S. HRG. 119–20

GOLDEN AGE OF INNOVATION: REFORMING SBIR-STTR FOR THE 21ST CENTURY

HEARING

BEFORE THE

COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP

OF THE

UNITED STATES SENATE

ONE HUNDRED NINETEENTH CONGRESS

FIRST SESSION

MARCH 5, 2025

Printed for the use of the Committee on Small Business and Entrepreneurship

Available via the World Wide Web: http://www.govinfo.gov

U.S. GOVERNMENT PUBLISHING OFFICE

59–474 WASHINGTON : 2025

COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP

ONE HUNDRED NINETEENTH CONGRESS

JONI ERNST, Iowa, *Chair*
EDWARD J. MARKEY, Massachusetts, *Ranking Member*

JAMES E. RISCH, Idaho	MARIA CANTWELL, Washington
RAND PAUL, Kentucky	JEANNE SHAHEEN, New Hampshire
TIM SCOTT, South Carolina	CORY A. BOOKER, New Jersey
TODD YOUNG, Indiana	CHRISTOPHER A. COONS, Delaware
JOSH HAWLEY, Missouri	MAZIE K. HIRONO, Hawaii
TED BUDD, North Carolina	JACKY ROSEN, Nevada
JOHN R. CURTIS, Utah	JOHN W. HICKENLOOPER, Colorado
JAMES C. JUSTICE, West Virginia	ADAM B. SCHIFF, California
JOHN HUSTED, Ohio	

MEREDITH WEST, *Republican Staff Director*
SEAN MOORE, *Democratic Staff Director*

CONTENTS

WITNESS PREPARED STATEMENTS

ADDITIONAL LETTERS/STATEMENTS FOR THE RECORD

QUESTIONS FOR THE RECORD

GOLDEN AGE OF AMERICAN INNOVATION: REFORMING SBIR-STTR FOR THE 21ST CENTURY

Wednesday, March 5, 2025

UNITED STATES SENATE,
COMMITTEE ON SMALL BUSINESS
AND ENTREPRENEURSHIP,
Washington, DC.

The committee met, pursuant to notice, at 2:34 p.m., in Room 428A, Russell Senate Office Building, Hon. Joni Ernst, chairwoman of the committee, presiding.

Present: Senators Ernst [presiding], Young, Hawley, Budd, Husted, Markey, Shaheen, and Rosen.

OPENING STATEMENT OF SENATOR ERNST

CHAIR. Thank you everyone, and I call the Committee on Small Business and Entrepreneurship to order. With its authorization expiring at the end of this fiscal year, today we turn our attention to the Small Business Innovation Research and Small Business Technology Transfer programs, or SBIR/STTR. This program has effectively partnered federal agencies with private sector entrepreneurs to scale research and development projects aimed at addressing the pressing challenges of the day.

While we've seen a measure of success over the years through the committee's oversight efforts, agency studies and GAO reports, it is clear SBIR is in need of additional reforms to safeguard taxpayer funds and enable this program to meet its full potential. Despite the funding spanning 11 agencies and countless critical technology areas, SBIR has demonstrated an incredible potential to revitalize our small business industrial base and preserve America's technological leadership. The cutting-edge technologies being generated are already serving to enhance competition, improve supply chains, and increase overall readiness.

For these reasons, I am excited to announce that today I'm introducing the Investing in National Next Generation Opportunities for Venture Acceleration and Technological Excellence or INNOVATE Act—we have to come up with these fancy names, okay—the INNOVATE Act, a bill to reauthorize and comprehensively reform the SBIR/STTR program.

My legislation streamlines and simplifies existing processes, directs the funding toward projects based on merit, channels funding to help accelerate the most promising projects towards final stage commercialization, protects against waste and abuse, and intro-

duces enhanced protections and accountability tools to prevent these new technologies from getting into the hands of our foreign adversaries.

First, the INNOVATE Act reforms Phase I to provide new applicants with a simplified two-page proposal process with smaller, one-time awards, so that more innovators throughout the country can have access to this program, even if they can't hire professional grant writers. My bill also eliminates DEI preferences. These measures enable agencies to scout the best proposals based on substance from across the country. I am committed to ensuring open competition for innovators with traditionally lower engagement in the program.

Second, my bill addresses the practice of SBIR Mills, where firms benefiting from their beltway connections and grant writing expertise have been able to collect an outsized portion of the funding, with fewer results to show for it. This problem was verified by both the GAO, the Government Accountability Office, and the DOD's Defense Industrial Board, which reported that the firms that got the most awards were less productive in terms of commercialization, investments, and patents than those who got fewer awards.

To prevent the use of Phase I or II funding as a permanent source of revenue, my bill imposes a $75 million lifetime cap. It forces small businesses with dozens of awards to demonstrate commercial traction or follow on contracts with non SBIR dollars.

Third, my bill empowers DOD to repurpose, underutilized and overly regulated STTR Phase II funding, to more efficiently scale the most promising technologies for long-term contracts for deployment through strategic breakthrough awards. For these awards of up to $30 million, the bill limits eligibility to small businesses making clear progress towards commercialization, and with an identified DOD end user.

It also requires 100 percent matching funds to ensure that firms have skin in the game, and aren't just in it for corporate welfare. These reforms will enable more flexible use of SBIR funding to help bridge the valley of death for the companies on the verge of success.

Finally, my bill builds on my longstanding work to safeguard these new SBIR technologies from being stolen by our adversaries. For years, China and other state actors have stolen intellectual property and proprietary secrets from American businesses and universities. That is why I championed the Foreign Ties Due Diligence Program Reforms in the 2022 reauthorization. But we have found that more needs to be done.

That's why my INNOVATE Act introduces a new definition of foreign risk, to create a stronger risk assessment baseline standard, that must be applied consistently across all agencies. It implements a clear list of ties to foreign countries of concern, that disqualify an applicant. And it empowers agencies with clear clawback authority if a small business exposes SBIR funded products to adversarial influence post award.

By targeting SBIR funds to the very best innovators in the country, by cutting off the unserious applicants who are just after corporate welfare, by providing a boost to the best companies who need it to get over the final hurdles and by better protecting our

taxpayer funded innovations from going directly to China, the SBIR/STTR program can expedite new technologies, increase economic opportunity, and attract investment back into our towns and cities, and help to usher in a new golden age of innovation for America.

I look forward to working with my colleagues to get this across the finish line. It's up to us, the members of this committee, to work together to optimize this important program. I'd like to thank the witnesses for being here today and being willing to share their experience and expertise with us. I now recognize Ranking Member Markey for his opening statement.

STATEMENT OF SENATOR MARKEY

Senator MARKEY. Thank you, Madam Chair. And today's hearing centers on American innovation and the small businesses that lead the way every day of the year.

For decades, the Small Business Innovation Research Program, or SBIR, and the Small Business Technology Transfer Program, or STTR, have played an essential role in driving our country's innovation. And I'm extremely proud that Massachusetts small businesses have played such a prominent role.

The Commonwealth is the second highest recipient of total awards in the country, receiving more than 24,000 SBIR awards, totaling $8.3 billion, and 2,000 STTR awards totaling over $720 million.

This success is due to the Massachusetts business plan: attract the best and the brightest, provide a world class education, and provide opportunities for small businesses to compete on a level playing field, while having the best educated and the best trained workforce in the country. We start in the fourth grade, we're number one in the fourth, eighth, and 10th grade in America in math and verbal. It's a business plan; it provides that workforce.

This has led to the development of America's high-tech highway, Route 128, which extends outside of Boston and into the surrounding area, akin to Silicon Valley in California, or the research triangle in North Carolina.

SBIR was codified in 1982, and STTR 10 years later, both on a bipartisan basis. During this time, Congress was keenly aware that the federal research and development needs of the country were not being met. SBIR and STTR were designed to use America's small businesses to drive innovation.

These highly competitive programs have contributed to the golden age of innovation in our country. We have experienced that over the last 40 years. Without these programs, Americans would not have novel technologies at their fingertips as they do today. For example, the very popular LASIK eye surgery, was developed in part due to an SBIR funding. SBIR also funded earlier Qualcomm wireless communications systems.

I'm proud of the SBIR and STTR advancements that have come from Massachusetts. Just as Iowa is rich in nutrient filled soil makes it the premier producer of corn, it is Massachusetts technology ecosystem that provides a fertile ground for innovation in the technology sector, which is why we're not just the Bay State, we're also the brain state.

For example, Massachusetts small businesses have received more than 70 awards for projects related to the treatment of Alzheimer's disease, the brain, and it's approaching it for many different avenues. Today we'll hear from Triton Systems, a company from the Commonwealth, that used an SBIR award to help create the world's smallest heart pump, which is now universally used in hospitals because of an SBIR grant.

Without SBIR and STTR funding, many of these products may have never seen the light of day. These programs are highly efficient and pay dividends for the American people. The return on investment for every dollar the government spends on these programs is anywhere from $20 to $30.

SBIR and STTR awards from the Department of Defense alone creates over 65,000 new jobs every year. The SBIR and STTR programs work because they prioritize merit and competition-Darwinian paranoia inducing competition—that's the hallmark of STTR and SBIR. That's what it's all about-Darwinian competition; the best ideas prevail.

We should not place limits on the number of awards or the amount of funding that goes to deserving small businesses. We should not put a limit on the best ideas or the best technologies. That's what we're going to need to compete against China. We would never limit the number of contracts that a large defense contractor receives from the Federal Government. So why would we consider limiting our most nimble allies in innovation-our small businesses?

We don't tell Raytheon or Lockheed Martin, "You've had enough Federal contracts; we're going to start with a smaller firm." We don't do that. We go to where the best ideas are. While SBIR and STTR have enjoyed bipartisan support for several decades, we have not yet been able to make them permanent. They're currently set to expire at the end of September.

I've worked throughout my time in Congress to make improvements to the programs and ensure that their authorization never lapses. It's critical that we do so again, and I'm looking forward to working with you, Chair Ernst, on this issue, and I want to thank all of our witnesses for your help in us understanding this issue today.

CHAIR. Great. Thank you, Ranking member Markey. And again, I want to extend a warm welcome to all of our witnesses today, and I will now introduce the three witnesses who are testifying today on behalf of the majority. I am thankful that all of you took time out of your busy schedules to join us in front of the committee and share your expertise and insight into the SBIR and STTR programs with this committee.

First is Mr. Austin Strawhacker, who is the Associate State Director at America's SBDC in Iowa, at Iowa State University in Ames, Iowa. The Iowa SBDC operates 15 centers across the state, providing expert business counseling to entrepreneurs and small business owners. Mr. Strawhacker oversees the Iowa's SBDC's Technology and Commercialization team, which supports innovative entrepreneurs in leveraging federal and state resources in all 99 counties.

He also chairs the Association of Small Business Development Centers Research and Data Committee, and serves on the Iowa Rural Development Council. Mr. Strawhacker also holds bachelor's degrees from Grandview University and a Master of Public Administration from Drake University, both in Des Moines, Iowa. So, Austin, thank you very much for being here today.

Next, Mr. Caleb Carr is the CEO of Vita Inclinata, an aerospace and industrial company headquartered in Broomfield, Colorado. Vita Inclinata received six SBIR awards totaling just over $4 million that were crucial to the company's success. Mr. Carr serves as a board member for the Software and Defense Coalition, and is a professor of entrepreneurship at the University of Colorado. He graduated with a bachelor's degree from the University of Colorado at Denver and holds a Juris Doctor from Mitchell Hamline School of Law.

Our third witness, Mr. David Rothzeid, is a Principal at Shield Capital, a venture capital firm focusing on investing in early-stage companies, developing technologies critical for national security. He served for eight years as an acquisition officer in the United States Air Force. Thank you very much for your service to our country, including a deployment with Special Operations Command in Afghanistan.

He subsequently worked at the Defense Innovation Unit, ending his time there as Director of Acquisition Pathways. Mr. Rothzeid has a bachelor's degree from Miami University, and an MBA from the University of Colorado, Colorado Springs. Thank you again. And I now recognize Ranking Member Markey to introduce his witness.

Senator MARKEY. Thank you, Madam Chair. The minority witness today is Dr. Ken Mahmud, who is the executive Vice President of Triton Systems, which is a business at the cutting edge of innovation. Triton Systems is a multi-award winning SBIR and STTR company and was awarded the Small Business Administration's TIBBETTS Award in 2016 for its success in the SBIR program.

Dr. Mahmud has more than 35 years of experience in research and development, including managing Triton's participation in the SBIR and STTR programs. And we welcome you, Doctor, to the panel today. Thank you, Madam Chair.

CHAIR. Thank you, Ranking Member. And briefly, I'd like to take a moment to explain our lighting set system to the witnesses. There are three lights in front of you; green means go, yellow means you are running out of time, and red means to go ahead and wrap up those remarks. So, I ask unanimous consent that the witness's full statements be included in the record. Without objection, so ordered.

As your written testimony has been made part of the record, the committee asks that you limit your oral remarks to five minutes. And with that Mr. Strawhacker, you are recognized for five minutes for your testimony.

STATEMENT OF MR. AUSTIN STRAWHACKER, ASSOCIATE STATE DIRECTOR, AMERICA'S SMALL BUSINESS DEVELOPMENT CENTER IOWA, AMES, IOWA

Mr. STRAWHACKER. Chair Ernst, Ranking Member Markey, and distinguished members of the committee, thank you for the opportunity to testify on the reauthorization of the Small Business Innovation Research and Small Business Technology Transfer Programs.

As the Associate State Director of America's SBDC Iowa, I provide oversight to our technology and commercialization center, which provides guidance to innovators, often including the exploration of SBIR and STTR funding. I'm proud to work for an organization that is vital to the success of so many small businesses. The Iowa SBDC fosters innovation, strengthens local economies, and drives small business success.

We engage with approximately 5,000 clients annually, that in 2024 alone launched 225 new businesses, created 101,795 new jobs—I wish it was the bigger number, generated $174 million in sales and secured $57 million in new capital. This yields an ROI of 3.7 on all of our funding sources.

Hosted by Iowa State University, the Iowa SBDC collaborates with various partners to provide tailored services that support businesses in both urban and rural areas. Our regional centers act as a pipeline to lead technology driven businesses to our technology and commercialization center for assistance with SBIR/STTR proposal development, intellectual property, and commercialization assistance.

Today I would like to focus on three main points: the importance of the SBIR/STTR programs, the importance of localized support, and outline a couple of challenges and opportunities. For over 40 years, SBIR and STTR have ensured that small businesses play a significant role in the federal research and development.

These programs help develop groundbreaking technologies, create high quality jobs, and enhance our global competitiveness. In Iowa SBIR and STTR fundings help bridge the gap between research and market deployment, particularly in key sectors like advanced manufacturing, agricultural technology, and biosciences. These programs also attract follow on investment, drive job creation, and expand local supply chains.

In fact, over 50 percent of successful SBIR and STTR applications that we have assisted with, have leveraged their awards to generate additional funding that has more than doubled the overall investment in these companies. Rural entrepreneurs in particular exemplify the grit and innovation that define American small businesses. Despite facing challenges such as limited access to capital, workforce shortages and geographic barriers, they drive technological advancement and local economic growth. SBIR and STTR often provide the critical support needed for these entrepreneurs to take risk, push innovation, and continue to contribute to the national competitiveness.

The success of small businesses, particularly in rural communities, depends on access to localized support. A prime example in Iowa is Senator Ernst Entrepreneur Expo, an annual collaboration between the Senator, the Iowa SBDC, and Iowa State University

Center for Industrial Research and Service. This event connects small businesses with industry experts, government resources, and potential investors, fostering collaboration and showcasing innovation.

Additionally, we have established the Great Plains SBIR working group with our partners in Kansas, Nebraska, and Oklahoma. This group meets monthly to share best practices, develop solutions and strengthen the regional support network.

While SBIR and STTR have been highly effective, there are opportunities to enhance their impact. Streamlining the application process and introducing a smaller Phase I award could lower barriers for first time applicants, particularly in rural areas. This would allow early-stage research to explore commercialization potential before full feasibility and commercialization work begins.

Many companies also receive very little feedback on their Phase I proposals if they're declined. Often the reason for declaration is something that SBDC could help with proactively if more guidance was provided. Increasing transparency and structured feedback would help applicants refine proposals and improve success rates.

There should be recognition that innovation exists everywhere across our nation, yet just five states receive 46 percent of SBIR/STTR awards and dollars according to public data on sbir.gov. Addressing this disparity through targeted outreach, regional training, and improved evaluation transparency, could ensure fair access to funding no matter the geographic location of the business.

In conclusion, SBIR and STTR awards have driven innovation, strengthened local economies, and created high quality jobs in America for over four decades. By leveraging SBDC's support, small businesses can access commercialization experts, funding strategies and technical assistance to maximize program benefits.

Continued collaboration among federal agencies, local resource providers and entrepreneurs will be essential in maintaining the United States leadership and innovation. I thank you for your time and consideration today, and I welcome any questions.

[The prepared statement of Mr. Strawhacker follows.]

Testimony of

Austin Strawhacker, MPA
Associate State Director, America's SBDC Iowa

Iowa State University Ivy College of Business

Before the U.S. Senate Committee on Small Business and Entrepreneurship

Hearing on the Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century

March 5, 2025

2:30 P.M.

Chair Ernst, Ranking Member Markey, and Distinguished Members of the Committee,

Thank you for the opportunity to testify on the reauthorization of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. As the Associate State Director of America's SBDC Iowa, it is my privilege to work directly with our team that empowers entrepreneurs and small businesses across Iowa, helping them navigate the challenges of starting, growing, and sustaining their ventures. Specifically, I provide oversight of our Technology and Commercialization Center, which provides guidance to innovators and often includes the exploration of SBIR/STTR funding.

I am proud to work for an organization that is vital to the success of many businesses. The Small Business Development Center (SBDC) network was established in 1980 as a nationwide initiative to provide small businesses with the necessary guidance and resources to thrive. With nearly 1,000 centers across the country, SBDCs have been instrumental in fostering entrepreneurship, delivering technical assistance, and connecting small businesses to critical funding opportunities. For over 45 years, SBDCs have helped millions of entrepreneurs start and expand their businesses, leading to job creation and economic growth in every state.

Many SBDCs also leverage the Federal and State Technology (FAST) Partnership Program grant to further support innovation. The FAST grant enables SBDCs to provide specialized training, proposal development assistance, and mentorship to small businesses seeking SBIR and STTR funding. By increasing awareness and helping applicants successfully navigate the complexity of these programs, the FAST grant recipients can act as a complimentary resource in helping more small businesses, particularly in rural areas, access federal research funding.

America's SBDC Iowa plays a crucial role in fostering innovation, strengthening local economies, and driving small business success across the state. We annually engage with approximately 5,000 clients. Last year, in 2024, our clients launched 225 new businesses, creating 1,795 new jobs, generating $174 million in sales, and, in the process, acquiring $57 million in new capital. Taken together, these results translate a return on investment (ROI) of 3.7.

These results are achieved because America's SBDC Iowa operates as a statewide network. Fifteen regional centers strategically hosted by eleven community colleges and our three public universities in the state provide direct business consulting, education, and technical assistance to entrepreneurs. Hosted by Iowa State University, the network collaborates with local economic development organizations, universities, community colleges, and government agencies to deliver customized support to small businesses. It is an effective and well-proven structure. It allows the Iowa SBDC to provide tailored services based on local and regional needs, ensuring that businesses in both urban and rural areas receive the support to succeed.

In our state, the regional SBDC centers serve as a pipeline to identify and support technology-driven businesses and to lead them to our Technology and Commercialization Center. This center specializes in assisting high-tech entrepreneurs with SBIR and STTR proposal development, intellectual property strategies, and commercialization planning. By leveraging the expertise of both regional advisors and state-level specialists, America's SBDC Iowa ensures that innovative businesses receive comprehensive guidance from ideation to market entry. A key part of that pathway is to enhance their competitiveness in securing federal research funding.

Today, my goal is to communicate three main points:

1. The Importance of SBIR/STTR
2. The Importance of Localized Support
3. Challenges and Opportunities

The Importance of SBIR and STTR

For over four decades, the SBIR and STTR programs have been instrumental in ensuring that American small businesses have a significant role to play in federal research and development. These initiatives enable small firms to develop groundbreaking technologies, create high-quality jobs, and compete globally. In Iowa, we see firsthand how SBIR and STTR funding empowers companies to bridge the gap between research and market deployment, particularly in sectors prioritized in our state, such as advanced manufacturing, agricultural technology, and biosciences.

The impact of these programs extends beyond direct recipients. SBIR/STTR funding attracts follow-on investment, strengthens university partnerships, and catalyzes commercialization pathways that might not otherwise exist. Many of the innovative businesses we work with at America's SBDC Iowa have leveraged these programs to transform ideas into viable businesses, generating economic benefits that ripple through our local communities. This follow-on investment has led to job creation, expansion of local supply chains, and increased private-sector capital flow into high-growth small businesses. Companies that receive SBIR/STTR funding often experience accelerated growth, hiring highly skilled workers and boosting local economies. Demonstrated early success with federal funding makes these businesses more attractive to venture capitalists

and private investors. It becomes an important part of how they secure the additional resources necessary to scale and bring cutting-edge innovations to market.

Iowa, like many states, provides direct follow-on investments upon a successful proposal. Iowa's investment, distributed through the Iowa Economic Development Authority, equates to a $50,000 investment for a successful Phase 1 award and $25,000 for a successful Phase 2. Furthermore, over 50% of successful SBIR/STTR applications we have helped with have leveraged their awards to generate follow-on funding that has more than doubled the total investment into these companies. The initial awards often allow other investors to feel more comfortable with these companies because of the solid research base they are able to achieve through an SBIR/STTR award.

Rural entrepreneurs, in particular, embody the grit, determination, and resourcefulness that define the American small business spirit. Despite facing unique challenges such as limited access to capital, workforce shortages, and geographic barriers, rural entrepreneurs demonstrate their drive and commitment to innovate, develop cutting-edge solutions, and create sustainable businesses that strengthen local economies. The SBIR and STTR programs provide them with the vital support needed to take calculated risks, push the boundaries of innovation, and contribute to the technological advancement of our nation.

The Importance of Localized Support

The success of small businesses, particularly those in rural communities, is often tied directly to the accessibility of localized support. America's SBDC Iowa and other SBDCs across the country play a key role in providing hands-on, local assistance to entrepreneurs, ensuring they have the resources, knowledge, and mentorship necessary for success. That includes support to navigate funding opportunities like SBIR and STTR. Our SBDC advisors work closely with local businesses to guide them through the proposal process, help refine their commercialization strategies, and connect them with the broader innovation ecosystem.

An example of a newly created impactful initiative supporting entrepreneurs in Iowa is Senator Ernst's Entrepreneur Expo, an annual event hosted by the Senator in collaboration with America's SBDC Iowa and the Iowa State University Center for Industrial Research and Service (CIRAS). The Entrepreneur Expo, which has been held at Iowa State University in Ames, IA, during its first two years, provides an important opportunity for small businesses, startups, and innovators to connect with industry experts, government resources, and potential investors. The expo fosters collaboration, provides hands-on technical assistance, and showcases the immense talent and ingenuity present in our state.

The success of Senator Ernst's Entrepreneur Expo demonstrates the value of convening local stakeholders to support small business innovation and commercialization. It is a worthy model for other states to consider replicating, as it strengthens local entrepreneurial ecosystems, bridges gaps between researchers and business leaders, and helps small businesses navigate federal funding opportunities like SBIR and STTR. By

exploring similar initiatives nationwide, the impact of federal programs on local communities can amplify and drive the potential for greater economic development across the country.

To further strengthen the local support and collaboration, the Iowa SBDC, along with our partners in Kansas, Nebraska, and Oklahoma, have established a “Great Plains SBIR” working group. This working group meets with a monthly cadence and is a chance for first-hand technical providers to share best practices, collectively work on solutions, and strengthen the regional support network.

Challenges and Opportunities for Improvement
While the SBIR and STTR programs have been highly effective and transformative for over 40 years, there are opportunities to enhance their accessibility and impact.

First, streamlining the application process and creating a smaller Phase 1 award amount would lower barriers for first-time applicants, particularly those in rural areas. Specifically, this step would allow for very early-stage research, the kind of research that is so important to small businesses, to be able to explore and describe the commercialization potential of their idea before they are truly ready to begin feasibility and commercialization work. This would allow a far greater number of firms the opportunity to develop critical technologies, roadmap their path to commercialization, and present a significantly stronger Phase 2 proposal that could eventually lead to more globally impactful technologies.

Second, many companies, especially those seeking Phase I awards, receive very little feedback if their proposal is not accepted. Some proposals are declined due to minor issues that the SBDCs could resolve if we were informed of them or knew of commonly made mistakes. Increasing transparency in the review process and enhancing structured feedback would greatly improve the ability of small businesses to refine their applications and submit stronger proposals, ultimately increasing participation and success rates.

Third, there should be recognition that innovation exists everywhere across our nation. Many companies in Iowa and in the heartland struggle to gain the same competitive advantage as firms located in other parts of the country. According to public data from SBIR.gov, just 5 states account for 46% of both the number of awards and total award dollars. While organizations like SBDCs and other FAST recipients help bridge this gap, additional measures could ensure that innovative companies receive full consideration, no matter where they are geographically. Addressing this disparity through targeted outreach, regional training, and improved evaluation transparency could ensure a level playing field for all entrepreneurs, regardless of geography.

Conclusion
For over 40 years, SBIR and STTR programs have played a transformative role in fostering innovation, supporting small businesses, and driving economic growth across the country. These programs not only help entrepreneurs bring groundbreaking technologies to market but also stimulate local economies by attracting follow-on investment and creating high-quality jobs. The impact of these initiatives is amplified through the work of America’s

SBDC Iowa and other SBDC networks nationwide, which serve as resource partners providing vital support to small businesses at every stage of development.

By leveraging the support of the SBDCs, small businesses gain access to expertise in commercialization, funding strategies, and technical assistance, ensuring they can fully capitalize on the opportunities provided by the SBIR/STTR program. As these programs continue to evolve, the collaboration between federal agencies, local resource providers, and entrepreneurs will be essential in maintaining the United States' leadership in innovation. Ensuring that small businesses have the tools, knowledge, and support they need will drive continued technological advancement and economic success for communities across the country.

Thank you for your time and consideration. I welcome any questions you may have.

CHAIR. Thank you very much, Mr. Strawhacker, and we will go next to Mr. Mahmud, and you are recognized for five minutes for your testimony.

STATEMENT OF DR. KEN MAHMUD, EXECUTIVE VICE PRESIDENT, TRITON SYSTEMS, CHELMSFORD, MASSACHUSETTS

Dr. MAHMUD. Good afternoon, Honorable Chair Ernst, Ranking Member Markey, and all other members of the Senate Small Business Committee. Thank you for the opportunity to speak at today's hearing. I'm pleased to share my insights into how Triton has supported SBIR's successful track record of both advancing national security and the economy. I'd like to share a few examples with the committee, mainly to show the different paths to commercialization and the benefits to both the war fighter and the United States as a whole.

First, a few words about myself. I received my Master's and Ph.D from RPI in upstate New York, in chemical engineering. I have been in leadership roles as Senator Markey mentioned in U.S. industry for over 35 years. I'm an inventor with over 30 patents, and I received the Tibbetts award from the SBA on behalf of Triton for commercial success and commercializing SBIR derived technologies.

Triton is a hundred percent U.S. owned company with significant employee ownership. Most of our technical staff have security clearances and carry an incredible passion for helping the country and the war fighter, as you will see. Let me show you some examples of the impact on national security and the economy as a whole.

