



Testimony of

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Before the

**United States House Committee on  
Small Business**

**SBIR/STTR: Fostering American Innovation**

*February 26, 2025*

***On behalf of***

**The Small Business Technology Council**

[www.sbtc.org](http://www.sbtc.org)

*SBTC is the nation's largest association of small, technology-based companies in diverse fields, and represents more companies that are active in the federal Small Business Innovation Research (SBIR) Program than any other organization. SBTC is proud to serve as the technology council of the National Small Business Association. Testimony Prepared by Jere Glover, Alec Orban, Bob Schmidt, and Kevin Burns.*



Chairman Williams, Ranking Member Velazquez, members of the Committee, thank you for inviting me to testify today on the reauthorization of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, and how to strengthen and improve them. I am Jere Glover, Executive Director of the Small Business Technology Council (SBTC), which represents high-tech, R&D-focused small businesses in America, many of whom participate in the SBIR and STTR programs.<sup>1</sup>

The SBIR program was created in 1982 by a bi-partisan Congress, and signed into law by President Reagan. They knew very little Federal R&D was going to small businesses. America was missing the opportunity to better mobilize small business entrepreneurship and innovation to meet Federal R&D needs and to bridge the technology gap eroding American competitiveness and jobs. So, they created this highly competitive program to make sure at least a small fraction of Federal R&D goes to small businesses. Time has shown they were right.

America's basic science is a primary national strength, but converting that science to American innovation and jobs faces increasing international competition. The SBIR/STTR programs provide seed corn for this challenge, combining private enterprise with American ingenuity to enable new innovations while building new products and businesses transforming American industry. SBIR asks our nation's small businesses, employing 35% of our scientists and engineers and led by American entrepreneurs, to convert American science into new scientific breakthroughs and useful innovations to meet Federal R&D needs and to commercialize that tech to build their businesses. SBIR firms must be American-based and owned by Americans, with work done in the U.S. The new technology, products and services are selected by the agencies based on merit; meet agency objectives; meet market and societal needs; and create new sustainable high quality, high paying manufacturing and service jobs in the U.S. while raising living standards and making American products more competitive. Today, facing uneven economic growth; aging infrastructure; and international competition, and with intellectual property theft that is draining American jobs, we should strengthen the SBIR/STTR<sup>2</sup> investment, unleashing small business energy and jobs towards a new wave of 21st century American-made products and services.

The SBIR/STTR programs have proven to be the most successful and efficient innovation programs in government, enlisting the energy of America's small business technologist entrepreneurs to do government R&D. The result, using only 3.65% of Federal extramural R&D spending, has resolved many technology challenges facing the government and enabled the creation of some of the most important new technologies in the world, while generating massive returns to America.

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<sup>1</sup> I have been involved in federal science and technology innovation programs since 1978, when I staffed joint Senate/House hearings and the resulting report that showed severe under-utilization of small business high-tech companies in the Federal R&D programs. The SBTC is an outgrowth of the White House Conference on Small Business in 1995, and is the nation's largest association of small, high-tech companies across diverse fields.

<sup>2</sup> Congress passed and George H. W. Bush signed Public Law No: 102-564, which created a smaller, companion Small Business Technology Transfer (STTR) program in 1992, for academic partnering.



Technologies you use every day were created with SBIR funding, including the GPS on a chip and CMOS camera systems in your smart phone. Seventeen countries have copied the program and created their own version of SBIR. SBIR is also the principal point of entry for small businesses to enter the government innovation ecosystem and industrial base, with around 40% of awards going to first-time winners. That equates to over 1,000 new businesses doing business with the government every year.

The economic return on the taxpayer dollar has been enormous. Studies performed at the DOD and NIH have shown that every dollar invested in SBIR results in \$20 to \$30 in total economic impact<sup>3</sup>. The DOD's SBIR program has generated \$2.50 in taxes for every \$1 invested, while at the NIH that figure is \$3.68, meaning the government is making more than double its money back on its SBIR investment. Thousands of firms have grown as well as licensed their technologies to larger firms, with over 2,000 SBIR-winning firms having been acquired, injecting their innovations and energy into larger companies. Several of the largest prime contractors have acquired more than 10 SBIR firms, including Lockheed Martin, RTX, and General Dynamics.

In addition to economic benefits, SBIR/STTR is helping the agencies fulfil their missions by tapping into the best, most innovative research and technology American small business has to offer. SBIR funds firms that have the infrastructure, expertise and ability to provide research and products needed specifically for the Government. It also funds thousands of firms at their earliest and most fragile state.

