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Report to Congressional Committees

May 2017

SMALL BUSINESS RESEARCH PROGRAMS

Most Agencies Met Spending Requirements, but DOD and EPA Need to Improve Data Reporting

GAO-17-453

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GAO Highlights

Highlights of GAO-17-453, a report to congressional committees

Why GAO Did This Study

Through the SBIR and STTR programs, federal agencies have awarded contracts and grants totaling about $44 billion to small businesses to develop and commercialize innovative technologies. The Small Business Act requires agencies with extramural R&D obligations that meet certain thresholds—$100 million for SBIR and $1 billion for STTR—to spend a percentage of these funds on the programs. The agencies are to report on their activities to SBA and, in turn, SBA is to report to Congress.

The 2011 reauthorization of the programs includes a provision for GAO to review agencies' compliance with SBIR and STTR spending and reporting requirements and other program aspects. This report examines, for fiscal year 2015, (1) the extent to which participating agencies met spending requirements, (2) the extent to which agencies and SBA met certain reporting requirements, (3) the potential effects of basing spending requirements on total R&D budget authority instead of on extramural R&D obligations, and (4) what is known about the amounts agencies spent to administer the programs. GAO reviewed agency spending data and reports and interviewed program officials from SBA and the 11 participating agencies.

What GAO Recommends

GAO recommends that DOD and EPA establish procedures to report obligations data or propose to Congress an alternative methodology for calculating spending requirements. DOD and EPA agreed with GAO's recommendation.

View GAO-17-453. For more information, contact John Neumann at (202) 512-3841 or neumannj@gao.gov.

What GAO Found

Data submitted to the Small Business Administration (SBA) indicate that most of the agencies participating in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs met spending requirements for fiscal year 2015. Nine of the 11 agencies participating in the SBIR program and 4 of the 5 agencies participating in the STTR program submitted the required data on obligations for extramural research or research and development (R&D)—which is generally conducted by nonfederal employees outside of federal facilities—needed to determine whether they met spending requirements. Of the agencies that submitted the required obligations data, 8 of 9 met SBIR spending requirements and all 4 met STTR spending requirements for fiscal year 2015. GAO could not determine compliance for 2 agencies—the Department of Defense (DOD) and the Environmental Protection Agency (EPA)—because these agencies did not submit the required obligations data. Officials at most agencies, including DOD and EPA, identified difficulties in using extramural R&D obligations data to calculate spending requirements and determine compliance. A working group of several participating agencies is considering proposing an alternative methodology to calculate spending requirements, according to an agency official involved in leading the effort. Until DOD and EPA find ways to provide obligations data or until the calculation methodology is changed, these 2 agencies will not know whether they have met the spending requirements, which limits SBA's reporting of that information to Congress.

Agencies inconsistently met certain requirements to report to SBA on their methodologies for calculating their extramural R&D budgets in fiscal year 2015, and SBA officials said they are taking steps to expedite SBA's required reporting to Congress. Five of the 11 agencies submitted their required methodology reports on time. Most agencies provided detailed information in these reports, but they did not consistently provide all of the information required. Regarding SBA's own reporting requirements, as of May 2017, SBA had not submitted its report for fiscal year 2015. GAO has previously made recommendations to SBA to address these issues, and SBA is in the process of implementing them.

GAO's analysis shows that basing SBIR and STTR spending requirements on an agency's total R&D budget authority instead of on its extramural R&D obligations for fiscal year 2015 would have increased spending requirements and the number of agencies required to participate in the programs. Officials from each of the participating agencies identified benefits or drawbacks of this potential change. For example, agency officials identified more awards to small businesses as a benefit, but officials from several agencies also stated that such a change could limit resources for other R&D programs.

Total administrative spending for the SBIR and STTR programs for fiscal year 2015 is unknown, but 9 agencies participating in an administrative pilot program—which permits agencies to fund new administrative activities—reported spending about $33.9 million on these activities for that year. Agencies are not required to and generally do not track their total administrative costs, so GAO could not determine total spending.

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Abbreviations

Commerce	Department of Commerce
DHS	Department of Homeland Security
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
Education	Department of Education
EPA	Environmental Protection Agency
HHS	Department of Health and Human Services
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation
R&D	research or research and development
SBA	Small Business Administration
SBIR	Small Business Innovation Research
STTR	Small Business Technology Transfer
USDA	U.S. Department of Agriculture

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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May 31, 2017

Congressional Committees

Federal agencies support research or research and development (R&D) projects at small businesses through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Through these programs, federal agencies awarded about 5,200 contracts and grants, totaling about $2 billion, in 2015 and have awarded about 159,000 contracts and grants, totaling about $44 billion, since the programs' inceptions in 1982 and 1992, respectively. These awards are intended to support the development and commercialization of innovative technologies. For example, one award from 2015 was intended to help a company develop a tool to prevent surgical wound infections. Another award from 2015 was intended to help a company identify and evaluate improved materials and designs for components of aerospace wind tunnel facilities. The SBIR and STTR programs are similar in that participating agencies identify topics for R&D projects and support small businesses, but the STTR program requires the small business to partner with a nonprofit research institution, such as a nonprofit college or university or a federally funded research and development center.[1]

Federal agencies with obligations of $100 million or more for extramural R&D are required to participate in the SBIR program, and federal agencies with obligations of $1 billion or more for extramural R&D are required to also participate in the STTR program.[2] Currently, 11 agencies participate in the SBIR program, and 5 of these agencies also participate in the STTR program, as shown in table 1.

[1]Federally funded research and development centers are government-funded entities operated by nongovernmental organizations to meet long-term research or development needs that cannot be met as effectively by existing governmental or contractor resources. These entities typically assist government agencies with scientific research and analysis, systems development, and system acquisition.

[2]Agencies' R&D efforts generally include funding for two types of R&D: intramural and extramural. Intramural R&D is conducted by employees of a federal agency in or through government-owned, government-operated facilities. Extramural R&D is generally conducted by nonfederal employees outside of federal facilities.

Table 1: Agencies Participating in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs

	Program	
Agency	**SBIR**	**STTR**
Department of Agriculture	X	
Department of Commerce	X	
Department of Defense	X	X
Department of Education	X	
Department of Energy	X	X
Department of Health and Human Services	X	X
Department of Homeland Security	X	
Department of Transportation	X	
Environmental Protection Agency	X	
National Aeronautics and Space Administration	X	X
National Science Foundation	X	X

Source: Small Business Administration. | GAO-17-453

The Small Business Act, which authorizes the SBIR and STTR programs, establishes the minimum percentage of an agency's extramural R&D obligations that it must spend on the programs annually.[3] In fiscal year 2015, agencies participating in the SBIR program were required to spend at least 2.9 percent of their extramural R&D obligations on the program, and agencies participating in the STTR program were required to spend at least 0.40 percent of their extramural R&D obligations on the program. The SBIR and STTR policy directives, which provide direction to the participating agencies for the general operation of the programs, require participating agencies to submit data to the Small Business

[3]The Small Business Act requires an agency to spend a minimum percentage of its extramural R&D "budget" on the SBIR and STTR programs annually, but the act defines the extramural R&D budget in terms of obligations. More specifically, the act defines an agency's extramural R&D budget as the sum of an agency's total R&D obligations minus amounts obligated for research conducted by employees of the agency in or through government-owned and government-operated facilities. In 2014, the Small Business Administration (SBA), which oversees the program, changed the terminology it uses from "extramural R&D budget" to "extramural R&D obligations" to clarify how agencies are required to calculate their spending requirements for the programs. In this report, we generally use the term extramural R&D obligations to be consistent with SBA's terminology. We use the term "spending" to refer to agencies' obligations for extramural R&D efforts, including those for the SBIR and STTR programs, and we refer to the amounts resulting from applying the mandated percentages to extramural R&D obligations as "spending requirements."

Administration (SBA) each year on the amount of their extramural R&D obligations and the amount they obligate for SBIR and STTR awards, among other information.[4]

The Small Business Act also establishes certain reporting requirements for participating agencies and SBA. Among other things, within 4 months of the enactment of agencies' annual appropriations, the agencies must report to SBA on their methodologies for calculating their extramural R&D obligations. Furthermore, SBA must annually report to Congress on the participating agencies' SBIR and STTR programs.

Both programs were reauthorized in 2011. The SBIR/STTR Reauthorization Act of 2011 (reauthorization act)[5] directed SBA to allow agencies to participate in a pilot program, known as the administrative pilot program, that permitted the funding of administrative and certain other costs in fiscal years 2013 through 2015.[6] This administrative pilot program, as outlined in the reauthorization act and policy directives, allows agencies to use not more than 3 percent of the funding allocated to the SBIR program for new activities, including program administration; outreach; commercialization; standardization and simplification of program procedures; prevention of waste, fraud, and abuse; and reporting. The SBIR and STTR policy directives specifically note that funding under the pilot program may not replace current agency administrative funding for SBIR or STTR activities. Instead, the administrative pilot program is intended to supplement the agency's existing administrative efforts. In November 2015, the National Defense Authorization Act for Fiscal Year 2016 extended the pilot program through September 30, 2017.[7] In December 2016, the National Defense

[4]SBA's Office of Investment and Innovation is responsible for overseeing and coordinating the participating agencies' efforts for the SBIR and STTR programs by setting overarching policy and issuing policy directives, collecting program data, reviewing agency progress, and reporting annually to Congress, among other responsibilities.

[5]SBIR/STTR Reauthorization Act of 2011, Pub. L. No. 112-81, div. E, tit. LI, §§ 5001-5168, 125 Stat. 1298, 1822-62 (codified at 15 U.S.C. §§ 638-638b (2017)).

[6]SBIR/STTR Reauthorization Act of 2011 § 5141 (codified as amended at 15 U.S.C. § 638(mm) (2017)).

[7]National Defense Authorization Act for Fiscal Year 2016, Pub. L. No. 114-92, § 873(e), 129 Stat. 726, 939 (2015) (codified at 15 U.S.C. § 638(mm)(1) (2017)).

Authorization Act for Fiscal Year 2017 extended the SBIR and STTR programs through fiscal year 2022 but did not extend the pilot program.[8]

The reauthorization act includes a provision for us to annually review the participating agencies' compliance with spending and reporting requirements for the programs, as well as other aspects of the programs. We issued four reports from September 2013 through May 2016 in response to this provision.[9] This report covers fiscal year 2015 and addresses (1) the extent to which participating agencies met SBIR and STTR program spending requirements, (2) the extent to which participating agencies and SBA met certain program reporting requirements, (3) the potential effects of basing the spending requirements for the programs on an agency's total R&D budget authority instead of on its extramural R&D obligations,[10] and (4) what is known about the amounts agencies spent to administer the programs.