We supply a critical component to the F–35 aircraft, which is the largest DOD platform ever. It is expected to save the Air Force over $550 million in sustainment costs. We supply another critical component to the F–22 aircraft, which will enable another $200 million in sustainment cost savings for the Air Force.

We have set up a venture in the state of Washington to manufacture long range aerial mobility systems, to support a Navy program of record. To do this, we are setting up an entire Berry compliant U.S. supply chain, bringing back capability that had moved overseas. This involves companies across the country, primarily starting with North Carolina, but also companies in Tennessee, Massachusetts, Rhode Island, Pennsylvania, and of course final manufacturing in the state of Washington.

Our hearing protection product is being qualified for Army helicopter air crew. I do want to point out here that hearing loss and tinnitus is two of the biggest health issues affecting our veterans. With over a million veterans affected, it is estimated that the VA provides over a billion dollars in disability benefits related to these conditions.

Our bladder relief product for aviators is being qualified for navy combat missions, and Air Force recon missions. Our SBIR derived sensor technology enabled the world's smallest heart pump for use in cardiac failure intervention. I do want to mention here that heart disease is the number one cause of death for Americans today.

We are also investing in the first large area metallic 3D printing capability in the country, with internal funding. This will be a new

capability for the United States, allowing for the manufacturer of 3D printed large metallic parts for aircraft, missiles and other DOD platforms. I would like to finish by offering some suggestions to the committee for improving the SBIR program based on our experience with it.

The SBIR program is one of the most successful technology programs in the federal government, as indicated by all National Academy of Science Studies and multiple agency studies. We believe this is because of the merit-based nature of the program, the competition, the ruthless competition that it fosters, and the flexibility, and this is very important, the flexibility given to the agencies to adapt it to their needs.

Our suggestions to the committee include: number one, provide meaningful incentives for transition to Phase III for DOD platforms in particular. I will just add on a personal note, that you know, for a small business when most of the platforms are owned by the prime contractors, it is incredibly hard for a small business which is focused on a sub component or a component to de-risk it, mature it, qualify it, and integrate it. It requires a tremendous amount of cooperation with the primes.

And I do want to add here that, small businesses like ours, who have developed a rare expertise in working with academia to reduce ideas to practice and working with primes, to then take them to a platform and transition it to a program of record, offer a unique skillset in our innovation ecosystem.

Number two, streamline the contracting process. I believe this is a request that all of the witnesses will make, streamline the contracting process by mandating standard contracts. Number three, adequately resource the agencies to implement the foreign risk management provisions.

And number four, reauthorize permanently, or at least for a longer term so that small businesses and agencies have some certainty in their business planning. I wish to end by thanking the members of the committee for your continuing support for the program, and for the opportunity for me to speak to you today.

[The prepared statement of Dr. Mahmud follows.]

Hearing of the Senate Small Business Committee
Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century

Testimony of

Dr. Ken Mahmud, Ph.D.
Executive Vice President
Triton Systems Inc.
March 5, 2025

Good afternoon, Honorable Chair Ernst, Ranking Member Markey, and all other members of the Senate Small Business Committee. Thank you for the opportunity to speak at today's hearing. I am pleased to share my insights into how the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs have enabled Triton Systems to make a significant impact in both the military and commercial space, as intended by Congress, helping to sustain America's technology leadership in both spheres.

First, a few words about myself. I received my Masters and Doctorate degrees from Rensselaer Polytechnic Institute (RPI), in Chemical Engineering. I have been working in advanced materials and their commercialization by US industry for over 35 years. I am an inventor, with over 30 patents in this space. Currently, I am responsible for coordinating our efforts in supporting the warfighter within Triton Systems. I received the Tibbets award from the Small Business Administration (SBA) in 2017, on behalf of Triton Systems, for our success in commercializing SBIR derived technologies.

Overview of Triton Systems Inc. (Triton)
Triton, based in Chelmsford, MA, was founded in 1992 with a mission to accelerate the transition from innovative ideas to practical solutions, with a focus on bringing early-stage technologies to both commercial and military markets. Triton embraced the core goals of the SBIR program:

i) Stimulating technological innovation by leveraging small business entrepreneurship
ii) Utilizing small businesses to meet Federal research and development needs
iii) Increasing the private sector commercialization of innovations derived from Federal research and development

Triton is a 100% US-owned company, with significant employee ownership. We exclusively employ U.S. persons, located across multiple states. Our primary focus is to address national security needs, and our technical team consists mainly of cleared personnel who possess highly specialized technical skills and a deep understanding of emerging threats and critical technology gaps in the military.

Over the years Triton has consistently demonstrated an exceptional track record in commercialization, exceeding the standards set by Congress. Our success in transitioning SBIR-derived technologies into the marketplace was recognized with the prestigious Tibbetts Award from the SBA. As you will see in our success stories, many of which have had significant impacts on national security and the economy, there are numerous pathways for transitioning and commercializing innovations that extend well beyond the metrics of traditional Phase III funding.

I will first provide an overview of how the SBIR/STTR program has benefited Triton and its ability to have a significant impact on retaining our nation's technological advantage in both national security and healthcare — two sectors where the U.S. holds a global leadership position. Additionally, I will

highlight how Triton has successfully partnered with academia and businesses across the country to address critical technology needs for the country through the SBIR program.

Impact on National Security and the Economy

1. **National Security: Impact areas – Cost Savings, Warfighter Lethality and Health**
   a) Mission critical component for the F-35 Joint Strike Fighter aircraft: Triton developed a mission critical component for the F-35, replacing a foreign source. **The F-35 is the Department of Defense's (DoD) largest weapon system ever. The Air Force estimates our solution will result in over $550 million in savings in sustainment costs for the F-35 fleet and** minimize the health risk to military maintenance personnel from exposure to hazardous substances. This was announced as a small business success story by the Air Force. It is important to note that these cost savings to DoD would not show up in the commercialization metrics that we report to the SBA.

   b) Mission critical component for the F-22 Raptor aircraft: Triton developed a product for the F-22 Raptor that is being used to attach materials critical for aircraft performance and survivability. Our solution greatly simplifies the repair and sustainment process and is expected **to result in over $200 million in life-cycle cost savings for the F-22.** Again, these cost savings to DoD would not show up in the commercialization metrics that we report to the SBA.

   c) Personal Air Mobility for expeditionary forces: Triton's advanced paraglider system to enhance the mobility and lethality of Marines is being qualified for acquisition with the **program of record starting in 2026.** We have set up a venture for manufacturing in the state of Washington. **To support the program of record, we are creating a Berry compliant US based supply chain consisting of companies in North Carolina, Tennessee, Massachusetts, Pennsylvania and Rhode Island, in addition to the state of Washington, re-establishing a manufacturing capability that had moved overseas.**

   d) Bladder Relief for Aviators: Triton's Aeroflow product is being qualified for use by both male and female military aviators for bladder relief in extended combat missions, and for long range reconnaissance missions to monitor adversaries, by the Navy and Air Force. Previously there were very limited options for female aviators in particular.

   e) Hearing protection for aircrew: Hearing loss and tinnitus are the top two health concerns among veterans. As of 2020 over 1 million veterans were receiving compensation for hearing loss and over 2 million for tinnitus per the VA. Triton's hearing protection and communication device for aircrews addresses this problem for Army aircrews.

These are all technologies that are critical for the warfighter, but with no clear near-term major commercial market.

2. **Healthcare: Impact Areas – Heart Disease Treatment, Cancer Therapy**
   Heart disease and cancer are the two leading causes of death in the US, and SBIR derived technologies have allowed Triton to make a significant impact in addressing both. Sensor technology developed by one of our spin off companies enabled the world's smallest heart pump. An SBIR derived cancer immunotherapy technology ultimately had an IPO on NASDAQ and was later acquired by a major pharmaceutical company.

Our company is considered an experienced firm under the FY 2022 reauthorization language, and hence we are subject to enhanced metrics. We have reported over $400 million in primarily private sector investments in SBIR derived technologies to the SBA, greatly exceeding the enhanced commercialization metric at $1.7 million per Phase II over our lifetime. Once again, this does not include greater than $700 million in cost savings to DoD generated by these technological advancements. These savings are not captured by the traditional metrics Congress uses to assess companies participating in the SBIR program, nor are the significant health benefits to the warfighter. The 2022 legislation also revised the Phase I to Phase II conversion metric, doubling it for experienced firms, and we fall slightly short of the new metric. This conversion metric does not measure commercialization success and is often dependent entirely on the agency's practice. For example, the Air Force has in the past given out many small dollar Phase I awards with the intention of only awarding one or a few Phase IIs, in order to capture as many as good ideas as possible. This represents a good value to the government by capturing many good ideas at low initial cost. However, it is not consistent with a 50% Phase I to II conversion metric. Keeping this metric will only discourage firms from putting forth innovative ideas and firms will consequently only focus on proposing programs where they are certain they can get to Phase II. This undermines one of the goals of the program to make small early bets in many technologies in order to pick the best. We urge Congress to only consider metrics that promote commercialization, transition and merit, which will result in the best technologies for the country and the warfighter.

Impact on the Local Economy

In addition to its significant impact on our national security, the SBIR program also serves as a key driver of local economies across the country. While many companies can attest to the positive effects they have on their communities, I would like to specifically highlight Triton's unique contributions to the local economy.

Our facility, in which we have invested well over $7 million of internal funds to build capabilities to support the warfighter, serves as the anchor tenant for the town of Chelmsford's newly established technology and business corridor. Triton is recognized every year by our neighboring university, the University of Massachusetts Lowell (UML), as a Preferred Partner due to the substantial research collaboration we sponsor at UML. Finally, we are currently investing over $ 3mm in internal funds to build a large scale metallic additive manufacturing pilot facility. This will be the first of its kind in the US to allow fabrication of large-sized additively manufactured metallic parts for use by DoD. This internal investment has a 10-15 year cycle to adoption, with no immediate commercial returns, as is common with the adoption of advanced new materials. Only companies with the scale and commitment to support government agency mission goals would take on the challenge to develop a capability that our adversaries do not yet have and is important for the US to stay ahead in the technology race. SBIR program support will be required to nurture and transition this new technology for use by our defense and aerospace industry. This is an example of why it is so critical for the SBIR program to be reauthorized without restrictions on the number of merit-based awards.

Collaboration with Higher Education

Triton has successfully established a strong presence in the national innovation ecosystem by collaborating with over 60 higher education institutions across 28 states, to transform campus ideas into practical solutions and support and facilitate the subsequent transition of these technologies.

Some examples that might be of interest to this committee is our work with the Missouri University of Science & Technology (Missouri S&T), Rolla, MO, to develop new materials for hypersonic

vehicles, the University of South Alabama, Mobile, AL, to develop new air cleaning systems for submarines, the University of Montana, Missoula, MT, to develop new drugs for hearing restoration for the warfighter, and the University of New Hampshire, Durham, NH, to develop underwater acoustic models for the Navy for anti-submarine warfare. Additionally, Triton's cancer immunotherapy spin-off IPO, Aduro Biotech, also started with a collaboration with the University of Massachusetts, Lowell.

Most of these collaborations are Phase III (non SBIR) contracts. None of these would have been possible without seed investments from the SBIR program.

Suggestions for Improving the SBIR Program

As this Committee and Congress begin to debate and discuss the reauthorization of the SBIR and STTR programs I would like to take this opportunity to provide suggestions to further improve these programs based on our experience with both the program and the agencies involved.

The SBIR program has proven to be the most successful innovation program in the country, using only 3.65% of federal extramural research and development (R&D) funding. All comprehensive studies, such as at least 18 studies conducted by the National Academy of Sciences validate the success of this program. Studies by DoD and NIH show that for every dollar invested, there is an up to $30 return.

We believe this success is because of its uncompromising focus on merit, its relentlessly competitive nature and the flexibility incorporated in the SBIR legislation to allow the agencies to adjust the program to meet their mission needs. As an example of flexibility, while some agencies have set a cap on the number of programs a company can win in a given year, DoD has determined that multi award winners serve critical needs for the DoD mission (OSD memo to Congress in 2022). We believe that any change that significantly impacts these core foundational pillars of the program, specifically the merit-based nature and agency flexibility to adapt to their mission needs, would ultimately undermine the program.

Areas where we believe the program can be significantly improved include:

1. **Incentives for Transitioning Technologies to Phase III**
   Transitioning SBIR technologies to Phase 3 remains extremely challenging to most small businesses despite multiple efforts in Congress to address the barriers. In particular, as it relates to DoD, most military platforms are built by only a few large prime contractors. Since most small businesses build components or sub-components, it is very challenging for the small business to derisk, mature and qualify the technology in isolation. Incentives in the SBIR legislation for the prime contractors to adopt new innovations from small businesses, as well as recognizing government program managers for their success in doing so, would greatly facilitate this effort.
2. **Improving the Contracting Process**
   Long delays in the contracting process will often result in the small business failing due to inability to meet payroll or losing personnel with critical skills. The SBIR legislation can mandate standardized contracts for each agency for Phase I and II programs, to streamline the process to the greatest extent possible.
3. **Improving Geographical Distribution**

The SBIR program plays a critical role in providing seed funding for small businesses. Unlike venture capital, which is often concentrated in a few sectors and regions of the U.S., SBIR awards help thousands of new businesses engage with the federal government each year across diverse sectors. To further enhance the program's impact, it would be beneficial for SBA and government agencies to establish stronger communication with small businesses to better understand the needs of the agency. Additionally, current SBIR awardees can play a pivotal role by mentoring businesses or higher educational institutions that are interested in becoming involved in the process. Strengthening outreach efforts, such as through programs like Federal and State Technology (FAST) Partnership program and allocating funding specifically for outreach initiatives can help broaden participation. Collaboration with experienced firms skilled in transitioning technologies can also help ensure greater success, as we have shown. Expanding the program will also provide more opportunities for under-represented businesses to benefit from SBIR awards.

4. **Foreign Risk Management Provisions**
   The foreign risk management provision incorporated into the last reauthorization bill was timely and is important in keeping SBIR technologies out of the hands of our adversaries. However, it is our perception that most of the agencies do not appear to be adequately resourced to conduct a thorough investigation of any issues flagged and to engage with the small business to investigate and allow for corrective action (similar to the process that the Defense Counterintelligence and Security Agency (DCSA) uses with contracts larger than $ 5 million). It will be important to allocate such resources to each agency to implement this provision in a fair and transparent manner with the small businesses. In addition, many small businesses will require significant education to protect against inadvertent foreign involvement or intrusion.

5. **Making the SBIR Program Permanent or Long Term**
   Making the program permanent or extending for 8 years as was the case in earlier reauthorizations will give the small businesses and agencies some certainty to ensure continuity.

Finally, I want to thank all members of the Small Business Committee, without whose support and championship, the SBIR program would not continue to exist. Our employees are composed of uniquely skilled and innovative engineers and scientists who are passionate about directly benefiting the warfighter and making a difference. They have given up many other more lucrative opportunities in most cases to do so. The SBIR program has provided a pathway for them to do this as you have seen from my testimony, and this would not have been possible without your support.

SUCCESS STORIES

AirForce SBIR/STTR

Triton Systems
Chelmsford, Massachusetts

MATERIALS TECHNOLOGY SET TO LOWER COSTS, REDUCE ENVIRONMENTAL HAZARDS IN F-35 AND OTHER AIRCRAFT

The Air Force is poised to reduce hazardous materials in aircraft, and save big dollars over the long haul, through a small business partnership.

With the backing of a SBIR contract, Massachusetts based **Triton Systems** successfully developed a technology to produce nickel-free material systems. In addition to eliminating nickel and associated environmental hazards, Triton's technology provides compelling cost savings for F-35 and other aircraft platforms. On the U.S. F-35 fleet alone, this could lead to an estimated $550 million savings across the life cycle of the program.

The technology has been developed and demonstrated in close collaboration with F-35 manufacturers, Northrop Grumman and Lockheed Martin.

Triton used the manufacturing process and pilot manufacturing scale equipment to demonstrate several relevant product forms. Triton also has demonstrated fully-formulated resin systems meeting specific technical requirements for the F-35.

Current fighter aircraft incorporate nickel-based materials to meet various system requirements, which creates several problems. In addition to high costs, nickel is a hazardous material that has been identified for removal to the widest extent possible because of its environmental, health and safety concerns. Nickel based materials require additional handling procedures during many steps in the installation process and their regulatory impacts include limitations on application equipment and controls as well as allowable worker exposure.

On the U.S. F-35 fleet alone, this could lead to an estimated $550 million savings across the life cycle of the program.

The newer Triton technology provides a path to eliminate nickel from a number of mission-critical material systems used on aircraft platforms. For the F-35 Joint Strike Fighter program, replacing nickel-based material systems with lower-cost, non-nickel based material systems is a high priority. The idea is to reduce hazards and address high operational and sustainment costs.

Courtesy U.S. Air Force

The technology is now positioned for transition to several applications on the F-35 program.

Triton's initial success under the SBIR program led to additional funding through the Rapid Innovation Fund (RIF) program. The RIF award allowed Triton to bring the technology and product to a maturity level ready for qualification and transition.

The company has a solid track record of driving early-stage technologies from the laboratory to the marketplace. Triton has spun-off a number of successful companies, attracting more than $200 million in external venture financing.

CHAIR. Thank you very much, Mr. Mahmud. I appreciate that. We'll move next to Mr. Carr. You're recognized for five minutes of testimony.

STATEMENT OF MR. CALEB CARR, CHIEF EXECUTIVE OFFICER, VITA INCLINATA TECHNOLOGIES, BROOMFIELD, COLORADO

Mr. CARR. Chairwoman Ernst, Ranking Member Markey, and members of the committee. Thank you for having me today.

I founded my company following the death of a friend of mine. While we were on a search and rescue exercise in the mountains, he experienced active cardiac arrest and we called the rescue helicopter to come and rescue him. The helicopter proceeded to lower a rescue basket down to us, but due to the winds of the helicopter, the rescue basket kept swinging, and because of it, we couldn't get it through the trees above. As a result, we called off the mission and called time of death.

Several years later, my business partner and I founded what would be known today as Vita, a company focused on designing technology that would eliminate the swing and sway of suspended loads on rescue helicopters and save lives. Preventing the reality that happened to my friend over a decade ago and drastically improving upon the current solution that our war fighters and rescue personnel use today, a rope.

We started in a cold garage in Denver, Colorado, working tirelessly to find a solution to the problem. Investors would turn us down, left, and right due to the lack of market knowledge on the issue and more importantly, the amount of complexity that designing a solution and selling said solution to the U.S. government would entail.

It wasn't until something else took a risk on us in late 2018-the SBIR program, specifically the open topic AFWERX SBIR program. The SBIR program took a risk on us, our three-page white paper, and our idea. And in doing so, it empowered us to quit our jobs, hire a team, and design a solution that we now call the Vita Rescue System. Subsequently, the company went on to secure two Phase II contracts and eventually a Phase III transition, $50 million IDIQ to the U.S. Army, which we anticipate putting into motion later this year.

Meanwhile, that system is now deployed to the battlefields of Ukraine, CALFIRE's fire attack helicopters that were used recently during the Palisades in Eaton fires, multiple Army National Guard units, including South Carolina and across the entire Air National Guard.

Yet that was just the beginning. Thanks to that investment by the SBIR program, Vida expanded into providing the essential gear that crews need to fight the mission, such as harnesses and rescue bags, to the point whereby just two weeks ago, we received the following message from a son. "I just wanted to thank you for making such a great product. My father was in a horrific helicopter accident and his best friend died on impact. He was in the backseat and had your harness on, and despite the helicopter being destroyed, he actually walked away from the incident with only bumps and bruises".

It's this type of mission, this type of capability, these products, would not be here today without the support of the SBIR program. You are going to hear a lot today about what the SBIR program is and is not. But I come to you as someone who used the SBIR program for what it was meant to do-transition real life solutions into the hands of the people that need it most.

What I can tell you is the SBIR program should not be a welfare program to award 50 plus contracts to the same party. The SBIR program is an investment program, an investment in ideas to facilitate solutions that take what was a rope for decades, and make it into a technology solution. An investment to empower Americans and frankly, the market to validate scale and deploy new capabilities that never thought about until today.

The SBIR program is a mission-focused initiative, that advances the objectives of the agencies it supports, providing structure and funding to enable companies to directly address these missions head on, whether for organizations like CALFIRE or the South Carolina Army National Guard. I wonder, would those crews have this capability today if the capability remained in the R&D environment. Yet at the end of the day, the SBIR program is the bedrock of transitioning the future into reality.

Therefore, as you consider how to improve the SBIR program during the upcoming reauthorization, I encourage you to support the following. One, dedicated funding mechanisms for companies that can demonstrate, private sector demand for commercialized technology and government demand for innovative solutions. As we must provide the tools to transition and transition quickly.

Two, the use of firm fixed price contracts for SBIR's default contracting vehicle, reducing the bureaucratic overhead, and allowing the SBIR program to take the small risk on people like me, and empower us to do something great.

And three, limits on SBIR awards for those repeat offenders, specifically companies that continue to receive SBIR awards without commercializing a viable product from the vast majority of their SBIR awards, directly to the end user, not to a prime to an end user. In doing so, you'll prevent the SBIR program from becoming a welfare program, and keep it focused on being an investment vehicle to allow entrepreneurs like me to ideate, innovate, and create the critical solutions that don't just sit on the shelf for someone to talk about one day, but instead are used in reality, executing the mission that it was designed to complete. Thank you for your time today, and I look forward to your questions.

[The prepared statement of Mr. Carr follows.]

Written Testimony:

Caleb Carr, Esq.
President & Chief Executive Officer
Vita Inclinata Technologies, Inc.

The Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century

Before the

U.S. Senate Committee on Small Business and Entrepreneurship

March 05, 2025

Chair Ernst, Ranking Member Markey, and distinguished members of the committee, thank you for the opportunity to appear before you to discuss the Small Business Innovation Research ("SBIR") and Small Business Technology Transfer ("STTR") programs.

My name is Caleb Carr, and I am the CEO of Vita Inclinata Technologies ("Vita"), headquartered in Broomfield, Colorado. I also serve as a board member of the Software in Defense Coalition and am a professor of entrepreneurship at the University of Colorado. I am honored to testify before you on the essential nature of the SBIR program, a cornerstone of small business innovation in the United States.

For over forty years, the SBIR and STTR programs have been the federal government's flagship vehicles to harness promising companies' unique agility for product, value, and job creation. From industry giants like Qualcomm, to small but mighty startups like Vita Inclinata, growing businesses have leveraged "America's Seed Fund" to develop groundbreaking technologies, bridging the gap between early-stage research and commercialization, and ultimately creating jobs and economic value in the process.

A Valley of Death Story

Vita Inclinata was not founded with a traditional business model in mind; it was born out of a personal tragedy and a desperate need for innovation. Over a decade ago, I witnessed a close friend suffer cardiac arrest during a search and rescue mission. A rescue helicopter arrived, but due to uncontrollable swinging of the rescue basket caused by rotor wash and winds that night, the crew was unable to complete the hoist mission. After repeated failed attempts, the helicopter crew called off the mission. We had no choice but to declare his time of death.

That moment solidified my commitment to finding a better solution for suspended load stabilization that wasn't the current practice – a rope. However, as with any hardware innovation, developing a viable product required significant capital. Time and again, Vita was rejected by investors who saw the barriers to entry in government procurement as insurmountable. The irony is that while the U.S. government is often seen as a highly desirable customer due to its purchasing power and contract stability, early-stage investors recognize the difficulty of breaking into federal markets, leading to significant hesitation in funding companies like ours.[1]

Eventually someone, or in this case, something took a risk on us – the SBIR program. In late 2018, Vita won one of the first open topic SBIR contract from AFWERX. The initial Phase 1

[1] This is not inclusive of investment funds which are supported by the DoD trusted capital environment as these funds are more prone to understanding the US government processes. More information can be found here: https://www.defense.gov/News/Releases/Release/Article/2470485/department-of-defense-announces-establishment-of-the-trusted-capital-digital-ma/

award of $75,000 gave us the jolt that we needed to take the risk of leaving our day jobs, hiring a team, and building a solution that wasn't just a research project but that was something tangible. This initial success paved the way for the company to go on and win an MD5 SBIR (now NSIN) and two Phase 2 SBIR contracts to complete the capability.

Eventually, that capability turned into a product known as the Vita Rescue System ("VRS"). A system that uses thrust to control a suspended load under a helicopter, simply put – a solution which would have saved my friend over a decade ago. The product went through rigorous Army testing equivalent to that of aircraft components and is now ready to execute its mission for the US Government, only slowed down by the length of time that it has taken to get an SBIR Phase 3 transition contract in place. By the end of the year, Vita is on track to receive a Phase 3 $50M IDIQ to execute on this mission and take this capability to the fleet of US Army aircraft.

The contracting process has taken almost as long, if not longer, than the airworthiness process, and forced the company to get creative with military customers. We leveraged the Defense Logistics Agency ("DLA") to get the VRS into the hands of the warfighter faster than the contracting processes would normally allow. As a result of the company's and the government's willingness to be flexible, the capability is now in the hands of the entire Air National Guard, Air Force Reserves, and numerous Army units. Outside of the Department of Defense, the VRS is now deployed to the battlefield of Ukraine, CALFIRE's firefighting helicopters that recently were recently used in the Palisade and Eaton fires, and the UAE Coast Guard, among others.

Through the SBIR program and the initial investment that it made, Vita successfully navigated the Valley of Death, deployed solutions to our nation's war fighters, facilitated deep military and humanitarian international relationships, and moved closer to ensuring that we bring everyone home, every time.

The SBIR Program is an Investment Program

The SBIR program is not a research grant, it is an investment program. As "America's Seed Fund," [2] its purpose is to jumpstart innovation, validate market potential, and accelerate commercialization. Unfortunately, some entities known as "SBIR Mills" exploit the system by securing a significant number of SBIR awards without ever transitioning technologies to market. This practice diverts funding away from companies that could benefit from the program's intended purpose.

To establish a real technology and a real solution, you must conduct Research and Development ("R&D"). That research should focus on the market, the use case, the technology solution itself,

[2] **U.S. Small Business Administration.** (n.d.). *Small Business Innovation Research (SBIR) program*. SBIR.gov., from https://www.sbir.gov

the unique value proposition it provides. However, the technology is but one part of the equation. It is critical that companies leverage their tools to complete R&D of all the other pillars of the technology simultaneously. If you do not, how can one successfully transition the technology into something meaningful and useful for the end user – in this case, the US Government?

At the end of the day, the SBIR program is meant to be a seed stage investor to encourage parties to innovate and create. It is not meant to be an R&D slush fund that allows for companies to survive off the income from the SBIR program due to their ability to win small proposals. Is that really what we want American businesses to become? People who just complete R&D contracts which don't turn into a tangible solution?

I ask these questions because the outcome matters. If Vita would have solely lived off our SBIRs, we would not be what we are today. Vita would be less than 20 people instead of the nearly 100 people we are now, taking a drip of SBIR funding in exchange for ideas sitting on dusty shelves; ideas that do not benefit the market or the government. Because Vita took the SBIR capability commercial, we were able to raise over $70,000,000 in capital, hire nearly 100 staff, and pursue the global market in addition to the US government. Isn't this what the SBIR program is meant to create? Isn't that what a seed fund is meant to do?

The SBIR Program is a Tool - not a Means to an End

Like many government programs, SBIR is one of many tools in the vast tool chest for executing development and, eventually, sales within the US Government. It goes without saying that the US government can be a challenging customer. However, SBIR is uniquely positioned to enable companies to excel when partnering with the US government.

