



September 2013

SMALL BUSINESS RESEARCH PROGRAMS

Actions Needed to Improve Compliance with Spending and Reporting Requirements

GAO Highlights

Highlights of [GAO-13-421](#), a report to congressional committees

Why GAO Did This Study

The Small Business Act established the SBIR and STTR programs to use small businesses to meet federal R&D needs. The law mandates that agencies, with extramural R&D budgets that meet the thresholds for participation, must spend a percentage of these annual budgets on the SBIR and STTR programs. The agencies are to report on their activities to SBA and, in turn, SBA is to report to Congress. Eleven agencies participate in SBIR, and five of them also participate in STTR. The act's 2011 reauthorization mandates that GAO review SBA's and the agencies' compliance with spending and reporting requirements, and other program aspects, for fiscal years 2006 to 2011. GAO determined (1) the extent to which participating agencies complied with spending requirements and how the agencies calculated these requirements, (2) the extent to which participating agencies and SBA complied with certain reporting requirements, (3) the potential effects of basing the spending requirements on an agency's total R&D budget, and (4) the cost to participating agencies of SBIR and STTR program administration. GAO reviewed agency calculations of spending requirements and the required reports and interviewed SBA and participating agency program and financial officials.

What GAO Recommends

GAO recommends, among other things, that SBA provide additional guidance to agencies for spending and reporting requirements and provide Congress with a more timely annual report with more analysis of the agencies' methodologies. SBA stated that it agrees with the recommendations and will implement them.

View [GAO-13-421](#). For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov

September 2013

SMALL BUSINESS RESEARCH PROGRAMS

Actions Needed to Improve Compliance with Spending and Reporting Requirements

What GAO Found

Using data agencies had reported to the Small Business Administration (SBA), GAO found that 8 of the 11 agencies participating in the Small Business Innovation Research (SBIR) program and 4 of the 5 agencies participating in the Small Business Technology Transfer (STTR) program did not consistently comply with spending requirements for fiscal years 2006 to 2011. In calculating their annual spending requirements for these programs, some agencies made improper exclusions from their extramural research and development (R&D) budgets and used differing methodologies. SBA, which oversees the programs, provided guidance in policy directives for agencies on calculating these requirements, but the directives do not provide guidance on calculating the requirements when appropriations are late and spending is delayed, resulting in agencies using differing methodologies. This made it difficult to determine whether agencies' calculations were correct. Without further SBA guidance, agencies will likely continue calculating spending requirements in differing ways.

The participating agencies and SBA have not consistently complied with certain program reporting requirements. For example, in their methodology reports to SBA, the agencies submitted different levels of detail on their methodologies, such as the programs excluded from the extramural budget and the reasons for the exclusions. SBA's guidance states that the methodology reports are to itemize each R&D program excluded from the calculation of the agency's extramural budget and explain why a program is excluded but does not specify the format of the methodology reports to ensure consistency. Also, SBA's annual reports to Congress contained limited analysis of the agencies' methodologies, often not including information on particular agencies. Without more guidance to agencies on the formats of their methodology reports and more analysis of the contents of those reports, SBA cannot provide Congress with information on the extent to which agencies are reporting what is required. Further, SBA has not submitted an annual report on these programs for fiscal years 2009 to 2011 but plans to submit the reports to Congress later in 2013—making the data available to Congress on the programs 2 to 4 years late.

Potential effects of basing each participating agency's spending requirement on its total R&D budget instead of its extramural R&D budget include an increase in the amount of the spending requirement—for some agencies more than others—depending on how much of the agency's R&D budget is composed of extramural spending. Also, if the thresholds of the spending requirements for participation in the programs did not change, changing the base to an agency's total R&D budget would increase the number of agencies required to participate.

The agencies' cost of administering the programs could not be determined because the agencies have not consistently tracked that cost as they are not required to by the authorizing legislation of the programs. Nine of the 11 agencies in SBIR provided GAO with estimates of some of these costs for fiscal year 2011—most of which were for salaries and expenses. With the start of a pilot program allowing agencies to use up to 3 percent of SBIR program funds for administrative costs in 2013, SBA plans to require agencies to track and report administrative costs paid from program funds.

Contents

Letter		1
	Background	5
	Data Indicate Most Agencies Have Not Consistently Complied with Mandated Requirements, Because of Improper Exclusions and Differing Methodologies	8
	Agencies and SBA Have Not Consistently Complied with Certain Reporting Requirements	14
	Basing Spending Requirements on Agencies' Total R&D Budgets Could Increase Spending and Program Participation	19
	Agencies' Cost for the Administration of the Programs Cannot Currently Be Determined Because the Agencies Do Not Identify or Track All Costs	23
	Conclusions	27
	Recommendations for Executive Action	28
	Agency Comments	29
Appendix I	Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011	32
Appendix II	Analysis of Alternative Scenarios for Basing SBIR and STTR Spending Requirements on Total R&D Budget	49
Appendix III	Description of SBIR and STTR Administrative Cost Data Obtained from the Participating Agencies	52
Appendix IV	GAO Contact and Staff Acknowledgments	55
Tables		
	Table 1: Performance of Agencies in Meeting Small Business Innovation Research (SBIR) Spending Requirements Aggregated over Fiscal Years 2006 to 2011	10

Table 2: Performance of Agencies in Meeting Small Business Technology Transfer (STTR) Spending Requirements Aggregated over Fiscal Years 2006 to 2011	11
Table 3: Comparison of Fiscal Year 2011 Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs' Spending Requirements under the Current Law and If Based on the Participating Agencies' Total R&D Budget	19
Table 4: Additional Agencies That Would Participate in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs if the 2011 Base Were Revised to Total R&D Budget Authority	23
Table 5: Summary of Alternative Scenarios to Illustrate the Potential Effects of Calculating Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Expenditure Requirements on an Agency's Total R&D Budget Instead of Its Extramural R&D Budget	50
Table 6: Comparison of Fiscal year 2011 Small Business Innovation Research (SBIR) Spending Requirements under the Current Law and the Three Alternative Scenarios	50

Figures

Figure 1: Number of Years Agencies Met Spending Requirements for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs for Fiscal Years 2006 to 2011	9
Figure 2: Comparison of the Department of Agriculture's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	33
Figure 3: Comparison of the Department of Commerce's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	34
Figure 4: Comparison of DOD's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	35
Figure 5: Comparison of the Department of Education's Reported Spending Requirements and Spending for the Small	

	Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	36
Figure 6:	Comparison of the Department of Energy's (DOE) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	37
Figure 7:	Comparison of the Department of Health and Human Services' Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	38
Figure 8:	Comparison of the Department of Homeland Security's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	39
Figure 9:	Comparison of the Department of Transportation's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	40
Figure 10:	Comparison of the Environmental Protection Agency's (EPA) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	41
Figure 11:	Comparison of National Aeronautics and Space Administration's (NASA) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	42
Figure 12:	Comparison of the National Science Foundation's (NSF) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011	43
Figure 13:	Comparison of DOD's Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011	44
Figure 14:	Comparison of the Department of Energy's (DOE) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011	45
Figure 15:	Comparison of the Department of Health and Human Services' (HHS) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011	46

Figure 16: Comparison of National Aeronautics and Space Administration's (NASA) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011	47
Figure 17: Comparison of the National Science Foundation's (NSF) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011	48

Abbreviations

DHS	Department of Homeland Security
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency
FTE	full time equivalent
HHS	Department of Health and Human Services
VA	Department of Veterans Affairs
NASA	National Aeronautics and Space Administration
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NSF	National Science Foundation
R&D	research and development
SBA	Small Business Administration
SBIR	Small Business Innovation Research
STTR	Small Business Technology Transfer
USDA	U.S. Department of Agriculture

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



September 9, 2013

Congressional Committees

Small businesses are a major driver of high-technology innovation and economic growth in the United States, generating significant employment, new markets, and high-growth industries, according to the National Academy of Sciences.¹ The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs target small businesses for federal research or research and development (R&D) funding to develop and commercialize innovative technologies.² The SBIR and STTR programs, managed by the Small Business Administration (SBA), were established in 1982 and 1992, respectively, in amendments to the Small Business Act. Most recently, these programs were reauthorized through September 30, 2017, by the National Defense Authorization Act for Fiscal Year 2012.³

Every federal agency⁴ with a budget of \$100 million or more for extramural R&D—which is generally conducted by nonfederal employees—is required to establish and operate an SBIR program, while every federal agency with a budget of \$1 billion or more for extramural R&D is required to establish and operate an STTR program.⁵ The Small Business Act increases the minimum portion of an agency’s R&D extramural budget that must be spent, with the SBIR funding percentage increasing from the 1997 to 2011 rate of not less than 2.5 percent to 2.6 percent in 2012 and to 3.2 percent in 2017 and beyond, and the STTR funding percentage increasing from 0.3 percent in 2004 to 2011 to 0.45 percent in 2016 and beyond.⁶ From the programs’ inception dates

¹National Research Council, *An Assessment of the SBIR Program* (Washington, D.C.: National Academies Press, 2008).

²In this report, we refer to research or research and development activities as R&D.

³Pub. L. No. 112-81, Title LI, 125 Stat. 1823 (2011).

⁴In this report we refer to federal departments and agencies as agencies.

⁵The act defines “extramural budget” to generally mean the sum of the agency’s total research obligations minus amounts obligated for research activities by employees of the agency in or through government-owned, government-operated facilities.

⁶In this report we refer to the amounts resulting from applying these minimum percentages to extramural R&D budgets as “spending requirements.”

through fiscal year 2011, federal agencies made about 126,000 awards under the SBIR program totaling about \$30.4 billion and about 9,000 awards under the STTR program totaling about \$2.3 billion.

Currently, 11 agencies participate in SBIR programs: the U.S. Department of Agriculture (USDA); the Departments of Commerce (Commerce), Defense (DOD), Education (Education), Energy (DOE), Health and Human Services (HHS), Homeland Security (DHS), and Transportation (DOT); the Environmental Protection Agency (EPA); the National Aeronautics and Space Administration (NASA); and the National Science Foundation (NSF). Of these agencies, 5 also participate in the STTR program: DOD, DOE, HHS, NASA, and NSF.

The Small Business Act sets certain reporting requirements for participating agencies and SBA. Among other things, such agencies are to report to SBA on their methodology for calculating extramural R&D spending requirements within 4 months of enactment of their annual appropriations. Agencies are also directed to submit annual reports to SBA on their SBIR and STTR spending requirements and the amount spent after the end of each fiscal year. Furthermore, SBA is to annually report to Congress on all the participating agencies' SBIR and STTR programs, including an analysis of the agencies' budget calculation methodologies. The act also created a pilot program beginning in fiscal year 2013 that would allow a portion of SBIR program funds to be used for administrative costs, outreach and technical assistance, contract processing, and other specified purposes.⁷ Agencies are otherwise generally not permitted to spend program funds on administrative costs.

In addition, the Small Business Act mandates that GAO review the participating agencies' compliance with spending and reporting requirements for the programs for fiscal years 2006 to 2011, as well as other aspects of the programs.⁸ Our objectives were to determine (1) the extent to which the participating agencies complied with the programs' spending requirements and how they calculated these requirements, (2)

⁷An agency may not use funds for the specified purposes until after the effective date of SBA-established performance criteria to measure any benefits of using funds for these purposes.

⁸National Defense Authorization Act for Fiscal Year 2012, Pub. L. No. 112-81, 125 Stat. 1298, § 5136.

the extent to which participating agencies and SBA have complied with certain reporting requirements, (3) the potential effects of basing the spending requirements for the SBIR and STTR programs on an agency's total R&D budget instead of its extramural R&D budget, and (4) the cost to participating agencies of SBIR and STTR program administration and how agency funds were used to cover these costs.

To gather information on both programs, we reviewed the laws governing the programs and the guidance that the SBA has issued regarding the programs. We reviewed prior GAO, SBA Inspector General, and other reports related to the programs. We also met with the SBA's SBIR and STTR program staff and interviewed program and financial management officials at each of the 11 agencies participating in SBIR. To determine the extent to which participating agencies have complied with the programs' spending requirements, we compared spending requirements for fiscal years 2006 to 2011 with the amounts agencies reported spending in each annual report to SBA. We determined that an agency met its spending requirement if the agency's reported spending for these programs was equal to or greater than the reported spending requirement. We used the agencies' obligations data to represent spending for the programs in part because obligations data were readily available from each of the agencies for program purposes, and obligations provided a reasonable measure of the spending for the programs in each year. In addition, we collected data and documents from agencies and interviewed agency officials about how they calculated their extramural R&D budgets, including any amounts agencies are authorized to exclude from those budgets. To assess the reliability of the spending data, we questioned agency officials about the source and data quality control procedures and reviewed relevant documentation. We determined that these spending data were sufficiently reliable for the purposes of this report.