To accomplish these objectives, we generally followed the methodology that we used for our previous four reports on these issues. Specifically, to examine the extent to which participating agencies met SBIR and STTR program spending requirements in fiscal year 2015, we used the data that agencies submitted to SBA and calculated each agency's spending requirement by applying the mandated percentages to the agency's reported extramural R&D obligations for fiscal year 2015. We then compared the spending requirements we calculated with the total program obligations data the agency submitted to SBA for fiscal year 2015. We reported that an agency met its spending requirement if the agency's spending for these programs was greater than or equal to the

[8]National Defense Authorization Act for Fiscal Year 2017, Pub. L. No. 114-328, § 1834 (2016).

[9]GAO, *Small Business Research Programs: Actions Needed to Improve Compliance with Spending and Reporting Requirements*, GAO-13-421 (Washington, D.C.: Sept. 9, 2013); *Small Business Research Programs: More Guidance and Oversight Needed to Comply with Spending and Reporting Requirements*, GAO-14-431 (Washington, D.C.: June 6, 2014); *Small Business Research Programs: Challenges Remain in Meeting Spending and Reporting Requirements*, GAO-15-358 (Washington, D.C.: Apr. 15, 2015); and *Small Business Research Programs: Agencies Have Improved Compliance with Spending and Reporting Requirements, but Challenges Remain*, GAO-16-492 (Washington, D.C.: May 26, 2016).

[10]Budget authority, which is provided by federal law, allows an agency to enter into financial obligations that will result in immediate or future outlays involving federal government funds.

spending requirement we calculated.[11] To assess the reliability of the data, we interviewed agency officials about the sources and quality control procedures for the data; examined the integrity of the data, which included looking for outliers and obvious errors; and reviewed relevant documentation. We found the data to be sufficiently reliable for the purposes of assessing whether agencies met their spending requirements. In cases in which agencies did not submit extramural R&D obligations data, we interviewed officials from those agencies and SBA about the data submitted to identify the reasons an agency did not provide the required data. In these cases, we determined the data these agencies submitted could not be used to determine whether these agencies met their spending requirements. We also discussed agencies' compliance with the spending requirements—including reasons agencies did not meet the spending requirements—with program managers at each of the participating agencies.

To examine the extent to which participating agencies and SBA met certain program reporting requirements for fiscal year 2015, we compared information in the reports that agencies submitted to SBA to describe the methodology for calculating their extramural R&D obligations, referred to as their methodology reports, with requirements in the Small Business Act and program guidance. We reported that a participating agency met its reporting requirements if the agency submitted a methodology report to SBA, submitted the report on time (within 4 months of receiving appropriations), itemized exclusions from its extramural R&D obligations, and explained those exclusions. We also examined whether the methodology reports included other information requested by SBA. Additionally, we discussed the status of SBA's required reports to Congress with SBA program officials.

To examine the potential effects of basing spending requirements for the SBIR and STTR programs on an agency's total R&D budget authority instead of on its extramural R&D obligations, we used fiscal year 2015 data on total R&D budget authority as reported by the Office of

[11]We used agencies' data on total program obligations to represent spending for the programs, in part because obligations data were readily available from each of the agencies for program purposes, and because obligations provided a reasonable measure of the spending for the programs in each year.

Management and Budget.[12] We used these data to calculate potential spending requirements for each federal agency under alternate scenarios, assuming that the same spending percentages currently required by the Small Business Act would apply to total R&D budget authority. We also assumed that current spending thresholds that, under the current law, require agencies to participate in SBIR and STTR programs would apply to the total R&D budget authority. As in our previous reports, we compared the spending requirements from the alternate scenarios with requirements under current law to determine the potential effects that changing the methodology for calculating spending requirements would have had in fiscal year 2015. We also analyzed additional scenarios that used smaller percentages than those currently required by the Small Business Act to determine whether they would lead to different outcomes. We spoke to program managers at all participating agencies about how potential changes to the calculation methodology could affect their programs.

To examine what is known about how much agencies spent to administer the SBIR and STTR programs in fiscal year 2015, we requested and analyzed administrative spending data from the 11 participating agencies and spending data associated with the administrative pilot program from the 9 agencies that participated in the pilot.[13] We discussed these data with officials and determined that the administrative spending data for the participating agencies were incomplete and came from such varied sources that we could not calculate the total amount the agencies spent to administer their programs. We also reviewed the total amounts the 9 agencies had estimated they would spend on the administrative pilot program in fiscal year 2015 as described in their proposals for the program; we then compared those amounts with the amounts the agencies reported spending. Further, we reviewed how the agencies used administrative pilot program funds to meet program goals. To assess the reliability of the data associated with the administrative pilot

[12]Office of Management and Budget, *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2017* (Washington, D.C.: 2016). Because agencies did not include information on their total R&D budget authority in the data they submitted to SBA, and we were seeking information across all government agencies, we relied on the amount of budget authority reported in the Analytical Perspectives volume to calculate the spending requirements for the alternative scenarios.

[13]To participate in the administrative pilot program, an agency must submit a work plan to SBA. For the purpose of this report, we define agencies as participating if they submitted such a work plan, even if they did not spend any of the proposed funds.

program, we discussed the completeness and accuracy of the data with officials from the 9 agencies that participated in the program. We determined that the data were sufficiently reliable for the purposes of determining the amounts that agencies spent on the administrative pilot program.

We conducted this performance audit from July 2016 to May 2017 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

The SBIR program was initiated in 1982 and has four main purposes: (1) use small businesses to meet federal R&D needs, (2) stimulate technological innovation, (3) increase commercialization of innovations derived from federal R&D efforts, and (4) encourage participation in technological innovation by small businesses owned by women and disadvantaged individuals. The STTR program was initiated a decade later, in 1992, and has three main purposes: (1) stimulate technological innovation, (2) foster technology transfer through cooperative R&D between small businesses and research institutions, and (3) increase private sector commercialization of innovations derived from federal R&D. Legislation enacted in 2011 reauthorized the programs for fiscal years 2012 through 2017,[14] and legislation enacted in 2016 extended the programs for fiscal years 2018 through 2022.[15]

The SBIR and STTR programs each include three phases:

- In phase I, agencies make awards to small businesses to determine the scientific and technical merit and feasibility of ideas that appear to have commercial potential. Phase I awards normally do not exceed $150,000. For SBIR, phase I awards generally last up to 6 months. For STTR, these awards generally last 1 year.
- In phase II, small businesses with phase I projects that demonstrate scientific and technical merit and feasibility, in addition to commercial

[14]SBIR/STTR Reauthorization Act of 2011, §§ 5001-5168.

[15]National Defense Authorization Act for Fiscal Year 2017, § 1834.

potential, may compete for awards of up to $1 million to continue the R&D for an additional period, normally not to exceed 2 years.

- In phase III, small businesses pursue commercialization of technology developed in prior phases. Phase III work derives from, extends, or completes an effort made under prior phases, but it is funded by sources other than the SBIR and STTR programs. In this phase, small businesses are expected to raise funds from private investors, the capital markets, or funding sources within the agency that made the initial award other than the agency's SBIR or STTR program. Agencies can also participate in phase III by, for example, purchasing the technology developed in prior phases.[16]

SBA's Office of Investment and Innovation is responsible for overseeing and coordinating the participating agencies' efforts for the SBIR and STTR programs. As part of SBA's oversight and coordination role, the agency issued SBIR and STTR policy directives to explain and outline requirements for agencies' implementation of these programs.[17] The policy directives include a list of the data that agencies must submit to SBA annually, such as their extramural R&D obligation amounts and the amounts they obligated for awards for their SBIR and STTR programs.

Each participating agency must manage its SBIR and STTR programs in accordance with program laws and regulations and the policy directives issued by SBA. In general, the programs are similar across participating agencies. All of the participating agencies follow the same general process to obtain proposals from and make awards to small businesses for both the SBIR and STTR programs. However, each participating agency has considerable flexibility in designing and managing specific aspects of these programs, such as determining research topics, selecting award recipients, and administering funding agreements. At least annually, each participating agency issues a solicitation requesting proposals for projects in topic areas determined by the agency. Each participating agency uses its own process to review proposals and determine which proposals should receive awards. The agencies that

[16]For examples of how one agency has participated in phase III by purchasing technology developed in prior phases, see GAO, *Small Business Innovation Research: DOD's Program Supports Weapon Systems, but Lacks Comprehensive Data on Technology Transition Outcomes,* GAO-14-96 (Washington, D.C.: Dec. 20, 2013).

[17]Small Business Administration, *Small Business Innovation Research (SBIR) Program Policy Directive* (Washington, D.C.: Feb. 24, 2014), and *Small Business Technology Transfer (STTR) Program Policy Directive* (Washington, D.C.: Feb. 24, 2014).

participate in both SBIR and STTR programs usually use the same process for both programs. Also, each participating agency determines whether to provide the funding for awards as grants or contracts.

Agency Data Indicate Most Participating Agencies Met Spending Requirements, but Not All Submitted the Required Data

Agency data indicate that most of the agencies participating in the SBIR and STTR programs met spending requirements for fiscal year 2015. Nine of the 11 agencies that participate in the SBIR program and 4 of the 5 agencies that also participate in the STTR program submitted the extramural R&D obligations data required to determine compliance with spending requirements. For 2 of the 11 agencies, we could not determine compliance with the spending requirements because these agencies did not submit required obligations data to SBA. Of the 9 agencies that submitted the required data, 8 met their SBIR spending requirements, and all of the 4 that also participate in the STTR program met their spending requirements for fiscal year 2015.

Most Agencies Submitted the Obligations Data Required to Determine Whether Spending Requirements Were Met, But Two Agencies Did Not Collect and Submit These Data

Nine of the 11 agencies participating in the SBIR program and 4 of the 5 agencies also participating in the STTR program submitted to SBA the extramural R&D obligations data required to determine whether they met the respective program spending requirements for fiscal year 2015. The Small Business Act requires agencies to spend a minimum percentage of their extramural R&D obligations on the SBIR and STTR programs annually. Determining whether an agency met the minimum spending requirement for its SBIR or STTR program requires data on the agency's obligations for the program as well as its total extramural R&D obligations. All participating agencies reported obligations data to SBA for their spending on the programs for fiscal year 2015. However, 2 agencies—the Department of Defense (DOD) and Environmental Protection Agency (EPA)—did not report total extramural R&D obligations data; instead, they reported budget authority amounts for extramural R&D.