When Vita first submitted for our Phase 1, the requirement was a 3-page white paper on the idea. Without this ease of submission, Vita would have never been able to submit for the Phase 1 which made Vita what it is today. This ease was due to the following:

- **Resource Constraints -** Everyone had day jobs, including myself. We simply couldn't dedicate 40+ hours a week to a proposal for the US Government.

- **Proposal Simplicity -** As an idea, it is just that – an idea. There is nothing tangible yet. A simple proposal focused on the future vs. on the past, enabling the company to dream and dream big, forcing the company to sell that idea to the SBIR team evaluating the possibility of the solution.

- **Unknown Unknowns -** The SBIR program, while structured and effective, often focuses on predefined problems and solutions. This approach can overlook groundbreaking ideas

that address unrecognized issues or offer novel solutions to existing challenges.[3] How does that bring new solutions to the forefront that no one thought about before? For instance, Vita's innovation in stabilizing suspended helicopter loads was initially met with skepticism, as the industry standard was a simple rope. No one had considered a technological solution because it wasn't perceived as a solvable problem.

Collectively, these tools were only possible because of the SBIR program. I am aware of no other program in the US Government that allows for simplicity but also allows for people to propose some of the most radical solutions to solve problems that no one knew that they had.

The Opportunity to Ideate and Innovate the SBIR Program

The upcoming SBIR reauthorization offers the opportunity to harness what small businesses do every day - ideate and innovate for the future. Through this reauthorization, we can create real improvements that can break down barriers and serve as even stronger catalysts to nurture ideas and grow them into viable products delivered by vibrant and disruptive companies. Ultimately,

---

[3] An active SBIR solicitation, SOCOM254-D002, requires the following:

The capability to provide oxygen therapy and generation far-forward will incorporate a design that is both durable and small-scale so that it is both portable and able to withstand travel and ground movement while simultaneously providing the necessary oxygen concentration to an adult patient and is able to generate oxygen by separating it from other gases in the atmosphere. As a part of this feasibility study, the proposers shall address the design options with specifications on the key equipment attributes:

- Able to generate and provide oxygen purity of 93% +/- 3%.
- Able to provide 15 liters per minute and capable of supporting multiple patients.
- Device must meet MIL-STD-810H and Environmental – Joint Enroute Care Equipment Test Standards.
- Device must be dual voltage with battery pack capability; capable of running off "shore" power.
- Battery has a run-time of 6 hours.
- Battery charging is compatible with universal USB-C; compatible with external AC/DC (110/240 VAC/12-24 VDC).
- Batteries are swappable without device losing memory or settings; must not require use of hold up battery.
- Battery recharge time is <35 minutes.
- Device has a replace sieve bend and replaceable / cleanable filter(s).
- Device must be able to fit within a standard "D" size oxygen cylinder mount (4.5" diameter x 20" length).
- Device is compatible with standard connectors.
- Device must have a tactical setting that allows audible alarms to be completely disabled or reduced to a level acceptable by the FDA.
- Device must have a tactical setting that changes all light sources or visual screens to the lowest level acceptable by the FDA.
- Device must weight < 5 lbs.
- Device is easily transportable by a single person.

the best SBIR model will incentivize small business participation, boost competition for awards, reduce undue bureaucratic process and contracting burdens, and employ mechanisms to help worthwhile awardees transition from start-up to viable and self-sufficient companies.

The intent and practice should be for every awardee to transition. The SBIR program is not and cannot be viewed as "corporate welfare," where applicants compete for dollars that go into an R&D "black hole." The newly reauthorized SBIR program should include a system that identifies the most promising technologies and has the necessary controls to ensure any government dollar invested is working toward this end – a real transition based on successful products brought to market, jobs created, procurement contracts secured, and captured revenues reinvested in a business' long-term growth. As such, I recommend the following:

1. Simplify and streamline the application and administrative processes by providing tools to submit simple applications that have quick response turn arounds and facilitate more entrants into the market.
2. Install measures that prioritize successful product commercialization over research alone. Whether it's including a mandate for program executives to account for Phase III funding in the PPBE (Planning, Programming, Budgeting, and Execution) process or simply conducting more oversight to ensure decision-makers and Commercial Technology Pipeline (CTP) partners are communicating and equipped to match available funding with the best technologies, methods to helping the right companies bridge the Valley of Death and achieve commercialization are necessary.
3. Default to Firm Fixed Price contract vehicles, with other options for contract vehicles remaining available to meet specific needs of different products enabling small businesses to be nimble and flexible as they work to get off the ground in the early days of the company.
4. Eliminate "SBIR Mills" by capping award and funding opportunities bringing back the SBIR program to what it is meant to be – a seed investment fund to create value not items that sit on a shelf.

Building on the myriad successes of the SIBR program, while incorporating lessons learned over time, we have an opportunity to refine and modernize the system—reducing administrative burdens, enhancing commercialization pathways, and expanding access to diverse and emerging innovators. By addressing these challenges now, we can ensure the SBIR program continues to drive technological leadership and economic prosperity for generations to come.

Thank you for the opportunity to testify before you today and for all you do to enable small business success. I look forward to answering your questions and working with this committee and our stakeholders to strengthen the SBIR program for the future.

CHAIR. Thank you very much, Mr. Carr. And now I recognize Mr. Rothzeid for five minutes of testimony.

STATEMENT OF MR. DAVID ROTHZEID, PRINCIPAL OF INVESTMENTS, SHIELD CAPITAL, WASHINGTON, D.C.

Mr. ROTHZEID. Thank you, Chair Ernst, Ranking Member Markey, the members of the committee, Senator Rosen, thank you for the opportunity to testify.

I'm an investor at Shield Capital, where I work with over 40 early-stage startups, building technology at the intersection of national security and commercial applications, colloquially known as dual use technology. Before this, I spent over a dozen years on active duty as an Air Force acquisition officer, including at Defense Innovation Unit, where I helped pioneer a new model for working with venture-backed startups.

The reality is that America's technological edge is eroding. While we maintain clear dominance in Iraq and Afghanistan, we face a very different challenge in the People's Republic of China, yet our defense and commercial technology ecosystems continue to operate in parallel universes. If we are going to win the global power competition, then we must leverage America's private capital markets backing the most innovative ideas.

Private capital is critical to accelerating the development of next generation defense tech. Venture capitalists bring funding, expertise, and a culture of iteration needed to develop cutting edge capabilities. Venture-backed startups thrive on rapid R&D, allowing them to develop, test, and scale disruptive technologies efficiently.

In recent years, the investment in defense tech has surged, growing from 8 billion in 2016 to 42 billion just last year, seven x increase. And this trend, it's driven by geopolitical instability and emphasis on streamlined processes from organizations like DIU and AFWERX, and a growing recognition of private capitals value in national security.

The SBIR and STTR programs were created as America's seed capital for innovation, avenues for non-dilutive funding, which have contributed to major technological breakthroughs developed by venture-backed companies. These program, SBIR or STTR should be reauthorized, but with vital improvements. I outlined a number of policy solutions in my written testimony, including addressing an obstacle course that favors entrenched companies so-called SBIR Mills.

A naval postgraduate school study found that of nearly 5,000 SBIR companies, the top 25 alone secure 18 percent of all DOD Phase I And Phase II funding. That's over 2.3 billion between 2012 and 2021. Many of these firms focus on securing grants rather than fielding operational capabilities. Meanwhile, true high growth startups like the one here on my right, the ones building the technology of the future, organized to scale, employing thousands, and attracting billions of private capitals, are often locked out. We must ask, shouldn't America's government backed seed capital be an entrepreneur's first step and not a bureaucratic bottleneck?

Even when startups win SBIR awards, too few transition to Phase III procurement contracts. That same MPS study found that only 16 percent of SBIR companies transition beyond Phase II, the

rest remain stuck in perpetual R&D. Programs like TACFI and STRATFI in the Air Force and Space Force and Catalyst in the Army provide a model for bridging this gap.

As a former acquisition officer, it is these types of programs that would incentivize a federal government program office to engage with SBIR companies rather than ignore them to the purview of government labs. Without these transition pathways, startups struggle to gain meaningful traction and investors hesitate to back them.

At Shield Capital, we have four startups that have successfully transitioned from a SBIR Phase II to winning a STRATFI contract, enabling them to integrate into emerging programs of record. We expect these startups will likely graduate from the SBIR program, creating an onramp to scalable operational technology. This is the paradigm we need to solve for.

VC financing on a grand scale-it is small but mighty force. Just like SBIR within federal R&D, by working together, we ensure that SBIR will be a true launchpad. Venture-Backed startups will gain a real onramp into government markets, and both private capital and federal investment can work together to co-fund the technologies our war fighters need.

R&D-it's a bipartisan issue that impacts the workforce and economy of every state in America. Chair Ernst, Ranking Member Markey, your states represent two critical sectors of American innovation. Iowa's ag tech drives food security, while Massachusetts biotech sector pioneers' life-saving advancements. Neither thrives without investment, scale, and clear pathways to impact.

In conclusion, I want to thank all the members of the Senate Small Business Committee. Now is the time to modernize SBIR as a bridge between government needs and America's private capital system. The golden age of American innovation will not be won by government funding alone, it will be secured by unlocking the full potential of America's arsenal, leveraging our free market system, ensuring economic prosperity, and national security resiliency. I look forward to being a resource and answering your questions. Thank you.

[The prepared statement of Mr. Rothzeid follows.]

Testimony of

David Rothzeid
Principal of Investments, Shield Capital

Before the U.S. Senate Committee on Small Business and Entrepreneurship

Hearing on "The Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century"

5 March 2025

Chair Ernst, Ranking Member Markey, and Members of the Committee,

Good Afternoon, and thank you for the opportunity to testify. I am a Principal of Investments at Shield Capital, where we have invested in over forty early-stage startups building technology at the intersection of national security and commercial innovation—colloquially known as dual-use technology. Prior to joining Shield Capital, I spent over a dozen years on active duty as an Air Force Acquisition Officer, with assignments at Peterson Air Force Base (AFB), CO; Hanscom AFB, MA; Macdill AFB, FL; at Defense Innovation Unit in Mountain View, CA; and the Pentagon. I deployed with Special Operations Command in 2014 to Bagram Air Base, Afghanistan as part of the GHOST program. In addition to my time at Shield Capital I am a reservist in the Pentagon under the Air Forces Senior Acquisition Executive.

Before joining the military through ROTC, I learned the power of small business growing up in Cincinnati, OH,—my parents were both small business owners. My mother spent 40 years in independent financial services, and my father recently sold his water heating business after 30 years of operation. I know firsthand that small businesses are the backbone of the American economy, and they always will be.

But competing with foreign adversaries requires a new class of American business—one that didn't exist when the SBIR program was first authorized in 1982: the venture-backed startup. These companies now drive the top of the S&P 500, driving a disproportionate share of private-sector research and development (R&D) funding and building compelling technology of the future.

Overview of Shield Capital

Founded in 2021, Shield Capital, a venture capital firm, is investing in early-stage companies building technologies that matter across artificial intelligence, autonomy, cybersecurity, and space. Shield Capitals team consists of founders, investors, and national security leaders. We

invest in mission-focused entrepreneurs addressing the convergence of commercial technology and national security. At Shield Capital, the MISSION MATTERS![1]

The Value of Private Capital in Defense Technology Development Ecosystem

Private capital plays a crucial role in accelerating the development and deployment of next-generation defense technologies. VC provides more than just funding; it brings expertise, networks, and a culture of speed and iteration that is essential in a world where technological superiority is contested. Unlike traditional defense contractors, venture-backed startups thrive on rapid innovation cycles, allowing them to develop, test, and scale disruptive technologies efficiently.

In recent years, venture investment in defense technology has surged, growing from $8 billion in 2016 to over $42 billion in 2024 as highlighted by Pitchbook. This trend is driven by various factors, including the more dangerous world we live in today, efforts from organizations like DIU and AFWERX, and a growing recognition that the private sector must play a greater role in national security. While federal R&D funding remains critical, it cannot match the agility, size, and market-driven discipline of the venture ecosystem.

Private capital also enables startups to overcome funding gaps that often plague government procurement processes. Many of the most promising defense technologies struggle to transition from prototype to production because of bureaucratic hurdles and inconsistent funding. Venture investment helps bridge this "Valley of Death" by sustaining companies through critical phases of product development and commercialization.

Moreover, private investors actively seek to build companies with long-term commercial viability. This dual-use approach strengthens supply chain resilience and ensures that America's defense industrial base remains competitive in both defense and commercial markets. Technologies developed with venture capital backing—such as artificial intelligence, autonomous systems, and cybersecurity—are already reshaping national security.

The value of integrating private capital into the defense innovation ecosystem cannot be overstated. If we do not continue to incentivize innovation and competition, then we risk ceding the advantage to adversaries who are aggressively investing in emerging technologies. By aligning SBIR with the strengths of venture-backed startups, we can create a more dynamic and effective pathway for deploying breakthrough technologies to the warfighter.

The Golden Age of American Innovation will not be won by government funding alone. It requires unlocking our most powerful asset—America's private capital system.

[1] https://shieldcap.com/

The Challenge: America's Technological Edge is Eroding

We sit at a pivotal moment for American competitiveness. While the U.S. maintained technological dominance in Iraq and Afghanistan, the People's Republic of China presents an entirely different challenge. Our defense and commercial technology ecosystems continue to operate in parallel universes, making it harder to field cutting-edge capabilities at scale. If we are going to win the Global Power Competition, we must unleash the full force of America's private capital markets backing our best founders and entrepreneurs.

SBIR Should Be a Launchpad, Not an Obstacle

The SBIR program was created as America's seed capital for innovation, as an avenue for non-dilutive funding to develop technologies with commercialization potential. SBIR and STTR funding have contributed to major breakthroughs, including regenerative wound healing therapies, biometric sensor technology, and more.

As we discuss reauthorization, we must address the fact that SBIR has become an obstacle course favoring entrenched companies—so-called SBIR Mills.

A Naval Postgraduate School report found that of nearly 5,000 SBIR companies, the top 25 alone secured 18% of all DoD Phase I and II funding—over $2.3 billion between 2012 and 2021. Many of these firms focus on securing grants rather than fielding operational capabilities.

Meanwhile, true high-growth startups—the ones building the technology of the future, structured to scale, employing thousands, and attracting billions in private capital—are often locked out.

We must ask: Shouldn't America's government-backed seed capital be an entrepreneur's first step, not a bureaucratic bottleneck?

Bridging the "Valley of Death"

Even when startups win SBIR awards, too few transition to Phase III procurement contracts. The same Naval Postgraduate School report found that only 16% of SBIR companies transitioned beyond Phase II, leaving most stuck in perpetual R&D.

Programs like TACFI and STRATFI in the Department of the Air Force and Catalyst in the Department of the Army provide a model for bridging this gap. As a former acquisition officer, these are the types of programs that incentivize a program office to engage the SBIR program rather than leaving it to the whims of R&D labs. Without clear transition pathways, startups struggle to gain traction, and investors hesitate to back them.

At Shield Capital, the SBIR program is often a first step in a company's journey working with the federal government. Four of our startups have successfully transitioned from SBIR Phase II to STRATFI contracts, integrating into emerging Programs of Record. It is unlikely those startups will need to leverage SBIR again, creating a true onramp to scalable, operational technology. This is the paradigm we need to solve for.

Recommendations to Improve SBIR for Venture-Backed Startups

Beyond limiting SBIR Mills and expanding STRATFI-like programs, additional reforms would make SBIR more accessible to venture-backed startups. As reauthorization discussions arise leading up to the September 30, 2025 deadline, I also ask the Committee to consider the following:

- Make SBIR contracts firm-fixed price by default and cost-reimbursement by exception. Expecting startups to build government-unique accounting systems for contracts between $50K - $750K is a major barrier to entry and generally discourages companies who are not predominantly focused on the government as their sole customer and generally discourages companies who are not predominantly focused on the government as their sole customer.
- Provide additional financing to first-time recipients to meet the NIST-mandated Cybersecurity Maturity Model Certification (CMMC) standards. Good cyber hygiene is critical, but compliance costs money and can operate as a barrier to entry.
- Increase resources for 'authority to operate' (ATO) and 'facility clearance' (FCL) approvals. These are typical barriers preventing commercial companies from working with DoD and generally stand in the way of moving from a Phase I/Phase II SBIR/STTR into a Phase III or other program/contract structure. Additional solutions to formalizing a Phase III SBIR program can be found in the National Venture Capital Association's letter, alongside coalition partners.[2]
- Institute and enforce a "shot clock" for award notification and contract award. Speed in execution is often the difference between winning and losing and our adversary is moving quickly.
- Create an avenue for due process and require agency feedback to companies that were passed over for the program.
- Implement and maintain a standard set of proposal formats for the SBIR/STTR program, so that individual agencies do not implement individual requirements that discourage young firms from participating.
- Strictly enforce use of open interoperability standards.

[2] Joint Innovation Coalition Comments re- SBIR Reauthorization 2024-10-03 - National Venture Capital Association - NVCA

Addressing Common Concerns

Lastly, to provide some additional clarity on some key considerations:

- *"VCs and startups only exist in a few regions. How do we ensure access across the U.S.?"*
  Startups naturally expand operations nationwide as they scale. For example, Anduril Industries began in California but has since expanded into Rhode Island, Massachusetts, Georgia, and Ohio, creating thousands of jobs for defense manufacturing.

  The National Venture Capital Association has partnered with Pitchbook to highlight state-specific data on how VC investment is transforming communities far beyond traditional hubs like Silicon Valley.[3]

- *"Most startups fail. How can the warfighter depend on venture-backed startups?"*
  While not all startups succeed, their technology and intellectual property often persist—either through M&A or tech transitions. A startup achieving product-market fit does not simply vanish.

- *"SBIR Mills conduct critical research. Why shift focus to venture-backed startups?"*

  Innovation thrives in a competitive market, where the best ideas rise to the top. Not every solution needs to come from a venture-backed startup, but SBIR Mills are exploiting a market inefficiency—one that allows them to exist indefinitely without meaningful growth, acquisition, or transition.

  In a healthy market, a small business with a promising innovation would scale, get acquired, or pivot. If it stopped innovating, it would fail and make room for new entrants. But SBIR Mills have mastered the art of proposal writing, not product development, using the program as a funding treadmill rather than a launchpad. The system incentivizes staying small, rather than scaling technology for real operational impact.

  Instead of continuing to fund perpetual small businesses, much of this bespoke, non-scalable research could be handled by FFRDCs, UARCs, and taxpayer-funded government labs, which are already designed for early-stage R&D. Meanwhile, the SBIR program should refocus on what it was meant for—launching groundbreaking startups that can scale.

Venture capital financing is a small but mighty force—just like SBIR within federal R&D. These two should not operate separately. By integrating them, we can:

[3] Venture Across America - National Venture Capital Association - NVCA

- Ensure SBIR is a launchpad, not a dead end.
- Give venture-backed startups a real onramp into government markets.
- Enable private capital and federal investment to co-fund critical technologies.

In conclusion, I want to thank all members of the Small Business Committee. I recognize my position as a military veteran, now turned venture capitalist, is a unique perspective for these types of hearings. Venture capital, and this new generation of defense tech startups are new to our national security arsenal. Now is the time to modernize SBIR—as a bridge between government needs and America's private capital system. The *Golden Age* of American Innovation will not be won by government funding alone—it will be secured by unlocking the full potential of our free-market system, ensuring economic prosperity and national security resiliency. I look forward to being a resource and welcome any questions.

CHAIR. Great. Thank you, Mr. Rothzeid. And now I recognize myself for five minutes of questions. We'll move into questions. So, we'll start with you. Mr. Strawhacker, thank you for your amazing work and support of small businesses in Iowa. I am very familiar with what you do, and thank you for it.

I believe it's in our national interest to scale the best technologies with strong potential to solve America's challenges no matter where they are located. What bureaucratic obstacles exist for small businesses who are new to SBIR and what reforms should Congress consider?

Mr. STRAWHACKER. Thank you, Chair Ernst, for that question. As I mentioned in my testimony, local support is critical for early-stage development, particularly when it comes to learning about what these programs can and cannot do for companies. The expo that we jointly host in the state has done tremendous work in educating people about these resources, but it has also brought federal agency representatives to our state to have firsthand conversations with those business owners. That's where I believe the most work occurs.

When someone can sit down with someone who can answer their questions, right then and there, and provide firsthand technical assistance in the moment, leads to significantly better planning as people start to enter this space.

In 2022, the year before the expo was launched, we held a very similar event. And while it was impactful—because it was the first one that we had done in quite some time, it was very difficult to get a lot of our agencies to come and have a presence at that event. Those that did come, were blown away by the amount of innovation that occurs in our state.

Thankfully we have many more of them coming to our event right now. But in addition to the expo, the other things that were mentioned in the testimony such as introducing a smaller Phase I award, will be very helpful as well as increasing the transparency and feedback when awards are not approved. Thank you.

CHAIR. Thank you. And if we could move on to you, Mr. Rothzeid. In your written testimony, you stated, "innovation thrives in a competitive market where the best ideas rise to the top". Over the past five years, just 10 percent of DOD's SBIR/STTR funding went to companies without prior government contracts. I'm concerned about whether SBIR is living up to its potential, and from what I've been able to see, a system so skewed towards the status quo and entrenched players is not utilizing competition to drive the innovation America needs to stay ahead. So how can we ensure real and open competition in the SBIR program?

Mr. ROTHZEID. Thank you, Senator Ernst. And I agree with you, it is not okay that only 10 percent of SBIR recipients are new entrants. This ought to be seed capital for the next emerging ideas. I think one of the major bottlenecks for that program is the idea of these esoteric, very nuanced, specific topics that are clearly wired for specific companies based on prior existing relationships with a company and government labs.

If we can start to generalize the topics more around different technology areas that an innovator can come and create a new solution around, that is what's going to create disruptive technology

for the future. It's also what's going to address the problems for the program officers that are responsible for fielding operational equipment to the war fighters.

The labs have a different perspective with R&D, versus the program office that are trying to deal with near and dear issues. Additionally, I do find it hard to believe that a company, a small business, can work on a myriad of different technology areas. For my startups any more than two or three, and they're very tapped out. So, we sort of have to ask ourselves, why is there such a market efficiency where a company can still be a small business, but work across a dozen different SBIR at the same time? Thank you, ma'am.

CHAIR. Thank you for pointing that out. I appreciate it. And I will now turn to Ranking Member—Oh, I can, yes, sir, I can. I will now turn to Senator Rosen for her questions. Thank you.

Senator ROSEN. Thank you, Madam Chair, thank you. Senator Markey. I have a 3:30 and I didn't want to miss, this is such a great hearing and it's so important. And I just want to thank you all for your ideas, for your energy to bring them into reality and to really think out of the box when you see a problem, be that those real problem solvers, and it is very exciting. This is a great committee to see the entrepreneurship and the way people think.

And so, the SBIR, the STTR, the programs, they're just critical sources or capital for startups, and for people who see a problem and think, how can I make it better? How can I fix it? How can I find that solution? But unfortunately, some states aren't receiving their fair share of this vital R&D funding.

Like the Chair, State of Iowa, Nevada sadly is ranked in the bottom third of SBIR and STTR award recipients. In 2023, we received only 23 of the SBA awards compared to the national average of 118 awards per state. I hope to maybe move that up. But the Federal and State Technology Partnership Program was created to address this gap. The FAST program provides funding to economic development entities, research institutions, and that in turn provide that technical assistance and support to the small businesses who are applying, you often just don't know how to get started, right? That's a big issue.

So FAST Mission to strengthen the competitiveness of underserved businesses seeking the SBIR/STTR grants, it's critical. And Congress, I believe must continue to support it alongside its innovation initiatives. So, Mr. Strawhacker, as a FAST recipient, I know you know how important it is, can you discuss the ways your SBDC has better served businesses who struggle to navigate the SBIR/STTR process. And what challenges are you facing that we can address here?

Mr. STRAWHACKER. Thank you, Senator Rosen. You are absolutely correct that the FAST program is tremendously valuable to this overall equation, but it does play a complimentary role to the business owners and the innovators. We are there to connect them to resources, connect them to people who can ultimately invest in these companies. But it's their idea and their innovation that drives us forward.

We have brought on a myriad of different proposal development tools. We have sent our advisors to as many trainings as we can

possibly get to. And I'm confident in saying that the proposals coming out of Iowa right now are as strong as they have ever been.

We have developed deeper partnerships with state agency, Iowa Economic Development Authority, who provides some of the matching funds. But there is still a lot of work to be done. I hope that other states will look at implementing an entrepreneur expo where they can bring firsthand agency representatives.

Senator ROSEN. I've already written that down. We're going to contact you on that.

Mr. STRAWHACKER. Happy to share any details. Thank you for your question.

Senator ROSEN. Thank you. I want to talk a little bit about rural business access to SBIR funding. Because we know small businesses are the key economic drivers in every Nevada community, in fact, Nevada is known for our large, obviously, casinos in Las Vegas, but to be honest, 99 percent of businesses in Nevada are small businesses. They bolster our industries, they support the good paying jobs, local jobs. It's true both urban and rural.

And despite their importance, rural small businesses historically face a lot of challenges accessing capital and small business resources, I know you know this as well. So again, I'm going to stick with you today, Mr. Strawhacker. What challenges do you think the rural businesses have and how can we help them address that maybe more specific need they have and the ways the FAST program can really better connect our resource partners to the SBIRs?

Mr. STRAWHACKER. Thank you, Senator. It is often remarkably difficult to physically get to certain parts of rural states.

Senator ROSEN. You've been to Nevada, so, you know, deep frontier, rural states, most mountainous state in the lower 48, I might add.

Mr. STRAWHACKER. I did not know that. Thank you. [Laughter.]

That is why we have utilized the longstanding success of the SBDC network to come alongside the FAST program. We have 15 offices strategically located around the state of Iowa through 11 partnerships with community colleges. And then four centers hosted by our three public institutions in the state.

Those people are in the community where those business owners are developing their ideas. They're constantly networking with different economic development agencies, different lenders. They serve as the pipeline for that technology-based business into our technology and commercialization center who can ultimately get them to that finish line.

Senator ROSEN. Well, good. We might be reaching out to you for some connection with Nevada.

Mr. STRAWHACKER. Absolutely.

Senator ROSEN. Thank you all for being here and what you do. And thank you again, Senator Markey, Madam Chair.

CHAIR. Yes. Thank you so much, Senator Rosen. Next, we'll go to Senator Husted for five minutes of questions.

Senator HUSTED. Thank you, Chair Ernst. Appreciate that. So business is hard. Many startups fail, particularly if you're in tech because there's somebody else out there, all the time, who's also innovating and trying to identify a path, a use for their technology.

And how do you go about the process of identifying who should receive assistance, who shouldn't? Because in a marketplace, it's so much easier in the sense that when it's your real money and it's your decision, you are far more discerning than when it's not. And so, how does that process work right now? And how can we make it more like how a real marketplace works? And I'm open to whomever can answer that question the best.

Mr. CARR. I mean, I'll jump in, it's an elevator pitch. At the end of the day, it's a quick white paper with a quick summary, 1, 2, 3 pages, and that's it. The reality is, the SBIR program has continuously gotten longer and longer and longer in regards to its proposals. I can tell you with a team of three people working in a garage, I did not have time to write a hundred-page proposal. I have an elevator pitch. And the question is, are you-as the person on the other side, willing to buy into that elevator pitch or do you think that something else should be awarded instead?

Senator HUSTED. And does the process that we're using in this, is it entrepreneurial enough? Does it work?

