SMALL BUSINESS INNOVATION RESEARCH | SMALL BUSINESS TECHNOLOGY TRANSFER

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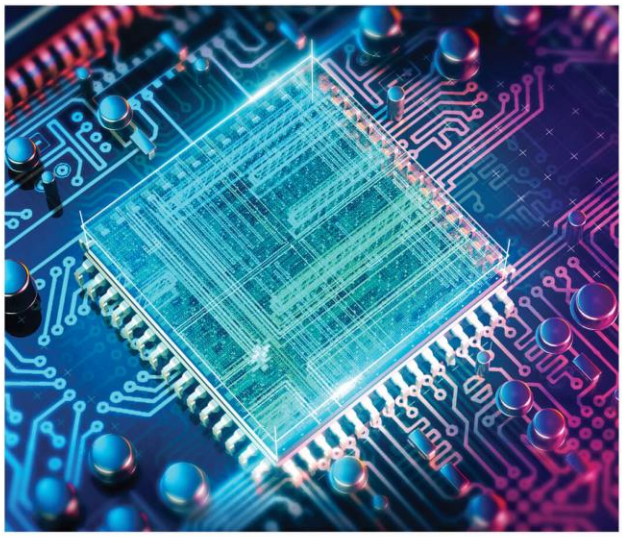

ANNUAL REPORT FISCAL YEAR 2018

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U.S. Small Business Administration

SBIR·STTR America's Seed Fund™ POWERED BY SBA

i | Executive Summary

This report provides a detailed breakdown of how the agencies that participate in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs obligated $2.78 billion of SBIR and $382.4 million of STTR funding in Fiscal Year 2018 (FY18). The U.S. Small Business Administration (SBA) analyzed data across the 11 agencies participating in the SBIR and STTR programs, states, program phases, firm types, and other categories as directed by section 9 of the Small Business Act, 15 U.S.C. § 638.

One of SBA's primary responsibilities is determining whether an agency meets the minimum spending requirements for the SBIR and STTR programs, which are established in sections 9(f) and (n) of the Small Business Act. SBA's analysis of agency compliance with the minimum spending requirement is found in section 9 of this report. SBA analyzed data from the 10 civilian agencies, the 3 Department of Defense (DoD) agencies (Army, Air Force, and Navy) and the combined 9 DoD components. Separating the data among the DoD components provides increased visibility into the DoD's SBIR and STTR (SBIR/STTR) programs, which is important as they represent over 42% of the funds obligated by all participating agencies. SBA found several civilian agencies and DoD components not in compliance with the minimum spending requirement, which is detailed further in section 9 of this report.

Over the last 3 years, SBA focused on solutions to ensure agencies could upload and verify data in an accurate and cost-effective manner. This focus enabled several breakthroughs, and the data integrity captured by the FY18 report is a testament to those improvements. SBA will continue working closely with the 11 Participating Agencies on data submissions, as well as to coordinate outreach, provide training, share best practices, and increase program awareness.

This report measures a multitude of factors, as well as the variance between agencies. Some of the variance is the product of differences at the agency enterprise level and others originate from different approaches to running the program. SBA is committed to evaluating these differences and encouraging agencies to adopt the best practices. Data from this report is crucial to assessments of the time between notification of award and the release of funding and the time between Phase I and II awards. The National Defense Authorization Act for Fiscal Year 2019 (FY19) directed GAO to study proposal selection and award timelines. SBA continues to expand the reporting on award timelines and provides this data in section 14.

The SBIR/STTR program continues to evolve and remain the primary source of early funding to thousands of highly successful small businesses. Many of these awardees leverage opportunities in the program to gradually become large businesses and some have become industry leaders. The recent economic impact studies developed by Air Force, Navy, DoD, and National Cancer Institute demonstrate that the program generates one of the highest returns on research and development (R&D) dollars for the Federal Government. These studies and much more can be found on SBIR.gov.

Sections

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1 | SBIR and STTR Data

SBA coordinates and monitors the SBIR/STTR programs for all Federal agencies with extramural budgets for research or research and development (R/R&D) in excess of the expenditures established in sections 9(f) and 9(n) of the Small Business Act. This includes providing policy guidance, monitoring agency performance, analyzing program data, and reporting on the program to Congress. SBA administers the program with maximum flexibility, allowing the Participating Agencies to tailor SBIR/STTR activities to best address unique agency missions, cultures, and needs.

SBIR/STTR Business Intelligence Platform – Housed at www.SBIR.gov

SBIR.gov serves as the central portal for accessing all award and performance information on the SBIR/STTR programs. SBIR.gov houses SBA's SBIR/STTR database and serves as a platform for users to access program information. Participating Agencies are required to provide the following through SBIR.gov:

- *Solicitations*. Agencies are responsible for posting SBIR and STTR solicitations to SBIR.gov within 5 business days of the solicitation open date (SBIR Policy Directive § 5(e)(2)). Not all agencies provide this information in accordance with the requirement. SBA is working with the agencies on addressing this issue.
- *Applications*. All SBIR and STTR applicant proposal data received during the reporting cycle must be uploaded through SBIR.gov (SBIR Policy Directive § 10(e)). SBA continues to work with the agencies to collect unawarded proposal coversheet data.
- *Awards.* Information required by statute on all awards obligated during the reporting cycle must be uploaded through SBIR.gov (SBIR Policy Directive § 10(f)). Not all agencies provide this information in a timely manner. SBA is working with the agencies on addressing this issue.
- *Annual Report.* By March 15, agencies are required to upload to SBIR.gov all SBIR and STTR activities for the previous fiscal year (SBIR Policy Directive § 10(h)). Not all agencies provide the submission by the deadline. SBA continues to work with agencies on addressing this issue.
- *Commercialization.* Company-specific and proprietary information collected from SBIR and STTR awardees and agencies on award commercialization efforts is uploaded through SBIR.gov (SBIR Policy Directive § 10(g)).

Table 1: SBIR Annual Report Submission History. The agencies are listed in descending order starting with the agency that obligates the most funding through the SBIR/STTR program.

Agency	First Submission Date*	Days (Early / Late†)	Final Submission Date	Days (Early / Late†)
DoD	07/01/2019	+108	07/01/2019	**+108**
HHS	04/11/2019	+27	04/11/2019	**+27**
DOE	03/15/2019	0	03/15/2019	**0**
NSF	03/15/2019	0	03/15/2019	**0**
NASA	06/09/2019	+86	06/09/2019	**+86**
DHS	05/14/2019	+60	05/14/2019	**+60**
ED	03/15/2019	0	03/15/2019	**0**
USDA	03/12/2019	-3	03/12/2019	**-3**
DOT	03/14/2019	-1	03/14/2019	**-1**
EPA	03/15/2019	0	03/15/2019	**0**
DOC	**03/21/2019**	**+6**	**03/21/2019**	**+6**

* The First Submission Date is the point when the data was communicated to have been complete and accurate.

† (-) early submission; (0) on time submission; (+) late submission

2 | Small Business Innovation Research (SBIR) Program Overview

The SBIR Program is a highly competitive program that encourages U.S. small businesses to engage in Federal Research/Research and Development (R/R&D) that has the potential for commercialization. Through a competitive awards-based program, SBIR enables small businesses to explore their technological potential and provides the incentive to profit from the commercialization. By including qualified small businesses in the Federal R/R&D arena, high-tech innovation is stimulated and the U.S. gains entrepreneurial spirit by encouraging participation by women and socially and economically disadvantaged persons as it meets its specific R/R&D needs. Participating Agencies administer individual programs within guidelines established by Congress and the Policy Directives established by SBA. These agencies designate R/R&D topics in the solicitations and receive proposals from eligible small businesses. Awards are made on a competitive basis after proposal evaluation.

This Fiscal Year 2018 (FY18) Annual Report provides comprehensive summary data and performance results for the SBIR and STTR Programs, aggregating information as reported to the SBA from the 11 federal agencies participating in the SBIR and the 5 Federal agencies participating in the Small Business Technology Transfer (STTR) Programs (referred to as Participating Agencies).

SBIR Mission and Program Goals

The mission of the SBIR Program is to support scientific excellence and technological innovation through the investment of Federal research funds in critical American priorities to build a strong national economy. The goals of the SBIR Program are to:

- Stimulate technological innovation;
- Meet Federal Government R/R&D needs;
- Foster and encourage participation in innovation and entrepreneurship by women and socially and economically disadvantage persons; and
- Increase private-sector commercialization of innovations derived from federal R/R&D funding.

Participating Agencies

The Small Business Act requires the SBIR Participating Agencies to allocate a certain percentage of their extramural R/R&D budgets to fund small business R/R&D activities through the SBIR Program. For FY18, Federal agencies with extramural R/R&D budgets exceeding $100 million were required to obligate a minimum of 3.2% of its FY18 extramural R/R&D budgets for SBIR awards to small businesses.

Section 9(e)(1) of the Small Business Act defines extramural budget as:

> [T]he sum of the total obligations minus amounts obligated for such activities by employees of the agency in or through government-owned, government-operated facilities, except that for the Department of Energy it shall not include amounts obligated for atomic energy defense programs solely for weapons activities or for naval reactor programs, and except that for the Agency for International Development it shall not include amounts obligated solely for general institutional support of international research centers or for grants to foreign countries.

The 11 SBIR Program Participating Agencies are listed below:

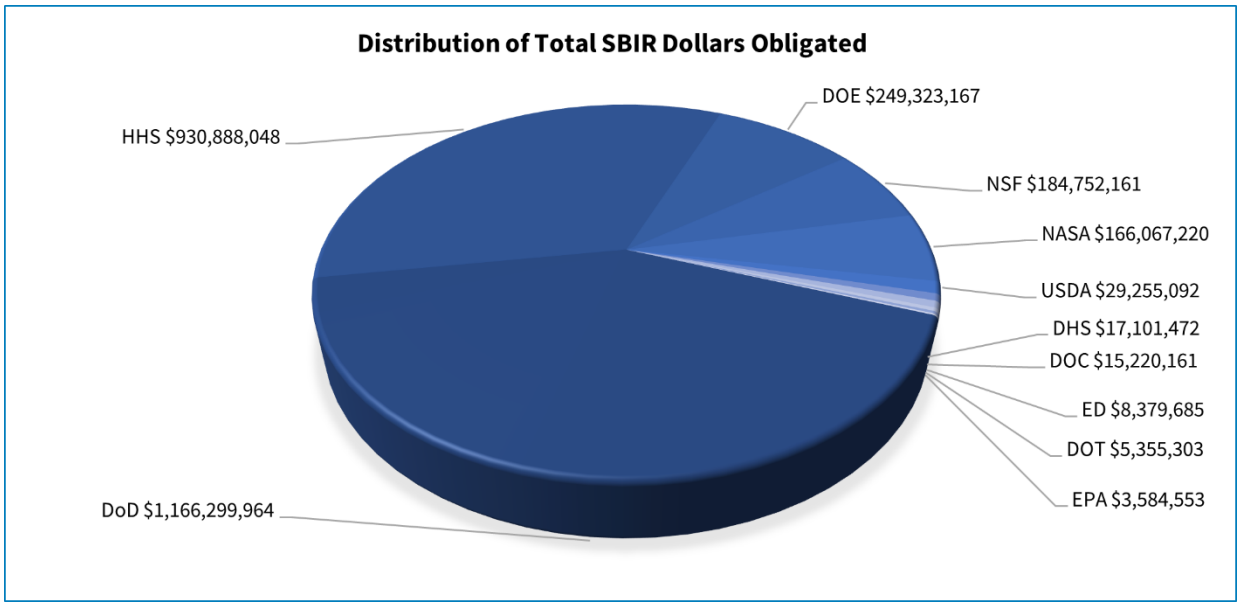
- Department of Agriculture (USDA);
- Department of Commerce (DOC);
- Department of Defense (DoD);
- Department of Education (ED);
- Department of Energy (DOE);
- Department of Health & Human Services (HHS);

- Department of Homeland Security (DHS);
- Department of Transportation (DOT);
- Environmental Protection Agency (EPA);
- National Aeronautics & Space Administration (NASA); and
- National Science Foundation (NSF).

FY18 SBIR Program Summary

In FY18, Participating Agencies' total SBIR obligations amounted to $2,776,226,826 of which $2,097,188,012 (76%) were attributed to DoD and HHS. The chart below shows the distribution of these funds by agency.

Chart 1: Distribution of Total SBIR Dollars Obligated by Participating Agencies



3 | Small Business Technology Transfer (STTR) Program Overview

The STTR Program expands funding opportunities in the federal innovation R/R&D arena. The unique feature of the program is the requirement for a small business to formally partner with a research institution. Participating Agencies administer individual programs within guidelines established by Congress and the SBA Policy Directive. They designate R/R&D topics and accept proposals from small businesses working in cooperation with allowable federally funded research and development centers and non-profit research institutions.

STTR Mission and Program Goals

The mission of the STTR Program is to support scientific excellence and technological innovation through the investment of federal research funds in critical American priorities to build a strong national economy. The goals of the STTR Program are to:

- Stimulate technological innovation;
- Foster technology transfer through cooperative R/R&D between small businesses and research institutions;
- Foster and encourage participation in innovation and entrepreneurship by women and socially and economically disadvantaged persons; and
- Increase private-sector commercialization of innovations derived from federal R/R&D.

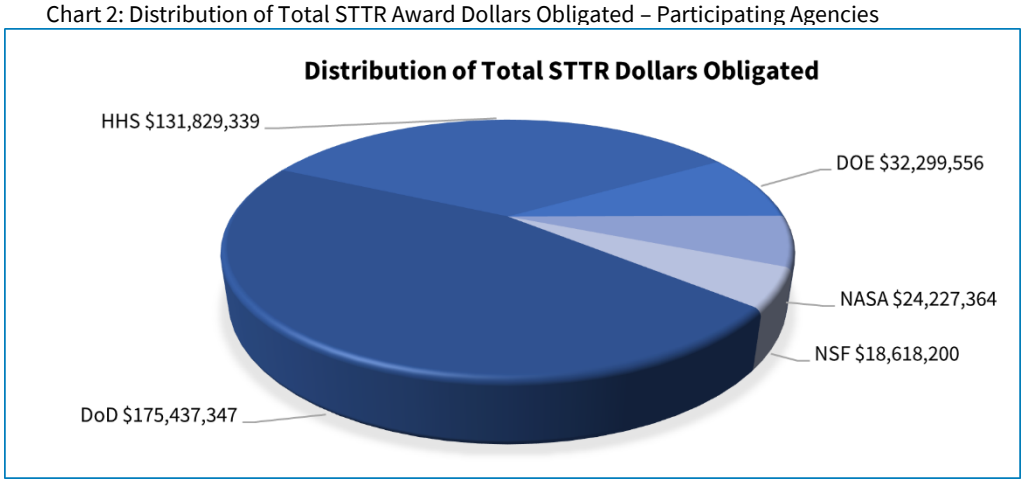
Participating Agencies

The Small Business Act requires STTR Participating Agencies with extramural R/R&D budgets exceeding $1 billion to obligate a minimum of 0.45% of their extramural R/R&D budgets to fund small business R/R&D activities through the STTR Program. In FY18, the DoD, DOE, HHS, NASA and NSF met this criterion.

FY18 STTR Program Summary

In FY18, Participating Agencies' total STTR obligations amounted to $382,411,806 of which $307,266,686 (80%) were attributed to DoD and HHS. The chart below shows the distribution of these funds by agency.

Chart 2: Distribution of Total STTR Award Dollars Obligated – Participating Agencies



4 | SBIR/STTR Programs are Structured in Three Phases

Phase I: Feasibility-Related Experimental Study or Theoretical Research/Research and Development

The objective of Phase I is to determine the scientific and technical merit, feasibility, and commercial potential of the proposed R/R&D efforts and to determine the quality of performance of the small business awardee prior to providing further federal support in Phase II. SBIR/STTR Phase I awards generally range from $100,000 to $225,000 for a 6 to 12-month period of performance.

Phase II: Continued Research/Research and Development Effort

The objective of Phase II is to continue the R/R&D efforts initiated in Phase I. Funding is based on the results achieved in Phase I and the scientific and technical merit and commercial potential of the project proposed in Phase II. SBIR/STTR Phase II awards generally range from $750,000 to $1,500,000 for a two-year period of performance. The Small Business Act authorizes agencies to fund additional Phase II awards with a company to continue the Phase II technology development through a Sequential Phase II (15 U.S.C § 638(ff)), and an award under the Commercialization Assistance Pilot Program (15 U.S.C § 638(uu)).

Phase III: Commercialization Effort

Phase III refers to work that derives from, extends, or completes an effort made through SBIR/STTR-funded Phase I or II R/R&D but is funded by sources other than the SBIR/STTR Programs. To the greatest extent practicable, federal entities, including government prime contractors pursuing R/R&D or production developed under the SBIR/STTR Programs shall issue Phase III awards to the SBIR/STTR awardee that developed the technology. The competition for SBIR/STTR Phase I and Phase II awards satisfies competition requirements, allowing federal agencies to issue direct or sole-source awards to SBIR/STTR awardees for Phase III efforts.

5 | SBIR Program – Civilian Agency Summary Data

SBIR Program Agency Summary Data is reported in separate sections of this report for Civilian Agencies and the Department of Defense (DoD). Moreover, DoDdata is separated by DoD Service Agencies and Components. Tables 2 and 3 provide proposal and award summary data from each of the 10 Civilian Agencies. This data was submitted by the agencies through the SBA Annual Report submission site and further analyzed to develop percent ratios for many of the reported fields. The agencies validated the data; however, SBA identified data verification challenges and continues to work with agencies on improving the accuracy of all reported data.

Table 2: SBIR Program - Civilian Agency Summary Data - HHS, DOE, NSF, NASA, and USDA

Phase	Report Field	HHS	DOE	NSF	NASA	USDA
Phase I	Solicitations Released (#)	24	2	2	1	1
	New Proposals Received (#)	4,712	1332	2,295	1,503	533
	New Awards (#)	931	350	255	301	79
	Selection Rate (%)*	20%	26%	11%	20%	15%
	Total Obligations ($)	$258,957,115	$57,380,362	$57,114,856	$37,170,828	$7,804,004
Phase II	New Proposals Received (#)	678	392	184	323	67
	New Awards (#)	370	174	98	146	35
	Selection Rate (%)*	55%	44%	53%	45%	52%
	Total Obligations ($)	$669,785,432	$189,484,572	$120,877,335	$128,646,402	$20,721,551
Phase III	Total Obligations ($) †	-	$3,213,153	-	$12,310,685	-
Admin	Discretionary Technical Assistance (DTA) Provided by Agency ($)	$2,145,501	$1,813,232	$1,435,000	$0	$729,537
	DTA Provided to Small Businesses in Award Obligations ($) ‡	$100,000	$553,505	$756,763	$162,930	$0
	Administrative Funding Pilot (AFPP) (3%) ($)	$0	$645,000	$5,324,970	$250,000	$0
Totals§	Total SBIR Obligations ($)	$930,888,048	$249,323,167	$184,752,161	$166,067,230	$29,255,092
	Amount of Extramural R/R&D reported to SBA minus Exemptions ($)	$29,317,202,304	$7,516,567,038	$5,588,420,000	$4,647,180,884	$980,934,931
	Percent of SBIR Obligations as determined using Agency-provided data (%)	3.18%	3.32%	3.31%	3.57%	3.15%
	SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements¶	Did Not Comply	Complied	Complied	Did Not Comply	Did Not Comply

* The selection rate is an estimate. For FY18 awards, the proposals received were from both FY17 and FY18.

† Agencies cannot use SBIR/STTR funding for Phase III awards and these dollars are not part of Total SBIR Obligations. This table includes Phase III dollars under the SBIR and STTR programs.

‡ These are DTA funds provided by the agency directly to the awardee through grant or contract and thus already included in PI/PII obligation award amounts.

¶ SBA determines compliance based on agency provided data (Percent of SBIR Obligations as determined using Agency-provided data) and by assessing the agency provided data relative to extramural R/R&D obligations submitted to the National Science Foundation's Survey of Federal Funds for Research and Development. As a result, the table may show an agency's percentage of obligations as compliant based on agency submitted data, but listed as "Did Not Comply" (or another status) based on SBA's assessment (SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements). Details on the SBA analysis are provided in Section 9 which describes SBA's validation process for extramural dollars and obligations as reported to SBA and NSF NCSES and includes the process SBA used to assess compliance.

Table 3: SBIR Program - Civilian Agency Summary Data - DHS, DOC, DOT, ED, and EPA

Phase	Report Field	DHS	DOC	ED	DOT	EPA	SBIR TOTAL All Civilian Agencies
Phase I	Solicitations Released (#)	1	2	1	1	1	36
	New Proposals Received (#)	89	177	225	198	70	11,134
	New Awards (#)	25	42	15	15	17	2,030
	Selection Rate (%)*	28%	24%	7%	8%	24%	18%
	Total Obligations ($)	$3,693,965	$4,787,716	$2,979,797	$2,203,838	$1,687,084	$433,779,565
Phase II	New Proposals Received (#)	43	30	11	10	15	1,753
	New Awards (#)	12	28	6	9	5	883
	Selection Rate (%)*	28%	93%	55%	90%	33%	50%
	Total Obligations ($)	$13,124,350	$10,194,313	$5,399,888	$3,010,331	$1,798,469	$1,163,042,633
Phase III	Total Obligations ($) †	-	-	-	$379,999	-	$15,903,837
Admin	Discretionary Technical Assistance (DTA) Provided by Agency ($)	$283,157	$180,000	$0	$75,000	$99,000	$6,760,427
	DTA Provided to Small Businesses in Award Obligations ($) ‡	$0	$0	$0	$29,887	$0	$1,603,085
	Administrative Funding Pilot (AFPP) (3%) ($)	$0	$58,133	$0	$66,134	$0	$6,344,237
Totals	Total SBIR Obligations ($)	$17,101,472	$15,220,161	$8,379,685	$5,355,303	$3,584,553	$1,609,926,862
	Amount of Extramural R/R&D reported to SBA minus Exemptions ($)	$475,336,046	$416,155,800	$265,242,372	$303,634,000	$111,037,700	$49,583,784,875
	Percent of SBIR Obligations as determined using Agency-provided data (%)	3.60%	3.66%	3.16%	1.76%	3.23%	3.25%
	SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements¶	Complied	Complied	Did Not Comply	Did Not Comply	Did Not Comply	

* The selection rate is an estimate. For FY18 awards, the proposals received were from both FY17 and FY18.

† Agencies cannot use SBIR/STTR funding for Phase III awards and these dollars are not part of Total SBIR Obligations. This table includes Phase III dollars under the SBIR and STTR programs.

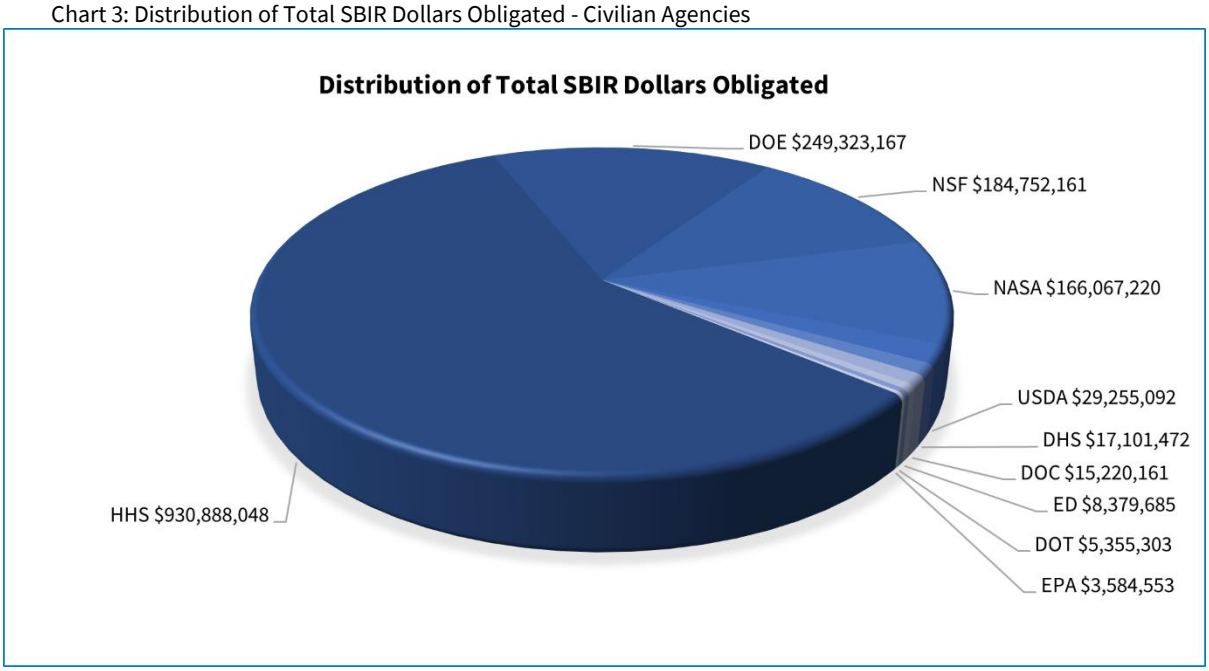
‡ These are DTA funds provided by the agency directly to the awardee through grant or contract and thus already included in PI/PII obligation award amounts, except for DOT DTA, which is not already included in PI/PII obligation award amounts.

¶ SBA determines compliance based on agency provided data (Percent of SBIR Obligations as determined using Agency-provided data) and by assessing the agency provided data relative to extramural R/R&D obligations submitted to the National Science Foundation's Survey of Federal Funds for Research and Development. As a result, the table may show an agency's percentage of obligations as compliant based on agency submitted data, but listed as "Did Not Comply" (or another status) based on SBA's assessment (SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements). Details on the SBA analysis are provided in Section 9 which describes SBA's validation process for extramural dollars and obligations as reported to SBA and NSF NCSES and includes the process SBA used to assess compliance.

SBIR Program Award Distribution - Civilian Agencies

In FY18, the Civilian Agencies' total SBIR obligations amounted to $1,609,926,862 of which $930,888,048 (58%) were attributed to HHS. Over 37% of total dollars were attributed to DOE, NSF, and NASA, with the remaining 5% of total FY18 SBIR award dollars obligated by USDA, DHS, DOC, ED, DOT, and EPA. The chart below shows the distribution of these funds by agency.

Chart 3: Distribution of Total SBIR Dollars Obligated - Civilian Agencies



Congress directs the SBIR Program to foster and encourage participation in innovation and entrepreneurship by women and socially and economically disadvantaged persons. The following tables and charts summarize SBIR participation across Participating Agencies by women-owned small businesses (WOSB);socially and economically disadvantaged small businesses (SDB); and small businesses located in Historically Underutilized Business Zones (HUBZone). For definitions of WOSB see the SBIR Policy Directive § 3(ss); for SDB see § 3(ll); and for HUBZone see 15 U.S.C. § 632(p)(3).

Table 4: SBIR Program - Civilian Agency Summary Data by Socioeconomic Group - HHS, DOE, NSF, NASA, and USDA

Socio Group	Phase	Report Field	HHS		DOE		NSF		NASA		USDA	
			Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
WOSB	Phase I	New Proposals	651	14%	144	11%	443	19%	159	11%	77	14%
		New Awards	119	13%	30	9%	57	22%	33	11%	9	11%
		New Obligations	$30,521,392	13%	$4,902,586	9%	$12,736,713	22%	$4,090,530	11%	$899,914	12%
		Total Obligations	$32,599,405	13%	$4,902,586	9%	$12,736,713	22%	$4,090,530	11%	$899,914	12%
	Phase II	New Proposals	77	11%	25	6%	32	17%	24	7%	5	7%
		New Awards	61	16%	12	7%	15	15%	12	8%	4	11%
		New Obligations	$49,147,460	15%	$14,078,551	7%	$11,414,051	15%	$9,008,844	8%	$2,398,882	12%
		Total Obligations	$84,996,959	13%	$14,078,551	7%	$18,778,700	16%	$9,878,700	8%	$2,398,882	12%
SDB	Phase I	New Proposals	288	6%	182	14%	453	20%	150	10%	3	1%
		New Awards	38	4%	27	8%	33	13%	30	10%	0	0%
		New Obligations	$10,234,169	4%	$4,288,773	8%	$7,412,037	13%	$3,725,831	10%	$0	0%
		Total Obligations	$10,932,337	4%	$4,288,773	7%	$7,412,037	13%	$3,725,831	10%	$0	0%
	Phase II	New Proposals	24	4%	21	5%	21	11%	32	10%	0	0%
		New Awards	12	3%	8	5%	9	9%	13	9%	0	0%
		New Obligations	$9,436,357	3%	$8,515,869	4%	$6,680,670	9%	$9,762,913	9%	$0	0%
		Total Obligations	$13,119,110	2%	$8,515,869	4%	$10,782,491	9%	$9,762,913	8%	$0	0%
HUB Zone	Phase I	New Proposals	4	0%	115	9%	174	8%	67	4%	92	17%
		New Awards	4	0%	33	9%	19	7%	5	2%	16	20%
		New Obligations	$1,797,916	1%	$5,225,292	9%	$4,272,726	7%	$620,670	2%	$1,595,319	20%
		Total Obligations	$1,797,916	1%	$5,225,292	9%	$4,272,726	7%	$620,670	2%	$1,595,319	20%
	Phase II	New Proposals	1	0%	29	7%	13	7%	5	1%	3	3%
		New Awards	1	0%	13	7%	8	8%	0	2%	1	4%
		New Obligations	$749,999	0%	$13,327,239	7%	$5,929,385	8%	$0	0%	$599,977	3%
		Total Obligations	$2,499,681	0%	$13,327,239	7%	$7,570,403	7%	$0	0%	$599,977	3%

Table 5: Civilian Agency Summary Data by Socioeconomic Group - DHS, DOC, ED, DOT, and EPA

Socio Group	Phase	Report Field*	DHS		DOC		ED		DOT		EPA		SBIR Civilian Total	
			Number	**Pct.**	**Number**	**Pct.**	**Number**	**Pct.**	**Number**	**Pct.**	**Number**	**Pct.**	**Number**	**Pct.**
WOSB	**Phase I**	New Proposals	15	17%	27	15%	82	36%	38	19%	5	7%	1,641	15%
		New Awards	4	16%	6	14%	6	40%	3	20%	1	6%	268	13%
		New Obligations	$599,813	16%	$659,093	14%	$1,184,211	40%	$430,424	20%	$98,991	6%	$56,123,667	14%
		Total Obligations	$599,813	16%	$659,093	14%	$1,184,211	40%	$430,424	20%	$98,991	6%	$58,201,680	13%
	Phase II	New Proposals	5	12%	2	7%	4	36%	1	10%	2	13%	177	10%
		New Awards	2	17%	2	7%	2	33%	1	11%	1	20%	112	13%
		New Obligations	$1,749,996	18%	$699,408	7%	$1,800,000	33%	$149,999	5%	$299,743	20%	$90,746,934	12%
		Total Obligations	$2,575,174	20%	$699,408	7%	$1,800,000	33%	$149,999	5%	$399,743	22%	$135,756,116	12%
SDB	**Phase I**	New Proposals	21	24%	28	16%	44	20%	45	23%	9	13%	1,223	11%
		New Awards	1	4%	4	10%	0	0%	0	0%	1	6%	134	7%
		New Obligations	$149,969	4%	$439,913	9%	$0	0%	$0	0%	$100,000	6%	$26,350,692	6%
		Total Obligations	$149,969	4%	$439,913	9%	$0	0%	$0	0%	$100,000	6%	$27,048,860	6%
	Phase II	New Proposals	3	7%	1	3%	0	0%	1	10%	2	13%	105	6%
		New Awards	1	8%	1	4%	0	0%	1	11%	0	0%	45	5%
		New Obligations	$749,975	8%	$300,000	3%	$0	0%	$149,999	5%	$0	0%	$35,595,783	5%
		Total Obligations	$999,975	8%	$300,000	3%	0	0%	$149,999	5%	$0	0%	$43,630,357	4%
HUB Zone	**Phase I**	New Proposals	3	3%	12	7%	16	7%	4	2%	4	6%	491	4%
		New Awards	0	0%	6	14%	0	0%	0	0%	2	12%	85	4%
		New Obligations	$0	0%	$659,418	14%	$0	0%	$0	0%	$199,583	12%	$14,370,924	3%
		Total Obligations	$0	0%	$659,418	14%	$0	0%	$0	0%	$199,583	12%	$14,370,924	3%
	Phase II	New Proposals	0	0%	2	6%	0	0%	0	0%	1	17%	54	3%
		New Awards	0	0%	2	7%	0	0%	0	0%	1	7%	26	3%
		New Obligations	$0	0%	$599,376	7%	$0	0%	$0	0%	$299,972	20%	$20,761,355	3%
		Total Obligations	$0	0%	$599,376	6%	$0	0%	$0	0%	$299,972	20%	$25,896,616	2%

* Data is based on proposals received and awards made in Fiscal Year 2018.