According to a SBA report and officials, SBA has been working with agencies for several years to clarify that they should be reporting extramural R&D obligations data to SBA. In our June 2014 report covering SBIR and STTR spending for fiscal year 2012, we recommended that SBA provide additional guidance to agencies about submitting data and calculating spending requirements.[18] In response to

[18]GAO-14-431.

our recommendation, SBA provided guidance in the template that agencies used to report data for fiscal year 2013; this guidance directed agencies to report actual obligations for both extramural R&D and the SBIR and STTR programs. SBA's reporting template for fiscal year 2015 continued this effort by providing the definition of total extramural R&D obligations and asking agencies to confirm that the amount reported was the amount actually obligated. SBA's efforts to clarify the required data have improved agencies' reporting. In fiscal year 2013, only 2 of the 11 agencies reported extramural R&D obligations data to SBA. This number increased to 8 agencies in fiscal year 2014 and 9 agencies in fiscal year 2015.

Officials from DOD and EPA told us their agencies did not report extramural R&D obligations for fiscal year 2015 because their program offices have no procedures to capture total extramural R&D obligations for a particular fiscal year. Moreover, they said they have no plans to establish such procedures, and establishing them would be challenging. For example, EPA officials told us that their agency's financial system does not distinguish extramural from intramural R&D funds, and that the agency's multi-year appropriations, which allow funds to be obligated over 2 years, make it hard to know in which fiscal year the extramural R&D funding was obligated. DOD officials told us that obtaining obligations data would require requesting information from more than 10 individual program offices that, in turn, would have to request the information from various DOD comptrollers, which would be a major effort. In contrast, all of the other agencies reported fiscal year 2015 obligations.

Officials at most agencies, including DOD and EPA, identified difficulties in using extramural R&D obligations data to determine spending requirements. As we also reported in May 2016, officials from several agencies told us that they believe it is unfair or impractical to hold their agencies to a requirement based on obligations, which are not known until after the end of the fiscal year, when it is not possible to obligate additional money for the SBIR and STTR programs.[19] Because of these difficulties, a working group of several participating agencies is considering proposing a recommendation to base spending requirements on extramural R&D budget authority, according to a Department of Energy (DOE) official involved in leading the effort. If Congress were to

[19]GAO-16-492.

take up such a proposal, it might eliminate the data collection challenges that some agencies have identified.

Until DOD and EPA find ways to provide the required data, or the spending requirements are changed and the identified data collection challenges are resolved, DOD and EPA will not know whether they have met the spending requirements. Further, without DOD and EPA reporting the required data, SBA will continue to be limited in its ability to accurately report that information to Congress, as we previously found.[20]

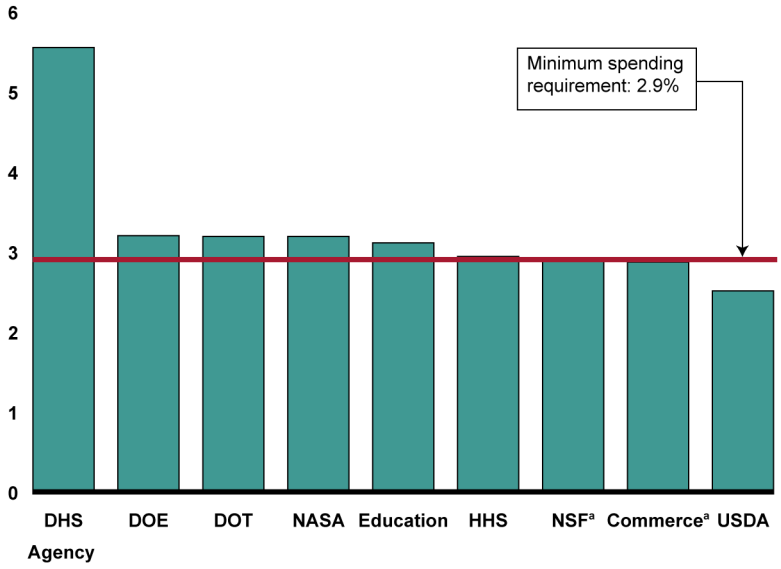
Agency Data Indicate Most Agencies Met SBIR and STTR Spending Requirements, and Some Have Developed Practices to Help Meet Them

Eight of the 9 agencies that submitted the required extramural R&D obligations data met or exceeded their SBIR spending requirements for fiscal year 2015, according to the agencies' data (see fig 1).[21] Those 8 agencies spent from 2.9 percent to 5.6 percent of their extramural R&D obligations on the program. The remaining agency, the U.S. Department of Agriculture (USDA), spent 2.5 percent—less than the required 2.9 percent. We could not determine compliance with spending requirements for DOD and EPA because, as previously discussed, those agencies did not submit the required obligations data. However, the data those 2 agencies submitted indicate that DOD spent $956.9 million on the SBIR program, while EPA spent $4.7 million on the program. Appendix I provides more details on agencies' SBIR spending and spending requirements.

[20]In our April 2015 report (GAO-15-358), we found that SBA's ability to determine compliance was limited because agencies were not submitting the required obligations data. In that report, we recommended that SBA notify Congress in its annual report if it cannot determine compliance because agencies did not report the required data, or develop a proposal to Congress that would change the requirement. In response to our recommendation, in SBA's March 2016 report to Congress on the SBIR and STTR programs for fiscal year 2013, SBA reported that it could not accurately determine whether agencies complied with spending requirements for those agencies that did not submit the required obligations data.

[21]For the purposes of this report, we defined compliance as spending at least 2.9 percent of an agency's reported extramural R&D obligations on the SBIR program in fiscal year 2015, as required in the Small Business Act. This method is consistent with SBA's approach for calculating spending requirements in its reports to Congress on the program.

Figure 1: Percentage of Extramural Research or Research and Development (R&D) Obligations That Participating Agencies Reported Spending on the Small Business Innovation Research (SBIR) Program in Fiscal Year 2015



Commerce	Department of Commerce
DHS	Department of Homeland Security
DOE	Department of Energy
DOT	Department of Transportation
Education	Department of Education
HHS	Department of Health and Human Services
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation
USDA	U.S. Department of Agriculture

Source: GAO analysis of agencies' data submitted to the Small Business Administration. | GAO-17-453

Notes: Small Business Administration (SBA) officials told us that they will continue verifying agency data until SBA submits its report to Congress about program spending.

Two agencies with SBIR programs—the Department of Defense and Environmental Protection Agency—are not represented in the figure because they did not submit the obligations data required by the Small Business Act. Therefore, we could not determine the percentages of extramural R&D obligations they spent on SBIR and their compliance with spending requirements.

[a]When determining whether agencies had met their spending requirement for the SBIR program, we rounded the calculated percentages to the nearest tenth of a percent. The percentages for the National Science Foundation and the Department of Commerce rounded up to the spending requirement of 2.9 percent.

In our September 2013 report, we recommended that SBA direct participating agencies to include in their annual reports if they did not meet the spending requirements, the reasons why they did not, and how

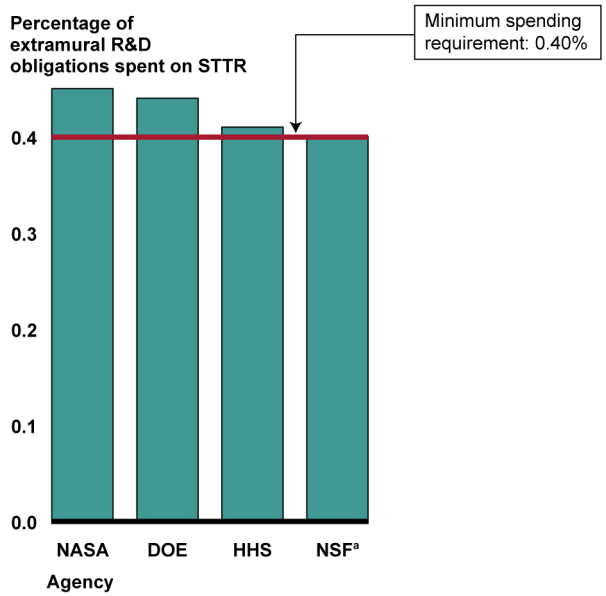
they planned to meet the spending requirements in the future.[22] SBA updated the annual report template for fiscal year 2015 data to request such information from agencies that did not meet the spending requirements. Given that this change may have improved agencies' compliance with spending requirements for fiscal year 2016, we are not making a new recommendation at this time.

Of the 5 agencies that also participated in STTR, 4 agencies submitted the required obligations data, and all 4 met their STTR spending requirements for fiscal year 2015, according to the agencies' data (see fig. 2).[23] According to the agencies' data, these 4 agencies spent from 0.40 percent to 0.45 percent of their extramural R&D obligations on their STTR programs, meeting or exceeding the required minimum spending requirement of 0.40 percent. We could not determine compliance with the spending requirement for the fifth participating agency—DOD—because it did not submit the required extramural R&D obligations data. However, DOD's submitted data shows that DOD spent $125.5 million on the STTR program for fiscal year 2015. Appendix II provides more details on agencies' STTR spending and spending requirements.

[22]GAO-13-421.

[23]For the purposes of this report, we defined compliance as spending at least 0.40 percent of an agency's reported extramural R&D obligations on the STTR program in fiscal year 2015, as required in the Small Business Act. This method is consistent with SBA's approach for calculating spending requirements in its reports to Congress on the program.

Figure 2: Percentage of Extramural Research or Research and Development (R&D) Obligations That Participating Agencies Reported Spending on the Small Business Technology Transfer (STTR) Program in Fiscal Year 2015



DOE Department of Energy
HHS Department of Health and Human Services
NASA National Aeronautics and Space Administration
NSF National Science Foundation

Source: GAO analysis of agencies' data submitted to the Small Business Administration. | GAO-17-453

Notes: Small Business Administration (SBA) officials told us that they will continue verifying agency data until SBA submits its report to Congress about program spending.

One agency with an STTR program—the Department of Defense—is not represented in the figure because it did not submit the obligations data required by the Small Business Act. Therefore, we could not determine its percentage of extramural R&D obligations spent on STTR and its compliance with its spending requirement.

[a]When determining whether agencies had met their spending requirements for the STTR program, we rounded the calculated percentages to the nearest hundredth of a percent. The percentage for the National Science Foundation rounded up to the spending requirement of 0.40 percent.