To determine the extent to which participating agencies and SBA have complied with certain reporting requirements for calculating their extramural research budgets, we compared the agencies' methodology and annual reports to SBA and SBA's annual report to Congress for fiscal years 2006 to 2011, to the extent available, with requirements in the

Small Business Act and SBA's related policy directives.⁹ We sought documentation of SBA's review and analysis of the methodology reports and copies of SBA's annual reports to Congress on the SBIR and STTR programs to determine the extent to which SBA carried out the mandated analysis of methodologies and publication of results in its annual reports.

To determine the potential effects of basing spending requirements for the SBIR and STTR programs on an agency's total R&D budget, we used actual data on total R&D budget authority from the President's budget to calculate potential spending requirements for each federal agency for fiscal years 2006-2011.¹⁰ In calculating these potential spending requirements, we assumed that the same funding percentages currently required by the Small Business Act would apply to total R&D budgets. We also assumed that the current spending thresholds that require agency participation in the SBIR and STTR programs— \$100 million and \$1 billion in extramural funding respectively—would instead apply to total R&D funding. In other words, an agency with total annual R&D funding of \$100 million would be required to participate in the SBIR program, while an agency with total annual R&D funding of \$1 billion would be required to participate in both the SBIR and STTR programs. We compared the spending requirements under this first scenario with the spending requirements under the current law to determine the potential effects of changing the methodology to calculate the spending requirements for fiscal years 2006 to 2011. We also developed two additional funding scenarios. We compared the potential spending requirements of these scenarios with the spending requirements under the current law for fiscal years 2006 to 2011.

⁹The prior and current policy directives citations are: Small Business Administration, *The Small Business Innovation Research (SBIR) Program Policy Directive*, (Washington, DC.: 2005); Small Business Administration, *The Small Business Innovation Research (SBIR) Program Policy Directive*, (Washington, DC.: 2012); Small Business Administration, *The Small Business Technology Transfer (STTR) Program Policy Directive*, (Washington, DC.: 2005); and Small Business Administration, *The Small Business Technology Transfer (STTR) Program Policy Directive*, (Washington, DC.: 2012).

¹⁰Office of Management and Budget, *Analytical Perspectives, Budget of the U.S. Government* (Washington, D.C.: FY 2008-2013). Because we could not estimate the total R&D budget of each agency and agencies did not include this amount in their annual reports, we relied on the amount of budget authority reported in the *Analytical Perspectives* volume for calculation of the required expenditures.

To determine the cost to participating agencies for SBIR and STTR program administration and how agency funds were used, we collected existing administrative cost data directly from agencies and interviewed program and financial officials at each agency to (1) learn the scope of existing data available on administrative costs, (2) identify amounts and categories of administrative costs, and (3) request existing annual cost data from them. We determined that these data were too incomplete and from such varied sources that an assessment of the available data's reliability was not possible. Thus, we could not use the data in our report. In addition, we gathered information on the agencies' implementation of the pilot program that allows a portion of SBIR program funds to be used for specific administrative costs.

We conducted this performance audit from April 2012 to August 2013 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

SBIR has four overarching purposes: to (1) use small businesses to meet federal R&D needs,¹¹ (2) stimulate technological innovation, (3) increase commercialization of innovations derived from federal R&D efforts,¹² and (4) encourage participation in technological innovation by small businesses owned by women and disadvantaged individuals. The SBIR program has a three-phase structure as follows:

¹¹According to SBA, an eligible small business in the SBIR or STTR program (1) is organized for profit, with a place of business located in the United States; (2) is at least 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States; (3) is at least 51 percent owned and controlled by another for-profit business concern that is at least 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States; and (4) has no more than 500 employees, including affiliates.

¹²For the SBIR program as implemented during the course of our review, SBA defined commercialization as the "process of developing marketable products or services and producing and delivering products or services for sale (whether by the originating party or by others) to government or commercial markets."

-
- In Phase I, agencies award up to \$150,000 for a period of about 6 to 9 months to small businesses to determine the scientific and technical merit and feasibility of ideas that appear to have commercial potential.
 - In Phase II, small businesses whose Phase I projects demonstrate scientific and technical merit, in addition to commercial 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.
 - Phase III is for small businesses to pursue commercialization objectives resulting from the Phase I and II R&D activities, where appropriate. Phase III is the period in which Phase II innovation moves from the laboratory to the marketplace. SBIR Phase III work completes an effort made under prior SBIR phases, but it is funded by sources other than the SBIR program. To commercialize their products, small businesses are expected to raise additional funds from private investors, the capital markets, or from non-SBIR sources within the agency that made the initial award.

According to SBA documents, STTR's purpose is to stimulate a partnership of ideas and technologies between innovative small businesses and research institutions through federally funded R&D.¹³ The program provides funding for research proposals that are developed and executed cooperatively between small businesses and research institutions. Like the SBIR program, the STTR program is structured in three phases as follows:

- Phase I aims to establish the technical merit, feasibility, and commercial potential of the proposed R&D efforts and to determine the quality of performance of the small businesses. STTR Phase I awards generally do not exceed \$150,000 for 1 year.
- Phase II funding is based on the results achieved in Phase I and the scientific and technical merit and commercial potential of the Phase II project proposed. STTR Phase II awards generally do not exceed \$1 million total costs for 2 years.
- Phase III is for small businesses to pursue commercialization of research or technology resulting from the Phase I and II R&D

¹³Pub. L. No. 102-564, 106 Stat. 4249. Research institutions include nonprofit colleges or universities, domestic nonprofit research organizations, and federally funded R&D centers.

activities, and it completes an effort made under the prior STTR phases but is funded by sources other than the STTR program. According to SBA, Phase III work can involve commercial application of R&D financed by nonfederal capital, including STTR products or services intended for use by the federal government and continuation of R&D that has been competitively selected in Phases I and II, according to the 2012 SBA policy directive.

As noted, federal agencies with a budget of more than \$100 million for extramural R&D are required to have an SBIR program, while federal agencies with extramural R&D budgets that exceed \$1 billion annually are required to have an STTR program. Generally, the extramural R&D budget is defined as the sum of the total obligations for R&D minus amounts to be obligated for intramural R&D, that is, R&D conducted by employees of a federal agency in or through government-owned, government-operated facilities. In determining their extramural R&D budget, agencies have authority to exclude certain R&D programs from the extramural R&D base used for calculating SBIR and STTR spending requirements, such as facilities and equipment used for R&D and certain intelligence activities. For example, under the Small Business Act, DOE must exclude amounts obligated for its naval reactor program from its extramural R&D budget.¹⁴ Likewise, under the act, DOD excludes programs carried out by certain elements of the intelligence community.¹⁵ In addition, DOT must exclude funds obligated for the Federal Highway Administration State Planning and Research program from its extramural R&D budget.¹⁶

In fiscal year 2011, the 11 participating agencies reported spending a total of \$2.2 billion for SBIR, and the 5 participating agencies reported spending a total of \$251 million for STTR, with DOD spending the most on these programs—\$1.1 billion and \$121 million, respectively. DOD's reported spending constituted 48.8 percent of total SBIR spending and 48.2 percent of total STTR spending in fiscal year 2011.

According to SBA documents, the agency's role is to serve as the oversight and coordinating agency for the SBIR and STTR programs and

¹⁴15 U.S.C. § 638(e)(1) (2006).

¹⁵15 U.S.C. § 638(e)(2) (2006).

¹⁶23 U.S.C. § 505(b)(3) (2006).

is to direct and assist the agencies' implementation of the programs, review their progress, collect agency reports, analyze the information in the agencies' methodology reports, and report annually to Congress on the programs. In this role, SBA issued SBIR and STTR policy directives in September 2002 and December 2005, respectively, and updated them in August 2012; these directives provide agencies with detailed guidance on implementation of the SBIR and STTR programs.

Data Indicate Most Agencies Have Not Consistently Complied with Mandated Requirements, Because of Improper Exclusions and Differing Methodologies

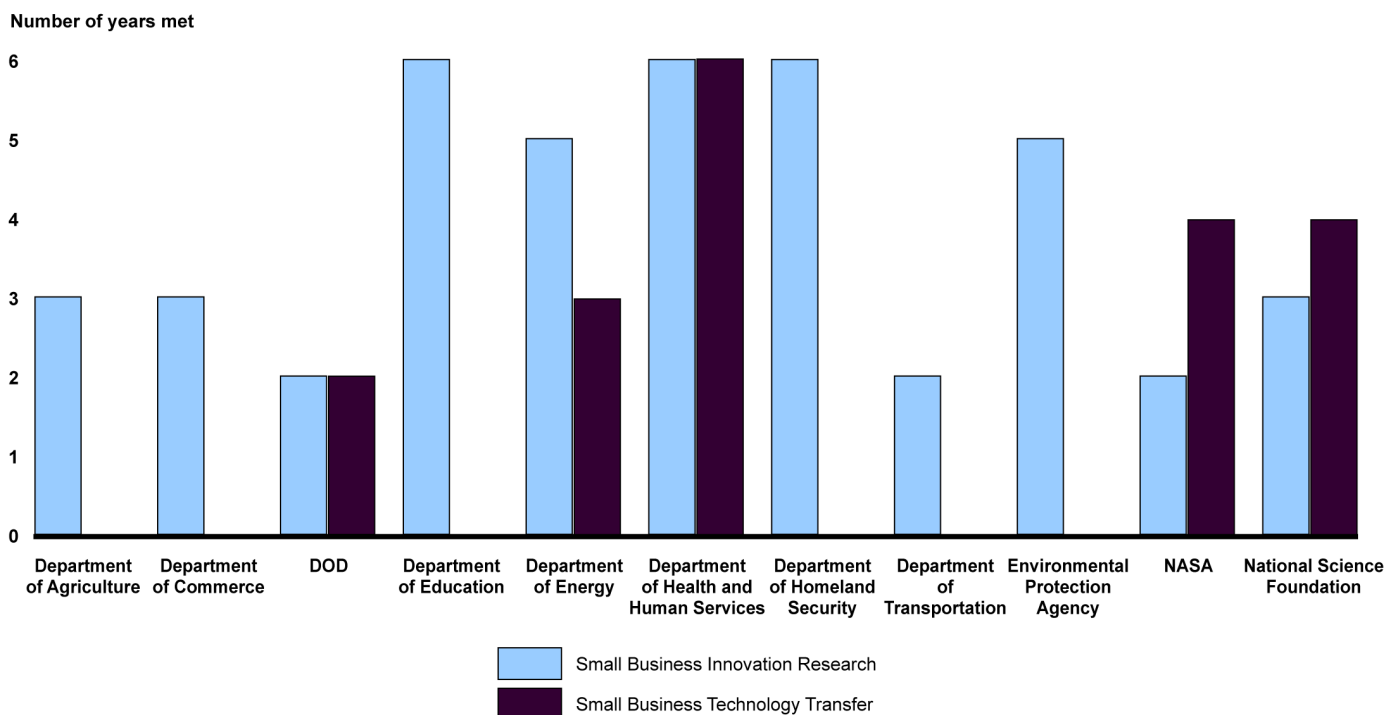
Data reported by the participating agencies to SBA for fiscal years 2006 to 2011 indicate that most of the agencies have not consistently complied with the mandated spending requirements for SBIR and STTR. In calculating their spending requirements, some participating agencies made improper exclusions and used differing methodologies.

Agency Data Indicate That Agencies Did Not Consistently Comply with Mandated Program Spending Requirements

Our analysis of data the participating agencies reported to SBA indicates that, from fiscal years 2006 to 2011, most agencies did not consistently comply with mandated spending requirements. Specifically, 8 of the 11 agencies did not consistently meet annual spending requirements for SBIR. Data from 3 of the agencies—DHS, Education, and HHS—indicate that they met their spending requirements for all 6 years. For STTR, 4 of 5 agencies did not consistently meet annual spending requirements. Data from 1 agency—HHS—indicate that it met its STTR spending requirements for all 6 years. Figure 1 shows the number of years that each agency met its annual SBIR and STTR spending requirements, based on the information submitted to SBA in each agency's annual

reports.¹⁷ See appendix I for further details on each agency's reported spending on these programs.