Chart 4: Percent of Phase I Total SBIR Dollars to Socioeconomic Groups - Civilian Agencies

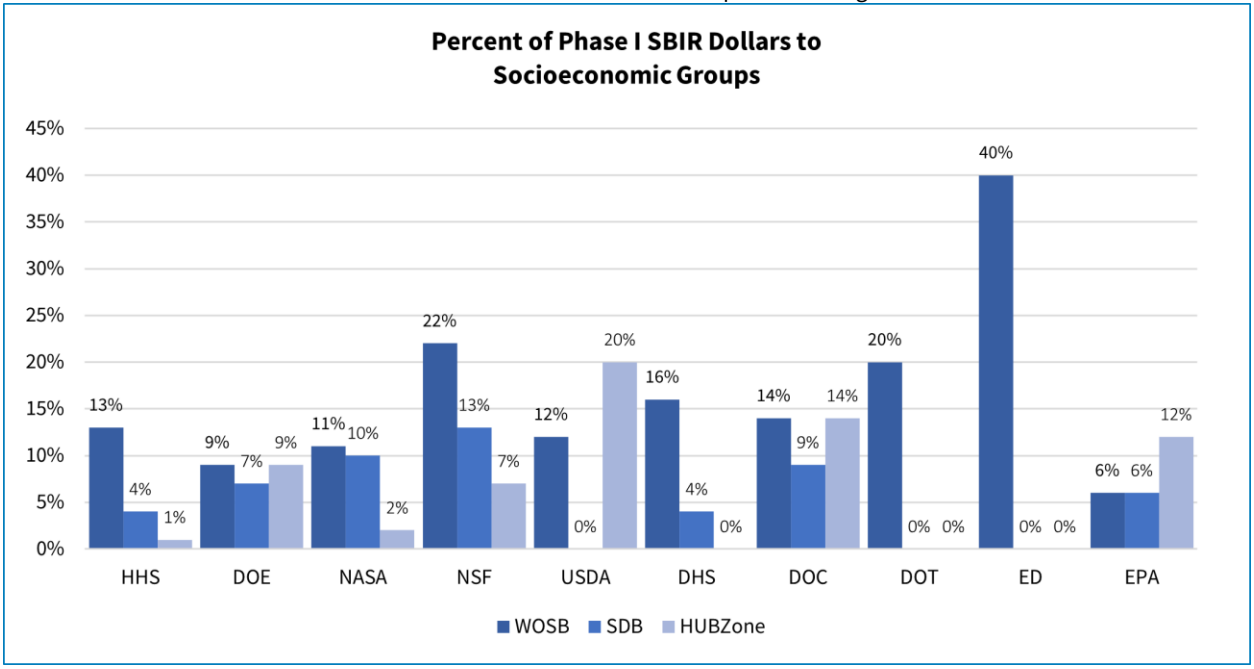


Table 6: Percent of Phase I Total SBIR Dollars to Socioeconomic Groups - Civilian Agencies

Agency	WOSB	SDB	HUBZone
HHS	13%	4%	1%
DOE	9%	7%	9%
NASA	11%	10%	2%
NSF	22%	13%	7%
USDA	12%	0%	20%
DHS	16%	4%	0%
DOC	14%	9%	14%
DOT	20%	0%	0%
ED	40%	0%	0%
EPA	6%	6%	12%

Chart 5: Percent of Phase II Total SBIR Dollars to Socioeconomic Groups - Civilian Agencies

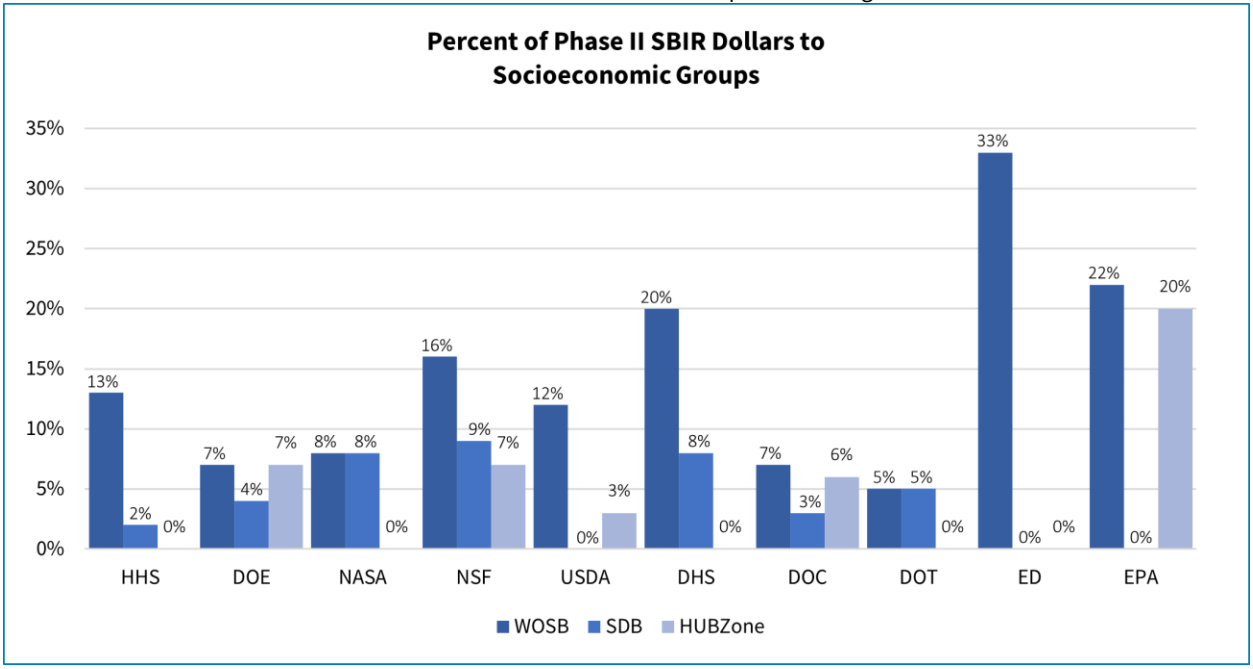


Table 7: Percent of Phase II Total SBIR Dollars to Socioeconomic Groups - Civilian Agencies

Agency	WOSB	SDB	HUBZone
HHS	13%	2%	0%
DOE	7%	4%	7%
NASA	8%	8%	0%
NSF	16%	9%	7%
USDA	12%	0%	3%
DHS	20%	8%	0%
DOC	7%	3%	6%
DOT	5%	5%	0%
ED	33%	0%	0%
EPA	22%	0%	20%

6 | SBIR Program – DoD Summary Data

To facilitate the review of the FY18 data collected on the DoD SBIR Program and present a more comprehensive reflection of individual DoD Component program performance, the DoD data is organized in Table 6 by DoD Service Agencies (Navy, Air Force, and Army) and the Other Defense Agencies (DARPA, MDA, DHA, CBD, SOCOM, DTRA, DLA, DMEA, and OSD). This data was submitted by the DoD through the SBA Annual Report submission site. SBA, the DoD, and the Components identified data verification challenges, and SBA continues to work with agencies on improving the accuracy of all reported data. Details on SBA's analysis are discussed in detail in Section 9.

Table 8: SBIR Program - DoD Summary Data - Service Agencies and Other Defense Agencies

Phase	Report Field	Navy	Air Force	Army	Other Defense Agencies	DoD Total Reported
Phase I	Solicitations Released (#)	3	3	3	3	3*
	New Proposals Received (#)	1656	2800	2029	1578	8,063
	New Awards (#)	357	244	224	280	1,105
	Selection Rate (%)	22%	9%	11%	18%	14%
	Total Obligations ($)	$61,223,394	$37,061,430	$29,465,445	$39,311,645	$167,061,914
Phase II	New Proposals Received (#)	282	366	337	376	1,361
	New Awards (#)	229	221	157	213	820
	Selection Rate (%)	81%	60%	47%	57%	60%
	Total Obligations ($)	$304,425,240	$246,231,483	$170,374,665	$257,463,524	$978,494,912
Phase III	Total Obligations (For both SBIR and STTR) ($) †	$718,110,637	$222,668,746	$5,074,817	$76,177,529	$1,022,031,729
Admin	Discretionary Technical Assistance (DTA) Provided by Agency ($)	$1,240,000	$0	$119,908	$0	$1,359,908
	DTA Provided to Small Businesses in Award Obligations ($) ‡	$0	$0	$0	$471,744	$471,744
	Administrative Funding Pilot (AFPP) (3%) ($)	$0	$0	$0	$11,905,866	$11,905,866
	DoD 1% CRP ($)	$3,266,259	$3,030,770	$199,642	$508,949	$7,005,620
Totals	Total SBIR Obligations ($)	$370,154,893	$286,323,683	$200,159,660	$309,661,728	$1,166,299,964
	Amount of Extramural R/R&D reported to SBA minus Exemptions ($)	$10,649,337,236	$18,132,704,918	$7,783,366,000	$12,376,296,530	$48,941,704,684
	Percent of SBIR Obligations as determined using DoD-provided data (%)	3.48%	1.58%	2.57%	2.50%	2.38%
	SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements¶	Unable to Determine	Did Not Comply	Did Not Comply	Varied[1]	

* This row is not a total. The DoD has three solicitations for which each branch / component can elect to participate.

† Agencies cannot use SBIR/STTR funding for Phase III awards and these dollars are not part of Total SBIR Obligations. Phase III dollars listed includes both SBIR and STTR programs.

‡ This is DTA funds that were provided by the agency directly to the awardee through grant or contract and thus already included in PI/PII obligation award amounts.

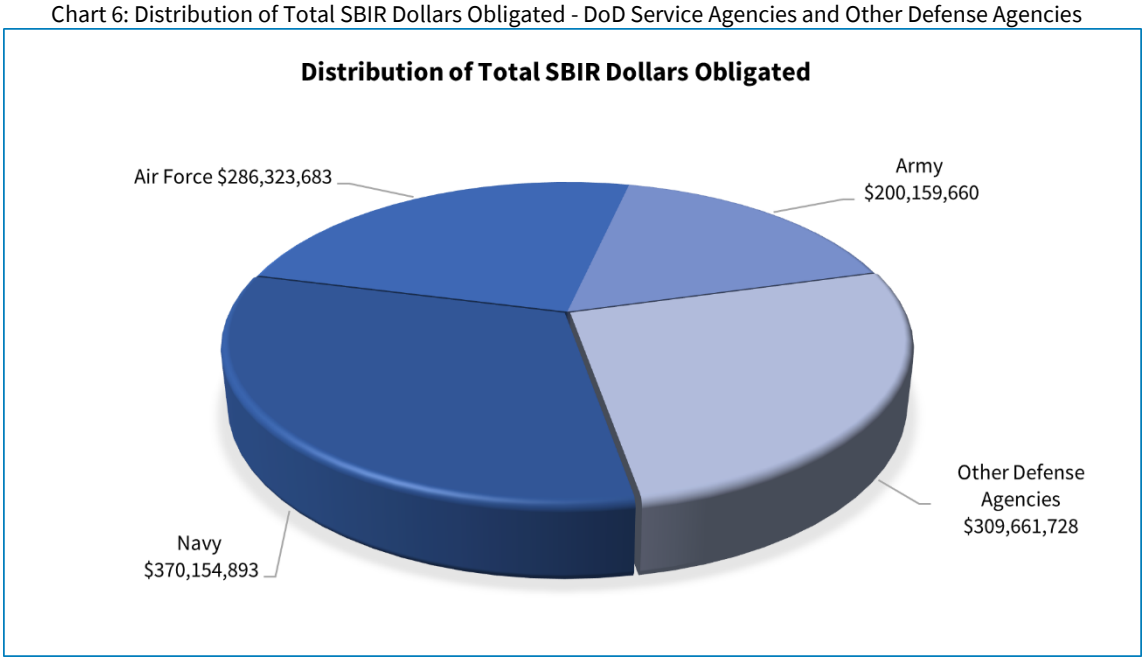
¶ SBA determines compliance based on agency provided data (Percent of SBIR Obligations as determined using Agency-provided data) and by assessing the agency provided data relative to extramural R/R&D obligations submitted to the National Science Foundation's Survey of Federal Funds for Research and Development. As a result, the table may show an agency's percentage of obligations as compliant based on agency submitted data but listed as "Did Not Comply" (or another status) based on SBA's assessment (SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements). Details on the SBA analysis are provided in Section 9 which describes SBA's validation process for extramural dollars and obligations as reported to SBA and NSF NCSES and includes the process SBA used to assess compliance.

[1] Section 9 details SBA's individual assessment for each of the 9 ODA components.

SBIR Program Award Distribution - DoD Service Agencies and Other Defense Agencies

In FY18, DoD Service Agencies' and Other Defense Agencies' total SBIR obligations amounted to $1,166,299,964 of which approximately 56% were attributed to Navy and Air Force. The chart below shows the distribution of thesefunds by the DoD Service Agencies and Other Defense Agencies.

Chart 6: Distribution of Total SBIR Dollars Obligated - DoD Service Agencies and Other Defense Agencies



Congress directs the SBIR Program to foster and encourage participation in innovation and entrepreneurship by women and socially and economically disadvantaged persons. The following tables and charts summarize SBIR participation across Participating Agencies by women-owned small businesses (WOSB);socially and economically disadvantaged small businesses (SDB); and small businesses located in Historically Underutilized Business Zones (HUBZone). For definitions of WOSB see the Policy Directive § 3(ss); for SDB see § 3(ll); and for HUBZone see 15 U.S.C. § 632(p)(3).

Table 9: SBIR Program - DoD Summary Data by Socioeconomic Group - Service Agencies and Other Defense Agencies

Socio Group	Phase	Report Field	Navy		Air Force		Army		Other Defense Agencies		DoD Total Reported	
			Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
WOSB	Phase I	New Proposals	212	13%	399	14%	314	15%	216	14%	1,141	14%
		New Awards	41	11%	28	11%	33	15%	37	13%	139	13%
		New Obligations	$5,520,066	12%	$4,097,615	12%	$3,098,519	14%	$5,307,265	15%	$18,023,465	13%
		Total Obligations	$7,191,666	12%	$4,247,615	11%	$4,197,780	14%	$5,457,299	14%	$21,094,360	13%
	Phase II	New Proposals	31	11%	47	13%	40	12%	47	13%	165	12%
		New Awards	22	10%	31	14%	21	13%	26	12%	100	12%
		New Obligations	$13,684,908	9%	$27,012,406	14%	$11,615,161	14%	$20,632,719	11%	$72,945,193	12%
		Total Obligations	$27,953,446	9%	$31,738,050	13%	$28,156,114	17%	$29,937,053	12%	$117,784,663	12%
SDB	Phase I	New Proposals	201	12%	374	13%	260	13%	181	11%	1,016	13%
		New Awards	25	7%	13	5%	15	7%	22	8%	75	7%
		New Obligations	$3,250,676	7%	$1,947,791	6%	$1,498,878	7%	$2,766,810	8%	$9,464,155	7%
		Total Obligations	$4,446,851	7%	$2,097,791	6%	$2,247,721	8%	$3,066,501	8%	$11,858,863	7%
	Phase II	New Proposals	27	10%	24	7%	25	7%	31	8%	107	8%
		New Awards	13	6%	9	4%	14	9%	16	8%	52	6%
		New Obligations	$8,158,329	5%	$8,751,102	5%	$6,844,570	8%	$11,416,210	6%	$35,170,211	6%
		Total Obligations	$19,637,341	6%	$9,605,700	4%	$8,755,413	5%	$16,497,371	6%	$54,495,825	6%
HUB Zone	Phase I	New Proposals	52	3%	77	3%	62	3%	61	4%	252	3%
		New Awards	8	2%	2	1%	7	3%	4	1%	21	2%
		New Obligations	$1,321,967	3%	$299,843	1%	$696,562	3%	$521,777	1%	$2,840,149	2%
		Total Obligations	$1,491,831	2%	$299,843	1%	$946,459	3%	$571,758	1%	$3,309,891	2%
	Phase II	New Proposals	5	2%	4	1%	7	2%	8	2%	24	2%
		New Awards	3	1%	3	1%	2	1%	4	2%	12	1%
		New Obligations	$2,369,982	2%	$2,183,557	1%	$876,953	1%	$3,179,954	2%	$8,610,446	1%
		Total Obligations	$3,155,558	1%	$2,183,557	1%	$2,109,437	1%	$3,671,786	1%	$11,120,338	1%

* For some FY18 awards, agencies had received proposals in FY17. Only proposals received in FY18 were reported by the agencies.

Chart 7: Percent of Phase I Total SBIR Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

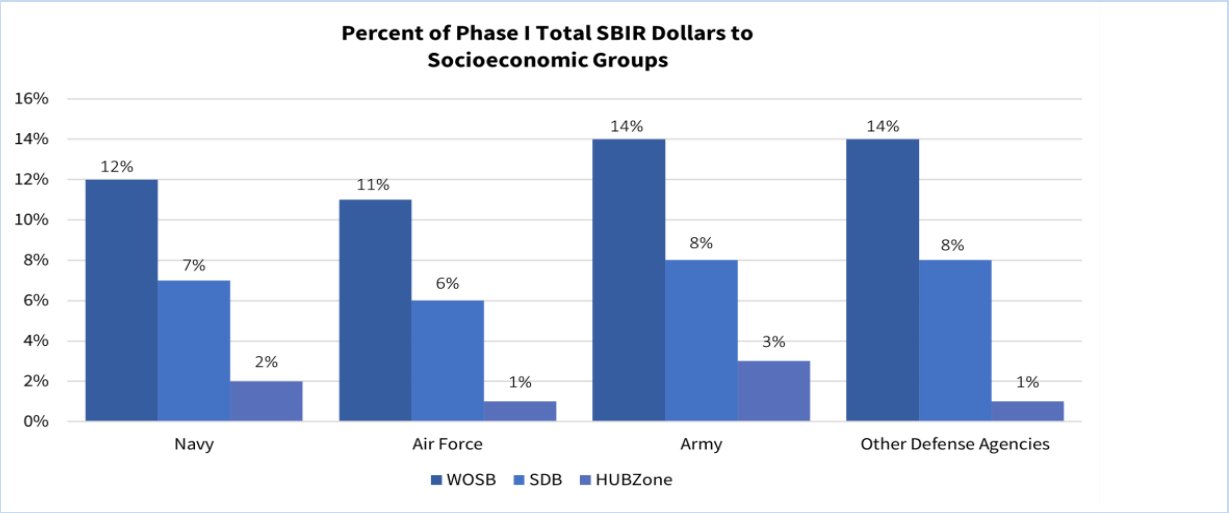


Table 10: Percent of Phase I Total SBIR Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

Agency	WOSB	SDB	HUBZone
Navy	12%	7%	2%
Air Force	11%	6%	1%
Army	14%	8%	3%
Other Defense Agencies	14%	8%	1%

Chart 8: Percent of Phase II Total SBIR Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

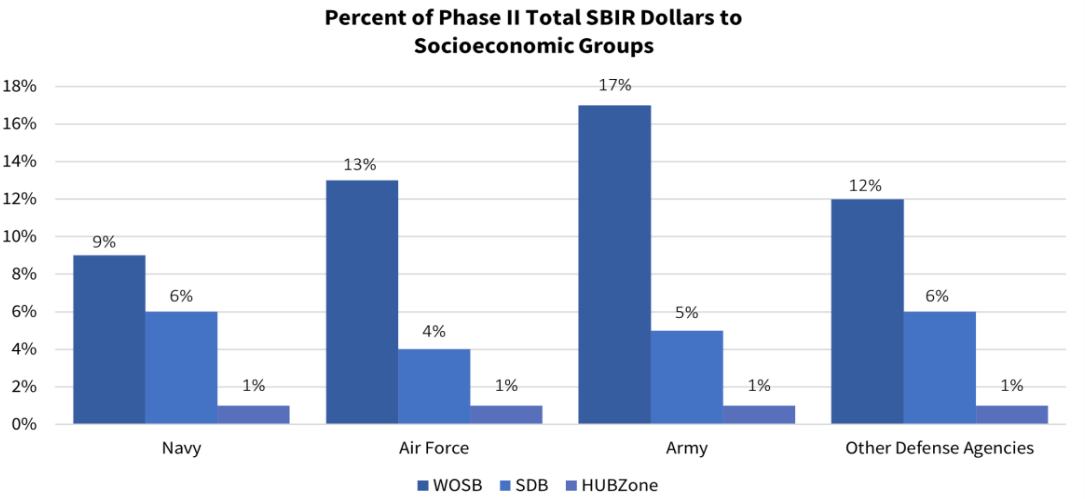


Table 11: Percent of Phase II Total SBIR Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

Agency	WOSB	SDB	HUBZone
Navy	9%	6%	1%
Air Force	13%	4%	1%
Army	17%	5%	1%
Other Defense Agencies	12%	6%	1%

7 | STTR Program – Civilian Agency Summary Data

Table 8 provides proposal and award summary data from the four Civilian Agencies with extramural R/R&D obligations exceeding $1 billion, thereby mandating participation in the STTR program. STTR data for the DoD is provided in Table 10. This data was submitted by the Agencies through the SBA annual report submission site, verified by SBA, and further analyzed to develop percent ratios for many of the reported fields. The agencies validated the data; however, some data verification challenges still exist which are detailed in the SBA analysis are provided in Section 9.

Table 12: STTR Program - Civilian Agency Summary Data - HHS, DOE, NSF, and NASA

PHASE	REPORT FIELD	HHS	DOE	NSF	NASA	STTR TOTAL All Civilian Agencies
Phase I	Solicitations Released (#)	25	2	2	1	30
	New Proposals Received (#)	1,150	215	359	150	1,874
	New Awards (#)	237	58	37	44	376
	Proposal Selection Rate (%)	20.6%	27.0%	10.3%	29.3%	20%
	Total Obligations ($)	$66,783,544	$9,395,438	$8,320,519	$5,480,917	$89,980,418
	Total Obligations for Research Institutions ($)	$29,317,661	$4,136,111	$3,390,416	$1,826,790	$38,670,978
	Total Obligations for Research Institutions (%)	44%	44%	41%	33%	43%
Phase II	New Proposals Received (#)	90	45	33	56	224
	New Awards (#)	37	20	10	24	91
	Proposal Selection Rate (%)	41.1%	44.4%	30.3%	42.9%	41%
	Total Obligations for Awards ($)	$65,045,795	$22,217,135	$10,297,681	$18,746,447	$116,307,058
	Total Obligations for Research Institutions ($)	$30,055,261	$7,712,093	$2,453,296	$5,990,010	$46,210,660
	Total Obligations for Research Institutions (%)	46.2%	34.7%	23.8%	32.0%	40%
Admin	Discretionary Technical Assistance (DTA) Provided by Agency ($)	$0	$686,982	$0	$0	$686,982
	DTA Provided to Small Businesses in Award Obligations ($) *	$0	$50,000	$60,000	$5,000	$115,000
	Obligations for "Phase 0" Programs (NIH only) ($)	$0	N/R	N/R	N/R	N/R
Totals	Total STTR Obligations ($)	$131,829,339	$32,299,556	$18,618,200	$24,227,364	$206,974,459
	Amount of Extramural R/R&D reported to SBA minus Exemptions ($)	$29,317,202,304	$7,516,567,038	$5,588,420,000	$4,647,180,884	$47,069,370,226
	Percent of STTR Obligations as determined using Agency-provided data (%)	0.45%	0.43%	0.33%	0.52%	0.44%
	SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements †	Complied	Did Not Comply	Did Not Comply	Did Not Comply	

*** This is DTA funds that were provided by the agency directly to the awardee through grant or contract and thus already included in PI/PII obligation award amounts.**

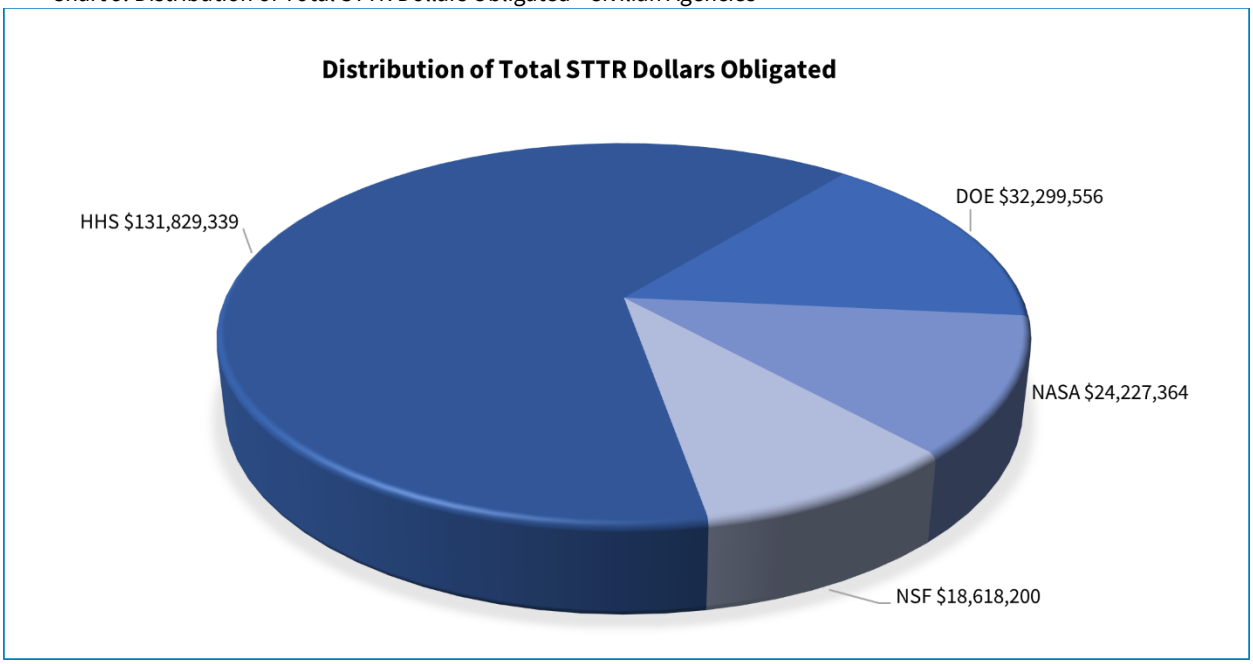
† SBA determines compliance based on agency provided data (Percent of SBIR Obligations as determined using Agency-provided data) and by assessing the agency provided data relative to extramural R/R&D obligations submitted to the National Science Foundation's Survey of Federal Funds for Research and Development. As a result, the table may show an agency's percentage of obligations as compliant based on agency submitted data, but listed as "Did Not Comply" (or another status) based on SBA's assessment (SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements). Details on the SBA analysis are provided in Section 9 which describes SBA's validation process for extramural dollars and obligations as reported to SBA and NSF NCSES and includes the process SBA used to assess compliance.

N/R – Not Required as only NIH has this authority.

STTR Program Award Distribution - Civilian Agencies

In FY18, the Participating Civilian Agencies' total STTR obligations amounted to $206,974,459 of which nearly 64%were attributed to HHS.

Chart 9: Distribution of Total STTR Dollars Obligated - Civilian Agencies



Congress directs the STTR Program to foster and encourage participation in innovation and entrepreneurship by women and socially and economically disadvantaged persons. The following tables and charts summarize STTR participation across Participating Agencies by women-owned small businesses (WOSB);socially and economically disadvantaged small businesses (SDB); and small businesses located in Historically Underutilized Business Zones (HUBZone). For definitions of WOSB see the Policy Directive § 3(ss); for SDB see § 3(ll); and for HUBZone see 15 U.S.C. § 632(p)(3).

Table 13: STTR Program - Civilian Agency Summary Data by Socioeconomic Group - HHS, DOE, NSF, and NASA

Socio Group	Phase	REPORT FIELD	HHS		DOE		NSF		NASA		Total	
			Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
WOSB	Phase I	New Proposals	168	15%	26	12%	43	12%	18	12%	255	14%
		New Awards	23	10%	3	5%	5	14%	6	14%	37	10%
		New Obligations	$5,773,273	9%	$484,824	5%	$1,124,315	14%	$749,472	14%	$8,131,884	10%
		Total Obligations	$6,606,255	10%	$484,824	5%	$1,124,315	14%	$749,472	14%	$8,964,866	10%
	Phase II	New Proposals	13	14%	3	7%	3	9%	3	5%	22	13%
		New Awards	6	16%	3	15%	2	20%	2	8%	13	14%
		New Obligations	$4,063,316	14%	$2,999,999	14%	$1,500,000	20%	$1,499,750	8%	$10,063,065	13%
		Total Obligations	$9,519,080	15%	$2,999,999	14%	$1,757,312	17%	$1,499,750	8%	$15,776,141	14%
SDB	Phase I	New Proposals	36	3%	34	16%	47	13%	21	14%	138	7%
		New Awards	2	1%	8	14%	6	16%	4	9%	20	5%
		New Obligations	$524,577	1%	$1,199,595	13%	$1,348,805	16%	$499,531	9%	$3,572,508	4%
		Total Obligations	$524,577	1%	$1,199,595	13%	$1,348,805	16%	$499,531	9%	$3,572,508	4%
	Phase II	New Proposals	4	4%	3	7%	2	6%	4	7%	20	9%
		New Awards	0	0%	2	10%	1	10%	4	17%	7	8%
		New Obligations	$0	0%	$1,999,999	9%	$750,000	10%	$2,986,480	17%	$5,736,479	7%
		Total Obligations	$0	0%	$1,999,999	9%	$777,316	8%	$2,986,480	16%	$5,763,795	5%
HUB Zone	Phase I	New Proposals	2	0%	31	14%	27	8%	4	3%	64	3%
		New Awards	2	1%	6	10%	10	27%	2	5%	20	5%
		New Obligations	$718,568	1%	$900,000	10%	$2,248,306	27%	$249,857	5%	$4,116,731	5%
		Total Obligations	$1,218,661	2%	$900,000	10%	$2,248,306	27%	$249,857	5%	$4,616,824	5%
	Phase II	New Proposals	0	0%	4	9%	5	15%	2	4%	11	5%
		New Awards	0	0%	3	15%	3	30%	0	0%	6	7%
		New Obligations	$0	0%	$3,008,288	14%	$2,398,446	32%	$0	0%	5,406,734	7%
		Total Obligations	$0	0%	$3,008,288	14%	$2,568,445	25%	$0	0%	5,576,733	5%

Chart 10: Percent of Phase I Total STTR Dollars to Socioeconomic Groups - Civilian Agencies

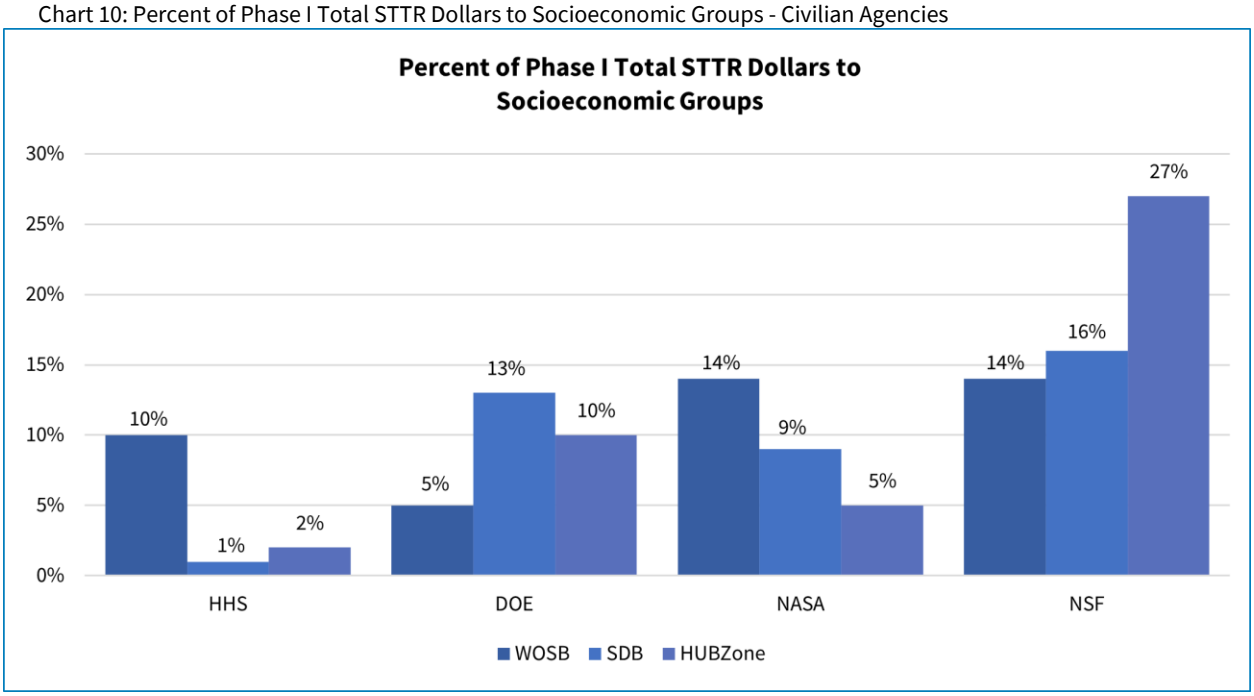


Table 14: Percent of Phase I Total STTR Dollars to Socioeconomic Groups - Civilian Agencies

Agency	WOSB	SDB	HUBZone
HHS	10%	1%	2%
DOE	5%	13%	10%
NASA	14%	9%	5%
NSF	14%	16%	27%

Chart 11: Percent of Phase II Total STTR Dollars to Socioeconomic Groups - Civilian Agencies

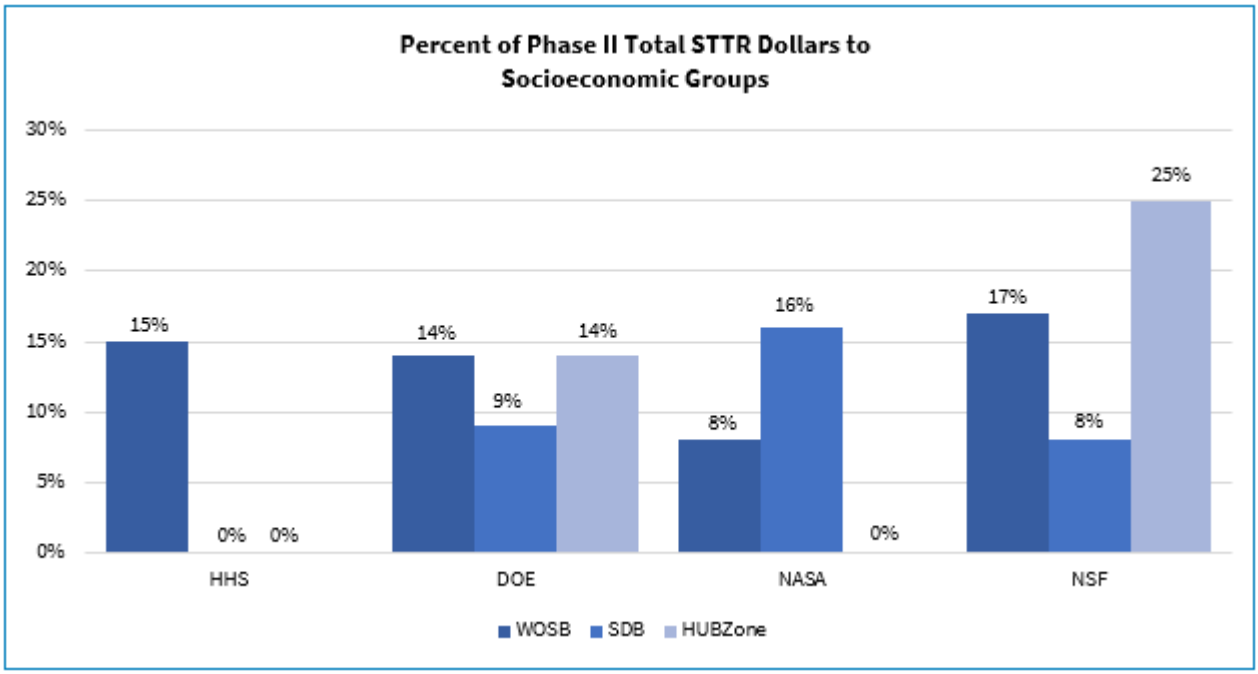


Table 15: Percent of Phase II Total STTR Dollars to Socioeconomic Groups - Civilian Agencies

Agency	WOSB	SDB	HUBZone
HHS	15%	0%	0%
DOE	14%	9%	14%
NASA	8%	16%	0%
NSF	17%	8%	25%

8 | STTR Program – DoD Summary Data

To facilitate the review of the FY18 data collected on the DoD STTR Program and present a more comprehensive reflection of individual DoD Component program performance, the DoD data is organized by DoD Service Agencies (Navy, Air Force, and Army) and the Other Defense Agencies (DARPA, MDA, DHA, CBD, SOCOM, DTRA, DLA, DMEA, and OSD). This data was submitted by the DoD through the SBA Annual Report submission site. SBA requires the data includedin this report be a summation of individual awards uploaded to SBA by the DoD, and that this data match what is available on SBIR.gov. SBA, the DoD, and the Components identified errors which are discussed in detail in Section 9.