Officials, including those from agencies that met their SBIR and STTR spending requirements and those from the agency that did not, cited a number of potential difficulties with meeting the requirements, including:

- *Minimum spending requirement is unknown until the end of the fiscal year.* Consistent with our previous reviews, agency officials said that it is difficult to meet the minimum spending requirements because the spending requirements are based on extramural R&D obligations, which are not known until after the end of the fiscal year. If an agency's actual extramural R&D obligations at the end of the fiscal

year turn out to be higher than estimated, the agency's estimate of spending requirements for the programs may turn out to be too low, according to some agency officials.[24] For example, USDA officials told us that their agency estimated total extramural R&D spending for fiscal year 2015 would be $697 million, which set their SBIR program budget at $20.2 million. USDA data submitted to SBA shows that USDA spent $22.7 million, which was more than the amount estimated earlier in the year. However, some agencies, including USDA, receive multi-year appropriations, which generally may be carried forward from one fiscal year to the next. According to the USDA officials, other programs that provide extramural R&D funding carried over about $240 million from fiscal year 2014, which increased extramural R&D obligations in fiscal year 2015 and thus increased the agency's SBIR spending requirement by about $6 million beyond the amount officials had estimated based on 2015 appropriations. As a result, USDA did not meet the spending requirement for fiscal year 2015 even though, according to USDA program managers, the agency spent the amount it budgeted for the SBIR program.

- *Agency cannot always issue all expected awards.* Agency officials said that they cannot always make all of the awards that they anticipated at the beginning of the fiscal year. For example, officials at DOE and the Department of Commerce (Commerce) told us of instances when, late in the award process, a small business declined an award or was found to be ineligible to receive the award and the agency was not able to make an award to another small business before the end of the fiscal year, hindering its ability to meet the minimum spending requirements.
- *Agency carries over program funds to the next fiscal year.* According to some agency officials, agencies do not always spend their SBIR or STTR funding in the fiscal year in which it is appropriated for various reasons. For example, DOD officials told us that circumstances such as receiving agency appropriations later in the fiscal year can delay spending, as we have previously reported.[25] This can make it difficult to meet the spending requirement for that year. USDA officials

[24]According to SBA's fiscal year 2013 report to Congress and officials from some participating agencies, actual extramural R&D obligations at the end of the fiscal year may differ from agencies' earlier estimates for many reasons, such as budget rescissions or supplemental appropriations during the fiscal year, carried-over multi-year funds from prior years, or challenges in estimating extramural R&D funds as a portion of general R&D funds.

[25]GAO-15-358.

explained that they may choose to spend their SBIR funds over multiple fiscal years to help spend the funds properly and efficiently. However, DOE officials told us that if an agency carries over SBIR or STTR funds into the next fiscal year, it might not spend enough to meet the spending requirement in the current fiscal year, although the carried-over funds may help the agency meet or exceed the spending requirement in the following year.

Despite the difficulties cited above, officials at most agencies told us that they had developed practices to help ensure they meet the minimum spending requirements. Those practices include:

- *Budget more than the minimum estimated spending requirement.* Commerce officials told us that in fiscal year 2015, one of their subunits estimated its SBIR budget using a higher percentage than the minimum spending requirement. According to agency officials, this helps ensure that the subunit meets the spending requirement, even if actual extramural R&D obligations exceed the amount estimated. DOE officials told us that they estimated the required SBIR budget based on the statutory minimum percentage but used some assumptions that led to an estimate of the agency's total extramural R&D obligations that exceeded the actual obligation amount, which helped DOE exceed its minimum spending requirement in fiscal year 2015. Department of Education (Education) officials told us they budget a set amount each year, $7.5 million, which has been higher than their minimum SBIR spending requirement.
- *Spend funds beyond the minimum estimated spending requirement budgeted.* Department of Homeland Security (DHS) and Department of Health and Human Services (HHS) officials told us their agencies generally spend funds beyond the minimum spending requirements for which they budgeted. EPA officials told us that, in addition to funds designated for SBIR awards, EPA provides annual administrative funding that typically exceeds the actual administrative costs for the agency's SBIR program. As a result, EPA can potentially fund an additional SBIR award with the excess funding.
- *Spend program funds across agency subunits.* HHS officials told us that agency subunits independently spend SBIR funds. However, if one subunit realizes that it cannot spend all of its SBIR funds, HHS officials identify a meritorious application to award from another subunit, which enables HHS to spend all the funds in that fiscal year.
- *Spend multi-year funds in the year appropriated.* Officials from EPA and National Science Foundation (NSF) said that they try to spend all

of their multi-year funds for SBIR in the same year that they are appropriated to better ensure that they meet the minimum spending requirement.

Participating Agencies Inconsistently Met Certain Reporting Requirements, and SBA Officials Report Having Taken Steps to Expedite Its Reporting to Congress

All of the agencies participating in the SBIR and STTR programs submitted methodology reports to SBA for fiscal year 2015, and about half of these agencies submitted them on time. While most agencies provided detailed information in their methodology reports, they did not consistently provide all of the information required by SBA's policy directive. As of May 2017, SBA had not submitted its annual report on the programs to Congress for fiscal year 2015, but SBA officials said they have taken steps to expedite reporting.

About Half of the Agencies Submitted Their Methodology Reports on Time, but Agencies Did Not Consistently Provide Required Information

All 11 participating agencies submitted their required methodology reports to SBA for fiscal year 2015, and about half of these agencies submitted their reports on time. According to the Small Business Act, agencies must submit to SBA a report describing the methodology they use to calculate their extramural R&D budgets, and the submission must occur within 4 months of enactment of their annual appropriations. Most participating agencies' appropriations for fiscal year 2015 were enacted in mid-December 2014, so their methodology reports were due by mid-April 2015.[26] Five agencies—DHS, DOE, EPA, HHS, and the National Aeronautics and Space Administration (NASA)—submitted their required methodology reports on time in fiscal year 2015.[27] More agencies

[26]Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. No. 113-235, 128 Stat. 2130 (enacted December 16, 2014). The exception among the participating agencies was DHS, for which appropriations for fiscal year 2015 were enacted on March 4, 2015, so the agency's methodology report to SBA was due in early July 2015. Department of Homeland Security Appropriations Act, 2015, Pub. L. No. 114-4, 129 Stat. 39 (enacted March 4, 2015).

[27]Commerce has two subunits—the National Oceanic and Atmospheric Administration (NOAA) and the National Institute of Standards and Technology (NIST)—that separately administer SBIR programs and separately submitted methodology reports for fiscal year 2015. NOAA submitted its fiscal year 2015 methodology report on time, while NIST did not.

provided timely submissions in fiscal year 2015 than in fiscal year 2014, when only 2 of the 11 agencies submitted their methodology reports on time.

Those agencies that submitted their methodology reports late generally did so only after SBA sent an e-mail in August 2015 requesting that the agencies submit their reports. Officials at Education, USDA, Commerce, and the Department of Transportation (DOT) told us that they had not known that they needed to submit the methodology report or had not known the deadline. In contrast, officials from the agencies that reported on time told us that they have routine procedures to submit the methodology report each year.

As we found in our September 2013 report, the late submission of the methodology reports makes it difficult for SBA to promptly analyze the methodologies and provide agencies with timely feedback to assist them with accurately calculating their spending requirements. Without such review and feedback, agencies may be calculating their extramural R&D obligations incorrectly, which could lead to agencies spending less than the required amounts on the SBIR and STTR programs. In our June 2014 report, we recommended that SBA request that the agencies submit their methodology reports within 4 months of the enactment of appropriations. SBA generally agreed with the recommendation, and SBA officials sent an e-mail to participating agencies in February 2016 requesting that they submit their fiscal year 2016 methodology reports on time. Given that SBA's request may have improved the timeliness of agencies' submissions for fiscal year 2016, we are not making a new recommendation on requesting the methodology reports at this time.

While most agencies provided detailed information in their methodology reports, they did not consistently provide all of the information required by SBA. According to the program policy directives, in addition to describing their methodology for calculating their extramural R&D budgets, agencies are to itemize the programs they exclude from their extramural R&D calculations and the reasons for the exclusions.[28] For fiscal year 2015, all

[28]Under the Small Business Act, certain subunits or programs must or can be excluded in calculating agencies' extramural R&D obligations. For example, agencies are not required to include subunits in the intelligence community when calculating their extramural R&D obligations, and the Department of Transportation is required to exclude the Federal Highway Administration's State Planning & Research Program from its extramural R&D obligations.

11 participating agencies submitted descriptions of their methodologies, 9 agencies at least partially itemized exclusions from their calculations of extramural R&D, and 8 agencies at least partially explained the reasons for these exclusions.[29]

Further, where agencies did provide the required information, they did so using different levels of detail. For example, 5 of the 11 agencies provided dollar amounts for total, intramural, and extramural R&D budgets. EPA and Commerce officials told us that providing such information reflects guidance that SBA had provided in prior years. Six agencies provided the dollar amounts of their planned SBIR funding. This funding information was explicitly requested in SBA's August 2015 e-mail, but SBA sent this guidance to only those agencies that had not yet submitted their reports.

In our April 2015 report, we concluded that the varying detail in agencies' methodology reports makes it difficult for SBA to analyze the reports and provide accurate information to Congress, and we recommended that SBA assess the methodology reporting requirement and revise its guidance, if necessary, to require adequate information.[30] SBA included updated reporting requirements in a proposed policy directive.[31] If implemented, the language in the proposed policy directive would expand the required information to include the planned amount of SBIR funding, which SBA officials said would make the reporting more useful for SBA's analysis of agencies' program funding.[32] SBA's proposed policy directive

[29]We counted an agency as meeting the itemization requirement if its report listed exclusions or specified that the agency had no exclusions. We counted an agency as partially meeting the itemization requirement if its report discussed exclusions for some but not all of the agency's subunits.

[30]GAO-15-358.

[31]In April 2016, SBA published a notice of proposed amendments to the SBIR and STTR policy directives in the *Federal Register*. Small Business Innovation Research Program and Small Business Technology Transfer Program Policy Directive, 81 Fed. Reg. 20,484 (Apr. 7, 2016). According to SBA officials, SBA withdrew the draft policy directive from Office of Management and Budget consideration in January 2017 and it is under further internal consideration in light of a recent executive order.