A recent National Academies of Sciences study at the NIH showed that SBIR/STTR awardees generated 12% of all new drugs approved, and 16% of "priority review" new drugs approved<sup>4</sup>. DoD has been using SBIR R&D to drive innovation and new concepts into large defense systems, e.g. substantial unmanned aerial vehicle advances and helping generate \$500 million in F-35 cost-savings.

The innovation SBIR generates is needed now more than ever, as China has now exceeded the US in 57 of 64 Critical Technologies.<sup>5</sup> Not only has the US fallen behind China, is it behind Europe as well. America needs to focus on improving our R&D funding, patent laws, and tax system. China's R&D expenditures have grown to almost as large as those of the U.S. (\$723 billion vs.

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<sup>3</sup> Swearingen, Will and Jeffrey Peterson, "National Economic Impacts from Air Force and Navy SBIR/STTR Programs, 2000-2013"; "1998-2018 National Economic Impacts from the National Cancer Institute SBIR/STTR Programs"; and "National Economic Impacts from the DOD SBIR/STTR Programs 1995-2018" Techlink

<sup>4</sup> National Academies of Sciences, Engineering, and Medicine. 2022. *Assessment of the SBIR and STTR Programs at the National Institutes of Health*. Washington, DC: The National Academies Press.

<sup>5</sup> ASPI's two-decade Critical Technology Tracker: The rewards of long-term research investment, 28 August, 2024, <https://www.aspi.org.au/report/aspis-two-decade-critical-technology-tracker>



\$784 billion for the U.S.), while the European Union is investing 20% of its R&D in small businesses<sup>6</sup>. Even France is now putting \$13 Billion into “disruptive technologies”.<sup>7</sup>

This is not the time to cut U.S. R&D investment. We should invest more optimally on new and emerging technology. Nascent and emerging small businesses are necessary to develop and market both entrepreneurs’ and university technology and innovations. If we are going to change these tides and have America regain the world’s leadership in technology and innovation, we need to take action. It is time to put our money where our innovation is, in small business. issue for small inventing businesses is the slow down of research funding. We must immediately reopen the valve for awarding contracts and grants and conduct reviews for new proposals, before we bankrupt too many new small businesses.

An essential part of SBIR’s success is its competitive, merit-based structure. Innovation thrives on competition, and across government in FY2022, only 16% of SBIR Phase I proposals are funded, with only 31% of Phase II proposals funded<sup>8</sup>. This high level of competition ensures that, through SBIR/STTR, taxpayers are buying the very best research and technology that America’s high-tech small businesses have to offer. And about half of projects that advance to Phase II eventually move on to Phase III toward becoming commercial products.

Another strength of SBIR/STTR is it invests early in innovation – well before VCs and banks will provide risk capital, with successful SBIR technologies often advancing to use VC and bank lending as they mature towards products. Also, SBIR innovation is directed across America’s innovation opportunities, not just in VC-favored sectors such as software, internet, pharma, and telecommunication, but also in areas distributed across the country key to building good American jobs, such as manufacturing, defense, energy, and the environment. And while VC tends to be concentrated in a handful of states, SBIR/STTR funds small businesses in all 50 states, with all but five states receiving at least 10 awards.

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<sup>6</sup> Horizon 2020 and the European Innovation Council pilot: a new dynamic for SMEs with breakthrough ideas, <https://ec.europa.eu/programmes/horizon2020/en/area/smes>

<sup>7</sup> **Jean Baptiste Su**, France Creates \$13 Billion Disruptive Innovation Fund, Hopes To Become The Next Startup Republic, <https://www.forbes.com/sites/jeanbaptiste/2018/01/17/france-creates-13-billion-disruptive-innovation-fund-hopes-to-become-the-next-startup-republic/#62fcc8e5405e>,

<sup>8</sup> Small Business Administration. *SBIR/STTR Annual Report for FY2022* SBA Office of Investment and Innovation



While the SBIR/STTR program has proven to be, as the National Research Council stated, “sound in concept and effective in practice”<sup>9</sup>, there are areas where the program can be improved and strengthened:

1. **Simplify and Streamline the Process.** The biggest obstacle to new entrants is the paperwork and complexity burden. Decades of requirement creep has made the solicitation process incredibly complex. For a small business owner with no experience in government contracting, simply understanding the dense legalese in most solicitations is daunting. Congress should insist on making solicitations simpler and easier to encourage more new firms to participate and to focus better on the innovations required by the agencies, not the paperwork. Sole-source standard contracts should be required by Congress for Phase II and III contracts to increase efficiency and lower administrative costs, as well as speeding the transition of new effective tools to the warfighter. Additionally, SBIR should be allowed to use Other Transitional Authority (OTA), or any other legal process for award vehicles. The agencies should develop model contracts and grants with the goal of providing contracts and grants together with the notice of award, which would save time, costs, and taxpayer expense.
2. **Grow the Program.** The SBIR/STTR allocation has not been meaningfully grown since the 2011 reauthorization increased SBIR from 2.5% to 3.2% of Federal extramural R&D and STTR from 0.3% to 0.45%. Given the outsize return on the taxpayer investment, it makes sense to increase both. DOD’s Section 809 paper on streamlining defense acquisition recommended the SBIR set-aside be increased to 7%<sup>10</sup>. We also believe that the STTR allocation should be increased to 1%. Universities license 70% of their research with small business, and increasing the STTR would facilitate more transfer of university technology. Increasing both SBIR/STTR allocations will allow the government to better leverage small business’ innovative capabilities without increasing federal spending at all. While America is at 3.6% overall, the European Union is investing 20% of its R&D in small businesses<sup>11</sup>. Even France is now putting \$13 Billion into “disruptive technologies”.<sup>12</sup>
3. **Permanence.** There have been at least 18 National Academy studies and dozens of GAO studies performed on the efficacy of the SBIR/STTR programs. It has proven time and time again that it has been tremendously successful both in delivering the research that agencies need in fulfilling their missions, and in the economic return to the taxpayer. The time has come to reauthorize the programs permanently, and give small businesses

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<sup>9</sup>National Research Council. *An Assessment of the SBIR Program*. Washington, DC: The National Academies Press, 2008.

<sup>10</sup> DOD Section 809 Panel, Jan. 2018: “Report of the Advisory Panel on Streamlining and Codifying Acquisition Regulations”, Sub recommendation 21b.

<sup>11</sup> Horizon 2020 and the European Innovation Council pilot: a new dynamic for SMEs with breakthrough ideas, <https://ec.europa.eu/programmes/horizon2020/en/area/smes>

<sup>12</sup> [Jean Baptiste Su](https://www.forbes.com/sites/jeanbaptiste/2018/01/17/france-creates-13-billion-disruptive-innovation-fund-hopes-to-become-the-next-startup-republic/#62fcc8e5405e), France Creates \$13 Billion Disruptive Innovation Fund, Hopes To Become The Next Startup Republic, <https://www.forbes.com/sites/jeanbaptiste/2018/01/17/france-creates-13-billion-disruptive-innovation-fund-hopes-to-become-the-next-startup-republic/#62fcc8e5405e>,



predictability and stability in knowing the programs will not be discontinued, or be subject to a lapse due to delays in reauthorization.

4. **Make Foreign Risk Management Provisions Transparent and Fair** – It is essential to keep research and technology generated by SBIR/STTR out of the hands of America’s adversaries, but the processes should be transparent and fair. If a small business is flagged with a security concern by the risk management provision, it should be told what the nature of that concern is, and if there are ways it can be mitigated. Additionally, companies should be given an opportunity to correct any mistakes made by the agencies in the submitted funding round.

### **Congressionally Mandated Goals of SBIR**

The SBIR program has four congressionally mandated goals:

1. stimulate technological innovation,
2. use small business to meet federal R&D needs,
3. foster and encourage participation by minority and disadvantaged persons in technological innovation, and
4. increase private-sector commercialization derived from federal research and development.

While there has been much focus on commercialization in recent years, it is only one of four. It is important that Congress avoids overemphasizing commercialization returns, because doing so may push the focus down the development path towards later-stage products, and away from the early-stage research where the most innovative technology is born.

### **Foreign Risk Management**

Unlike other federal R&D programs, SBIR has always included requirements that it fund only small businesses in the United States, that are at least 50% owned by American citizens, and that the research be done in the US. SBIR/STTR’s purpose from the very beginning is that the funding for the programs be used to produce research and technology that would benefit the United States, and America’s small businesses.

To further strengthen security against America’s adversaries attempting to steal SBIR/STTR technology, the SBIR/STTR reauthorization act passed in 2022 added requirements to establish foreign risk management programs to identify attempts from countries of concern to appropriate SBIR-funded technologies. Agencies have begun to implement these processes, but are still in the



early stages of implementation, and agencies are still determining best practices. The DOD issued a detailed policy memo establishing Department-wide processes that seem to be working well, and could be used as a model for other agencies.

DOD began implementing these processes in June 2023, and since then the DOD has conducted foreign risk-based due diligence reviews on over 17,000 SBIR/STTR proposals.

- 2.9 percent (506) of total proposals flagged for potential security risks
- China was identified as country of concern in 78.5 percent (397) of identified proposals
- **Only a handful of awards were rejected due to foreign risk concerns**

As agencies continue to fine-tune their processes, there are some concerns from the small business community that SBTC would like to see addressed. Some firms have had their awards flagged under the foreign risk management without any reason given for the concern, or an opportunity to cure or mitigate. This is particularly true civilian agencies, which have less experience than the DOD at mitigating foreign risk concerns. It is essential that firms are made aware of why they have been flagged, so that they can address whatever the concern is and correct it. Not providing this feedback not only harms the small business, but it also makes the US innovative economy less secure from foreign influence.