Table 16: STTR Program - DoD Summary Data - Service Agencies and Other Defense Agencies

Phase	Report Field	Navy	Air Force	Army	Other Defense Agencies	DoD Total
Phase I	Solicitations Released (#)	3	3	3	3	3 †
	New Proposals Received (#)	326	324	219	255	1,124
	New Awards (#)	75	60	2 ‡	55	192
	Proposal Selection Rate (%)	23%	19%	1%	22%	17%
	Total Obligations ($)	$13,358,014	$10,034,867	$449,564	$7,791,709	$31,634,154
	Total Obligations for Research Institutions ($)	$5,470,027	$4,802,028	$268,288	$3,588,318	$14,128,660
	Total Obligations for Research Institutions (%)	41%	48%	60%	46%	45%
Phase II	New Proposals Received (#)	46	77	54	75	252
	New Awards (#)	34	30	29	40	133
	Proposal Selection Rate (%)	74%	39%	54%	53%	53%
	Total Obligations for Awards ($)	$43,299,063	$31,853,701	$27,457,907	$41,192,522	$143,803,192
	Total Obligations for Research Institutions ($)	$22,707,717	$17,737,006	$14,513,263	$18,475,066	$73,433,052
	Total Obligations for Research Institutions (%)	52%	56%	53%	45%	51%
Admin	Discretionary Technical Assistance (DTA) Provided by Agency ($)	$0	$0	$0	$0	$0
	DTA Provided to Small Businesses in Award Obligations ($) *	$0	$0	$0	$0	$0
Totals	Total STTR Obligations ($)	$56,657,077	$41,888,568	$27,907,471	$48,984,231	$175,437,347
	Amount of Extramural R/R&D reported to SBA minus Exemptions ($)	$10,649,337,236	$18,132,704,918	$7,783,366,000	$12,376,296,530	$48,941,704,684
	Percent of STTR Obligations as determined using DoD-provided data (%)	0.53%	0.23%	0.36%	0.40%	0.36%
	SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements§	Unable to Determine	Did Not Comply	Did Not Comply	Varied[2]	

* This is DTA funds that were provided by the agency directly to the awardee through grant or contract and thus already included in PI/PII obligation award amounts

† This row is not a total. The DoD has three solicitations for which each branch / component can elect to participate.

‡ Army data is based on two (2) STTR Awards made during FY18.

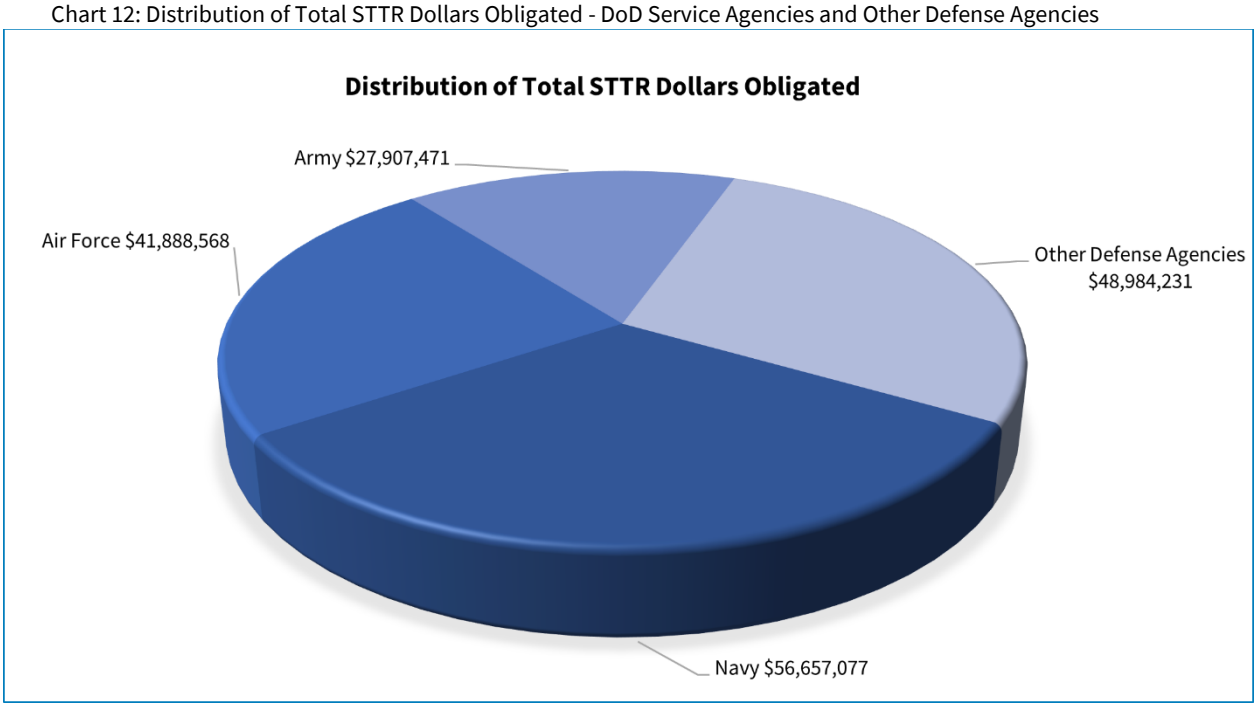
§ SBA determines compliance based on agency provided data (Percent of SBIR Obligations as determined using Agency-provided data) and by assessing the agency provided data relative to extramural R/R&D obligations submitted to the National Science Foundation's Survey of Federal Funds for Research and Development. As a result, the table may show an agency's percentage of obligations as compliant based on agency submitted data, but listed as "Did Not Comply" (or another status) based on SBA's assessment (SBA Assessment of Agency Compliance with Meeting Minimum Spending Requirements). Details on the SBA analysis are provided in Section 9 which describes SBA's validation process for extramural dollars and obligations as reported to SBA and NSF NCSES and includes the process SBA used to assess compliance.

[2] Section 9 details SBA's individual assessment for each of the 9 ODA components.

STTR Award Distribution - DoD Service Agencies and Other Defense Agencies

DoD Service Agencies' and Other Defense Agencies' STTR obligations totaled $175,437,347 in FY18, of which 32%were attributed to the Navy, 24% to the Air Force, 16% to the Army, and 28% to the Other Defense Agencies as shown below.

Chart 12: Distribution of Total STTR Dollars Obligated - DoD Service Agencies and Other Defense Agencies



Congress directs the STTR Program to foster and encourage participation in innovation and entrepreneurship by women and socially and economically disadvantaged persons. The following tables and charts summarize STTR participation across Participating Agencies by women-owned small businesses (WOSB);socially and economically disadvantaged small businesses (SDB); and small businesses located in Historically Underutilized Business Zones (HUBZone). For definitions of WOSB see the Policy Directive § 3(ss); for SDB see 3(ll); and for HUBZone see 15 U.S.C. § 632(p)(3).

Table 17: STTR Program - DoD Agency Summary Data by Socioeconomic Group - Service Agencies and Other Defense Agencies

Socio Group	Phase	Report Field	Navy		Air Force		Army		Other Defense Agencies		DoD Total Reported	
			Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
WOSB	Phase I	New Proposals	49	15%	39	12%	39	18%	14	13%	141	13%
		New Awards	11	15%	16	27%	0	0%	11	20%	38	20%
		New Obligations	$1,379,492	15%	$2,399,489	24%	$0	0%	$1,597,109	22%	$5,376,090	21%
		Total Obligations	$1,679,087	13%	$2,399,489	24%	$0	0%	$1,647,109	21%	$5,725,685	18%
	Phase II	New Proposals	4	9%	8	10%	13	24%	10	13%	35	14%
		New Awards	1	3%	9	30%	9	31%	2	5%	21	16%
		New Obligations	$750,000	4%	$6,551,566	30%	$5,575,172	34%	$1,514,047	5%	$14,390,785	16%
		Total Obligations	$4,970,542	11%	$7,038,763	22%	$8,066,482	29%	$1,541,047	4%	$21,616,834	15%
SDB	Phase I	New Proposals	41	13%	35	11%	20	9%	16	15%	112	10%
		New Awards	6	8%	16	27%	0	0%	0	0%	22	11%
		New Obligations	$759,135	8%	$2,399,554	27%	$0	0%	$0	0%	$3,158,689	12%
		Total Obligations	$759,135	6%	$2,549,520	25%	$0	0%	$0	0%	$3,308,655	10%
	Phase II	New Proposals	0	0%	12	16%	6	11%	5	7%	23	9%
		New Awards	1	3%	9	30%	3	10%	1	3%	14	11%
		New Obligations	$749,998	4%	$6,748,368	31%	$2,041,045	12%	$499,999	2%	$10,039,410	11%
		Total Obligations	$3,085,208	7%	$8,781,328	28%	$2,540,921	9%	$1,003,265	2%	$15,410,722	11%
HUB Zone	Phase I	New Proposals	4	1%	7	2%	4	2%	1	1%	16	1%
		New Awards	1	1%	10	17%	1	50%	0	0%	12	6%
		New Obligations	$124,934	1%	$1,499,569	15%	$149,684	50%	$0	0%	$1,774,187	7%
		Total Obligations	$124,934	1%	$1,499,569	15%	$149,684	33%	$0	0%	$1,774,187	6%
	Phase II	New Proposals	0	0%	3	4%	1	0%	0	0%	4	2%
		New Awards	0	0%	6	20%	0	0%	0	0%	6	5%
		New Obligations	$0	0%	$4,499,686	21%	$0	0%	$0	0%	$4,499,686	5%
		Total Obligations	$0	0%	$4,499,686	14%	$0	0%	$0	0%	$4,499,686	3%

* For some FY18 awards, agencies had received proposals from back in FY17. Only FY18 proposals received were reported by the agencies.

Chart 13: Percent of Phase I STTR Total Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

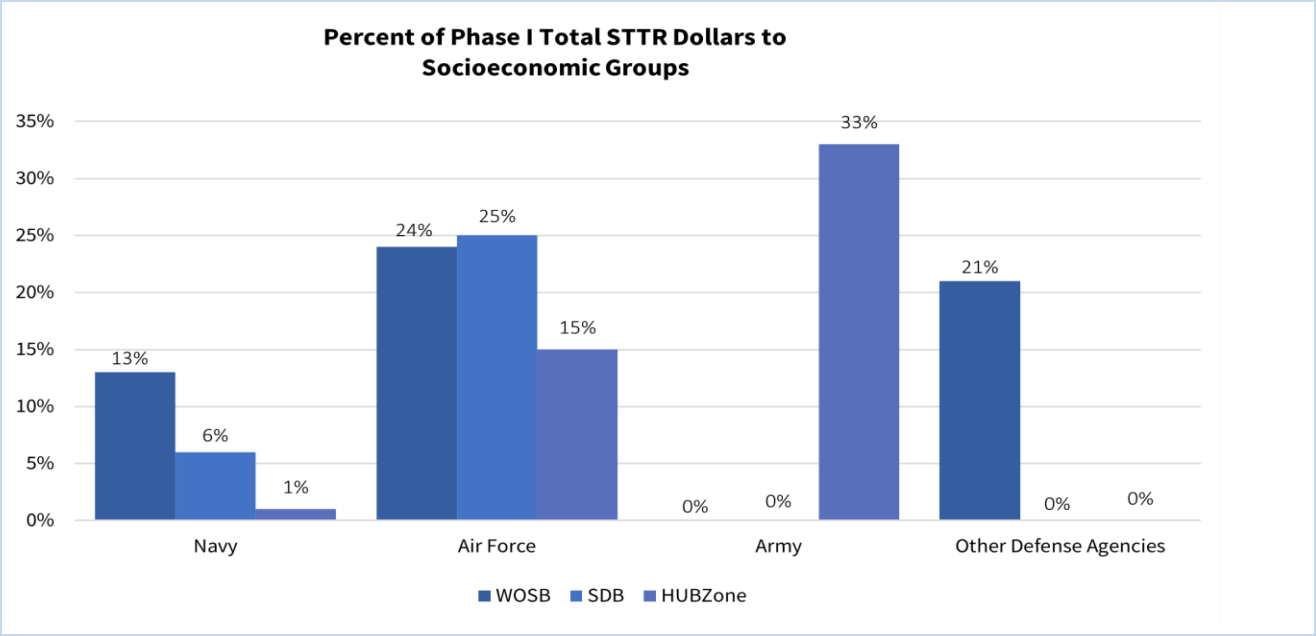


Table 18: Percent of Phase I STTR Total Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

Agency	WOSB	SDB	HUBZone
Navy	13%	6%	1%
Air Force	24%	25%	15%
Army	0%	0%	33%
Other Defense Agencies	21%	0%	0%

Chart 14: Percent of Phase II Total STTR Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

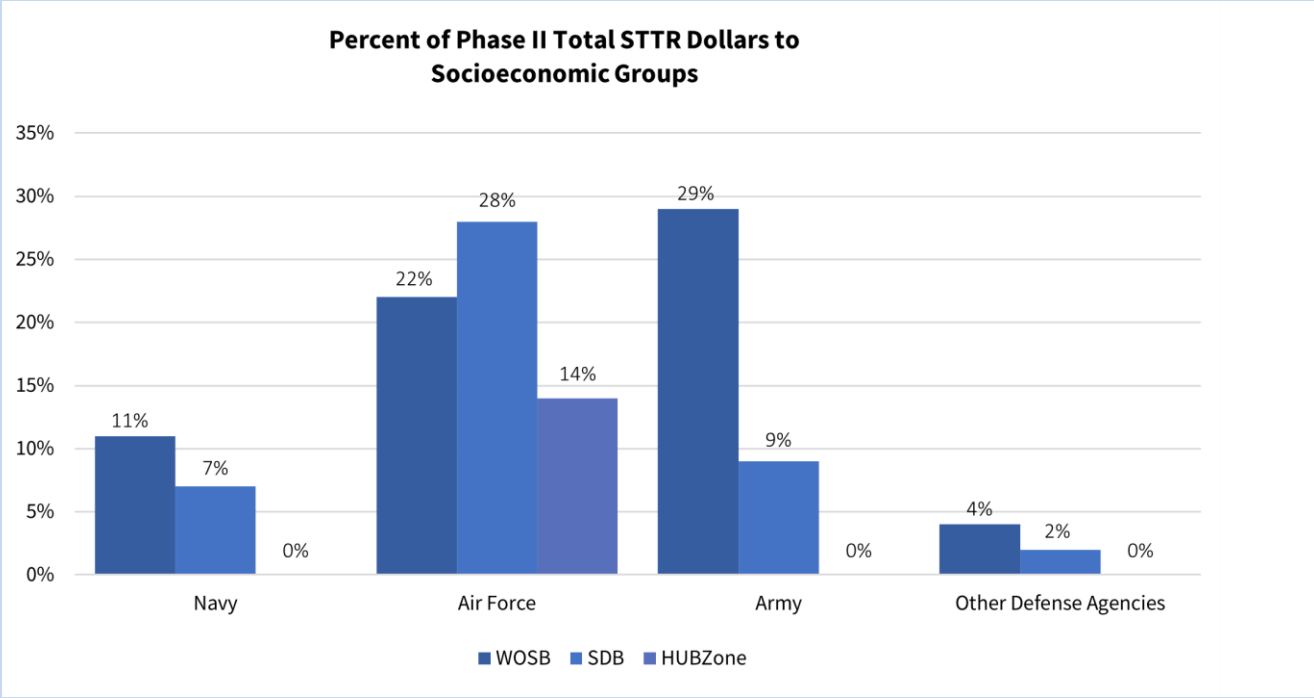


Table 19: Percent of Phase II Total STTR Dollars to Socioeconomic Groups - DoD Service Agencies and Other Defense Agencies

Agency	WOSB	SDB	HUBZone
Navy	11%	7%	0%
Air Force	22%	28%	14%
Army	29%	9%	0%
Other Defense Agencies	4%	2%	0%

9 | Minimum Spending Requirements and Understanding the Variance Between Extramural R/R&D Reported to SBA and NSF NCSES

The Small Business Act, at 15 U.S.C. § 638(f)(1) and (n)(1), establishes the minimum spending requirement for each year. For FY18, the minimum spending requirement was 3.2% for the SBIR program and 0.45% for the STTR Program. Agencies are required to meet or exceed these minimum percentages. SBA determined whether the Participating Agencies met this minimum spending requirement by calculating the percentage of an agency's extramural R/R&D obligations which funded SBIR/STTR awards and activities, as compared to an agency's total extramural R/R&D obligations for the fiscal year. Therefore, the size of the SBIR/STTR Programs in any given year is dependent on the size of the extramural R/R&D budgets of the Participating Agencies for that year.

Participating Agency Compliance with Meeting Minimum Spending Requirements

The Small Business Act, at 15 U.S.C. § 638(i)(2)(A), requires each Participating Agency to report the methodology usedto calculate its extramural R/R&D budget not later than 4 months after the date of the enactment of the agency's appropriations. As part of the Annual Report submission due to SBA, each Participating Agency reports the total extramural R/R&D funds obligated that year along with exemptions and exclusions. This enables SBA's evaluation of agency compliance with minimum spending requirements.

As noted in the May 2017 GAO report, *Small Business Research Programs: Most Agencies Met Spending Requirements, but DoD and EPA Need to Improve Data Reporting* (https://www.gao.gov/products/GAO-17-453), there are challenges with reporting and meeting the minimum spending requirements. The challenges are summarized below:

- The first challenge is identifying a common and transparent accounting of agency extramural R/R&D obligations for the year. The original Congressional intent in using extramural R/R&D as the basis for the SBIR/STTR funding requirement is clear: this is the portion of an agency's total R/R&D budget performed by non-federal employees and may therefore be performed by small businesses through grants and contracts. 15 U.S.C. § 638(e)(1) defines the term "extramural budget" as:

  > [T]he sum of the total obligations [for R/R&D] minus amounts obligated for such activities by employees of the agency in or through Government-owned, Government- operated facilities, except that for the Department of Energy it shall not include amounts obligated for atomic energy defense programs solely for weapons activities or for naval reactor programs, and except that for the Agency for International Development it shall not include amounts obligated solely for general institutional support of international research centers or for grants to foreign countries.

  As prescribed in section 10(h)(4)(i) of the February 2014 SBIR/STTR Policy Directives, Participating Agencies must report the total fiscal year extramural R/R&D obligations as reported to the National Science Foundation (NSF)[3] pursuant to the annual budget of the United States Government, commonly known as the NSF National Center for Science and Engineering Statistics (NCSES) Survey of Federal Funds for Research and Development (NCSES Survey). Currently the extramural R/R&D obligations reported by Participating Agencies to the NCSES Survey may differ from the amounts reported to the SBA. Therefore, SBA requested that Participating Agencies provide a rationale for any variance between the amounts reported to SBA for the Annual Report and amounts reported to NSF for the NCSES Survey. When provided, Participating Agency explanations are included in this report.

[3] NSF's National Center for Science and Engineering Statistics (NCSES) at https://www.nsf.gov/statistics/srvyfedfunds/#sd indicates that there are some measurement problems known to exist in the data that is collected by the Survey of Federal Funds for Research and Development.

- The second challenge stems from the statutory definition of extramural budget, which looks to the amount that a Participating Agency "obligated" during the Fiscal Year. While most Participating Agencies report amounts of extramural R/R&D funding obligations, the DoD continues to report extramural R/R&D budget appropriations rather than the actual amount of funding obligated during the fiscal year. In this case, SBA cannot validate whether they met the SBIR/STTR minimum spending requirements because the total extramural R/R&D obligations is unknown, and the budget authority may be different.

- The third challenge is Participating Agencies cannot account for all obligations for SBIR/STTR awards or extramural R/R&D spending until the fiscal year is over. Agencies must estimate these amounts and make minor adjustments when possible during the year.

- The fourth challenge involves delays in the contracting process, especially for agencies with multi-year budget authority. Even when a Participating Agency plans to obligate funds during the fiscal year to meet theminimum spending requirement, delays in the contracting process may prevent those awards from being issued in that fiscal year and cause the agency to miss the minimum spending requirement.

- The fifth challenge is that several agencies have no-year or two-year funding, which allows the agency to obligate those funds in future years. The DoD has two-year funding and much of its funding is obligated in the second year of availability. DoD's SBIR/STTR allocation may increase from the prior year, but SBA measures what was obligated in the current year regardless of the year the funds were set aside.

SBA reports on how the Civilian and Defense agencies met the minimum spending requirements separately. This approach enables a more detailed review and discussion on the individual DoD components. The total extramural R/R&D amounts each participating Civilian Agency reported to SBA and used to determine the SBIR/STTR minimum spending requirement for FY18 is shown in Table 12 and the DoD components are reported in Table 14.

Through a separate process, the NCSES Survey of Federal Funds for Research and Development administers an annual census completed by the Federal agencies conducting R&D programs. As one of 13 Federal statistical agencies, NCSES is mandated to collect, interpret, analyze, and disseminate objective data on the science and engineering enterprise. Beginning with the FY13 annual report, SBA compared extramural R/R&D budgets reported through the NCSES Survey to the Annual Report submission to SBA. This comparison is a useful tool to identify compliance withthe minimum spending requirements.

SBIR/STTR Program Funding as Share of Agency Reported Extramural R/R&D – Civilian Agencies

Table 20: SBIR/STTR Program Funding as Share of Agency Reported Extramural R/R&D - Civilian Agencies

SBIR									STTR		
Calculation using Extramural Levels Reported by Participating Agency to SBA						Calculation using Extramural Levels Reported on NCSES Survey			SBA	NCSES	
Agency *	Total Extramural R/R&D Obligations Reported to SBA($)	Amount of Program Exemptions Reported to SBA ($) †	Extramural R/R&DReported to SBA by Participating Agency minus Exemptions‡	Amount Obligatedfor SBIR Awards as Reported to SBA ($)	% Measured by SBIR obligations divided by Agency reported Extramural R/R&D (3.2% Min)	Total Extramural R/R&D Obligations Reported to NCSES[4] ($)	Extramural R/R&D Amount Reported to NCSES minus Exemptions Reported by Participating Agency to SBA($)	% Measured using NCSES Extramural R/R&D Obligations (3.2% Min)	Amount Obligated for STTR Awards as Reported toSBA ($)	% Measured by Extramural R/R&D Obligations to SBA (0.45% Min)	% Measured by Extramural R/R&D Obligations Reported toNCSES (0.45% Min)
HHS	$29,317,202,304	N/A	$29,317,202,304	$930,888,048	3.18%	$28,596,200,000	$28,596,200,000	3.26%	$131,829,339	0.45%	0.46%
DOE[5]	$13,535,060,038	$6,018,493,000	$7,516,567,038	$249,323,167	3.32%	$11,496,400,000	$5,477,907,000	4.55%	$32,299,556	0.43%	0.59%
NSF	$5,849,450,000	$261,030,000	$5,588,420,000	$184,752,161	3.31%	$5,836,200,000	$5,575,170,000	3.31%	$18,618,200	0.33%	0.33%
NASA	$6,765,345,312	$2,118,164,428	$4,647,180,884	$166,067,230	3.57%	$9,232,500,000	$7,114,335,572	2.33%	$24,227,364	0.52%	0.34%
USDA[6]	$980,592,658	$51,657,727	$928,934,931	$29,255,092	3.15%	$928,200,000	$876,542,273	3.34%			
DHS	$477,086,046	$1,750,000	$475,336,046	$17,101,472	3.60%	$547,300,000	$545,550,000	3.13%			
DOC	$416,155,800	N/A	$416,155,800	$15,220,161	3.66%	$411,400,000	$411,400,000	3.70%			
ED	$265,242,372	N/A	$265,242,372	$8,379,685	3.16%	$255,900,000	$255,900,000	3.27%			
DOT[7]	$927,170,000	$623,536,000	$303,634,000	$5,355,303	1.76%	$835,600,000	$212,064,000	2.53%			
EPA	$111,037,700	N/A	$111,037,700	$3,584,553	3.23%	$232,400,000	$232,400,000	1.54%			
TOTAL	**$58,613,416,030**	**$9,074,631,155**	**$49,538,784,875**	**$1,609,926,862**	**3.25%**	**$58,372,100,000**	**49,297,468,845**	**3.27%**	**$206,974,459**	**0.44%**	**0.44%**

* Agencies are listed in descending order of Amount Obligated for SBIR Awards as Reported to SBA

† N/A-Not Applicable; Many agencies do not have authority under 15 U.S.C. § 638 to exempt Extramural R/R&D dollars from the budget calculation

‡ Some Participating Agencies reported this figure in terms of dollars obligated, while others reported this figure in terms of amounts budgeted for the Fiscal Year. See Table 13.

[4] NSF's National Center for Science and Engineering Statistics (NCSES) at https://ncsesdata.nsf.gov/fedfunds/2018/html/ffs18-dt-tab007.html.

[5] DOE exemptions include Weapons Activities and Naval Reactors.

[6] USDA exemptions include the Agriculture Research Service (ARS) and Forest Service.

[7] DOT exemptions include the Federal Aviation Administration (FAA) and the Federal Highway Administration (FHWA) State Planning and Research Program.

The following subsections summarize SBA's assessment of whether each participating Civilian Agency complied with SBIR/STTR minimum spending requirement, variance between extramural R/R&D reported to SBA and NCSES, and the Agency explanation to SBA regarding variance between these two reported amounts.

SBA assesses compliance through two measures: 1) by determining the percentage of funding obligated for SBIR/STTR activities divided by total extramural R/R&D obligation minus program exemptions reported to SBA, and 2) by determining the percentage of funding obligated for SBIR/STTR activities based on the total extramural R/R&D obligations reported by the Agency for the NCSES Survey minus the amount of program exemptions reportedto SBA. When the agency's total extramural R/R&D obligations reported to NCSES is lower than what is reported to SBA, the agency's minimum SBIR or STTR percentages will be higher relative to the SBA reported data, and vice versa.

SBA uses the following rubric based on the above assessment in determining compliance:

- **Complied:** Agency must have obligated at least 3.2% for SBIR and .45% for STTR of its total extramural R/R&D obligations as reported to SBA, and the R/R&D obligations reported to NCSES are not significantlymore (<15%) than what was reported to SBA.

- **Did Not Comply:** Agency is not compliant if it reports obligating less than the respective percentages (3.2%for SBIR and .45% for STTR) of its total extramural R/R&D obligations as reported to SBA, or the R/R&Dobligations reported to NCSES are significantly more (>15%) than the extramural R/R&D obligations reported to SBA.

- **Unable to Determine:** SBA is unable to determine compliance because SBA cannot validate the agency's exemptions.

A detailed analysis of each Agency's compliance with the minimum spending requirement can be found below.

Table 21: Compliance with the Minimum Spending Requirement - Civilian Agencies

Agency	Whether Extramural R/R&D is Reported to SBA as Obligations (O) or Appropriations (A)	Timeframe to Obligate Allocated Funding	SBA Analysis of Compliance with	SBIR/STTR Minimum Spending Requirements
			SBIR	STTR
HHS	O	1-year	Did Not Comply	Complied
DOE	O	No-year	Complied	Did Not Comply
NSF	O	2-year	Complied	Did Not Comply
NASA	O	2-year	Did Not Comply	Did Not Comply
USDA	O	1-year and No-year	Did Not Comply	N/A
DHS	O	3-year	Complied	N/A
DOC	O	2-year	Complied	N/A
ED	O	1-year	Did Not Comply	N/A
DOT	O	No year	Did Not Comply	N/A
EPA	A	2-year	Did Not Comply	N/A

HHS. HHS did not comply with the SBIR minimum spending requirement because the SBIR obligations as reportedto SBA were less than the minimum requirement. Based on the extramural R/R&D reported to SBA, HHS obligated 3.18% instead of the required 3.2% for SBIR awards, but with 0.45% obligated for STTR awards, HHS complied withthe STTR minimum spending requirements. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

HHS explained:

> HHS determines the 3.2% SBIR set-aside at the beginning of the fiscal year by estimating the extramural R/R&D funds that will be obligated for that fiscal year. However, the actual extramural R/R&D obligationsare not known until after the fiscal year is completed. FY2018 included significant multi-year funding fromcongressionally mandated programs making estimation more difficult than in prior years. Historically, HHShas met or exceeded the SBIR obligation using this estimation and anticipates meeting its obligation in FY2019.
>
> Starting in FY2020, HHS has improved the centralized management of the SBIR/STTR programs. The National Institutes of Health (NIH), which coordinates the HHS SBIR and STTR programs, created a new Small business Education and Entrepreneurial Development (SEED) Office to support the innovator community in their efforts to validate the potential health impacts of promising scientific discoveries and advance them into healthcare products that improve patient care and enhance health. As part of this mission,SEED is implementing strategic approaches and policies to enhance the return on the SBIR/STTR programs.SEED is also improving the budgeting and reporting process to ensure all HHS operating divisions meet theirSBIR and STTR obligations.

DOE. DOE exceeded the minimum spending requirements with 3.32% obligated for SBIR activities but did not comply with the STTR requirement with 0.43% obligated for STTR activities. DOE did not comply because the STTRobligations as reported to SBA were less than the minimum requirement. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

DOE explained:

> Failure to meet STTR obligation requirement: During FY 2018, an internal General Counsel determinationfound that the SBIR and STTR programs were subject to reprogramming restrictions associated with DOE appropriations. These reprogramming restrictions created challenges for obligating STTR funds, particularlyfor those appropriations lines with smaller funding levels. Unobligated STTR funds were carried over to FY2019 for obligation. DOE made operational changes in FY 2019 to the STTR program to attempt to addressthese restrictions.
>
> Differences between SBA and NCSES reporting: Our FY 2018 Annual Report to SBA contains actual FY 2018 extramural R&D obligations. Extramural R&D available from NCSES may be estimates or actual datadepending on when the data are accessed.

NSF. NSF exceeded the SBIR minimum spending requirement with 3.31% obligated for SBIR activities but did not comply with the STTR minimum spending requirement. NSF obligated 0.33% for STTR activities, based on the dataprovided to SBA. NSF did not comply because the STTR obligations were less than the minimum requirement. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

NSF explained:

> NSF's baseline expenditures for STTR were $18,618,200 which is 0.33% of the extramural R/R&D amountfor FY18. However, NSF also spent approximately $5,000,000 on activities directly benefitting the SBIR/STTR awardees, which, when added to the baseline expenditures, brings the total expenditures to $23,618,200 for a total of .42% spending for the STTR program. NSF exceeded the minimum spending requirement for SBIR, including five STTR Phase I projects that converted to SBIR Phase II projects. A total of 2,376,890 of FY18 STTR funds were carried over for obligation in FY19. NSF spent the additional $5,000,000 on activities related to the SBIR/STTR programs that directly benefitted the STTR program andthe STTR awardees, including additional technical assistance support to STTR awardees. In addition, and consistent with NSF policy and practice across the agency, some of the funds listed in this line were spent onthe costs of conducting our external merit review process (including reviewer travel and contract support). If

the additional amount of funding for these activities is included in the total obligations, the total would be $23,618,200 for a total of .42% spending in FY18 for the STTR program. NSF did not use any of its STTR budget for costs associated with salaries and expenses.

NASA. SBA has determined that NASA did not comply with the minimum SBIR and STTR obligations because the discrepancy in what was reported to NCSES compared to what was reported to SBA is greater than 15%. Based solelyon what NASA reported to SBA, NASA would have exceeded the minimum spending requirement with 3.57% obligated for SBIR activities and 0.52% obligated for STTR activities. However, based on the extramural R/R&D reported to NCSES, NASA did not comply with the minimum spending requirements with 2.33% for SBIR activitiesand 0.34% obligated for STTR activities.

