

SBIR/STTR Matching Fund

Impact Report 2023



Launch
Tennessee

Introduction

Over the past five years, LaunchTN has worked to bolster startup activity and increase participation from Tennessee entrepreneurs in what's colloquially known as America's Seed Fund.

Every year, 11 participating federal agencies allocate capital totalling \$4 billion to SBIR/STTR programs. The programs are the country's biggest source of early-stage funding for research and development.

LaunchTN supports founders' applications to the federal programs, and if the founders land that funding, then LaunchTN invites the company to apply for matching funds.

LaunchTN has deployed matching funds to more than 130 Tennessee companies.

Those funds have gone on to create 650 jobs that have an average of more than \$80,000 a year. Tennessee companies that have received SBIR/STTR Matching Funds have created nearly \$350 million in total economic impact.¹ This report further illustrates the value that commercialization has had on the state of Tennessee.

LaunchTN aims to continue these research-and-development investments through these programs, which have demonstrated an enormous economic impact.

With our support in preparing applications to the SBIR/STTR programs and Tennessee's commitment to investing in technology innovation, **Tennessee founders are able to better compete for federal funding while successfully navigating early stage technology commercialization.**

Charles Layne
LaunchTN Innovation Manager



The LaunchTN Microgrant Program

Through the Microgrant Program, LaunchTN provides technical support to founders applying for federal SBIR/STTR funds.

LaunchTN is thankful for the opportunity to participate in the SBA Federal and State Technology (FAST) Partnership Program, which supports the commercialization efforts of Tennessee entrepreneurs involved in the microgrant program.

"Receiving support from LaunchTN through the Microgrant Program assisted us in preparing a successful SBIR application to the National Science Foundation, which we used to develop the technology to a point to raise outside capital."

– Deanna Meador,
Couture Technologies
CEO



¹Total economic impact is calculated using wages, capital raised, and grants leveraged.

The SBIR/STTR Programs

The SBIR/STTR programs, colloquially known as America's Seed Fund, are the country's biggest source of early-stage funding for research and development.

America's Seed Fund is composed of two programs:

- Small Business Innovation Research (SBIR)
- Small Business Technology Transfer (STTR)

Every year, the 11 participating federal agencies provide non-dilutive funding for the commercialization and development of innovative technologies in the United States.



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The focus on commercialization — bringing founders from lab to market — is an essential component of **creating a thriving state economy.**”

Commissioner Stuart McWhorter

Tennessee Department of Economic and Community Development

SBIR/STTR phases

PHASE 1

- Proof of Concept
- 6-12 months
- Federal Award between \$50,000 - \$275,000

PHASE 2

- Technology Development
- 24 months
- \$750,000 - \$1.8 million

PHASE 3

- Commercialization
- Unlock sole source access to the \$665 billion federal contracting marketplace



The Federal SBIR and STTR Programs

SBIR: *Small Business Innovation Research*

STTR: *Small Business Technology Transfer*

These programs are highly competitive and encourage U.S. small businesses to engage in federal research and development with the goal of getting innovative technologies into the commercial market.

The awards-based programs provide the incentive to small businesses to profit from commercialization and allows entrepreneurs to explore their tech potential.

The programs allow small businesses to finance high-risk, state-of-the-art technologies, such as:

- developing a prototype or proof of concept
- buying equipment, materials
- hiring subject matter experts or technical staff
- funding partnerships with universities



Mission

The SBIR/STTR programs boost the national economy by investing in scientific excellence and technological innovation.

The program's goals are to:

- stimulate technological innovation
- meet federal research and development needs
- increase diversity in entrepreneurship and innovation
- boost private sector innovations funded by federal research and development dollars

In addition, the STTR program aims to:

- Foster technology transfer through cooperative R&D between small businesses and research institutions

More about STTR

Partnerships between small businesses and nonprofit research institutions are essential to the STTR program, which has two phases of formal collaboration with each research institution.

Launch Tennessee SBIR/STTR Matching Fund Eligibility

To be eligible, companies should be startups in Tennessee that contribute to the state's overall economic development, and they should also align with LaunchTN's mission to support entrepreneurship and innovation.

By accepting a Matching Fund award, a company commits to remaining headquartered in Tennessee for at least 24 months post-award and to semi-annual reporting with LaunchTN.