### **Integrate SBIR with Primes and Programs to Unlock Transition**

While SBIR has proven to do a tremendous job in bringing in new companies to government innovation, more needs to be done to help transition that technology into the marketplace or programs of record. Integrating SBIR technology with Prime contractors is essential to making that happen.

In the past decade there have been numerous new boards and offices created to advance innovation: Defense Innovation Initiative, Defense Innovation Unit, Strategic Capabilities Office, Defense Digital Service, Defense Innovation Board, Army Futures Command, Joint Artificial Intelligence Center, AFWERX, Naval Army Applications Lab, and the Rapid Defense Experimentation Reserve.<sup>13</sup>

Most of these efforts focus on the large end of the tech transition funnel: getting innovations submitted to and funded by DOD. Where they fail is not addressing the most important pathway for speedy technology transition to DOD: the large prime contractors. This is small end of the funnel. DOD Prime contractors determine what technology they want to put in their program of

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<sup>13</sup> Brown, Mike. "The Big Disconnect: Defense R&D And Warfighter Capabilities" *Forbes.com*. March 26, 2024





record, and most of the time they would rather use technology they develop in-house, instead of looking outside for the best technology.

Unless the primes and DOD Program Managers are required to look outside for the best technology available, report on technologies they insert, and are given incentives to find and insert technology, the problems of technology transition at the DOD will continue. DOD can begin by requiring prime contractors and Program Managers to report on the SBIR and non-traditional firm technologies they adopt and provide incentives for the adoption of outside technologies.

The Army's Vista program is a good start, but much more has to be done. Transitions can also be advanced by better utilizing SBIR's rapid contracting capabilities and restarting the Rapid Innovation Fund. The law already requires prime to report of their use of SBIR technology (15 USC 638 (y)) but the agencies and SBA have not enforced the law. Additionally, more sole source Ph III programs will advance SBIR technology development making the technology more acceptable for prime implementation.

Further, contracting officer training is imperative to make sure they understand Congressionally mandated regulations, particularly the protection of SBIR Data Rights and the ability of the SBIR firms to keep their technology rather than being given to the world, as so many contracting officers prefer. This will also help keep the manufacturing of SBIR technology in the US.

### **Sec. 174 R&D Tax Expensing**

In 2022 changes to the tax code went into effect that removed the immediate R&D tax deduction in Sec. 174 of the tax code, and replaced it with a 5-year amortization requirement. Deferrals on expenses for tax purposes have been crippling for SBIR firms, which are small and heavily focused on R&D innovation, and so face large added tax bills without cash or other earnings to offset. While the temporarily-added tax revenues from SBIR firms contribute very little to the federal budget, the firms that are hardest hit are the smallest innovators and the early-stage high-growth companies that are not yet making a profit, yet face huge added Sec 174 taxes, threatening their existence and limiting their ability to attract further loans and other investment. While the European Union and China are increasing tax benefits and support for R&D and small business, this cash penalty applied to America's SBIR entrepreneurs is stifling our earliest stage innovators.





## **The Market Loves SBIR**

The federal agencies that fund SBIR research benefit tremendously from the technology that it produces. But SBIR-funded technology is also found in all sectors of the commercial marketplace. Here are some facts that show that SBIR makes a difference:

- Between 1996 and 2020, 99 new drug approvals (12% of all new drugs approved) were developed by firms that received SBIR/STTR funding
- Over the same period, 16% of “priority review” drugs, representing significant health advances over existing treatment, were developed by firms that received SBIR/STTR funding.
- 24,475 PMAs or 510 (k) were linked with SBIR/STTR
- Economic Impact studies of SBIR Phase II awards show a return on investment of between \$22-33 for every dollar, depending on the agency, and these studies do not count major outcomes such as sales by licensees and acquirers of the new technologies.
- For every dollar invested in the SBIR/STTR program there are 11 dollars of commercial sales at NCI and 5 dollars of commercial sales at DOD.
- 10% of all VC investments go to SBIR firms
- The DOD Section 809 Panel Recommends doubling SBIR and RIF for DOD
- Universities license 70% of all their technology to small business, and are using SBIR and STTR to help get their technology into the market. VC have invested twice as much as the Government in SBIR firms
- 19% of IN-Q-Tel (DARPA) investments are in SBIR firms
- 829 SBIR related firms have gone public
- 2,120 SBIR firms have been acquired, injecting their innovations into larger companies
- L3 Com, GE, SAIC,BAE,Lockheed Martin, Raytheon, Gen Dynamics, Philips, Teledyne have each acquired 10 or more SBIR Firms. One firm, L3 Com has acquired 43 SBIR Firms
- Many SBIR companies have licensed their technologies, with the licenses reinvigorating the technologies of the typically larger and older-technology firms that are granted licenses.
- The SBIR/STTR Programs have been copied by seventeen countries around the world. While the SBIR/STTR program accounts for only 3.65% of the Federal extramural R&D budget over the last 4 years, SBIR has created 22% of our key innovations.