NASA explained:

> Similar to the explanation from previous years, NASA's variance between the extramural R/R&D obligations reported to SBA and the NSF Survey is "the data reported to NSF for R&D obligations includes all NASA R&D. The only exclusions included in the data set for intramural R&D are administrative costs for R&D performance such as personnel and travel. For the SBIR/STTR calculations, NASA follows the definition ofextramural budget as defined in the statute and in the Small Business Administration Policy Directive. The definition states that "extramural budget" is: 'The sum of the total obligations for R/R&D minus amounts obligated for R/R&D activities by employees of a Federal agency in or through Government-owned, Government operated facilities.'" Based on this definition, NASA identifies the exclusions that are considered intramural R&D. In addition to the exclusions in the NSF survey for FY 2018, NASA also excluded the following categories from total R/R&D obligations reported to SBA:
>
> 1. Support contractors performing NASA Center on- or near-site science, engineering, technical ormanagement services;
> 2. Launch vehicle procurements (as these are transportation costs); and
> 3. Procurements and administrative expenses associated with NASA "in-house" performed R&D projectsand activities.

SBA's response:

> SBA does not believe the definition of extramural budget provided in 15 U.S.C. 638 (e)(1) supports the exclusions identified in items 1 and 3 above. SBA continues to work with NASA to clarify the authorities NASA references in support of the exemptions.

USDA. USDA did not comply with the minimum spending requirement because the SBIR obligations reported to SBA were less than the required 3.2%. Based on the extramural R/R&D reported to SBA, USDA obligated 3.15% instead of the required 3.2%. The extramural R/R&D reported for the NCSES Survey was not significantly more thanwhat was reported to SBA.

USDA explained:

> USDA would like to note that the current SBIR expenditure calculation methodology uses the total FY 2018 extramural R/R&D obligations for an agency and compares the total agency obligations to the required appropriated set-aside percentage of 3.2 percent to be obligated on SBIR projects.
>
> To fund an SBIR program, each agency must set up its SBIR budget by setting aside 3.2 percent of its extramural R/R&D budget authority appropriated funds for the same year. This is typically done at the beginning of the fiscal year. It is impossible to set up the budget for an SBIR program using end of year obligations as this data is not available until after the fiscal year is completed.
>
> USDA met the requirement of setting up its SBIR budget at the beginning of FY 2018 by taxing the FY 2018 extramural R/R&D appropriations at 3.2 percent and obligated these taxed set-aside funds over the FY 2018 fiscal year on USDA SBIR projects. USDA continues to report and show that non-SBIR USDA programs obligate no-year funds from prior years that are included in the fiscal year extramural R/R&D obligations calculation reported to SBA.

These no-year obligations artificially increase the total amount of extramural R/R&D funding upon which the SBIR minimum spending requirement is to be based. These non-SBIR programs also have the legal authority by statute to reserve and obligate appropriated funds in future years. Under the budget authority appropriations process, the USDA SBIR program already received the taxed set-aside no-year funds in the same year as those funds were appropriated and the SBIR program obligated those funds the same fiscal year.

DHS. DHS exceeded the minimum spending requirement based on the extramural R/R&D reported to SBA with 3.60% obligated to SBIR activities. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

DOC. DOC exceeded the SBIR minimum spending requirement based on the extramural R/R&D reported to SBA with 3.66% obligated for SBIR activities. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

ED. ED did not comply with the minimum spending requirement because the SBIR obligations as reported to SBA were less than the minimum requirement. Based on the extramural R/R&D reported to SBA, ED obligated 3.16% instead of the required 3.2%. The extramural R/R&D reported for the NCSES Survey was not significantly more thanwhat was reported to SBA.

DOT. DOT did not comply with the minimum spending requirement because the SBIR obligations as reported to SBAwere less than the minimum requirement. Based on the extramural R/R&D reported to SBA, DOT obligated 1.76% instead of the required 3.2%. The extramural R/R&D reported for the NCESES Survey was not significantly more than what was reported to SBA.

EPA. SBA has determined that EPA did not comply because the discrepancy in what was reported to NCSES is greaterthan 15% of what was reported to SBA. Based on the extramural R/R&D reported to SBA, EPA would have exceededthe minimum spending requirement with 4.47% obligated for SBIR activities, however, based on the NCSES total, EPA did not comply with the minimum spending requirement with 1.54% obligated to SBIR activities.

SBIR/STTR Program Funding as Share of Agency Reported Extramural R/R&D – DoD Components

Table 22: SBIR/STTR Program Funding as Share of Agency Reported Extramural R/R&D - DoD Components

SBIR									STTR		
Calculation using Extramural Levels Reported to SBA						Calculation using Extramural Levels Reported on NCSES Survey			SBA		NCSES
Service Component*	Total Extramural R/R&D Obligations Reported to SBA ($)	Amount of Program Exemptions Reported to SBA ($)	Extramural R/R&D Reported to SBA by Participating Agency minus Exemptions	Amount Obligated for SBIR Awards as Reported to SBA ($)	% Measured by SBIR obligations divided by Agency reported Extramural R/R&D (3.2% Min)	Total Extramural R/R&D Obligations Reported to NCSES[8] ($)	Extramural R/R&D Amount Reported to NCSES minus Exemptions Reported by Participating Agency to SBA ($)	% Measured using NCSES Extramural R/R&D Obligations (3.2% Min)	Amount Obligated for STTR Awards as Reported to SBA ($)	% Measured by Extramural R/R&D Obligations Reported to SBA (0.45% Min)	% Measured by Extramural R/R&D Obligations Reported to NCSES (0.45% Min)
Navy	$14,129,682,236	$3,480,345,000	$10,649,337,236	$370,154,893	3.48%	$11,222,100,000	$7,741,755,000	4.78%	$56,657,077	0.53%	0.73%
Air Force	$18,170,957,918	$38,253,000	$18,132,704,918	$286,323,683	1.58%	$27,905,600,000	$27,867,347,000	1.03%	$41,888,568	0.23%	0.15%
Army	$8,341,287,000	$557,921,000	$7,783,366,000	$200,159,660	2.57%	$6,288,300,000	$5,730,379,000	3.49%	$27,907,471	0.36%	0.49%
ODAs	$15,411,113,565	$3,034,817,035	$12,376,296,530	$309,661,728	2.50%	$12,176,100,000	$9,141,282,965	3.39%	$48,984,231	0.40%	0.54%
DoD Total	**$56,053,040,719**	**$7,111,336,035**	**$48,941,704,684**	**$1,166,299,964**	**2.38%**	**$57,711,800,000**	**$50,600,463,965**	**3.39%**	**$175,437,347**	0.36%	0.35%
Other Defense Agencies (ODAs) Break Out											
MDA	$6,074,074,000	$2,915,768,000	$3,158,306,000	$60,916,171	1.93%	$5,076,800,000	$2,161,032,000	2.82%	$11,754,671	0.37%	0.54%
DARPA	$2,761,859,770	$101,770	$2,761,758,000	$98,977,196	3.58%	$2,744,100,000	$2,743,998,230	3.61%	$11,539,204	0.42%	0.42%
OSD	$2,663,740,505	$7,505	$2,663,733,000	$500,000	0.02%	$2,542,900,000	$2,542,892,495	0.00%	$0	0.00%	0.00%
DHA	$1,663,565,760	$28,760	$1,663,537,000	$50,382,074	3.03%	N/A†	N/A	N/A	$9,864,630	0.59%	
SOCOM	$711,002,000	$70,709,000	$640,293,000	$32,496,078	5.08%	$502,000,000	$431,291,000	7.53%	$8,784,299	1.37%	2.04%
CBD	$588,396,720	$38,881,000	$549,515,720	$14,533,698	2.64%	$488,900,000	$450,019,000	3.23%	$1,880,456	0.34%	0.42%
DLA & DMEA	$318,645,900	$0	$318,645,900	$20,445,832	6.42%	$315,200,000	$315,200,000	6.49%	$1,876,223	0.59%	0.60%
DTRA	$319,211,530	$9,321,000	$309,890,530	$14,224,909	4.59%	$329,600,000	$320,279,000	4.44%	$3,084,750	1.00%	0.96%
NGA**	-	-	-	$4,299,212	-	N/A	N/A	N/A	$199,998	N/A	N/A

* Service Components are listed in descending order of Amount Obligated for SBIR Awards as Reported to SBA

**NGA is an intelligence organization and it participates voluntarily and uses OSD SBIR/STTR funding.

† N/A - Not Available; the data provided by the NCSES survey does not allow the extramural funding to be isolated for this component.

[8] NSF's National Center for Science and Engineering Statistics (NCSES) at https://ncsesdata.nsf.gov/fedfunds/2018/html/ffs18-dt-tab009.html

SBA is reporting the DoD and Civilian agencies compliance with the minimum spending requirements separately, aswell as delineating the DoD data by individual Service Agencies and the Other Defense Agencies. Delineating the data also provides a more transparent account of individual Component performance. SBA was able to evaluate compliance for Components that provided extramural R/R&D obligations and exemptions. In FY18, the DoD Officeof Small Business Programs (OSBP) was responsible for collecting the Component data and uploading it to the SBAAnnual Report submission site. To ensure the report data matches what is available on SBIR.gov, SBA requires the data used for this annual report to be a summation of the individual awards uploaded to SBA. SBA used the data provided by DoD OSBP for the individual Components. SBA continues to work closely with each of theseorganizations to provide the most accurate data available and allow them an opportunity to provide comment into thisreport.

The DoD does not provide year-end total extramural R/R&D obligations, and SBA cannot properly validate the dollars considered by the DoD to be exempt. DoD only has the total extramural R/R&D budget estimates through the Methodology Report based on budget appropriation (for those Components that provided it) rather than final obligations, as directed by law.

For the Components that provided SBA with a Methodology Report, SBA used that data to generate the exemptions and extramural R/R&D listed in column 1 and 2 of Table 12. Obtaining final year-end obligation amounts from eachDoD Component would enable a more accurate assessment of compliance with the minimum spending requirement. SBA would also like to receive that data by the funding appropriation year and the funding obligation year, as this would enable SBA to address the challenge DoD has in obligating SBIR funding in the year it was obligated and at the same pace as its non-SBIR funding. SBA believes delineating the DoD's obligations and award data between individual Service Agencies and Other Defense Agencies will provide Congress as well as the public with a more a transparent representation of the DoD SBIR/STTR Program.

The following subsections summarize SBA's assessment of whether each of the DoD Service Agencies and Other Defense Agencies complied with the SBIR/STTR minimum spending requirement, variance between extramural R/R&D reported to SBA and NCSES, and the Component's response to SBA regarding variance between these two reported amounts. SBA analyzed compliance through two measures: 1) by determining the percentage of funding obligated for SBIR/STTR activities based on the extramural R/R&D amount minus the amount of program exemptions reported to SBA by the Component, and 2) by determining the percentage of funding obligated for SBIR/STTR activities based on the total extramural R/R&D reported by the Component for the NCSES Survey minus the amountof program exemptions reported to SBA.

A Component is considered to have "complied" with the minimum spending requirements for FY18 if, as per the SBIR and STTR Policy Directives, the Component obligated not less than 3.2% of its total extramural R/R&D obligations for SBIR activities, and not less than 0.45% of its total extramural R/R&D obligations for STTR activities,based on the extramural R/R&D amount reported to SBA. When the Component's total extramural R/R&D obligationsreported to NCSES is lower than what is reported to SBA, its minimum SBIR or STTR percentages will be higher relative to the SBA reported data, and vice versa.

SBA uses the following rubric based on the above assessment in determining compliance:

- **Complied:** Agency must have obligated at least 3.2% for SBIR and .45% for STTR of its total extramural R/R&D obligations as reported to SBA, and the R/R&D obligations reported to NCSES are not significantlymore (<15%) than what was reported to SBA.

- **Did Not Comply:** Agency is not compliant if it reports obligating less than the respective percentages (3.2% for SBIR and .45% for STTR) of its total extramural R/R&D obligations as reported to SBA, or the R/R&Dobligations reported to NCSES are significantly more (>15%) than the extramural R/R&D obligations reported to SBA.

- **Unable to Determine:** SBA is unable to determine compliance because SBA cannot validate the agency's exemptions.

The DoD has 2-year funding, meaning it can obligate the annually appropriated dollars over a 2-year period. To provide a more comprehensive account of the DoD's compliance with meeting the minimum spending requirements,

SBA would like the DoD to report SBIR and STTR obligations by the year the funding was appropriated and the yearthat funding was obligated. The DoD would also need to provide the total extramural R/R&D obligations (the non SBIR/STTR funds used as the denominator in determining the minimum percent) in the same way. Having a 2-year account of this information would enable SBA to validate DoD's compliance with the minimum spending requirements.SBA requested the Service Agencies and Other Defense Agencies provide the 2-year funding data for this report. DoD did not provide year end extramural obligation amounts to SBA which further limits the ability to make a determination. This requirement derives from Section 10(h)(4)(i) of the SBIR/STTR Policy Directives.

A detailed analysis of each Component's compliance with the minimum spending requirement can be found below.

Table 23: Compliance with the Minimum Spending Requirement - DoD Components

Agency*	Whether Extramural R/R&D is Reported to SBA as Obligations (O) or Appropriations (A)†	Timeframe to Obligate Allocated Funding	SBA Analysis of Compliance with	SBIR/STTR Minimum Spending Requirements
			SBIR	STTR
Navy	A	2-year	Unable to Determine	Unable to Determine
Air Force	A	2-year	Did Not Comply	Did Not Comply
Army	A	2-year	Did Not Comply	Did Not Comply
DARPA	A	2-year	Complied	Did Not Comply
MDA	A	2-year	Did Not Comply	Did Not Comply
DHA	A	2-year	Did Not Comply	Unable to Determine
CBD	A	2-year	Did Not Comply	Did Not Comply
SOCOM	A	2-year	Complied	Complied
DTRA	A	2-year	Complied	Complied
DLA/DMEA	A	2-year	Complied	Complied
NGA	A	2-year	Unable to Determine	Unable to Determine
OSD	A	2-year	Did No Comply	Did Not Comply

*** SBA recognizes Components of the Other Defense Agencies transfer all or portions of its STTR funding to another Component to obligate. The FY17 SBIR and STTR Annual Report represents the first time STTR obligations are represented by individual Components.**

† Agencies report the extramural R/R&D budget to SBA as either obligations or appropriations. DoD reports its extramural R/R&D budget as appropriations.

Navy. SBA is unable to determine if Navy complied with the SBIR and STTR minimum spending requirements because SBA cannot validate the exempted programs. Based on the extramural R/R&D reported to SBA, Navy exceeded the minimum spending requirements with 3.48% obligated for SBIR activities and 0.53% obligated for STTR activities. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

Navy reported $3,480,345,000 in exemptions. However, SBA is unable to determine the spending requirement calculation for Navy because SBA does not have access to examine and validate the lines of funding which are beingexcluded.

Navy explained:

> The Department of Navy has not assessed how the total extramural R/R&D obligations for the reporting fiscal year differs, if at all, from the amount reported to the NSF NCSES Survey of Federal Funds for Research and Development pursuant to the annual Budget of the United States Government.

Air Force. Air Force did not comply with the SBIR and STTR minimum spending requirements because the respective obligations as reported to SBA were less than the minimum requirements. Based on the extramural R/R&D reportedto SBA, Air Force obligated 1.58% for SBIR activities and 0.23% for STTR awards instead of the required 3.2% and .45%, respectively. Additionally, the extramural R/R&D reported for the NCSES Survey was significantly more, greater than 15%, than what was reported to SBA. Air Force did not provide any additional information regarding thevariance.

Air Force reported $38,253,000 in exemptions, which is substantially lower than the other DoD Agencies. However,SBA is unable to determine the spending requirement calculation for Air Force because SBA does not have access toexamine and validate the lines of funding which are being excluded.

Army. Army did not comply with the SBIR or STTR minimum spending requirements because the SBIR and STTR obligations as reported to SBA were less than the minimum requirements. Based on the extramural R/R&D reported to SBA, Army obligated 2.57% for SBIR activities and 0.36% for STTR awards instead of the required 3.2% and .45%, respectively. The extramural R/R&D reported for the NCSES Survey was not significantly more than what wasreported to SBA.

Army reported $557,921,000 in exemptions. SBA does not have access to examine and validate the lines of funding which are being excluded.

DARPA. DARPA exceeded the SBIR minimum spending requirement but did not comply with the STTR minimum spending requirement. Based on the extramural R/R&D reported to SBA, DARPA obligated 3.58% for SBIR activities but did not comply with the STTR minimum spending requirement with 0.42% obligated instead of the required .45%.The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

DARPA explained:

> Obligation totals for DoD and DARPA include both FY17 & FY18 funds. DoD and DARPA utilize two-year RDT&E funds, as a result, FY18 compliance cannot be determined until the close of FY19.
>
> At the close of FY19 DARPA had obligated a total of $118,480,796.97 in FY18 SBIR funds and $14,425,796.97 in FY18 STTR funds. These totals are in excess of the minimum spending requirements of the of 3.2% for SBIR and .45% for STTR.
>
> The completion of the NCSES Survey is not completed by DARPA SBPO. As a result, the totals listed in this survey cannot be validated in a timely manner for this report and should not be used to determine compliance.

MDA. MDA did not comply with the SBIR and STTR minimum spending requirements because the respective obligations as reported to SBA were less than the minimum requirements. Based on the extramural R/R&D reported to SBA, MDA obligated 1.93% for SBIR activities and 0.37% for STTR awards instead of the required 3.2% and .45%, respectively. The extramural R/R&D reported for the NCSES Survey was not significantly more than what wasreported to SBA.

MDA reported $2,915,768,000 in exemptions. SBA does not have access to examine and validate the lines of fundingwhich are being excluded.

DHA. DHA did not comply with the SBIR minimum spending requirement because the SBIR obligations as reportedto SBA were less than the minimum requirement. Based on the extramural R/R&D reported to SBA, DHA obligated3.03% instead of the required 3.2% for SBIR activities. DHA reported obligating .59% for STTR awards, which would exceed the minimum requirement. However, SBA cannot compare the extramural R/R&D reported to SBA against what was reported to the NCSES Survey because the NCSES Survey does not isolate DHA extramural funding. Therefore, SBA is unable to determine if DHA met the minimum STTR obligation requirement.

DHA explained:

> DHA's obligations for FY18 funding were spread across FY18 and FY19 due to the SBIR/STTR programs being RDTE funding, which is available to obligate for two years. To offset the typical Continuing Resolution, DHA reserves enough SBIR/STTR funding to cover new awards and increments/options for efforts that are due in the first quarter of the new fiscal year. Although this practice results in delayed obligations, it is necessary to avoid funding gaps for the small business concerns that may otherwise experience a financial hardship if the agency is unable to provide funding on time. In addition, this practice also mitigates delays in research for the ongoing SBIR/STTR projects, which could negatively impact the company's ability to transition innovative technologies to the Warfighter, or to commercialize technologies beneficial to the private sector.
>
> Delaying obligations of all FY funding creates a funding buffer to get DHA SBIR/STTR efforts through theCRs expected every year that can last from 1-6 months depending on the decisions of Congress.

CBD. CBD did not comply with the SBIR and STTR minimum spending requirements because the respective obligations as reported to SBA were less than the minimum requirements. Based on the extramural R/R&D reported to SBA, CBD obligated 2.64% for SBIR activities and 0.34% for STTR awards instead of the required 3.2% and .45%,respectively. The extramural R/R&D reported for the NCSES Survey was not significantly more than what was reported to SBA.

CBD reported $38,881,000 in exemptions. SBA does not have access to examine and validate the lines of funding which are being excluded.

SOCOM. SOCOM exceeded the minimum spending requirements with 5.08% obligated for SBIR activities and 1.37%obligated for STTR awards. The extramural R/R&D reported for the NCSES Survey was not significantly more thanwhat was reported to SBA.

SOCOM reported $70,709,000 in exemptions. Although SBA does not have access to examine and validate the linesof funding which are being excluded, the total SBIR and STTR obligations surpass the minimum requirements basedon the SOCOM total extramural R/R&D budget prior to such exemptions.

DTRA. DTRA exceeded the minimum spending requirements with 4.59% obligated for SBIR activities and 1.00% obligated for STTR awards. The extramural R/R&D reported for the NCSES Survey was not significantly more thanwhat was reported to SBA.

DTRA reported $9,321,000 in exemptions. Although SBA does not have access to examine and validate the lines of funding which are being excluded, the total SBIR and STTR obligations surpass the minimum requirements based onthe DTRA total extramural R/R&D budget prior to such exemptions.

DTRA explained:

> The extramural funding level reported in the FY 2018 NCSES Survey was higher due to the receiptof additional RDT&E funds from the FY 2018 Omnibus reprogramming in late September of FY 2018.

DLA/DMEA. DLA/DMEA exceeded the SBIR and STTR minimum spending requirements with 6.42% obligated forSBIR activities and .59% obligated for SBIR awards. The extramural R/R&D reported for the NCSES Survey was notsignificantly more than what was reported to SBA.

OSD. OSD did not comply with the SBIR or STTR minimum spending requirements because the SBIR and STTR obligations as reported to SBA were less than the minimum requirements. Based on the extramural R/R&D reported to SBA, OSD obligated .02% for SBIR activities and reported zero obligations for STTR awards instead of the required 3.2% and .45%, respectively. The extramural R/R&D reported for the NCSES Survey was not significantly more thanwhat was reported to SBA.

OSD explained:

> Since the majority of OSD funding in FY18 was distributed to other DoD Components for obligation, it is very likely that the majority of OSD's obligations were reported by those Components that received the funding. Further, OSD's obligations for FY18 funding were spread across FY18 and FY19 due to the SBIR/STTR programs being RDT&E funding, which is available to obligate for two years. To offset the typical Continuing Resolution, OSD reserves enough SBIR/STTR funding to cover new awards andincrements & options for efforts that are due in the first quarter of the new fiscal year. Although this practiceresults in delayed obligations, it is necessary to avoid funding gaps for the Small Business Concerns that mayotherwise experience a financial hardship if the agency is unable to provide funding on time. In addition, thispractice also mitigates delays in research for the ongoing SBIR/STTR projects, which could negatively impact the company's ability to transition innovative technologies to the Warfighter, or to commercialize technologies beneficial to the private sector. Delaying obligations of FY funding creates a funding buffer toget OSD SBIR/STTR efforts through the CR's, expected every year, that can last from 1-6 months dependingon the decisions of Congress.

NGA. The SBA cannot determine or validate whether the NGA met the minimum spending requirements for the SBIR/STTR program as they did not provide SBA with the statutorily required methodology report data. The Methodology Report provides details on the estimated extramural R/R&D budget and planned exemptions. These reports typically come from the DoD central SBIR/STTR office and are due to SBA within 4 months of the Presidentsigning the DoD's appropriation bill.

NGA explained:

> NGA is an intelligence organization and is exempt from mandatory participation. However, NGA participates voluntarily and uses the OSD budget to fund its topics. Therefore, the methodology report provided for the OSD budget covers any SBIR/STTR obligations made by NGA for FY18.

10 | Extramural Trend Data – 2014 to 2018

The following provides the Extramural and SBIR obligation trends for the "Big 5" agencies (DoD, HHS, DOE, NASA, and NSF) for years 2014 to 2018. Note that exemptions are allowed only under 15 U.S.C. § 638 for DoD and DOE. However, other agencies have been known to identify exceptions and/or exemptions basedon other legislation or the agency's interpretation of what constitutes an exception/exemption.

Table 24: Extramural Trend Analysis - DoD, HHS, DOE, NASA, and NSF

DoD							
FY	**Total Extramural R/R&D Reported to NSF NCSES**	**Total Extramural R/R&D Including Exemptions Reported to SBA ($)**	**$ Program Exemptions**	**$ Extramural R/R&D to Determine Set Aside**	**$ Obligated for SBIR Awards**	**% Obligated / Extramural**	**Min Spending REQ %**
2014	$43,865,600,000	N/P	N/P	$31,556,545,718	$1,056,795,663	3.35%	2.80%
2015	$41,333,700,000	$40,387,481,759	$6,676,078,000	$33,711,403,759	$956,913,114	2.84%	2.90%
2016	$46,970,400,000	$42,370,743,093	$5,668,210,000	$36,702,533,093	$981,839,347	2.68%	3.00%
2017	$44,831,000,000	N/P	N/P	N/P	$1,153,167,255	N/P	3.20%
2018	$57,711,800,000	$56,053,040,719	$7,111,336,035	$48,941,704,684	$1,166,299,964	2.38%	3.20%

HHS							
FY	**Total Extramural R/R&D Reported to NSF NCSES**	**Total Extramural R/R&D Including Exemptions Reported to SBA ($)**	**$ Program Exemptions**	**$ Extramural R/R&D to Determine Set Aside**	**$ Obligated for SBIR Awards**	**% Obligated / Extramural**	**Min Spending REQ %**
2014	$24,100,600,000	$24,096,641,379	$0	$24,096,641,379	$680,729,893	2.82%	2.80%
2015	$23,627,900,000	$24,244,452,788	$0	$24,244,452,788	$714,379,162	2.95%	2.90%
2016	$25,093,200,000	$25,859,796,811	$0	$25,859,796,811	$773,384,238	2.99%	3.00%
2017	$25,124,300,000	$27,455,557,340	$0	$27,455,557,340	$885,737,322	3.23%	3.20%
2018	$28,596,200,000	$29,317,202,304	$0	$29,317,202,304	$930,888,048	3.18%	3.20%

N/P – Not Provided

DOE

FY	Total Extramural R/R&D Reported to NSF NCSES	Total Extramural R/R&D Including Exemptions Reported to SBA ($)	$ Program Exemptions	$ Extramural R/R&D to Determine Set Aside	$ Obligated for SBIR Awards	% Obligated / Extramural	Min Spending REQ %
2014	$10,021,100,000	$9,976,752,234	$3,921,500,000	$6,055,252,234	$182,758,991	3.02%	2.80%
2015	$10,319,300,000	$11,699,955,601	$5,645,250,000	$6,054,705,601	$193,555,724	3.20%	2.90%
2016	$10,661,200,000	$11,982,292,000	$5,454,273,000	$6,528,019,000	$199,642,873	3.06%	3.00%
2017	$10,964,800,000	$12,190,508,000	$5,286,716,000	$6,903,792,000	$223,735,470	3.24%	3.20%
2018	$11,496,400,000	$12,803,283,038	$5,286,716,000	$7,516,567,038	$249,323,167	3.32%	3.20%

NASA

FY	Total Extramural R/R&D Reported to NSF NCSES	Total Extramural R/R&D Including Exemptions Reported to SBA ($)	$ Program Exemptions	$ Extramural R/R&D to Determine Set Aside	$ Obligated for SBIR Awards	% Obligated / Extramural	Min Spending REQ %
2014	$9,214,900,000	$4,742,000,000	$0	$4,742,000,000	$144,553,504	3.05%	2.80%
2015	$9,542,400,000	$4,960,320,000	$0	$4,960,320,000	$158,335,561	3.19%	2.90%
2016	$10,618,700,000	$6,036,000,000	$0	$6,036,000,000	$163,327,061	2.71%	3.00%
2017	$11,002,200,000	$3,590,595,217	$0	$3,590,595,217	$155,799,248	4.34%	3.20%
2018	$9,232,500,000	$4,647,180,884	$0	$4,647,180,884	$166,067,220	3.57%	3.20%

NSF

FY	Total Extramural R/R&D Reported to NSF NCSES	Total Extramural R/R&D Including Exemptions Reported to SBA ($)	$ Program Exemptions	$ Extramural R/R&D to Determine Set Aside	$ Obligated for SBIR Awards	% Obligated / Extramural	Min Spending REQ %
2014	$5,316,800,000	$4,688,000,000	$0	$4,688,000,000	$140,066,833	2.99%	2.80%
2015	$5,579,900,000	$5,367,000,000	$0	$5,367,000,000	$147,733,251	2.75%	2.90%
2016	$5,490,000,000	$5,444,000,000	$0	$5,444,000,000	$161,577,024	2.97%	3.00%
2017	$5,549,200,000	$5,440,330,000	$0	$5,440,330,000	$174,463,775	3.21%	3.20%
2018	$5,836,200,000	$5,588,420,000	$0	$5,588,420,000	$184,752,161	3.31%	3.20%

11 | Awards Exceeding Guideline Amounts

The Small Business Act set guideline award amounts for Phase I awards at $150,000 and Phase II awards at $1 million. Participating Agencies with smaller budgets have traditionally chosen to solicit for award sizes at or less than the guideline amounts, with the rationale that it allows them to issue a larger number of awards to reach a wider range ofviable solutions to R&D needs. Agencies with larger budgets tend to make more awards that exceed the guideline amounts with the rationale that in some cases larger award sizes are needed when dealing with capital intensive research projects, while the larger SBIR/STTR budgets still allow the agency to fund a sufficiently wide range of proposals within the guideline thresholds. A Participating Agency may, at its discretion, exceed the guideline amounts by up to 50%,making the effective maximum award amounts $225,000 for a Phase I award and $1.5 million for Phase II awards. These amounts are adjusted every year for inflation. During the FY18 reporting year, agencies could issue a Phase I award up to $252,131 and a Phase II award up to $1,680,879 without seeking SBA approval. Any award above those levels required a waiver from SBA. Only DoD, HHS, and DOE made awards above these levels in FY18.

Table 25: Awards Exceeding Guideline Amounts by More Than 50%

Awards Amounts by	Exceeding	Guideline	More Than	50% (FY18)
Program	Phase	DoD	HHS	DOE
SBIR	Phase I	1,106	931	350
	Phase I Exceeding	2 / 0.2%	333 / 36%	0 / 0%
	Phase II	820	370	174
	Phase II Exceeding	13 / 1.6%	114 / 31%	2 / 1%
STTR	Phase I	192	237	58
	Phase I Exceeding	0 / 0%	86 / 36%	0 / 0%
	Phase II	133	37	20
	Phase II Exceeding	1 / 0.8%	0 / 0%	0 / 0%
($252,131 for Phase I, $1,680,879 for Phase II) *includes FY18 obligations on prior year awards				

The Small Business Act permits Participating Agencies to request a waiver from the SBA for certain awards to exceed the cap. The SBA established inSection 7(i)(4) of the SBIR/STTR PolicyDirectives that an agency making such a request must provide the SBA with: 1) evidence that the limitations on awardsize interfere with the ability of the agency to fulfill its R&D mission; 2) evidence that the agency will minimize, to the maximum extent practicable, the number of awards that exceed the cap forthe topic area; and, 3) evidence that research costs for the topic area differ significantly from those in other areas to warrant going over the cap. Agencies must report to SBA any such awards made, to include the identity and location of each awardee.

For FY18, NIH requested, and the SBA approved, waivers granting NIH authority to solicit and make awards over the cap for specific biomedical-related research topics that often require funding levels above the statutory guidelines. The SBA approved NIH's waiver request under the condition that NIH would monitor and report to the SBA any awards exceeding a Phase I or Phase II cap. DoD requested, and the SBA approved, waivers for awards exceeding thecap on a project-by-project basis.

HHS. HHS' justification for awards exceeding guideline amounts is that the length of time and cost of research involving development and evaluation of certain biomedical technologies exceeds that routinely awarded for SBIR/STTR awards.

HHS explained:

> In order for NIH to leverage the SBIR/STTR Programs to improve health and save lives, projects must be funded at a level which is typically over the statutory guidelines because:
> - The cost of early-stage research in the biomedical and behavioral arenas is in many cases above the statutory guidelines and higher than most other research and development research areas.
> - Biomedical SBIR/STTR projects need to reach a stage of development sufficient to attract third party funding and partnerships in order to continue along the commercialization path. Reaching market access can take years and possibly tens/hundreds of millions of dollars after the SBIR/STTR Phase.

- Biomedical products require extensive pre-clinical research and development to facilitate regulatoryfilings, testing, and approval.

Lack of sustained funding for a Phase I, II, or IIB SBIR/STTR project could cause projects to fail and not reach the healthcare marketplace due to any one or more of the above. As a consequence, NIH would not be able to fulfill its mission and could not bring life-saving and life-changing technologies to the market.

DoD. For awards that exceeded guidelines by more than 50%, the DoD stated that "the contract cost is reasonable and necessary to ensure the performance of a quality investigation of the proposed idea".

DOE. DOE requested and received approval from SBA to exceed the Phase II award amounts for the Development of Light Source X-Ray Detectors and Spectrometers for Advanced Materials Research Techniques topic. The topic would allow Phase II awards up to $5 million.

12 | SBIR/STTR Proposal Selection Rates

Proposal selection rates are the number of awards made divided by the total number of proposals received. The SBA monitors the selection rates for Phase I Awards and Phase II Awards.

SBIR Program

In FY18, small businesses submitted a total of 19,197 SBIR Phase I proposals across the eleven Participating Agencies. Agencies made 3,135 new Phase I awards, resulting in an average Phase I proposal selection rate of 16%. Agencies received 3,114 SBIR Phase II proposals and selected 1,703 new Phase II awards, resulting in an average Phase II selection rate of 55%. For a topic that received only one proposal, DOC (2), DoD (1), DOE (10), and NASA (1) made Phase I awards.