Figure 1: Number of Years Agencies Met Spending Requirements for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs for Fiscal Years 2006 to 2011



Sources: GAO analysis of agency annual report data submitted to SBA.

Note: Data are from agency annual reports to SBA, except for those of DHS, DOE, and EPA; those agencies submitted revised data to us, which we incorporated into our analysis. Agencies for which STTR data are not shown did not have STTR programs, with the exception of DHS. DHS had an STTR program in FY 2006 and 2007. However, the agency was not required to participate, because its extramural R&D budget for each of those years was actually below the \$1 billion threshold required for participation in the STTR program. The agency stated it had inadvertently used an incorrect extramural budget amount to determine its participation requirement.

¹⁷Three agencies—DHS, EPA, and DOE—told us that the information they submitted in their annual reports to SBA was incorrect or incomplete. The agencies provided us with revised information, which we incorporated into our analysis.

Most participating agencies that did not meet their spending requirements in a given year spent at least 5 percent less than the required amount. In commenting on this information, agency officials said that funds are frequently carried into the next fiscal year for SBIR and STTR purposes. Although the SBIR and STTR spending requirements apply for each fiscal year, some agency officials said they follow the practice for most R&D funding, which typically may be spent over a 2-year period of availability,¹⁸ allowing agencies to “carry over” funding that was appropriated in 1 year and spend it in the next year. In addition, some agency officials said examining their performance over a number of years would provide another perspective on their spending. In response to this comment, we compared agencies’ aggregated spending data for the SBIR program with their spending requirements, as calculated by the agencies, over the 6-year period of our review. When we did so, we found that seven agencies spent more than the aggregated sum of their requirements for the 6 years, and four spent less. Overall, for the 6-year period of our review, agencies’ SBIR total spending was less than 1 percent or \$80 million under the spending requirement, as calculated by the agencies. See table 1 for details.

Table 1: Performance of Agencies in Meeting Small Business Innovation Research (SBIR) Spending Requirements Aggregated over Fiscal Years 2006 to 2011

Dollars in billions

Agency	SBIR amount spent	SBIR spending requirement ^a	Difference between SBIR amount spent and the spending requirement	Percentage under- or over-spent
DOD	\$6.754	\$6.940	(0.186)	(2.68%)
HHS	3.659	3.610	0.049	1.36%
DOE	0.865	0.824	0.041	4.98%
NSF	0.648	0.678	(0.030)	(4.42%)
NASA	0.695	0.690	0.005	0.72%
DHS	0.137	0.106	0.031	29.25%
USDA	0.117	0.118	(0.001)	(.85%)
Education	0.060	0.049	0.011	22.45%
DOT	0.036	0.043	(0.007)	(16.28%)

¹⁸Exceptions to the 2-year period of availability for R&D appropriations include HHS.

Dollars in billions				
Agency	SBIR amount spent	SBIR spending requirement ^a	Difference between SBIR amount spent and the spending requirement	Percentage under- or over-spent
Commerce	0.043	0.039	0.004	10.26%
EPA	0.029	0.026	0.003	11.54%
Total	\$13.043	\$13.123	(0.080)	(0.61%)

Source: GAO analysis of agency data reported to SBA, except for those of DHS, DOE, and EPA; those agencies submitted revised data to GAO, which were incorporated into its analysis.

^aAs calculated by the agency.

Note: The differences in each row may be affected by rounding.

For the STTR program, we also compared agencies' aggregated spending with their spending requirements over the 6-year period of our review and found that three of the five participating agencies spent more than the aggregated sum of their requirements, and two spent less. Overall, for the 6-year period of our review for participating agencies, STTR spending was within less than 1 percent, or about \$12 million, of the spending requirement.

Table 2: Performance of Agencies in Meeting Small Business Technology Transfer (STTR) Spending Requirements Aggregated over Fiscal Years 2006 to 2011

Dollars in billions				
Agency ^a	STTR amount spent	STTR spending requirement ^b	Difference between STTR amount spent and spending requirement	Percentage under- or over-spent
DOD	\$0.792	\$0.833	(\$0.041)	(4.92%)
HHS	0.447	0.433	0.014	3.23%
DOE	0.098	0.099	(0.001)	(1.01%)
NSF	0.094	0.081	0.013	16.05%
NASA	0.086	0.083	0.003	3.61%
Total	\$1.517	\$1.529	(\$0.012)	(0.78%)

Sources: GAO analysis of agency data reported to SBA, along with annual report corrections that DHS, DOE, and EPA submitted to GAO.

^aDHS also had an STTR program in FY 2006 and 2007. However, the agency was not required to participate, because its extramural R&D budget for each of those years was actually below the \$1 billion threshold required for participation in the STTR program. The agency stated it had inadvertently used an incorrect extramural budget amount to determine its participation requirement.

^bAs calculated by the agency.

Note: Calculations may be affected by rounding.

SBIR and STTR program managers cited three reasons why spending the required amount in a given fiscal year could be difficult. First, delays in receiving final appropriations can delay agencies' awarding of contracts for SBIR or STTR projects. Some program managers said that they tend to wait to award some grants and contracts until receiving their final appropriations in case the agency's extramural R&D budget—and, therefore, its SBIR or STTR spending requirement—differs significantly from the expected amount. Because the award process can be lengthy, a delay can push the awards and spending into the following fiscal year. Over the period of our review, agencies often received final appropriations decisions after the beginning of the fiscal year and in some cases more than 6 months into the year. For example, in fiscal year 2011, many participating agencies operated under a continuing resolution until April 2011,¹⁹ when they received their final appropriation for the remainder of the fiscal year. DOD officials noted that carrying over funds enables agencies to effectively manage contracts to accommodate the timing of the awards and delays in funding decisions. The second reason cited by SBIR and STTR managers was that in a given fiscal year, agencies decide on a mix of Phase I and Phase II awards to meet program objectives, and the collective amount of these awards may not equal their annual spending requirement—leaving the difference between the awards and the spending requirement unused. NASA officials said a third reason agencies may have difficulty spending all required funds is that changes in a company's status—through a merger, for example—could make a company that was under consideration for an award too large to be eligible for the program. According to these officials, such changes could occur too late to spend those funds in a given fiscal year.

Some Agency Calculations of Spending Requirements Show Improper Exclusions and Differing Methodologies

In calculating the programs' spending requirements, some participating agencies made improper exclusions from their extramural R&D budgets, which are the basis for calculating the requirements, and when appropriations were received late in the year, agencies used differing methodologies to calculate their spending requirements, making it difficult to determine whether agencies' calculations were correct.

¹⁹A continuing resolution is an appropriations act for federal agencies to continue in operation when Congress and the President have not completed action on the regular appropriation acts by the beginning of the fiscal year.

Some agencies have specific statutory authority to exclude certain subunits or programs in calculating the extramural R&D budget used for determining the spending requirements for SBIR and STTR programs, but we found that some participating agencies made exclusions that are not consistent with this statutory authority. For example, as discussed below, two agencies excluded the extramural R&D budgets of agency subunits because those budgets were lower than the threshold requirements for program participation—\$100 million for SBIR and \$1 billion for STTR—even though, as defined in law, the thresholds apply to the entire departmental budget and not to agency subunits:

- DOD reported excluding the Research, Development, Testing, and Evaluation budget of the United States Special Operations Command subunit from its extramural R&D budget because the budget is less than the \$1 billion required for participating in the STTR program.
- HHS reported excluding the extramural R&D budgets of the Centers for Disease Control and Prevention and the Food and Drug Administration because these subunit budgets are less than the \$1 billion required for participating in the STTR program.

In another example, a third agency, DOT reported excluding the Federal Aviation Administration's extramural R&D budget, which is well in excess of \$100 million annually, from the SBIR program budget calculation. We asked DOT and FAA to provide the legal authority for this exclusion, but they did not supply this information.

Improperly excluding subunits reduced calculations of three agencies' respective extramural R&D and, in turn, the agencies' spending requirements for SBIR and STTR. Over fiscal years 2006 to 2011, these improper exclusions resulted in a \$7.7 million reduction to DOD's STTR spending requirement, a \$34.7 million reduction to DOT's SBIR requirement, and HHS' exclusions resulted in a \$6.1 million reduction to its STTR spending requirement. Officials at DOD said they changed the agency's policy on exclusions as of fiscal year 2013 and that the new policy, which will not allow these improper exclusions, is currently being implemented. DOT provided no further information on its exclusion. HHS met its overall agency spending requirement even with the improper exclusions, according to the data in HHS' annual reports to SBA.

In addition to identifying improper exclusions, we found that, when appropriations were received late in the year, agencies used differing methodologies to calculate their spending requirements, making it difficult

to determine whether agencies' calculations were correct. For example, some agency program managers told us that, when appropriations were received late in the year, they used their prior year actual spending to calculate their current year spending requirement, while others calculated their current year spending requirement using some other methodology. Specifically, program managers at the National Institute of Standards and Technology (NIST)—a subunit of Commerce—stated that program managers at NIST used the past year's actual SBIR spending to calculate the current year's requirement. In contrast, NASA calculated its SBIR spending requirement by determining what percentage its extramural R&D spending comprised of its total R&D spending in the prior year. NASA then applied this percentage to the current year's total R&D budget to calculate the current year's extramural budget, which it then used as the basis for calculating the SBIR and STTR spending requirements. Although SBA provided guidance in policy directives for participating agencies on calculating their spending requirements, neither SBA's prior nor its current policy directives provide guidance to agencies on how to calculate such spending requirements when agency appropriations are delayed. Without such guidance, agencies will likely continue to calculate spending requirements in differing ways.

Agencies and SBA Have Not Consistently Complied with Certain Reporting Requirements

Agencies participating in the SBIR and STTR programs have not consistently complied with Small Business Act requirements for annually reporting a description of their methodologies for calculating their extramural R&D budgets to SBA. In addition, SBA has not consistently complied with the act's requirements for annually reporting to Congress, including reporting on SBA's analysis of the agencies' methodologies for calculating their extramural R&D budgets.

Agencies' Reporting of Methodologies Did Not Consistently Comply with Requirements

With the exception of NASA in certain years, agencies did not submit their methodology reports to SBA within the time frame required by the Small Business Act for fiscal years 2006 to 2011 for the SBIR and STTR programs. The act requires that agencies report to SBA their methodologies for calculating their extramural budgets within 4 months after the date of enactment of their respective appropriations acts.²⁰ However, most participating agencies documented their methodologies

²⁰15 U.S.C. 638(i)(2)(A).

for calculating their extramural R&D budgets for these fiscal years and submitted them to SBA after the close of the fiscal year with their annual reports, but three agencies—USDA, Education, and DOT—did not provide a methodology report for 1 fiscal year during this period. USDA did not submit a report on its fiscal year 2007 methodology because agency officials said it was identical to prior years. Officials from Education and DOT said they typically submitted their methodology reports with their annual reports. However, they told us that for fiscal year 2011 they did not submit their methodology reports to SBA on time because that was the first year that agencies were required to submit their annual reports to SBA's automated system and there was not a place in SBA's system to submit methodology reports. SBA officials said that they nonetheless expected agencies to submit their methodology reports and that there are several methods to transmit this information, such as by memorandum or e-mail. Education officials later told us they submitted their 2011 methodology report to SBA in January 2013.

SBA officials said that they have not held the agencies to the act's deadline for submitting methodology reports, in part because continuing resolutions enacting final appropriations have sometimes not been passed until the middle of the fiscal year. This timing for appropriations has pushed the required reporting date of the methodology report—due 4 months after appropriations are set—until late in the fiscal year. SBA officials said this has made it more convenient for participating agencies to submit the methodology report with the annual report. Further, SBA officials said the agency uses the methodology reports for their annual reports to Congress. By not having the methodology reports earlier in the year as specified by law, however, SBA does not have an opportunity to promptly analyze these methodologies and provide the agencies with timely feedback to assist agencies in accurately calculating their spending requirements. SBA officials said they have provided feedback orally and through e-mails to the participating agencies about their methodology reports, but many agency program managers said that SBA has provided little feedback. By not providing such feedback, SBA is forgoing the opportunity to assist agencies in correctly calculating their program spending requirements and helping to ensure that they meet mandated requirements.