Federal SBIR eligibility

Companies must be/have:

- for-profit entities located in the U.S.
- fewer than 500 employees
- owned and controlled by U.S. citizens or permanent residents

State matching fund eligibility

Companies must:

- have an SBIR/STTR Notice of Award date between July 1, 2022 and June 30, 2023
- be a startup in accordance with LaunchTN's mission to support entrepreneurship and innovation across the state
- demonstrate a pathway to commercialization
- commit to remaining headquartered in Tennessee for at least 24 months post-award, and to semi-annual reporting with LaunchTN.

Company prioritization

- Prioritized industries: life sciences/biotech, advanced energy/cleantech, agtech, automotive/mobility industries, and financial technologies
- Companies are also prioritized if they:
 - are first-time applicants to both federal and state SBIR/STTR
 - received a commercialization microgrant from LaunchTN that led to an application to the Commercialization Matching Fund.
 - are from underrepresented counties
 - are applying for Phase II matching funds that previously received matching funds for Phase I applications



Program Metrics

Since 2017, the SBIR/STTR Matching Fund Program has supported 133 companies, more than 75 percent of which are women, minority or veteran-led.

Further, 18% of LaunchTN's equity investments to date have gone to companies benefitting from existing LaunchTN commercialization programs.

Program Overview

171 Total number of companies

that applied to SBIR/STTR Matching Fund Program since 2017.

FY18 • 14 companies
FY19 • 18 companies
FY20 • 34 companies
FY21 • 44 companies
FY22 • 61 companies

133 total number of awards matched through SBIR/STTR Matching Fund Program

76% percentage of applications matched through SBIR/STTR Matching Fund Program

9.7 average years of employment of companies supported through SBIR/STTR Matching Fund

8.4 average yearly lifespan of companies supported through SBIR/STTR Matching Fund



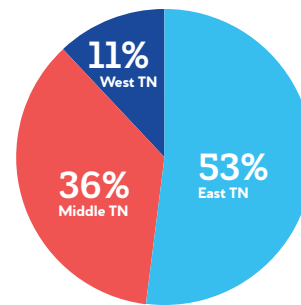
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The benefits of the SBIR/STTR Matching Fund are vast. And the funding supports founders from diverse backgrounds, industries and locations. **It's a great advantage for our state and its economy as we look to innovate and lead the way in technological advances.**”

Rep. Patsy Hazlewood

(R-District 27) + LaunchTN Board member

Geographic Breakdown*



15 West Tennessee companies

70 East Tennessee companies

48 Middle Tennessee companies

**Of this 100 percent, 15 percent of companies were in rural areas*

Industry breakdown



Industries of companies receiving SBIR/STTR Matching Funds include:

- Life sciences and biotechnology
- Advanced energy and cleantech
- Transportation and mobility
- AgTech
- EdTech
- Cyber Security
- Artificial intelligence
- ConstructionTech
- Wearables and fashion tech



SBIR Matching Fund

Entrepreneur Success Stories

Dextrous Robotics

The startup is building robots for logistics. The company's smart robots can unload a trailer three times faster than a human.

CEO Evan Drumwright

Location Memphis

Year of Award 2021

Fast fact The picking appendages were modeled after chopsticks, and allow the robot to pick a variety of sizes and textures, just like the eating utensils.

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"There's always going to be a need in logistics to move things as quickly as possible. Phase II funding would allow us to work on getting our robots to manipulate robustly at higher speeds. It will also help us cross over from the lab environment to customer environments as we look to deploy our first robots."

— Evan Drumwright, Dextrous Robotics CEO, on what Phase II SBIR funding will support



Whisper Aero

The business, which came out of stealth mode in July 2021, is building an electric thruster that is meant to blend noise that comes from delivery drones into background levels so it becomes undetectable to the human ear. The company also hosted a Demo Day and brought venture capitalists from across the world to Crossville, TN.

CEO Mark Moore

Location Crossville

Year of Award 2022

Fast fact Whisper Aero is also working with Tennessee Tech University to build a wind tunnel.

Couture Technologies

The company's team is dedicated to creating the most accurate and efficient technology that allows customers to try on clothes virtually.

CEO Deanna Meador

Location Nashville

Year of Award 2020

Fast fact The technology the company works with is called VTO — virtual try on.



SBIR Matching Fund

Entrepreneur Success Stories



"SBIR matching funds help strengthen the economic development of Tennessee startup companies by providing critical funding for complementary activities to the R&D funded by the SBIR programs. It helps companies leverage SBIR-funded R&D results into real products, and enables us to make long-term investments in our communities, including high-paying jobs and infrastructure investments. SkyNano could not have made the progress we've made without this support."