[32]The proposed policy directive asks that an agency's report include the agency's plan to meet the program funding requirement for the current fiscal year rather than only the agency's methodology to calculate total extramural R&D. Specifically, the directive asks that the report include three main elements: (1) an explanation of the calculations of total extramural R&D, (2) a review of the prior year's funding process to determine if it enabled the agency to meet the spending requirement, and (3) a funding plan for the current fiscal year showing how the agency expects to at least meet expected minimum spending requirements for the program.

was not in force for fiscal year 2015, so we could not evaluate the effect of this guidance on methodology reporting, and we are not making additional recommendations at this time.

SBA Has Not Submitted Its Required Report to Congress for Fiscal Year 2015, but Officials Said Steps Have Been Taken to Expedite Reporting

The Small Business Act requires SBA to report to certain congressional committees on the SBIR and STTR programs—including an analysis of the agencies' methodology reports—not less than annually, but the act does not specify a date when the report is due. SBA issued its report to Congress on the SBIR and STTR programs for fiscal year 2013 in March 2016, but it has not submitted its report for fiscal years 2014 or 2015.

In our September 2013 report, we concluded that without more rigorous oversight by SBA and its more timely and detailed reporting, it would be difficult for SBA to ensure that intended benefits of the SBIR and STTR programs are being attained and that Congress is receiving critical information to oversee these programs. In that report, we recommended that SBA provide Congress with a timely annual report. SBA agreed and stated that it planned to implement the recommendation.

However, SBA has not yet done so, and as we found previously and in this review, it continues to lag in its submissions to Congress. SBA issued its fiscal year 2012 report to Congress in November 2014, 19 months after the agencies' data were due to SBA. SBA issued its fiscal year 2013 report to Congress in March 2016, 2 years after the agencies' data were due to SBA. As of May 2017, SBA was continuing to develop the reports for fiscal years 2014 and 2015, about 26 months and 14 months after the agencies' data were due to SBA, respectively. SBA officials said that they have not set issuance dates for either the fiscal year 2014 or fiscal year 2015 report to Congress, in part because it is difficult to predict the completion of an Office of Management and Budget review that is not in their control. Additionally, according to these officials, report production has been slowed by SBA staff leaving the agency. Given that SBA officials told us that they are working to respond to our previous recommendation by taking steps to expedite the submission of the reports, we are not making additional recommendations at this time.

Basing Spending Requirements on Total R&D Budget Authority Would Have Increased Spending Requirements and Participation with Potential Benefits and Drawbacks

Changing the methodology for calculating SBIR and STTR spending requirements to use total R&D budget authority rather than extramural R&D obligations would have increased agencies' spending requirements and the number of agencies required to participate in the programs for fiscal year 2015. Agency officials identified several benefits and drawbacks that changing the calculation methodology could have for their agencies' SBIR and STTR programs.

Changing the Calculation Methodology to Total R&D Budget Authority Would Have Increased Spending Requirements and Participation in the Programs

Changing the methodology for calculating SBIR and STTR spending requirements to use an agency's total R&D budget authority rather than its extramural R&D obligations would have increased spending requirements for fiscal year 2015. Specifically, we estimated that the total spending requirements for the SBIR and STTR programs in fiscal year 2015 would have increased from $2.5 billion to $4.4 billion, or by 76 percent, assuming the same percentages and participation thresholds defined in current law. The increase would have occurred for two reasons: (1) an agency's total R&D budget authority is larger than its extramural R&D obligations, and therefore agencies that currently participate would have been required to spend more on the programs, and (2) additional agencies would have been required to participate. Figure 3 shows the effects at each agency of changing the calculation methodology from current law, which is based on a percentage of extramural R&D obligations, to an alternative scenario that applies the same percentages to total R&D budget authority. These effects are consistent with our findings in previous reports.[33]

[33]GAO-13-421, GAO-14-431, GAO-15-358, and GAO-16-492.

Figure 3: Fiscal Year 2015 Spending Requirements for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs Compared to an Alternative Scenario Using Current Percentages

Agency (Dollars in millions)	Agency's budget: Total research and development budget authority[a]	Agency's budget: Extramural research and development obligations[b]	SBIR Program: SBIR spending requirement under current law[c]	SBIR Program: SBIR spending requirement under alternative scenario[d]	SBIR Program: Percentage difference between current law and alternative scenario	STTR Program: STTR spending requirement under current law[e]	STTR Program: STTR spending requirement under alternative scenario[f]	STTR Program: Percentage difference between current law and alternative scenario
Agency for International Development	250	[g]	[g]	7	[g]	[g]	[h]	[h]
Department of Agriculture	2,284	905	26	66	153	[g]	9	[g]
Department of Commerce	1,293	316	9	37	309	[g]	5	[g]
Department of Defense	65,431	33,711[b]	978[c]	1,897	94	135[e]	262	94
Department of Education	279	241	7	8	16	[g]	[h]	[h]
Department of Energy	13,364	6,055	176	388	121	24	53	121
Department of Health and Human Services	30,280	24,244	703	878	25	97	121	25
Department of Homeland Security	604	373	11	18	62	[g]	[h]	[h]
Department of the Interior	827	[g]	[g]	24	[g]	[g]	[h]	[h]
Department of Transportation	860	350	10	25	146	[g]	[h]	[h]
Department of Veterans Affairs	1,178	[g]	[g]	34	[g]	[g]	5	[g]
Environmental Protection Agency	518	145[b]	4[c]	15	258	[g]	[h]	[h]
National Aeronautics and Space Administration	12,081	4,960	144	350	144	20	48	144
National Science Foundation	5,569	5,367	156	162	4	21	22	4
Total	**134,818**	**76,666**	**2,223**	**3,910**	**76**	**297**	**526**	**77**

Agency did not participate in the program in fiscal year 2015, but it would be required to do so if participation were based on the total research and development budget and the thresholds for participating in the programs remained the same.

Source: GAO analysis of agency data. | GAO-17-453

Note: Calculations may be affected by rounding.

[a]Each agency's total research and development (R&D) budget authority is derived from the Office of Management and Budget's *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2017*. We excluded the "facilities and equipment" category that is included in the document from the total R&D amount because agencies do not include this information in their calculations.

[b]Each agency's extramural R&D obligations are derived from data submitted by the agencies to the Small Business Administration (SBA). Neither the Department of Defense (DOD) nor the Environmental Protection Agency (EPA) submitted obligations data for extramural R&D. Instead, these agencies submitted budget authority data. We present the data that DOD and EPA submitted for the purpose of this analysis.

[c]Each agency's spending requirement for the SBIR program under the current law is calculated as 2.9 percent of its extramural R&D obligations. Because DOD and EPA did not submit obligations data, we could not determine their actual spending requirements. For the purpose of this analysis, we used the budget authority data they submitted to SBA as a proxy for their obligations data to calculate their spending requirements.

[d]This alternative scenario calculates each agency's SBIR spending requirement as 2.9 percent of its total R&D budget authority, which is the percentage currently required under the current law, and assumes no reductions for excluded programs.

[e]Each agency's spending requirement for the STTR program under current law is calculated as 0.40 percent of its extramural R&D obligations. Because DOD did not submit obligations data, we could not determine its actual spending requirement. For the purpose of this analysis, we used the budget authority data it submitted to SBA as a proxy for its obligations data to calculate its spending requirement.

[f]This alternative scenario calculates each agency's STTR spending requirement as 0.40 percent of its total R&D budget authority, which is the percentage required under the current law, and assumes no reductions for excluded programs.

[g]Agency did not participate in the program in fiscal year 2015.

[h]Agency's total R&D budget authority did not meet the threshold for participating in STTR under the alternative scenario.

As shown in figure 3, some agencies' spending requirements would have increased more than others under the alternative scenario. This variation is due primarily to differences in the relative proportions of the agencies' extramural and intramural R&D obligations, but it is also affected by how many programs are excluded by statute. Under the alternative scenario, agencies that fund primarily extramural research would have seen smaller increases to their spending requirements for the SBIR and STTR programs, while agencies that fund more intramural research would have seen larger increases in their spending requirements, a finding consistent with those of our previous reports. Examples are as follows:

- NSF used 96.4 percent of its total R&D budget authority to fund extramural research in fiscal year 2015 and was required, based on data it submitted to SBA, to spend $156 million on its SBIR program that year. Under the alternative scenario, NSF's SBIR spending requirement would have been $162 million, an increase of about 4 percent.
- Commerce, on the other hand, used 24.5 percent of its total R&D budget authority to fund extramural research in fiscal year 2015 and was required to spend about $9 million on its SBIR program that year. Under the alternative scenario, Commerce's spending requirement would have more than quadrupled to about $37 million. Furthermore, assuming that the thresholds for participating in the program did not change, this scenario would have required Commerce to spend approximately $5 million on a new STTR program in fiscal year 2015. The alternative scenario would have required Commerce to spend about $33 million more on the SBIR and STTR programs in fiscal year 2015, an increase of more than 360 percent.

As noted above, changing the calculation methodology from basing the spending requirement on extramural R&D obligations to basing it on total R&D budget authority would also require additional agencies to participate in the SBIR and STTR programs, assuming that the dollar thresholds for participation remain the same. Under the alternative scenario, 3 additional agencies—the Department of Veterans Affairs, the Department of the Interior, and the U.S. Agency for International Development—would have been required to participate in SBIR during fiscal year 2015.[34] Adding these agencies to the SBIR program would have increased total SBIR spending requirements by $65 million, in addition to the $1.6 billion increase in spending requirements at the 11 agencies that currently participate in the SBIR program. Likewise, under the alternative scenario, 3 additional agencies—USDA, Commerce, and the Department of Veterans Affairs—would have been required to participate in STTR.[35] Adding these agencies to the STTR program would have increased total STTR spending requirements by $19 million, in addition to the $210 million increase in spending requirements at the 5 agencies that currently participate in STTR.

Alternatively, basing the SBIR and STTR spending requirements on an agency's total R&D budget authority and applying a lower percentage than required under current law could result in total spending requirements similar to those under current law. However, our analysis shows that such a scenario would lower spending requirements at some agencies and raise them at others. As shown in figure 4, if the percentage applied to an agency's total R&D budget authority had been 1.65 percent for the SBIR program and 0.23 percent for the STTR program in fiscal year 2015, and the thresholds for participation had remained the same, total required spending on the programs would be similar to required spending under current law. Using these lower percentages, spending requirements would have increased at agencies that primarily fund intramural research, such as EPA and Commerce. In contrast, spending

[34]Based on the data as reported by the Office of Management and Budget in *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2017,* each of these 3 agencies had total R&D budget authority in excess of $100 million. Under current law, a federal agency with more than $100 million in extramural R&D obligations is required to participate in the SBIR program.