Chart 15: SBIR Phase I Proposal Selection

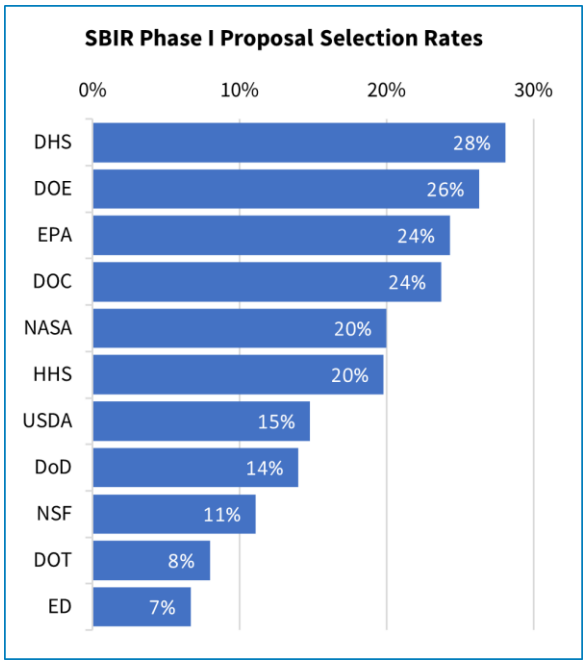
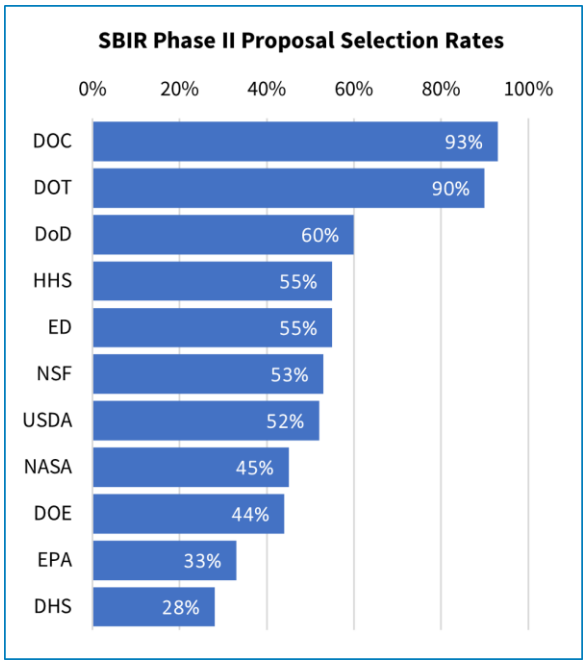


Chart 16: SBIR Phase II Proposal Selection Rates



STTR Program

In FY18, small businesses submitted a total of 2,998 STTR Phase I proposals to the five Participating Agencies. Agencies selected 568 new Phase I awards, resulting in an average Phase I proposal selection rate of 19%. Agencies received 476 Phase II proposals and selected 224 new Phase II awards, resulting in an average Phase II proposal selection rate of 47%. DOE (1) and NASA (1) each made a Phase I award for a topic that received a single proposal.

Chart 17: STTR Phase I Proposal Selection Rates

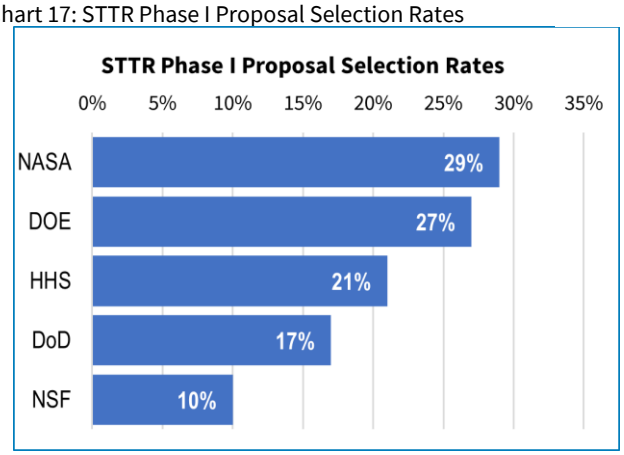
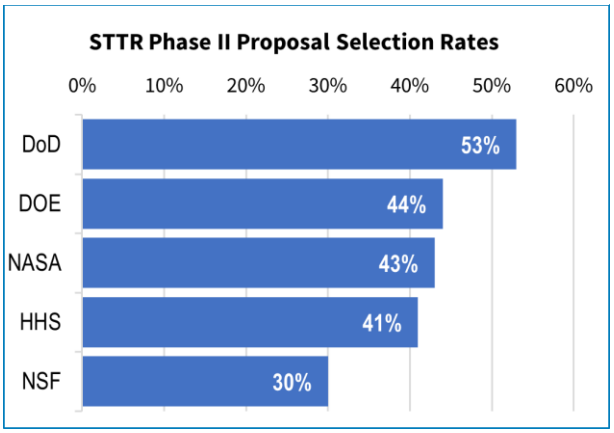


Chart 18: STTR Phase II Proposal Selection Rates



Awards to Multiple Award Winners

Table 18 that follows the text below covers Phase IIs made to companies which received more than 15 Phase IIs during the preceding 5 fiscal years. The table then covers the amount of FY18 Phase I awards that these companies had received.

FY13 - FY17 Phase II Awards

In the preceding 5 fiscal years (FY13 - FY17), the 11 Participating Agencies selected 3,849 companies to receive a Phase II award. 46 (1%) companies received more than 15 Phase II awards during the period. Although these 46 companies represent a small percentage of the unique firms that received a Phase II, they represent 1,491 (16%) of the9,177 overall Phase II awards for FY13-FY17. Aside from the NSF and ED, every Participating Agency made at leastone Phase II during the five-year period to a company with greater than 15 Phase IIs.

Of the 1,491 Phase II awards won by these 46 companies, 1,123 (75%) of them were awarded by DoD with each of the 46 firms winning at least one Phase II from DoD during this period. The 1,123 DoD awards to the 46 companies represents 25% of the total number of Phase II awards (4,578) made by DoD during the 5-year FY13-FY17 period.

These companies accounted for 27% of DHS Phase II awards, representing the largest share of any single agency.

FY18 Phase I Awards

For FY18, the 11 Participating Agencies selected 2,385 companies to receive a Phase I award. Among the 46 companies with more than 15 Phase II awards from FY13-FY17, 45 received a Phase I award. These 45 companies received 535 (14%) of the total 3,703 Phase I awards. Aside from the NSF and ED, every Participating Agency made at least one FY18 Phase I award to a company with greater than 15 Phase IIs from FY13-FY17.

Forty-three (43) out of the 46 multiple award firms were selected for Phase I by the DoD, representing 93% of all companies DoD selected for a Phase I. These 43 companies received 370 (29%) of the DoD's total Phase I awards (1,297). The 370 Phase I awards from DoD accounts for 69% of all awards (535) the 46 companies won from the Participating Agencies.

DOT had the highest percentage (29%) of companies that received more than 15 Phase II SBIR awards. These companies accounted for 33% of their Phase I awards.

Table 26: Phase IIs Made to Small Business Concerns Which Received More Than 15 Phase IIs during the Preceding 5 Fiscal Years - Participating Agencies

FY13-FY17 Phase II Awards – Companies												
	DoD	HHS	NSF	NASA	DOE	USDA	DHS	DOC	ED	DOT	EPA	Total
Number of Companies with a Phase II Award	1,603	1,283	546	375	425	125	69	74	32	44	39	3,849
At Least One Phase II to Companies with >15 Phase IIs (FY13-17)	46	15	0	29	22	5	14	5	0	6	2	46
Percent of Phase IIs to Companies with >15 Phase IIs (FY13-17)	3%	1%	0%	8%	5%	4%	20%	7%	0%	14%	5%	1%

FY13-FY17 Phase II Awards – Awards												
	DoD	HHS	NSF	NASA	DOE	USDA	DHS	DOC	ED	DOT	EPA	Total
Total Phase II Awards	4,578	2,078	562	700	797	142	102	81	37	61	39	9,177
Phase II Awards to Companies with >15 Phase IIs (FY13-17)	1,123	65	0	120	123	7	28	9	0	14	2	1,491
Percent of Phase II to Companies with >15 Phase IIs	25%	3%	0%	17%	15%	5%	27%	11%	0%	23%	5%	16%

FY18 Phase I Awards – Companies												
	DoD	HHS	NSF	NASA	DOE	USDA	DHS	DOC	ED	DOT	EPA	Total
Number of Companies with a Phase I Award	686	935	322	259	292	75	39	24	16	14	15	2,385
At Least One Phase I to Companies with >15 Phase IIs (FY3-17)	43	13	0	22	18	5	4	6	0	4	1	45
Percent of Phase I Awards to Companies with >15 Phase IIs (FY13-17)	6%	1%	0%	8%	6%	7%	10%	25%	0%	29%	7%	2%

Phase I Awards – Awards for FY18												
	DoD	HHS	NSF	NASA	DOE	USDA	DHS	DOC	ED	DOT	EPA	Total
Total Phase I Awards	1,297	1168	408	345	292	79	25	42	15	15	17	1,297
Phase I Awards to Companies with >15 Phase IIs (FY13-17)	370	33	0	51	55	6	5	8	0	5	1	370
Percent of Phase I Awards to Companies with >15 Phase IIs (FY13-17)	29%	3%	0%	15%	19%	8%	20%	19%	0%	33%	6%	14%

13 | SBIR/STTR Awards by U.S. State & Territory

The SBA has noted that more SBIR/STTR funding goes to states with the largest populations and those that have a record of receiving substantial R&D funding from Federal programs outside of the SBIR and STTR Programs. For SBIR and STTR funding approximately 65% of total FY18 SBIR award dollars and 59% of total FY18 STTR award dollars were concentrated in California, Massachusetts, Virginia, Maryland, Colorado, Pennsylvania, New York, Ohio, and Texas.

The SBA and Participating Agencies have worked to coordinate outreach efforts and tap into the innovation pipelines within the most underrepresented regions. Key outreach contacts have been identified within these states (and all states and territories) to include economic development agencies, universities, accelerators, and state or local small business service providers, to foster cross-collaboration, increase small business awareness, and encourage future participation in the SBIR/STTR Programs.

The FY18 SBA Road Tour, which included in-person events, coordinated by SBA and featuring the majority of the Participating Agencies, visited Tennessee, Alabama, Arkansas, Mississippi, Louisiana, New York, Pennsylvania, Ohio, West Virginia, North Carolina, Oregon, Washington, Alaska, Delaware, Connecticut, Rhode Island, New Hampshire, and Maine to increase program participation in underrepresented states and among underrepresented populations.

Table 19 on the following page shows the total dollar amount and number of SBIR and STTR Phase I and Phase II awards across the U.S. This data is also publicly available on a searchable database at www.SBIR.gov and remains current to include subsequent funding of ongoing projects.

Table 27: SBIR/STTR Awards by U.S. State and Territory

State	SBIR Phase I		STTR Phase I		SBIR Phase II		STTR Phase II		SBIR Total Awards		STTR Total Awards		SBIR/STTR Total Awards	
	(#)	($)	(#)	($)	(#)	($)	(#)	($)	(#)	($)	(#)	($)	(#)	($)
AK	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
AL	42	$6,136,525	12	$2,442,765	38	$40,167,096	10	$9,349,645	80	$46,303,621	22	$11,792,409	102	$58,096,030
AR	11	$1,846,034	1	$300,000	3	$5,821,182	0	$0	14	$7,667,216	1	$300,000	15	$7,967,216
AS	0	$0	1	$149,498	0	$0	0	$0	0	$0	1	$149,498	1	$149,498
AZ	0	$0	12	$3,074,381	37	$34,275,265	2	$2,301,999	37	$34,275,265	14	$5,376,380	51	$39,651,645
CA	660	$126,011,010	70	$14,636,055	338	$456,626,681	34	$37,230,785	998	$582,637,691	104	$51,866,840	1102	$634,504,531
CO	139	$23,719,266	26	$4,428,168	95	$98,931,343	13	$16,790,818	234	$122,650,609	39	$21,218,986	273	$143,869,595
CT	43	$7,417,796	8	$2,132,069	17	$21,469,878	1	$2,683,404	60	$28,887,674	9	$4,815,473	69	$33,703,147
DC	12	$2,587,011	3	$458,057	4	$6,626,244	1	$774,407	16	$9,213,255	4	$1,232,464	20	$10,445,719
DE	22	$3,678,232	5	$928,293	10	$15,570,111	4	$3,510,715	32	$19,248,343	9	$4,439,008	41	$23,687,351
FL	106	$17,351,001	18	$3,648,204	42	$54,793,328	11	$8,800,266	148	$72,144,329	29	$12,448,470	177	$84,592,799
GA	27	$6,327,487	6	$1,100,979	21	$30,683,620	4	$3,974,917	48	$37,011,107	10	$5,075,896	58	$42,087,003
HI	13	$2,713,665	3	$421,000	14	$21,089,943	2	$1,125,000	27	$23,803,608	5	$1,546,000	32	$25,349,608
IA	16	$3,214,034	3	$524,504	4	$5,619,344	0	$0	20	$8,833,378	3	$524,504	23	$9,357,882
ID	5	$599,054	1	$124,940	1	$1,750,314	0	$0	6	$2,349,368	1	$124,940	7	$2,474,308
IL	69	$13,421,354	15	$3,509,547	37	$44,658,210	6	$7,972,077	106	$58,079,564	21	$11,481,624	127	$69,561,188
IN	24	$4,279,688	9	$2,041,409	12	$14,775,603	2	$2,489,526	36	$19,055,291	11	$4,530,935	47	$23,586,226
KS	16	$3,121,968	3	$674,094	3	$2,866,568	0	$0	19	$5,988,536	3	$674,094	22	$6,662,630
KY	26	$5,559,109	7	$1,860,717	9	$14,050,790	0	$0	35	$19,609,899	7	$1,860,717	42	$21,470,616
LA	9	$1,570,781	3	$574,645	8	$5,623,849	0	$0	17	$7,194,630	3	$574,645	20	$7,769,275
MA	325	$68,324,775	51	$11,096,219	201	$253,812,299	22	$20,920,455	526	$322,137,074	73	$32,016,674	599	$354,153,748
MD	173	$39,162,889	20	$4,256,085	74	$93,766,626	9	$12,971,546	247	$132,929,515	29	$17,227,631	276	$150,157,146
ME	6	$1,449,632	1	$303,381	2	$2,187,865	0	$0	8	$3,637,497	1	$303,381	9	$3,940,878
MI	70	$13,021,221	16	$3,738,484	35	$47,640,700	5	$4,630,574	105	$60,661,921	21	$8,369,058	126	$69,030,979
MN	42	$7,205,491	7	$1,625,129	25	$29,382,994	5	$5,634,581	67	$36,588,485	12	$7,259,710	79	$43,848,195
MO	35	$8,002,414	13	$2,832,263	9	$14,076,322	3	$2,352,344	44	$22,078,736	16	$5,184,607	60	$27,263,343

State	SBIR Phase I		STTR Phase I		SBIR Phase II		STTR Phase II		SBIR Total Awards		STTR Total Awards		SBIR/STTR Total Awards	
MS	2	$324,317	1	$180,830	3	$2,176,395	0	$0	5	$2,500,712	1	$180,830	6	$2,681,542
MT	18	$3,285,735	5	$999,076	9	$7,526,967	0	$0	27	$10,812,702	5	$999,076	32	$11,811,778
NC	112	$24,139,354	21	$5,278,939	46	$62,642,224	3	$6,320,402	158	$86,781,578	24	$11,599,341	182	$98,380,919
ND	1	$94,172	0	$0	0	$0	0	$0	1	$94,172	0	$0	1	$94,172
NE	3	$726,614	0	$0	4	$4,657,583	0	$0	7	$5,384,197	0	$0	7	$5,384,197
NH	58	$9,842,503	7	$2,170,980	25	$29,464,639	5	$4,626,330	83	$39,307,142	12	$6,797,310	95	$46,104,452
NJ	68	$11,490,637	6	$1,174,524	18	$27,398,084	9	$9,520,803	86	$38,888,721	15	$10,695,327	101	$49,584,048
NM	38	$6,079,266	6	$999,597	22	$30,535,484	4	$4,888,758	60	$36,614,750	10	$5,888,355	70	$42,503,105
NV	4	$590,181	2	$375,000	2	$2,581,195	0	$0	6	$3,171,376	2	$375,000	8	$3,546,376
NY	136	$26,646,356	31	$7,272,468	67	$88,382,464	9	$10,773,988	203	$115,028,820	40	$18,046,456	243	$133,075,276
OH	118	$19,199,236	28	$4,891,127	76	$86,582,773	10	$11,781,294	194	$105,782,009	38	$16,672,421	232	$122,454,430
OK	9	$1,522,162	2	$449,268	5	$5,574,156	0	$0	14	$7,096,318	2	$449,268	16	$7,545,586
OR	25	$5,667,000	3	$574,659.	35	$37,373,511	0	$0	60	$43,040,511	3	$574,659	63	$43,615,170
PA	125	$23,543,897	28	$6,496,934	74	$93,634,883	10	$10,101,195	199	$117,178,780	38	$16,598,129	237	$133,776,909
PR	4	$1,438,241	0	$0	0	$0	0	$0	4	$1,438,241	0	$0	4	$1,438,241
RI	14	$2,742,835	2	$372,811	3	$8,035,155	0	$0	17	$10,777,990	2	$372,811	19	$11,150,801
SC	14	$2,261,241	6	$2,485,822	3	$5,934,809	1	$984,129	17	$8,196,050	7	$3,469,951	24	$11,666,001
SD	5	$744,097	0	$0	2	$3,174,798	0	$0	7	$3,918,895	0	$0	7	$3,918,895
TN	21	$3,642,056	5	$1,123,436	10	$12,814,510	3	$5,123,868	31	$16,456,566	8	$6,247,304	39	$22,703,870
TX	130	$26,215,359	41	$8,567,960	67	$75,977,552	13	$13,212,051	197	$102,192,911	54	$21,780,011	251	$123,972,922
UT	34	$5,859,535	8	$1,871,509	23	$27,414,638	7	$8,179,655	57	$33,274,173	15	$10,051,164	72	$43,325,337
VA	154	$27,133,175	29	$5,089,662	117	$136,840,148	14	$17,628,357	271	$163,973,323	43	$22,718,018	314	$186,691,341
VT	7	$1,761,191	2	$494,449	4	$5,742,718	0	$0	11	$7,503,909	2	$494,449	13	$7,998,358
WA	55	$11,351,680	14	$3,275,098	32	$42,755,601	0	$0	87	$54,107,281	14	$3,275,098	101	$57,382,379
WI	32	$8,059,920	6	$1,538,006	11	$12,965,050	2	$2,843,265	43	$21,024,970	8	$4,381,271	51	$25,406,241
WV	5	$709,971	0	$0	4	$3,640,627	0	$0	9	$4,350,598	0	$0	9	$4,350,598
WY	7	$1,037,539	1	$150,000	2	$2,561,603	0	$0	9	$3,599,142	1	$150,000	10	$3,749,142

The number of awards are only for new awards during FY18. The dollars obligated includes funding for both new and prior year awards. Agencies have the ability to update the number and dollar amounts for awards so this may be updated on SBIR.gov. The data represented in this table reflects a snapshot in time.

14 | SBIR/STTR Award Timelines

The SBIR/STTR provisions in the SBIR/STTR Reauthorization Act of 2011 focused on reducing the gaps in the time between the close of the solicitation, the notification of award, and the performance start date. The Policy Directive prescribed the duration between the closing date of the solicitation and the notification of recommendation of award to be not more than one year for NIH or NSF; and not more than 90 calendar days for all other agencies. The Policy Directive also prescribed the duration between the closing date of the solicitation and the first date of the period of performance on the funding agreement as not more than 15 months for NIH and NSF; and not more than 180 calendardays for all other agencies. The data in this section originates from the proposal notification and award timeline data the Participating Agencies uploaded to SBA. Though the agencies validated the data, SBA identified some agencies provided incomplete timeline information and others provided timeline data which included errors. SBA will continueworking closely with the 11 Participating Agencies on improving the accuracy of all reported data.

Civilian Participating Agencies SBIR Timelines

NASA, NSF, ED, and DOC reported 100% of Phase I SBIR awards were issued within the required timeline, while ED and DOC reported 100% of Phase II SBIR awards were issued within the required timeline.

Table 28: SBIR Award Timelines - Civilian Agencies

SBIR TIMELINES*	HHS	DOE	NASA	NSF	USDA	DHS	ED	DOC	DOT	EPA
Average time between Phase I Solicitation Close and Award Notification (days)	199	84	77	194	166	71	80	82	104	183
Average time between Phase I Notification and First Day of Period of Performance (days)	60	45	63	7	129	34	8	69	70	103
Percentage of Phase I Awards where the time between Solicitation Close and Notification was less than or equal to 90 days (1 year for HHS and NSF only)	97%	99%	100%	100%	0%	0%	100%	100%	0%	0%
Percentage of Phase I Awards where time between Solicitation Close and First Day of Performance was less than or equal to 180 days (15 months for HHS and NSF only)	96%	98%	100%	100%	0%	80%	100%	100%	100%	0%
Average time between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance (days)	220	164	155	267	183	199	190	169	175	271
Average time between Phase II Solicitation Close Date, or Proposal Receipt Date, and Award Notification Date (days)	198	78	94	190	97	55	84	71	62	93
Average time between Phase II Notification Date and First Day of Period of Performance (days)	63	51	62	1	81	130	0	45	77	87
Percentage of Phase II Awards where time between Solicitation Close, or Proposal Receipt, and Notification Date was less than or equal to 90 days (<=1 year for HHS and NSF only)	97%	97%	88%	99%	0%	100%	100%	100%	100%	0%
Percentage of Phase II Awards where time between Solicitation Close, or Proposal Receipt, and First Day of Performance was less than or equal to 180 days (<=15 months for HHS and NSF only)	94%	94%	81%	100%	29%	56%	100%	100%	78%	100%

*HHS and DOE Phase II timelines also include Fast-Track projects that use the Phase I Solicitation Close Date when the Fast-Track proposal was submitted, which can increase the average Phase II timelines.

Chart 19: SBIR Average Time Between Phase I Solicitation Close and Award Notification – Civilian

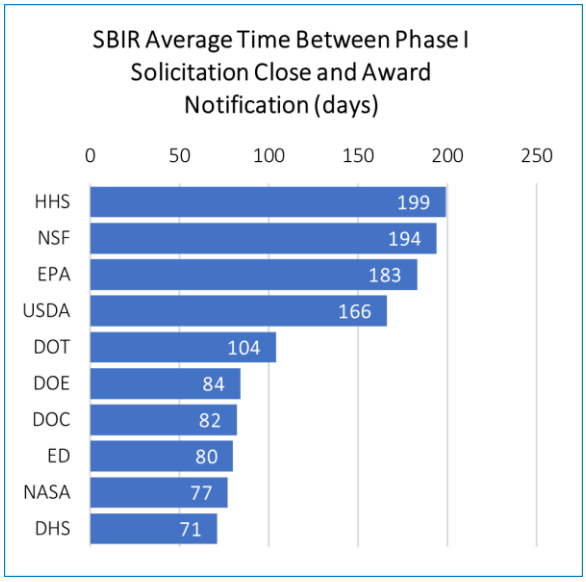


Chart 20: SBIR Average Time Between Phase II Solicitation Close and Award Notification - Civilian

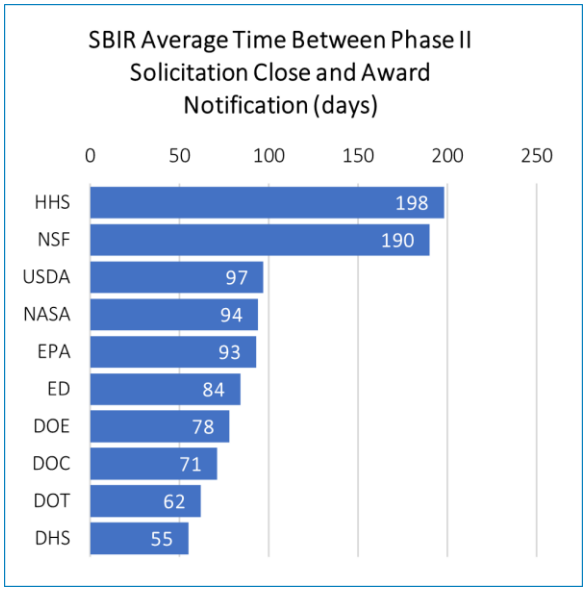


Chart 21: SBIR Average Time Between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance – Civilian Agencies

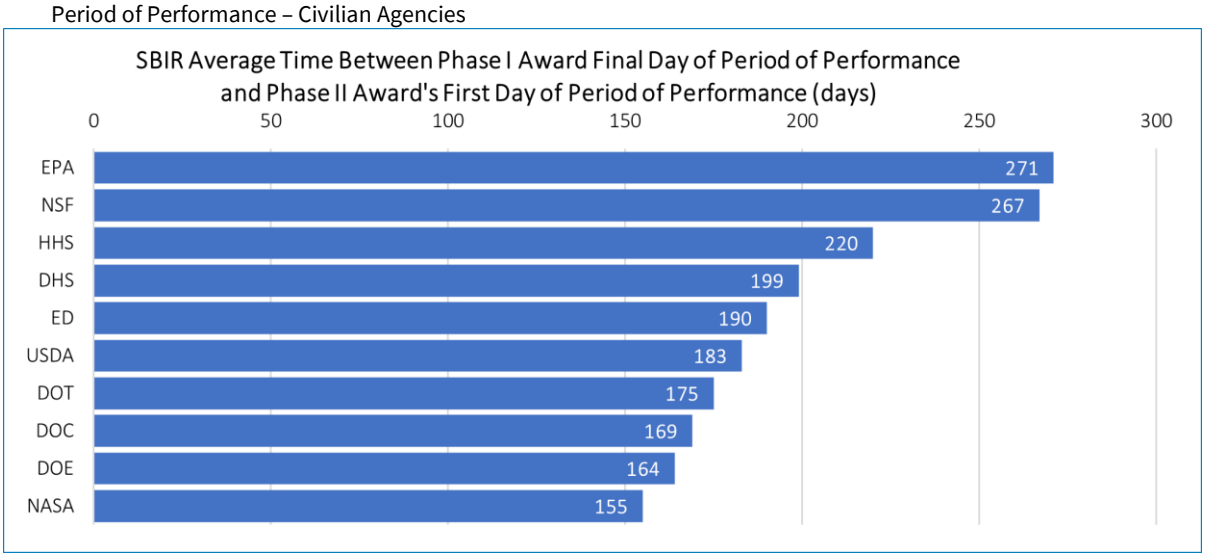


Table 21 below shows how DoD Service Agencies and Other Defense Agencies performed on the SBIR program during FY18. Navy, Air Force, and Other Defense Agencies reported Phase I SBIR awards were issued within the required timeline. The Policy Directive prescribes the duration between the closing date of the solicitation and the notification of recommendation of award of no more than 90 calendar days.

Table 29: SBIR Award Timelines - DoD Service Agencies and Other Defense Agencies

SBIR TIMELINES	Navy	Air Force	Army	ODAs	DoD Total
Average time between Phase I Solicitation Close and Award Notification (days)	70	79	91	80	78
Average time between Phase I Notification and First Day of Period of Performance (days)	54	89	131	91	89
Percentage of Phase I Awards where the time between Solicitation Close and Notification was less than or equal to 90 days	91%	40%	24%	65%	66%
Percentage of Phase I Awards where time between Solicitation Close and First Day of Performance was less than or equal to 180 days	89%	63%	35%	65%	67%
Average time between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance (days)	159	205	159	205	183
Average time between Phase II Solicitation Close Date, or Proposal Receipt Date, and Award Notification Date (days)	75	86	71	74	75
Average time between Phase II Notification Date and First Day of Period of Performance (days)	133	106	217	153	151
Percentage of Phase II Awards where time between Solicitation Close, or Proposal Receipt, and Notification Date was less than or equal to 90 days	66%	61%	97%	76%	76%
Percentage of Phase II Awards where time between Solicitation Close, or Proposal Receipt, and First Day of Performance was less than or equal to 180 days	46%	51%	17%	38%	39%

For Phase I notifications, the Navy met this timeline requirement for 91% of its awards, the Other Defense Agencies 65%, the Army 24%, and the Air Force 40%.

The following FY18 charts are organized by DoD Service Agencies and Other Defense Agencies and contrast the performance on Phase I and Phase II SBIR proposals.

Chart 22: SBIR Average Time Between Phase I Solicitation Close and Award Notification – DoD Service Agencies and Other Defense Agencies

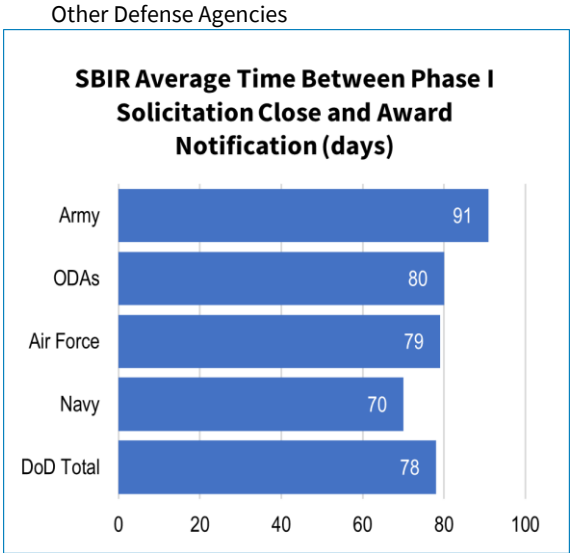


Chart 23: SBIR Average Time Between Phase II Close and Award Notification – DoD Service Agencies and Other Defense Agencies

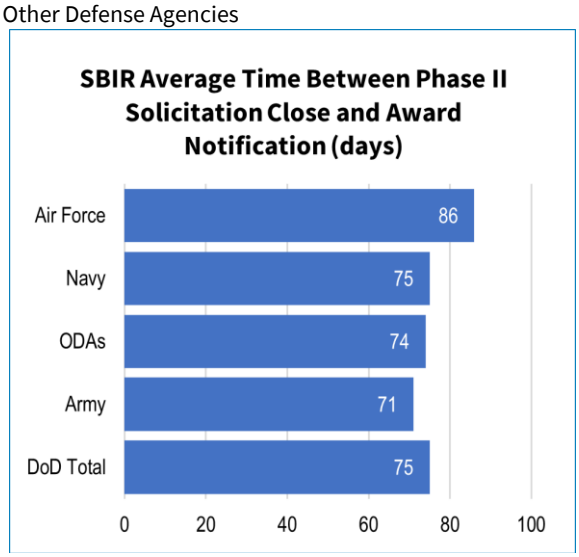
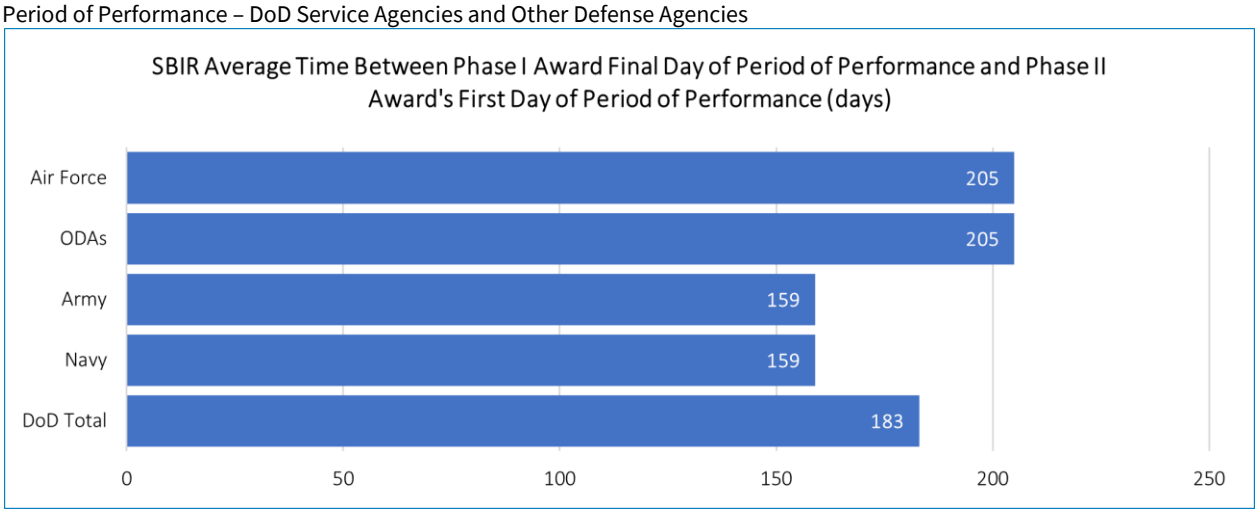


Chart 24: SBIR Average Time Between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance – DoD Service Agencies and Other Defense Agencies



Civilian Participating Agencies STTR Timelines

DOE and NSF reported 100% of Phase I STTR and Phase II STTR awards were issued within the required timeline. NASA reported 100% of Phase I and 83% of Phase II STTR awards were issued within the required timeline. HHS reported 99% of Phase I and 94% of Phase II STTR awards were issued within the required timeline.