— Anna Douglas, SkyNano CEO

SkyNano

Company overview: Science-based tech startup SkyNano is working on commercializing a free-market solution to carbon pollution.

CEO Anna Douglas

Location Knoxville

Year of Award 2019

Fast fact CEO Anna Douglas landed on Forbes 30 Under 30 list in Energy in 2019, and her startup was a finalist in Tesla founder Elon Musk's \$100 million XPRIZE Carbon Removal prize.

HD Clean

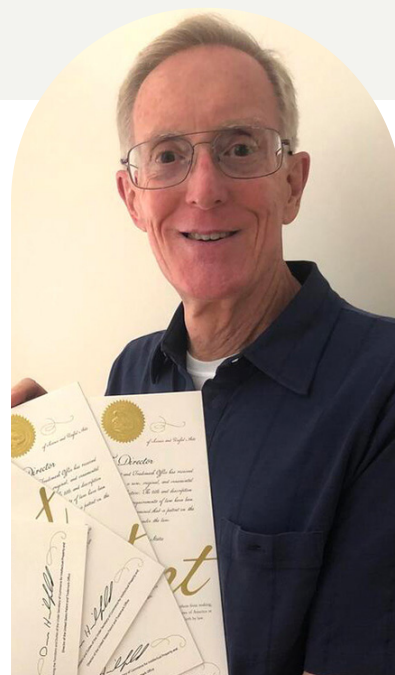
Company overview: HD CLEAN is a disabled Veteran-owned, sole-proprietor small business with a mission of bringing products to market that make dialysis safer.

CEO TJ O'Neil

Location Johnson City

Year of Award 2022

Fast fact HD CLEAN LLC was awarded the American Association of Kidney Patients' 2023 Jenny Kitsen Patient Safety Award. And O'Neil was named SBA Innovator of the Year in 2022.



Looking Forward

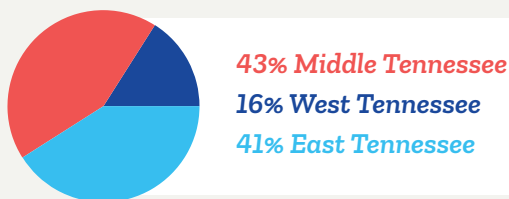
Due to the success of the program in supporting Tennessee entrepreneurs and the commercialization of innovative technologies across the state, Launch Tennessee looks forward to continued investment in the program which was recommended for annual recurring funds in the governor's budget this year.

As part of the SBIR/STTR Matching Fund Program, Launch Tennessee conducted mid-point interviews to understand the project's status and inform ways to support the commercialization efforts of the 37 entrepreneurs awarded \$7M in matching funds during the FY23 program year.

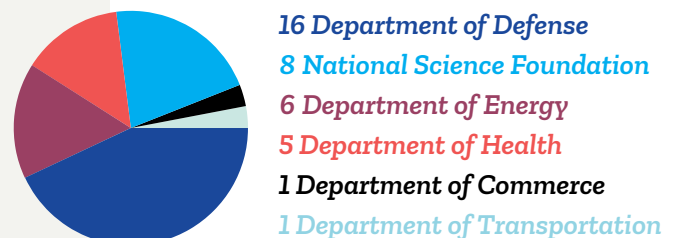
The following provides an overview of the entrepreneurs and innovators interviewed as part of the FY23 SBIR/STTR Matching Fund Program, and the feedback they provided for additional needs for innovation support in the state of Tennessee.

Of the 37 companies interviewed in FY23:

Geographic distribution



Agency breakdown

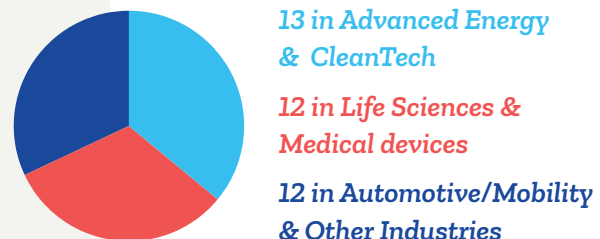


Commercialization breakdown



16 Raising Venture Capital
11 Pre-Revenue

Industry breakdown



Demographic breakdown



25 Diverse Leadership
11 Rural
4 Veteran
14 Woman Led



Results and recommendations

After interviewing the 37 entrepreneurs and innovators who participated in the FY23 SBIR/STTR Matching Fund Program, themes about how to improve commercialization efforts emerged.

LaunchTN used the feedback to create improvement recommendations based on existing innovation programs across the nation.