Mr. CARR. I think the bureaucracy, as much as I would love to make it simpler, it forces you to be an entrepreneur. Because at the end of the day, you got to figure out how to navigate the market. And if you're trying to navigate the U.S. government, you've got to learn and be that entrepreneurial self to be able to figure out how you complete that navigation.

And so, from my perspective I believe a lot of the proposals, supporting, making that elevator pitch much easier for smaller companies to make it, you will continue to see more and more entrants coming into the program to be able to validate whether it's real or not.

Senator HUSTED. As I was doing a little research on this, one of the common complaints is that, hey, the people who do figure it out are the ones who are getting all the money. And the people who haven't figured it out, you know, and there's just a barrier that it's like a mystery of, what door I go into and how I do this? How do we improve upon that?

Mr. ROTHZEID. Well, if I may, you know, I've been somebody on the other side as a government evaluator. And a big part of it, because on certain areas, you get so many proposals that you try to take the easy way out, and you say, who didn't cross their t and dot their i perfectly. And so that sort of sentiment certainly favors those who have gone through the process before because they're able to rinse and repeat a lot of their proposals going forward.

And I think that's why with Chair Ernst and her recommendations of putting a cap, sort of gets us away from being more process oriented and more about the spirit of the idea. Because when the same companies can submit 50 applications at a time in a given window, and the resources to be able to evaluate all of the incoming solicitations, there has to be a level of empathy for the reviewer on the government side.

As a venture capitalist, I take pitches all the time. Right? I've got three more scheduled later today on different companies. Most of them are going to receive a no, and that's just the reality. Because I'm looking at the competitive marketplace, the ins, you know, how good is the founder? What is the opportunity for them

to sell into? These are difficult things that you learn over years and reps. And our government stakeholders don't necessarily have that same background, but we just need to make it easier for them to evaluate less companies.

Senator HUSTED. Thank you. My time is going to run out. And I want to ask a question because I'm not sure how to do. Is it more difficult the way we set up particularly for our contracting with the U.S. military? I was told one time that small businesses—that the big contractors welcome them as long as they stay in their box. And if they can't have a they really try to—we have bidding rules that make it hard for a small business to do entry. Is that accurate for anybody who's worked on that?

Mr. CARR. I can jump up and say absolutely not. As a lawyer, one of the best things I ever did was go to law school, because I'll tell you the NDAs that I signed with some of the big primes, they take your IP, they absolutely take the knowledge, the idea, and then they fit you into that box, and they force you into that box.

Senator HUSTED. And you must stay in that box.

Mr. CARR. You must stay in that box, which is completely against the idea.

Senator HUSTED. Yes. Madam Chair, an opportunity maybe to explore that issue on another occasion. Thank you.

CHAIR. Yes, absolutely. Thank you, Senator Husted. And Senator Markey, we'll go back to you.

Senator MARKEY. Thank you so much. And I agree with—listen, this whole idea of the big companies, like Microsoft just swiped the browser idea, you know, from Netscape, just swiped it. Oh, we're going to give it away. We've innovated it so we can give it away—the Internet Explorer. Big companies actually don't make breakthroughs, it's just a joke, they steal it from younger companies, whoever, they'll buy it up. But a lot of stealing goes on. You got to protect these people from the highway robbery of Silicon Valley companies. They just put more police on that beat.

The SBIR and STTR programs provide small businesses early-stage funding when private sector funding is less likely. Many small businesses have said that without SBIR and STTR funding their businesses and the technologies that they successfully develop may not exist.

More often than not, companies utilize SBIR to develop technologies that ultimately reach the market to benefit Americans across the country and provide critical technology to the government. So, Dr. Mahmud, can you speak to the impact that SBIR and STTR funding have had on Tritons ability to innovate technologies that benefit everyday Americans?

Dr. MAHMUD. Thank you, Senator, for the question. So, as I had mentioned at the beginning, just because of the passion of our employees, we do target benefiting the war fighter for a lot of the technologies that we develop. And it turns out in many cases that the technologies have a dual use. In fact, in our business model, when the technology has a commercial use, we completely spin off the company to go raise money in the venture capital market, as has been discussed. Because the commercial market operates, you know, the venture capital industry has very tight timelines and expectations, as was just mentioned.

So, one example that I can cite, which is benefiting everyday Americans, is when we started and we created a spinoff for a sensor technology, a location sensor technology, and the application—the biggest application turned out to be for a heart pump. A heart pump that is used as I had just mentioned, for Cardiac disease, heart attacks and cardiac disease are the number one cause of deaths, for Americans.

This heart pump used this sensor, they enabled the heart pump to become the smallest heart pump and heart pumps are inserted through the artery, it has to be very small. And so, it enabled this technology and that heart pump is now widely used. So, this is an example of something that has widespread application, but did come from an SBIR technology that was targeting a different application.

Senator MARKEY. Again, half all SBIR and STTR awards are made by the defense department.

Dr. MAHMUD. Correct.

Senator MARKEY. The Defense Department has to approve these SBIR awards, this is the technology the defense department wants, to protect our country. And, ultimately our advantage over China or any other country is that we're technologically superior to them.

My mother would always say to me, when she was disappointed in me as a boy, she would say, Eddie, your father and I are going to donate your brain to Harvard Medical School, it's a completely unused human organ. Okay? So, you have to learn how to work smarter, not harder. So that's what technology is, and it has to be the best technology if you're going to surpass the Chinese, this is a ruthless Darwinian world that we're in right now.

So, in your opinion, doctor, does the Defense Department make those kind of ruthless Darwinian decisions to enhance our defense capability when they're deciding who gets these SBIR awards?

Dr. MAHMUD. I can only speak to my company's experience; I can't speak to DODs practices. In our experience, we tend to focus on trying to understand what the gap is for the war fighter. We focus a lot to understand that. Oftentimes the commercial application may not be obvious to us. And when we do find a commercial application, as I said, we spin off the company to raise money in the venture capital market.

And as I've showed in our examples, when we understand the problem, and I'll give you the example of the F–35, there was two problems there. One is of course sustainability costs, the source was a foreign source, and then the second problem was that it was causing a significant health hazard to the war fighter, the maintenance depots, and the service depots.

And so, we worked with the primes, and as I mentioned, you do have to work with the primes because they own the F–35. They own most platforms. We work with the primes closely to incorporate this new material to solve this problem, which as the Air Force has announced, is going to save them over a half a billion dollars. So, I'm not sure if I answered your question.

Senator MARKEY. Well, you did. You have a technology that the military's going to use, would work smarter, not harder, saves money, you know, it works better. It's a smart technology. And you did it in conjunction with the Defense Department wanting a solu-

tion and you did it with the prime, but the prime itself wasn't coming up with the answer. And the SBIR incentivize you to find the answer to the problem. Is that correct?

Dr. MAHMUD. That's correct, Senator. And if I may add, you know, cost savings that we bring to the government, like in this case, and there are other cases, there's another case where we save $200 million for the F–22 platform. They do not show up in any metrics. None of our metrics, SBIR metrics, success metrics, they don't show up.

So, it's highly unlikely if we don't solve this problem that anyone else will do it. Because there's no financial incentive for most companies to take on a problem that has a low return for the company, relatively speaking, versus the government.

Senator MARKEY. And if I may, so you are saying essentially venture capital money is looking to make a big profit. And here there's not a big profit, but there's a big problem that has to get solved by the Defense Department because of some medical condition that they want to see solved.

Dr. MAHMUD. I will just say, you know, our spinoffs are very active in the venture capital market, so we understand, you know, how the venture capital market works very well. I will just say that there are problems that are debilitating and life-changing and very, very difficult for the war fighter. I just mentioned the hearing loss problem. The hearing loss problem is a significant problem for the war fighter.

The F–35 problem was really exposing them to a lot of toxic dust. The bladder relief problem which we worked on, and is now being evaluated by the pilots in the Navy and the long-range recon missions that the Air Force is running over our adversaries. You know, there is no restroom for female pilots. There is no solution. You know, some pilots practice tactical dehydration. It is not a good situation. And, you know, we came in with a solution that was optimal for female pilots, female aviators actually. And also, for male aviators now.

So, these are not problems that the traditional marketplace looks to address because the market is too small. There's only so many pilots. There's only so many—the market is just not big enough to attract those investments. And those are the ones where we feel we have brought tremendous benefit to the war fighter.

Senator MARKEY. Thank You, doctor. Thank you.

CHAIR. Thank you. And I now recognize Senator Shaheen. Thank you.

Senator SHAHEEN. Well, thank you Madam Chair and Ranking Member. I'm delighted that we're doing this hearing on the SBIR and STTR programs. Thank you to all the witnesses for being here. I apologize for missing your testimony. I was at Armed Services hearing subcommittee, so that's why you weren't there, Senator Ernst. [Laughter.]

Senator SHAHEEN. But the reason I'm so enthusiastic about, one of the reasons I'm so enthusiastic about the SBIR program is that it was created by New Hampshire Senator Warren Rudman back in the 1980s. And so, I've had a chance to see it up close from that time to see how it's grown and to see the difference that it's made for small business in New Hampshire. And I know that you have

stories about the differences that it's making in Massachusetts and Iowa and across the country.

And you may have already asked this question, question, Senator Markey, because I just came in on the end of it. But as I understand Dr. Mahmud, in your testimony, you described millions of dollars in savings to the Defense Department from SBIR work that your company has done. And do you know if those savings are counted in statistics about the SBIR return on investment or on in the commercialization data that's provided?

Dr. MAHMUD. Thank you, Senator. I did, you missed that part, that question was asked, but I will repeat that. Thank you for asking that. So, you know, cost savings that we realize for the government and just as importantly benefits to the war fighter's health, preventing hearing loss, once a war fighter is exposed to noise, and they are exposed to a lot, air crews are exposed to a lot of noise, it is a permanent condition, it's impossible to reverse it. It's very difficult to reverse it, I should say. It's not impossible, it's very difficult to reverse it.

And I also mentioned that the VA, there's a million veterans with hearing loss right now, and 2 million with tinnitus, which is related. So, we have focused in terms of our support to the war fighter on developing technologies for air crew protection that's being qualified for Army helicopters. And we are developing bladder relief for female pilots for long distance recon mission.

Senator SHAHEEN. I did hear you talking about that.

Dr. MAHMUD. Okay. Thank you.

Senator SHAHEEN. Apologize my attention because you were talking about hearing loss, and we have a New Hampshire company that's developed a new hearing protection helmet system for aircraft carrier deck crew for that very reason. And they estimate that the Navy's going to save about $500 million because of their SBIR award. So, it is something that I think we ought to think about how we include that information in the statistics about the program.

Mr. Strawhacker, I think you talked about working together with neighboring states on the FAST program. Do you think more funding for FAST would help with those partnerships and or how can we encourage that kind of collaboration?

Mr. STRAWHACKER. Well, I do think that that type of collaboration should definitely be looked at being implemented everywhere across the nation. Especially those FAST awardees who exist within an SPDC program. We already have a nationwide network that builds in geographic subgroups, that meet together some annually, some quarterly. I know the Southeast area is very strong in the SPDC network.

Those that have the FAST grant in addition to the SBDC program, have that natural group already there. They just need to tap into bringing the right advisors to the table and having that. The FAST grant plays a complimentary role to the business owners, they are the innovators, it's their technology. They just need us to support them and help them access the correct resources. Thank you, Senator.

Senator SHAHEEN. Thank you. Dr. Mahmud, I know that there has been some discussion about limiting the number of awards that

a business can get through the SBIR program. And I would ask you and others on the panel, if that's something that would be helpful. I know that we have a number of companies in New Hampshire that have been very successful at getting multiple awards, and I would hate to have them be limited in what they could get. So, I don't know, maybe you could speak to that and others could speak to it if you have a view on that issue.

Dr. MAHMUD. Sure, thank you, Senator, for the question. I think one of the most powerful foundations of the SBIR program, it was set up very wisely, that the agencies have a tremendous amount of flexibility to adapt the program to their mission needs. So, they have the flexibility to decide on limiting the number of applicants. They have the flexibility to decide on how many open topics, they have tremendous flexibility to adjust to what they need.

So, you know, from our view, we support the mission of the agencies. And if we are allowed to, if we see a problem, we'll put in our idea. And if it is a good idea or the best idea, it is often recognized. And if it's not, its not. We think the tent is wide and we have a shrinking defense industrial base. We have no opportunity to take out good ideas. We are not going to win if we take out good ideas. So, there's no reason to cap good ideas.

Senator SHAHEEN. Thank you. I'm out of time, Madam Chair, but I don't know if anybody else would want to speak to that?

Mr. CARR. I would just add, so I'm a large proponent of putting some type of cap in, especially for Phase I and Phase II. And the specific reason for it, is we're talking about small businesses here, we're not talking about primes. If you're a small business, I can't chase 20, 30, 50, a hundred different technologies with different market applications and different things. I can't raise money for it. These guys would never give me money. Because the reality is, I've got to be super focused as an entrepreneur, to be able to scale that capability into an actual product and then naturally into a company.

So, if we have companies that have hundreds of different products and technologies, what are they working on? And in fact, I would argue that they're absolutely getting disincentivized to be able to take that one particular technology that we say.

Senator SHAHEEN. And do we have any that fit in that category? Is there information that shows that we have multiple companies that fit into that category?

Mr. CARR. I would argue that SBIR Mills would be the way to do it.

Senator SHAHEEN. And do you also feel that way if it's done not simultaneously, but serially, so the company gets an award, is successful, then applies again, and gets another award and is successful or not, applies again. Are you concerned about that aspect of it as well?

Mr. CARR. I mean, for us we actually—because of the dual use aspect of the SBIR program going into, we actually diversified into construction cranes and now stabilize loads on suspended cranes. But it's tangential technology specific to what we are building. What I would argue there is that if it continues to be linear and you go from one technology to the next, are you really exiting the business or are you just continuing to basically create kind of a

new product at the bequest of the U.S. government, i.e., the SBIR program, but never taking that to the final step, which is, Hey, you're my customer. How do I get this to you? And how do I get it to you as fast as I can? But not just you, but the whole market as a whole.

Senator SHAHEEN. Thank you. Thank you, Madam Chair.

CHAIR. Thank you. And Senator Budd, you are recognized for five minutes.

Senator BUDD. Thank the Chair and thank you all for being here today. Mr. Rothzeid, every day I hear from small businesses in North Carolina particularly small businesses with innovative solutions to real problems facing our war fighters who discuss challenges to working with the DOD. We hear it all the time.

So, the PPBE reform report, or the commission on Planning, Programming, Budgeting and Execution, I'm sure you're familiar with it, highlights the barriers to new and emerging defense companies in working with the DOD. Specifically, PPBE commission finds that "A challenge SBIR faces, is that promising Phase II projects are not deployed as often as would be preferred by the DOD." So, what do you see as the principal barriers to Phase II projects deploying further within DOD?

Mr. ROTHZEID. Thank you, Senator Budd. And I would just recognize that the managing partner of Shield Capital Raj Shah, was one of the commissioners on the PPB and E.

Senator BUDD. You might have a little insight then.

Mr. ROTHZEID. So as far as you know, the transition rates which I highlighted in my testimony being about 18 percent, moving from Phase II to Phase III, is a low number. And I'm not here to argue that it needs to be a hundred percent right. We're talking about seed innovation; we're trying out ideas. The war fighters can provide feedback. If it's not meeting a need or if it's not a scalable need, then there's no need to continue it forward.

But I think one of the areas that really hampers the Department of Defense is, while you can win an SBIR in the year of execution, so within this current fiscal year, the planning programming and budgeting, and execution is inherently a two year long process. So, there's no gap year to be able to fill that need, so that what the war fighter likes and sees and wants to scale, they now have to sort of sit on their hands and wait for the PPB and E to now catch up for the ensuing fiscal year, often two fiscal years ahead.

And that can be a really big challenge for a company that is trying to sell a product that is very specific to the war fighter. Now, in a lot of cases in the companies that we invest in, they're dual use tech. So yes, we want them to sell to the Department of Defense National Security, we also want them to be selling to the commercial environment. That sort of leverage provides them an opportunity to stay afloat while the PPBE cycle catches up.

However, why should our war fighters have to wait for a solution that they need today? Right? We're working for a readiness that allows us to be prepared tomorrow.

Senator BUDD. So, in simple terms, what's the fix there? Other than just getting cash flow, I imagine from the commercial applications.

Mr. ROTHZEID. Absolutely. And so, one thing that the Department of the Air Force came up with in March of 2020 was the STRATFI/TACFI program. And it allows them to leverage additional SBIR funding up to 15 million with just SBIR funding, to carry forward on promising technology that has matching funds. In that so far as the DOD has non SBIR funding allocated to them, and they've also erased third party venture capital.

Senator BUDD. Okay. So, you mentioned that 18 percent kind of make that gap over to Phase II, right?

Mr. ROTHZEID. From Phase II to Phase III.

Senator BUDD. Phase II to Phase III. So, 82 percent don't. So, with this new system, if you will, in place that you just mentioned, what does that number go to? It goes from 18 percent to—what would you estimate it to be?

Mr. ROTHZEID. Well, with the reality of an opportunity cost, where now more of that funding that would've gone to fund more Phase I, more Phase IIs being put into this other bucket of STRATFI or a bridge if you will, you're probably going to see a shrinkage of the amount of total number of SBIR Phase I, Phase IIs, a larger number of opportunities to transition to Phase III. I would expect it to go more to the 35 percent, ideally doubling.

Senator BUDD. And you're saying in that 82 percent, which would diminish in this scenario, the 82 percent fails. There's a lot of good useful things. It doesn't, need to be a hundred percent that passes, but the 82 percent that fails, there's a lot of useful things in there for our war fighters that are unnecessarily failing.

Mr. ROTHZEID. Unfortunately, that is the case.

Senator BUDD. Okay. The PBBE Reform Commission also recommended aligning the SBIR program to the DOD overall science and technology strategy by ensuring that the programming and budgeting process includes specific analysis of SBIR and STTR projects as budget requests are being developed. So, can you speak to your views on that recommendation?

Mr. ROTHZEID. I'm sorry, sir, I wasn't quite following.

Senator BUDD. So, I think there's the question of, they want to align the PBBE Reform Commission, they want to align it with the DoDs overall science and technology strategy. And they want the budgeting process to include specific analysis of SBIR and STTR projects as the budget requests are being developed. So, do you have any thoughts on that?

Mr. ROTHZEID. I would just say that 11 of the 14 critical technology areas as identified by the Department of Defense, 11 of them are commercially developed. We need to align our S&T strategy with where the emerging market trends in the commercial sector are occurring, and make sure we are providing healthy amount of financing in those areas for DOD programs.

Senator BUDD. That's very helpful. Thank you all.

CHAIR. Thank you, Senator Budd. I'll go ahead and start, if you'd like a second round.

Senator MARKEY. If I may, if you don't mind.

CHAIR. I'll go ahead and—if you want to go ahead, I'll close up after you. Absolutely, Ranking Member, go ahead.

Senator MARKEY. No, I thank you so much. Two weeks ago, the House Small Business Committee held a hearing on SBIR and

STTR where Chairman Williams in the house, talked about the importance of preserving merit-based competition in the program. He said, innovators thrive in an environment where competition reigns supreme, where they are free from the limitations or caps on their success. And I agree with that. We should prioritize merit without adding extra layers of bureaucracy.

So, Dr. Mahmud, through Triton Systems we have seen great success in meeting the increased commercialization benchmarks for experienced small businesses. And I understand that the company did not meet the increased transition benchmarks leading to a limit on the number of Phase I and direct to Phase II awards Triton can receive. How have these caps impacted your company's strategy in determining what you would be proposing in the future?

Dr. MAHMUD. Thank you, Senator, for the question. I think we can all agree that the commercialization benchmark, this is what everybody's talked about, is very important. Everything needs to have a purpose. Everything needs to—we need to maximize commercialization. That's how all companies should be measured, at least in my opinion. The Phase I to Phase II conversion metric does not have a commercialization meaning, you know.

For example, we just talked about bringing in more companies, giving out a lot of Phase I awards. Air Force did that, by the way. They gave out a lot of small Phase I awards, and then maybe they had one or two Phase IIs in mind. I don't know.

Senator MARKEY. Maybe they had one or two?

Dr. MAHMUD. Phase II's in mind. Because they want to see what's out there. So, this is the idea, is to make small investments and capture the best idea. So, I certainly don't feel that the Phase I to Phase II conversion metric carries any commercialization meaning.

Having said that, the Phase II awards as was discussed here, it was just discussed in a number of questions. Oftentimes the small business has no control, the need may have gone away. The customer no longer needs it, or the agency no longer needs it, or there's no funding. Or they will award many, many Phase Is and determine one Phase II. So, what we have done based on these new benchmarks is really become extremely risk averse and we only focus now on Phase Is where we totally understand how to transition this, you know, what is the best endpoint——

Senator MARKEY. So, you just look now at surefire commercialization?

Dr. MAHMUD. That's right. We do not take high risk.

Senator MARKEY. You don't focus as much on the breakthrough technology that can be transformative because it's not a surefire commercialization yet. We need to be taking the risk to find the breakthrough because, in China, they're throwing tens of hundreds of billions of dollars at the breakthroughs.

Dr. MAHMUD. Correct. We do not pursue high risk opportunities even if we have a good idea because we are not sure what the outcome is.

Senator MARKEY. Which is very, very helpful. And can you explain the process of transitioning from proof of concept, or a Phase I award, to a Phase II award and how rigorous that process can be even for the most innovative technologies? Dr. Mahmud.

Dr. MAHMUD. Would you like me to explain the process, or excuse me, I didn't catch the question?

Senator MARKEY. The question is, can you explain the process for transitioning from a proof of concept or a Phase I award to a Phase II award? How rigorous is that process?

Dr. MAHMUD. I'd be delighted to. So, you know, the, the philosophy of the SBIR program is to invest low in the Phase I's and then to see which of these proof of concepts is demonstrated. That's the process. But agencies have very different practices, as I just mentioned. Some may have a path to a Phase II, some may have no funds for a Phase II, this happens quite a bit. So, the agency itself may not have a plan on moving it forward, and oftentimes the need goes away.

So, the process for a general small business is understand, you know, if you can show the concept in the Phase I, then compete to demonstrate you have the best solution for the Phase II. And you know, that's the process. But as I said, because the agency practices are very different and the situations are different, the Phase II may become irrelevant, and then the small business has no control.

Senator MARKEY. No, and I thank you for that. And I thank all the witnesses. I thank you, Madam Chair. And I can just finish up, if I may, just by saying that we've heard the word "Mills" thrown around today disparaging some of the most innovative and dedicated small businesses.

Massachusetts is proud of its mill culture. Our economy was built off of the textile mills during the Industrial Revolution. The only reason Thomas Markey left Ireland to go to Dover, New Hampshire was the mills were in Dover, New Hampshire, where Senator Shaheen's husband was being raised. So that's the only reason I'm here—is those mills.

And today the Senate Republicans, they're trying to paint a picture that innovative, ambitious, and productive small businesses or "mills," as they like to call them, are bad. These mills that they want to end, they're small businesses that delve into novel ideas and bring them to reality. They are small businesses that develop cancer therapy technology and the world's smallest heart pump. Small businesses that save hundreds of millions of dollars for the federal government and have a huge return on investments, small businesses that advance the national security interest of our country.

If being a mill means being an efficient and effective small business innovator, then I don't think that's a bad thing. And Massachusetts and many other states are hubs of innovation, and that's why we produce such tremendous technology. And we don't have big businesses that much in Massachusetts that drive our economy, we have small businesses that come up with good ideas that serve our nation and save lives, especially in this defense sector. Okay, this is where we specialize.

Department of Energy is high on the list as well, but 80 percent as we know of the Department of Energy budget is just nuclear weapons, nuclear management. Right? You need the smartest people thinking about that, NASA all the way down the line. Those are the agencies that are asking for these technologies to be in-

vested in, okay? And it's to keep us ahead of our geopolitical rivals in the rest of the world. It's using our brain power, and we just have to ensure that these small businesses are able to freely compete for government funding and are not penalized for their excellence. If someday they want to sell to a big company, Raytheon or Lockheed, that's their right.

But the innovation's going to come for our defense and for many other areas, from these smaller companies, and that has to be the primary thing. Is it going to likely produce that breakthrough or not? And does the Defense Department want to take a risk over here with some breakthrough technologies that may or may not get the result they're looking for in the first or second round? Okay.

That's the decision I think we have to make as a country. And I thank you, Madam Chair, for this very valuable hearing.

CHAIR. Thank you. I do have just a couple of additional questions and we'll demonstrate why we think there is a need for reform. And so, Dr. Mahmud, again, thank you for being here. And please answer yes or no for this question. Are you aware of any ties between your leadership team, personnel, or spinoff companies with foreign countries of concern?

Dr. MAHMUD. May I answer the question?

CHAIR. Yes.

Dr. MAHMUD. So, we are a cleared facility. We are audited by the Defense Counterintelligence and Security Agency (DCSA). We work closely with DCSA on vetting out any kind of foreign intrusion into the company. As I had just mentioned, when our spinoffs go out in the venture capital market, you know, we have no control of them. The spinoffs, you know, they will go and raise money in the venture capital market. We have no say on that.

We have taken in consultation with DCSA incredible safeguards to isolate our technologies and our personnel from everyone, including the board and the management of our company. We have worked very closely with DCSA to do that because of this exact concern that spinoffs, we have no control over what they do.

CHAIR. So, you are aware though, that there have been ties to countries of concern?

Dr. MAHMUD. I've read in the press. I am not personally aware, but I've read in the press that, you know, one of the spinoffs, has made—raised money globally. So, there is concern about that, and we cut off all ties with those spinoffs a long time ago.

CHAIR. Okay. And just so for the record, Triton has received 902 SBIR/STTR awards, accounting for more than $350 million. And that is really hard for me to explain to Iowans how someone who has received over $300 million can still be considered a small business. So that's really difficult for me to explain in the Heartland.

So, I do want to enter into the record open-source data that I found on ties between Triton CEO and joint ventures with Triton spinoff companies. You did state that you can't control those companies, but they are ties between your spinoff companies and companies in China, and without objections, so ordered.

CHAIR. So again, what we found in 2020, was that Tritons current CEO then was appointed to serve on the board of CITIC Capital Acquisition Corporation, which is a Chinese financial service sponsored by a state-owned financial conglomerate in China. Fur-

ther, FRX polymer, a spinoff again of Triton, received $22 million from CITIC and pursued a joint venture with a Chinese company in 2019. Tritons biotech division also merged to become Chinook Therapeutics, which in 2021 pursued a joint venture with Pivotal bioVentures China.

Triton, CEO was the chairman of FRX until last month, and was a board member of Chinook Therapeutics. I would like to enter into the record open-source data on these ties with China, and without objection, so ordered.

CHAIR. I also want to point out the SBIR due diligence disclosures require Triton to disclose joint ventures and foreign investment. Spinning these companies off to do joint ventures and taking Chinese investment appears to be a loophole, and this track record should be accounted for when Triton applies for SBIR awards.

Triton does not seem to care who they are selling taxpayer funded research to. This is a national security risk and why I've proposed strengthening the due diligence evaluation standards, to make sure agencies are catching all of this open-source analysis and making prudent judgment calls on who they award repeat contracts to.

So, again, the SBIR mills, I understand that while there may be opportunity out there for these small businesses, I'm going to set the record straight with this. Success is not measured in the number of SBIR awards a company wins, but rather the commercial and mission impact made by leveraging SBIR dollars. I think a number of you stated that. We should not reward firms that game the system and use SBIR known by many as America's Seed Fund, as their primary revenue source, yet have fewer sales, fewer investments, and fewer patents as GAO reports.