More significantly, the majority of the agencies did not include information consistent with a provision in SBA's SBIR and STTR policy directives that

specifies the act's requirement for a methodology report from each agency.²¹ Specifically, the SBA policy directives state that the methodology report must include an itemization of each R&D program excluded from the calculation of the agency's extramural budget and a brief explanation of why it is excluded. In our review, we found that

- two of the participating agencies—EPA and HHS—complied fully with the requirements because they included in their methodology reports an itemization of the programs excluded from the calculation of their extramural R&D budget and an explanation of why the programs were excluded for all 6 fiscal years in our review; and
- six agencies—DHS, DOD, DOE, DOT, NASA and NSF—did not fully meet these requirements for the 6 fiscal years in our review because their methodology reports either identified some excluded programs but not others that we identified or the reports omitted explanations for exclusions.²²

As a result, agencies submitted different information, including different levels of detail on their methodologies. For example, some agencies provided itemization of each R&D program excluded, including dollar amounts and statutory authority, as part of the calculation of the agency's extramural budget and a brief explanation of why it is excluded, while other agencies only provided a brief explanation. SBA officials told us that most participating agencies' methodology reports have changed little from year to year, so SBA does not raise questions about details of their methodologies. In the absence of guidance from SBA on the format in which the methodology reports are to be presented, DOD developed a methodology template that guides the calculation of DOD's extramural R&D budget and in turn the programs' spending requirements, including the identification of any R&D programs excluded from the basis for calculating their spending requirements and a brief explanation of why they are excluded. Without guidance on the format of methodology

²¹The 2002 SBIR and the 2005 STTR policy directives were in effect during the period of our review.

²²Three other agencies—Commerce, Education, and USDA—did not report excluding any programs from the calculation of extramural R&D for any of the fiscal years. Because existing SBA guidance in policy directives does not require agencies to affirm that no exclusions were made, we asked the three agencies if they had in fact made exclusions but just not reported them. In each case, the agencies confirmed that they had, in fact, not made exclusions.

reports, participating agencies are likely to continue to provide SBA with broad, incomplete, or inconsistent information about their methodologies and spending requirements. Furthermore, without having more consistent information from agencies, it is difficult for SBA to comprehensively analyze the methodologies and determine whether agencies are accurately calculating their spending requirements.

In addition, for the agency annual report requirement, SBA has provided a template that asks agencies for the extramural R&D budget base used to calculate the SBIR or STTR spending requirements, but it does not ask for the specific calculations used to derive that budget base. Unlike the requirement set by law and SBA policy directives for methodology reports to include a description of their methodologies for calculating extramural R&D budgets, information on actual calculations, such as identifying exclusions, is not required for agency annual reports to SBA. However, because annual reports show the results of the previously described methodology including such information in the annual reports is important. By not requesting that agencies include calculations used to derive the budget base in its template, SBA has been receiving incomplete information from the participating agencies, which limits the usefulness of data the agency reports to Congress. SBA officials told us that participating agencies' calculations of spending requirements have changed little from year to year, and so SBA does not raise questions about the calculations. SBA likewise does not request that agencies include information in their annual reports that would enable SBA to conduct better oversight, including information on (1) whether agencies met the mandated spending requirements, (2) the reasons for any noncompliance with these requirements, and (3) the agencies' plans for meeting any noncompliance in future years. By including this information, SBA could more fully oversee the programs and provide more complete information to Congress.

SBA Annual Reports to Congressional Committees Are Often Late and Incomplete

SBA has not consistently complied with the requirement for reporting its analysis of the agencies' methodologies in its annual report to Congress,²³ as required by the Small Business Act.²⁴ Over the 6 years covered in our review, SBA reported to Congress for 3 of those, fiscal years 2006, 2007, and 2008. Furthermore, these reports contained limited analyses of the agencies' methodologies, and some of the analyses were inaccurate. For example, SBA's analysis was limited to a table attached to the annual report to Congress that often did not include information on particular agencies; SBA provided no other documentation showing the results of its analysis of the agency methodology reports. For example, in its fiscal year 2006 annual report, SBA concluded that all of the participating agencies complied with program requirements in calculating their extramural R&D budgets but did not present the basis for its conclusion. As noted earlier, our review showed that some participating agencies improperly excluded some extramural programs from their funding base calculation and did not consistently comply with SBA's instructions in its policy directive to itemize the exclusions in their calculation of the R&D extramural budget for either the SBIR or STTR program. Without more comprehensive analysis and accurate information on participating agencies in SBA's annual report, Congress does not have information on the extent to which agencies are reporting what is required by law or if they are under spending by, for example, taking improper exclusions.

Moreover, SBA officials said they delayed submitting their annual reports to Congress for fiscal years 2009, 2010, and 2011 to reconcile significant inconsistencies the agency found between spending data submitted by participating agencies in their annual reports to SBA and data routinely collected in SBA's automated system from agencies and awardees on SBIR and STTR awards made during the fiscal year. In commenting on a draft of this report in August 2013, SBA program officials said that the three reports had been consolidated into one report that was being reviewed by the Office of Management and Budget. The agency plans to submit the reports to Congress in 2013, making the data available to Congress on the programs 2 to 4 years after the end of the fiscal year.

²³The act directs that the SBA Administrator report not less than annually to the Committee on Small Business and Entrepreneurship of the Senate and to the Committee on Science and Technology and the Committee on Small Business of the House of Representatives.

²⁴15 U.S.C. § 638(i)(2)(B).

Basing Spending Requirements on Agencies' Total R&D Budgets Could Increase Spending and Program Participation

Changing the methodology to calculate the SBIR and STTR spending requirements based on each agency's total R&D budget instead of each agency's extramural R&D budget would increase the amount of each agency's spending requirement for the programs, some much more than others, depending on the assumptions about how the funding base change is implemented. Also, it would increase the number of agencies that would be required to participate in the programs. Some agencies reported that such a change could have effects on their R&D programs and may create challenges.

Changing the Base for SBIR and STTR Budgets to Total R&D Would Increase Agency Spending Requirements

If the SBIR and STTR spending requirements under current law were applied to an agency's total R&D budget rather than to the extramural R&D budget, the spending requirements for each agency would increase because their extramural R&D budget is a part of, and therefore smaller, than their total R&D budget.²⁵ Table 3 shows a comparison of the agencies' spending requirements for the SBIR and STTR programs in fiscal year 2011 under the current law, based on an agency's extramural R&D budget, and this alternative methodology.

Table 3: Comparison of Fiscal Year 2011 Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs' Spending Requirements under the Current Law and If Based on the Participating Agencies' Total R&D Budget

Dollars in millions

Agency	Agency's extramural R&D budget ^a	Agency's total R&D budget ^b	SBIR spending requirement under current law ^c	SBIR spending requirement based on 2.5 percent of the total R&D budget	Percentage difference in SBIR from current law	STTR spending requirement under current law ^d	STTR spending requirement based on 0.3 percent of the total R&D budget	Percentage difference in STTR from current law
USDA	\$768	\$2,284	\$19	\$57	200	^e	^e	^e
Commerce	239	1,021	6	26	333	^e	^e	^e
DOD	41,678	77,410	1,042	1,935	86	\$125	\$232	86
Education	346	362	8.6	9.1	6	^e	^e	^e
DOE	5,857	9,915	146	248	70	18	30	67
HHS	24,714	31,099	618	777	26	74	93	26
DHS	468	512	12	13	8	^e	^e	^e

²⁵The SBIR and STTR spending requirements were 2.5 percent and 0.3 percent, respectively, of extramural R&D budgets for fiscal years 2006 through 2011.

Dollars in millions

Agency	Agency's extramural R&D budget ^a	Agency's total R&D budget ^b	SBIR spending requirement under current law ^c	SBIR spending requirement based on 2.5 percent of the total R&D budget	Percentage difference in SBIR from current law	STTR spending requirement under current law ^d	STTR spending requirement based on 0.3 percent of the total R&D budget	Percentage difference in STTR from current law
DOT	384	929	10	23	130	^e	^e	^e
EPA	182	584	5	15	200	^e	^e	^e
NASA	4,998	8,839	125	221	77	15	27	80
NSF	4,956	5,091	124	127	2	15	15	0
Total	\$84,590	\$138,046	\$2,116	\$3,451	63	\$247	\$397	61

Sources: GAO analysis of agencies' data.

^aEach agency's extramural R&D budget as reported by the agencies in their annual reports to SBA.

^bEach agency's total R&D budget authority is from the Analytical Perspectives volume of the President's Budget. The category of "Facilities and Equipment" is not included in the total shown in this table.

^cEach agency's SBIR spending requirement under the current law in fiscal year 2011 is calculated as 2.5 percent of its extramural R&D budget.

^dEach agency's STTR spending requirement under the current law in fiscal year 2011 is calculated as 0.3 percent of its extramural R&D budget.

^eAgency did not participate in STTR.

Note: Calculations may be affected by rounding.

As shown in table 3, some agencies' spending requirements would increase more than others. This is due to differences in the relative proportions of the extramural and intramural R&D budgets among agencies. Examples are as follows:

- NSF used almost its entire R&D budget for extramural R&D in fiscal year 2011 and was required to spend about \$124 million on its SBIR program in that year. Its spending requirement would have increased slightly to \$127 million—about a 3 percent increase—if the spending requirement were based on the total R&D budget instead of the extramural R&D budget. For NSF's STTR program, the spending requirement in fiscal year 2011 would have increased about 3 percent—the same percentage increase as for SBIR.
- Commerce used a relatively small percentage of its total R&D budget—about 25 percent—for extramural R&D in fiscal year 2011, and its spending requirement for SBIR would have more than quadrupled from about \$6 million to \$26 million—333 percent—in fiscal year 2011 if the calculation methodology changed. While Commerce does not participate in the STTR program currently, it would have to participate in the STTR program if the calculation

methodology changed. Its spending requirement would have been \$3 million rather than zero.

To put these figures in perspective, if the funding percentage in law were applied to the total R&D budget instead of the extramural budget, NSF's spending on SBIR in 2011 would have increased to about 2.6 percent of its extramural R&D budget, while Commerce's spending would have increased to about 10.7 percent of its extramural R&D budget. For the STTR program, if the funding percentage in the law were applied to the total R&D budget instead of the extramural budget, NSF's spending on STTR would have increased to about 2.7 percent of the extramural R&D budget, and Commerce's spending would have increased from zero.

In addition to the changes in the dollar amount of funds available for STTR and SBIR spending requirements, agencies said that changing the base for calculation of budgets for these programs would affect agency operations, depending on assumptions about how the funding base change is implemented. For example, changing the base would increase SBIR and STTR budgets and could result in reductions in certain types of intramural R&D with corresponding reductions in full-time equivalent staffing of these programs. In addition, some agency officials said there were potential changes in the content of the agency's extramural R&D effort because of changes in the types of businesses that receive grants and contracts.

In addition to applying the same percentages as used under current law to the total R&D budget, we analyzed the potential changes to spending requirements using two other alternative scenarios that apply different percentages to the total R&D budget. In these scenarios, some agencies would have experienced an increase in spending requirements, while others would have experienced a decrease. Appendix II contains a discussion of the alternate scenarios and the results of our analysis.

Changing the Calculation Methodology Would Increase the Number of Agencies Required to Participate

Changing the calculation methodology to the total R&D budget would also increase the number of agencies that would be required to participate in the SBIR and STTR programs, assuming the same dollar thresholds for participating in the programs were applied to the total R&D budget rather than only the extramural R&D budget. For example, our analysis of the total R&D budget for all federal agencies for fiscal year 2011 indicates that

-
- For SBIR, two additional agencies—the Departments of Veterans Affairs (VA) and the Interior—would have been required to participate in fiscal year 2011 if total R&D budgets had been the criteria. These agencies reported total R&D budgets to SBA in excess of \$100 million, which is the threshold for participation in the SBIR program. Adding these two agencies to participating SBIR agencies in fiscal year 2011 with the total R&D budget as the base, would have increased total federal SBIR spending by \$48 million.
 - For STTR, three additional agencies—Commerce, USDA, and VA—would also have been required to participate in the STTR program for fiscal year 2011 if total R&D budgets had been the criteria for meeting the threshold. These agencies reported total R&D budgets in excess of \$1 billion, which is the threshold for participation in the STTR program. Adding these three agencies to STTR in fiscal year 2011 with the total R&D budget as the base would have increased total STTR spending by \$13 million.²⁶

Table 4 shows these agencies' R&D budgets and what their SBIR and STTR spending requirements for fiscal year 2011 would have been if the spending methodology was changed to the total R&D budget.

