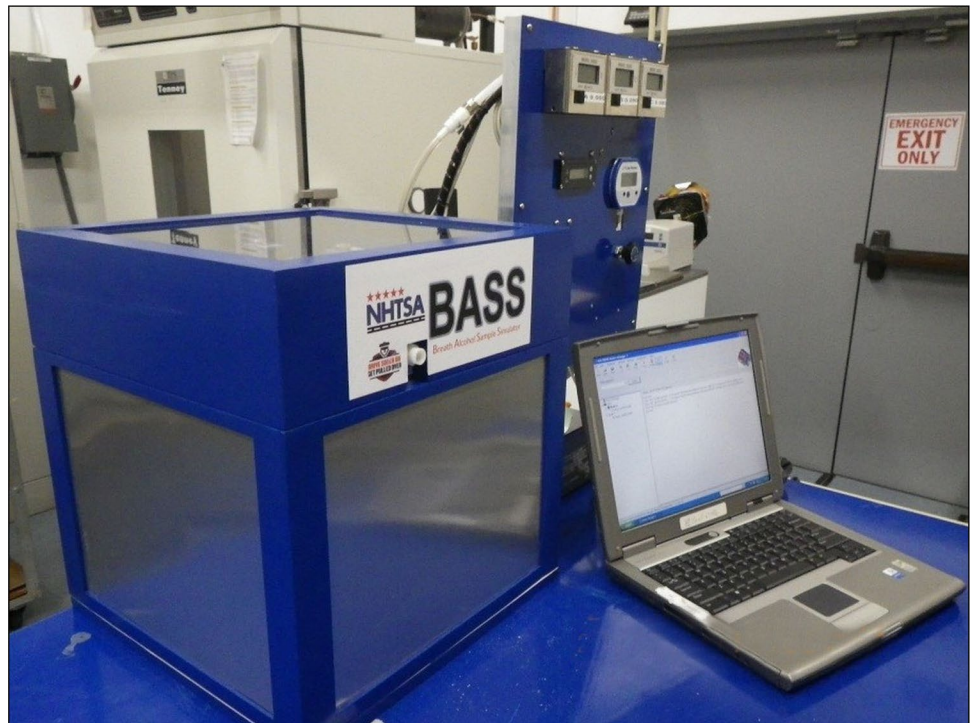
- **Alcohol countermeasures.** According to an IAA between the Volpe Center and NHTSA, the Volpe Center's Alcohol Countermeasures Laboratory supports NHTSA in its aims to reduce and detect alcohol impairment by (1) developing measurement techniques for alcohol in the breath, (2) developing performance criteria for breath alcohol measurement devices, and (3) evaluating the accuracy of those devices.²⁶ The Volpe Center annually reports the log of devices that were tested, including both those that met the required model specifications and those that did not. NHTSA uses this annual report to maintain and update the conforming products list with breath testing devices that may be used to conduct alcohol confirmation tests for workplace drug and alcohol testing for the federally regulated transportation industry.²⁷ The lab also evaluates the accuracy of the

²⁶The Volpe Center's Alcohol Countermeasures Laboratory began in 1970 as the NHTSA-recognized laboratory with the task of testing and approving alcohol-detection devices used by law enforcement or the transportation industry.

²⁷49 C.F.R. § 40.231 (2018) establishes the requirements for devices used for alcohol confirmation tests.

devices that may be of interest to NHTSA, such as disposable or re-usable personal breath testers, passive breath testers, or devices that test other bodily fluids for alcohol (see fig. 5).

Figure 5: Volpe Center Alcohol Countermeasures Laboratory Equipment



Source: Volpe Center. | GAO-24-106287

DOT Considers Expertise, Nature of the Work, and Response Time When Choosing the Volpe Center for Research and Services

Officials from selected DOT operating administrations said that they consider a variety of factors when choosing the Volpe Center for a given project. They told us that they consider (1) whether the Volpe Center has expertise in the area, (2) the nature of the work to be performed, and (3) the required response time.