Table 30: STTR Award Timelines - Civilian Agencies

STTR Award Timelines	HHS	DOE	NASA	NSF
Average time between Phase I Solicitation Close and Award Notification (days)	210	84	77	195
Av Average time between Phase I Notification and First Day of Period of Performance (days)	52	42	63	9
Percentage of Phase I Awards where the time between Solicitation Close and Notification was less than or equal to 90 days (1 year for HHS and NSF only)	99%	100%	100%	100%
Percentage of Phase I Awards where time between Solicitation Close and First Day of Performance was less than or equal to 180 days (15 months for HHS and NSF only)	98%	100%	100%	100%
Average time between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance (days)	222	169	164	371
Average time between Phase II Solicitation Close Date, or Proposal Receipt Date, and Award Notification Date (days)	199	76	184	190
Average time between Phase II Notification Date and First Day of Period of Performance (days)	47	42	51	3
Percentage of Phase II Awards where time between Solicitation Close or Proposal Receipt and Notification Date was less than or equal to 90 days (1 year for HHS and NSF only)	94%	100%	83%	100%
Percentage of Phase II Awards where time between Solicitation Close or Proposal Receipt and First Day of Performance was less than or equal to 180 days (450 days or 15 months for HHS and NSF only)	97%	100%	83%	100%

Chart 25: STTR Average Time Between Phase I Solicitation Close to Award Notification - Civilian Agencies

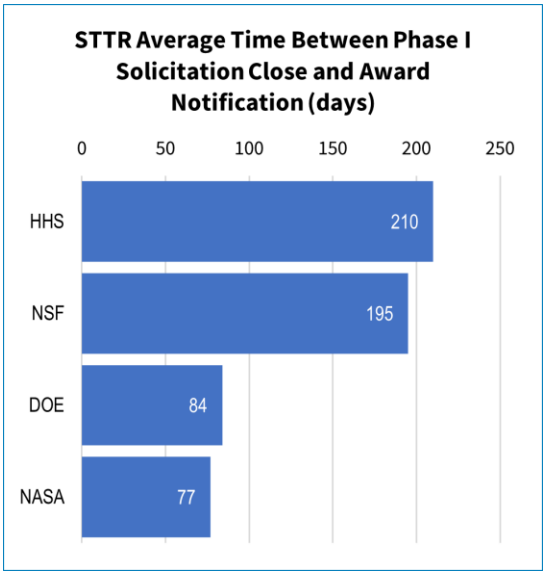


Chart 26: STTR Average Time Between Phase II Solicitation Close to Award Notification - Civilian Agencies

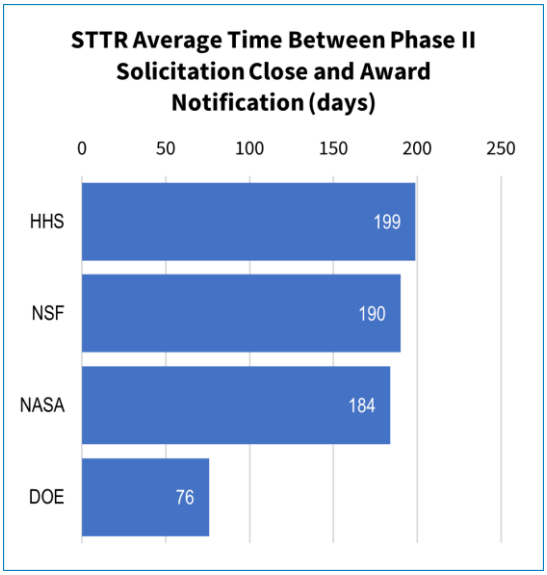
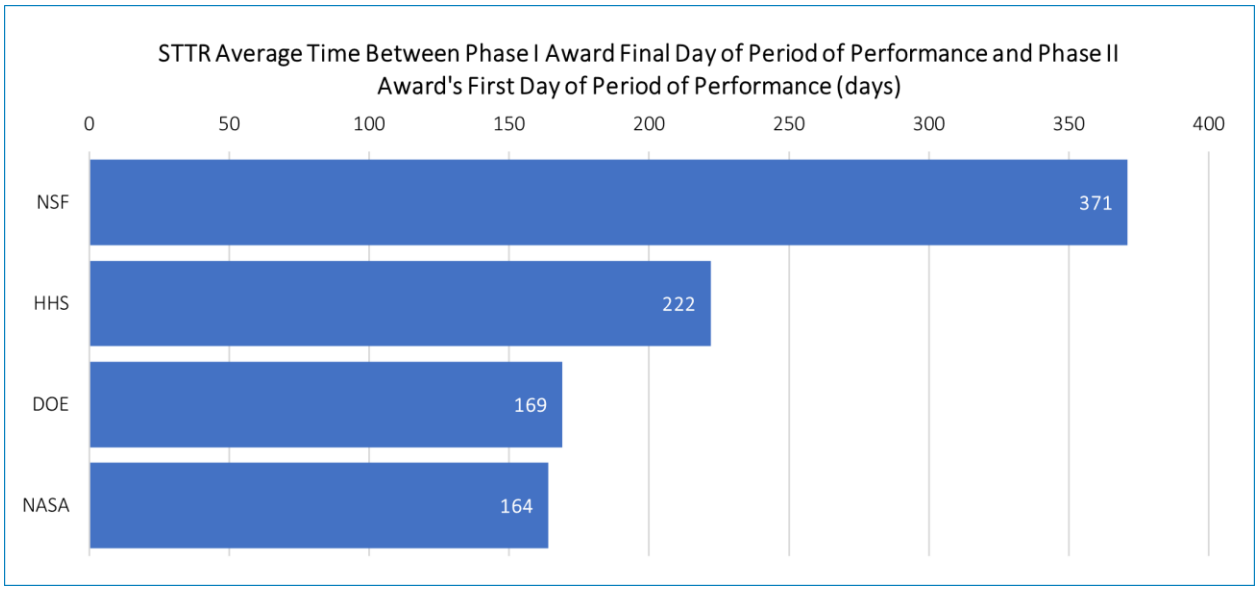


Chart 27: STTR Average Time Between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance



DoD Service Agencies and Other Defense Agencies STTR Timelines

Table 23 below shows how DoD Service Agencies and Other Defense Agencies (ODAs) performed during FY18 in the STTR program. The Policy Directive prescribes the duration between the closing date of the solicitation and the notification of recommendation of award of no more than 90 calendar days.

Table 31: STTR Award Timelines - DoD Service Agencies and Other Defense Agencies

STTR Award Timelines	Navy	Air Force	Army	ODAs	DoD Total
Average time between Phase I Solicitation Close and Award Notification (days)	66	63	91	68	68
Average time between Phase I Notification and First Day of Period of Performance (days)	59	116	56	91	89
Percentage of Phase I Awards where the time between Solicitation Close and Notification was less than or equal to 90 days	100%	62%	0%	84%	83%
Percentage of Phase I Awards where time between Solicitation Close and First Day of Performance was less than or equal to 180 days	85%	45%	100%	64%	63%
Average time between Phase I Award Final Day of Period of Performance and Phase II Award's First Day of Period of Performance (days)	444	223	243	253	277
Average time between Phase II Solicitation Close Date, or Proposal Receipt Date, and Award Notification Date (days)	108	94	142	99	89
Average time between Phase II Notification Date and First Day of Period of Performance (days)	143	176	121	154	150
Percentage of Phase II Awards where time between Solicitation Close or Proposal Receipt and Notification Date was less than or equal to 90 days	47%	44%	24%	53%	53%
Percentage of Phase II Awards where time between Solicitation Close or Proposal Receipt and First Day of Performance was less than or equal to 180 days	44%	37%	52%	41%	43%

For Phase I notifications, the Navy met this timeline requirement for 100% of its awards, the Other Defense Agencies 84%, the Army 0%, and the Air Force 62%.

The following FY18 charts are organized by DoD Service Agencies and Other Defense Agencies and contrast the performance on Phase I and Phase II STTR proposals.

Chart 28: STTR Average Time Between Phase I Solicitation Close and Award Notification - DoD Service Agencies and Other Defense Agencies

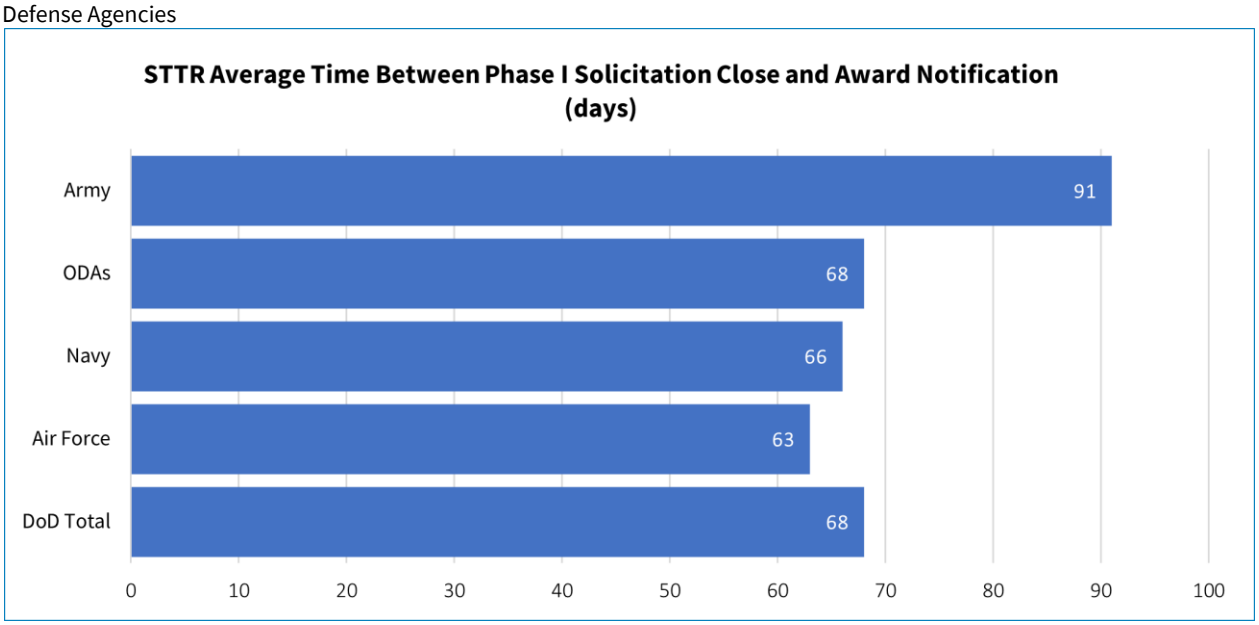


Chart 29: Average Time Between Phase II Solicitation Close and Award Notification - DoD Service Agencies and Other Defense Agencies

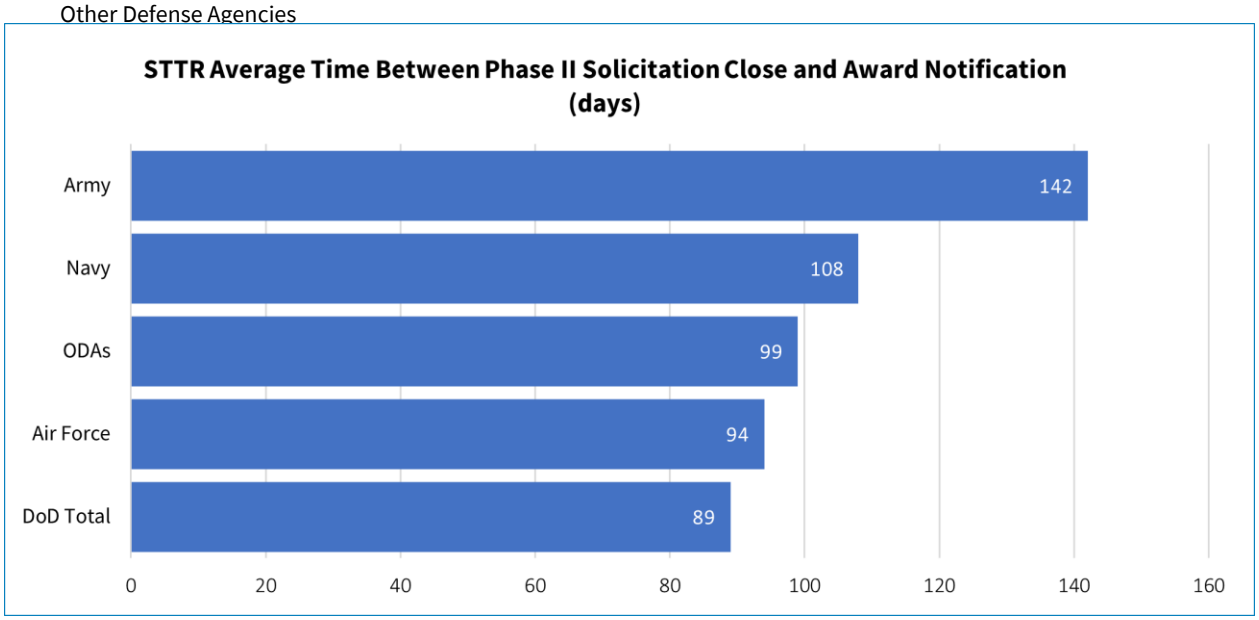
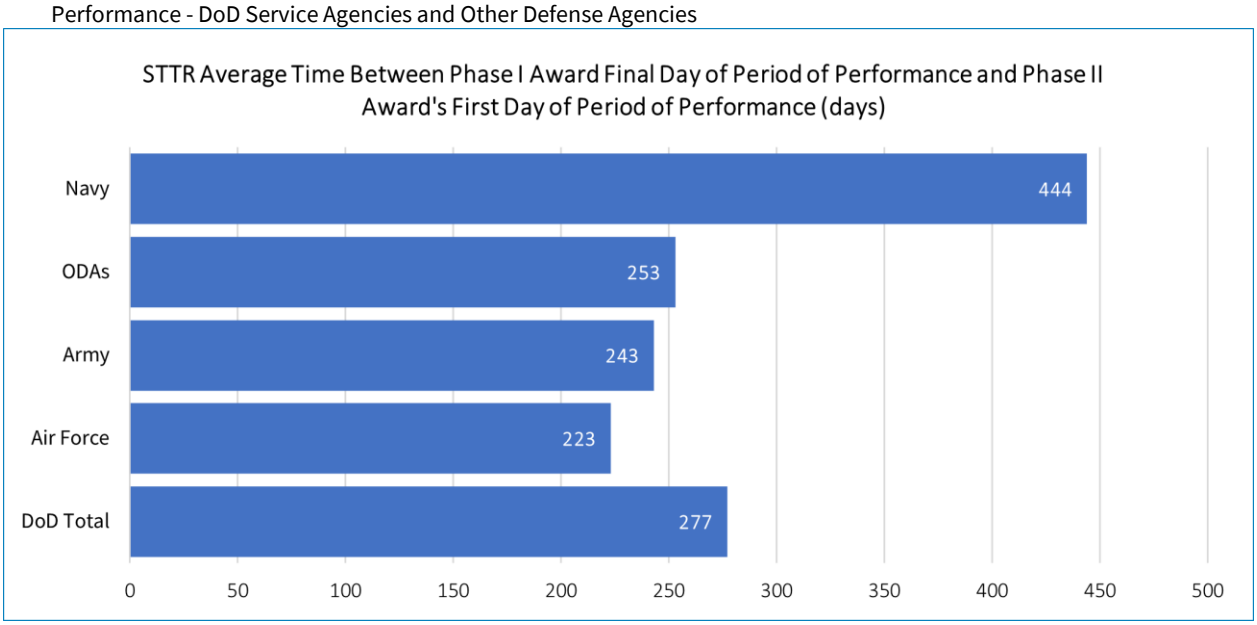


Chart 30: STTR Average Time Between Phase I Award Final Day of Performance and Phase II Award's First Day of Period of Performance - DoD Service Agencies and Other Defense Agencies



15 | SBIR/STTR Administrative Funding Pilot Program (AFPP) and Outreach to SDBs/WOSBs

The SBIR/STTR Reauthorization Act of 2011 authorized a pilot program permitting Participating Agencies to request up to 3% of their SBIR funding to support Assistance for Administrative, Oversight, and Contract Processing Costs. The AFPP is an essential tool for the agencies, as it generates dedicated resources toward support initiatives to improve the program and the experience for small businesses participating in the program. Specifically, agencies used the funds to: update and/or upgrade information technology systems to accommodate new reporting requirements; modify program application, review, and selection processes and procedures to shorten award timelines; develop targeted marketing and commercialization plans; assess prior awardee commercialization efforts; and extensive outreach to increase Small Business Concern participation, especially from underrepresented communities.

AFPP expired on October 1, 2017 and was not reinstated until August 11, 2018 via the FY19 National Defense Authorization Act (NDAA). The FY19 NDAA reestablished the pilot program until September 30, 2022. As a result of this gap, for FY18 only six Agencies including DoD (Other Defense Agencies), DOE, NASA, NSF, DOC, and DOT participated in the program. In FY18, six Participating Agencies obligated $18,250,103 for AFPP activities.

Agencies are required to submit a work plan for SBA approval to use the authority. The work plan must include the specific activities to be supported, the estimated costs for the activities, milestones, and the expected results. The activities are required to improve program performance in areas such as streamlining award processes, enhancing reporting, and expanding outreach efforts to underrepresented individuals. As part of the Annual Report submission, SBA requires agencies to report AFPP obligations and performance criteria outcomes organized into the following areas: 1) Outreach; 2) Commercialization; 3) Streamlining and Simplification; 4) Prevention and Detection of Fraud, Waste, and Abuse; 5) Reporting; and 6) Administration and Implementation of Reauthorization.

SBA approved FY18 work plans from five agencies, DOE, NSF, NASA, DOT, and DOC for a total request of $8,844,267. HHS, EPA, USDA, ED, DHS, Navy, Air Force, and Army did not participate in the AFPP program during FY18. DoD (Other Defense Agencies (ODA) did not submit or obtain SBA approval in FY18 for use of AFPPfunding. SBA received ODA's FY18 AFPP work plan on November 30, 2018, which was after the year the funding expired. Even though ODA did not obtain approval, they reported $11,905,866 in FY18 AFPP obligations.

The amount of AFPP funds requested and obligated by the agencies varied significantly. Only NSF requested the maximum allowable funding amount of Administrative Funding authority based on the work plan projections. The difference between the approved plan and the amount obligated was primarily attributed to the constraints surrounding the timing of the following factors: 1) the length of agency appropriations; 2) the program office receipt of SBIR funding; and 3) the amount of time available to make obligations.

Agency AFPP "approved" budgets and actual obligations are shown below.

Table 32: Administrative Funding Pilot Program

AFPP Maximum Allowable and Obligated Amount per Agency			
Agency	**Max Allowable***	**Funding Approved**	**Obligated†**
Other Defense Agencies	$9,289,851	$0	$11,905,866
DOE (Program Office)	$7,374,000	$645,000	$645,000
NSF	$5,325,000	$5,325,000	$5,324,970
NASA	$4,760,000	750,000	$250,000
DOT	N/A	$66,134	$66,134

AFPP Maximum Allowable and Obligated Amount per Agency			
NOAA (DOC)	$ 303,150	$58,133	$58,133
Totals	**$27,052,001**	**$6,844,267**	**$18,250,103**

* Maximum Allowable obligations as reported to SBA in the work plan
N/A DOT did not request new funding, instead DOT obligated prior year funding in FY 2018.
† Dollars Obligated as reported to SBA in the Annual Report Submission

Additional examples of agency efforts under the AFPP pilot program are provided below.

***DoD/Other Defense Agencies*.**
Streamlining and simplifications activities in FY 18 included:
DOD R&E continued its SBIR One effort from FY17. SBIR One leverages the collective knowledge and experience of Government and Industry to identify and develop a streamlined cradle to grave SBIR/STTR process. This includes topic creation, proposal management, proposal review, debriefing, reporting/data management, commercialization, and general enhancements to current DOD SBIR/STTR platforms.

- DOD R&E improved its topic development process to incorporate R&D topics increasing technology transition that aligns with the mission and needs of each Component and the SBIR/STTR program,
- DOD R&E looked to leverage topic suggestion features within the new platform
- DOD R&E continued its efforts to facilitate an integrated, streamlined, unified source-selection architecture simplifying the evaluation process and allowing seamless updates and enhancements across services and Components.
- SBIR One reporting allows for integrated, unified reporting system architecture for all DOD SBIR/STTR programs allowing timely and accurate data transfers to SBA. Additionally, this will increase the departments' ability to track program metrics and improve data collection processes and procedures.
- The Small Business aspect of SBIR One allows users to find information easily and reduce inquiries about common questions regarding the SBIR/STTR Program.

HHS. Since the Administrative Funding Pilot Program was not reauthorized until late in FY18, no Work Plan was submitted to SBA and HHS was unable to participate in the program.

DOE. SBA approved DOE's FY18 AFPP request for $645,000, which was $6,570,904 less than the estimated maximum allowable funding amount ($7,374,000). In the Annual Report submission, DOE reported $645,000 in obligations, which were $6,570,904 less than the maximum allowable funding amount based on actuals ($7,215,904). DOE's reported outcomes included:

- Phase I Principal Investigator Meetings: Initiated SBIR/STTR Phase I Principal Investigator Meetings in FY 2018. These 2-day meetings provide: (1) opportunities for Principal Investigators to have face to face meetings with DOE program managers and commercialization assistance providers; (2) networking opportunities with other small businesses; (3) presentations from DOE offices regarding proper administration of their grants and intellectual property, preparing for Phase II, and other topics of interest (success stories, investors, partners). The SBIR/STTR Programs Office held two Principal Investigator Meetings.

NSF. SBA approved NSF's FY18 AFPP request for $5,325,000, which was the estimated maximum allowable funding amount. In the Annual Report submission, NSF reported $5,324,970 in obligations. NSF's reported outcomes included:

- NSF's Postdoctoral Diversity Fellowship program, in partnership with the American Society for Engineering Education (ASEE), provides funding for postdoctoral scholars from a wide range of scientific, engineering, and education-related disciplines to spend one to two years working with an NSF-funded SBIR/STTR awardee small business on their cutting-edge research effort. It allows these fellows to gain valuable work experience in a fast-paced small business environment and gives them what is often their first deep exposureto a non-academic career path. In addition, many of the fellows have been hired on full-time with the smallbusiness after their fellowship ended. The program has supported 100 fellows over the past five years, mostof them from underrepresented groups. FY18 funding will continue support for the initiative for 2018-2020 and support 45 new fellows, including 29 from underrepresented groups/geographies.

NASA. SBA approved NASA's FY18 AFPP request for $750,000, which was $4,010,000 less than the estimated maximum allowable funding amount ($4,760,000). In the Annual Report submission, NASA reported $250,000 in obligations, which were $4,510,000 less than the maximum allowable funding amount based on actuals ($4,760,000). NASA's reported outcomes included:

- NASA SBIR/STTR outreach activities will have a continued focus on increasing the overall percentage of SBIR and STTR applicants from underrepresented groups (SDBs, WOSBs, and small businesses in states with a historically low level of SBIR/STTR awards).
- Continuing to pilot the Innovation Corps (I-Corps) program as directed by the Office of Management and Budget (OMB) to train awardees to prepare for and make better decisions as they progress through their SBIR/STTR Phase I awards.
- The NASA SBIR/STTR Program will undergo redesigning its operating model and organizational structure to better meet strategic priorities and deliver program outcomes. This effort will result in streamlining and simplifying business processes that impact internal stakeholders and external customers.

DOT. Since the Administrative Funding Pilot Program was not reauthorized until late in FY18, no Work Plan was submitted to SBA and carry-over Administrative Funds from prior years were used in FY18. These funds were used to continue to implement in FY18 the goals and activities previously set forth in the FY17 Administrative Funding Plan. DOT's reported outcomes included:

- In FY 2018, the DOT outreach activities continued to focus on increasing the overall percentage of applicants from underrepresented groups and areas, using data to target specific areas through our outreach and participation in SBA events. Outreach also included website improvements and articles to communicate DOT SBIR success stories.
- DOT continued to provide the Commercialization Assistance Program (CAP) services for Phase I and Phase II awardees who opted to receive this service and started to track the benefits this assistance brings.
- The DOT SBIR Program Office also provides funding to Phase II and Phase IIB Contracting Officer Representatives (CORs) to travel to see the research conducted by their awardees. DOT SBIR Program CORs made 2 visits to small businesses in FY18.
- In FY18, the DOT SBIR program office continued to use and make improvements to electronic Phase I andII proposal submission and evaluation sites, which are designed to make the evaluator experience more streamlined and user-friendly, and provide easy access to the necessary data used by the Program Office and Contracting Officers.
    - In addition, the DOT continued to deliver several webinars to streamline the proposal and evaluation processes:
        - Pre-proposal webinars are delivered during each open solicitation to provide guidance to small businesses.
        - Technical Evaluation Team (TET) webinars are delivered prior to each Phase I evaluation period to train TET members and the COR on the process.

- Continue to conduct outreach to both current awardees and Contracting Officer Representatives to inform them of the activities associated with waste, fraud, and abuse.
- The SBIR Program Office is located in Cambridge, Massachusetts. Travel was required to attend SBA SBIR Program Manager meetings as well as to brief DOT Operating Administrations on SBIR milestones and progress in-person.

NOAA. SBA approved NOAA's FY18 AFPP request for $58,132.65, which was less than the estimated maximum allowable funding amount. In the Annual Report submission, NOAA reported $58,132.65 in obligations, which were $227,332.95 less than the maximum allowable funding amount based on actuals ($285,465.60). NOAA's reported outcomes included:

- NOAA's outreach activities included providing information and technical assistance to minority-owned Small Businesses.
- Continued to maintain and manage the NOAA Commercialization Assistance Program (NOAA-CAP) for SBIR awardees. In FY18, there are 18 total Phase II awardees. This brings the total NOAA-CAP recipients to potentially 18 companies.

Outreach Including Specific Activities to Women- and Socially and Economically Disadvantaged-Owned Small Business Concerns (SBCs), and Underrepresented States

Each Participating Agency is required to report its efforts to increase outreach and awards to firms owned and controlled by women or by socially and economically disadvantaged individuals. Examples of outreach efforts are listed below by agency.

DoD. DoD SBIR routinely participates in Outreach events targeting SDBs and WOSBs. Examples of these efforts are the SBA SBIR/STTR Road Tours, as well as the Spring and Fall National Conferences.

Outreach activities in FY 18 included:
DOD R&E undertook a Training and Advocacy Program supplying information to Small Business Concerns (SBCs) regarding the SBIR/STTR Program. This served as both Outreach and Training for the DOD SBIR/STTR community. Webinars conducted:

- DOD SBIR/STTR BAA
- Technology Transition / Commercialization Best Practices
- How to Use the DOD SBIR/STTR Submission Site
- Managing Intellectual Property
- Understanding the Evaluation & Debrief Process / How to Submit a Compliant Proposal
- Working with Prime Contractors
- DOD Acquisition & Contracting Process
- Marketing, Business Development & Capture Management Essentials
- Introduction to Commercialization Readiness Programs
- Test & Evaluation
- Phase III Process: How to Identify Non-SBIR Funding

HHS. HHS's SBIR/STTR outreach activities during FY18 were directed at increasing awareness of the SBIR/STTR programs, and identifying new SBIR/STTR applicants, with a special emphasis on women-owned businesses(WOSB), socially and economically disadvantaged businesses (SDB) and under-represented states, known as

Institutional Development Award (IDeA) States. HHS's SBIR/STTR outreach strategy is implemented by NIH, including the 24 Institutes and Centers with SBIR/STTR programs, and CDC, FDA, and ACL.

Outreach activities included in FY 18 included:

- Participated in 4 SBIR Road Tours covering 18 states, including 4 IDeA States, reaching over 2,400 attendees.
- Dedicated a session at our HHS SBIR/STTR Conference to the topic of encouraging women and minority SBIR/STTR applicants to participate.
- Developed key contacts and relationships with multiple U.S. Historically Black Colleges and Universities (HBCUs) through site visits and targeted outreach.
- Created and facilitated SBIR Workshop model for HBCU faculty at Howard University.
- Released an SBIR Administrative Diversity Supplement specifically to provide funding for underrepresented groups to be hired on existing grants/research projects.
- Updated the central HHS SBIR/STTR website regularly with news, guides, and additional resources for small businesses.
- Participated in SBA's SBIR Outreach Workgroup to determine upcoming SBIR outreach priorities.
- Leveraged our NIH SBIR/STTR listserv with 20,000+ subscribers.
- Presented during national and local conferences to reach new biomedical entrepreneurs.
- Held informational webinars on SBIR/STTR, including topics such as the SBIR Grant Omnibus Solicitation, SBIR Contract Solicitation, and I-Corps at NIH.
- Participated in local/state SBIR events/conferences by providing virtual One-on-One meetings with attendees.
- Earned 1,000 new Twitter followers through strategic, engaging, informative messaging.
- Launched #DiversifySBIR social media campaign to highlight Women and Minorities in leadership at NIH, and the importance of diversity in the scientific workforce.
- Collaborated with the NIH IDeA program to promote the SBIR/STTR programs in underrepresented states, participating in conferences and events in 13 IDeA States.
- Partnered with SBA and other SBIR/STTR governmental agencies, state-based economic development centers, and universities to conduct outreach to WOSB and SDB.

Summary of our outcomes for FY 18:

- 206 events (in person and virtual) hosted in 40 states (including 13 IDeA States), plus the District of Columbia (DC) that collectively reached over 27,000 attendees
- Reached over 2,400 attendees and 18 states, including Alaska, during the SBIR Road Tour
- 774 SDB reached
- 990 WOSB reached

DOE. Through Phase 0, DOE provides application support and assistance services to potential DOE Phase I applicants. These Phase 0 services, provided at no cost to eligible small businesses, include: Letter of Intent support, proposal preparation and review assistance, budget formulation, IP consultation, and registration assistance with mandatory federal systems. As of January 2019, Phase 0 Application Assistance Program services were provided to 96 small businesses. Of this group, 20 were women-owned, 31 were socially and economically disadvantaged, and 36 were from under-represented states. Note that companies may have multiple designations. There were 34 companies thatwere first-time applicants but did not belong to any of the three under-represented groups.

NSF. On September 17, 2018, NSF awarded $5.324 million to the American Society of Engineering Education (via award 1853888) to extend our support for the Postdoctoral Research Diversity Fellowship Program. This program encourages active NSF SBIR/STTR Phase II grantees to bring postdoctoral scholars from underrepresented groups into their ongoing research project. The goal is for the participating scholar to acquire authentic, real-life entrepreneurial research experience and to bring the latest innovative theories and techniques from the academic community to the country's entrepreneurial technology sector. As part of this funding renewal, we strengthened key

recruitment and support aspects of the program to further strengthen its ability to target underserved groups and encourage their participation in entrepreneurship and innovation going forward.

- Through NSF support, Indiana University organized its 2nd annual Accelerating Women and Underrepresented Entrepreneurs (AWARE): Accelerating Entrepreneurial Success (ACCESS) Commercialization and Entrepreneurship Summit on November 14, 2018.
- NSF staff attended over 60 outreach events in-person in over two dozen states. These events included dozens of presentations as well as over 300 one-on-one meetings with potential applicants and other stakeholders. Among other events, we exhibited at and attended the Annual Biomedical Research Conference for Minority Students.
- NSF SBIR/STTR program staff conducted multiple pre-solicitation webinars in advance of each Phase I proposal deadline.
- NSF sent multiple Program Directors and/or senior staff on each of the 2018 SBIR Road Tour legs, supporting events in several underserved states and regions.
- NSF's SBIR/STTR programs also continued to offer supplemental funding opportunities to Phase II awardees with a specific focus on supporting underrepresented groups. One example is the Phase IIA opportunity that provides Phase II grantees up to $150,000 to build research partnerships with minority-serving institutions.
- NSF's annual Phase II Grantee Conference featured a dedicated networking session for female entrepreneurs and innovators. This year's session had over 100 attendees.

USDA. In FY2018, the USDA SBIR program participated in all the SBA organized road tours and regional events. Each of these events were focused on providing outreach to SDBs and WOSBs. Additionally, in FY2018 the USDA SBIR program completed a train the trainer program to train USDA extension staff on the USDA SBIR program. This program has a goal to ensure that USDA extension staff is versed in the SBIR program and are able to assist small businesses in the development of applications to the SBIR program.

DHS. DHS continues to take advantage of multi-agency outreach events to open opportunities to SDBs and WOSBs. It also produced a series of YouTube videos on various aspects of working with DHS SBIR with a primary target audience of WOSBs.

DOT. U.S. DOT program representatives met with small businesses during the New England Road tour and the Defense Innovation Convention in Tampa, FL. Program Representatives also served on SBIR panels and gave brief presentations at the events.

DOC. Both NIST and NOAA takes steps to increase outreach to SDBs and WOSBs in a number of ways including participation in the SBIR national conferences and SBA Road Tours. NIST's Phase I selection process gives priority to technically excellent proposals from SDBs and WOSBs. NOAA plans to do the same in all future evaluation processes. Lastly, both NIST and NOAA are working to plan joint events to increase SDB and WOSB participation.

ED. Each year for more than a decade, the ED SBIR conducts outreach and technical assistance to hundreds of small businesses around the country. ED SBIR conducts outreach through participation at the SBIR national and DC-based conferences, participation at a number of industry and developer focused conferences, forums, and meetings, through its vast network of stakeholders, and through a variety of web-based outreach strategies including blogging, emailing, and webinars.

In FY2018, ED SBIR met one-on-one or had phone conversations with more than 300 small business firms around the country to provide technical assistance to firms on their concepts and with information about the ED SBIR Program, including more than 100 WOSBs and dozens of SDBs.

In FY 2018, ED SBIR conducted outreach directly to underrepresented groups, including to socially and economically disadvantaged small businesses (SDBs) and women-owned small businesses (WOSBs). The specific actions to reach individuals and firms (including WOSB and SDBs) included: attending government events (e.g., the Department of Education's Small Business Summit, the ED Games Expo) and industry events and conferences (e.g., Games for Change, Serious Games, The Future of Assessment, the State Education Technology Directors Association Annual

Conference, the Jefferson Education Exchange Summit, the Software and Information Industry Association conference) where ED SBIR met with many small businesses, many of whom were WOSBs and SDBs; posting program announcements and numerous blogs published on websites such as ED.gov; IES.ED.gov, FBO.gov, SBIR.gov; through Tweets; through news stories on leading e-newsletters and publications such as EdSurge; through networking with dozens of leaders and stakeholders within and outside of government, communicating with the Department of Education's liaisons, and through direct outreach to its network of hundreds of small businesses. A significant number of WOSBs and SDBs were reached through these modes of outreach.

EPA. EPA continues to do outreach to all small businesses including SDBs and WOSBs through many venues including the SBIR National Conference(s) (where EPA presented, had a booth and did one-on-ones), state meetings/webinars, and one webinar hosted by EPA prior to the release of the Phase I solicitation for all potential applicants.

NASA. In FY18, the NASA SBIR/STTR Program executed goals against its FY18 Outreach Strategy which focused on outreach efforts on underrepresented groups by attending targeted industry days and conferences.

In FY18, the program participated in the HBCU-NASA Engagement Forum, NASA HUB Zone Industry Day, University Startups Conference in Washington, DC, and KSC's Business Opportunities Expo which highlighted Historically Underutilized Business Zone (HUBZone), Service Disabled Veteran Owned Small Business (SDVOSB) and Women Owned Small Business (WOSB).

The program continued to partner with the Office of Small Business Programs (OSBP) and the Small Business Administration (SBA) on outreach activities specifically targeting disadvantaged-, veteran-, and women-owned businesses. Example of these outreach efforts include: continued participation in the SBIR Road Tour to underrepresented states, the NASA HBCU/MSI Road Tour visiting numerous HBCUs, Small Business Meetings, and visits to local universities – including Texas Women's University and Tribal Colleges in Minnesota and Wisconsin..