Recommendation 1



Create broader flexibility to match other sources of federal commercialization funds beyond the SBIR/STTR programs

With recent federal authorizations through the Bipartisan Infrastructure Law and the CHIPS and Science Act for research and development significantly exceeding the annual ~\$4 billion budget of the SBIR/STTR programs, LaunchTN is proposing expansion of the SBIR/STTR Matching Fund Program to include other federal commercialization programs, henceforth becoming the LaunchTN Commercialization Matching Fund.

In a survey of the existing LaunchTN Commercialization Portfolio, 42% of respondents reported applying to other commercialization programs beyond the Federal SBIR/STTR Programs.

Broader flexibility to match other commercialization awards would make applications from Tennessee companies more competitive for federal research and development funding, while further establishing Tennessee as the most startup friendly state in the nation.

Recommendation 2



Provide greater support for university startup formation and translational research efforts

Several companies participating in the SBIR/STTR Matching Fund Program during FY23, which were engaged in active partnerships with both university and industry partners, ran into administrative barriers surrounding their commercialization and translational research efforts.

Notably, these barriers included access to university resources, such as talent and innovation assets.

With dedicated proof-of-concept funds, LaunchTN could assist universities in building their capacity to support startups and their translational research efforts.

Recommendation 3



Give increased access to laboratory equipment for early stage commercialization and technology scaling

Over 50% of entrepreneurs in the LaunchTN SBIR/STTR Matching Fund communicated a need for additional lab equipment to scale their technologies.

And, many early state innovators and entrepreneurs need to make significant tech investments in order to synthesize and validate their work. They need to do this before they are able to generate revenue or get to the commercialization stage.

Additionally, the technology and lab equipment are capital intensive. It's not uncommon to need more than \$5 million to get started. Capital investments to provide greater access to laboratory equipment or further entrepreneur support of lab equipment procurement would be incredibly beneficial for technology development and retention of Tennessee innovators.



Appendix I: Recommendations

Utilizing feedback received from Tennessee entrepreneurs participating in the FY23 SBIR/STTR Matching Fund Program, the following appendix is a list of additional commercialization support programs beyond the SBIR/STTR Matching Fund that would be beneficial in building the Tennessee entrepreneurship and innovation ecosystem.

Recommendation	Program	State	Organization	Match Requirement
Recommendation 1: Commercialization matching fund flexibility	Federal Matching Grant	South Carolina	South Carolina Research Authority	50%, up to \$50,000
	EDGE Grant	Delaware	Division of Small Business	33%, up to \$100,000
	Maryland Small Business and Technology Transfer Incentive Program	Maryland	TEDCO	25%, up to \$75,000
	Matching Grants Research Program (MGRP)	Florida	Florida High Tech Corridor	50%, up to \$150,000
Recommendation 2: Greater support university startup formation & translation research efforts	Proof of Concept Program	South Dakota	Governor's Office of Economic Development	10%, up to \$25,000
	ADVANCE Grant Program	Michigan	Michigan State University	50%, up to \$20,000
	KYNETIC Grant Program	Kentucky	University of Kentucky	\$50,000, renewal every 6 months up to \$200,000
Recommendation 3: Increased access to laboratory equipment	Graduated Lab Space Grant Program	Delaware	Delaware Prosperity Partnership	66%, up to \$3.5M
	Iowa Innovation Acceleration Fund	Iowa	Iowa Economic Development Administration	50%, up to \$1M
	Washington Clean Energy Test Bed	Washington	University of Washington	N/A



Appendix II: Results

This table shows a breakdown of companies' region, industry and money awarded.