## Patents

The current patent laws are a major barrier to the growth of SBIR firms. Laws such as the America Invents Act and the introduction of the Patent Trial and Appeals Board have killed claims; 85% + of patents experience invalidity of at least one claim and 65%+ see all claims nullified.<sup>14</sup> Supreme Court cases such as eBay, Alice, and many others have made it almost impossible for inventors to protect their creations. In order for small business inventors to help keep America competitive in world markets, they need Congress to undo the acts giving American SBIR created technology to multi-national corporations for commercialization in other countries, particularly China.

## Success Stories

Technologies funded by the SBIR/STTR Program are used by millions of Americans on a daily basis, and at least two of these in your pocket or purse right now. The technology that allows cell phones to use GPS on a chip was developed by Dr. Reza Rofougaran under an SBIR award. And the fast CMOS camera technology used by most cell phones and digital cameras was developed for military use under an SBIR award as well.

<p><b>GPS/WiFi/Bluetooth Chips</b> Physical Research/ Broadcom</p>  <p>GPS on a chip, and combined WiFi and Bluetooth communications used globally in cell phones and U.S. military systems, are derived from a DoD SBIR award to Dr. Reza Rofougaran.</p>	<p><b>CMOS Cameras</b> Photobit/Micron</p>  <p>SBIR supported Photobit in developing fast CMOS imagers for military use, now used in all cell phones and most other digital cameras.</p>
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Successful alumni of the SBIR program include: Qualcomm (cell phone communications), Symantec (computer security), Genzyme (biotech therapies), Affymatrix (GeneChip), Amgen (biopharmaceuticals), Jarvick Heart (artificial heart), Titan (now Intersection, interactive computer graphics), Chiron (pediatric vaccines), AMTI (advanced materials, radars), Amorworks (military armor), Biogen (Idec, neurological, autoimmune therapies), American Biophysics (mosquito control), Millennium Pharma (gene databases), Geron (telomerase inhibitors for cancer treatment), Neocrine Bioscience (neurological and endocrine pharmaceuticals), ABIOMED

<sup>14</sup> Former Chief Judge of the Federal Circuit, Paul Michel, **How to Improve Patent Quality for Everyone—Fast**, <https://ipwatchdog.com/2025/02/20/improve-patent-quality-everyone-fast/id=186307/>



(world's smallest heart pump), Aerovironment (unmanned aircraft), iRobot (unmanned robotic vehicles, vacuum cleaning, Roomba), JDS Uniphase (fiber optics, lasers, software), Stem Cells Inc. (cell based therapies for CNS and liver disorders), and Nanosys (quantum dot displays), as well as thousands of others.

Phase III awards from government are another area of success. In recent years, the Navy has entered to \$2.5 billion dollars of Phase III contracts, the Air Force over \$1.5 billion contracts and the GSA has entered into contracts that could be worth \$4 billion. All three agencies have shortened the time it takes to get some Phase III contracts awarded.

To view more SBIR/STTR success stories, visit <https://www.sbir.gov/news/success-stories>



## Appendix

**Table 1: DOD Recognized Phase III Obligations FY2018- FY2024 By Service<sup>15</sup>**

	Navy	Air Force	Army	Big 3 Totals
2018	\$809,618,488	\$393,661,806	\$175,278,883	<b>\$1,385,384,688</b>
2019	\$681,988,594	\$535,842,600	\$245,846,329	<b>\$1,542,102,717</b>
2020	\$910,962,564	\$866,849,927	\$246,644,585	<b>\$2,225,111,809</b>
2021	\$937,641,933	\$886,789,759	\$291,877,872	<b>\$2,282,820,127</b>
2022	\$1,091,967,844	\$1,075,531,752	\$311,843,338	<b>\$2,730,167,580</b>
2023	\$1,195,687,063	\$1,547,05,5471	\$293,837,077	<b>\$3,390,000,915</b>
2024	\$1,511,902,975	\$1,735,033,938	\$313,659,538	<b>\$3,560,598,475</b>
<b>Totals</b>	<b>\$7,139,769,461</b>	<b>\$5,493,766,800</b>	<b>\$1,878,987,622</b>	<b>\$17,116,186,311</b>