²⁶In other fiscal years that we reviewed, these agencies may not have been required to participate in the STTR program as their total R&D spending fell below the threshold requirement.

Table 4: Additional Agencies That Would Participate in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs if the 2011 Base Were Revised to Total R&D Budget Authority

Dollars in millions

Agency	Agency's total R&D budget authority ^a	SBIR spending requirement based on 2.5 percent of the total R&D budget	STTR spending requirement based on 0.3 percent of the total R&D budget
Department of the Interior	\$755	\$19	^c
Department of Veterans Affairs	\$1,160	\$29	\$3
Department of Agriculture	\$2,284	^b	\$7
Department of Commerce	\$1,021	^b	\$3

Source: GAO analysis of fiscal 2011 agency data.

^aEach agency's total R&D budget authority is from the Analytical Perspectives volume of the President's Budget.

^bAgency currently participates in the SBIR program.

^cThe agency's total R&D budget does not meet the threshold for the program.

Note: Calculations may be affected by rounding.

Agencies' Cost for the Administration of the Programs Cannot Currently Be Determined Because the Agencies Do Not Identify or Track All Costs

The participating agencies' cost of administering the SBIR and STTR programs cannot be determined because the agencies neither collect that information nor have the systems to do so. Neither the authorizing legislation for the programs nor SBA guidance directs agencies to track and estimate all administrative costs, and neither the law nor SBA guidance defines these administrative costs. Estimates agencies provided indicated that the greatest amounts of administrative costs in fiscal year 2011 were for salaries and expenses, contract processing, outreach programs, technical assistance programs, support contracts, and other purposes. With the implementation in 2013 of a pilot program allowing agencies under certain conditions to use up to 3 percent of SBIR program funds for certain administrative costs, SBA expects to require agencies in the pilot program to track and report the spending of that 3 percent but not all of their administrative costs.

Agencies Have Not Comprehensively Identified or Tracked Administrative Costs for Several Reasons

The participating agencies have not comprehensively identified or tracked the cost of administering the SBIR and STTR programs for several reasons. Agency officials said that the costs cannot be determined because the agencies do not have the systems for collecting the data. Neither the authorizing legislation for the programs nor SBA guidance directs agencies to track and estimate administrative costs, and neither the law nor SBA guidance defines these administrative costs. We found that the amount of funds that participating agencies spent administering the SBIR and STTR programs—and the way the funds were used—cannot currently be estimated because the agencies have not identified or tracked many categories of program administrative costs. Agency officials said an important reason that administrative costs for the SBIR and STTR programs are not comprehensively identified or tracked is that using SBIR or STTR budgets to fund administrative costs has been generally prohibited. The Small Business Act generally prohibits agencies, except for DOD, from using any of their SBIR or STTR budgets to fund administrative costs of the programs, including the cost of salaries.²⁷ Agencies reported that administrative costs of the programs were paid out of budget accounts other than the SBIR and STTR accounts.

In addition, agency officials told us that the SBIR and STTR programs cut across many agency programs and disciplines and that the staff supporting the programs may work on a full-time or part-time basis, making identification and estimation of costs more difficult. For example, DOE reported the administrative costs of the SBIR and STTR program office only, but pointed out that the programs involved the part-time efforts of 70 to 100 additional people throughout DOE, including technical program managers, grants specialists and contracting officers, whose costs were not estimated.

Similarly, HHS officials said it would be an exceptionally complex calculation to determine how much is currently spent on the administrative costs of the SBIR or STTR program because a large number of HHS staff work a fraction of their time on these programs. Officials in HHS' National Institutes of Health (NIH), which accounts for the majority of HHS' SBIR and STTR R&D programs, said there were a

²⁷As previously noted, beginning in fiscal year 2013, under a pilot program a portion of SBIR program funds may become available for administrative costs, such as the provision of outreach and technical assistance, and contract processing, and other specified purposes.

small number of full-time staff on these programs; rather, NIH officials said that most staff managing the programs do so as a collateral part of their duties and are not required to track the portion of their time spent on the programs. NASA reported that its budget estimate included a separate line for SBIR and STTR program management that covers personnel costs, travel, and procurement costs. NASA officials noted, however, that other costs to operate the programs are not included in this budget estimate, including the cost of NASA technical experts to review proposals and the cost of technical and contracting representatives interacting with small businesses. NASA officials did provide a rough estimate for the number of hours and full time equivalent staff spent by NASA technical reviewers and contracting personnel in a typical year as 25 to 38 full-time equivalent staff. The officials noted that the estimate does not include hours spent by others involved: mission directorate representatives, center chief technologists, contracting officers, support contractors, procurement support, and legal support. They also said that they did not have estimates for such categories as support contracts, outreach, and technical assistance.

Most Estimated SBIR and STTR Administrative Costs Were in Salaries and Expenses, Contract Processing, Outreach and Technical Assistance, Support Contracts, and Other Categories

In response to our request for information on administrative costs for fiscal year 2011, 9 of the 11 participating agencies provided us with estimates of a portion of their costs to administer the SBIR and STTR programs in fiscal year 2011. Of the administrative costs estimated by these 9 agencies, the greatest amounts were for salaries and expenses, contract processing costs, outreach programs, technical assistance programs, and support contracts, and the “other” category.²⁸ In some cases, officials for some agencies identified having costs in these categories or several others but provided no estimates of the amounts. The agency with the most administrative costs estimated in the most categories for 2011 was DOD, which provided estimates in 10 cost categories.²⁹ Of the 11 participating agencies, Commerce and HHS did

²⁸The “other” category was used to collect costs that did not fit into the categories available, or costs that were not categorized.

²⁹The 10 categories of costs that DOD and its subunits were asked to estimate were: salaries and expenses, travel, contract processing costs, personnel and assistance for application reviews, outreach and technical assistance, commercialization and outreach activities, oversight and congressional reporting, oversight and quality control measures, support contracts and other.

not provide estimated administrative costs or identify having administrative costs in any category.

In response to our data requests and questions regarding fiscal year 2011, the 9 agencies provided some estimates, identified unestimated costs, or had no response in many of the costs categories for which we requested data. An overview of the information we obtained is contained in appendix III.

Participation in the Administrative Costs Pilot Program Will Require Agencies to Track Certain, but Not All Costs

As noted earlier, the National Defense Authorization Act for Fiscal Year 2012 created a pilot program beginning in fiscal year 2013 that would allow up to 3 percent of SBIR program funds to be used for administrative costs, the provision of outreach and technical assistance and contract processing, and other specified purposes.³⁰ Agencies are otherwise generally not permitted to spend SBIR or STTR program funds on administrative costs.

According to SBA's policy directive, funding under this pilot is not intended to and must not replace current agency administrative funding in support of SBIR activities. Rather, funding under this pilot program is intended to support additional initiatives. SBA issued its guidance for the pilot program as part of its revised policy directive of August 2012 and requires agencies to submit annual work plans to SBA for approval on spending priorities, amounts, milestones, expected results, and performance measures before agencies can begin the pilot.³¹ The SBA guidance also directs agencies to report to them on the use of the funds allowed to be spent on administrative costs under the pilot program authority in their annual reports. However, agencies will not identify or track all of their administrative costs so SBA will not be able to report to Congress on total administrative costs. Of the 11 agencies participating in

³⁰An agency was not to use funds for the specified purposes until after the effective date of SBA-established performance criteria to measure any benefits of using funds for these purposes, which SBA first provided to participating agencies on July 30, 2012. STTR program funds were not made available by the pilot program provision.

³¹Under Sec. 5141(a) of Pub. L. No. 112-81, the 2011 reauthorization act establishing the pilot program, the SBA Administrator was to issue rules to carry out the pilot program within 180 days of enactment of the law. The directive containing the guidance was published in the *Federal Register* on August 6, 2012—219 days after enactment of the law establishing the pilot program.

the SBIR program, 10 have submitted plans for the pilot program to SBA. SBA officials told us that, as of August 2013, all 10 of the agencies' pilot plans had been approved for implementation in the current fiscal year.

Conclusions

To help small businesses develop and commercialize innovative technologies, federal agencies have awarded billions of dollars to such businesses under the SBIR and STTR programs, which SBA oversees. In its role overseeing the programs, SBA has issued policy directives that provide agencies with guidance on the implementation of the programs. Agencies participating in the programs are required by law to spend a specific minimum portion of their extramural R&D budgets on these awards and to report certain information related to their spending to SBA. In turn, SBA is to review this information and report on it annually to Congress. However, participating agencies' compliance with the programs' spending requirements is unclear because some agencies improperly calculated their spending requirements and—in the absence of specific guidance from SBA when their appropriations were delayed—agencies used differing methodologies for calculating these requirements. Without guidance from SBA, agencies will likely continue to calculate spending requirements in differing ways, which will continue to raise questions about their compliance. In addition, most agencies' reports to SBA about their methodologies for calculating their spending requirements did not contain key details, such as the identification of any R&D programs excluded from the basis for calculating their spending requirements and a brief explanation of why they are excluded, which is required both by law and SBA policy directives. Agencies also submitted differing information in these reports because SBA's policy directives do not specify the format for the reports. Without guidance on the format of methodology reports, participating agencies are likely to continue to provide SBA with broad, incomplete, or inconsistent information about their methodologies and spending requirements. Furthermore, without more complete and consistent information from agencies, it is difficult for SBA to comprehensively analyze the methodologies and whether agencies are accurately calculating their spending requirements. Moreover, according to agency officials, SBA provided little timely feedback about the agencies' methodology reports. By not providing such feedback, SBA is forgoing the opportunity to assist agencies in correctly calculating their program spending requirements and helping to ensure that they meet mandated requirements.

In addition, for the participating agencies' annual report requirement, SBA has provided a template requesting the extramural R&D budget base that

agencies used to calculate the programs' spending requirements, but the template does not request the specific calculations agencies used to derive those requirements. By not requesting such calculations, SBA has been receiving inconsistent and incomplete information from the participating agencies, which limits the usefulness of data it reports to Congress. SBA likewise does not request that agencies include information in their annual reports that would enable better oversight, including information on (1) whether agencies met the mandated spending requirements, (2) the reasons for any noncompliance with these requirements, and (3) the agencies' plans for meeting any noncompliance in future years. Finally, SBA's annual reports to Congress have been years late or contained little analysis of the methodology reports agencies submitted to describe how they calculated their spending requirements. Without more rigorous oversight by SBA and more timely and detailed reporting on the part of both SBA and participating agencies, it will be difficult for SBA to ensure that intended benefits of these programs are being attained and that Congress receives critical information to oversee these programs.

Recommendations for Executive Action

To ensure that participating agencies and SBA comply with spending and reporting requirements for the SBIR and STTR programs, we recommend the SBA Administrator take the following four actions:

- Provide additional guidance on how agencies should calculate spending requirements when agency appropriations are received late in the fiscal year and the format agencies are to include in their methodology reports.
- Provide timely annual feedback to each agency following submission of its methodology report on whether its method for calculating the extramural R&D budget used as the basis for the SBIR and STTR spending requirements complies with program requirements including an itemization of and an explanation for all exclusions from the basis for the calculations.
- Direct participating agencies to include in their annual reports the calculation of the final extramural R&D budget used as the basis for their SBIR and STTR spending requirements and, if they did not meet the spending requirements, the reasons why not and how they plan to meet the spending requirements in the future.

-
- Provide Congress with a timely annual report that includes a comprehensive analysis of the methodology each agency used for calculating the SBIR and STTR spending requirements, providing a clear basis for SBA's conclusions about whether these calculations meet program requirements.

Agency Comments

We provided copies of our draft report to the Secretaries of USDA, Commerce, DOD, Education, DOE, HHS, DHS, and DOT; the Administrators of SBA, EPA, and NASA; and the Director of NSF for review and comment. In response, six of the agencies—USDA, Education, DOE, EPA, NASA, and NSF—stated by e-mail that they had no technical or written comments. Five other agencies—Commerce, DHS, DOD, DOT, and HHS—provided technical comments by e-mail, which we incorporated into the draft report as appropriate.