SBIR mills push out innovators in the heartland states like mine of Iowa, and like Senator Jackie Rosen's in Nevada. I have a hard time justifying again to Iowans that companies that can take hundreds of millions of dollars of SBIR grants can still pass as a small business. So those concerns outline exactly why I am pursuing changes to the SBIR/STTR program. I do hope that we will have a bipartisan bill that we will be able to move forward. We have been joined by Senator Young. Senator Young, do you have questions before we close today's hearing?

Senator YOUNG. Well, I do Chairman. Thank you so much, Chair Ernst, I thank the Ranking Member for holding this important hearing. Thank all of our witnesses for being here.

As Congress continues to consider reauthorizing this important SBIR/STTR program, I think it's critical that we take this opportunity to review the framework, look for ways in which we can improve it. Relatedly, over the last year or so, I've had the privilege of chairing a commission, the National Security Commission on Emerging Biotechnology.

And one of the topics that will be included in our report to Congress, is how China is outspending and out strategizing the United States when it comes to critical technology investment, and development of those technologies, especially in the area of biotechnology. And, and so I asked Mr. Rothzeid, how can the federal government better ensure that funds of this program are trans-

lating into material technology innovation, especially in the areas that require sustained capital to scale?

Mr. ROTHZEID. Thank you, Senator Young. In my mind, the only way that the U.S. can compete with China when it comes to technology is by leveraging its greatest asset, and that's the private capital marketplace, the envy of the world, because it attracts entrepreneurs both here in the United States and abroad to want to come build here.

The days of the government being able to foot the bill with its R&D budget are long gone past, but the systems and the programs and the structures that we've put in place, were predicated on that paradigm. Just going back to 1960, 24 percent of all the world's R&D expenditure were happening in government labs, today, it's less than 1 percent.

So, if we're going to compete, we have to get smarter about how we're leveraging taxpayer dollars and leveraging third party capital providers, to build technology companies of consequence. Thank you, sir.

Senator YOUNG. Well, thank you. Your points of emphasis are well received, especially in light of the fact that I've been working with, I think every member of this committee, on something outside of the jurisdiction of this committee, but it's to preserve research and development deductions through the tax code for our small businesses and frankly, for emerging high growth potential businesses pre profitability, to offer them an R&D tax credit to incentivize their early-stage R&D and then hopefully growth as a company. Mr. Rothzeid, to continue, do you have additional thoughts on how the SBIR/STTR program can better support American tech innovation and biotech and other critical sectors?

Mr. ROTHZEID. Yes. Senator Young, I think what Chair Ernst has proposed with creating bridge programs within the SBIR program to provide larger pots of funding for technology of consequence as signaled by the federal agencies, similar to what the Air Force and Space Force have done with STRATFI and the Army with Catalyst, these are the types of signals that help ensure that the investors can then understand what's really important to the federal agencies, provide additional capital to those companies so that they can hire the right amount of people, invest in cutting edge equipment, and continue to scale and grow.

Because if we're not building companies that want to scale and grow, then they won't be able to meet the needs of national security and outfitting thousands of soldier sailors, marines, airmen, and guardians.

Senator YOUNG. Thank you for that. I have about a minute left and would just like to briefly explore with you, Mr. Rothzeid, something related to DODs integration of open topic solicitations. My office has been impressed with these and their importance. These allow small businesses to propose solutions, to more broadly define problems. As we think about ways to support small businesses that are working on innovative technologies, it seems like expanding what departments and agencies can solicit open topic proposals for, might make some sense. Can you offer any reflections on this topic?

Mr. ROTHZEID. Senator, I believe that the open topic is the reason why this convening is happening today, getting interest from

venture capitalists like myself and startup founders, like Mr. Carr. It's because innovators are building solutions that the department hasn't even imagined.

If we leave it to the whims of the department, they'll come up with very bespoke requirements around the things that they've already thought of. But that's a very small pool of people. Instead, we need to open it up to open topics. What are the solutions to the problems I didn't even know I had, and let the entrepreneurial class of America go to work.

Senator YOUNG. In light of the fact that I've already gone over my time. Might I work with you on an ongoing basis to explore ways to expand the scenarios and situations with which open topic proposals can be utilized and related topics?

Mr. ROTHZEID. Senator Young, absolutely.

Senator YOUNG. All right, great. Thank you, Chair.

CHAIR. Thank you. Are there any additional questions? Okay. And with no further questions, I want to thank the witnesses for being here today. I ask unanimous consent that the record of today's hearing remain open for two weeks for members to submit questions, revise, and extend their remarks, and submit additional information into the record.

CHAIR. Without objection, so ordered. And with that, the Committee on Small Business and Entrepreneurship stands adjourned.

[Whereupon, at 4:11 p.m., the hearing was adjourned.]

March 7, 2025

The Honorable Joni Ernst
Chair, Senate Small Business Committee
U.S. Senate
Washington, DC 20510

The Honorable Ed Markey
Ranking Member, Senate Small Business Committee
U.S. Senate
Washington, D.C. 20510

The Honorable Roger Williams
Chairman, House Small Business Committee
U.S. House of Representatives
Washington, DC 20515

The Honorable Nydia Velazquez
Ranking Member, House Small Business Committee
Washington, D.C. 20515

The Honorable Brian Babin
Chairman, House Committee on Science Space & Technology
U.S. House of Representatives
Washington, DC 20515

The Honorable Zoe Lofgren
Ranking Member, House Committee on Science Space & Technology
Washington, D.C. 20515

Subject: Strong Endorsement of the INNOVATE Act

Dear Chairs Ernst, Williams, Babin, and Ranking Members Markey, Velazquez, Lofgren:

The Alliance for Commercial Technology in Government is delighted to provide our enthusiastic endorsement of, and support for the INNOVATE Act, released March 5th by the Senate Small Business Committee. The Small Business Innovation Research (SBIR) program, known as America's Seed Fund, is a highly effective research program with commercialization of government funded research by small business its main goal. It should be reauthorized with much-needed reforms included in INNOVATE.

For more than 40 years, SBIR has provided seed capital to some of our nation's greatest companies, including Anduril, Aerovironment, AMGEN, Boom Technologies, Broadcom, Ginkgo Bioworks, GoTenna, IRobot, JDS Uniphase, Millennium Pharmaceuticals, Qualcomm, Symantec and ViaSat. Our members leverage SBIR awards, often combined with private capital, to commercialize state-of-the-art defense and dual-use capabilities and get them into the hands of our warfighters, keeping us ahead of our adversaries while providing our nation a return on investment many times over. These successes generate economic growth and tax revenue, build America's technology infrastructure, and train the next generation of innovators.

In our recommendation letter of October 3, 2024, we suggested several improvements to the program that would fix long-standing barriers to commercialization and broaden the appeal of the program to the commercial innovation ecosystem, a community that historically has avoided the defense market, but one that our national defense can no longer do without. 95%+ of global research now occurs outside of the defense industry, making it imperative for DoD to join forces with and leverage commercial investment. We are delighted to see so many of our suggestions appear in the INNOVATE Act.

Specific things we love about the INNOVATE Act:

1) **Strategic Breakthrough awards**: effectively a formalized Phase III transition program, modeled after the highly successful Air Force STRATFI program, funded with an additional 0.25% permanent budget, and requiring both matching external funding and an end-user customer. $60M max contract awards to be used exclusively for manufacturing scaleup, inventory, production, and delivery.
2) **Clever 1A program**: only open to first-time applicants with a very lightweight 2-page proposal format will entice first time entrants into the program, debunking the perception that the program is rigged for insiders.
3) **90 day "Shot Clock" for award notification and contract award:** putting some certainty/timeliness into the process.
4) **Clear, consistent standards in Foreign Malign Influence Assurance.**
5) **Firm Fixed Price as a default purchasing method for both Phase I and II:** begins to align SBIR to commercial business practices.
6) **Legitimate curbs on SBIR Mills:** $75M lifetime cap on SBIR awards per company, 1:1 minimum revenue threshold for external revenue to SBIR awards after 25 Phase IIs, below $40M annual revenue size standard, limits on number of proposals submittable per company and per agency
7) **Clear definition of Open Topic:** Fixes problem of agencies merely slapping the word "open" on their otherwise conventional topics

These long-overdue reforms go a long way towards eliminating the Valley of Death, neutralizing the perceived and justified reputation of the program being rigged for incumbents, confirming the program is a seed funding program to help startups get into a product business and not a business unto itself, and establishing firm fixed price purchasing as the default buying mechanism to align with commercial business practices enabling companies to have a single business model for both markets. We stand ready to assist with passage of this groundbreaking legislation.

Thank you so much for your service in the 119th Congress.

Sincerely,

Warren Katz
Chairman
The Alliance for Commercial Technology in Government

cc: House Appropriations Subcommittee on Defense
House Select Committee on the Chinese Communist Party
House Oversight and Accountability Committee
Senate Appropriations Subcommittee on Defense
Senate Committee on Homeland Security and Governmental Affairs

IOWA ECONOMIC DEVELOPMENT AUTHORITY
1963 Bell Avenue, Suite 200 | Des Moines, Iowa 50315 USA | Phone: 515.348.6200
iowaeda.com

IOWA Economic Development

March 5, 2025

The Honorable Joni Ernst
Chair, Senate Committee on Small Business and Entrepreneurship
United States Senate
260 Russell Senate Office Building
Washington, D.C. 20510

The Honorable Ed Markey
Ranking Member, Senate Committee on Small Business and Entrepreneurship
United States Senate
255 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Chair Ernst and Ranking Member Markey,

I'm writing in support of your proposal to reform and reauthorize the Small Business Innovation Research and Small Business Technology Transfer (SBIR-STTR) programs as part of the INNOVATE Act. Expanding the reach of these programs to more innovators across the country is critical to our nation's competitiveness and to Iowa's economic growth.

Over time, Iowa has worked to lay the groundwork for a vibrant economy by investing in industries that are ripe for growth here – specifically, the biosciences, manufacturing, insurance and financial services. Our state rewards innovation because it's the common thread that enables these key industry sectors to continue to scale wealth. As a result, Iowa has nurtured an entrepreneur ecosystem that is thriving. The SBIR-STTR programs play a critical role in Iowa's efforts by supporting entrepreneurs who build emerging technologies. We're proud that Iowa received 97 awards worth $55.8 million in the four-year period that ended June 30, 2023, and our current success rate of 26% is double the national average.

However, the SBIR-STTR programs aren't realizing their full potential in helping companies nationwide compete for funding. Many smaller companies and rural startups that would benefit most from the programs lack the resources or expertise to navigate the SBIR-STTR solicitation process. As a result, most awards benefit companies in coastal metropolitan areas.

I appreciate that the INNOVATE Act makes fundamental changes to encourage more participation, including appropriate standards for the size of participating companies and Phase II awards for entrepreneurs transitioning into the workforce from academia. Also, the proposal to create Phase 1A awards with a shorter, streamlined application will attract thousands of new small business owners and entrepreneurs, both urban and rural, who may have been discouraged previously by bureaucratic red tape.

I love to think of the potential for our Iowa entrepreneurs who are building innovative ideas in their garages, machine shops or labs. Thank you for your efforts, consideration and continued support of Iowa.

Sincerely,

Debi Durham
Director

MASSBIO

700 Technology Square, 5th Floor
Cambridge, MA 02139
617.674.5100 | massbio.org

March 5, 2025

The Honorable Joni Ernst
Chair, Senate Committee on Small Business and Entrepreneurship
United States Senate
Washington, DC 20510

The Honorable Ed Markey
Ranking Member, Senate Committee on Small Business and Entrepreneurship
United States Senate
Washington, DC 20510

RE: Massachusetts Biotechnology Council (MassBio) Testimony to the Senate Committee on Small Business and Entrepreneurship: "Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century"

Dear Chair Ernst and Ranking Member Markey:

On behalf of the Massachusetts Biotechnology Council (MassBio) and our more than 1,700 member companies, I write to express our strong support for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. These programs are essential to fostering early-stage biotechnology innovation. Reauthorization of the program is essential in ensuring that startups to develop groundbreaking therapies, medical devices, and technologies that improve patient outcomes and strengthen U.S. global leadership in life sciences. We applaud the work by you and the Committee in identifying opportunities to modernize and improve SBIR and STTR programs for the 21st century, and we urge you to prioritize reforms that enhance program accessibility, efficiency, and effectiveness for biotech entrepreneurs.

The biotechnology sector is uniquely capital-intensive, requiring more than a decade of research, clinical trials, and regulatory approvals before products reach patients. Unlike many other industries, early-stage biotech companies often struggle to secure private investment due to the high-risk nature of their research. The SBIR and STTR programs provide critical non-dilutive funding that enables these startups to pursue transformative scientific discoveries that might not otherwise attract early-stage capital.

Consider, for example, Alzheimer's disease. Alzheimer's is a progressive neurological disorder that affects memory, thinking, and behavior and greatly impacts quality of life. Recent estimates suggest that more than 6.9 million Americans – about 1 in every 9 over the age of 65 – have Alzheimer's disease.[1] These numbers expected to grow over the coming decades. Fortunately, Massachusetts-based companies are on the frontlines in the development of treatments to slow,

[1] Alzheimer's Association 2024 Facts and Figures; https://www.alz.org/getmedia/76e51bb6-c003-4d84-8019-e0779d8c4e8d/alzheimers-facts-and-figures.pdf

reduce impacts, and possibly even cure Alzheimer's disease – and the SBIR program is helping make that possible. Since 2020 alone, more than 30 Massachusetts-based companies have received SBIR grants to diagnose, prevent, or treat Alzheimer's.[2]
These grants have supported a diverse range of projects, from the development of novel therapeutics targeting the mechanisms responsible for the development of Alzheimer's, to advanced diagnostic tools leveraging MRI technology, machine learning, and blood-based biomarkers. The grants have also enabled the creation of cutting-edge assistive technologies, such as autonomous robots for fall detection and digital therapeutics aimed at reducing Alzheimer's risk. Additionally, funding for projects focusing on early identification of at-risk individuals, cognitive frailty monitoring, and brain imaging advancements are helping contribute to a more comprehensive approach to tackling Alzheimer's disease. By fostering groundbreaking research across multiple disciplines, SBIR funding is empowering small businesses to drive meaningful progress in understanding and combating this devastating condition.

MassBio recognizes the vital role that SBIR and STTR play in supporting early-stage biotech companies and driving scientific innovation toward treating diseases like Alzheimer's. Understanding the importance of these programs to our members, we recently conducted a survey to assess their impact and identify opportunities for improvement of the program. The survey, conducted in late 2024, gathered insights from companies at the forefront of scientific discovery. The majority of respondents were from companies less than 10 years old and with fewer than 25 employees. Their responses reinforced the significance of SBIR/STTR funding in enabling groundbreaking research and the critical importance in ensuring the programs are reauthorized in a timely fashion. However, in response to questions asking how the SBIR/STTR programs could be improved, several common themes emerged among opportunities for reform:

Streamlining the Application and Award Process:

Respondents highlighted that the lengthy and complex application process presents a significant challenge, often making it difficult to plan for funding. The National Academies 2022 assessment of SBIR and STTR programs at NIH similarly found that the review timeline is out of alignment with the needs of innovative small businesses.[3] We strongly support recommendations to streamline the process and ensure award decisions are communicated within 90 days of the application deadline.

Reducing Administrative Burden:

Respondents reported that navigating post-award compliance processes is cumbersome and nearly necessitates a full-time administrator. These concerns align with the findings of the SBA

---

[2] SBIR Award Data; https://legacy.www.sbir.gov/sbirsearch/award/all/alzheimer%27s?f%5B0%5D=im_field_state%3A105829&f%5B1%5D=itm_field_award_yr%3A2022&f%5B2%5D=itm_field_award_yr%3A2023&f%5B3%5D=itm_field_award_yr%3A2021&f%5B4%5D=itm_field_award_yr%3A2020&f%5B5%5D=im_field_program%3A105791

[3] National Academies, Assessment of the SBIR and STTR Programs at the National Institutes of Health (2022); https://nap.nationalacademies.org/catalog/26376/assessment-of-the-sbir-and-sttr-programs-at-the-national-institutes-of-health

Invention, Innovation, and Entrepreneurship Advisory Committee's (IIEAC) 2024 report.[4] The IIEAC recommended reducing administrative burdens by streamlining program forms and reporting requirements. We support IIEAC's recommendation and encourage the Committee to explore ways to simplify these processes to better support small businesses.

Addressing the Impact of R&D Tax Amortization:

The mandatory amortization of R&D expenses, implemented in 2022, has placed an undue financial burden on pre-revenue biotech companies receiving SBIR funding. This policy disproportionately affects small businesses in our industry, undermining the very innovation that SBIR is designed to support. MassBio, along with other state biosciences associations, continues to advocate for the restoration of full R&D expensing to ensure that small biotech firms can continue driving scientific breakthroughs without facing unintended financial hardship.[5]

Finally, we recognize that the long-term success of the SBIR program requires efforts to improve the programs structure for companies as well as thoughtful improvements to better align funding with the program's core mission – supporting small businesses in developing innovative technologies that lead to commercialization. We understand concerns that SBIR award data indicates that across some agencies a portion of funding may be concentrated among a small group of companies who receive awards for years without demonstrating meaningful commercialization outcomes. From our experience, MassBio believes SBIR has served as an investment in emerging biotechnologies, rather than a perpetual funding source. Establishing clear expectations for progress toward commercial viability will help to ensure that SBIR funding continues to fuel innovation, drive economic growth, and support the development of cutting-edge solutions that meet the needs of both government and private sector markets.

We urge you to pursue timely reauthorization of the SBIR and STTR programs so biotechs in Massachusetts and across the country can continue to develop new innovations to treat patients. Additionally, we hope the Committee considers solutions to streamline the award process, reduce administrative burdens, and enhance effectiveness of the award dollars to ensure the programs remain a powerful tool for advancing scientific discovery, job creation, and global competitiveness in biotechnology.

MassBio appreciates your leadership and commitment to fostering innovation through the SBIR and STTR programs. We welcome the opportunity to further discuss the program's critical role in the biotech sector and how reforms can maximize its impact for the next generation of entrepreneurs.

---

[4] SBA Invention, Innovation, and Entrepreneurship Advisory Committee (IIEAC), Enhancing U.S. Economic Competitiveness Through Support for Small Businesses and Innovators FY2024 Report; https://www.sba.gov/sites/default/files/2025-02/Invention%2C%20Innovation%2C%20and%20Entrepreneurship%20Advisory%20Committee%20Report_0.pdf

[5] Council of State Biosciences Associations Letter to House & Senate Leadership (March 2023); https://www.massbio.org/wp-content/uploads/2023/11/CSBA-Tax-Amortization-Impact-March-2023-3.28.23.pdf

Sincerely,

Kendalle Burlin O'Connell
President and CEO
Massachusetts Biotechnology Association (MassBio)

Massachusetts Medical Device Industry Council
P.O. Box 177
Brookline, MA 02446

March 5, 2025

The Honorable Joni Ernst, Chair
The Honorable Ed Markey, Ranking Member
Committee on Small Business and Entrepreneurship
428A Russell Senate Office Building
United States Senate
Washington, DC 20510

RE: Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century

Dear Chair Ernst and Ranking Member Markey,

On behalf of New England's health technology community, I write to offer my full-throated endorsement of the Small Business Innovation Research (SBIR) program and encourage the Senate Committee on Small Business and Entrepreneurship to permanently reauthorize it before it expires at the end of September.

SBIR grants play a critical role in sustaining medical technology innovation. The program's non-dilutive seed grants provide essential early-stage funding where private investment is difficult and often impossible to attract. The program's impact is tangible. To cite just one recent example, Lumicell, a company based in Newton, Massachusetts, is living proof that SBIR grants catalyze life-changing innovation in medicine. With Phase I and II SBIR grants from the National Institute of Health (NIH) in 2013 and 2014, Lumicell developed LUMISIGHT, a real-time fluorescent imaging platform that allows surgeons to detect and remove cancer cells with more precision, enhancing the standard of care in breast cancer patients. After more than a decade of development, Lumicell secured premarket approval from the Food and Drug Administration (FDA) in April of last year. This milestone, and the significant impact it will have on patient outcomes, was made possible by NIH's early support of the company and its novel solution to a decades-old problem.

Each year, hundreds of our region's companies are awarded SBIR grants and, over the past five years, more than 60 percent of those grants have supported medical device innovation. The program helps weather storms that impact private capital, ensuring transformative medical devices can reach patients regardless of market conditions. Reauthorizing the program is an investment in the future of patient care. I strongly urge the committee not only to permanently reauthorize the SBIR program, but to use this opportunity to expand the program by increasing allocations at the various agencies, reducing administrative complexities, and allow companies to secure these grants based on merit, without limitation.

Thank you for convening this important hearing, "Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century," and for your dedication to the innovation ecosystem that makes America the envy of the world. With the Congress' support, I can confidently promise that New England will continue to churn out advancements that improve patient outcomes.

Sincerely,

Brian Johnson
President

NEW ENGLAND INNOVATION ALLIANCE
20 NEW ENGLAND BUSINESS CENTER, ANDOVER, MA 01810

Testimony for the Record:
"The Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century"
Hearing of the Senate Committee on Small Business and Entrepreneurship
March 5,2025 (Submitted March 18, 2025)

Thank you Chair Ernst, Ranking Member Markey, and Members of the Senate Committee on Small Business and Entrepreneurship for holding this hearing. As Congress and this Committee begin the process of reauthorizing the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, which are set to expire at the end of September, we are pleased to share some insights based on our firsthand experience with these programs that provide enormous benefits to U.S. small businesses and the federal government.

The New England Innovation Alliance (NEIA) is a coalition of small, disruptive innovation businesses located in Massachusetts and New Hampshire. Our states are fortunate to have many excellent universities. Graduates from those universities have diverse skillsets. Multiple small companies have formed in our area to take advantage of that source of brilliant, new-technology innovators. Our NEIA meetings bring leaders of those companies, who are otherwise competitors, together in informal gatherings to discuss topics of mutual interest, concerns, and best practices such as security, hiring, and changing government regulations. This information-sharing benefits each company, provides mentoring for newer, less-experienced businesses, and helps each optimize priorities, practices and investments that provide long term benefit to their company and the U.S. government.

Our local universities, recognized as national and international leaders, provide skilled new scientists and engineers, but to be successful small businesses must focus their innovative ideas on solving the critical needs of customers. NEIA mentorship helps to train businesses to construct a development program that stepwise demonstrates feasibility and viability by using objectives and tasks to set milestone goals throughout the SBIR and STTR Phase I and Phase II programs. This approach results in successful programs that demonstrate a high technology readiness at the end of Phase II and the basis for conversion to Phase III technology demonstrations and transition.

Our companies learn of the customer need/technology application by reading agency Strategic Plans, attending agency Briefings for Industry and SBIR topic briefings, and by speaking with the Topic author during open discussion periods.

NEW ENGLAND INNOVATION ALLIANCE
20 NEW ENGLAND BUSINESS CENTER, ANDOVER, MA 01810

NEIA members are not typically single-technology companies on a linear venture-capital driven trajectory. They focus on innovating technologies that federal agencies, like the U.S. Department of Defense (DoD) and its service branches, need to meet critical mission objectives, for which no other stakeholders are positioned to deliver. These companies then seek to mature multiple, and often complementary, technology platforms across diverse fields.

NEIA member companies employ a range of approaches to bring SBIR-funded technology to the market, employing the best approach to reach commercial and government customers. In many instances, numerous SBIR awards, across multiple agencies, are needed to develop a technology platform. Technology development remains an uncertain process that involves risk-taking; success is accomplished in years, not months.

The SBIR/STTR programs only recently acquired the venture capital motivated slogan "America's Seed Fund." The legislation's founding intent had four objectives:

1. "Stimulate technological innovation,"
2. "**Use small business to meet Federal research and development needs,"**
3. "Increase private sector commercialization of innovations derived from Federal research and development," and
4. "Foster and encourage the participation of socially and economically disadvantaged small business concerns and women-owned small business concerns in technological innovation."

The second goal (with emphasis added) is to develop technology that enables the US government to fulfill its mission to keep America the world leader.

In some cases, commercialization of SBIR-funded technology can actually yield adverse consequences. Many of the products commercialized through SBIR funding are on the open markets, available to adversaries around the world. Our adversaries are then able to reverse engineer the product and manufacture their own version within years. Many companies deemphasize patenting technology to limit that technology transfer. An example of commercial technology transfer from one of our member companies is a standoff optical methane detector for natural gas surveys – making homes safe. Within two years of its release, less-expensive Chinese versions were on the market. These foreign products are cheaper because there is less development cost.

China's 100-year plan is to achieve global hegemony by 2049. They are already near-peers in many technologies. Clearly, certain technologies are needed to maintain a US strategic advantage and not be commercially available. It is not a goal of the SBIR program to enable placing these advanced technologies in the hands of our adversaries.

NEW ENGLAND INNOVATION ALLIANCE
20 NEW ENGLAND BUSINESS CENTER, ANDOVER, MA 01810

SBIR topics are also not exclusively about heroic entrepreneurs building a large new spacecraft, aircraft, or ship. They are much more often about creating significant innovative improvements to component capabilities that maintain the technological dominance of those platforms, or reducing the cost of sustaining those platform. Those markets for commercialization are small, take a long time for innovative technology to be evaluated, certified and adopted. The commercial methane detector mentioned above took three years to get to the market. Military technology can take a decade. And the U.S. government expects the best price, so the profit is low.

As a result, few of these technologies, by themselves, scale into a large commercial enterprise. In most cases SBIR funding is used to initially develop and then de-risk the technology to a level of maturity suitable for commercial adoption or insertion into a much larger and higher value military or homeland security platform.

NEIA member companies function as bridges from university concepts, then under SBIR and STTR funding reduce-to-practice and demonstrate the technology. Our companies then provide the important further bridge to prime contractors in aerospace or industrial partners in the commercial world. Our member companies' successes in transitioning technologies across the Valley of Technology Death, is from our focus on transition to the customer from the first proposal creation.

It was suggested in recent Senate testimony that SBIR technology insertion via sales to a prime contractor for platform integration should not be counted as successful commercialization, regardless of the benefit to the taxpayer. That flawed approach devalues an important role played by small businesses and would leave a handful of large and risk-averse defense companies as the exclusive agents of defense modernization.

It was also asserted in Senate testimony that innovative companies with SBIR-funding can, and only should, do one thing well at a time. That they are not capable or concurrently transitioning technologies in multiple fields. This view is a disservice to the thousands of US small companies that do this every day. It is a myopic view of how business operates, skewed by the need for venture funded enterprises to rapidly deliver high returns to their investors.

Transition is a complex and difficult activity and benefits from experience. small businesses seeking to meet these needs or insert their technology to meet problems of significance need to address a broad range of issues:

- Navigating the transition from Technology Development to Product Engineering to Manufacturing,
- Addressing the skills and priorities of multiple organizations including universities, other small businesses, Science and Technology (S&T) funding organizations, prime contractors, and/or government and commercial end users.

NEW ENGLAND INNOVATION ALLIANCE
20 NEW ENGLAND BUSINESS CENTER, ANDOVER, MA 01810

- Developing the certified manufacturing processes, quality systems, information technology, and classified program capabilities necessary to be viewed as a reliable component technology supplier to higher value platforms.
- Investing in a broad range of special facilities, equipment, certifications, and training to address multiple low volume markets that reach full market potential over a decade or longer.

We thank Chair Ernst, and others, for contributing language in the 2022 Reauthorization that increase security oversight to address SBIR technology theft by foreign adversaries. The current Congress appears to be increasing scrutiny of this Chinese threat.