Company Name	City	Year	Industry
3RT Innovations	Brentwood	2022	Life Sciences & Biotechnology
4XTechnologies	Knoxville	2022	Advanced Manufacturing
490 BioTech	Knoxville	2017	Life Sciences & Biotechnology
490 BioTech	Knoxville	2019	Life Sciences & Biotechnology
Accurate Automation Corporation	Chattanooga	2017	Advanced Manufacturing
Active Energy Systems	Knoxville	2021	Advanced Energy & CleanTech
Active Energy Systems	Knoxville	2019	Advanced Energy & CleanTech
Adaptive Technology Consulting	Murfreesboro	2019	Life Sciences & Biotechnology
Addiguru	Knoxville	2022	Advanced Manufacturing
Addiguru	Knoxville	2021	Advanced Manufacturing
American Nanotechnologies	Knoxville	2021	Life Sciences & Biotechnology
American Nanotechnologies	Knoxville	2022	Life Sciences & Biotechnology
ARMS Cyber Defense	Brentwood	2021	Cyber Security & Artificial Intelligence
ARMS Cyber Defense	Brentwood	2022	Cyber Security & Artificial Intelligence
Assured Bio Labs	Oak Ridge	2020	Life Sciences & Biotechnology
Avadain	Eads	2022	Advanced Manufacturing
Aviation Resources and Consulting Services	Cookeville	2022	Transportation & Mobility
Becq	Knoxville	2022	Advanced Energy & CleanTech
BenchFly	Nashville	2017	EdTech
BlueWonder Creative	Nashville	2022	EdTech
Branch Technology	Chattanooga	2019	ConstructionTech
Branch Technology	Chattanooga	2020	ConstructionTech
Carbon Rivers	Knoxville	2019	Advanced Energy & CleanTech
Carbon Rivers	Knoxville	2021	Advanced Energy & CleanTech
Cinco Research Corporation	Elizabethton	2022	Advanced Manufacturing
Coulometrics	Chattanooga	2021	Advanced Energy & CleanTech
Coulometrics	Chattanooga	2018	Advanced Energy & CleanTech
Couture Technologies	Gallatin	2021	Wearables & Fashion Technology
CrossLink Composites	Crossville	2022	Transportation & Mobility
Cumberland Pharmaceutical	Nashville	2019	Life Sciences & Biotechnology
Curie Co	Chattanooga	2019	Life Sciences & Biotechnology
Cyromagnetics	Oak Ridge	2019	Advanced Manufacturing
Daxor Corporation	Oak Ridge	2020	Life Sciences & Biotechnology
DayLyte Batteries	Knoxville	2022	Advanced Energy & CleanTech
Dextrous Robotics	Memphis	2022	Transportation & Mobility
Diatech Diabetes	Memphis	2022	Life Sciences & Biotechnology
E&G Associates	Chattanooga	2019	Advanced Manufacturing
E&G Associates	Chattanooga	2018	Advanced Manufacturing
Eden Concepts	Knoxville	2021	AgTech
Endeavor Composites	Knoxville	2021	Advanced Manufacturing
Endeavor Composites	Knoxville	2022	Advanced Manufacturing
EndoTheia	Nashville	2021	Life Sciences & Biotechnology
EndoTheia	Nashville	2022	Life Sciences & Biotechnology
Energy to Power Solutions	Knoxville	2019	Advanced Manufacturing

Company Name	City	Year	Industry
Enexor BioEnergy	Franklin	2022	Advanced Energy & CleanTech
Eonix	Knoxville	2022	Advanced Energy & CleanTech
Eonix	Knoxville	2021	Advanced Energy & CleanTech
eSpin Technologies	Chattanooga	2017	Advanced Manufacturing
eSpin Technologies	Chattanooga	2019	Advanced Manufacturing
FC Renew	Knoxville	2022	Advanced Energy & CleanTech
FICS	Thompsons Station	2019	Advanced Manufacturing
Fort Defiance Industries	Loudon	2019	Life Sciences & Biotechnology
Foundation Instruments	Collierville	2022	Life Sciences & Biotechnology
Frontier Diagnostics	Nashville	2018	Life Sciences & Biotechnology
Gloyer-Taylor Laboratories	Tulahoma	2018	Life Sciences & Biotechnology
Grid Fruit	Knoxville	2020	Advanced Energy & CleanTech
Groundstar	Crossville	2021	Transportation & Mobility
HD Clean	Johnson City	2022	Life Sciences & Biotechnology
Healing Innovations	Nashville	2021	Life Sciences & Biotechnology
HealthChart	Memphis	2018	Life Sciences & Biotechnology
HeroWear	Nashville	2020	Wearables & Fashion Technology
HeroWear	Nashville	2019	Wearables & Fashion Technology
IDBiologics	Nashville	2020	Life Sciences & Biotechnology
Immuno Technologies	Memphis	2021	Life Sciences & Biotechnology
Immuno Technologies	Memphis	2018	Life Sciences & Biotechnology
Infusense	Nashville	2022	Life Sciences & Biotechnology
Innerworld	Nashville	2020	Life Sciences & Biotechnology
International FemtoScience	Nashville	2022	Advanced Energy & CleanTech
iQuity Labs	Nashville	2019	Life Sciences & Biotechnology
iQuity Labs	Nashville	2017	Life Sciences & Biotechnology
iQuity Labs	Nashville	2021	Life Sciences & Biotechnology
LiBAMA	Cookeville	2020	Advanced Energy & CleanTech
LiBAMA	Cookeville	2019	Advanced Energy & CleanTech
LiveSchool	Nashville	2018	EdTech
LUCI	Brentwood	2022	Transportation & Mobility
Lux Semiconductors	Knoxville	2021	Advanced Manufacturing
Millennitek	Knoxville	2019	Advanced Manufacturing
Mobius	Lenoir City	2020	Advanced Energy & CleanTech
Mobius	Lenoir City	2018	AgTech
Muzology	Nashville	2021	EdTech
NellOne Therapeutics Inc.	Knoxville	2021	Life Sciences & Biotechnology
Neptune Fluid Flow Systems	Knoxville	2019	Life Sciences & Biotechnology
Neptune Fluid Flow Systems	Knoxville	2022	Life Sciences & Biotechnology
NeuroDyne	Germantown	2021	Life Sciences & Biotechnology
Non-Contact Technologies	Tulahoma	2022	Advanced Manufacturing
Nth Cycle	Knoxville	2019	Advanced Manufacturing
OculoTherapy	Memphis	2021	Life Sciences & Biotechnology
OculoTherapy	Memphis	2019	Life Sciences & Biotechnology
Path Ex	Nashville	2017	Life Sciences & Biotechnology
Peroxygen Systems	Knoxville	2017	Advanced Manufacturing
Phelps2020	Knoxville	2021	Transportation & Mobility
PixelEXX Systems	Maryville	2021	Life Sciences & Biotechnology
Preteckt	Memphis	2021	Transportation & Mobility