Volpe Center Expertise

Officials from all five of the selected operating administrations told us they consider the Volpe Center’s expertise and institutional knowledge when choosing the center to perform services. Examples include:

- **Crash-avoidance technology.** According to our review of an IAA between NHTSA and the Volpe Center, NHTSA has leveraged the Volpe Center’s expertise in engineering, analysis, and advanced-technology safety systems since 2007 to research and evaluate crash-avoidance technologies. At that time, the Volpe Center developed a pre-crash scenario typology and identified 37 pre-crash scenarios that laid the foundation for crash avoidance research for advanced driver assistance systems. In 2019, the Volpe Center revised the pre-crash scenario typology, defined a new set of pre-crash scenarios, and developed a method that enables researchers to statistically describe target pre-crash scenarios for any vehicle type. At the time of our review, the Volpe Center was working to revise the crash data query methodology, upgrade the implementation software, and update pre-crash scenario statistics and trends with more recent data.
- **Noise and air quality.** According to FHWA officials and our review of an IAA between FHWA and the Volpe Center, FHWA has worked with the Volpe Center’s noise and air modeling division since the center’s inception. According to Volpe Center officials, this relationship has led to members of the Volpe Center team having a level of experience and institutional knowledge as great as the staff in FHWA’s program office. Specifically, FHWA leverages the center’s technical expertise in noise reduction and air quality to create tools for state departments of transportation and metropolitan planning organizations.²⁸ They said that practitioners may use these tools to demonstrate reduced congestion and improved air quality from their projects when applying for funding from FHWA’s Congestion Mitigation and Air Quality Improvement Program.

Nature of the Work to Be Performed

Officials from four of the five selected operating administrations told us that because the Volpe Center is a part of DOT, certain issues—such as those involving sensitive agency matters or inherently governmental

²⁸For example, the Volpe Center team measures vehicle emissions of particles, which are regulated by the Environmental Protection Agency under the Clean Air Act, to develop mathematical models for practitioners to measure the environmental benefits from proposed projects. Through the Congestion Mitigation and Air Quality Program, states may use funding for eligible projects including those in areas of “nonattainment”—areas that do not meet the minimum standard for air quality for ozone, carbon monoxide, or particulate matter—if the project demonstrates reduced congestion and improved air quality, subject to program requirements.

functions—can be best addressed by Volpe Center staff.²⁹ Examples include:

- **Analyses of DOT’s human resources.** According to Volpe Center officials and our review of the IAA, DOT’s Departmental Office of Civil Rights had the Volpe Center produce analyses of Diversity, Equity, Inclusion, and Accessibility benchmarks and trends—including employee hiring, pay, promotions, and separations—in support of mandated federal reporting. According to Volpe Center officials, their staff worked with DOT’s Office of Human Resources to collect the necessary sensitive data from the last 10 years to independently analyze trends in hiring, promotions, and time in grade. The Volpe Center then developed a final report that presented its findings and recommendations for where changes in the hiring and promotion process could be made.
- **Motor carrier inspection and enforcement.** FMCSA officials said that projects that involve inherently governmental work—such as inspection and enforcement—are better suited for Volpe than other entities. For example, the Volpe Center supports FMCSA’s inspection and enforcement role by producing annual estimates of safety benefits achieved from performing inspections and traffic enforcements related to FMCSA’s Motor Carrier Safety Assistance Program.³⁰ The Volpe Center also produces annual estimates of safety benefits attributable to interventions with motor carriers, which are part of the Compliance, Safety, and Accountability Program.³¹ The Volpe Center documents these estimates in an annual report, and FMCSA officials told us that they may use the report to inform decisions to improve these programs.

²⁹We asked each of the five selected operating administrations how they determine whether to work with the Volpe Center or other entities for any given service. Four cited the nature of the work to be performed as a factor that they consider, while the fifth did not state whether this was or was not a factor that they consider.

³⁰The Motor Carrier Safety Assistance Program is a federal formula grant program that provides financial assistance to states to reduce the number and severity of crashes and hazardous materials incidents involving commercial motor vehicles. 49 U.S.C. § 31102(b). States are eligible for this financial assistance by submitting a commercial vehicle safety plan that complies with program requirements. 49 U.S.C. § 31102(c).

³¹The Compliance, Safety, and Accountability Program is FMCSA’s data-driven safety compliance and enforcement program designed to improve safety and prevent commercial motor vehicle crashes, injuries, and fatalities. The program consists of three components: the Safety Measurement System, interventions, and a Safety Fitness Determination rating system to determine the safety fitness of motor carriers.

Required Response Time

Officials from four of the five selected operating administrations told us that they consider the Volpe Center's ability to rapidly respond to agency needs when selecting them for support services.³² For example:

- **Joint Office of Energy and Transportation.** According to Volpe Center officials and our review of the IAA, DOT's Office of the Secretary of Transportation tasked the Volpe Center with helping the agency and the Department of Energy quickly form the new Joint Office of Energy and Transportation (Joint Office), as required by the Infrastructure Investment and Jobs Act.³³ According to the statement of work, the Volpe Center is to provide subject matter expertise to support the development of the Notice of Funding Opportunity for relevant grant programs, provide technical reviews of applications as well as comments and scores, and make recommendations to aid in the final selection for funding. According to Volpe Center officials, the Volpe Center is well suited for this type of activity because they have a long history of helping DOT quickly stand up new program offices and performing technical reviews of grant applications.
- **IAA Processing Time.** According to FRA officials, the funding mechanism can be a deciding factor for selecting the Volpe Center because IAAs require less time to process. According to DOT officials, when working with nonfederal entities, operating administrations must follow a competitive procurement process for funding mechanisms such as contracts and grants. They said that the solicitation and review of applicants and proposals required by this process is more time-consuming than the process for entering into an IAA, which can allow work on a project to get started sooner.