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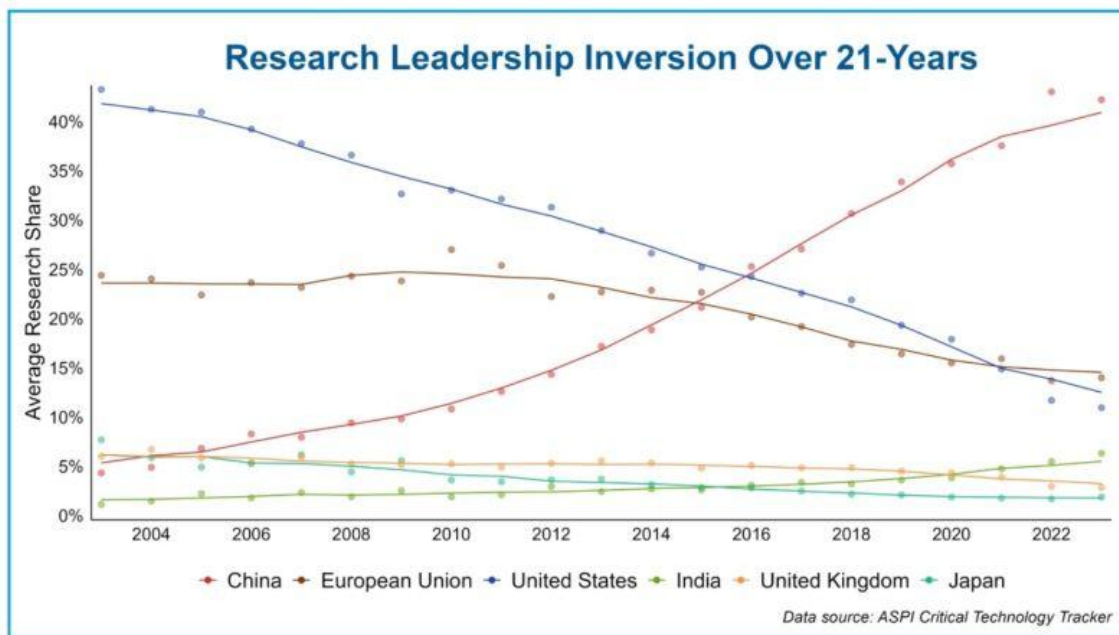
<sup>15</sup> Data from Sam.gov

**Table 2: Mergers & Acquisitions of SBIR Firms**

Corporations having acquired multiple SBIR-involved <i>Italics=SBIR involved firms June 2017</i>	
L3 Communications <small>Recently, L3 divesting several</small>	<b>L3:41</b> 25
<i>Titan Corporation</i> (acquired by L3)	16
SAIC; General Electric Company	13
Raytheon Company, Lockheed Martin Corporation	11
Agilent Technologies Inc.; BAE Systems; ECO Corporation; General Dynamics Corporation; <i>Invitrogen Corporation</i>	10
JDS <i>Uniphase Corporation</i> ; Philips	9
Johnson & Johnson; Northrup Grumman Corporation (Litton); PerkinElmer, Inc.; Pfizer Inc.; Teledyne Technologies, Inc; Thermo Fisher Scientific, Inc	8
Becton, Dickenson & Company; <i>Sierra Nevada Corporation</i>	7
<i>Amgen</i> ; ATK Inc.; Beckman Coulter, Inc; Boeing Company, BristolMyers Squibb; Charles River Laboratories; Corning, Inc.; Danaher Corporation, <i>Genzyme Corporation</i> ; ICx Technologies, Inc.; ManTech International Corporation; Novartis AG; Medtronic, Inc.: Qiagen NV; Roche Holdings AG; Ultra Electronic Holdings	6

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**Table 3: US vs World in Research Leadership**



Average annual research share across the 64 technologies between 2003 and 2023. Image: ASPI

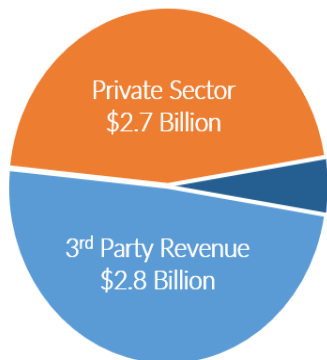


**Table 4: Two SBIR Success Stories**

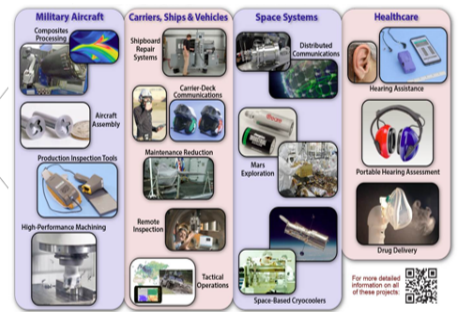
**Creare LLC SBIR/STTR Commercialization/Transition**