The SBIR/STTR program participated in other events in 2018 beyond those mentioned above such as:

- The SBIR/STTR National Conference 2018 in Anaheim, CA and the SBIR/STTR Innovation Summit held in Tampa, Florida outreaching to the entire SBIR/STTR community, and
- Newspace 2018, Space Tech Expo and Conference, AIAA SciTech Forum, and SpaceCom Houston.

The program also ensured that the Center Technology Transition Leads (CTTLs) conducted their outreach efforts equipped in branded program collateral and business card scanning capability that made networking and interface with the firms more prominent and trackable. They are also equipped with an event feedback mechanism that helps the program with strategic planning for future events.

16 | Government Phase III Funding

Phase III funding is measured as the revenue a business receives through the funding of additional R&D, licensing, investment and/or sales for work that can be tied back to SBIR/STTR funded technology. Phase III, by definition, is work that derives from, extends, or completes Phase I or II work and is not supported by SBIR or STTR dollars.

In the FY15 Annual Report, SBA began collecting agency awarded Phase III funding data from the Participating Agencies. SBA understands the challenges with obtaining and reporting this data. Agencies commonly provide funding to a business for work based on earlier SBIR/STTR efforts but are often not aware of the SBIR/STTR lineage.For example, the SBIR/STTR awardee may serve as a supplier or subcontractor beyond what is recorded on the award. Furthermore, some Phase III efforts are not documented because the acquisition programs do not report the award to the SBIR/STTR program offices. Similarly, small businesses are not required to notify the SBIR/STTR program of their Phase III funding. Those figures are only collected if the company applies for additional SBIR/STTR Phase I or II funding. Moreover, agencies have even less insight into Phase III funding for companies which no longer participate in the SBIR/STTR programs.

SBA is working with the agencies to develop tools which will provide a more efficient way to obtain and validate data on private sector sales, licenses, equity investment and acquisition. Due to these challenges, Phase III reporting through the Annual Report will likely continue to represent a subset of the total Phase III funding. For Participating Agencies issuing SBIR/STTR grants, such as DOE and NIH, most of the Phase III funding typically comes from the private sector. However, several of the granting agencies more actively buy products and fund follow-on R&D. Agencies should work to increase the Phase III funding levels that the agency or Federally Funded Research and Development Centers (FFRDC's) make. SBA recognizes GSA for establishing a Phase III Contracting Office that provides an efficient and effective way for other agencies to execute Phase III awards. In FY18, GSA obligated $78 million in funds for phase III awards from other agencies. This program continues to grow and is becoming the preferred method for Phase III awards as many agencies continue to face challenges in executing Phase III awards.

Table 25 below provides a listing of Participating Agencies reporting Phase III funding during FY18. The Civilian agencies combined to report $16 million in funding, of which NASA made up $12.3 million, DOE obligated $3.2 million, and DOT obligated $400,000

The Participating Agencies issuing SBIR/STTR contracts, such as DoD and NASA, are often the customers or buyers of Phase III technology developed under previous SBIR/STTR awards. These agencies use later stage Research, Development, Test, and Evaluation (RDT&E) and procurement funds to further develop or purchase the SBIR/STTR technology. Aligning the awards with agency customers encourages Phase III commercialization. A best practice for agencies is to identify and fund SBIR/STTR Phase I and II work with a transition path into a program or platform. This approach best positions the SBIR/STTR awardee to work with the integrator (government or prime) to ensure the project meets the specifications as they work towards and reach the desired Technology Readiness Level (TRL) for the effort and is an approach the Navy has used for many years with the Air Force making major changes in FY18to create a similar model and mindset.

Table 33: Government Phase III Funding

Agency	Total Phase III Obligations ($) †
Navy	$718,110,637
Air Force	$222,668,746
Other Defense Agencies	$76,177,529
NASA	$12,310,685
Army	$5,074,817
DOE	$3,213,153
DOT	$379,999
Totals	**$1,037,935,566**

† Agencies cannot use SBIR/STTR funding for Phase III awards and these dollars are not part of Total SBIR Obligations. Phase III dollars listed includes both SBIR and STTR programs.

Table 25 provides a summary of all the agencies that made Phase III awards in FY18 and the variance between agencies is substantial. Congress has continuously highlighted the importance of Phase III for both the Civilian and DoD agencies. DoD Phase III activity shows the Navy reporting $718 million (70% of the total DoD Phase III obligations), Air Force reporting $223 million, Army reporting $5 million, and the Other Defense Agencies reporting $76 million. SBA encourages the DoD to study the root cause of this difference and identify if best practices used by some DoD components could be shared with others to increase overall DoD Phase III awards.

The DoD has still not addressed several requirements established in the 2012 NDAA and described in 15 U.S.C. § 638(y). This legislation authorized DoD to establish goals for the transition of Phase III technologies in subcontracting plans and requires a prime contractor on such a contract to report the number and dollar amount of contracts entered into by that prime contractor for Phase III SBIR/STTR projects for efforts over $100,000,000; set a goal to increase the number of Phase II SBIR and STTR contracts that lead to technology transition into programs of record or fielded systems; and use incentives to encourage agency program managers and prime contractors to meet these goals. SBA believes implementing these practices across the DoD would increase the Phase III awards made and the number of SBIR and STTR technologies that transition into acquisition platforms. A more detailed discussion on the requirements for the DoD in relation to the Commercialization Readiness Program (CRP) is described in Section 17.

Economic Impact Studies

SBA and the 11 Participating Agencies are committed to capturing the economic impact of SBIR/STTR awardees and using this knowledge to stimulate additional economic growth opportunities. Three organizations have funded major studies that looked at Phase II awards over a 10-year period. They measured a number of economic impacts to include additional R&D, sales, spin offs, jobs created, average salaries and total economic impact. These studies funded by and performed for the National Institute of Cancer, Air Force, Navy, and recently the entire DoD, provide the most detailed data on the impact of the SBIR and STTR programs. The reports examine the direct and indirect of SBIR andSTTR investments, and while the underlying methodologies vary based on the funder, they generally found a positiveimpact on job creation and economic development, with the recent DoD report identifying a 22:1 return on the DoD SBIR/STTR investment. The reports can be found at https://www.sbir.gov/node/832335.

17 | SBIR/STTR Commercialization Programs

DoD Commercialization Readiness Program (CRP)

The Commercialization Readiness Program (CRP) was originally authorized and created as part of the National Defense Authorization Act of Fiscal Year 2006 as the Commercialization Pilot Program (CPP) under the OSD and the Secretary of each Military Department. Congress permanently authorized the program through the SBIR/STTR Reauthorization Act of 2011. The purpose of the CRP is to pay for activities that accelerate the transition of DoD SBIR/STTR-funded technologies to Phase III, especially those providing significant benefit to the nation's warfighters in improved performance, new capabilities, increased reliability, and cost savings well exceeding investment. Phase III commercialization work derives from, extends, or completes efforts made under prior funding agreements under the SBIR/STTR Programs, and requires small businesses to obtain funding from the private sector and/or non- SBIR/STTR government sources. Under the CRP, up to 1% of the available SBIR funding may be used by DoD Service Agencies and Other Defense Agencies for payment of expenses incurred to support CRP activities. The CRP pays for activities that enhance the connectivity among SBIR/STTR firms, prime contractors, and DoD science & technology and acquisition communities.

According to Section 9 of the Small Business Act (15 U.S.C. § 638(y)), for any contract with a value of $100,000,000 or greater, DoD is authorized to establish goals for the transition of Phase III technologies in subcontracting plans and require a prime contractor on such a contract to report the number and dollar amount of contracts entered into by that prime contractor for Phase III SBIR/STTR projects. In addition, DoD must set a goal to increase the number of Phase II SBIR and STTR contracts that lead to technology transition into programs of record or fielded systems; use incentives to encourage agency program managers and prime contractors to meet these goals; and submit to SBA the number and percentage of Phase II SBIR/STTR contracts that led to technology transition into programs of record or fielded systems; information on the status of each project that received funding through the CRP and efforts to transition those projects into programs of record or fielded systems; and a description of each incentive used and the effectiveness of that incentive in meeting the goal.

To date, the DoD has not provided SBA with the number and percentage of Phase IIs leading to technology transition; information on the status of each project receiving funding through CRP and efforts to transition those projects; as well as any details or evidence they set a goal to increase Phase IIs that lead to technology transition or a description of the incentives used to increase the effectiveness. The DoD provides SBA with a CRP report which describes the activities and firms helped under CRP funding and authority. The full FY18 DoD CRP report will be posted at https://www.sbir.gov/annual-reports-files.

Commercialization Readiness Pilot Program for Civilian Agencies (CRPP)

The SBIR/STTR Reauthorization Act of 2011 created the Civilian Agency Commercialization Readiness Pilot Program (CRPP) that allows an agency to use up to 10% of its SBIR/STTR budget for additional awards to SBIR/STTR awardees. The size of these awards may be up to three times the Phase II guideline amount. The DoD CRP is structured in a completely different way in that all funding goes to entities and processes to support the transition of awardee technologies rather than directly funding the awardees. Note that once an agency submits and has its CRPP plan approved by SBA, it does not have to reapply year to year.

The following table provides further data on how HHS, NASA, and DHS used the CRPP authority in FY18.

Table 34: Commercialization Readiness Pilot Program for Civilian Agencies (CRPP) - HHS, NASA, DHS

Agency	Number of Awards	Amount Obligated
HHS	35	$23,064,708
NASA	10	$8,050,631
DHS	3	$307,172.43

According to Section 9 of the Act, 15 U.S.C. § 638(b)(7)(F), Participating Agencies must provide an accounting of funds, initiatives, and outcomes under the CRPP to SBA. The following subsections summarize FY18 CRPP activities.

HHS. HHS issued its first CRPP solicitation on November 2, 2015, and the first CRPP applications were received and awards made in FY16. In FY18, HHS obligated $23,064,708 across CRPP projects, including $1,605,501 on 2 new CRPP awards, and $21,459,207 on 33 non-competing (started in FY17) Phase II follow-on awards.

NASA. NASA chose not to release a CRPP call in FY18 in order to review the 2017 process and make adjustments and improvements. NASA obligated $8,050,631 on 10 Phase II follow-on awards (started in previous fiscal years).

DHS. DHS received 1 CRPP proposal in FY18, which was funded with $200,000. In addition, DHS obligated $107,172.40 to fund two companies to participate in the I-Corps program.

18 | Other SBIR/STTR Reporting Requirements

Awards to Small Business Concerns (SBCs) Majority-Owned by Venture Capital Operating Companies

The SBIR/STTR Reauthorization Act of 2011 provided authority to SBIR Participating Agencies to use a portion of its program funds for awards to firms that are majority-owned by multiple venture capital operating companies (VCOCs), hedge funds (HFs) or private equity firms (PEFs). HHS's NIH and Centers for Disease Control and Prevention (CDC) and DOE's Advanced Research Projects Agency-Energy (ARPA-E) elected to begin using this authority in 2013. Hereafter, firms that are majority-owned by multiple VCOCs, HFs, or PEFs are referred to as portfolio companies.

ED. In 2018, ED SBIR made one Phase I award to a firm that is owned by multiple VCOCs for $200,000, less than the maximum threshold for such awards through its program. ED submitted a written determination which was approved by SBA on August 3, 2018.

HHS/NIH. In FY2013, HHS/NIH submitted its written determination to SBA and Congress that NIH intended to exercise the authority to allow portfolio companies to apply to its SBIR program. Every new NIH SBIR solicitation issued after 1/28/13 has allowed portfolio companies to apply to the NIH SBIR program.

HHS/CDC. On July 30, 2014, HHS/CDC submitted its written determination to SBA and Congress that CDC intended to exercise the authority to allow portfolio companies to apply to its SBIR program. Every new HHS SBIR solicitation, that CDC participates in, issued after July 30, 2014, has allowed portfolio companies to apply to the CDC SBIR program.

HHS has controls in place to ensure that overall spending on NIH and CDC portfolio companies will not exceed 25% or 15% of its SBIR set-aside, respectively.

Table 35: HHS SBIR Awards to SBC majority-owned by multiple VCOCs, hedge funds or private equity firms

FY18 HHS SBIR Awards to SBC majority-owned by multiple VOCs, hedge funds or private equity firms	
Number of proposals received	13
Number of awards	12
Total dollar amount of awards	$3,604,284
Number of Phase I proposals Received	9
Number of Phase I Awards	8
Total dollar amount of Phase I Awards	$1,642,459
Number of Phase II proposals received	4
Number of Phase II Awards	4
Total dollar amount of Phase II Awards	$3,411,674
Number of non-competing awards	16 (year 2 or 3 of a Phase II, funded one FY at a time or a supplement to existing award from prior FY)
Total dollar amount of non-competing Phase II Awards	$9,793,451
Overall dollar amount of awards (competing and non-competing)	$13,205,125

Phase III Appeals

Pursuant to section 4(c)(8) of the SBIR/STTR Policy Directives, Participating Agencies are to notify the SBA before they pursue follow-on work on a technology developed under an SBIR/STTR Award with an entity other than the SBIR/STTR Awardee that developed the technology. The SBA did not receive such a notification from any funding agency during FY18. The SBA may also be contacted directly by SBIR/STTR awardees seeking assistance with perceived violations of the Phase III preference requirements or SBIR/STTR data rights. In such cases, the SBA works with the awardee and the relevant agency to resolve the issue and may, if warranted, appeal an agency decision or action to pursue Phase III work with another entity. None of the Participating Agencies or SBIR/STTR awardees reported Phase III appeals in FY18.

Outreach to Women and Socially and Economically Disadvantaged Small Business Concerns (SBCs), and Underrepresented States

Pursuant to 15 U.S.C. §638(b)(7)(C), the SBA reports a description of the extent to which each federal agency is increasing outreach and awards to firms owned and controlled by women or by socially and economically disadvantaged individuals under each of the SBIR and STTR Programs. Proposal and award statistical information can be found in Sections 5 and 6 of this report. Detailed information on the individual agencies' activities can be foundin Section 15.

Participating Agency Compliance with Executive Order 13329 - Encouraging Innovation in Manufacturing (E.O. 13329)

Section 9(ss) of the Act, 15 U.S.C. § 638(ss), requires that the Annual Report contain the following information from agencies that make more than $50 million in SBIR/STTR awards about Executive Order (E.O.) 13329:

- a description of efforts undertaken by the head of the federal agency to enhance United States manufacturing activities;
- a comprehensive description of the actions undertaken each year by the head of the federal agency in carrying out the SBIR or STTR Program of the agency in support of E.O. 13329 (69 Fed. Reg. 9181; relating to encouraging innovation in manufacturing);
- an assessment of the effectiveness of the actions carrying out E.O. 13329 at enhancing the research and development of United States manufacturing technologies and processes;
- a description of efforts by vendors selected to provide discretionary technical assistance to help SBIR and STTR concerns manufacture in the United States; and
- recommendations that the program managers of the SBIR or STTR Program of the agency consider appropriate for additional actions to increase the effectiveness of enhancing manufacturing activities.

Pursuant to E.O. 13329, agencies must give priority to small business concerns that participate in or conduct R/R&D "…relating to manufacturing processes, equipment and systems; or manufacturing workforce skills and protection." Each agency includes in its Annual Report to the SBA a synopsis of its implementation of these requirements. Agencies utilized a variety of approaches in addressing the E.O. 13329 directive. For most, these requirements are assessed within the scope of each agency's R/R&D needs with tangible numbers of solicitation topics, awards, and dollars. Mechanisms commonly used by agencies to give priority to manufacturing-related work include: adding manufacturing-related topics in solicitations; requesting in solicitations that proposals address any possible manufacturing-related elements of the small businesses' proposed work, technological approach, delivery or resulting technological applicability to manufacturing processes; and, noting in solicitations that including such elements in proposals may provide a competitive advantage in the award selection process. Additionally, cross-agency collaborations, targeted outreach efforts, and other agency-specific activities related to manufacturing contribute to addressing the objectives of E.O. 13329. A detailed report on the individual agencies' activities and initiatives is located at https://www.sbir.gov/annual-reports-files.

Participating Agency Compliance with the Energy Independence and Security Act of 2007 (EISA)

Section 9(z) of the Act, 15 U.S.C. §638(z), requires that the Annual Report include a determination of whether Participating Agencies give high priority to small business concerns that participate in or conduct energy efficiency or renewable energy system research and development projects.

Pursuant to the Energy Independence and Security Act of 2007 (Pub. L. No. 110-140) and the SBIR/STTR Policy Directives issued by the SBA, Participating Agencies must give high priority to Small Business Concerns that participate in or conduct energy efficiency or renewable energy system R/R&D projects. Agencies utilize a variety of approaches to comply with EISA and the Policy Directives. For some, such as DOE, these efforts are ingrained in the agency mission and therefore easy to assess in very tangible ways. Mechanisms commonly used by agencies – aside from specifically adding energy related topics in solicitations – include adding that solicitation proposals address any energy efficiency or renewable energy aspects related to the small businesses' technological approach, delivery or technological applicability and often provide such proposals a competitive advantage in the award selection process. Cross-agency collaborations, outreach efforts, and other initiatives also become critical to assessing the collective achievements of the program rather than focusing on individual agency performance. Each Participating Agency's Annual Report addresses EISA compliance by including: examples of SBIR/STTR projects related to energy efficiency or renewable energy; procedures and mechanisms used during the reporting fiscal year to give priority to energy efficiency and renewable energy projects in SBIR/STTR; and, specific actions taken to promote and support energy efficiency and renewable energy research projects. A detailed report on the individual agencies' activities andinitiatives is located at https://www.sbir.gov/annual-reports-files.

Interagency Policy Committee (IPC)

The Interagency Policy Committee (IPC), as created by the SBIR/STTR Reauthorization Act of 2011, is co-chaired by the SBA and the White House Office of Science and Technology Policy (OSTP). The IPC is comprised of representatives from all SBIR/STTR Participating Agencies with the collective purpose to review issue areas and make policy recommendations on ways to improve SBIR/STTR Program effectiveness and efficiency. Throughout FY17, the SBA, OSTP, and the agency representatives (Program Managers) collaborated through the IPC in bimonthly Program Managers' meetings at the SBA to formulate policy recommendations to be submitted to Congress. The IPCalso achieved significant accomplishments in the areas of government data and reporting mechanisms through continued build-out of the www.SBIR.gov portal for registered users, creating administrative and programmatic efficiencies for agency reporting officials and small businesses participating in the SBIR/STTR Programs.

Annual Report on SBIR/STTR Program Goals

Pursuant to Section 15 U.S.C. § 638(nn), added by the Reauthorization Act:

> The head of each Federal agency required to participate in the SBIR Program or the STTR Program shall develop metrics to evaluate the effectiveness and the benefit to the people of the United States of the SBIR Program and the STTR Program of the Federal agency that are science-based and statistically driven; reflect the mission of the Federal agency; and include factors relating to the economic impact of the programs.

It further requires the agency to conduct an annual evaluation using these metrics and provide that report to the House and Senate Small Business Committees and House Committee on Science, Space and Technology, as well as the SBA Administrator. SBA followed up and verified with the Participating Agencies that no individual reports were submitted to Congress to address the reporting requirement pursuant to Section 15 U.S.C. § 638(nn). Agencies indicated that they feel the SBA Annual Report meets the spirit of this provision.

Direct to Phase II Awards

The SBIR/STTR Reauthorization Act of 2011 granted the authority to the National Institutes of Health, Department of Defense, and the Department of Education to make Phase II awards to small business concerns without regard to

whether the company was provided a Phase I award. Prior to such an award, the heads of those agencies, or designees, must issue a written determination that the small business has demonstrated the scientific and technical merit and feasibility of the ideas that appear to have commercial potential. The determination must be submitted to SBA prior to issuing the Phase II award. This authority expired September 30, 2017. The National Defense Authorization Actfor Fiscal Year 2019 signed on August 13, 2018 reauthorized this authority through FY22. The bill also requested SBA provide an analysis and metrics on the program. In accordance with the requirement, SBA has provided metricsand analysis on agency use of the Direct to Phase II authority for FY18.

NIH. In FY18, due to the authority expiring on September 30, 2017, the National Institutes of Health did not make any new Direct to Phase II awards. NIH did allocate $89,337,597 in funding to previously awarded Direct to Phase IIs. NIH uses the program to fund technologies in which the firm has already matured past the Phase I feasibility stage with their own resources and is ready for the Phase II demonstration stage. Direct to Phase II at NIH typically reduces the technology maturation time by two years, which brings critical medical technologies to the public faster.

DoD Other Defense Agencies. DARPA awarded 4 new Direct to Phase II awards in FY18. These awards totaled $2,519,320. DARPA also obligated $14,709,246 for awards from years prior to FY17. The program has been extremely beneficial to DARPA by allowing them to accelerate the transition of new technologies to the warfighter. This authority also enables DARPA Program Managers to explore vastly different approaches to meeting the needs of their portfolio by selecting Phase I and Direct to Phase II proposals for certain topics. The authority has been shownto reduce the time from identified need to Phase III by two to three years. In general, DoD uses this authorization in places where there is a critical need and identified Phase III funding and through the pilot has fielded several successes.

Air Force. Air Force awarded no new Direct to Phase II awards in FY18. Obligations totaling $563,177 were given to previously awarded contracts. The program has been extremely beneficial to the Air Force by allowing them to accelerate the transition of new technologies to the warfighter. It has been shown to reduce the time from identified need to Phase III by two to three years. Air Force uses this authorization in places where there is a critical need and identified Phase III funding and through the pilot has fielded several successes.

ED. The Department of Education has not used the authority since its inception due to the limitations of its budget size.

Table 36: Direct to Phase II Awards

Agency	Number of New Awards	Total Obligations
HHS-NIH	0	$89,337,597
Other Defense Agencies (DARPA)	4	$17,228,566
Air Force	0	$563,177
ED	0	$0
Total	4	$107,129,340

NIH Phase 0 Proof of Concept Partnership Pilot Program

The Phase 0 Proof of Concept Partnership Pilot Program was created through the National Defense Authorization Act for Fiscal Year 2012 (P.L. 112-81) and allowed the National Institutes of Health (NIH) to use $5 million of its annual STTR funds to make awards to research institutions (not to exceed $1 million per institution per year) ***to accelerate the creation of small businesses and the commercialization of research innovations***. The funds were to be used by a qualifying institution ("site") to award grants to individual researchers to support the proof of concept and commercialization mentoring needed to translate promising academic research projects and technologies into viable companies. The funds could be used to support work including technical validation, market research, clarification of intellectual property rights position and strategy, and investigation of commercial or business opportunities. The legislation indicated that the Proof of Concept Partnership at each site was to use a market-focused project management oversight process that included a technical review board with relevant local expertise, technology validation milestones focused on market feasibility, and the ability to identify and shift resources from failing projects

to projects with greater potential. Sites were also asked to include educational resources and guidance for researchers relevant to commercializing their innovations.

The pilot program was initially authorized for three years, through the end of FY 2017, but was subsequently reauthorized through FY 2022 in the John McCain National Defense Authorization Act for Fiscal Year 2019 (H.R. 5515 Sec 854). An evaluative report on the pilot program was submitted by the Director of NIH to the Committee on Science, Space, and Technology and the Committee on Small Business of the House of Representative and the Committee on Small Business and Entrepreneurship of the Senate. The report, requested in the initial legislation, was to include a description of institutional and proposal selection processes, an accounting of funds used, a description of the pilot program, a list of the results achieved by the pilot program, including the number of small business concerns, business packages, and projects that resulted in subsequent STTR awards, and an analysis of the effectiveness of the pilot program with supporting data.

The NIH provided $9 million to fund three Phase 0 Proof of Concept Partnership sites for three years, through what NIH referred to as the Research Evaluation and Commercialization Hub (REACH) program. The funded sites included the Long Island Bioscience Hub (LIBH) based at Stony Brook University, in partnership with Cold Spring Harbor Laboratory, Brookhaven National Laboratory, and the Feinstein Institute for Medical Research; MN-REACH at the University of Minnesota; and University of Louisville (UofL) Expediting Commercialization, Innovation, Translation, and Entrepreneurship (ExCITE). When SBA refers to REACH in this section, we are referring to these three sites. NIH included a requirement in the funding opportunity that each site provide matching funds for technology development awards and program operations. Each REACH site designed and implemented independent programs that included selection processes using external review boards, milestone-driven project management, and programming that included relevant skills development, as mandated by the legislation. At each REACH site, some of the federal funds supported technology development awards and some supported operational costs, though it is notclear from the NIH report how much of the funds went towards either.

At the time of the November 2018 report from NIH, the three REACH sites launched in 2015 funded 109 total projects. These projects led to the formation of 22 startup companies, 12 SBIR/STTR applications, 5 SBIR/STTR awards, and $13.6 million in follow on funding. The three sites also provided entrepreneurship or commercialization education and training to 1,013 individuals. In the evaluative report, NIH concludes that the effort supported by the STTR Phase0 funding was an effective mechanism for transitioning basic science discoveries into the commercialization pipeline. From the perspective of SBA, there is currently not enough data to support this conclusion.

According to the enabling legislation, the goal of the REACH program is to accelerate the creation of small businessesand the commercialization of research innovations. With the program only having been in existence for three years atthe time of the NIH report, it was not possible to assess whether this goal has been achieved, as the data provided shows a low number of new businesses created and minimal follow on funding. Based on data from the NIH evaluativereport, only 10% of projects funded by the Phase 0 Proof of Concept Pilot Program led to the formation of companies.As reported in November 2018, the REACH program supported the submission of 12 SBIR/STTR applications, though ten of the twelve came from a single site, LIBH. SBA was provided updated data at the December 2019 Annual Phase 0 Proof of Concept Center meeting with the new numbers documenting 20 SBIR/STTR applications with 13 ofthose coming from LIBH, 4 from MN-REACH, and 3 from UofL ExCITE. Of those 20 applications, eight awards have been made. This success rate is higher than the typical NIH Phase 1 SBIR/STTR application success rate; however, all 8 awards were made to projects coming out of LIBH, which is located in a metropolitan area that consistently ranks near the top in terms of the number of SBIR/STTR awards made.

Given the low number of company formations and limited impact on SBIR/STTR awards to date, it is not possible to demonstrate the program is effective in accelerating the creation of small businesses. SBA will be interested in tracking all three sites over the next several years and hopes that NIH can provide additional updates on the progress of the projects.

One component of the NIH report suggests that the program may be having an impact on academic culture as it relates to research commercialization. Through interviews with innovators, it was found that most participants in the program had little prior experience with commercialization, though NIH did not provide details about these interviews, including any indication of how many total innovators were interviewed, what percentage indicated this, or whether there were differences between the sites. A key metric of success will be if the programs and potential changes in

academic culture can be sustained when the period of federal funding ends. If the programs end and the projects don't continue to move toward commercialization, form new companies, and apply for SBIR/STTR programs at a higher rate compared to rates from those sites prior to the Phase 0 program, the program is not likely to have a meaningful, long term impact. The legislation itself includes program sustainability as a REACH award criterion by asking that institutions demonstrate a plan for sustainability beyond the duration of the funding award in their application. Sustainability may be partially addressed by the requirement for sites to provide 1:1 matching funds for the program, which would suggest that they may be able to maintain some portion of the program after the period of the federal funding has ended. In order to fully evaluate the impact of the program, NIH needs to continue tracking the three funded sites, in terms of outcomes and the sustainability of changes that occurred, after the period of federal funding has concluded.

There is a considerable amount of flexibility in both the legislation and the guidance provided by NIH in the REACH Funding Opportunity Announcement (FOA). Some degree of flexibility is important because individual innovation ecosystems and academic cultures have different resources and needs and are at different levels of maturation. With this flexibility, each REACH site independently developed and executed their programs, which resulted in some substantial differences in program outcomes. LIBH funded 50 projects, nearly half of the total projects funded by all sites, MN-REACH funded 40 projects, while UofL ExCITE only funded 18 projects. As noted previously, 13 of 20 SBIR/STTR applications were submitted as a result of projects that came from the LIBH site. NIH did not provide an explanation for these significant differences in outcome, but it could be that the flexibility allowed by the current legislation or the way the FOA was structured by NIH may have led sites to prioritize outcomes differently.

Because accelerating the creation of small business is explicitly stated as a goal of the legislation, it is the position of the SBA that formation of companies should have been a priority for all sites. Additionally, given that the program is supported by STTR funds, SBA believes that growing the SBIR/STTR pipeline by increasing the number of SBIR/STTR submissions and awards should have also been a priority for all sites. Alignment of these priorities would have provided an opportunity to evaluate the different approaches taken versus the outcomes achieved at each site and allowed NIH to do a deeper analysis to determine best practices. SBA's recommendation is to modify the legislation or the FOA to highlight these priority metrics in order to accelerating the creation of small businesses and the commercializing of research innovations.

The funding for the Proof of Concept pilot program comes from the NIH STTR appropriation. The overall goals of the STTR program are to stimulate technological innovation, foster technology transfer through cooperative R&D between small businesses and research institutions, and increase private sector commercialization of innovations derived from federal R&D; goals that are in alignment with the legislated goals of the Phase 0 Proof of Concept pilotprogram. Part of the SBA's assessment was to review the value of using STTR funds for this effort, as the underlyingintent of the STTR program is to support small business R&D and the commercialization of innovations from researchinstitutions. The 9 million in federal dollars that funded the pilot program would have otherwise gone directly to smallbusinesses to fund approximately 36 Phase I STTR awards, between thirty and sixty percent of which would have gone back to Universities for cooperative work.

It is not clear what portion of the funds went to sites for program administration, providing educational resources and guidance, or to fund projects. It is also not clear what kinds of efforts the project funds supported. This information could help clarify whether the pilot program was an appropriateuse of STTR funds.

While the NIH Phase 0 Proof of Concept pilot program could be valuable in getting university researches to think more about the commercialization and fund research that is past basic but too early in the pipeline for a successful STTR application, SBA believes it is too early to properly measure the impact of this pilot. SBA is interested in learning more about the efforts to train and encourage researchers to establish viable small businesses, identify markets, clarify IP strategies and apply for and win STTR and SBIR funding.

At this time, SBA cannot recommend the Phase 0 Proof of Pilot program become permanent or be extended to other agencies without additional data, analysis of the impact of the program, and clarification of the congressional intent.

19 | SBA SBIR/STTR Accomplishments

The Office of Innovation and Technology (OI&T) is the office at SBA responsible for the oversight and management of the SBIR and STTR Programs on behalf of the Administrator. SBA responsibilities identified in Section 9 of the Small Business Act (15 U.S.C. § 638(b)) include: assisting small businesses in participating in the SBIR/STTR Programs; coordinating and monitoring Federal agency operation of the SBIR/STTR Programs; managing databases and SBIR/STTR Program data; and reporting activities to Congress.

Advocacy for SBIR/STTR

OI&T focuses on building stronger relationships with and for the 11 Participating Agencies. Improving assistance provided to potential applicants, especially those from underrepresented communities is a priority and much of that is executed by building a strong network of those that are often called the "innovation ecosystem". This network is made up of individuals, for profit, nonprofit, universities, state economic development, and others. SBA plays the role of intermediary for these organizations and the Participating Agencies. Our network is much wider than the FAST and Growth Accelerators we fund directly, and it continues to grow.

Key efforts included the SBIR Road Tour, major upgrades to the SBIR.gov business intelligence database platform and working with the university startup community. SBA continues to improve and expand the training tools available on the SBIR.gov. SBA exposes the hundreds of stakeholders across the innovation ecosystem to these tools and provides them training so they themselves can better train entrepreneurs in applying to the programs. Additional activities are discussed below.

SBIR.gov Improvements

A continued focus for 2018 is improving data quality from Participating Agencies, incorporated into these annual reports and posted on SBIR.gov. SBA implemented solutions that improved SBIR.gov for both the public and agency users. More of the data fields that agencies submit to SBA were made mandatory and quality control checks that identifies false or false probable data are being used. The agencies now have tools to help them identify missing data during the upload process as well as improve topic solicitation data uploads. These updates incorporated additional questions, text changes, and templates to improve data collection and reporting. Furthermore, SBA continued working with agencies to collect unawarded proposal coversheet data. Unawarded proposal data is an important piece to understanding overall data trends and areas for improvement.

Innovation Ecosystem Support

Collecting award data, monitoring agencies, and reporting SBIR/STTR activity are part of the overall goals for the office, but equipping networks within the innovation ecosystem is also critical to increase quality SBIR/STTR assistance for potential applicants, regardless where they are based. During 2018, SBA formalized a monthly call for SBIR support organizations, growing its reach from just over 200 to 340 individuals around the country. Those calls featured updates directly from Participating Agencies, announcements of funding opportunities for support organizations, and fostered an environment of collaboration between federal and state partners.

In FY 2018, SBA was appropriated funds for two programs to support the innovation ecosystem. The Federal and State Technology (FAST) Partnership Program is described in detail in section 21 of this report, and the Growth Accelerator Fund Competition (GAFC) which was funded at $1,000,000, however was not executed until FY 2019.

Road Tour and Conferences

The SBIR Road Tour is a national outreach effort coordinated by the SBA and supported by the federal Participating Agencies to grow the national innovation ecosystem. By working with local and regional hosts, SBA raises awareness of SBIR/STTR funding opportunities, provides information to help potential applicants develop more competitive proposals, and highlights relevant partners and programs.

The FY18 SBIR Road Tour brought on average 16 SBIR agencies or components to each stop to meet directly with potential applicants and community partners, successfully reaching historically underrepresented states and individuals (including women-owned as well as socially and economically disadvantaged small businesses, rural populations, HBCU's and MSI's.) Furthermore, these stops offered opportunities to engage the R&D community and local innovation support organizations (including SBDCs and PTACs) critical to the growth and development of local technology ecosystems. The fourth year of the SBIR Road Tour included 18 stops over 4 tours: Southern, Eastern, Pacific Northwest, and New England. These events averaged over 160 attendees per stop. In total, these tours provided almost 3,000 attendees with a local opportunity to hear directly from Program Managers from the Participating Agencies and facilitated over 2,900 one-on-one meetings. SBA and the Participating Agencies also participated in the 2018 SBIR Innovation Summit (Anaheim, CA) and the 2017 Fall SBIR/STTR Conference (Tampa, FL).