New companies, with staff fresh from universities and with limited funding, do not have the resources to train employees in security procedures and develop information systems well protected against cyber-attacks. They need additional development funds and are thus vulnerable to foreign influence. The Navy study on SBIR technology stolen by foreign entities were almost entirely from very small companies. This is a reality, and a risk factor, that could be exacerbated during the upcoming reauthorization process

Experienced SBIR companies – including many NEIA members – have put in place the procedures and training systems to protect their technology. They have developed processes and certifications to be considered viable suppliers of technology to prime contractors. Our company and others have invested significant capital to create facilities and systems to support our Defense Industrial Base.

It takes time and resources to create this capability. As mentioned above, few of these SBIR developed hardware systems would support the necessary infrastructure for a viable company. Diversified technology companies have many technology platforms sharing resources. And their staff are continually applying their innovative ideas to address the next government need. These innovators include women and minority technologists and owners who are committed to providing solutions to problems of national defense and security even though it is an arduous process - because of its vital importance.

The SBIR program is de facto the only early-stage R&D funding available to small businesses. Agency budgets are tight and devoted to operating and sustaining ongoing programs, leaving no funds for technology upgrades and improvements. Forcing companies such as ours out of the SBIR program eliminates this source of technology investment and ultimately weakens the nation's industrial base.

There have been suggestions that the SBIR and STTR programs should behave as pure venture capital funds, supporting companies on a single-technology linear path to a commercially successful outcome with time-limited funding and a mandate to "graduate" from the program. We strongly disagree. That singular intent of the program was not enshrined in its 1982 creation or subsequent execution. It would not serve the needs of the mission agencies of the US government that provide the largest segment of funding for the program. NEIA opposes any reauthorization proposal that would convert the SBIR

program into “corporate welfare” for established, well-funded, VC-backed companies that will exploit the program for “free” taxpayer money to leverage VC investments.

It is important to understand the different objectives of venture capital and mission agency technology investment. Venture capital invests to obtain the largest possible monetary return, at the highest possible margin, in the shortest time. Mission agencies invest to obtain a capability return, not available commercially and superior to our adversaries, at the lowest possible margin, on timescales consistent with platforms that take over a decade to develop, and often at market sizes that are not attractive for commercial investment.

This contrast, and its consequence, was identified in the 2019 Council on Foreign Relations – Independent Task Force 77 report entitled “Innovation and National Security: Keeping Our Edge.” [1] That task force was co-chaired by Admiral William McRaven, the retired commander of the US Special Forces Command and former Chancellor of the University of Texas system. The report identified a shift in venture capital investment in software vs hardware from a 55%/45% split in 2006 to a 92%/8% split in 2017. Others have noted that this strategy focusses almost 70% of all venture funding into narrow technology ecosystems in three coastal states.

The report offered the following explanations for this disinvestment in hardware: “Companies built around hardware face high risk in terms of technology development and high costs associated with building research facilities, attracting scientific expertise, and manufacturing.” Furthermore: “Given the smaller risks of investing in software, VC firms funnel the vast majority of their investments to software, resulting in a funding gap for hardware.” It noted that “Weapons platforms that involve large numbers of warfighters in the loop, such as airplanes, submarines, and ships, will always demand longer development times, exceptional performance, and steady oversight” and “not everything, of course, can fail fast.”

To improve their own economic success, the venture-only advocates have stated that SBIR funding should only go to technologies that can “scale” to commercial as well as mission agency applications. This approach would severely limit the ability of the program to invest in those specialized capabilities that do not meet this scaling criteria. Furthermore, this approach tends to “commoditize” our capabilities to a level of commercial performance that is more easily copied and hence readily available to our adversaries. The suspicion that the Chinese Large Language Model *DeepSeek* is built on Open AI’s *ChatGPT* is only the latest example of this form of technology transfer.

Arbitrarily limiting the ability of capable small businesses to contribute to future US production capability, based what is effectively a software-centric technology funding doctrine, portends a commodity-equipped US military going up against an industrial peer with four times our population.

NEW ENGLAND INNOVATION ALLIANCE
20 NEW ENGLAND BUSINESS CENTER, ANDOVER, MA 01810

SBIR Reauthorization

A recurrent theme in the hearings surrounding the reauthorization of the SBIR/STTR programs is the difficulty small technology firms experience in bringing innovative technology to the needs of the US government. That difficulty is present whether the firms are experienced businesses like ours or a new entrant into the program. A goal during this program reauthorization should be to reduce barriers to entry and broaden, not restrict, participation in the program. The task of "Reforming SBIR-STTR for the 21st Century" should reinforce several principles:

Merit-based Awards - Congress should maintain the competitive, merit-based fundamentals of the program to ensure the best technology is developed to keep America as the world leader. The GAO review of the program showed that Multiple Award Winners were effective in meeting their 4.5X increase in performance metrics and that there were no "SBIR Mills" crowding out other small businesses by any accepted measure of market concentration. There should be no arbitrary award caps, submission limits, or forced graduation from programs. The ability of most multi-award winners to meet the enhanced participation metrics included in the 2022 legislation that reauthorized SBIR/STTR programs indicates the intent of the program is being exceeded. These metrics have been in place for a much shorter time than the typical commercial (5-7 years) and defense (10-15 years) technology insertion times and should be assessed over these longer time scales rather than yet again moving the bar with this reauthorization.

Application Simplification – The largest barrier to participation in the program for new entrants is the increased administrative burden and complexity of proposal submission. Safeguards to address foreign influence and technology transfer, however necessary, have further increased that barrier. A myriad of proposal formats and solicitations, changes in how proposed program staffing is reported, and the impact on small businesses of recent mid-program changes in the allowability of administrative and facility costs, have made it difficult for even the most sophisticated organizations to participate in the program. Data has shown that per capita proposal submission rates from underserved regions of the country are some of the lowest in the program, reflecting those administrative barriers. With that said, Congress must ensure that any efforts to spur greater participation include appropriate guardrails to ensure FAR or DFAR compliance and mitigate the possibility of rampant fraud and abuse. And perhaps most important, so that new entrants to the SBIR program are not ripe for exploitation by foreign elements.

Improved Communication – Agencies should be required to improve the communication of their needs and opportunities to small businesses across all topic types. Open topics provide a way to make topic managers aware of potential technology solutions, but their lack of specificity can deprive companies of the ability to tailor their proposals to meet specific needs that might improve their potential for award and ultimate technology transition.

NEW ENGLAND INNOVATION ALLIANCE
20 NEW ENGLAND BUSINESS CENTER, ANDOVER, MA 01810

Agency Discretion - Agencies should have discretion to shape the program and define merit consistent with their missions. The GAO recently found that multi-award winners are regularly selected to research and develop technologies that meet specific agency or warfighter needs without wider applications. Multiple Award Winners should not be penalized for those agencies' lower rate of adoption and commercialization potential. The ability of a small business to submit proposals should not be unreasonably restricted to effectively limit competition or to inhibit the federal government's ability to secure the very best technology it wants/needs.

Permanent Authorization – Companies make investments based on an assessment of their ability to grow and recover that investment. The GAO report identified investments in dedicated testing, training, contracting, IT, and business processes as key to receiving awards from the DoD. Commercialization of technologies requires investment in capital equipment and facilities, with long depreciation times, to be viewed as dependable suppliers for our national industrial base. Program permanency reduces the perception that those investments will be stranded at the next reauthorization without limiting the ability of Congress to make further adjustments to the program.

Citation

[1] James Manyika and William H. McRaven, Chairs, Adam Segal, Project Director, "Innovation and National Security: Keeping Our Edge," Report of the Council of Foreign Relations Independent Task Force 77, September 2019 (https://www.cfr.org/report/keeping-our-edge/)

Open Source Investigation into Triton Systems Connections to China

Triton Systems located in Chelmsford, Massachusetts, has several troubling foreign ties to Chinese entities that raise significant concern about whether SBIR awards won by Triton Systems funded Chinese innovation in critical technology areas.

The CEO of Triton Systems, Ross Haghighat, has held connections to a Chinese state-sponsored investment firm. In 2020, Ross Haghighat was appointed to the board of CITIC Capital Acquisition Corp, a special purpose acquisition company (SPAC) sponsored by CITIC Capital Holdings Limited, a branch of the Chinese state-owned CITIC Group.[1] In 2021, the SPAC merged with the tech company Quanergy to go public.[2] In 2022, Quanergy went bankrupt.[3]

Triton Systems has two spinoff companies with concerning ties to China, FRX Polymers and Aduro Biotech. FRX Polymers was spun off from Triton Systems in 2007 and is based in Chelmsford, Massachusetts.[4] FRX Polymer in 2016 received investment CITIC Capital, a Chinese state-owned investment company.[5] In 2019, FRX Polymers started a joint venture with a Chinese company to produce flame retardants.[6] Triton Systems received multiple SBIR awards to produce flame retardants.[7] In 2025, FRX Innovations, the holding company of FRX Polymers based in Vancouver, Canada, sold all its equity interests in FRX Polymer with the new owner being responsible for paying FRX Polymer's $16.5 million of debt.[8] The buyer was the Belgian

---

[1] *CITIC Capital Acquisition Corp. Appoints Ross Haghighat to the Board*, MARKETSCREENER (May 7, 2020), *available at* https://www.marketscreener.com/quote/stock/CITC-CAPI-105997940/news/CITIC-Capital-Acquisition-Corp-Appoints-Ross-Haghighat-to-the-Board-33878787/.

[2] Echo Wang, *Exclusive: Quanergy nears China-backed SPAC deal to go public*, REUTERS, (June 21, 2021), *available at* https://www.reuters.com/technology/exclusive-quanergy-nears-china-backed-spac-deal-go-public-sources-2021-06-21/.

[3] Dan Primack, *Quanergy goes bankrupt, less than a year after going public*, AXIOS, (Dec. 14, 2022), *available at* https://www.axios.com/2022/12/14/quanergy-goes-bankrupt-less-than-a-year-after-going-public.

[4] FRX INNOVATIONS, FRX POLYMERS, INC., *History Our Fast Moving Evolution*, *available at* https://web.archive.org/web/20240213202828/https:/www.frx-innovations.com/history.

[5] Frank Esposito, *$22 million investment to help FRX grow in China*, PLASTICS NEWS, (Sept. 9, 2016), *available at* https://www.plasticsnews.com/article/20160909/NEWS/160909798/22-million-investment-to-help-frx-grow-in-china.

[6] Press Release, FRX INNOVATIONS, *FRX Polymers® and China's Yoo-Point Jointly Develop Water-Based Emulsions Containing Nofia® Non-Halogenated Flame Retardants*, (Apr. 29, 2019), *available at* https://web.archive.org/web/20240524172434/https:/www.frx-innovations.com/news/frx-polymers%C2%AE-and-china%27s-yoo-point-jointly-develop-water-based-emulsions-containing-nofia%C2%AE-non-halogenated-flame-retardants.

[7] NOVEL LOW COST FIRE RESISTANT COMPOSITE FOR VARTM, *SBIR.gov Portfolio Award Data, available at* https://www.sbir.gov/awards/119181; SBA, SBIR.GOV PORTFOLIO AWARD DATA, *High Temperature Multifunctional Foam Core Materials, available at* https://www.sbir.gov/awards/119178; ; SBA, SBIR.GOV PORTFOLIO AWARD DATA *Enabling Hull Structural Innovations for High Speed Lighters, available at* https://www.sbir.gov/awards/119309.

[8] Press Release, NEWMEDIAWIRE, *FRX Innovations Announces Closing of the Sale of Its Operating Subsidiary FRX Polymers, Inc. Amid Strategic Restructuring and Move to the NEX Board of the TSXV*, (Jan. 24, 2025), *available at* https://finance.yahoo.com/news/frx-innovations-announces-closing-sale-052346916.html.

company Nofia Solutions.[9] Triton Systems CEO Ross Haghighat was a Chairman of the Board at FRX Polymer until its most recent sale.[10]

The second spinoff with concerning adversarial ties is Aduro BioTech. Triton BioSystems, a spinoff of Triton Systems, merged with a separate company, Oncologics, to create Aduro Biotech in 2008.[11] In 2020, Aduro Biotech merged with the biotech company Chinook Therapeutics.[12] In 2021, Chinook Therapeutics began a joint venture with the Chinese life science firm Pivotal bioVenture Partners China.[13] Triton Systems CEO, Ross Haghighat, was an independent director at both Aduro BioTech and Chinook Therapeutics.[14]

---

[9] Press Release, NEWSWIRE, *Nofia Solutions BV Announces the Completion of the Acquisition of FRX Polymers, Inc. and New Leadership*, (Jan. 29, 2025), *available at* https://www.thenewswire.com/press-releases/1k6WF8qyM-nofia-solutions-bv-announces-the-completion-of-the-acquisition-of-frx-polymers-inc-and-new-leadership.html.

[10] Ross Haghighat, Linkedin, (last visited Mar. 6, 2025), *available at* https://www.linkedin.com/in/ross-haghighat-4875229/.

[11] *Oncologic and Triton BioSystems Merge to Form Aduro BioTech*, FIERCE BIOTECH, (June 3, 2008), *available at* https://www.fiercebiotech.com/biotech/oncologic-and-triton-biosystems-merge-to-form-aduro-biotech.

[12] Press Release, GLOBALNEWSWIRE, *Chinook Therapeutics Closes Merger with Aduro Biotech and Completes $115 Million Private Placement Financing*, (October 5, 2020), *available at* https://www.globenewswire.com/news-release/2020/10/05/2103580/0/en/Chinook-Therapeutics-Closes-Merger-with-Aduro-Biotech-and-Completes-115-Million-Private-Placement-Financing.html.

[13] Ben Adams, *Chinook launches a new biotech with major VCs in China to double down on kidney disease R&D*, FIERCE BIOTECH, (Nov. 30, 2021), *available at* https://www.fiercebiotech.com/biotech/chinook-launches-a-new-biotech-major-vcs-china-to-double-down-kidney-disease-r-d.

[14] WSJ MARKETS, *FRX Innovations Inc.*, (Accessed Mar. 5, 2025), *available at* https://www.wsj.com/market-data/quotes/FRXIF/company-people/executive-profile/78471647.

Navy SBIR/STTR Success

Firm:
Triton Systems, Inc.
200 Turnpike Road
Chelmsford, MA
01824

Topic:
N02-207/2

SBIR Investment:
$524K

Project Revenue:
$21M

SYSCOM:
ONR

Published:
2011

Title: Fire Retardant Blast Mitigation for Sea Vessels

Unprotected Walls Can Collapse and Send Dangerous Debris into Building

Walls with Protective Fire and Blast Coating Deflect, but Do Not Collapse

"The technology provides tremendous potential to help protect Navy personnel and equipment against fragmentation in the event of a targeted explosion aimed at a surface vessel."

About the Technology:

- The purpose of this project was to develop and demonstrate a fire and blast mitigation system to protect Navy ship structures.
- Triton Systems Blast mitigation technology provides force and infrastructure protection by preventing fragmentation and wall collapse.
- The blast mitigation technology incorporates fire retardance that is: non halogenated, environmentally friendly, non volatile, non migrating (does not migrate out of host plastic), highly flame retardant and melt processable, and requires minimal change to the mechanical properties of its host plastic.
- This blast mitigation technology has transitioned to both Air Force and Department of Homeland Security for applications requiring critical asset protection against blast threats.
- This technology has enabled the founding of a spinoff company, FRX Polymers. The spinoff company has been able to raise over $14M from a global institutional base. FRX has recently commissioned tow pilot plants in Chelmsford MA, a semi-works plant in Europe (Switzerland) and is now planning a second production plant in Europe. FRX is currently executing over 50 market development programs with leading chemical suppliers.

FORM 8-K

Current report filing

Filing Date: **2020-05-07** | Period of Report: **2020-05-07**
SEC Accession No. 0001193125-20-136322

FILER

CITIC Capital Acquisition Corp.
CIK:**1794621**| IRS No.: **000000000** | Fiscal Year End: **1231**
Type: **8-K** | Act: **34** | File No.: **001-39222** | Film No.: **20856931**
SIC: **6770** Blank checks

Mailing Address
9/F, EAST TOWER, GENESIS BEIJING
NO. 8 XINYUAN SOUTH ROAD
CHAOYANG DISTRICT F4 100027

Business Address
9/F, EAST TOWER, GENESIS BEIJING
NO. 8 XINYUAN SOUTH ROAD
CHAOYANG DISTRICT F4 100027
86 10 5802 3889

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

Date of Report (Date of earliest event reported): May 7, 2020

CITIC CAPITAL ACQUISITION CORP.
(Exact name of registrant as specified in its charter)

Cayman Islands	**001-39222**	**N/A**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

9/F, East Tower, Genesis Beijing
No. 8 Xinyuan South Road
Chaoyang District, Beijing 100027
People' s Republic of China
(Address of principal executive offices, including zip code)

Registrant' s telephone number, including area code: +86 10 5802 3889

Not Applicable
(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Units, each consisting of one Class A ordinary share, par value $0.0001, and one-half of one redeemable warrant	**CCAC.U**	**The New York Stock Exchange**
Class A ordinary shares, par value $0.0001	**CCAC**	**The New York Stock Exchange**
Redeemable warrants, each warrant exercisable for one Class A ordinary share, each at an exercise price of $11.50 per share	**CCAC WS**	**The New York Stock Exchange**

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

On May 7, 2020, the board of directors (the "Board") of CITIC Capital Acquisition Corp. (the "Company") appointed Ross Haghighat to the Board. Mr. Haghighat was appointed to serve as a Class III director with a term expiring at the Company' s third annual meeting of stockholders.

The Board appointed Mr. Haghighat, who was determined to be an "independent director" as defined in the applicable rules of The New York Stock Exchange, to the Board' s Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee.

Ross Haghighat is a U.S.-based business executive, entrepreneur and venture capitalist who has been the chairman and chief executive officer of Triton Systems, Inc. since 2004. Mr. Haghighat has 24 years of operating experience with private and public entities and seven years of experience in strategic investment and capital markets. Mr. Haghighat has been a founder, co-founder and board member of more than a dozen private and public technology companies in the U.S., Europe, Middle East, and Australia. Mr. Haghighat currently serves on the board of directors for Electriq-Global, Angel Medical Systems, Inc., Aduro Biotech Inc. (Nasdaq: ADRO) and Fluence Corporation Ltd and has served on the audit committee of the board of directors for Aduro Biotech Inc. since 2015 and served on the audit committee of Fluence Corporation Ltd from 2016 to 2019.

On May 7, 2020, the Company entered into an indemnity agreement (the "Indemnity Agreement") with Mr. Haghighat, pursuant to which the Company has agreed to provide contractual indemnification, in addition to the indemnification provided in the Company' s Amended and Restated Memorandum and Articles of Association, against liabilities that may arise by reason of their respective service on the Board, and to advance expenses incurred as a result of any proceeding against either of them as to which either could be indemnified, in the form previously filed as Exhibit 10.5 to the Company' s Registration Statement on Form S-1 (File No. 333-236006) for its initial public offering, initially filed with the U.S. Securities and Exchange Commission on January 22, 2020 (as amended, the "Registration Statement").

On May 7, 2020, the Company entered into a letter agreement with Mr. Haghighat (the "Letter Agreement") on substantially the same terms as the form of letter agreement previously entered into by and between the Company and each of its other officers and directors in connection with the Company' s initial public offering.

The foregoing descriptions of the Indemnity Agreement and the Letter Agreement do not purport to be complete and are qualified in their entireties by reference to the form of indemnity agreement and the Letter Agreement, copies of which are attached as Exhibit 10.5 to the Registration Statement and Exhibit 10.1 hereto, respectively, and are incorporated herein by reference.

On May 7, 2020, CITIC Capital Acquisition LLC, the Company' s sponsor, transferred 22,000 Class B ordinary shares of the Company to Mr. Haghighat

Other than the foregoing, Mr. Haghighat is not party to any arrangement or understanding with any person pursuant to which he was appointed as director, nor is he party to any transactions required to be disclosed under Item 404(a) of Regulation S-K involving the Company.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

EXHIBIT INDEX

Exhibit No.	Description
10.1	Letter Agreement, dated May 7, 2020, by and between the Company and Ross Haghighat.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

CITIC CAPITAL ACQUISITION CORP.

By: /s/ Fanglu Wang
Name: Fanglu Wang
Title: Chief Executive Officer

Dated: May 7, 2020

Exhibit 10.1

May 7, 2020

CITIC Capital Acquisition Corp.
9/F, East Tower, Genesis Beijing
No. 8 Xinyuan South Road, Chaoyang District
Beijing 100027
People' s Republic of China

Re: Initial Public Offering

Ladies and Gentlemen:

This letter (this "***Letter Agreement***") is being delivered to you in accordance with the Underwriting Agreement (the "***Underwriting Agreement***") entered into by and among CITIC Capital Acquisition Corp., a Cayman Islands exempted company (the "***Company***"), and Credit Suisse Securities (USA) LLC, as representative (the "***Representative***") of the several underwriters (each, an "***Underwriter***" and collectively, the "***Underwriters***"), relating to the underwritten initial public offering (the "***Public Offering***") of 27,600,000 units, including the issuance of 3,600,000 units as a result of the underwriter' s exercise of their over-allotment option in full (the "***Units***"), each comprised of one of the Company' s Class A ordinary shares, par value $0.0001 per share (the "***Class A Ordinary Shares***"), and one-half of one redeemable warrant. Each whole warrant (each, a "***Warrant***") entitles the holder thereof to purchase one Class A Ordinary Share at a price of $11.50 per share, subject to adjustment as described in the Prospectus (as defined below). The Units were sold in the Public Offering pursuant to a registration statement on Form S-1 and prospectus (the "***Prospectus***") filed by the Company with the U.S. Securities and Exchange Commission (the "***Commission***") and are listed on the New York Stock Exchange. Certain capitalized terms used herein are defined in paragraph 9 hereof.

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the undersigned member of the board of directors of the Company (the "***Director***") hereby agrees with the Company as follows:

1. The Director agrees that if the Company seeks shareholder approval of a proposed Business Combination, then in connection with such proposed Business Combination, he shall (i) vote any Ordinary Shares (as defined below) owned by him in favor of any proposed Business Combination and (ii) not redeem any Ordinary Shares owned by him in connection with such shareholder approval. If the Company seeks to consummate a proposed Business Combination by engaging in a tender offer, the Director agrees that he will not sell or tender any Ordinary Shares owned by him in connection therewith.

2. The Director hereby agrees that in the event that the Company fails to consummate a Business Combination within 24 months from the closing of the Public Offering, or such later period approved by the Company' s shareholders in accordance with the Company' s amended and restated memorandum and articles of association (as it may be amended from time to time, the "***Charter***"), the Director shall take all reasonable steps to cause the Company to (i) cease all operations except for the purpose of winding up, (ii) as promptly as reasonably possible but not more than ten (10) business days thereafter, redeem 100% of the Class A Ordinary Shares sold as part of the Units in the Public Offering (the "***Offering Shares***"), at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the Trust Account (as defined below), including interest earned on the funds held in the Trust Account (less taxes payable and up to $100,000 of interest to pay dissolution expenses), divided by the number of then outstanding Offering Shares, which redemption will completely extinguish all Public Shareholders' (as defined below) rights as shareholders (including the right to receive further liquidating distributions, if any), and (iii) as promptly as reasonably possible following such redemption, subject to the approval of the Company' s remaining shareholders and the Company' s board of directors, dissolve and liquidate, subject in the case of clauses (ii) and (iii) to the Company' s obligations under Cayman Islands law to provide for claims of creditors and in all cases subject to the other requirements of applicable law. The Director agrees to not propose any amendment to the Charter (A) to modify the substance or timing of the Company' s obligation to allow redemption in connection with our initial business combination or to redeem 100% of the Offering Shares if the Company does not complete a Business

Combination within the required time period set forth in the Charter or (B) with respect to any other material provisions relating to shareholders' rights or pre-initial Business Combination activity, unless the Company provides its Public Shareholders with the opportunity to redeem their Offering Shares upon approval of any such amendment at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the Trust Account, including interest earned on the funds held in the Trust Account and not previously released to the Company to pay its taxes, divided by the number of then outstanding Offering Shares.

The Director acknowledges that he has no right, title, interest or claim of any kind in or to any monies held in the Trust Account or any other asset of the Company as a result of any liquidation of the Company with respect to the Founder Shares held by him, if any. The Director hereby further waives, with respect to any Ordinary Shares held by him, if any, any redemption rights he may have in connection with (a) the consummation of a Business Combination, including, without limitation, any such rights available in the context of a shareholder vote to approve such Business Combination, or (b) a shareholder vote to approve an amendment to the Charter (A) to modify the substance or timing of the Company' s obligation to allow redemption in connection with our initial business combination or to redeem 100% of the Offering Shares if the Company has not consummated a Business Combination within the time period set forth in the Charter or (B) with respect to any other material provisions relating to shareholders' rights or pre-initial Business Combination activity or in the context of a tender offer made by the Company to purchase Offering Shares (although the Director and his affiliates shall be entitled to redemption and liquidation rights with respect to any Offering Shares it or they hold if the Company fails to consummate a Business Combination within the time period set forth in the Charter).

3. During the period commencing on the effective date of the Underwriting Agreement and ending 180 days after such date, the Director shall not, without the prior written consent of the Representative, (i) sell, offer to sell, contract or agree to sell, hypothecate, pledge, grant any option to purchase or otherwise dispose of or agree to dispose of, directly or indirectly, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Securities Exchange Act of 1934, as amended (the "***Exchange Act***"), and the rules and regulations of the Commission promulgated thereunder, with respect to, any Units, Ordinary Shares (including, but not limited to, Founder Shares), Warrants or any securities convertible into, or exercisable, or exchangeable for, Ordinary Shares owned by it, him or her, (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of any Units, Ordinary Shares (including, but not limited to, Founder Shares), Warrants or any securities convertible into, or exercisable, or exchangeable for, Ordinary Shares owned by him, whether any such transaction is to be settled by delivery of such securities, in cash or otherwise, or (iii) publicly announce any intention to effect any transaction specified in clause (i) or (ii). The Director acknowledges and agrees that, prior to the effective date of any release or waiver, of the restrictions set forth in this paragraph 3 or paragraph 5 below, the Company shall announce the impending release or waiver by press release through a major news service at least two business days before the effective date of the release or waiver. Any release or waiver granted shall only be effective two business days after the publication date of such press release. The provisions of this paragraph will not apply if the release or waiver is effected solely to permit a transfer not for consideration and the transferee has agreed in writing to be bound by the same terms described in this Letter Agreement to the extent and for the duration that such terms remain in effect at the time of the transfer.

4. The Director hereby agrees and acknowledges that: (i) the Underwriters and the Company would be irreparably injured in the event of a breach by such Director of his obligations under paragraphs 1, 2, 3, 5(a), and 5(b), as applicable, of this Letter Agreement, (ii) monetary damages may not be an adequate remedy for such breach and (iii) the non-breaching party shall be entitled to injunctive relief, in addition to any other remedy that such party may have in law or in equity, in the event of such breach.

5. (a) The Director agrees that he shall not Transfer any Founder Shares (or any Class A Ordinary Shares issuable upon conversion thereof) until the earlier of (A) one year after the completion of the Company' s initial Business Combination and (B) subsequent to the Business Combination, (x) if the closing price of the Class A Ordinary Shares equals or exceeds $12.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after the Company' s initial Business Combination or (y) the date on which the Company completes a liquidation, merger, amalgamation, capital stock exchange, reorganization or other similar transaction that results in all of the Company' s Public Shareholders having the right to exchange their shares of Class A Ordinary Shares for cash, securities or other property (the "***Founder Shares Lock-up Period***").