2

- Private Sector:** Phase III, Licenses, Product Sales
- Cryogenic Machining Technology for the High Productivity Manufacturing of Titanium Components
  - Fastener Measurement Tool (FMT™): A Rate-Enabling Inspection Tool for F35 Production
  - Wireless Audiometric Headsets (WHATS™) for In-Situ Hearing Evaluation
  - Robotic Inspection Technology for Catapult Tubes on Navy Carriers
  - Power Conversion Electronics for Next-Generation Combat Vehicles (NGCVs)
  - Compact Swaging Machine for Navy Carriers
  - High-Torque Fasteners (MORTORQ®) for Aerospace Assembly
  - Corrosion Protective Coverings (Envelop®) for Navy Topside Assets
  - NCS Cryocooler that Revived the Hubble Space Telescope
  - Miniaturized Vacuum Pumps for the Curiosity Mars Rover and Future (ExoMars) Space Missions
  - Edare LLC – A Creare Affiliate Focused on Low-to-Medium Volume Manufacturing of Creare-Developed Innovations for the Commercial and DOD Markets



**Federal Sales \$300 Million**



- 3rd Party Revenue:** Licensee revenue from Creare technologies
- MAG Industrial Automation Systems/5ME LLC – Cryogenic Machining Technology
  - Shield Technologies Corporation – Envelop Coverings
  - Phillips Screw Company - MORTORQ®
  - FLUENT® Computational Fluid Dynamics Software Acquired by ANSYS®
  - Mikros Manufacturing: A Leading Supplier of Ink-Jet and Fuel Injector Products
  - FUJIFILM Dimatix – Inkjet Printheads for Commercial and Industrial Printing

**1,243% Return on Federal SBIR/STTR Investment**

2

**Technology FOOTPRINT**

Legend:

- VIRGINIA Class Plan of Record Capability
- Future VIRGINIA Transition Candidate

Technologies shown:

- Weapon Launch & Payload Control Systems
- Multi-Tube Weapon Simulator
- Digital Data Collection System/ Acoustic Media Center/ Ruggedized Storage Server
- Acoustic Intercept & Ranging
- Cyber Security Solutions
- Tech Insertion Hardware
- Non-Hull Penetrating Hydrophone
- Sonar Transmit Group
- Hull-mounted Acoustic Sensors: Conformal Acoustic Velocity Sensor, Improved Radius of Curvature Sensor
- Submarine Reliability Management System
- Periscope Image Processing
- Next Generation Countermine Platform Protection/Acoustic Device Countermine MK2
- Virtualized SWFTS Architecture
- Advanced Submarine Control
- Torpedo Technology Insertion
- Towed Array Vector Sensor
- Lightweight Wide Aperture Array
- Shipboard Automation and Manning Reduction (Operations, Maintenance, and Administration)
- SWFTS Systems Engineering and Real Time Service Based Architecture



### **Table 5: Why SBIR Works: Designed for Success**

- Federal R&D directed to solve Federal R&D challenges in support of agencies' missions
- Agencies select topics, select winners, make awards to meet their needs
- Merit selection based on science and technology
- Highly competitive: Only 1 in 20 proposals advances to the main Phase 2 R&D work.
- Leverages university research: some 50-70% of SBIR work is done either with direct university faculty involvement or employing former university faculty, focused into small business growth drivers.
- While performing R&D for Federal purposes, SBIR/STTR is simultaneously a unique seed fund for American technological innovation, stimulating early-stage innovation in pre-commercial technologies prior to stages at which Venture Capital or banks are interested.
- The impact on American industry is broad, not just on medical, software and IT, reinvigorating American industry from the ground up.
- At the same time, firms with SBIR-validated technologies attract subsequent VC investment as they advance towards products and market entry.
- American manufacturing on-ramp: SBIR focus on products is re-invigorating American manufacturing with a flow of new products designed and made in America.
- Small technologies businesses tend to grow their employment base in the US, and are less likely to outsource the jobs their technologies create.
- SBIR supports new startup formation and provides technical and commercialization business assistance, a virtual incubator for entrepreneurs across the country including in non-traditional locations for technology businesses including center cities and rural areas.