SBA provided technical comments on the draft report and officials of SBA's Office of Technology said by e-mail through the Office of Congressional and Legislative Affairs that they agree with the findings of the report and will work to implement the recommendations. Specifically, in response to our recommendation to provide additional guidance on how agencies should calculate spending requirements, SBA said it plans a training session for all SBIR and STTR agencies to provide guidance and uniformity in the calculation of extramural budgets. In response to our finding that SBA is not receiving timely methodology reports from the agencies in order to provide feedback, SBA said it has strongly encouraged the agencies to submit their methodologies to SBA in a timely manner. We incorporated SBA's technical comments into the report as appropriate.

We are sending copies of this report to 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; the appropriate congressional committees; and other interested parties. In addition, this 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 ruscof@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix IV.

A handwritten signature in black ink that reads "Frank Rusco". The signature is written in a cursive style with a long, sweeping horizontal line extending to the right from the end of the name.

Frank Rusco
Director, Natural Resources and Environment

List of Committees

The Honorable Mary L. Landrieu
Chairman
The Honorable James E. Risch
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 Sam Graves
Chairman
The Honorable Nydia M. Velázquez
Ranking Member
Committee on Small Business
House of Representatives

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figures 2 through 12 compare reported spending requirements of the 11 agencies participating in the Small Business Innovation Research (SBIR) program with their reported spending over fiscal years 2006 to 2011.

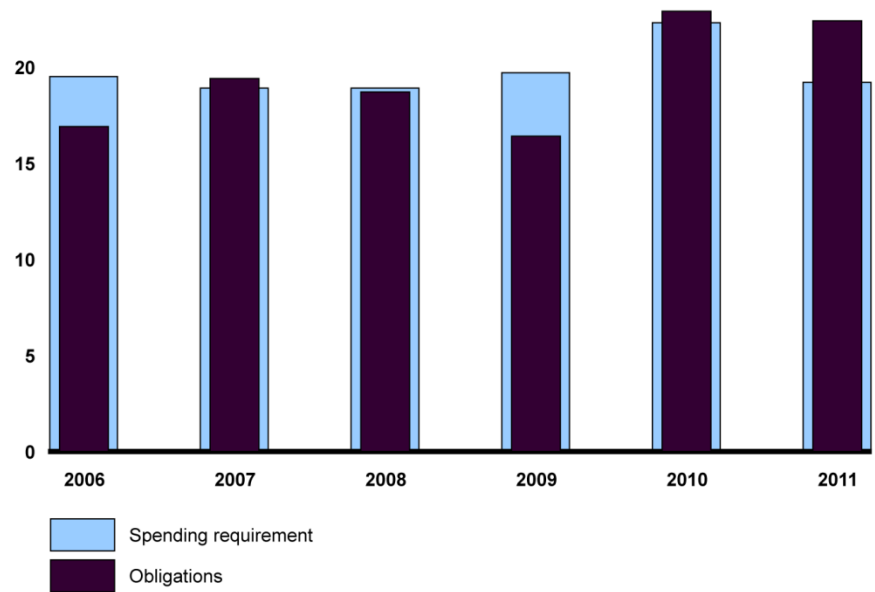
Figures 13 through 17 compare reported spending requirements of the 5 agencies participating in the Small Business Technology Transfer (STTR) program with their reported spending over fiscal years 2006 to 2011.¹ The Department of Homeland Security also had an STTR program in FY 2006 and 2007. However, the agency was not required to participate, because its extramural R&D budget for each of those years was actually below the \$1 billion threshold required for participation in the STTR program. The agency stated it had inadvertently used an incorrect extramural budget amount to determine its participation requirement. Since the agency was not required to participate in STTR and therefore had no spending requirement, no figure is included here for its STTR expenditures.

¹We used the agencies' obligations data to represent spending for the programs because spending data were not readily available from each of the agencies. Obligations provided a reasonable measure of the spending for the programs in each year.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 2: Comparison of the Department of Agriculture's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

Dollars in millions
\$25

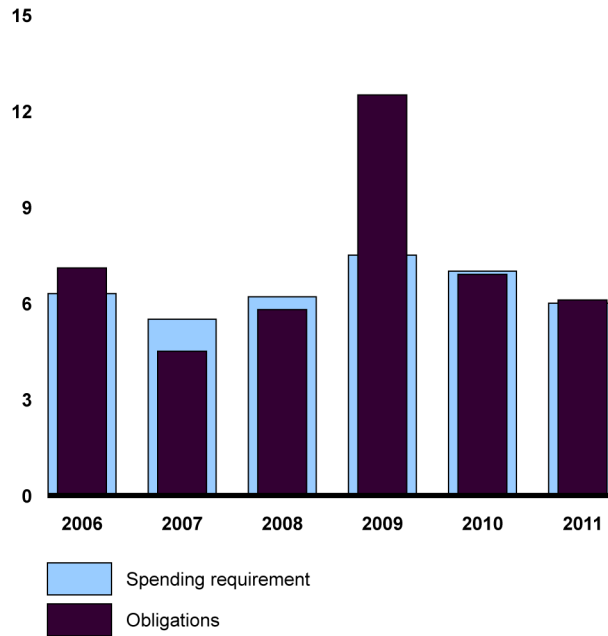


Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 3: Comparison of the Department of Commerce's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

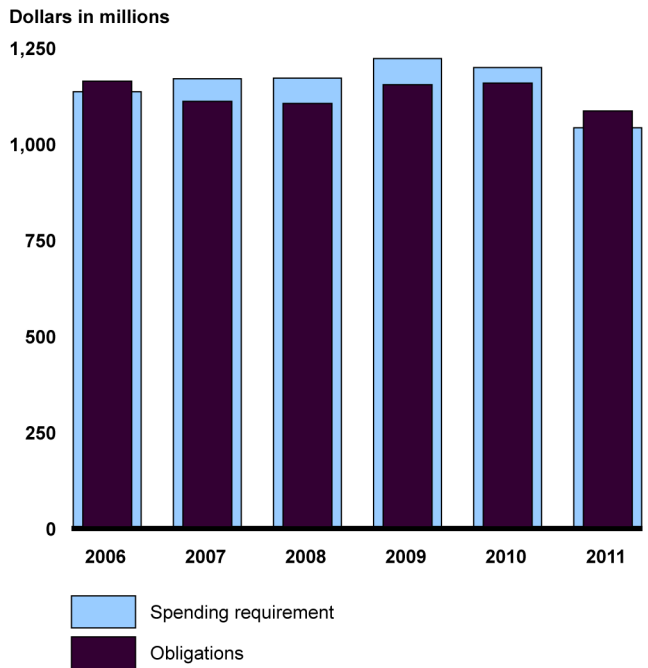
Dollars in millions



Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 4: Comparison of DOD's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011



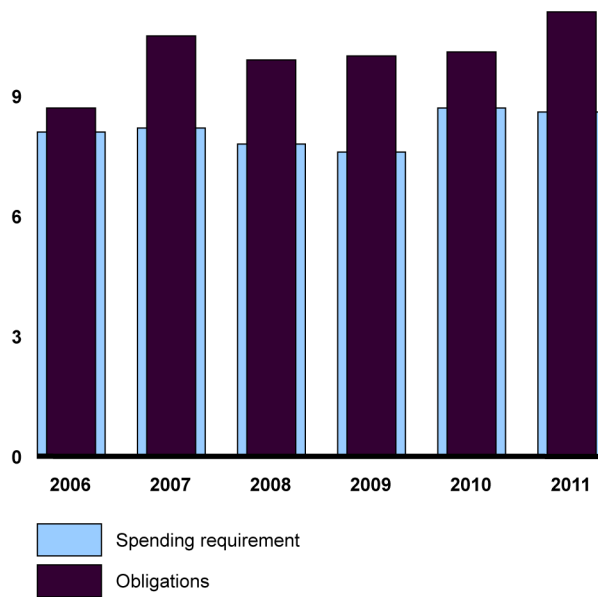
Source: GAO analysis of agency annual report data submitted to SBA.

Note: Although the statutory requirement for agencies is to spend an amount equivalent to the annual spending requirement within each year, DOD officials said the agency spends approximately the full annual spending requirement over a 2-year period.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 5: Comparison of the Department of Education's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

Dollars in millions
12

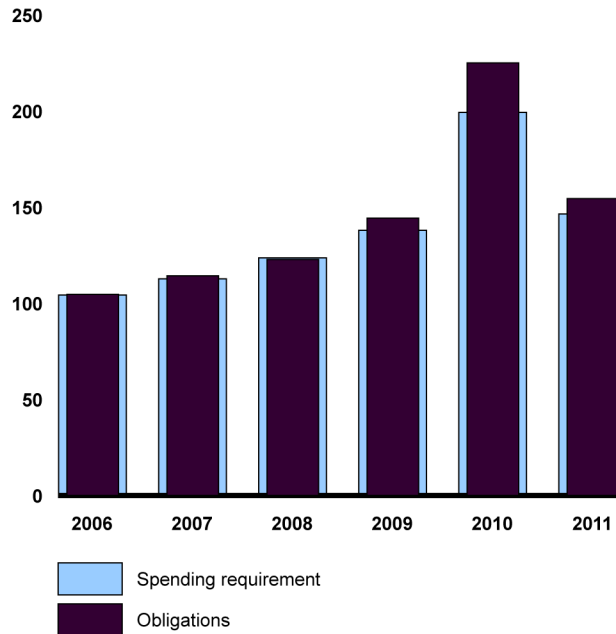


Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 6: Comparison of the Department of Energy's (DOE) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

Dollars in millions



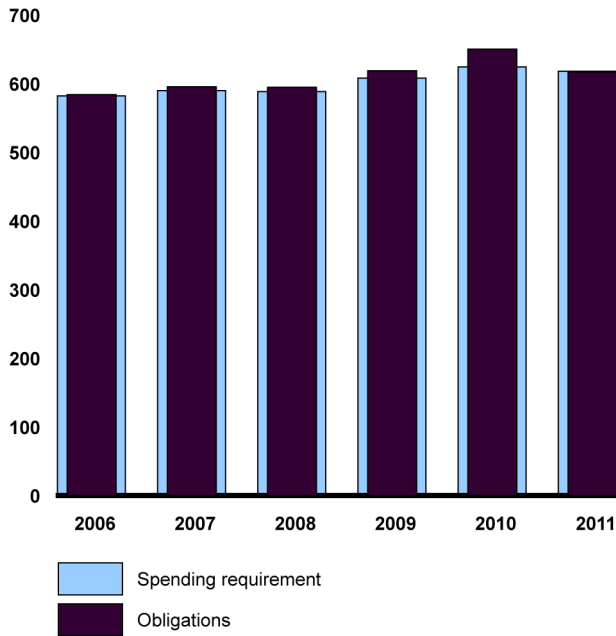
Source: GAO analysis of agency annual report data submitted to SBA.

Note: DOE officials said that their annual reports to the Small Business Administration (SBA) did not include spending for Supplemental Phase II Awards or for Technical Commercial Assistance and that adding this spending eliminates under spending during this period. They also said SBA's annual report format does not include a place to report technical assistance spending. DOE supplied this additional information, which we incorporated into our analysis.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 7: Comparison of the Department of Health and Human Services' Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

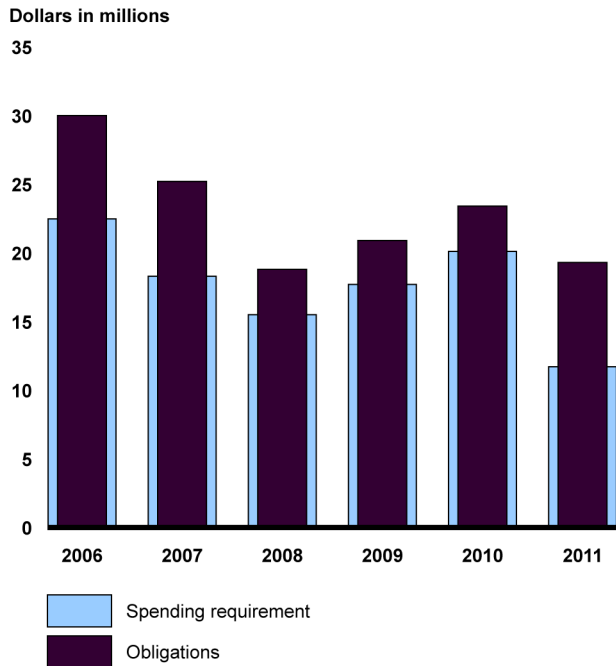
Dollars in millions



Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 8: Comparison of the Department of Homeland Security's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011



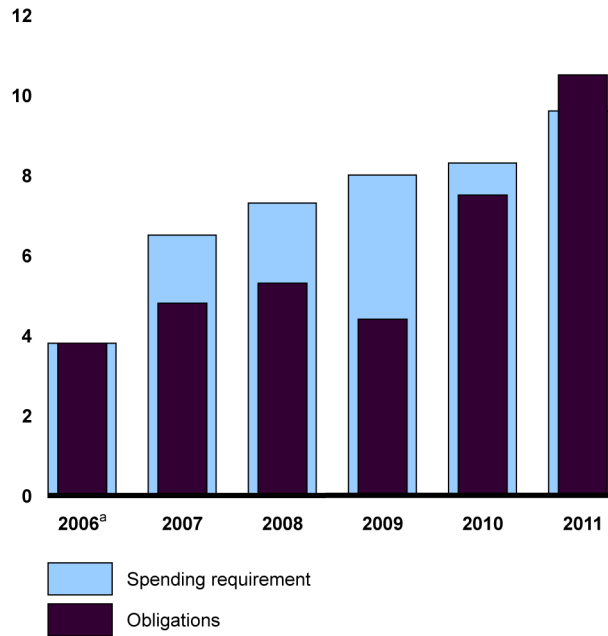
Source: GAO analysis of agency annual report data submitted to SBA.