(b) The Director agrees that he shall not Transfer any Private Placement Warrants (or any Class A Ordinary Shares underlying the Private Placement Warrants), until 30 days after the completion of a Business Combination (the "***Private Placement Warrants Lock-up Period***", together with the Founder Shares Lock-up Period, the "***Lock-up Periods***").

(c) Notwithstanding the provisions set forth in paragraphs 5(a) and (b), Transfers of the Founder Shares, Private Placement Warrants and the Class A Ordinary Shares underlying the Private Placement Warrants that are held by the Director and any of his permitted transferees (that have complied with this paragraph 5(c)), are permitted (a) to the Company' s officers or directors, any affiliate or family member of any of the Company' s officers or directors, any affiliate of the Sponsor or to any members of the Sponsor or any of their affiliates; (b) in the case of an individual, by gift to a member of such individual' s immediate family or to a trust, the beneficiary of which is a member of such individual' s immediate family, an affiliate of such individual or to a charitable organization; (c) in the case of an individual, by virtue of laws of descent and distribution upon death of such individual; (d) in the case of an individual, pursuant to a qualified domestic relations order; (e) by private sales or transfers made in connection with any forward purchase agreement or similar arrangement or in connection with the consummation of an initial Business Combination at prices no greater than the price at which the securities were originally purchased; (f) in the event of the Company' s liquidation prior to the completion of an initial Business Combination; (g) by virtue of the laws of the Cayman Islands or the Sponsor' s limited liability company agreement upon dissolution of the Sponsor; or (h) in the event of the Company' s liquidation, merger, capital stock exchange or other similar transaction which results in all of the Company' s shareholders having the right to exchange their Class A Ordinary Shares for cash, securities or other property subsequent to the Company' s completion of an initial Business Combination; provided, however, that in the case of clauses (a) through (e) or (g), these permitted transferees must enter into a written agreement with the Company agreeing to be bound by the transfer restrictions herein and the other restrictions contained in this Agreement (including provisions relating to voting, the Trust Account and liquidating distributions).

6. The Director represents and warrants that he has never been suspended or expelled from membership in any securities or commodities exchange or association or had a securities or commodities license or registration denied, suspended or revoked. The Director' s biographical information furnished to the Company (including any such information included in the Prospectus) is true and accurate in all respects and does not omit any material information with respect to the Director' s background. The Director' s questionnaire furnished to the Company is true and accurate in all respects. The Director represents and warrants that: he is not subject to or a respondent in any legal action for, any injunction, cease-and-desist order or order or stipulation to desist or refrain from any act or practice relating to the offering of securities in any jurisdiction; he has never been convicted of, or pleaded guilty to, any crime (i) involving fraud, (ii) relating to any financial transaction or handling of funds of another person, or (iii) pertaining to any dealings in any securities and he is not currently a defendant in any such criminal proceeding.

7. Except as disclosed in the Prospectus, the Director shall not receive from the Company any finder' s fee, reimbursement, consulting fee, non-cash payments, monies in respect of any repayment of a loan or other compensation prior to, or in connection with any services rendered in order to

effectuate, the consummation of the Company' s initial Business Combination (regardless of the type of transaction that it is), other than the following, none of which will be made from the proceeds held in the Trust Account prior to the completion of the initial Business Combination: repayment of a loan and advances up to an aggregate of $300,000 made to the Company by the Sponsor; payment to the Sponsor for certain office space, utilities, secretarial and administrative support as may be reasonably required by the Company for a total of $10,000 per month; reimbursement for any reasonable out-of-pocket expenses related to identifying, investigating, negotiating and completing an initial Business Combination, and repayment of loans, if any, and on such terms as to be determined by the Company from time to time, made by the Sponsor or an affiliate of the Sponsor or any of the Company' s officers or directors to finance transaction costs in connection with an intended initial Business Combination, provided, that, if the Company does not consummate an initial Business Combination, a portion of the working capital held outside the Trust Account may be used by the Company to repay such loaned amounts so long as no proceeds from the Trust Account are used for such repayment. Up to $1,500,000 of such loans may be convertible into warrants at a price of $1.00 per warrant at the option of the lender. Such warrants would be identical to the Private Placement Warrants, including as to exercise price, exercisability and exercise period.

8. The Director has full right and power, without violating any agreement to which it is bound (including, without limitation, any non-competition or non-solicitation agreement with any employer or former employer), to enter into this Letter Agreement and, as applicable, to serve as a director on the board of directors of the Company.

9. As used herein, (i) "***Business Combination***" shall mean a merger, capital stock exchange, asset acquisition, stock purchase, reorganization or similar business combination, involving the Company and one or more businesses; (ii) "***Ordinary Shares***" shall mean the Class A Ordinary Shares and Class B ordinary shares, par value $0.0001 per share (the "***Class B Ordinary Shares***"); (iii) "***Founder Shares***" shall mean the 6,900,000 Class B Ordinary Shares issued and outstanding; (iv) "***Initial Shareholders***" shall mean the Sponsor and any director or officer that holds Founder Shares; (v) "***Private Placement Warrants***" shall mean the 7,520,000 warrants that the Sponsor purchased for an aggregate purchase price of $7,520,000, or $1.00 per warrant, in a private placement that occurred simultaneously with the consummation of the Public Offering; (vi) "***Public Shareholders***" shall mean the holders of securities issued in the Public Offering; (vii) "***Sponsor***" shall mean CITIC Capital Acquisition LLC; (viii) "***Trust Account***" shall mean the trust fund into which a portion of the net proceeds of the Public Offering and the sale of the Private Placement Warrants were deposited; and (ix) "***Transfer***" shall mean the (a) sale of, offer to sell, contract or agreement to sell, hypothecate, pledge, grant of any option to purchase or otherwise dispose of or agreement to dispose of, directly or indirectly, or establishment or increase of a put equivalent position or liquidation with respect to or decrease of a call equivalent position within the meaning of Section 16 of the Exchange Act, and the rules and regulations of the Commission promulgated thereunder with respect to, any security, (b) entry into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of any security, whether any such transaction is to be settled by delivery of such securities, in cash or otherwise, or (c) public announcement of any intention to effect any transaction specified in clause (a) or (b).

10. The Company will maintain an insurance policy or policies providing directors' and officers' liability insurance, and each Director shall be covered by such policy or policies, in accordance with its or their terms, to the maximum extent of the coverage available for any of the Company' s directors or officers.

11. This Letter Agreement constitutes the entire agreement and understanding of the parties hereto in respect of the subject matter hereof and supersedes all prior understandings, agreements, or representations by or among the parties hereto, written or oral, to the extent they relate in any way to the subject matter hereof or the transactions contemplated hereby. This Letter Agreement may not be changed, amended, modified or waived (other than to correct a typographical error) as to any particular provision, except by a written instrument executed by all parties hereto.

12. No party hereto may assign either this Letter Agreement or any of its rights, interests, or obligations hereunder without the prior written consent of the other parties. Any purported assignment in violation of this paragraph shall be void and ineffectual and shall not operate to transfer or assign any interest or title to the purported assignee. This Letter Agreement shall be binding on the Director and his respective successors, heirs and assigns and permitted transferees.

13. Nothing in this Letter Agreement shall be construed to confer upon, or give to, any person or corporation other than the parties hereto any right, remedy or claim under or by reason of this Letter Agreement or of any covenant, condition, stipulation, promise or agreement hereof. All covenants, conditions, stipulations, promises and agreements contained in this Letter Agreement shall be for the sole and exclusive benefit of the parties hereto and their successors, heirs, personal representatives and assigns and permitted transferees.

14. This Letter Agreement may be executed in any number of original or facsimile counterparts and each of such counterparts shall for all purposes be deemed to be an original, and all such counterparts shall together constitute but one and the same instrument.

15. This Letter Agreement shall be deemed severable, and the invalidity or unenforceability of any term or provision hereof shall not affect the validity or enforceability of this Letter Agreement or of any other term or provision hereof. Furthermore, in lieu of any such invalid or unenforceable term or provision, the parties hereto intend that there shall be added as a part of this Letter Agreement a provision as similar in terms to such invalid or unenforceable provision as may be possible and be valid and enforceable.

16. This Letter Agreement shall be governed by and construed and enforced in accordance with the laws of the State of New York. The parties hereto (i) all agree that any action, proceeding, claim or dispute arising out of, or relating in any way to, this Letter Agreement shall be brought and enforced in the courts of New York City, in the State of New York, and irrevocably submit to such jurisdiction and venue, which jurisdiction and venue shall be exclusive and (ii) waive any objection to such exclusive jurisdiction and venue or that such courts represent an inconvenient forum.

17. Any notice, consent or request to be given in connection with any of the terms or provisions of this Letter Agreement shall be in writing and shall be sent by express mail or similar private courier service, by certified mail (return receipt requested), by hand delivery or facsimile transmission.

18. This Letter Agreement shall terminate on the earlier of (i) the expiration of the Lock-up Periods or (ii) the liquidation of the Company; provided further that paragraph 4 of this Letter Agreement shall survive such liquidation.

[Signature Page Follows]

Sincerely,

By: /s/ Ross Haghighat
Name: Ross Haghighat

Acknowledged and Agreed:

CITIC CAPITAL ACQUISITION CORP.

By: /s/ Fanglu Wang
Name: Fanglu Wang
Title: Chief Executive Officer

[Signature Page to Letter Agreement]

1156 15th St NW
Suite 502
Washington, DC 20005
www.sbtc.org

March 5, 2025

The Honorable Joni Ernst
Chair
US Senate Committee on Small Business
and Entrepreneurship

The Honorable Ed Markey
Ranking Member
US Senate Committee on Small Business
and Entrepreneurship

Chair Ernst, Ranking Member Markey,

The Small Business Technology Council (SBTC) is grateful for the Senate Small Business Committee's work on the important issue of SBIR/STTR renewal and improvement before it is set to expire on September 30. SBTC looks forward to engaging with the Committee as it works to develop a 2025 program renewal that leverages the successes of the most effective R&D programs in government.

The key elements of success that should be preserved are the focus on merit selection and true competition among small business innovations including attracting new entrants (only 1 in 20 proposals reaches Phase II, and each year 40% of winners are new to the program); and each agency picking the best solutions to meet their needs. Another success factor is the two-phase process in which the Phase I demonstrates the validity of the proposed innovative concept and the Phase II enables substantive development of the innovation, followed by a third phase done outside the program where the best solutions can be rapidly advanced outside of the SBIR funding.

SBIR is the most innovative program in government because it is not corporate welfare; it is a fierce competition based on science and technical merit to meet agency needs, and America benefits the most if the best innovations win. We are deeply concerned with proposed changes to require agencies to install caps or limits on the number of awards a firm can win, which would move the program away from this key source of its success and deprive the American people and the agencies the best possible innovative solutions. Agencies pick their specific SBIR programs to meet their needs. The program will operate best when the agencies direct their own competitions and select the small business research or technology they want to select to solve their requirements.

We look forward to hearing more details about proposed provisions for upcoming SBIR/STTR legislation. SBTC believes that Congress has an opportunity to strengthen this incredibly successful program, and encourages the Committee to consider simplifying and streamlining the proposal process, increasing the allocation, standardizing risk management processes to ensure it is fair and transparent, and above all to make SBIR/STTR permanent.

The Small Business Technology Council (www.SBTC.org) is the nation's largest association of small, technology-based companies in diverse fields. SBTC advocates on behalf of firms who participate in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

Software in Defense Coalition

March 04, 2025

The Honorable Joni Ernst
Chairwoman
Senate Committee on Small
Business and Entrepreneurship
Washington, DC 20510

The Honorable Edward Markey
Ranking Member
Senate Committee on Small
Business and Entrepreneurship
Washington, DC 20510

Dear Chairwoman Ernst and Ranking Member Markey:

The Software in Defense Coalition represents a diverse and innovative base of software technology startups and small businesses, industry thought leaders, and investors committed to ensuring the competitive advantage of the United States. Start-up companies provide cutting edge, mission-focused technologies to support our warfighters as our country faces an increasingly dangerous geopolitical landscape where adversaries are building their military power to levels not seen since World War II.

We are writing to urge the reauthorization of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs with Chairwoman Ernst's critical reforms to enhance their effectiveness in accelerating the transition of battle-ready technologies. We strongly support the SBIR and STTR programs. Since its inception, these programs have demonstrated significant outcomes in supporting innovative small businesses that contribute to the Department of Defense's (DoD) national security mission. For new emerging technology start-ups, the SBIR/STTR programs have been a key source to find non-dilutive capital to support national security missions. There are significant gaps, however, that have impeded the programs' effectiveness in transitioning technology to Phase III contracts for warfighter advantage.

Reforms are necessary to ensure that these programs fulfill their intended purpose efficiently and effectively. Over the past decade, the DoD has concentrated a substantial portion of SBIR Phase I/II investment dollars into a small number of companies. According to the 2024 Defense Innovation Board's study, "Terraforming the Valley of Death" and a 2023 study cited by the Naval Postgraduate School's Acquisition

Research Symposium, the top 5% of companies receiving the most DoD Phase I/II awards collectively secured 49% of all Phase I/II funding under the Department's SBIR program. Furthermore, a 2024 Government Accountability Office (GAO) report highlighted that just 22 firms—representing less than 1% of awardees—received 10% of all SBIR contracts, totaling $3.2 billion.

The Senate's legislation includes some key updates including:

- Firm Fixed Price Structure for Startups – The vast majority of our member companies use firm fixed price to participate in the defense industry, one that has seen a 40% decline in small vendor engagement over the past decade. The legislation includes a pricing structure adjusted to allow startups to compete using a firm fixed price model, ensuring a level playing field and mitigating financial barriers that prevent new entrants from successfully participating in the SBIR/STTR programs.
- Enhances Competition – Increasing competition within the SBIR program is crucial. We support shorter, streamlined applications focused on commercialization potential for considered technologies. This would enable a greater number of small businesses to enter the program and demonstrate their innovations without significant administrative burdens.
- Expanding Direct to Phase II Authority – All agencies should have the authority to issue Direct to Phase II awards, which would allow companies with demonstrated feasibility to bypass Phase I and accelerate their development process. These reforms would eliminate unnecessary delays and improve the transition of innovative technologies to practical deployment.
- Larger Phase II Strategic Breakthrough Funding Awards of up to $30 million – With the higher funding thresholds and a focus on commercialization, these awards will help direct funds to the most viable and impactful technologies at the level needed to help move from innovation to scaled production.

SBIR and STTR programs are an essential part of enabling innovative high-tech companies to advance national security technologies. We strongly urge adoption of these crucial reforms to foster a more competitive and innovative ecosystem in the federal enterprise, protected from adversarial influence. These changes will ensure SBIR and STTR programs continue to drive innovation for the benefit of our nation's defense and technological leadership.

Sincerely,

The Software in Defense Coalition

THE TECHNOLOGY ASSOCIATION OF IOWA

Dear Chair Ernst and Ranking Member Markey,

On behalf of the Technology Association of Iowa (TAI) and our statewide membership of technology leaders, entrepreneurs, and innovators, we express our strong support for the INNOVATE Act, a critical step toward modernizing and improving the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

Iowa's tech-driven small businesses play an essential role in advancing innovation, creating high-quality jobs, and driving economic growth across the state. However, many of these companies face significant barriers when seeking federal funding for research and development. Current SBIR-STTR application processes are complex and time-consuming, limiting participation from new and emerging startups that lack the resources to navigate the challenging process. The INNOVATE Act directly addresses these challenges by introducing a streamlined Phase 1A application process, making it easier for first-time applicants to access funding and contribute to the nation's technological advancement.

Additionally, the bill takes necessary steps to restore the program's original intent — supporting early-stage innovation and commercialization rather than allowing a small number of repeat recipients to dominate funding opportunities. By placing reasonable limits on lifetime Phase I and Phase II awards and ensuring companies meet strong commercialization standards, the INNOVATE Act fosters true competition and ensures SBIR-STTR investments drive real-world impact.

At TAI, we advocate for policies that strengthen Iowa's innovation ecosystem, empower small businesses, and position our state as a leader in technology development. The INNOVATE Act represents a forward-thinking approach that will expand access to funding, promote fair competition, and accelerate the commercialization of groundbreaking technologies.

We support this effort and encourage its passage to ensure that Iowa's entrepreneurs —and small businesses across the country—have the resources needed to succeed in today's competitive tech landscape.

Sincerely,

Brian Waller
President
Technology Association of Iowa

500 EAST COURT AVENUE, SUITE 100 DES MOINES, IOWA 50309 515.280.7700 TECHNOLOGYIOWA.ORG

PAUL
HASTINGS

1(202) 551-1880
keithschomig@paulhastings.com

Subject: **Triton's Expanded and Clarified Testimony**

Date: **March 19, 2025**

This memo is in response to certain statements made regarding our client, Triton Systems Inc. ("Triton"), at the March 5, 2025, hearing of the Senate Small Business and Entrepreneurship Committee, entitled "Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century". In addition to general information about how Triton safeguards Small Business Innovation Research ("SBIR") technology and sensitive information, Triton is submitting clarifications to the hearing record.

Summary

a) **Ownership and Management:** Triton is 100% owned by U.S. citizens. The members of its Board of Directors are also all U.S. citizens. Triton strictly complies with all U.S. Government regulations regarding protection of classified and sensitive unclassified information, and it voluntary implements additional measures to segregate information related to Triton's U.S. Government programs from its Board and Chairman. Triton's voluntary arrangement has been submitted to the Defense Counterintelligence Security Agency ("DCSA").

b) **Relationship with companies mentioned in connection with Triton:** All of the companies mentioned in the hearing are or were publicly traded companies listed on the NASDAQ, NYSE, or Toronto stock exchange (TSX). Triton has no financial interest in any of these companies and no ability to influence them.

c) **Triton's SBIR technologies**: Triton has never licensed any SBIR-derived technology to any foreign owned or domiciled company, university, or government.

d) **Security**: Triton possesses a facility security clearance and operates its secure facility in strict compliance with the National Industrial Security Program regulations and is regularly audited by the DCSA. Any contact with foreign persons or foreign travel by Triton personnel is reported if and when it occurs, and Triton has regularly passed DCSA audits regarding its security standards and protocols without issue.

PAUL
HASTINGS

Statement of Clarifications

Triton Systems thanks the U.S. Senate Small Business and Entrepreneurship Committee for the opportunity to present at the Senate's hearing on SBIR and STTR Reauthorization on March 5, 2025.

Triton would hereby like to clarify specific comments for the record. Triton has proudly served its US government clients for more than 33 years and has an impressive record of transitioning early concepts to functioning products on a number of DoD platforms. We work closely with major DoD primes and our customers repeatedly select us because of a track record of success. Triton reiterates that no SBIR data or funding has been involved in any of the matters below.

a. **CITIC Capital Acquisition Corporation ("CC Acquisition Corp.")** – A reference was made to "…CITIC Capital Acquisition Corporation, which is a Chinese sponsored financial services firm…." To clarify, CC Acquisition Corp. was a U.S. NYSE publicly listed entity whose ownership, governance, and source funding was reviewed and cleared by the U.S. Securities and Exchange Commission ("SEC") pursuant to an S-1 filing for a U.S. Initial Public Offering ("IPO"). The IPO was managed by Credit Suisse Securities (USA) LLC of New York. Moreover, in early 2022 CC Acquisition Corp. merged with another U.S. company, which was focused on homeland security border control, in a deal that was cleared by the SEC. Additionally, the U.S. Committee on Foreign Investment in the United States ("CFIUS") determined that the deal did not require CFIUS review and approval.

   Mr. Haghighat was invited to serve on CC Acquisition Corp.'s Board as an Independent Non-Executive Director of the NYSE-listed public company long after its IPO. Mr. Haghighat was one of two public company Independent Directors to be appointed to the company's Board. Mr. Haghighat was not operationally involved with the company, its fund raising, nor its intellectual property. He did not have a working interaction with Chinese persons or entities in connection with CC Acquisition Corp. It should be noted that Mr. Haghighat never accepted compensation for this position. Although he was allocated shares in the public entity, he never monetized or accepted such shares, or any other payments, nor did he receive any consideration for his service. It should be further noted that CC Acquisition Corp merged with Silicon Valley Quanergy Systems shortly after Mr. Haghighat's appointment.

b. **FRX Polymers** – It was stated in the hearing that Mr. Haghighat was Chairman of FRX Polymers "until a month ago". For the record, he resigned from the Canadian public company, listed as FRX Innovations, in June 2024.

   FRX, now known as Nofia Solutions, is a global chemicals company that sells purely commercial additives into the global consumer electronics, textiles and automotive markets. The company was backed by institutional investors and strategic companies (all publicly available data) and has not received any SBIR funding. Additionally, Triton has not licensed or transferred any technology derived from SBIR-related funding to FRX.

c. **Chinook Therapeutics** – A reference was made to "Triton's biotech spin off, merged to become Chinook Therapeutics". Triton's Biotech spin off, Triton Biosystems was formed in 2001, merged to become Aduro BioTech in 2008, and was subsequently listed as a publicly traded company in 2015. In 2020, Aduro merged with Chinook Therapeutics, another public company. By then Triton had sold all its holdings in Aduro and had no financial, programmatic or intellectual property affiliation with Chinook. Furthermore, Aduro BioTech pursued a completely different cancer treatment technology, unrelated to Triton's original SBIR technology. Chinook, which was focused on treatment of kidney disease, never received any SBIR derived technology in the merger. Mr. Haghighat had served as a board member of Aduro and continued on the board of Chinook until April 2023, prior to its acquisition by Novartis.

Disclosures to the agencies

Triton routinely discloses all information related to any relationships with any foreign company by any of its management to DCSA using the form SF 328. In addition, Triton regularly provides updates related to any foreign contact or travel, and other information on the company, as required by DCSA. This information is accessible to other government agencies. Additionally, Triton has fully complied with all of the requirements for reporting any foreign affiliation under the SBIR Reauthorization Act of 2022. Further, when permitted by Triton's U.S. government customers, and per their specific instructions, Triton appends detailed information to its proposals beyond what is required by the foreign affiliation disclosure form. Out of an abundance of caution we have also voluntarily provided all of this information to the Organization of Commercial and Economic Analysis (OCEA) under the Air Force, as OCEA has been designated as the lead organization within DoD for screening companies for foreign affiliation risk. To our knowledge, the DCSA has been satisfied with our full disclosures and safeguards put in place to protect US technology.

PAUL
HASTINGS

In summary, it is Triton's belief that the protocols and safeguards instituted by Triton set an exemplary standard for how a small business can protect sensitive information and technology, provide full disclosures to the agencies related to foreign affiliation risk, and at the same time develop the expertise for commercializing technologies as intended by SBIR legislation.

Triton thanks the Committee for the opportunity to clarify the record of its hearing on the SBIR/STTR program on March 5, 2025. Please direct any follow-up questions regarding the statements made in this letter to my attention.

Sincerely,

Keith Schomig
Partner
Paul Hastings LLP

Chair Ernst Additional Statement for the Record

On March 5, 2025, I raised concerns about Triton Systems' China-linked spinoffs and Mr. Ross Haghighat's prior role on the board of CITIC Capital Acquisition Corp (CCAC) while simultaneously serving as Chief Executive Officer (CEO) of Triton Systems. Shortly after I brought these facts to light, Triton Systems removed Mr. Haghighat as its CEO.[1] Nonetheless, he continues to serve as Chairman of the company according to his LinkedIn profile on March 19, 2025.[2] Mr. Haghighat's professional relationship with CITIC and continued leadership role at Triton Systems remain concerning, given the ongoing taxpayer investment in Triton Systems: over $30M from SBIR-STTR awards in 2024 alone.[3]

In 2016, while Mr. Haghighat was Chairman of the Board, FRX Polymers received a $22 million investment round led by China-based CITIC Capital.[4] A few years later, Mr. Haghighat was appointed on the board of CCAC, a special purpose acquisition company sponsored by CITIC Capital.[5] In its SEC filings, CCAC stated that "CITIC Capital, which owns our sponsor and is our affiliate, is a global alternative investment management and advisory firm with a strong and established position in China ... We intend to draw upon CITIC Capital's infrastructure, personnel, network and relationships."[6] At the time of its SEC registration, the founder and CEO of CCAC, Fanglu Wang, was "a senior managing director of CITIC Capital" [7] and "a managing partner of CITIC Capital Silk Road Fund."[8] CITIC Capital previously described itself as "the international investment banking arm of CITIC Group," [9] which is known as "China's most influential conglomerate,"[10] and owned by the Chinese Communist Party.

---

[1] *Triton Leadership Team*, TRITON SYSTEMS, *available at* https://tritonsystems.com/about/leadership-team/ (last visited Mar. 19, 2025).
[2] Ross Haghighat, LINKEDIN, *available at* https://www.linkedin.com/in/ross-haghighat-4875229/ (last visited Mar. 19, 2025),
[3] SBA, *SBIR.gov Portfolio Award Data, available at* https://www.sbir.gov/awards.
[4] Frank Esposito, *$22 million investment to help FRX grow in China*, PLASTICS NEWS, (Sept. 9, 2016), *available at* https://www.plasticsnews.com/article/20160909/NEWS/160909798/22-million-investment-to-help-frx-grow-in-china.
[5] *CITIC Capital Acquisition Corp. Appoints Ross Haghighat to the Board*, MARKETSCREENER (May 7, 2020), *available at* https://www.marketscreener.com/quote/stock/CITC-CAPI-105997940/news/CITIC-Capital-Acquisition-Corp-Appoints-Ross-Haghighat-to-the-Board-33878787/; Press Release, BUSINESSWIRE, *CITIC Capital Acquisition Corp. Secures $125 Million Capital Commitment from Global Emerging Markets in Advance of Planned Business Combination with Quanergy,* (Dec. 14, 2021), *available at* https://www.businesswire.com/news/home/20211213006137/en/CITIC-Capital-Acquisition-Corp.-Secures-%24125-Million-Capital-Commitment-from-Global-Emerging-Markets-in-Advance-of-Planned-Business-Combination-with-Quanergy.
[6] FORM S-1 REGISTRATION STATEMENT, SECURITIES AND EXCHANGE COMMISSION, *CITIC Capital Acquisition Corp*, Page 2, (Nov. 27, 2019), *available at* https://www.sec.gov/Archives/edgar/data/1794621/000095012319011679/filename1.htm#bc828746_1
[7] *Id.* at 2.
[8] *Id.* at 2.
[9] Press Release, *CITIC Capital and CITIC Securities Join Forces to Create an Integrated, Cross-Border Equities Business,* CITIC Capital, *available at* https://www.citiccapital.com/News%20Files/2006-0116%20CITIC%20Capital%20and%20CITIC%20Securities%20Join%20Forces%20to%20Create%20an%20Integrated,%20Cross-Border%20Equities%20Business.pdf (last visited Mar. 19, 2025).
[10] Shen Hong and Ned Levin, *China's First Capitalist Firm Gets Approval for $37 Billion Deal,* WALL ST. J., *available at* https://www.wsj.com/articles/shareholders-approve-citic-pacifics-37-billion-takeover-of-state-owned-parents-assets-1401791756.

Additional information provided by the company's attorney for the record claims that "no SBIR data or funding has been involved in any of the matters"[11] including FRX Polymers and that "Triton has not licensed or transferred any technology derived from SBIR-related funding to FRX." However, a publication from the U.S. Navy SBIR-STTR programs office states that the fire-retardant technology developed by Triton Systems through SBIR awards (under the topic number N02-207/2) "enabled the founding of a spinoff company, FRX Polymers."[12] Mr. Haghighat also maintained board seats at FRX Polymers and Chinook Therapeutics when they pursued joint venture agreements with Chinese entities.