In October 2022, DOT issued guidance directing its operating administrations to document their rationale for entering into each IAA with the Volpe Center for all services including research, following a 2019

³²We asked each of the five selected operating administrations how they determine whether to work with the Volpe Center or other entities for any given service. Four cited required response time as a factor that they consider, while the fifth did not state whether this was or was not a factor that they consider.

³³Infrastructure Investment and Jobs Act, Pub. L. 117-58, 135 Stat. 429 (2021). The Infrastructure Investment and Jobs Act includes \$5 billion in dedicated formula funding under the National Electric Vehicle Infrastructure Formula Program to provide funding to states to strategically deploy electric vehicle charging infrastructure. Infrastructure Investment and Jobs Act, Pub. L. 117-58, 135 Stat. 429, 1421 (2021). The act also establishes a \$2.5 billion discretionary grant program for Charging and Fueling Infrastructure to strategically deploy publicly accessible electric vehicle charging infrastructure and hydrogen, propane, and natural gas fueling infrastructure along designated alternative fuel corridors. *Id.* at § 1101 (codified at 23 U.S.C. § 151).

recommendation by the DOT Office of Inspector General.³⁴ The Office of Inspector General report stated that better documenting the rationale for choosing an IAA with the Volpe Center over a contract with a nonfederal entity will reassure DOT it is ensuring the best use of federal funds. In March 2023, citing factors including DOT's issuance of this guidance, the Inspector General closed the recommendation.³⁵

Portion of Fiscal Year 2022 Research Funding Committed to Volpe Center and Other Entities Varied Across Selected DOT Operating Administrations

The five selected DOT operating administrations committed a total of \$378.1 million in research funding in fiscal year 2022, 13 percent (\$50.5 million) to the Volpe Center and 87 percent to other entities.³⁶ These other entities include universities, businesses, and non-profit organizations.

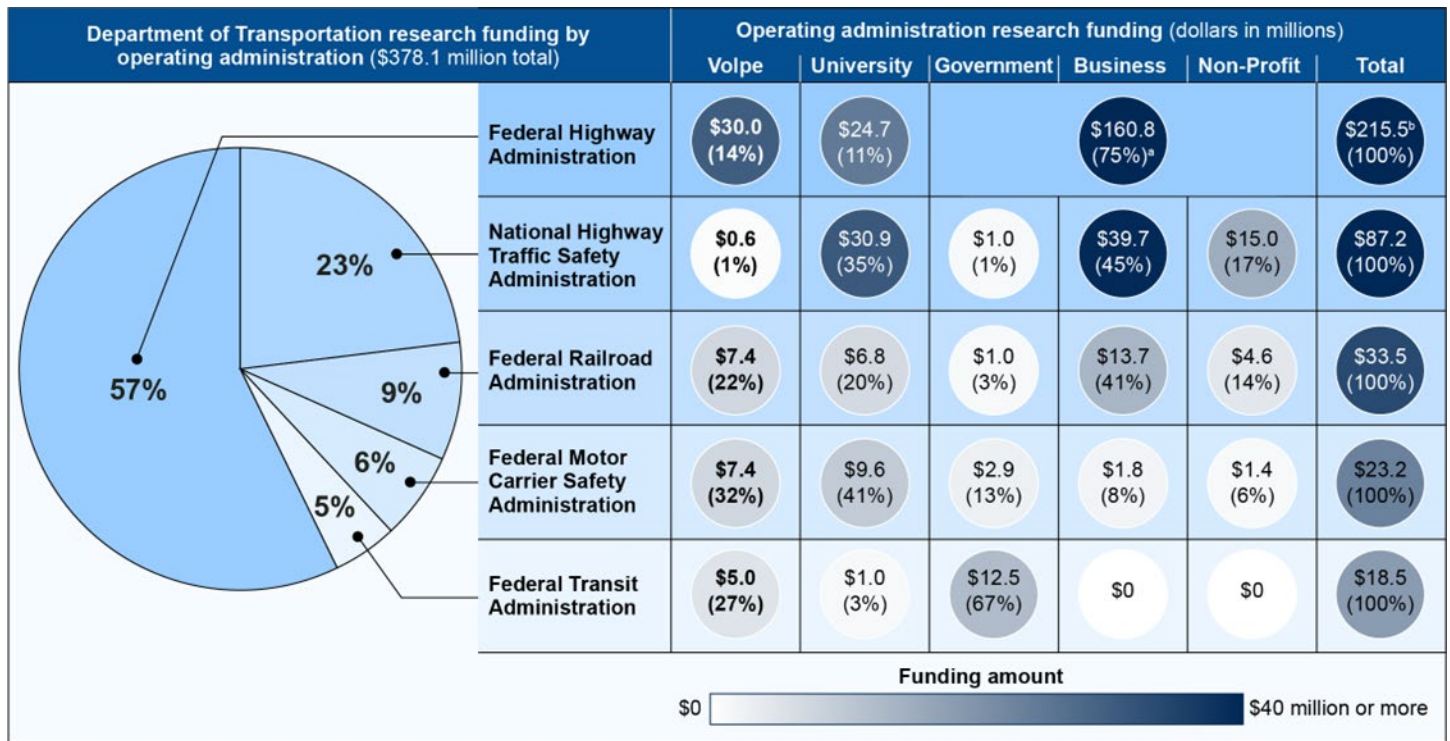
We found that the proportion of research funding committed to the Volpe Center as compared to other entities varied across the five selected DOT operating administrations in fiscal year 2022, as shown in figure 6 and described in more detail below. For example, NHTSA committed less than 1 percent of its research funding to the Volpe Center, and committed 35, 45, and 17 percent to universities, businesses, and non-profit organizations, respectively. Conversely, FMCSA committed greater shares of its research funding to the Volpe Center (32 percent) and universities (41 percent) in fiscal year 2022, and smaller shares to businesses (8 percent) and non-profits (6 percent).