[35]Based on the data as reported by the Office of Management and Budget in *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2017*, each of these 3 agencies had a total R&D budget authority in excess of $1 billion. Under current law, a federal agency with more than $1 billion in extramural R&D obligations is required to participate in the STTR program.

requirements would decrease at agencies that primarily fund extramural research, such as HHS and NSF. In this scenario, the spending requirement reductions, including $203.7 million at HHS and $63.8 million at NSF, were large enough to offset increases in spending requirements at other agencies.[36]

Figure 4: Fiscal Year 2015 Spending Requirements for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs Compared to an Alternative Scenario Using Lower Percentages

Agency	Agency's budget		SBIR Program			STTR Program		
Dollars in millions	Total research and development budget authority[a]	Extramural research and development obligations[b]	SBIR spending requirement under current law[c]	SBIR spending requirement under alternative scenario[d]	Percentage difference between current law and alternative scenario	STTR spending requirement under current law[e]	STTR spending requirement under alternative scenario[f]	Percentage difference between current law and alternative scenario
Agency for International Development	250	[g]	[g]	4	[g]	[g]	[h]	[h]
Department of Agriculture	2,284	905	26	38	44	[g]	5	[g]
Department of Commerce	1,293	316	9	21	133	[g]	3	[g]
Department of Defense	65,431	33,711[b]	978[c]	1,079	10	135[e]	148	10
Department of Education	279	241	7	5	-34	[g]	[h]	[h]
Department of Energy	13,364	6,055	176	220	26	24	30	25
Department of Health and Human Services	30,280	24,244	703	499	-29	97	68	-29
Department of Homeland Security	604	373	11	10	-8	[g]	[h]	[h]
Department of the Interior	827	[g]	[g]	14	[g]	[g]	[h]	[h]
Department of Transportation	860	350	10	14	40	[g]	[h]	[h]
Department of Veterans Affairs	1,178	[g]	[g]	19	[g]	[g]	3	[g]
Environmental Protection Agency	518	145[b]	4[c]	9	104	[g]	[h]	[h]
National Aeronautics and Space Administration	12,081	4,960	144	199	38	20	27	38
National Science Foundation	5,569	5,367	156	92	-41	21	13	-41
Total	**134,818**	**76,666**	**2,223**	**2,223**	**0**	**297**	**297**	**0**

Agency did not participate in the program in fiscal year 2015, but it would be required to do so if participation were based on the total research and development budget and the thresholds for participating in the programs remained the same.

Source: GAO analysis of agency data. | GAO-17-453

Note: Calculations may be affected by rounding.

[a]Each agency's total research and development (R&D) budget authority is derived from the Office of Management and Budget's *Analytical Perspectives, Budget of the United States Government, Fiscal*

[36]In this scenario, spending requirements would also be reduced at Education ($2.4 million) and DHS ($843,400).

Year 2017. We excluded the "facilities and equipment" category that is included in the document from the total R&D amount because agencies do not include this information in their calculations.

[b]Each agency's extramural R&D obligations are derived from data submitted by the agencies to the Small Business Administration (SBA). Neither the Department of Defense (DOD) nor the Environmental Protection Agency (EPA) submitted obligations data for extramural R&D. Instead, these agencies submitted budget authority data. We present the data that DOD and EPA submitted for the purpose of this analysis.

[c]Each agency's spending requirement for the SBIR program under the current law is calculated as 2.9 percent of its extramural R&D obligations. Because DOD and EPA did not submit obligations data, we could not determine their actual spending requirements. For the purpose of this analysis, we used the budget authority data they submitted to SBA as a proxy for their obligations data to calculate their spending requirements.

[d]This alternative scenario calculates each agency's SBIR spending requirement as 1.65 percent of its total R&D budget authority and assumes no reductions for excluded programs.

[e]Each agency's spending requirement for the STTR program under current law is calculated as 0.40 percent of its extramural R&D obligations. Because DOD did not submit obligations data, we could not determine its actual spending requirement. For the purpose of this analysis, we used the budget authority data it submitted to SBA as a proxy for its obligations data to calculate its spending requirement.

[f]This alternative scenario calculates each agency's STTR spending requirement as 0.23 percent of its total R&D budget authority and assumes no reductions for excluded programs.

[g]Agency did not participate in the program in fiscal year 2015.

[h]Agency's total R&D budget authority did not meet the threshold for participating in STTR under the alternative scenario.

Agency Officials Identified Potential Benefits and Drawbacks to Changing the Calculation Methodology to Total R&D Budget Authority

Officials at each of the participating agencies identified potential benefits or drawbacks to changing the calculation methodology for their SBIR and STTR spending requirements to use total R&D budget authority rather than extramural R&D obligations. For example, agency officials told us that changing the calculation method could simplify how the spending requirement is determined, increase the number and dollar amount of SBIR and STTR awards, and speed up disbursements of funds to program offices. However, officials also told us that the change could also have drawbacks for their agencies. First, changing the spending requirement to total R&D budget authority and keeping the same percentage requirement could negatively affect other R&D efforts, including intramural R&D, by shifting resources away from them to the SBIR and STTR programs, according to officials at several agencies. Shifting these resources could more broadly undermine their agency's ability to accomplish its mission, according to officials from Commerce's National Institute of Standards and Technology. For example, these officials said that work that is done within the agency may need highly specialized and unique equipment that may not be available to small businesses. In addition, agency officials at DOD, DOT, and NASA told us that a significant increase in the spending requirements resulting from the change could also strain their administration of the SBIR and STTR programs by requiring additional staffing and resources to manage the

larger programs. As a result, officials at these agencies suggested that if the calculation methodology is changed to base spending requirements on total R&D budget authority, the percentages should be lowered to avoid shifting resources away from other programs and straining the administration of the SBIR and STTR programs.

Total Administrative Spending for Fiscal Year 2015 Is Unknown, but Nine Agencies Spent $33.9 Million on the Administrative Pilot Program

Total administrative spending for the SBIR and STTR programs for fiscal year 2015 is unknown because the agencies that participate in the programs generally do not—and are not required to—fully track these costs. The 9 agencies that participated in the administrative pilot program reported spending $33.9 million in fiscal year 2015, but this amount does not represent total administrative spending. Officials from all 11 agencies participating in the SBIR and STTR programs told us that the administrative pilot program is beneficial, but officials from a few agencies also told us there are constraints to participating in it.

Total Administrative Spending for Fiscal Year 2015 Is Unknown

The total amount that the 11 participating agencies spent to administer their SBIR and STTR programs for fiscal year 2015 is unknown because the agencies generally do not—and are not required to—track these costs.[37] Officials at 9 of these 11 agencies told us that it is challenging to accurately estimate total administrative costs because staff and contractors that help administer the program also spend time on other programs, and the agencies do not have systems in place to track the time they spend specifically on the SBIR and STTR programs. Officials at 1 of the 2 remaining agencies, Education, told us that it is not challenging to estimate the expenses because the department has one person engaged nearly full time with its SBIR program, and it also has estimates for the hours that staff from other program offices contributed to the SBIR program. Officials from the other remaining agency, DOT, told us that they have implemented a system that allows them to track most of their administrative expenses for the programs, but they acknowledged that they are not able to track all their expenses, particularly for staff that do not spend much time on SBIR activities.

[37]Prior to the implementation of the administrative pilot program, agencies were generally prohibited from spending program funds on program administration.

In response to our requests for data on their fiscal year 2015 administrative costs, 9 of the 11 participating agencies provided information on some categories of administrative costs and partial estimates of costs.[38] These estimates ranged from about $288,000 to $10.4 million. As with the cost data for fiscal years 2011 through 2014 we obtained from the agencies for our previous reports, these data were incomplete and unverifiable.

Nine Agencies Participated in the Administrative Pilot Program in Fiscal Year 2015 and Spent $33.9 Million

Nine agencies—Commerce, DOD, DOE, DOT, Education, HHS, NASA, NSF, and USDA—participated in the administrative pilot program in fiscal year 2015, and these agencies reported spending $33.9 million on administrative and oversight activities as part of the program.[39] This represents an increase in the number of participating agencies from previous years—6 agencies participated in fiscal year 2013, and 7 agencies participated in fiscal year 2014.

The policy directives require each agency that participates in the administrative pilot program to submit to SBA a work plan that includes, among other information, a prioritized list of initiatives, the estimated percentage of funds or amounts to be spent on each initiative, and the expected results to be achieved. After the fiscal year has ended, agencies are to report on their actual spending on the administrative pilot program.

In fiscal year 2015, agencies proposed that they would spend $59.8 million on the administrative pilot program, but our analysis of the work plans and data that agencies submitted to SBA shows that the agencies obligated $33.9 million, or 57 percent of the proposed amount (see table 2). This represents an increase over previous years; agencies obligated $12.3 million (21 percent of the proposed amount) in fiscal year 2013 and $19.1 million (34 percent of the proposed amount) in fiscal year 2014. Officials from 2 agencies told us that they propose the maximum allowable amount in their work plans to give them the ability to spend those funds, but they do not necessarily intend to spend the full amount. Officials from other agencies told us they either proposed what they planned to spend or higher than what they planned but not the maximum

[38]DOD and HHS did not provide estimates of their administrative funding for the SBIR and STTR programs.

[39]To participate in the administrative pilot program, an agency must submit a work plan to SBA. For the purpose of this report, we define agencies as participating if they submitted such a work plan, even if they did not spend any of the proposed funds.

amount. The 9 agencies that participated in the administrative pilot program varied greatly in the extent to which they actually obligated what they proposed to spend on the program. For example, DOE obligated almost all of its proposed amounts, but Education obligated little of its proposed amount. Officials at Education told us they proposed to spend funds on several outreach activities but obligated far less when they found they had time to attend only one conference.

Table 2: Proposed Spending and Actual Amounts Obligated for the Administrative Pilot Program in Fiscal Year 2015

Agency	Proposed spending for fiscal year 2015 administrative pilot program (dollars)	Obligations for fiscal year 2015 administrative pilot program (dollars)	Percentage of proposed spending obligated in fiscal year 2015
Department of Agriculture	582,450	220,253	38
Department of Commerce	116,000	36,256	31
Department of Defense	29,679,802	20,724,739	70
Department of Education	15,000	651	4
Department of Energy	1,357,065	1,274,251	94
Department of Health and Human Services	20,600,000	10,272,276	50
Department of Transportation	107,500	95,061	88
National Aeronautics and Space Administration[a]	5,700,000	0	0
National Science Foundation	1,700,000	1,261,929	74
Total	**59,857,817**	**33,885,417**	**57**

Source: GAO analysis of agency data. | GAO-17-453

Note: Calculations may be affected by rounding.