Navy SBIR/STTR Success

Firm: Triton Systems, Inc.
200 Turnpike Road
Chelmsford, MA
01824

Topic: N02-207/2

SBIR Investment: $524K

Project Revenue: $21M

SYSCOM: ONR

Published: 2011

Title: Fire Retardant Blast Mitigation for Sea Vessels

Unprotected Walls Can Collapse and Send Dangerous Debris into Building

Walls with Protective Fire and Blast Coating Deflect, but Do Not Collapse

"The technology provides tremendous potential to help protect Navy personnel and equipment against fragmentation in the event of a targeted explosion aimed at a surface vessel."

About the Technology:

- The purpose of this project was to develop and demonstrate a fire and blast mitigation system to protect Navy ship structures.
- Triton Systems Blast mitigation technology provides force and infrastructure protection by preventing fragmentation and wall collapse.
- The blast mitigation technology incorporates fire retardance that is: non halogenated, environmentally friendly, non volatile, non migrating (does not migrate out of host plastic), highly flame retardant and melt processable, and requires minimal change to the mechanical properties of its host plastic.
- This blast mitigation technology has transitioned to both Air Force and Department of Homeland Security for applications requiring critical asset protection against blast threats.
- This technology has enabled the founding of a spinoff company, FRX Polymers. The spinoff company has been able to raise over $14M from a global institutional base. FRX has recently commissioned tow pilot plants in Chelmsford MA, a semi-works plant in Europe (Switzerland) and is now planning a second production plant in Europe. FRX is currently executing over 50 market development programs with leading chemical suppliers.

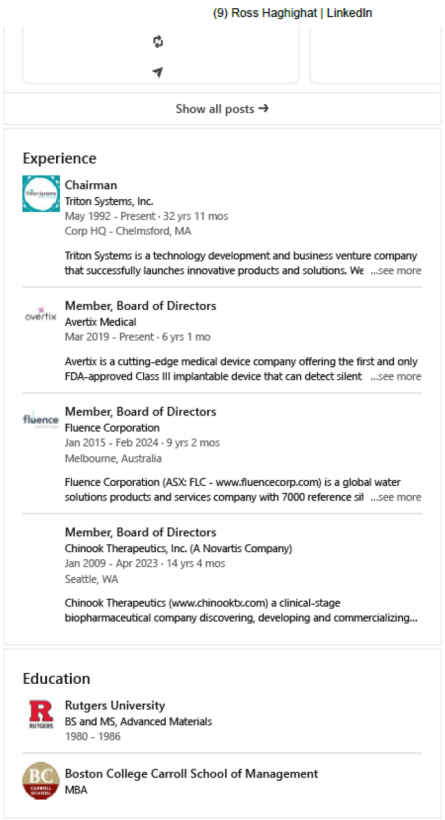
In addition to no longer being listed as CEO on Triton's website, it appears that Mr. Haghighat has attempted to scrub public records of his ties to Triton's China-linked spinoffs. When accessed

---

[11] *Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century Hearing Before the S. Comm. on Business and Entrepreneurship*, 119th Cong. (March 5. 2025) (statement submitted by Keith Schomig), PAULHASTINGS, Triton's Expanded and Clarified Testimony on Mar. 19, 2025).

[12] U.S. NAVY, OFFICE OF NAVAL RESEARCH, *Navy SBIR/STTR Success: Fire Retardant Blast Mitigation for Sea Vessels, Triton Systems*, *available at* https://www.navysbir.com/success/docs/Triton_Systems-N02-207.pdf

on March 5, 2025, Mr. Haghighat's LinkedIn profile referenced that he was Chairman of the Board at FRX Polymers, also known as FRX Innovations, until January 2025, but this leadership role has since been removed from his profile. He remains the Chairman of Triton Systems.



April 9, 2025

Follow-Up Questions for the Record

Questions for Mr. Mahmud

Questions from: Senator Cantwell

Defense and Research Funding

Dr, Mahmud, I was pleased to hear of your business connections to Washington state. Thank you for testifying.

Washington state has received 4,580 SBIR awards, totaling over $1.6 billion. I was glad to hear of your substantial work in Washington state. Washington state is consistently in the top 15 states for number of SBIR awards and funding. That includes companies that are helping with military innovation and readiness. For example, Starfish, in King County, has received $12 million in SBIR funding to help develop a satellite servicing vehicle to meet Air Force needs. In addition to supporting the Air Force, SBIR funding for this project helps the local economy. Starfish has hired 44 employees and is still hiring more. Another example is the Ultra Safe Nuclear Corporation, headquartered in Seattle. USNC has worked with NASA and the Defense Department on nuclear thermal propulsion systems, advanced radioisotope power, and more. They've received $1.2 million in SBIR funding since 2020.

QUESTION 1:

Can you describe the impact that SBIR recipients like your company, Triton, have on local economies?

ANSWER 1:

The impact of SBIR recipients on the local economy is probably one of the most significant benefits of the SBIR program and is often underestimated when the attention is focused on major success stories only. To win and execute highly competitive SBIR programs successfully through Phase 1, 2 and transition requires a high level of technical skill and innovation. This leads to the nurturing of unique skill sets and capabilities, that then become embedded in the local economy. The impact on the local economy is further enhanced often by strong collaboration with neighboring academic institutions - which are also a source of new hires and interns, neighboring manufacturing facilities and supply chain vendors. This in turn leads to enhanced work force training, sustainable job growth and a sustained positive impact on the local economy.

Also due to the entrepreneurial nature of a small business pursuing a new idea, the SBIR recipient company will also nurture many skilled and innovative employees who may go on to form their own companies with the next great ideas. These small businesses will also tend to stay local. The end result of this virtuous cycle is an ecosystem where the local economy and region becomes a nexus for a highly skilled labor pool with multiple businesses providing well paid jobs and an innovation ecosystem sustainably supporting the local economy.

Triton is a good example of this multiplier effect on the local economy. The company is strategically located at the intersection of I-495 and Route 3 in Massachusetts, and is a leader in the newly established Route 129 technology corridor, driving innovation in defense and aerospace manufacturing. Triton's newly built facility was designed to support cutting edge research and product development, but is increasingly involved in manufacturing products for the Department of Defense (DoD). This year Triton announced expansion plans for an additive manufacturing facility in the same technology corridor, enabling the production of large-scale, high-performance metallic components critical to the U.S. defense and aerospace sectors. To quote Paul Cohen, Chelmsford (MA) Town Manager, "Triton has repeatedly demonstrated its commitment to the Town of Chelmsford and to the Route 129 corridor, first with its state-of-the-art R&D center on Billerica Road, and now with this cutting-edge manufacturing facility on Apollo Drive. Triton is an excellent employer, contributor to the local economy and a great neighbor." The impact on the local economy is further multiplied by the strong collaboration with the neighboring University, University of Massachusetts, Lowell, which is a comprehensive win-win relationship consisting of collaboration with faculty to reduce ideas to practice, use of shared facilities, and hiring and training opportunities for students. The University has recognized Triton with the 'preferred industrial partner' designation the last few years.

Additionally, many skilled personnel at Triton have acquired the necessary skills to start their own company. While many of these new companies established their operations in the local region, I would also like to add that the impact can be much broader, not only primarily on the local economy. As an example, partnerships like the one mentioned above with a Washington state based company, in the case of Triton, will lead to a significant expansion in manufacturing capability in the State of Washington to support DoD needs. The associated supply chain being built up will have a significant impact across six states. Partnerships with companies and universities across states to reduce an idea to practice, often lead to crucial seed funding for a new start up in a different state than where the SBIR awardee initially developed the idea.

QUESTION 2:

You mentioned the need to improve geographical distribution in your testimony. Do you have any thoughts about how SBA could increase SBIR participation among small countries in rural areas, like Eastern Washington, or rural Iowa?

You spoke of the importance of DoD's SBIR program supporting companies that may make products that are important for defense, but don't have a commercial use. But the opposite can be true, too. As I believe you observed, some DOD-funded research translates to commercial benefit – the Internet for example – in some cases, the defense purpose may initially be elusive but the commercial opportunity may give birth to a business.

ANSWER 2:

Further improving the geographical distribution of the SBIR awards is very important. SBIR is likely to be the only source of seed capital investment in rural areas as most venture capital type early-stage funding, tend to be narrowly focused geographically and have an even narrower focus in their choice of technology space. For example, in 2024, only 5 states accounted for 61% of all venture deals (https://ssti.org/blog/useful-stats-state-us-venture-capital-2024) and Artificial Intelligence related ventures accounted for 46% of total venture capital investment value (https://www.bipventures.vc/news/2024-venture-capital-investment-trends-and-impacts-report).

Improving the geographical outreach of the SBIR program further, will require a number of efforts in parallel and working closely together. We would like to propose these steps for consideration by the Committee:

I) Improved outreach efforts - strengthening outreach efforts, using programs like the Federal and State Technology (FAST) Partnership program, and allocating funding to the agencies for specific outreach efforts for rural communities. This can be further facilitated by making outreach a core part of the responsibilities of the government program managers responsible for managing the SBIR programs.

II) More effective use of the regional academic hubs - these institutions already have significant infrastructure in place to provide both technical, facility and administrative support for small businesses to compete, win and execute SBIR programs. As possibly the only innovation program accessible to the region, these institutions need to make supporting the small business applicants a core part of their mission.

III) Focus of the agencies to support first time awardees particularly in the rural areas - most often the first award to a business in a rural area is also the first encounter with a government agency regarding technology innovation, and it is critical that the small business execute it's first program in a spirit of partnership with the government agency personnel to ensure a positive outcome. Multiple successes in a region soon become self-sustaining. This will require focused support from the agency.

IV) Initiation of a mentor-protege program to support first time awardees and applicants to the program – most experienced firms and larger government contractors would (in our opinion) be very willing to support such a program where the experienced government contractor is the mentor and the first-time awardee is the protege. One

model is the DoD mentor-protégé program which partners small businesses with experienced primes (https://business.defense.gov/Programs/Mentor-Protege-Program).

QUESTION 3:

Can you speak to how DoD funding can have value to society, even where the funded research doesn't meet the needs for the core mission of the Department of Defense?

ANSWER 3:

The Defense Acquisition University's definition of DoD's core mission areas as identified under the most recent Quadrennial Roles and Missions (QRM) review include Homeland Defense and Civil Support (HD/CS); Deterrence Operations; Major Combat Operations (MCOs); Irregular Warfare; Military Support to Stabilization Security, Transition, and Reconstruction Operations; Military Contribution to Cooperative Security. Taken in their entirety, unless unique to the development of military weapons, DoD funding routinely adds value to society through commercial markets, which often outpace the transition of the technology to DoD. One of the best examples of how technology developed with an eye toward supporting the core mission of DoD often results in providing equal or greater value to society, is the Defense Advanced Research Projects Agency (DARPA). DARPA is a DoD agency chartered to pursue transformational innovation that helps keep the US at the leading edge of technology advances. A key to their success is built into the way DARPA brings people in from different parts of the technical community for short periods of time to identify and start projects: technical leaders in their fields; people who come with backgrounds in the commercial or defense industry; entrepreneurs or people who have worked in big companies; people from every part of the not-for-profit community and from universities. The projects end when the technology risk has been reduced and it can be handed off to industry for transition to DoD, commercialization or stopped if they are not making adequate progress. Well known examples of DoD investments leading to widespread commercial success include microwave technology (1940s), satellite technology leading to GPS, the microchip (used now in every electronic device), smart phones, voice recognition and numerous other examples that are now an essential part of daily life.

QUESTION 4:

In your testimony, you said that the SBIR program should be made permanent to give small businesses and agencies more certainty. Can you expand on that?

ANSWER 4:

Uncertainty is the biggest risk for any business, big or small, and predictable cash flow is the life blood of small businesses. For small business owners and entrepreneurs, managing cash flow

largely determines the ability for a small business to survive and retain its workforce. Lenders also look at cash flow forecasts for determining lines of credit, which may also be critical for managing a small business. Long contractual delays and uncertainty for an SBIR awardee make it very challenging to plan ahead, retain the confidence of lenders and investors, make the investment in equipment and personnel, and retain the skill sets and facilities necessary to execute on a contract when awarded. The SBIR reauthorization history is such that reauthorization typically happens towards the later half of the year. Further reauthorization periods have been gradually reduced from 8 years, to 5 years, to 3 years (in the last reauthorization bill passed in 2022). As the deadline for reauthorization approaches, it is natural that agencies will slow down the process for future commitments as there is uncertainty. The government administrative and contracting machinery then must be restarted once the reauthorization is in place, leading to additional delays in contracting. These delays pose a significant additional challenge for small businesses as described above.

QUESTION 5:

You mentioned that there are already delays in the SBIR contracting process. Can you talk about the importance of the SBA workforce in the contracting process?

ANSWER 5:

I do not have sufficient insight into government organizations to be able to provide input on this.

Questions for Mr. Mahmud

Questions from: Senator Hirono

Reauthorization of SBIR

Mr. Mahmud, given your role within an innovative business that has received several awards through the SBIR and STTR programs, you have firsthand experience dealing with these programs. I have been a longtime supporter of the programs, and I am interested in bipartisan changes that could improve the programs – before they expire later this year.

QUESTION 1:

What would you say are the highest priorities for a potential reauthorization of the SBIR and STTR programs?

ANSWER 1:

A. Incentives for Transitioning Technologies to Phase III

Despite multiple efforts in Congress to address the barriers, transitioning SBIR technologies to Phase III remains extremely challenging to most small businesses. In particular, as it relates to DoD, it is well known that most military platforms are built by only a few large prime contractors. Because small businesses will be selected to primarily build components or sub-components of the entire system, it is very challenging for the small business to mature, derisk, qualify and integrate the technology into the platform in isolation. Meaningful incentives in the SBIR legislation for the prime contractors to adopt new innovations from small businesses, as well as recognizing government program managers for their success in doing so, would greatly facilitate this effort.

B. Improving the Contracting Process

Long delays in the contracting process may result in the small business being unable to survive such a delay or losing personnel with critical skills. The SBIR legislation could mandate standardized contracts for each agency for Phase I and II programs, to streamline the process to the greatest extent possible.

C. Improving Geographical Distribution

The SBIR program plays a critical role in providing seed funding for small businesses. Unlike venture capital, which is often concentrated in a few technology sectors and geographical regions of the U.S., SBIR awards help thousands of new businesses engage with the federal government each year across diverse sectors and geographical areas. Improved utilization of the already existing college and other educational center infrastructure to create SBIR hubs to provide support to first time applicants and awardees in

rural areas, would greatly improve the geographical distribution. Strengthening outreach efforts, such as through programs like Federal and State Technology (FAST) Partnership program and allocating funding specifically for outreach initiatives can help broaden participation. Collaboration of first-time awardees with experienced firms and large government contractors, skilled in transitioning technologies through a mentor-protege program can also help ensure greater success. Expanding the program and the number of Phase 1 awards, will also provide more opportunities for under-represented geographical areas to benefit from SBIR awards.

D. Making the SBIR Program Permanent or Long Term

Making the program permanent or extending for 5-8 years, as was the case in earlier reauthorizations, will give the small businesses better capability to plan and manage cash flow and investment decisions.

QUESTION 2:

Can you speak to the importance of making sure innovative businesses that have a track record of success can continue to participate in the programs?

ANSWER 2:

I can speak to this primarily from Triton's experience as a DoD contractor. The defense industrial base faces critical challenges, for example: a) after decades of consolidation there are fewer than 10 major defense prime contractors in industry b) the small business industrial base is shrinking – according to one report, the number of small businesses participating in defense contracting has fallen by 32% between 2014 and 2023 (https://www.governing.com/management-and-administration/small-businesses-arent-getting-enough-defense-work-heres-how-to-help-them). In parallel, to counter current and emerging threats, and protect the US technology lead, DoD has rightfully instituted significant compliance standards for protecting sensitive technology. It is our opinion, that companies that have a track record of success and innovation as a small business, and are experienced DoD suppliers (for example can meet all of the required security, administrative and financial requirements to be a qualified supplier), can fill a unique and critical role in the US innovation ecosystem for sustaining technology leadership that cannot be easily replaced. Some characteristics of such companies include: a) investments made in facility security, contracting and related infrastructure to be in compliance with stringent DoD requirements for processing sensitive information and technologies b) experience in working with academic institutions and federally funded research laboratories to reduce ideas to practice, specially where the technology maybe restricted (for example, has ITAR constraints) c) experience in working with the large prime defense contractors in transitioning a component technology into a DoD platform owned by the prime contractor and d) ability to solve agency problems or challenges by bringing together

sufficient diversity of disciplines rapidly and at relatively low cost (compared with a large defense contractor).

April 9, 2025

The Honorable Joni Ernst
Chair
Committee on Small Business and Entrepreneurship
U.S. Senate
Washington, DC 20510

Re: Responses to QFRs following the hearing titled "Golden Age of American Innovation: Reforming SBIR-STTR for the 21st Century"

Questions from Senator Cantwell

Question 1:
Can you share your thoughts on what more SBA could do to better use existing programs such as the SBIR and STTR to improve access to capital for entrepreneurs and other small businesses helping grow these regional Tech Hubs?

Answer: Senator Cantwell, American innovation is endemic across the United States. While there is a perception that innovative companies might only occur in a few concentrated geographies like Silicon Valley, CA; Seattle, WA; Boston, MA; among others, the reality is entrepreneurs building compelling technology is ubiquitous.

Despite this point, NVCA's 2025 Yearbook cites that fundraising in non-prime ecosystems has actually more than doubled in the last decade, increasing from 5.9 billion in 2014 to 12.2 in 2024. In Washington specifically, $28.4 billion of VC investment went to over 2300 startups between 2019 and 2023. In 2022 alone, 240,000 Washingtonians were employed by VC backed startups.

I raise this to underscore the value that venture capital already brings to nontraditional tech hubs. For the United States to compete in an ever growing competitive global market, companies need access beyond that of Federal Government grant programs. The need for growth and scale is more prevalent in technology industries tied to semiconductors and other critical technology areas.

That said, additional non-dillutive grants are only additive for our portfolio companies. The Economic Development Administration has played an important role supporting R&D through the regional tech hubs program. It is too soon to tell on the success of this program, but looking ahead, prioritizing the development of critical technologies in grant program, encouraging regional interconnectivity, and recognizing the value of federal dollars in partnership with venture capital, will only further catalyze R&D across these areas and increase our nation's

competitiveness. I would encourage requiring additional education for entrepreneurs leveraging these programs to help them navigate their business decisions, especially as it relates to growing and scaling their businesses. Venture Forward's VC University provides a curriculum that demystifies working with VCs.

Question 2:
You spoke of the need to better support VC-funded small businesses. I agree to some extent. Government can have a role where there may be more risk, but the potential innovation is critical. You suggested something that got my attention: strictly enforcing use of open interoperability standards. This could be counterintuitive where a new company may want to control its intellectual property. Can you clarify what you mean?

Answer: Thank you for the thoughtful question. You are absolutely right that venture-backed startups rely heavily on the protection of their intellectual property as a core component of their business strategy. My suggestion to support open interoperability standards is not intended to diminish that value. Rather, it is to promote a framework that allows diverse technologies to operate together effectively while still preserving the proprietary innovation of individual firms.

Open standards do not preclude companies from building differentiated or defensible products. In fact, history shows us that interoperability can be a powerful enabler of both innovation and commercial success. A well-known example is TCP/IP, the set of communication protocols that underpins the modern internet. These standards did not emerge through formal regulation. Instead, they were developed and adopted as a result of real-world best practices that demonstrated their utility. TCP/IPs widespread adoption allowed an entire ecosystem of companies to flourish, from early infrastructure providers to today's cloud computing leaders. Crucially, companies built on top of these open standards, retaining their intellectual property and creating immense enterprise value.

In the context of national security and emerging technology, the stakes are even higher. If each new company fields a closed and incompatible system, we risk building a fragmented technological landscape that impedes operational effectiveness. This unfortunate reality is what underpinned the push for the multi-billion dollar Joint All-Domain Command and Control (JADC2) program. Essentially, the military systems cannot effectively communicate with one another e.g. an F-35 cannot communicate with an F-22 despite both being developed by Lockheed Martin. Encouraging the use of open standards ensures that capabilities developed by small businesses and venture-backed startups alike can scale and integrate into the broader defense ecosystem. This is particularly important in fast-moving domains such as artificial intelligence, autonomous systems, and communications technologies, where modularity and integration are essential for mission success.

The role of the government here is not to impose rigid requirements, but rather to accelerate the adoption of best practices through its procurement power. By favoring solutions that adhere to

open, interoperable frameworks, agencies can shape a more cohesive innovation environment. Over time, these practices can evolve into de facto standards that benefit the entire ecosystem while preserving the intellectual property rights and commercial interests of the startups developing these technologies.

In short, enforcing open interoperability standards does not inhibit innovation. It enables it by allowing the best technologies to work together and reach scale in service of both national security objectives and commercial viability.

U.S. Senate Committee on Small Business and Entrepreneurship

"Reforming SBIR-STTR for the 21st Century"

Responses for the Record:

Submitted to Senator Hirono

By Mr. Austin Strawhacker

Associate State Director

America's Small Business Development Center Iowa

Iowa State University, Ivy College of Business

1. ***What questions do these businesses generally have about the SBIR and STTR programs?***

Our client interactions vary significantly based on the stage of business development, with the majority of entrepreneurs in the ideation phase. These early-stage clients often seek foundational guidance such as:

- How do I protect my intellectual property?
- What are the SBIR/STTR programs?
- Which federal agencies participate in and fund SBIR/STTR?
- What is the application process for SBIR/STTR funding?
- How do I identify and track new SBIR/STTR funding opportunities?
- How frequently do agencies release Requests for Proposals (RFPs)?
- How do I formally start my business, obtain an EIN, and open a bank account?

In addition to answering these questions, we guide clients through the Business Model Canvas, which helps them begin to conceptualize the commercialization path alongside the development of their innovation. This framework plants the initial seed that successful innovation must also solve a market need, not just a technical one.

For clients in later stages—those with a developed concept or early prototype—we continue to support commercialization planning. If they have not yet completed a Business Model Canvas, we facilitate that process. We also assist with:

- Customer discovery planning to identify potential markets and ensure alignment between their innovation, federal agency interests, and commercial viability.
- Team development: helping to identify and integrate individuals with complementary skill sets.
- Proposal development tools, such as TurboSBIR, which streamlines the drafting of SBIR/STTR applications.

- Access to state-backed technical writing resources for support in responding to RFPs.

At this stage, clients frequently ask:

- What are the required components of a competitive proposal?
- Which agencies best align with my innovation?
- How long does the SBIR/STTR process take?
- What must be included in my project budget?
- Are there tools or platforms available to support the proposal development process?
- How can I effectively connect with a program manager for a specific opportunity?

We also provide post–Phase I support, including:

- Phase II application preparation
- Budget review and optimization
- Ongoing team development
- Intellectual property protection strategies post-research

Our holistic, stage-specific approach ensures that innovators receive the right guidance at the right time—accelerating both their technical development and their path to commercialization.

2. *What barriers do they face to accessing the programs?*

Small businesses—especially those in rural areas—face multiple barriers when trying to access the SBIR and STTR programs:

- **Cumbersome and complex application process**: The application process is highly technical and resource-intensive. For many first-time applicants, especially in rural regions, it can be intimidating and difficult to navigate without experienced guidance. The depth of scientific, financial, and commercialization information required can deter otherwise qualified entrepreneurs who lack grant-writing expertise.
- **Insufficient feedback on declined proposals**: When a company's application is unsuccessful, they often receive little to no feedback on what went wrong. This lack of transparency hinders their ability to improve and resubmit a stronger proposal. Some are declined due to relatively minor issues that organizations like SBDCs could easily help address—if only they had insight into the specific problems.
- **Geographic inequity in awards**: Public data shows that five states receive 46% of both the total number of awards and the total award dollars. This creates a disproportionate advantage for companies in those regions, while innovative companies in states like Iowa struggle for equal consideration. This geographic imbalance makes it harder for rural or Heartland-based entrepreneurs to compete on a level playing field.

- **Limited early-stage support**: There's a significant need for funding and support at the idea exploration stage—before entrepreneurs are ready for full Phase I feasibility and commercialization. Without this early validation funding, many promising technologies never make it to the proposal stage.

3. ***How can we make it easier for them to access the programs?***

There are several targeted improvements that could dramatically increase participation and success for underrepresented businesses:

- **Streamline the application process and add smaller early-stage awards**: Introducing smaller, pre-Phase I awards would allow companies to assess the commercialization potential of their technologies early on. This would lower the threshold for entry, particularly benefiting first-time applicants and rural entrepreneurs, who often don't have the capacity to immediately meet the demands of a full Phase I proposal.
- **Improve transparency and feedback for rejected applications**: Agencies should provide detailed, structured feedback to applicants whose proposals are declined. With better insights into reviewer concerns or common mistakes, entrepreneurs can make the necessary adjustments and increase their chances of success on subsequent submissions.
- **Address geographic disparities**: Recognizing that innovation exists everywhere, the programs should implement measures that prioritize outreach, evaluation fairness, and regional training to ensure small businesses across the country—including in rural and less populous states—can compete effectively.
- **Support regional collaboration and best practice sharing**: Initiatives like the "Great Plains SBIR" working group (covering Iowa, Kansas, Nebraska, and Oklahoma) are effective in creating a stronger regional support system. These types of partnerships should be encouraged and supported as a way to expand capacity and knowledge-sharing among SBIR/STTR support professionals.

4. ***Can you speak to the importance of the FAST program to making sure more businesses can participate in the SBIR and STTR programs?***

The FAST program is an important, complementary program in expanding access to the SBIR and STTR programs, especially for entrepreneurs who may not otherwise have the resources or guidance to pursue federal R&D funding.

- **FAST bridges the gap between innovation and opportunity**. In Iowa, for instance, FAST funding enables America's SBDC Iowa to identify high-tech businesses early in their development and guide them through proposal writing, commercialization planning, and IP strategy—tailored, technical support that makes a real difference in applicant success rates.
- By supporting statewide and regional outreach, training, and mentorship, FAST ensures that **more geographically dispersed businesses** can compete effectively. The result is not only a broader pool of applicants but also stronger proposals that are more likely to secure funding.

- FAST strengthens partnerships between small businesses and organizations like universities, SBDCs, and economic development agencies, creating a more robust pipeline for innovation and commercialization.

5. ***Why is it so important that we continue to fund the FAST program?***

Continued investment in the FAST program is critical to ensuring that the SBIR and STTR programs remain inclusive, effective, and impactful across the country:

- **FAST empowers non-traditional entrants and rural communities**. It helps level the playing field by providing targeted technical assistance to entrepreneurs who might otherwise lack access to the expertise needed to compete for SBIR/STTR funding. This is especially vital in states like Iowa where many high-potential businesses are located outside traditional innovation hubs.
- **FAST enhances program outcomes**. By improving the quality of proposals and increasing the number of competitive applicants, FAST leads to more successful awards, stronger commercialization outcomes, and greater return on federal investment.
- **It multiplies the economic impact**. FAST-funded efforts often lead to job creation, follow-on private investment, and the scaling of small businesses that are developing cutting-edge technologies. The long-term effects include stronger local economies and more resilient innovation ecosystems.
- **Without FAST, critical support disappears**. The kind of intensive, hands-on assistance that FAST funds—like proposal development, IP guidance, and market analysis—is rarely available elsewhere at no cost to the entrepreneur. Eliminating FAST would mean fewer businesses participating and succeeding in the SBIR/STTR programs.