## **National Academies of Science Studies of SBIR**

(5,522 pages)

1. National Academies of Sciences, Engineering, and Medicine. *Assessment of the SBIR and STTR Programs at the National Institutes of Health*. Washington, DC: The National Academies Press, 2022. (271 Pages)

***“The NIH SBIR/STTR programs provide a critical and dedicated channel through which small and young firms are able to contribute in a meaningful and sustained way to research and innovation aimed at advancing life sciences innovation and ultimately health outcomes.”***

2. National Academies of Sciences, Engineering, and Medicine. *STTR: An Assessment of the Small Business Technology Transfer Program*. Washington, DC: The National Academies Press, 2016. (339 pages)

***“STTR is meeting its congressional objective of fostering cooperation between small business concerns and research institutions, and does so in some respects to an extent that SBIR does not.”***

3. National Academies of Sciences, Engineering, and Medicine. *SBIR/STTR at the National Institutes of Health*. Washington, DC: The National Academies Press, 2015. (376 pages)

***“The NIH SBIR program is having a positive overall impact. It is meeting three of its four legislative objectives, namely, stimulating technological innovation, using small businesses to meet federal R&D needs, and increasing private sector commercialization of innovations derived from federal R&D.”***

4. National Academies of Sciences, Engineering, and Medicine. *SBIR at the National Science Foundation*. Washington, DC: The National Academies Press, 2015. (366 pages)

***“the Committee finds that with one exception the NSF SBIR program is meeting its overall legislative and mission-related goals.”***

5. National Research Council. *SBIR at the Department of Defense*. Washington, DC: The National Academies Press, 2014. (444 pages)

***“SBIR projects at DoD commercialize at a substantial rate.”***

6. National Research Council. *Venture Funding and the NIH SBIR Program*. Washington, DC: The National Academies Press, 2009. (140 pages)

***“In its recent assessment of SBIR, the Committee found that the concept of the program is sound and recommended that the basic program structure of SBIR be preserved. Accordingly, the Committee recommends that SBA and the agencies should maintain an open competition that is based on scientific quality and commercial potential.”***

7. National Research Council. *Revisiting the Department of Defense SBIR Fast Track Initiative*. Washington, DC: The National Academies Press, 2009. (212 pages)



***“The Fast Track Program should be continued, given its success in encouraging firms with little or no prior SBIR experience to innovate and commercialize their product.”***

8. National Research Council. *An Assessment of the Small Business Innovation Research Program at the National Aeronautics and Space Administration*. Washington, DC: The National Academies Press, 2009. (344 pages)

***“The NASA SBIR program stimulates collaboration, technological innovation, and generates new knowledge”***

9. National Research Council. *An Assessment of the Small Business Innovation Research Program at the National Institutes of Health*. Washington, DC: The National Academies Press, 2009. (456 pages)

***“The NIH SBIR program is making significant progress in achieving the congressional goals for the program.”***

10. National Research Council. *An Assessment of the Small Business Innovation Research Program at the Department of Defense*. Washington, DC: The National Academies Press, 2009. (468 pages)

***“SBIR is in broad alignment with the needs of the DoD agencies and components.”***

11. National Research Council. *An Assessment of Small Business Innovation Research Program at the Department of Energy*. Washington, DC: The National Academies Press, 2008. (256 pages)

***“SBIR awards from the Department of Energy fund the development of technologies that, otherwise, might have developed more slowly, if at all.”***

12. National Research Council. *An Assessment of the SBIR Program*. Washington, DC: The National Academies Press, 2008. (402 pages)

***“The SBIR program is sound in concept and effective in practice.”***

13. National Research Council. *An Assessment of the SBIR Program at the National Science Foundation*. Washington, DC: The National Academies Press, 2007. (366 pages)

***“The National Science Foundation’s (NSF) Small Business Innovation Research (SBIR) program is adding to the storehouse of public scientific and technological knowledge.”***

14. National Research Council. *SBIR and the Phase III Challenge of Commercialization: Report of a Symposium*. Washington, DC: The National Academies Press, 2007. (200 pages)

***“the Small Business Innovation Research (SBIR) program is the nation’s premier innovation partnership program.”***

15. National Research Council. *SBIR Program Diversity and Assessment Challenges: Report of a Symposium*. Washington, DC: The National Academies Press, 2004. (200 pages)

***“SBIR facilitates the development and utilization of human capital and technological knowledge.”***



16. National Research Council. *An Assessment of the Small Business Innovation Research Program: Project Methodology*. Washington, DC: The National Academies Press, 2004. (124 pages)

17. National Research Council. *The Small Business Innovation Research Program: An Assessment of the Department of Defense Fast Track Initiative*. Washington, DC: The National Academies Press, 2000. (372 pages)

*“The SBIR Program is contributing to the achievement of Department of Defense mission goals. Valuable innovative projects are being funded by the SBIR.”*

18. National Research Council. *The Small Business Innovation Research Program: Challenges and Opportunities*. Washington, DC: The National Academies Press, 1999. (186 pages)

*“SBIR [has a] history of supporting not only the growth of jobs and the overall economy, but also the missions of participating agencies.”*