[a]The National Aeronautics and Space Administration submitted a work plan to participate in the administrative pilot program in fiscal year 2015, but agency officials told us that they submitted the work plan late in the fiscal year and thus could not obligate funds during that year. Officials told us they intend to participate in the program in fiscal year 2016.

Although funding for the pilot program cannot replace current agency administrative funding, the administrative pilot program provides agencies with new flexibility to undertake activities they otherwise could not have undertaken.[40] Agencies that participated in the administrative pilot program in fiscal year 2015 used funds towards six goals developed by

[40]The policy directives state that the purpose of the pilot program is to assist with the substantial expansion in commercialization activities; prevention of fraud, waste, and abuse; expansion of reporting requirements by agencies; and other agency activities required for the programs.

SBA in consultation with agency officials, as shown in table 3. Our review of the funds agencies spent on the administrative pilot program showed that some goals received more attention than others. In particular, 8 of the agencies that participated in the administrative pilot program spent funds to increase outreach to underserved communities, 5 agencies spent funds to help awardees commercialize their products, and 4 agencies spent funds to streamline and simplify the application and award process. Four agencies also spent funds on preventing fraud, waste, and abuse, and fewer agencies spent funds on congressional and interagency reporting.

Table 3: Actual Amounts Obligated for the Administrative Pilot Program, per Goal, in Fiscal Year 2015 (dollars)

Agency	Outreach	Commercialization	Streamlining and Simplification	Prevention and Detection of Fraud, Waste, and Abuse	Reporting - Administrative, Congressional and Interagency	Administration and Implementation of Reauthorization
Department of Agriculture	28,407	5,141	0	0[a]	0[a]	186,705
Department of Commerce	36,256	0	0	0	0	0
Department of Defense	4,766,690	8,289,896	3,937,700	414,495	2,072,474	1,243,484
Department of Education	651	0	0	0	0	0
Department of Energy	840,348	0	0	903	0	433,000
Department of Health and Human Services	2,200,012	1,391,414	1,720,016	13,367	3,296,305	1,651,163
Department of Transportation	[b]	[b]	[b]	[b]	0	[b]
National Aeronautics and Space Administration[c]	0	0	0	0	0	0
National Science Foundation	924,929	187,000	150,000	0	0	0
Number of Agencies Obligating Funds per Goal	**8**	**5**	**4**	**4**	**2**	**5**

Source: GAO analysis of agency data. | GAO-17-453

Note: We considered the agency as not obligating funds toward a specific goal of the administrative pilot program if the agency did not report it.

[a]The Department of Agriculture (USDA) reported that it completed activities related to this goal of the administrative pilot program, but it considered these activities as in-kind support from the department to the SBIR program. For example, in December 2014 (fiscal year 2015), USDA Small Business Innovation Research (SBIR) program staff provided fraud, waste, and abuse training at the Phase II commercialization workshop and had 98 percent of Phase II companies in attendance, according to the department's annual SBIR report to the Small Business Administration. In addition, the SBIR

program coordinator worked with the Office of Information Technology at the National Institute of Food and Agriculture to modify the current database to meet new SBIR reporting requirements, including unawarded and awarded data, according to the same source.

[b]The Department of Transportation reported that it obligated funds related to this goal of the administrative pilot program, but it did not specify the amount.

[c]The National Aeronautics and Space Administration submitted a work plan to participate in the administrative pilot program in fiscal year 2015, but agency officials stated that they submitted the work plan proposal late in the fiscal year and thus could not obligate funds during that year. Officials stated that they intend to participate in the program in fiscal year 2016.

Within each of these six goals, agencies developed a variety of specific uses for their funds for the administrative pilot program. Table 4 provides examples of these uses.

Table 4: Examples of Agencies' Uses of Administrative Pilot Program Funds during Fiscal Year 2015

Outreach	• The Departments of Agriculture (USDA), Commerce, Defense (DOD), Education, Energy (DOE), Health and Human Services (HHS), and Transportation (DOT), and the National Science Foundation (NSF) conducted outreach, such as by traveling to states that have been underrepresented in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs and by meeting with local business and economic development organizations and other organizations, such as the National Society of Black Engineers. • NSF funded an entrepreneurial program with the University of Illinois to connect academic and entrepreneurial groups to increase awareness about NSF's SBIR and STTR programs. • DOE awarded a contract to provide application support and assistance services to potential DOE applicants.
Commercialization	• HHS hired "Investors-in-Residence" and "Entrepreneurs-in-Residence" to advise applicants and awardees on commercialization. • DOT created the Commercialization Assistance Program designed to assist SBIR program awardees in planning for and implementing commercialization activities, including the development of their Phase II proposal commercialization strategy. • USDA developed a survey to determine the success of past USDA SBIR Phase II awardees.
Streamlining and Simplification	• The Air Force continued to modernize its web server environment, which is intended to improve its reporting procedures for the SBIR and STTR programs. • DOT implemented pre-proposal conference calls for Phase II awardees to help them discuss research goals and prepare proposals.
Prevention of Fraud, Waste, and Abuse	• DOT conducted outreach to both current awardees and Contracting Officer Representatives to inform them about activities that would be considered fraud, waste, and abuse. • HHS hired support staff to assist in prevention and detection of fraud, waste, and abuse. • The Air Force partnered with the Air Force Office of Special Investigations to increase tracking and reporting of instances of fraud, waste, and abuse.
Reporting - Administrative, Congressional and Interagency	• HHS covered personnel costs, including costs for the program manager, a program analyst, and other contractor support. • The Navy updated its program management databases to manage its reporting requirements, which officials said it resulted in improved accuracy of reporting Phase II and III awards and funding.

Administration and Implementation of Reauthorization	• DOE upgraded the system it uses to manage its application and award process. • HHS developed an evaluation framework and tools to improve collection, storage, and analysis of data related to STTR and the mission of the National Institutes of Health.

Source: GAO analysis of agency data. | GAO-17-453

Officials Identified Benefits and Constraints that Affect Participation and Spending on the Administrative Pilot Program

Officials from all 11 agencies participating in the SBIR and STTR programs told us that the administrative pilot program is beneficial. For example, officials at 4 agencies told us that benefits include allowing them to conduct outreach and other activities, which would not have been possible without funding from the administrative pilot program. Further, officials at 1 agency told us that the increased outreach seems to have resulted in more applications, including from underserved states.

However, officials also identified the following constraints to participating in the administrative pilot program:

- *Administrative pilot program authority is temporary.* Officials at 2 agencies told us that the temporary nature of the administrative pilot program constrained them from implementing longer-term activities. For example, officials at 1 agency said that the temporary nature limits them to projects that can be completed within 1 year, and officials at the other agency told us that the temporary nature prevents them from hiring additional staff that would allow them to more fully implement the pilot. Program managers at 8 of the 9 agencies participating in the administrative pilot program told us they supported making it permanent.[41] SBA officials acknowledged that the temporary nature of the pilot program is its biggest constraint. As of May 2017, the administrative pilot program has not been extended past fiscal year 2017.
- *Funds can be used only for new activities, and some program officials were unsure about how long certain activities would be considered as new.* Agencies can only spend the funds from the administrative pilot program on new activities, and officials at 4 agencies told us that written clarification regarding how SBA defined new activities would

[41]Officials from the remaining agency, Education, told us they want to participate in the pilot program longer before deciding whether it should become permanent.

be helpful, particularly because the administrative pilot program has been in effect for a few years.[42]

SBA is required to collect data and report on the use of funds to achieve the objectives of the administrative pilot program.[43] In May 2016, we recommended that SBA could include in its annual report to Congress an evaluation of the constraints that have hindered agencies' participation in the administrative pilot program and steps to address these constraints.[44] SBA officials told us they probably will not discuss potential constraints in the fiscal year 2014 report to Congress because SBA is not required to discuss such constraints in its annual reports and has not collected information on constraints from all the participating agencies. As of April 2017, SBA officials said that SBA is in the process of completing its follow-up with agencies to document agencies' utilization of the administration pilot program. Officials said they will draft a report once SBA receives the information requested from the agencies. As of April 2017, a formal date for completing and submitting the report has not been established.

We continue to believe that having SBA include an evaluation of potential constraints to participating in the administrative pilot program could be useful if Congress decides to continue the program in the future. Without such information, SBA and Congress will not have the information they need to address the constraints and help ensure agencies are implementing the administrative pilot program to the fullest extent.

Conclusions

Under the SBIR and STTR programs, federal agencies have awarded billions of dollars to small businesses to develop and commercialize innovative technologies. In our previous reports on these programs, we identified some steps SBA could take to better ensure agencies' compliance with spending and reporting requirements and to improve management of the administrative pilot program. SBA has taken some of these steps, such as revising its annual reporting template to clarify the

[42]We found in our May 2016 report that officials at 2 agencies told us that the requirement to expend funds on only new activities constrained their ability to participate in the program and that the requirement puts a heavy burden on offices with smaller budgets, as they must start up new activities as well as continue existing activities with limited budgets. See GAO-16-492.

[43]15 U.S.C. § 638(mm)(6) (2017).

[44]GAO-16-492.

required data that agencies should submit. One key remaining issue is ensuring that all agencies submit the data required for SBA to determine whether they have met spending requirements. In fiscal year 2015, 2 participating agencies—DOD and EPA—did not submit these data because they do not have procedures for collecting the data, and they face challenges in collecting these data. A working group of agencies participating in the SBIR and STTR programs is considering proposing an alternative methodology to calculate spending requirements for the programs. Until DOD and EPA find ways to provide the required data or until the spending requirements are changed or the identified data collection challenges are resolved, DOD and EPA will not know whether they have met the spending requirements, and SBA will be limited in its ability to accurately report that information to Congress.

Recommendation for Executive Action

To ensure full compliance with SBIR and STTR spending and reporting requirements, we recommend that the Secretary of Defense and the EPA Administrator establish procedures to collect and submit obligations data or—through SBA, independently, or through a working group of agencies participating in the SBIR and STTR programs—propose to Congress an alternative methodology for calculating spending requirements for their agencies.