Note: DHS officials said the extramural budget reported in the agency's fiscal year 2006 annual report to SBA was incorrect and they planned to submit a corrected annual report. They said with the resulting corrected spending requirement, the fiscal year 2006 spending exceeded the spending requirement. DHS provided us with revised information, which we incorporated into our analysis.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 9: Comparison of the Department of Transportation's Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

Dollars in millions

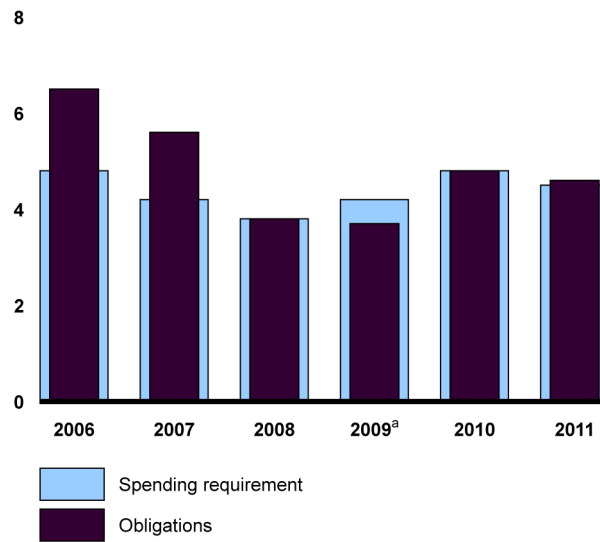


Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 10: Comparison of the Environmental Protection Agency's (EPA) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

Dollars in millions
10

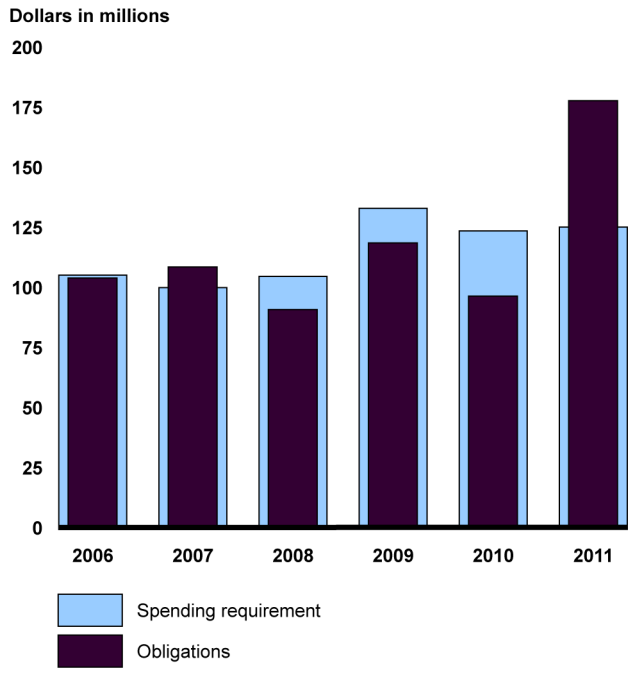


Source: GAO analysis of agency annual report data submitted to SBA.

Note: EPA officials said the extramural budget reported in its fiscal year 2006 annual report to SBA was incorrect and they planned to submit a corrected annual report. They said with the resulting corrected spending requirement, the fiscal year 2006 spending exceeded the spending requirement. EPA provided us with revised information, which we incorporated into our analysis.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

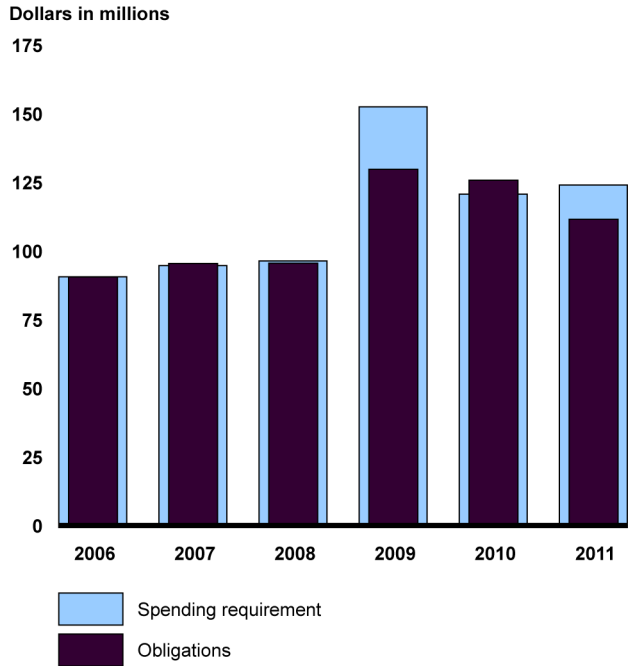
Figure 11: Comparison of National Aeronautics and Space Administration's (NASA) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011



Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 12: Comparison of the National Science Foundation's (NSF) Reported Spending Requirements and Spending for the Small Business Innovation Research (SBIR) Program, Fiscal Years 2006 to 2011

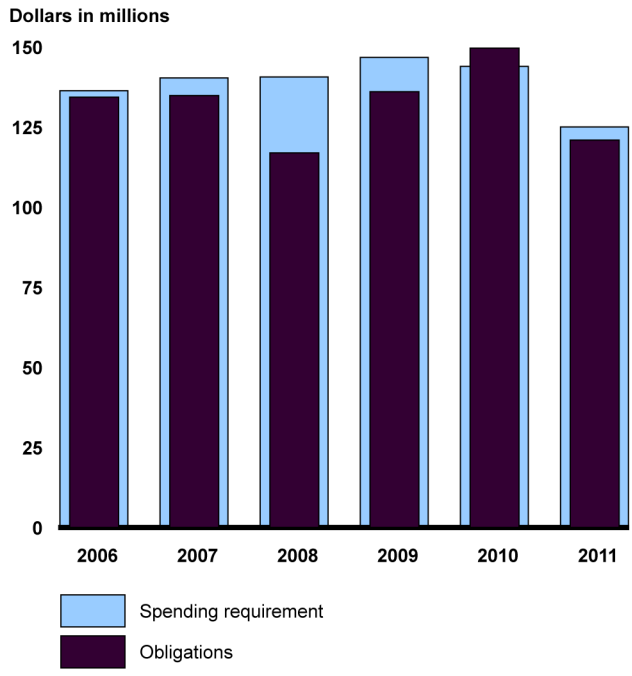


Source: GAO analysis of agency annual report data submitted to SBA.

Note: NSF officials said that the larger gap between spending requirements and spending in fiscal year 2009 was due to the additional funds made available by the American Recovery and Reinvestment Act of 2009 in June, after most of the NSF's awards had been made in the two funding cycles that fiscal year. The act's funding was subsequently used for the proposals submitted in response to the fiscal year 2010 solicitations.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 13: Comparison of DOD's Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011

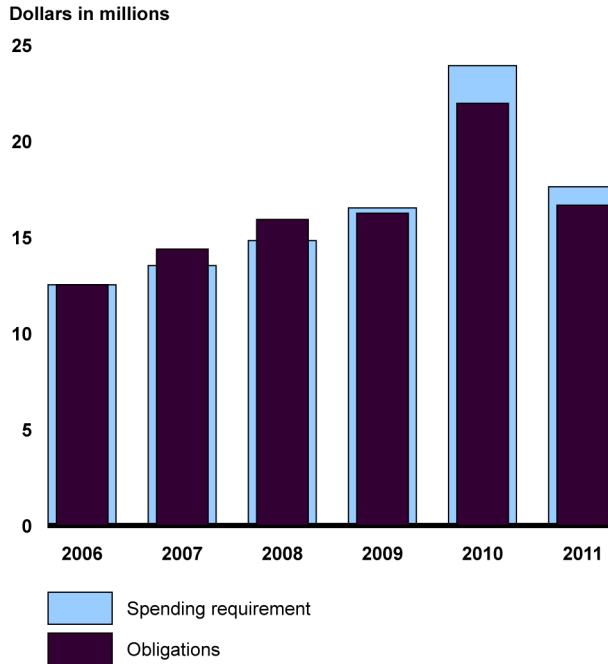


Source: GAO analysis of agency annual report data submitted to SBA.

Note: Although the statutory requirement for agencies is to spend an amount equivalent to the annual spending requirement within each fiscal year, DOD officials said the agency spends approximately the full annual spending requirement over a 2-year period by carrying over a portion of each year's funds to the following year.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 14: Comparison of the Department of Energy's (DOE) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011



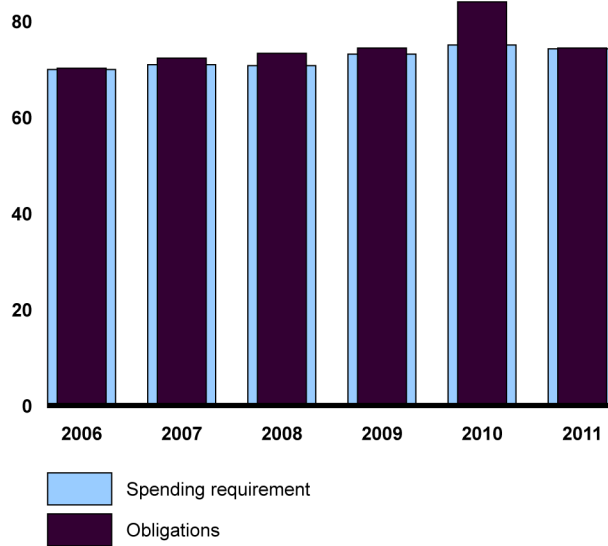
Source: GAO analysis of agency annual report data submitted to SBA.