³⁴*Departmental Guidance for Entering into IAAs with Volpe*, U.S. Department of Transportation, October 2022. The DOT OIG found that the various practices operating administration used for planning IAA work with Volpe led to inconsistencies in how they evaluate whether an IAA with Volpe represents the best business decision. See *DOT Needs to Strengthen Its Oversight of IAAs with Volpe*, DOT Office of the Inspector General, Report No. ZA2019087, September 30, 2019.

³⁵In October 2023, DOT officials told us that some operating administrations had begun updating their respective internal guidance to comply with the new agency-wide guidance and that the Office of the Secretary of Transportation planned to request all operating administrations to self-certify their implementation of the new guidance in early 2024.

³⁶In fiscal year 2022, the five DOT surface transportation operating administrations selected for inclusion in this review committed a total of \$378.1 million in research funding to either the Volpe Center or other entities. Of the selected operating administrations—FHWA, FMCSA, FRA, FTA, and NHTSA—more than half of this funding (\$215.5 million) was committed by FHWA (see fig. 1).

Figure 6: Total Research Funding Committed to the Volpe Center and Other Entities by Selected DOT Surface Transportation Operating Administrations, Fiscal Year 2022



Source: GAO analysis of Department of Transportation data. | GAO-24-106287

Note: The individual percentages may not add up to 100 percent due to rounding.

^aThe Federal Highway Administration (FHWA) was unable to provide entity categories for its research funding data. However, based on the information provided, GAO was able to identify the amounts of funding committed to the Volpe Center and universities. GAO then combined the remaining FHWA funding amounts into the government, business, and non-profit category for this figure.

^bThis amount does not include \$27.5 million in research funding that was obligated to State departments of transportation through a different financial management system.

As mentioned earlier, individual DOT operating administrations manage their respective research portfolios. According to DOT officials, each operating administration’s distribution of research funding is driven by its

mission and role, the scope of individual projects, and the factors described above.³⁷

- **Federal Highway Administration.** FHWA committed 14 percent of its total research funding to the Volpe Center in fiscal year 2022. FHWA officials said that it is important for FHWA to be able to pursue agreements with vendors such as the Volpe Center for research support, some of which has been ongoing for decades. For example, officials from the Volpe Center said their staff have conducted FHWA noise and air quality research since the center's inception in 1970 (see fig. 7). Also in fiscal year 2022, FHWA committed 11 percent of its total research funding to universities. Ongoing university research that FHWA has funded includes the University of Michigan's Transportation Research Institute's Smart Intersections Project, which tests how roadside connected-vehicle sensors placed at intersections can help manage traffic flow and reduce congestion.