Training

SBA continued improving the training tools available on SBIR.gov while offering targeted Train-the Trainer courses for stakeholders across the innovation ecosystem, including entrepreneur support organizations working directly with small businesses. In FY18, SBA offered 8 courses focused on either helping potential applicants or assisting first time awardees. Each course included 10 sessions with a live instructor, discussion boards, and select homework assignments to better equip participants and deepen their understanding of the SBIR/STTR programs.

SBIR/STTR Program Managers Meetings

SBA continued facilitating bi-monthly meetings with the SBIR/STTR Program Managers. In these meetings, SBA and the 11 Participating Agencies discussed issues including outreach strategies, best practices, challenges, improvingdata integration, and policy updates.

Fraud, Waste, and Abuse

Fraud, Waste, and Abuse (FWA) was a regular topic for discussion at the Bi-Monthly SBIR Program Managers meetings. SBA discussed the topic at every meeting and encouraged agencies to share FWA best practices. This included best practices on sharing information regarding duplicate proposals submitted by firms, having agency Inspector General contact information and successful FWA cases published on their websites, as well as the importance of making sure companies complete the FWA certifications.

The SBIR program office (Innovation and Technology) had ongoing discussions with the SBA Office of Inspector General (OIG) regarding FWA trends discussed by participating SBIR agencies at the SBIR OIG Working Group.

20 | Agency Summaries

Department of Commerce (DOC)

The Department of Commerce's SBIR Programs are administered by the National Institute of Standards and Technology (NIST) and the National Oceanic and Atmospheric Administration (NOAA).

FY 2018 SBIR Highlights

- Both NIST and NOAA fund small businesses to perform research and development in technology areas that align with the agencies' missions as described in annual solicitations. The technologies demonstrate significant potential for successful commercialization.

FY 2018 SBIR Success Stories

- In FY 2018, DoC increased SBIR participation by women-owned and minority-owned small businesses. This achievement can be attributed to DoC's increase in outreach activities, such as SBIR public events or social media presence and engagement.
  - Total Phase I award dollars obligated to women-owned SBCs increased from $ 438K in FY17 to $659K in FY18.
  - Total Phase I award dollars obligated to minority-owned SBCs increased from $298K in FY17 to $439K in FY18.

FY 2018 Commercialization/Outreach Activities

- Commercialization Assistance Program: Participating awardees are provided with individualizedtraining, business mentorship and support which should improve their potential of commercialization success.
  - NIST continued its Technology Commercialization Assistance Program (TCAP) for NIST Phase I and Phase II awardees.
  - NOAA continued its Technology Commercialization Assistance Program (NOAA-CAP) for NOAA Phase II awardees.
- Outreach Activities:
  - Both NIST and NOAA continue to participate in the SBA-sponsored SBIR Road Tours and conferences.

Department of Education (ED)

ED's SBIR program, operated by the Institute of Education Sciences (IES), provides up to $1.1M in funding to small businesses and partners to translate their innovative R&D ideas into commercially viable products to address educational challenges and improve relevant outcomes for teachers, students, and administrators, in education and special education. The funds enable firms to develop prototypes, conduct iterative R&D to inform refinements, access full-scale development, and perform pilot research in schools to determine the feasibility and promise. After a project ends, firms commercialize or disseminate the products to schools, teachers, and students, often producing solid results and gaining media and key stakeholder recognition of ED SBIR as an innovation driver in the ed-tech ecosystem. Information about the program can be found on the program website http://ies.ed.gov/sbir, the video page http://ies.ed.gov/sbir/videos.asp, and the success story page http://ies.ed.gov/sbir/successstories.asp.

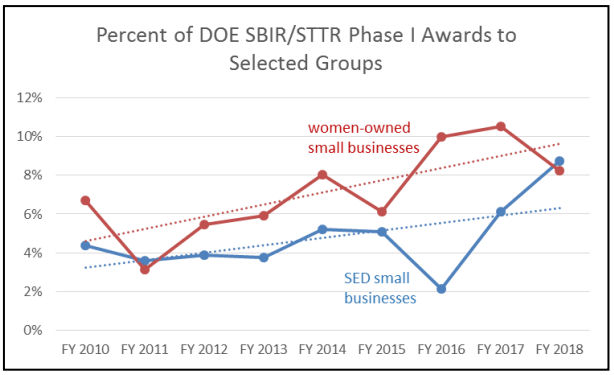
Key FY18 Achievements

- ***Visible Impact*** – in recent years millions of students in thousands of schools have used products developed fully or in part with support of ED SBIR.
- ***Organized Major SBIR Event*** – For the 5th consecutive year, ED SBIR led the ED Games Expo, an event to showcase more than 50 SBIR-supported small businesses that received funding from SBIR programs at ED, NSF, NIH, and the DOA. In 2018 the event was held at the John F. Kennedy Center for the Performing Arts. Articles and blogs about the 2018 ED Games Expo appear in *EdSurge* (Here), and by SBIR awardees Fablevision (Here), Schell Games (Here), and Killer Snails (Here).
- ***Building Capacity for Small Businesses Across the Field of Education Technology*** – ED/IES SBIR provided substantive technical assistance to over 300 small business firms, including potential applicants before solicitations were released and to all awardees during- and after- the project period.
- **An SBIR Product in Space:** Read Here a blog describing an SBIR project by Future Engineers that was featured in Space Innovation Day at the Air and Space Museum, in coordination between NASA, the Smithsonian, and ED SBIR.
- ***Feature Story*** – Game Industry News published a feature story on the ED/IES SBIR program.
- ***Industry Awards*** - Several ED SBIR products won prestigious national industry competitions in 2018, including: Schell Games made the shortlist at VR Awards for HoloLAB Champions (Read Here); Electric Funstuff won a Parents' Choice Gold for Up From The Dust (Read here); Readorium won a Gold Medal at the Reimagine Education Conference for Best K12 product ((Read Here); and Happy Atoms by Schell Games named one of the top kids toys by Good Housekeeping (Read Here).
- **In the News:** *NPR's WESA* featured HoloLAB Champions by Schell Games. (Listen Here); The *Pittsburgh Post Gazette* featured HoloLAB Champions Schell Games (Read Here); *Variety.com* featured HoloLAB Champions by Schell Games (Read Here); *Blast Magazine* highlighted Brainquake's Wuzzit Trouble and Filament Games' Reach for the Sun (Read here); *Hechinger Report* featured SuperChemVR by Schell Games (Read Here); EdSurge detailed Sokikom's acquisition (Read here).

Department of Energy (DOE)

The DOE SBIR & STTR Programs provide research and development funding to advance the physical sciences and improving energy and national security. Small businesses participating in these programs often collaborate with the DOE National Laboratories to take advantage of their unique capabilities and expertise.

***SBIR/STTR Funding*:** DOE obligated $282M for theSBIR and STTR programs for FY 2018, which included 408Phase I awards and 194 Phase II awards. Although DOE was able to exceed the obligations requirements for the SBIR program (3.32% versus 3.20% requirement), obligations for the STTR program fell short (0.43% versus 0.45% requirement) as a result of implementing statutory reprogramming restrictions on its appropriated funds. FY 2018 funds that were not obligated are being carried over toFY 2019 for obligation. DOE is modifying its operating procedures for the programs to address the reprogrammingrestrictions and meet its annual obligation requirements.



Under-represented Groups: DOE was able to continue its Phase 0 application assistance program for under-represented groups in FY 2018 through its existing contract, although the lapse in the administrative funding pilot program resulted in the termination of this support contract. With the passage of the FY 2019 NDAA and reinstatement of the administrative funding pilot program, DOE will restart its Phase 0 application assistance programin FY 2019. The long-term trend in participation by women-owned and socially and economically disadvantaged (SED) small businesses continues to be positive.

Small Business Highlight
Telescent | Irvine, CA

Based on the theory of knots and braids, Telescent has developed a robotic fiber optic cross-connect capable of automating the physical layer of connections in data centers. Their recently introduced Telescent G4 Network Topology Manager (NTM) is the result of an intensive, multi-year engineering tour de force supported by $13M in Angel investment, in addition to the SBIR support. It exemplifies the growing reliance on robotics and artificial intelligence across all market sectors. The NTM is now deployed across the globe in 15 large-scale data centers, and the number of deployments is rapidly growing. The Telescentteam currently totals 36 employees and is forecast to exceed 100 in the near future as annualsales ramp to $250M in four years.

Department of Health and Human Services (HHS)

The HHS SBIR/STTR Programs are administered by the National Institutes of Health (NIH) to invest in early-stage biomedical, health, and life science companies creating a wide range of innovative technologies aligning with NIH's mission to improve health and save lives. A key objective of this work is translating promising technologies with strong potential for commercialization to the private sector through strategic public and private partnerships, so that life-saving innovations reach consumer markets.

FY 2018 SBIR/STTR Highlights

- Awarding over 1,400 SBIR/STTR Phase I, Phase II, Phase IIB, and Fast Track applications to US small businesses.
- HHS Technical Assistance (Niche Assessment, Commercialization Accelerator, I-Corps) Programs assisted ~300 SBCs.

FY 2018 Commercialization/Outreach Activities

- 206 events (in person and virtual) hosted in 40 states, (including 13 IDeA states) that reached over 27,000 attendees
- Reached over 2,400 attendees and 18 states, including Alaska, during the SBIR Road Tour.
- 774 SDB reached; 990 WOSB reached.
- 19th Annual HHS SBIR/STTR conference was hosted in Milwaukee, WI on November 7 – 9, 2017, reaching 498 attendees from 37 states plus Puerto Rico, and 202 businesses. This event included a workshop designed for WOSB/SDB.
- Coordinated an HHS Women and Minority Outreach Small Business group to develop strategies to increase WOSB/SDB.
- Began development of NIH-wide Entrepreneur in Residence program to assist small businesses.
- Developed key contacts and relationships with multiple U.S. Historically Black Colleges and Universities (HBCUs) through site visits and targeted outreach.

FY 2018 SBIR/STTR Success Stories

- **RxFunction Inc. (MN** - raised $7.5 million in series A funding for market and conduct more clinical trial work on its medical device "walkasins," used to improve balance and mobility for patients with peripheral neuropathy);
- **Profusa, Inc. (CA** - Closes $45 Million Series C Financing);
- **PositveMotion dba Stand2Learn (TX** - acquired by VARIDESK, a Texas based furniture manufacturer known for its trademark height-adjustable standing desks); and
- **Lucigen (WI** - acquired by LGC Limited, a UK-based testing and diagnostics company).

Department of Homeland Security (DHS)

The DHS SBIR Program serves to increase small business access to DHS R&D opportunities while providing innovative solutions for DHS technology needs. The DHS SBIR Program is administered through the Science and Technology Directorate (S&T) and the Countering Weapons of Mass Destruction (CWMD) Office.

S&T SBIR focuses on near-term commercialization and delivery of operational prototypes to federal, state and local emergency responders and managers, as well as internal DHS operational units to support the DHS missions: Prevent Terrorism and Enhance Security, Secure and Manage Our Borders, Enforce and Administer Our Immigration Laws, Safeguard and Secure Cyberspace, and Strengthen National Preparedness and Resilience

CWMD SBIR focuses on aggressive and expedited small business R&D developing break-through technologies to prevent attacks against the United States using a weapon of mass destruction. CWMD works with small business to identify, explore, develop, and demonstrate new technologies and capabilities that federal, state, and local law enforcement and other public safety officials can use to carry out their mission to prevent chemical, biological, radiological, and nuclearthreats and incidents

DHS SBIR Addresses the R&D Needs of the 7 DHS Operational Units (as well as First Responders nationwide)

- U.S. Coast Guard
- U.S. Transportation Security Administration
- U.S. Customs and Border Protection
- Federal Emergency Management Agency
- U.S. Citizenship and Immigration Services
- U.S. Immigration and Customs Enforcement
- U.S. Secret Service

DHS SBIR-funded Technology Enables U.S. Small Businesses to be Successful and Profitable

- 453 Small Businesses in 43 States, and in DC, have received DHS SBIR Funding
- 92 Patents Filed*
- 28 Patents Issued*
- 23 Patents Pending*
- 50+ Commercial Products in the Market*
- 30+ Mergers and Acquisitions*

** data from a 2015 survey (includes standalone products, active licenses, products with DHS technology incorporated)*

Commercialization Readiness Pilot Program: In FY2018, while continuing its Commercialization Assistance Program, the DHS SBIR Program initiated several efforts aimed at improving the chances of commercial success of SBIR technology efforts and the small businesses developing them. Key aspects of this approach include: mentoring of small businesses to improve business and marketing skills including end-user product knowledge, additional investment in promising Phase II technologies to improve technical readiness, and inclusion of DHS SBIR firms in the NSF I-Corps program.

Department of Transportation (DOT)

DOT's SBIR program, managed for over 30 years by Volpe, the National Transportation Systems Center, seeks to contract with small businesses to pursue R&D on innovative solutions to our nation's transportation challenges across all modes. DOT seeks SBIR applicants who can help the Department anticipate and address emerging issues by advancing technical, operational, and institutional innovations through specific R&D topics of interest to DOT operating administrations: Federal Aviation Administration; Federal Highway Administration; Federal Motor Carrier Safety Administration; Federal Railroad Administration; Federal Transit Administration; National Highway Traffic Safety Administration; Pipeline and Hazardous Materials Safety Administration; Maritime Administration; and the Office of the Assistant Secretary for Research and Technology.

FY 2018 SBIR Highlights

- In FY 2018, U.S. DOT awarded 15 Phase I SBIR awards across 10 research topics funded by five DOT operating administrations, and awarded nine Phase II or IIB awards to prior Phase I awardees.
- Approximately 75% of FY 2018 awardees participated in DOT's Commercialization Assistance Program (CAP), accessing a wide variety of business services to help their technology progress and reach commercialization

FY 2018 Commercialization/Outreach Activities

- DOT continued to offer the Commercialization Assistance Program (CAP) to all Phase I and Phase II awardees. All SBIR awardees may receive up to $5,000 per year of award for a wide variety of services provided by DOT's vendor, or the awardee may use their own vendor.
- The DOT SBIR Program Office participated in the SBA's SBIR Road Tour and the SBIR/STTR Innovation Summit, reaching small businesses across the country.

FY 2018 SBIR/STTR Success Stories

- **GS Engineering, Inc.** developed and tested the Locomotive Access System, which makes accessing freight locomotives easier and safer for railroad engineers and workers by eliminating the large first step and reducing additional steps needed to board a train.
- **Fuchs Consulting, Inc.** developed a suite of infrared-based technologies that assess the condition of paint coatings, image subsurface damage in concrete, and measure the level of stress in steel. These dataare then used by customers to inform key decisions on maintenance and repairs.
- **Migma Systems, Inc.** innovated a pedestrian detection and counting technology using a combination ofa high-resolution infrared light-emitting diode (IR LED) camera and a laser scanner to provide urban planners, designers, and transportation agencies a better understanding of their traffic systems.
- **Intelligent Automation, Inc.** developed, tested, and deployed a low profile, multi-sensor, low power-consumption, light-weight, and visually Unobtrusive Traffic Monitoring System (UTMS) that takes advantage of existing infrastructures to seamlessly monitor traffic information and ensures timely data collection and reporting.

Environmental Protection Agency (EPA)

EPA's SBIR Program is the small program with the big mission – to develop and commercialize technologies that protect human health and the environment. EPA works to keep its annual solicitation responsive and relevant. Interaction and communication within the Agency is key to identifying the most important and current environmental needs in areas such as drinking water, air quality, chemicals, manufacturing, greener buildings and homeland security.

FY 2018 Commercialization

- EPA works closely with its small businesses to help them commercialize their technologies. The proposal evaluation criteria place an increased emphasis on commercialization, including business expertise, partnerships and track record. Peer reviewers with commercialization experience make up a significant portion of each peer review panel. EPA also provides commercialization assistance to all its Phase I and Phase II companies. In addition, EPA has a commercialization option where Phase II companies can receive a funding supplement of up to $100,000 from EPA for securing 3rd party investment. Many of EPA's companies continue to have significant commercial success while also protecting human health and the environment. See highlights below.

FY 2018 SBIR/STTR Success Stories

- **SioTex** a small business in Texas, has developed a novel alternative to fumed silica, an important additive for products in many industries. This environmentally friendly method uses no toxic chemicals,is more energy efficient and uses an agricultural waste material as a feedstock. Commercially, SioTeX is producing silica for agricultural consumers, and the company plans to increase its manufacturing abilities to keep up with demand.
- **Industrial Microbes, Inc**., a small business out of California, is engineering a microbe that uses waste materials instead of palm oil to make ingredients for detergents and lubricants. Palm oil is the largest oil market in the world, but its production is associated with enormous environmental and societalcosts. Compared to current production, this new process requires minimal land and can use a variety of organic wastes as raw materials. The new process is not limited to specific climates and will create bio-manufacturing jobs in the United States. The success of Industrial Microbes has resulted in commercialization partnerships and investments, including from Point Reyes Capital Management and individual angel investors.
- **Hi-Z,** another California company, has developed an innovative cookstove, The Power Stove, which uses low-cost thermoelectric power to cook food while reducing harmful smoke emissions by 70 percent. Additionally, the stove generates electricity while it's in use; one day of cooking should charge two cell phones and provide light for four hours. The Power Stove will be introduced into the market in India, where over 65 percent of its population cooks on open fires and maybe also in Africa. Hi-Z's ability to affordably produce thermoelectric modules has generated a partnership in which they will produce modules for a Norwegian Private Enterprise.

National Aeronautics and Space Administration (NASA)

The NASA SBIR and STTR programs fund the research, development, and demonstration of innovative technologies that fulfill NASA needs as described in the annual Solicitation and have significant potential for successful commercialization. Commercialization encompasses the transition of technology into products and services for NASA mission programs, other Government agencies and non-Government markets. NASA research and technology areas solicited in 2018 are aligned by the Agency's Mission Directorates. The Directorates identify high priority research and technology needs for their respective programs and projects. The needs are explicitly described in the topics and subtopics descriptions developed by technical experts at NASA's Centers.

FY 2018 Key SBIR/STTR Highlights

- In FY18, Woman-Owned Small Businesses represented 11 percent of the awards, Small, Disadvantaged Businesses received 10 percent of the awards, and approximately 78 percent of awards went tocompanies with fewer than 50 employees.

FY 2018 Commercialization/Outreach Activities

- **Request for Information (RFI):** NASA utilizes an RFI to engage industry and small businesses to build awareness, gain insights, and obtain feedback to help shape the Program. This provides an opportunity for small businesses and industry, in general, to provide feedback to benefit the stakeholders of NASA's SBIR/STTR Program. The RFI also provides a networking opportunity for businesses participating in this RFI to share contact information with other RFI participants and develop partnerships. After the close of Phase I submissions for FY18, the program requested feedback on the FY18 subtopics. The input was used to refine existing subtopics, and inspire new subtopics for 2019.
- **I-Corps Training Program:** In FY18, NASA continued its partnership with the National Science Program (NSF) which allowed NASA selected teams from the Phase I awardees to participate in the NSF Innovation Corps program (I-Corps TM) (hereinafter I-Corps). I-Corps educates teams on how to translate technologies from the laboratory into the marketplace. The intended result of I-Corps is to provide firms with a better understanding of their customers' needs, to give firms a better understanding of their company's value proposition as it relates to those customer needs, and to provide firms with an outline of a business plan for moving forward. In FY18, NASA selected 14 SBIR Teams to participatein the NSF I-Corps Bootcamp program and 3 STTR Teams were selected to participate in the NSF I- Corps Cohort program.
- **Phase II-E/X Options in active Phase II Contracts:** The objective of the Phase II-E/X Option is to further encourage the advancement of innovations developed under Phase II via an option to further R/R&D efforts underway on active Phase II contracts that are in good standing with NASA. Eligible firms shall secure a non-SBIR/STTR investor to contribute funding towards further enhancing the research to qualify for this option. The investor may be a non-SBIR/STTR NASA or NASA program; or may be an investor external to NASA, from another government agency or the private sector, depending on the strategy being pursued for enhancing the technology for further research, infusion, and/or commercialization. For FY18, 44 SBIR and 4 STTR Phase II-E/X Options were executed.
- **Civilian Commercialization Readiness Pilot Program (CCRPP):** The CCRPP paused in FY18 to review the results and input from stakeholders, and consider beneficial changes to the program. However, some firms received their awards from the FY17 call in FY18 and several additional selectionswere made. The full CCRPP was reintroduced in FY19.
- **Innovation and Opportunity Conference (IOC):** NASA made the decision to focus its annual event on infusion and commercialization and therefore looked to partner with an economic development entity.In order to allow time to develop the partnership and find a date that worked for all parties, the 2018 IOCtook place in early FY19.

FY 2018 SBIR Success Stories

- Pancopia, Inc.: High Performance Water Recycling System for Space Exploration: Pancopia created an innovative water recycling process that leverages novel microorganisms to provide cost-effective, closed-loop water purification on the International Space Station (ISS) and on Earth. NASA SBIR awarded Pancopia $885,000 to build and expand the prototype. Pancopia received two commercialization awards with USDA SBIR for this new recycling system and has partnered with USDA's Agricultural Research Service to license its patented anammox bacteria.
- Tethers Unlimited, Inc. (TUI): CubeSat Thrusters Powered by Green Propellant: NASA selected the HYDROS-C thruster for demonstration on the first Pathfinder Technology Demonstration (PTD)CubeSat mission, planned for launch in early 2019. The HYDROS-C thruster, developed under a SBIRcontract and matured to flight-readiness under a NASA Tipping Point Technologies Public-Private Partnership, is a revolutionary space propulsion technology that uses water as propellant.

Operational and Technical Modernization

- The program underwent an operational and technical modernization effort throughout 2018 by rolling out new modules of the program's Electronic Handbook (EHB) system with each process in the cycle. The EHB is the primary technology interface for firms and internal NASA users and typically handles about 1600 proposals, 3000 evaluations, 400 awards, and 4000 deliverables annually. Key objectives were to provide: seamless user experience with an intuitive and user-friendly interface; user-centric rather than process-centric business rules; scalability and flexibility for future program needs; multi- layer security to protect sensitive and SBC proprietary intellectual property; integrated data analytics and visualization capabilities; Section 508 compliance; responsive design for multiple device platforms;focus on federated data access rather than duplicative systems; prevention of data duplication; and increased interoperability with other systems (NASA or other government agency).

National Science Foundation (NSF)

America's Seed Fund powered by the National Science Foundation (NSF) awards $200 million annually to startups and small businesses, transforming scientific discovery into products and services with commercial and societal impact. Startups working across almost all areas of science and technology can receive up to $1.5 million in non-dilutive funds to support research and development (R&D), helping de-risk technology for commercial success. America's Seed Fund is congressionally mandated through the Small Business Innovation Research (SBIR) program. The NSF is an independent federal agency with a budget of about $7 billion (in FY2018) that supports fundamental research and education across all fields of science and engineering. For more information, visit seedfund.nsf.gov.

FY 2018 SBIR/STTR Highlights

- Engaging and Supporting First-Time Applicants – A total of 58% of all Phase I proposals received in FY2018 were from first-time applicants (i.e. companies who had never submitted a proposal to NSF before).
- A total of 55% of all Phase I awards made were to first-time NSF applicants. Our Phase I awardee companies were mostly small (95%) and young (84%) companies.

FY 2018 Outreach Activities

- NSF sponsored and participated in more than 95 in-person and virtual outreach events in 2018.
- Broadening Participation – NSF awarded the American Society for Engineering Education (ASEE) a $5.3-million grant to manage the Innovative Postdoctoral Entrepreneurial Research Fellowship (I-PERF) through 2022. Through I-PERF, ASEE will recruit, train, mentor, place, and fund underserved, early-career science and engineering doctoral degree recipients to participate in entrepreneurial activities and perform innovative research at eligible NSF-funded small businesses.
- Tradeshow Highlight– NSF sponsored the Consumer Electronics Show (CES), which drew more than 180,000 attendees, and had a much larger footprint on the show floor at Eureka Park.

FY 2018 SBIR/STTR Success Stories

- Acquisition Highlights – The calendar year 2018 saw 22 confirmed acquisitions, mergers, or initial public offerings of NSF awardee firms (Apama Medical, $300 million and Netsil, $70 million).
- Featured Awardee – Gingko Bioworks, originally funded by NSF in 2009, raised $275 million. The company designs custom microbes for customers across multiple markets, developing new organisms that replace technology with biology.
- NSF SBIR Portfolio companies raised 46 separate private capital rounds that were greater than $10 million each and 142 separate private capital rounds that were greater than $1 million in fiscal year 2018 (including $275 million for Ginkgo Bioworks, $72 million for SQZ, $70 million for Sila Nanotechnologies, and $60 million for BitSight).
- The total private equity funding raised by the NSF SBIR portfolio companies in 2018, according to CB Insights, was $2.79 billion.

21 | Federal and State Technology Partnership (FAST) Program

The Federal and State Technology Partnership (FAST) Program, reestablished under the Consolidated Appropriations Act of 2010, is a competitive grants program administered by the SBA and designed to build and grow the pipeline of potential SBIR/STTR applicants. FAST improves the participation of small technology firms in the innovation and commercialization of new technology, thereby helping keep the United States on the forefront of R&D in science and technology. All 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and the American Samoa may receive funding for an array of services in support of the SBIR/STTR Programs.

FAST places an emphasis on helping underrepresented applicants, specifically women, socially and economically disadvantaged, and rural-based firms compete in the SBIR/STTR Programs.

In FY 2017, the 2018 cohort of 21 organizations was announced, with a program period ranging from September 30, 2017 to September 29, 2018. The 2018 cohort's efforts played a vital role in helping entrepreneurs around the country learn about funding SBIR/STTR funding opportunities, submit competitive proposals, and commercialize the work developed under their SBIR/STTR award. Examples of successful cohort initiatives included strengthening relationships with other local innovation ecosystem partners, hosting events for potential applicants particularly in underrepresented areas and populations, fostering relationships with research institutions as well as labs, offering training sessions on key issue areas, helping companies identify technical assistance needs, connecting companies with mentors, and developing newsletters highlighting SBIR/STTR opportunities.

In FY 2018, a total of $3,000,000 was appropriated as grants for entities to carry out targeted activities. SBA announced the selection of the 2019 Cohort in August 2018, which included 24 FAST grants for up to $125,000 eachto state and local economic development agencies, Small Business Technology Development Centers, Women's Business Centers, incubators, accelerators, colleges, and universities to support innovative, technology-driven small businesses developing and commercializing high risk technologies. FAST candidates were submitted through each oftheir state and territorial governors, as each governor may submit only one proposal. Proposals were evaluated by panels of reviewers from SBA, NASA, NIST, USDA, SOCOM, DHS, DOE, MDA, and NIH. FAST awards were made based upon the merits of each proposal. Varying levels of matching funds were required, based on the number of SBIR Phase I awards in each state. The FAST award project and budget periods are for 12 months, beginning September 30, 2018 through September 29, 2019.

The 2019 FAST Cohort includes the following awardees:

FAST State Organizations awarded up to $125K:

- **Arkansas** | University of Arkansas System – Arkansas Small Business and Technology Development Center
- **Colorado** | Colorado Office of Economic Development and International Trade
- **Delaware** | University of Delaware – Delaware Small Business Development Center
- **Hawaii** | Hawaii Technology Development Corporation
- **Idaho** | Boise State University – Idaho Small Business Development Center
- **Illinois** | Women's Business Development Center
- **Kansas** | Wichita State University
- **Kentucky** | Kentucky Cabinet for Economic Development
- **Louisiana** | Louisiana Business & Technology Center/LSU
- **Maryland** | Maryland Technology Development Corporation
- **Minnesota** | Minnesota High Tech Association
- **Montana** | Montana State University
- **North Carolina** | First Flight Venture Center
- **Nebraska** | University of Nebraska at Omaha – Nebraska Business Development Center
- **New Mexico** | Arrowhead Center of New Mexico State University
- **New York** | The Research Foundation of State University of New York – New York SBDC
- **Ohio** | Ohio Aerospace Institute
- **Oklahoma** | Board of Regents of the University of Oklahoma Office of Research Services
- **Oregon** | Oregon BEST
- **South Carolina** | University of South Carolina
- **South Dakota** | University of South Dakota – SD Small Business Development Center
- **Tennessee** | Tennessee Technology Development Corporation – Launch Tennessee
- **Wisconsin** | Board of Regents of the University of Wisconsin System – Center for Technology Commercialization
- **Wyoming** | University of Wyoming – Wyoming Small Business Development Center

22 | Appendix: SBIR/STTR Program History

For the U.S. government to recognize the necessity of federal engagement of small businesses in R&D of high-risk technology development and to coordinate such a network would not have been possible without the support of key framers, politicians, and legislators. The 'Father' of the SBIR Program, Roland Tibbetts (pictured right), experienced firsthand how government programs affect individuals after President Roosevelt signed the GI Bill into law in 1944. Previously a distinguished first lieutenant in the U.S. Army Air Corp during World War II, Tibbetts was able to complete his undergraduate degree at Boston University and then his MBA at Harvard due to benefits from the GI Bill. After garnering close to 20 years of corporate experience, including serving as the VP of two small high-tech firms, Tibbetts was appointed as a Senior Program Officerat NSF in 1972. As an NSF program manager, Tibbetts was known as a task masterwith well-honed instincts for enabling potentially game-changing projects. He also recognized the importance of small, high-tech firms to the economy and observed the fierce opposition they faced from other recipients when pursuing federal R&D funding.

Senator Edward Kennedy (pictured on the left) also recognized the vital role that small businesses play in America's growing economy and spent much of the 1970s tirelessly championing for NSF to support the research of qualified small businesses as the chairman of the National Science Foundation Subcommittee of the Senate Labor and Public Welfare Committee. Kennedy continued to introducedifferent proposals to increase the percentage of the budget directed toward small businesses. Once NSF recognized the need for ongoing support for small business, the Foundation instituted the SBIR Program in 1977.

In addition to Senator Kennedy, much of the legislative support for the SBIR Program was directly due to the work of Arthur and Judith Obermayer, this year's SBIR Hall of Fame recipients (also pictured above with Senator Kennedy). As early as 1970, Arthur testified before the U.S. Congress on the challenges small R&D companies faced in dealingwith the government. He also lobbied alongside Kennedy for the initial 1974 NSF Authorization Act, which was actualized in the first NSF SBIR Program, designed by Roland Tibbetts. Tibbetts envisioned a 3-phase structure to foster the R&D of small, high-tech businesses and push them to realize their commercial potential. He believed thesefirms were instrumental in converting government R&D into public benefit through technological innovation and commercial applications, therefore stimulating aggregate economic growth. Of the 42 Phase I Awards and 21 Phase II Awards selected in 1977, one firm went on to discover the cystic fibrosis gene and complete the Human Genome Map, a small language-understanding firm (then MicroComputer) became Symantec, and a high-risk firm (then Relation Technology Inc.) became the data giant Ingres Corporation. It seems that Arthur Obermayer was on to something when he advised the Congressional committee in 1978 that the NSF SBIR Program was "potentially…the most significant government program of this century in the field of science and technology."

Due to the success of the NSF SBIR Program, in 1979 the Small Business Administration concluded SBIR Programs should be installed at all government agencies involving research to encourage U.S. innovation and technology. Senator Kennedy, an avid supporter of small businesses, spearheaded legislation to institute a government-wide SBIRProgram. He and other legislators called for every federal agency with a budget over $100 million to establish a program modeled after Tibbetts' NSF SBIR Program. The Obermayers convinced most delegates at the 1980 White House Conference on Small Business to support SBIR. President Reagan signed a government-wide SBIR Program

into law in 1982 (pictured on the right). To date, the Programs have resulted in 70,000 issued patents, close to 700 public companies, and approximately $41 Billion in venture capital investments.

Legislative History

The SBIR Program was created by enactment of Public Law 97-219, the Small Business Innovation Development Act of 1982. The program was reauthorized with the enactment of the Small Business R&D Enhancement Act of 1992, Public Law 102-564. Title I of the bill expanded and reauthorized the SBIR Program while Title II created the STTR Program.

In September 1996, Public Law 104-208 reauthorized the STTR Program through FY 1997. In December 1997, Public Law 105-135 reauthorized the program through September 30, 2006. In 2000 the SBIR Program was re-authorized until September 2009 by the Small Business Innovation Research Program Reauthorization Act of 2000. In October 2001, Public Law 107-50 reauthorized the STTR Program through FY 2009 and increased the program set-aside from 0.15% to 0.30% which began in Fiscal Year 2004.

From 2009 to 2011, the SBIR and STTR Programs were authorized by a series of Continuing Resolutions issued by Congress. In December 2011, the Programs were reauthorized until Fiscal Year 2017 (FY17) by the 2012 National Defense Authorization Act, Public Law 112-81. The bill also increased the minimum set-aside amounts for both Programs:

SBIR: Participating Agencies with extramural R&D budgets exceeding $100M were required to set aside 2.6% of their Fiscal Year 2012 (FY12) extramural R&D budget for SBIR Awards to small businesses (an increase of 0.1% over Fiscal Year 2011). The minimum percentage was then set to increase in increments of 0.1% each year until FY16when it reached 3.0%. For FY17 and each fiscal year thereafter, the minimum percentage will remain at 3.2%, unless subsequently modified by statute.

STTR: Participating Agencies with extramural R/R&D budgets exceeding $1B were required to set aside 0.35% of their FY12 and FY13 extramural R&D budget for STTR Awards to small businesses (an increase of 0.05% over Fiscal Year 2011). The minimum percentage was then set to increase to 0.40% for FYs 2014 and 2015, and again to 0.45% for FY16 and each fiscal year thereafter, unless subsequently modified by statute.

In December 2016, the National Defense Authorization Act for Fiscal Year 2017 (P.L. 114-328) extended the SBIR and STTR programs through September 30, 2022. In August 2018, the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232) made several changes to the statute, including modifying language regarding business and technical assistance, and established a pilot to accelerate award timelines within the Department of Defense.

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