Note: DOE officials said that their annual reports to SBA did not include spending for Supplemental Phase II Awards or for Technical Commercial Assistance and that inclusion of these result in no under spending during this period. They also said SBA's annual report form does not include a place to report technical assistance spending. DOE provided us with revised information, which we incorporated into our analysis,

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 15: Comparison of the Department of Health and Human Services' (HHS) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011

Dollars in millions
100

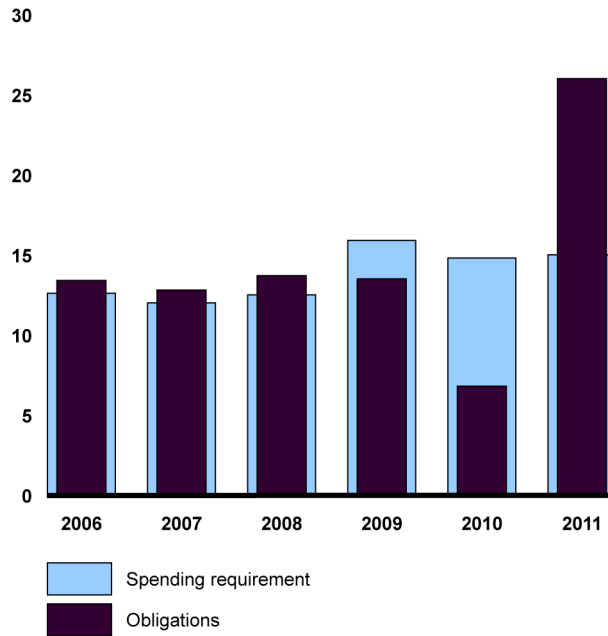


Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 16: Comparison of National Aeronautics and Space Administration's (NASA) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011

Dollars in millions

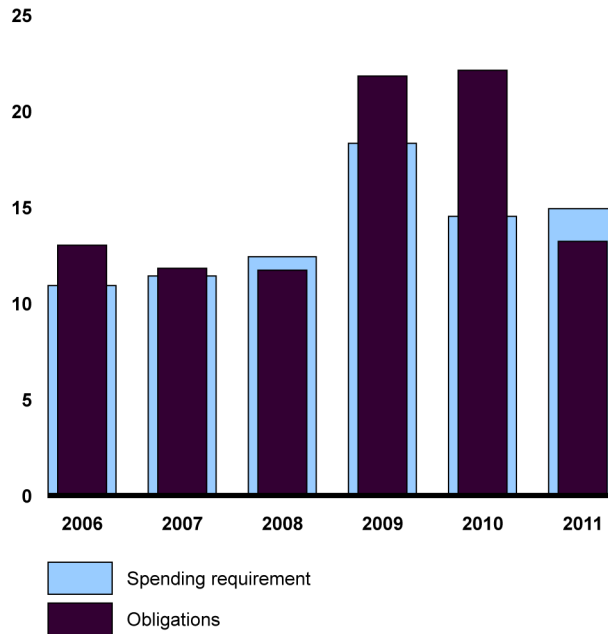


Source: GAO analysis of agency annual report data submitted to SBA.

Appendix I: Comparison of Participating Agencies' Reported Requirements and Spending for the SBIR and STTR Programs, Fiscal Years 2006 to 2011

Figure 17: Comparison of the National Science Foundation's (NSF) Reported Spending Requirements and Spending for the Small Business Technology Transfer (STTR) Program, Fiscal Years 2006 to 2011

Dollars in millions



Source: GAO analysis of agency annual report data submitted to SBA.

Appendix II: Analysis of Alternative Scenarios for Basing SBIR and STTR Spending Requirements on Total R&D Budget

To calculate the expenditure requirements for the SBIR and STTR programs, we used two key variables: (1) the “base,” which is the research and development (R&D) funding from which the requirement is calculated, and (2) the percentage that is applied to that base. For example, for fiscal years 2006 to 2011, the base for SBIR and STTR funding is the extramural R&D budget, and the mandated percentages applied to that base were 2.5 and 0.3 percent, respectively. We tested three alternative scenarios that vary the percentage applied to the total R&D budget to illustrate the potential effects of changing the methodology to calculate agencies’ SBIR and STTR expenditure requirements.¹ The scenarios analyzed were as follows:

- For scenario 1, we applied the same percentages for the expenditure requirements under the current law to the total R&D budget instead of the extramural R&D budget.
- For scenario 2, using fiscal year 2006 numbers as our base, we determined the percentage to apply to the total R&D budget of all participating agencies for fiscal years 2006 through 2011 that would hold the total expenditure requirement constant for the programs.
- For scenario 3, using fiscal year 2006 numbers as our base, we determined the percentage to apply to the total R&D budget of each individual agency for fiscal years 2006 through 2011 to hold each individual agency’s expenditure requirement constant for the programs.

See the details of the three scenarios and current law in table 5, and their effects on spending requirements are in table 6.

¹There are many other alternatives that we could have selected for this analysis; we selected these three alternatives to provide examples of how the expenditure requirements for the programs could change if Congress chose to change the methodology for calculating the requirements.

**Appendix II: Analysis of Alternative Scenarios
for Basing SBIR and STTR Spending
Requirements on Total R&D Budget**

Table 5: Summary of Alternative Scenarios to Illustrate the Potential Effects of Calculating Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Expenditure Requirements on an Agency's Total R&D Budget Instead of Its Extramural R&D Budget

Scenario	Base	Percentage applied to the base	
		SBIR	STTR
Current law	Extramural R&D budget	2.5%	0.3%
Scenario 1	Total R&D budget	2.5%	0.3%
Scenario 2	Total R&D budget	1.6%	0.2%
Scenario 3	Total R&D budget	^a	^b

Source: GAO analysis of agencies' data.

^aThis would vary by agency from 0.5 percent to 2.5 percent

^bThis would vary by agency from 0.1 to 0.3 percent

Note: 2006 was selected as the base year from which to determine the new percentage to apply to the total R&D budget to more clearly show how the funding for the SBIR and STTR programs would be distributed across federal agencies.

Table 6: Comparison of Fiscal year 2011 Small Business Innovation Research (SBIR) Spending Requirements under the Current Law and the Three Alternative Scenarios

Dollars in millions

	Agency's extramural R&D budget ^a	Agency's total R&D budget authority ^b	SBIR spending requirement under current law ^c	(Scenario 1) SBIR spending requirement based on 2.50 percent of the total R&D budget	(Scenario 2) SBIR spending requirement based on 1.63 percent of the total R&D budget	(Scenario 3) SBIR spending requirement based on variable percentages by agency
USDA	\$768	\$2,284	\$19	\$57	\$37	\$21
Commerce	239	1,021	6	26	17	7
DOD	41,678	77,410	1,042	1,935	1,262	1,195
Education	346	362	9	9	6	9
DOE	5,857	9,915	146	248	162	137
HHS	24,714	31,099	618	777	507	637
DHS	468	512	12	13	8	13
DOT	384	929	10	23	15	4
EPA	182	584	5	15	10	9
NASA	4,998	8,839	125	221	144	102
NSF	4,956	5,091	124	127	83	121
Total	\$84,590	\$138,046	\$2,116	\$3,451	\$2,250	\$2,255

Sources: GAO analysis of agencies' data.

^aEach agency's extramural R&D budget as reported by the agencies in their annual reports to SBA.

**Appendix II: Analysis of Alternative Scenarios
for Basing SBIR and STTR Spending
Requirements on Total R&D Budget**

^bEach agency's total R&D budget authority is from the Analytical Perspectives volume of the President's budget.

^cEach agency's SBIR spending requirement was calculated under the current law in fiscal year 2011 as 2.5 percent of its extramural R&D budget.

Note: Calculations may be affected by rounding.

Appendix III: Description of SBIR and STTR Administrative Cost Data Obtained from the Participating Agencies

The following describes the administrative cost data obtained, identified, or not available from the participating agencies for fiscal year 2011.

- *Department of Commerce (Commerce)*: Officials with the two participating subunits, the National Institute of Standards and Technology (NIST) and the National Oceanic and Atmospheric Administration (NOAA), said that the administrative costs for the program included salaries and expenses but that they did not have an estimate of them. The officials said the agencies did not specifically track administrative costs. Such costs were not allowed to be charged against the SBIR funds.
- *Department of Homeland Security (DHS)*: Officials in DHS' Science and Technology Directorate, which is one of two subunits managing the SBIR program at DHS, provided a partial list of administrative costs for the fiscal year. These included salary, travel, and other costs (e.g. contracting fees, support contracts and audit costs) that were estimated at \$962,000. Categories of costs that the agency identified but did not estimate included salaries and expenses of other DHS supporting staff and contractors. DHS officials in the Science and Technology Directorate said that the directorate's management and administrative budget began fully funding the administrative costs for SBIR in 2011; previously, these costs were funded from the extramural R&D budget of the directorate. The other DHS unit with an SBIR program, the Domestic Nuclear Detection Office did not identify or estimate administrative costs.
- *DOD*: Agency officials said that while DOD had not tracked administrative costs of the SBIR or STTR programs through 2011 agency-wide, such costs had been reported to various extents by the 13 DOD subunits that participate in one or both of the programs. Based on reports from some subunits, DOD's partial administrative costs totaled \$30.2 million. The 13 DOD subunits varied in their identification of administrative costs. Some identified none; some identified a few; and others identified many categories but did not provide estimates for each cost category. DOD Office of Small Business Programs officials stated that the department did not track "non-legislated administrative expenses," which were described as the program administrative costs before the start of the administrative costs pilot program.
- *Department of Energy (DOE)*: Agency officials in the DOE Office of Science, which manages most of the SBIR and STTR programs in DOE, said administrative costs for these programs were in three

categories: salaries and benefits, support contracts, and travel, and totaled \$1.2 million in fiscal year 2011. According to these officials, these costs did not include personnel expenses for over 70 specialists who spend a fraction of their time on the programs.

- *Department of Transportation (DOT)*: Agency officials said administrative costs in fiscal year 2011 were estimated at \$363,000, primarily for salaries and expenses but also including travel and other smaller categories. These program managers said this represents part of its administrative costs that directly support the SBIR program's management but not other support activities like procurement and legal services that are provided by other DOT subunits.
- *Department of Education (Education)*: Agency officials estimated administrative costs for fiscal year 2011 totaled \$479,000, of which \$4,000 was for travel, \$174,000 for salaries and benefits of department employees who administer the program, including preparing solicitations, running competitions, performing oversight, congressional reporting, and monitoring awards. Officials said the 2011 total included \$38,000 for salary and benefits of the department contracts and acquisitions management staff, and \$263,000 for salary and benefits of personnel assisting with application reviews.
- *Environmental Protection Agency (EPA)*: Agency officials said that known administrative costs for fiscal year 2011 were \$953,000, which included \$533,000 for the salaries and expenses of four FTE staff that run the program, \$350,000 for external peer review of SBIR proposals at various funding phases, and \$70,000 for a contract to provide program support. Officials said there were other administrative costs that were associated with staff that also manage other grant programs and that these costs were not easily separated by program and they were not tracked.
- *Department of Health and Human Services (HHS)*: Agency officials said they do not track or report the amount of administrative costs for the SBIR and STTR programs. They said it would be very difficult to determine how much is currently spent on the administrative costs of the program. HHS officials reported that since authorizing legislation did not allow SBIR/STTR funds to be spent on administration, funding for administrative costs, such as salary and expenses, training and travel, comes from other accounts.

- *National Aeronautics and Space Administration (NASA)*: Agency officials estimated administrative costs for certain categories as roughly \$11.9 million in fiscal year 2011, which included, among other things, \$8.6 million for procurement costs, about \$3 million for salaries and expenses, and \$151,000 for travel. According to these officials, other identified unestimated and untracked costs to administer the SBIR and STTR programs include the costs of technical experts within NASA reviewing proposals, the cost of holding review panels, and the cost that technical and contracting representatives spend interacting with companies seeking and receiving funding.
- *National Science Foundation (NSF)*: Agency officials said they identified administrative costs of \$4 million for the SBIR and STTR programs. These include 10 FTE within the agency costing approximately \$2 million in salaries and benefits and \$2 million NSF designates from its extramural research and spends for SBIR and STTR administrative costs, primarily for contracted technical and administrative support. NSF has contracted for this support for many years because of the high volume of actions in the program and the time frames that need to be met in the process. NSF officials said there were other administrative costs, including the efforts of federal staff that devote substantial time to the programs, but these have not been tracked or estimated.
- *U.S. Department of Agriculture (USDA)*: Agency officials said that in fiscal year 2011 administrative costs for SBIR included \$184,000 for experts who provided peer review of project proposals to cover such costs as honoraria and travel. Officials said USDA does not break out administrative costs for the SBIR program beyond honoraria and travel.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact:

Frank Rusco, (202) 512-3841 or ruscof@gao.gov

Staff Acknowledgments

In addition to the individual named above, Tim Minelli, Assistant Director; Hilary Benedict; Antoinette Capaccio; Cindy Gilbert; Richard Johnson; Cynthia Norris; John Scott; Ilga Semeiks; and Vasiliki Theodoropoulos made key contributions to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (<http://www.gao.gov>). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to <http://www.gao.gov> and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#). Subscribe to our [RSS Feeds](#) or [E-mail Updates](#). Listen to our [Podcasts](#). Visit GAO on the web at www.gao.gov.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Website: <http://www.gao.gov/fraudnet/fraudnet.htm>

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Katherine Siggerud, Managing Director, siggerudk@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800 U.S. Government Accountability Office, 441 G Street NW, Room 7149 Washington, DC 20548