³⁷DOT officials told us that each operating administration's distribution of research funding is driven by its respective mission and authority, along with the President's priorities, the Secretary of Transportation's priorities, and Congressional mandates (e.g., the Infrastructure Investment and Jobs Act). These officials added that because these operating administrations are sometimes required to implement congressional mandates that are inherently governmental in a very short delivery timeframe, the Volpe Center may be leveraged due to its institutional knowledge.

Figure 7: Volpe Center Noise Research Equipment



Source: Volpe Center. | GAO-24-106287

- **National Highway Traffic Safety Administration.** NHTSA committed less than 1 percent of its total research funding to the Volpe Center in fiscal year 2022. NHTSA officials said the Volpe Center’s recent NHTSA research has been limited but noted the center’s alcohol and drug countermeasures laboratory support for NHTSA’s evaluation of alcohol measurement devices. These officials said that most of NHTSA’s research funding is committed to businesses, universities, and non-profits to research and test new safety features.
- **Federal Railroad Administration.** FRA committed 22 percent of its total research funding to the Volpe Center in fiscal year 2022. FRA officials said that they provide funding to entities with the expertise and equipment to address their research needs and support FRA’s

mission.³⁸ For example, they said that the Volpe Center's demonstrated expertise in applied human factors research and its technical skills in designing and conducting experiments using the FRA rail simulator³⁹ make it likely that the agency will select Volpe for additional human factors rail research in the future.⁴⁰ These officials also said that there are universities with equipment needed for specific rail research. For example, they said that Virginia Tech University has a designated laboratory to research issues related to railroad tie materials and track layout.

- **Federal Motor Carrier Safety Administration.** FMCSA committed 32 percent of its total research funding to the Volpe Center in fiscal year 2022. FMCSA officials said that they seek the Volpe Center's technical expertise in areas such as connected vehicle technology and automated driver systems to inform regulatory decisions. The largest portion (41 percent) of FMCSA's fiscal year 2022 research funding was committed to universities. According to FMCSA officials, universities are well-suited for naturalistic driving field tests and human factors research because they have the testing environments and technological infrastructure necessary for collecting and storing large amounts of data.⁴¹
- **Federal Transit Administration.** FTA committed 27 percent of its total research funding to the Volpe Center in fiscal year 2022. FTA officials said that the research funding they commit to the Volpe Center generally involves assessing specific technologies and conducting market research that provides insight on the future of public transportation.⁴² These officials said that most of their research

³⁸FRA's research mission is to ensure the safe movement of people and goods by rail through the research and development of innovative technologies and solutions in five areas: human factors, railroad systems issues, rolling stock, track, and train control and communication.

³⁹DOT officials said that the Federal Rail Administration has entrusted the Volpe Center to operate and maintain their rail simulator.

⁴⁰According to Office of Management and Budget Circular A-11, Section 84.2(c), applied research is defined as original investigation undertaken to acquire new knowledge that is directed primarily towards a specific practical aim or objective.

⁴¹FMCSA's mission is to reduce crashes, injuries, and fatalities involving large trucks and buses.

⁴²FTA's research mission is to enable a robust public transportation network that connects communities and protects the environment. This is achieved by developing, demonstrating, evaluating, and deploying transformative technologies and processes that enable connected, climate friendly communities.

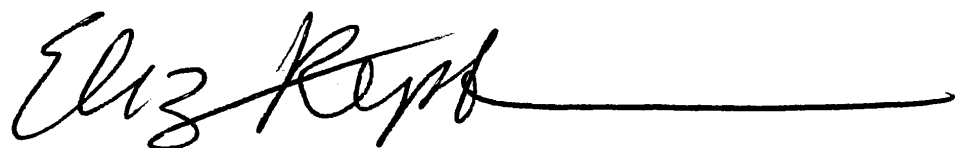
funding is committed to state and local governments, such as transit agencies, to pilot and demonstrate these technical solutions to address specific problems in their operations.

Agency Comments

We provided a draft of this report to the Department of Transportation for review and comment. The Department of Transportation provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Transportation, and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or repkoe@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix I.

A handwritten signature in black ink, reading "Elizabeth Repko", followed by a long horizontal line extending to the right.

Elizabeth Repko
Director, Physical Infrastructure Issues

Appendix I: GAO Contact and Staff Acknowledgments

GAO Contact

Elizabeth Repko, (202) 512-2834 or repkoe@gao.gov

Staff Acknowledgments

In addition to the contact named above, Brandon Haller (Assistant Director); Chad Williams (Analyst-in-Charge); McKenna Stahl; Maria Wallace; Melissa Bodeau; Laura Bonomini; Serena Lo; Josh Ormond; and Alicia Wilson made key contributions to this report.

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