Company Name	City	Year	Industry
Preteckt	Memphis	2022	Transportation & Mobility
PreTel	Chattanooga	2019	Life Sciences & Biotechnology
PreTel	Chattanooga	2018	Life Sciences & Biotechnology
Purist	Knoxville	2019	Life Sciences & Biotechnology
PurSolutions	Nashville	2018	Life Sciences & Biotechnology
Qardian Labs	Knoxville	2020	Life Sciences & Biotechnology
RegScale	Knoxville	2022	Cyber Security & Artificial Intelligence
Reliable MicroSystems	Franklin	2022	Advanced Manufacturing
RenTec	Maryville	2021	Transportation & Mobility
Resilient Energy & Infrastructure	Madison	2022	Advanced Energy & CleanTech
Robotic Technologies of Tennessee	Cookeville	2018	Advanced Manufacturing
RxBio	Johnson City	2021	Life Sciences & Biotechnology
SEAK Therapeutics	Memphis	2021	Life Sciences & Biotechnology
Secure Food Solutions	Memphis	2022	Life Sciences & Biotechnology
Secure Food Solutions	Martin	2017	Life Sciences & Biotechnology
SkyNano	Knoxville	2020	Advanced Energy & CleanTech
SkyNano	Knoxville	2019	Advanced Energy & CleanTech
SkyNano	Knoxville	2022	Advanced Energy & CleanTech
Statheros	Crossville	2022	Transportation & Mobility
Stony Creek Colors	Springfield	2020	AgTech
Stony Creek Colors	Springfield	2019	AgTech
Stony Creek Colors	Goodlettsville	2017	AgTech
TensorX	Nashville	2022	Cyber Security & Artificial Intelligence
Tetrahive Technologies	Brentwood	2020	Advanced Manufacturing
Tetrahive Technologies	Brentwood	2019	Advanced Manufacturing
Third Dimension Technologies	Knoxville	2017	EdTech
Third Dimension Technologies	Knoxville	2019	EdTech
Ultrasonic Technology Solutions	Knoxville	2021	Advanced Energy & CleanTech
Ultrasonic Technology Solutions	Knoxville	2019	Advanced Manufacturing
VasaMetrix	Nashville	2022	Life Sciences & Biotechnology
VenoStent	Nashville	2018	Life Sciences & Biotechnology
Virtuoso Surgical	Nashville	2017	Life Sciences & Biotechnology
Virtuoso Surgical	Nashville	2020	Life Sciences & Biotechnology
VoluMetrix	Nashville	2019	Life Sciences & Biotechnology
VoluMetrix	Nashville	2018	Life Sciences & Biotechnology
Whisper Aero	Crossville	2022	Transportation & Mobility
Winter Innovations	Knoxville	2021	Life Sciences & Biotechnology
Xtallized Intelligence	Nashville	2020	Advanced Manufacturing
Xtallized Intelligence	Chapmansboro	2022	Advanced Manufacturing
Yaya Scientific	Nashville	2021	Life Sciences & Biotechnology