Agency Comments and Our Evaluation

We provided a draft of this report to SBA and the 11 participating agencies for review and comment. In written comments, DOD and EPA agreed with the recommendation, and EPA stated that it will work with SBA to develop an alternative methodology for calculating spending requirements. DOD's and EPA's comments are reproduced in appendixes III and IV. Three agencies—Commerce, HHS, and NSF—provided technical comments, which we incorporated as appropriate. Seven agencies—DHS, DOE, DOT, Education, NASA, SBA, and USDA—had no technical or written comments.

We are sending copies of this report to the appropriate congressional committees; the Secretaries of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, and Transportation; the Administrators of the Small Business Administration, the Environmental Protection Agency, and the National Aeronautics and Space Administration; the Director of the National Science Foundation; and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or neumannj@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 V.

John Neumann
Director, Natural Resources and Environment

List of Committees

The Honorable James Risch
Chairman
The Honorable Jeanne Shaheen
Ranking Member
Committee on Small Business & Entrepreneurship
United States Senate

The Honorable Lamar Smith
Chairman
The Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
House of Representatives

The Honorable Steve Chabot
Chairman
The Honorable Nydia M. Velázquez
Ranking Member
Committee on Small Business
House of Representatives

Appendix I: Agencies' Spending and Spending Requirements for the Small Business Innovation Research Program for Fiscal Year 2015, According to Agency Data

Nine of the 11 agencies participating in the SBIR program submitted the extramural research or research and development (R&D) obligations data required to determine compliance with program spending requirements for fiscal year 2015. Eight of these 9 agencies met or exceeded their SBIR spending requirements for fiscal year 2015, according to the agencies' data. For the purposes of this report, we defined compliance as spending at least 2.9 percent of an agency's reported extramural R&D obligations on the SBIR program in fiscal year 2015, as required by the Small Business Act. This method is consistent with the Small Business Administration's approach for calculating spending requirements in its reports to Congress on the program. We could not determine compliance with spending requirements for the Department of Defense and the Environmental Protection Agency because those agencies did not submit the required extramural R&D obligations data. Table 5 shows agency SBIR spending for all 11 participating agencies and spending requirements for the 9 agencies that submitted the required obligations data.

Table 5: Agency Spending and Spending Requirements for the Small Business Innovation Research (SBIR) Program for Fiscal Year 2015, According to Agency Data

Dollars in millions

Agency	Extramural research or research and development (R&D) obligations (dollars)	Amount spent on SBIR[a] (dollars)	Calculated spending requirement[b] (dollars)	Difference between amount spent and spending requirement (dollars)	Percentage of extramural R&D obligations spent on SBIR
Department of Defense[c]	N/A	956.9	N/A	N/A	N/A
Department of Health and Human Services	24,244.5	713.4	703.1	10.3	2.9
Department of Energy	6,054.7	193.6	175.6	18.0	3.2
National Science Foundation	5,367.0	155.4	155.6	(0.2)	2.9[d]
National Aeronautics and Space Administration	4,960.3	158.2	143.8	14.4	3.2
Department of Agriculture	904.5	22.7	26.2	(3.5)	2.5
Department of Homeland Security	372.6	20.7	10.8	9.9	5.6
Department of Transportation	349.8	11.2	10.1	1.0	3.2
Department of Commerce	316.2	9.1	9.2	(0.1)	2.9[d]
Department of Education	240.7	7.5	7.0	0.5	3.1
Environmental Protection Agency[c]	N/A	4.7	N/A	N/A	N/A
Total[c]	**42,810.2**	**2,253.4**	**1,241.5**	**50.3**	**3.0**

Legend: N/A = not available

Source: GAO analysis of agencies' data submitted to the Small Business Administration (SBA). | GAO-17-453

Notes: Calculations may be affected by rounding. Negative numbers are placed within parentheses.

[a]The amount spent is the agency's obligations for SBIR that the agency reported to SBA.

[b]We calculated the spending requirement as 2.9 percent of the agency's extramural R&D obligations, as required by the Small Business Act.

[c]Two participating agencies—the Department of Defense and the Environmental Protection Agency—did not submit the required extramural R&D obligations data. Therefore, we could not determine their compliance with SBIR spending requirements, and we excluded their SBIR spending when calculating the total percentage of extramural R&D obligations spent on SBIR by participating agencies.

[d]When determining whether each agency had met its spending requirement for the SBIR program, we rounded the calculated percentage to the nearest tenth of a percent. The percentages for the National Science Foundation and the Department of Commerce rounded up to the spending requirement of 2.9 percent.

Appendix II: Agencies' Spending and Spending Requirements for the Small Business Technology Transfer Program for Fiscal Year 2015, According to Agency Data

Four of the five agencies participating in the STTR program submitted the extramural research or research and development (R&D) obligations data required to determine compliance with program spending requirements for fiscal year 2015. All four of these agencies met or exceeded their STTR spending requirements for fiscal year 2015, according to the agencies' data. For the purposes of this report, we defined compliance as spending at least 0.40 percent of an agency's reported extramural R&D obligations on the STTR program in fiscal year 2015, as required by the Small Business Act. This method is consistent with the Small Business Administration's approach for calculating spending requirements in its reports to Congress on the program. We could not determine compliance with spending requirements for the Department of Defense because it did not submit the required extramural R&D obligations data. Table 6 shows agency STTR spending for all five participating agencies, and spending requirements for the four agencies that submitted the required obligations data.

Table 6: Agency Spending and Spending Requirements for the Small Business Technology Transfer (STTR) Program for Fiscal Year 2015, According to Agency Data

Dollars in millions

Agency	Extramural research or research and development (R&D) obligations (dollars)	Amount spent on STTR[a] (dollars)	Calculated spending requirement[b] (dollars)	Difference between amount spent and spending requirement (dollars)	Percentage of extramural R&D obligations spent on STTR
Department of Defense[c]	N/A	125.5	N/A	N/A	N/A
Department of Health and Human Services	24,244.5	100.3	97.0	3.3	0.41
Department of Energy	6,054.7	26.4	24.2	2.1	0.44
National Science Foundation	5,367.0	21.3	21.5	(0.2)	0.40[d]
National Aeronautics and Space Administration	4,960.3	22.1	19.8	2.3	0.45
Total[c]	**40,626.5**	**295.6**	**162.5**	**7.6**	**0.42**

Legend: N/A = not available

Source: GAO analysis of agencies' data submitted to the Small Business Administration (SBA). | GAO-17-453

Notes: Calculations may be affected by rounding. Negative numbers are placed within parentheses.

[a]The amount spent is the obligations for STTR that the agency reported to SBA.

[b]We calculated the spending requirement as 0.40 percent of the agency's extramural R&D obligations, as required by the Small Business Act.

[c]Because the Department of Defense did not submit the required extramural R&D obligations data, we could not determine its compliance with its STTR spending requirement, and we excluded its STTR spending when calculating the total percentage of extramural R&D obligations spent on STTR by participating agencies.

[d]When determining whether each agency had met its spending requirement for the STTR program, we rounded the calculated percentage to the nearest hundredth of a percent. The percentage for the National Science Foundation rounded up to the spending requirement of 0.40 percent.

Appendix III: Comments from the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

MAY 9 2017

Mr. John Neumann
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Neumann:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-17-453, "SMALL BUSINESS RESEARCH PROGRAMS: Most Agencies Met Spending Requirements, but DOD and EPA Need to Improve Data Reporting," dated April 12, 2017 (GAO Code 101004). Detailed comments on the report recommendations are enclosed.

Sincerely,

James J. Galvin, Jr.
Acting Director, Office of
Small Business Programs

Enclosure:
As stated

GAO Draft Report Dated April 12, 2017
GAO-17-453 (GAO CODE 101004)

"SMALL BUSINESS RESEARCH PROGRAMS: MOST AGENCIES MET SPENDING REQUIREMENTS, BUT DOD AND EPA NEED TO IMPROVE DATA REPORTING"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATION

RECOMMENDATION: To ensure full compliance with SBIR and STTR spending and reporting requirements, the GAO recommend that the Secretary of Defense and the EPA Administrator establish procedures to collect and submit obligations data or – through SBA, independently, or through a working group of agencies participating in the SBIR and STTR programs – propose to Congress an alternative methodology for calculating spending requirements for their agencies.

DoD RESPONSE: DoD concurs with the recommendation.

Appendix IV: Comments from the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

May 11, 2017

OFFICE OF
RESEARCH AND DEVELOPMENT

Mr. John Neumann, Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, DC 20548

Dear Mr. Neumann:

Thank you for the opportunity to review and comment on GAO's draft report, "Small Business Research Programs: Most Agencies Met Spending Requirements, but DOD and EPA Need to Improve Data Reporting."

The purpose of this letter is to provide the EPA's response to your recommendation.

Recommendation: *To ensure full compliance with SBIR and STTR spending and reporting requirements, we recommend that the Secretary of Defense and the EPA Administrator establish procedures to collect and submit obligations data or—through SBA, independently, or through a working group of agencies participating in the SBIR and STTR programs—propose to Congress an alternative methodology for calculating spending requirements for their agencies.*

Response: The EPA concurs with the recommendation. EPA will work directly with the SBA to develop an alternative methodology for calculating spending requirements that align with EPA's financial management processes and systems.

We appreciate GAO's acknowledgement that EPA follows practices to ensure meeting minimum spending requirements including: "Spend funds beyond the minimum estimated spending requirement budgeted." and "Spent multi-year funds in the year appropriated." Development of an alternate methodology for calculating spending requirements for EPA will further show EPA's commitment to its SBIR program.

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Thank you again for the opportunity to review and respond to the draft GAO report. We request that you include the entirety of this response as an appendix to the GAO final report. If you have any questions, please contact Beatriz Cuartas at (202) 564-4948.

Sincerely,

Robert J. Kavlock, Ph.D.
Acting Assistant Administrator

cc: EPA GAO Liaison Team
Dr. James H. Johnson, Jr., Director, National Center for Environmental Research, ORD
James Gentry, Deputy Director, National Center for Environmental Research, ORD
April Richards, Program Manager, Small Business Innovation Research (SBIR) Program

Appendix V: GAO Contacts and Staff Acknowledgments

GAO Contacts

John Neumann, (202) 512-3841 or neumannj@gao.gov

Staff Acknowledgments

In addition to the contact named above, Hilary Benedict (Assistant Director), John Barrett, Antoinette Capaccio, Ellen Fried, Cindy Gilbert, Terry Hanford, and Sara Sullivan made key contributions to this report.

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