



The Honorable Daniel J. McKee
Governor of the State of Rhode Island

March 21, 2024

The Honorable K. Joseph Shekarchi
Speaker of the House of Representatives

The Honorable Dominick J. Ruggiero
President of the Senate

RE: Report on the Science and Technology Advisory Council for Calendar Year 2023

Dear Governor McKee, Speaker Shekarchi, and President Ruggiero,

We are pleased to submit this report pursuant to RI Gen L § 42-143-4.

Science and technology represent crucial economic drivers for the state through industries like marine trades and the blue economy, life sciences and public health, energy, advanced materials, and food innovation. Since inception in 2005, the Science and Technology Advisory Council (STAC) has been charged to facilitate collaboration and synergies between the high level of research happening in our state and it's potential to be commercialized – further driving innovation, economic development and jobs. With this, STAC works to catalyze an ecosystem of innovation centered on the science research and technology development taking place in the state's institutions, elevated by the state's economic development goals, and in service of promoting, enhancing and investing in Rhode Island's innovation economy.

In the following report, you'll learn about the efforts of STAC in this past year, as well as the impact of our work, alongside the state of Rhode Island's leaders of economic development. We further outline what's in store for 2024.

We welcome your questions, thoughts and engagement. Thank you for your continued work and support to ensure a thriving Rhode Island innovation ecosystem.

Sincerely,

A handwritten signature in black ink, appearing to read "JPipl", written in a cursive style.

Jill Pipher
Vice President, Research
Brown University
Co-Chair, STAC

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Bethany Jenkins
Interim Vice President, Research
University of Rhode Island
Co-Chair, STAC

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Lisa Carnevale
VP, Innovation Initiatives
RI Commerce Corporation
Executive Director, STAC



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Overview & Background

The **Science and Technology Advisory Council (STAC)** was launched by executive order in 2005 and sustained by statute in 2006 to make science and technology innovation central to the state's leadership agenda.

STAC assists state leadership in implementing programs and policies that fuel new business growth in Rhode Island through these key drivers:

- (1) **Increase Research and Development** leading to new products, more-efficient production methods, and new business growth in Rhode Island;
- (2) **Encourage Entrepreneurship** through the transfer of new technologies and viable discoveries into the marketplace; and
- (3) **Enable Innovation** through supporting an environment rich in talent, capital and ideas that can solve real world issues and capture the global market.

Council membership consists of leaders in academic, business and public sectors who work collaboratively to advance these important issues. Council members meet on a regular basis to review progress and develop new recommendations for enhancing research and development, supporting entrepreneurial activity, and increasing innovation in Rhode Island.



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The Science & Technology Plan Domains

In 2009 and again in 2014, the RI Science and Technology Advisory Council (STAC) identified three priority Science and Technology (S&T) domains: marine sciences, life sciences and energy and environment. These domains have maintained as economic drivers in the State over the past six years—including persisting through the pandemic. In 2021, an update to the state’s science and technology plan includes two additional complementary domains (advanced materials and food innovation and technology), as well as updated focus areas within each domain. As such, the current priority science and technology domains are: (1) Marine Sciences, (2) Life Sciences and Public Health, (3) Energy, (4) Advanced Materials, and (5) Food Innovation & Technology.

All five S&T domains seek to meet the following criteria:

- 1) Tackle complex global societal challenges;
- 2) Demonstrate RI’s leadership and expertise;
- 3) Leverage RI’s geography, population and assets;
- 4) Provide local to global scalable solutions; and
- 5) Offer clear opportunities for intersection and collaboration across domains.

Year in Review

Since inception of the **RI Science and Technology Advisory Council (STAC)**, innovation, technology, and science have played a strong role in Rhode Island’s economic growth efforts. STAC’s work has helped the state more deeply understand the Rhode Island innovation ecosystem and establish our innovation priorities. As the State invests in innovation, STAC continues to evolve our contribution so that our work adds strategic insight to these investments and further catalyzes economic success.

In 2023, the STAC’s focus areas were:

- Aligning STAC efforts and expertise directly to State economic development priorities
- Engaging deeply in the Blue Economy and Life Sciences efforts in state to ensure federal research funding, higher education research, and commercial research are aligned in support of these efforts
- Redoubling STAC’s communications efforts and redefine STAC as a central thought leader on science and technology in Rhode Island

In addition, STAC continued oversight of the Innovate Rhode Island Small Business Fund. In 2023, STAC awarded 46 grants within its programming totaling \$1.3M in investments.



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Key Priorities

Following is an update on STAC's 2023 efforts:

2023 Core Priority 1: [Aligning STAC efforts and expertise directly to State economic development priorities](#)

In 2023, the State through RI Commerce underwent two connected, required, and important economic development planning efforts: the statutorily required Long-Term Economic Development Vision and Policy and the Comprehensive Economic Development Strategy (CEDS), which is required by the Economic Development Agency (EDA) in order to continue to unlock federal EDA funding. To assist in these economic development planning efforts, STAC met with RI Commerce leadership to give input on plan drafts on two separate occasions, relative to the current Science & Technology Plan. Further, STAC utilized the CEDS in their advisory for the new EPSCoR E-CORE application.

Beyond this, 2023 was a year filled with realigning and expanding STAC membership to broaden expertise and input. STAC has recruited six new members to the Council, including representation from Lifespan, FM Global, Roger Williams University, Johnson & Wales and RIHub. These new members join representatives from URI, Brown, RISD, SENEDIA/UTIC, and the New England Medical Innovation Center. As a group, these appointees bring the skills and industry knowledge required to support STAC's charge to advise and invest in science and technology innovation, fulfill STAC's role as EPSCoR Steering Committee, and support the high growth opportunity sectors with a diversity of backgrounds.

2023 Core Priority 2: [Engage deeply in the Blue Economy and Life Sciences efforts in state to ensure federal research funding, higher education research, and commercial research are aligned in support of these efforts](#)

2023 was an extraordinarily exciting year for advancements in two strategic focus areas for the State and the Science & Technology Plan.

Related to Blue Economy: The State, through a consortium led by RI Commerce, applied for and received designation as a Tech Hub by the U.S. Economic Development Administration, with a focus on ocean technology within the Blue Economy. This designation unlocked our ability to apply for upwards of \$70 million in Q1 2024. Our designation is for the Ocean Tech Hub – a regional initiative to build a globally recognized Hub to rapidly commercialize research and technology in undersea vehicles, robots, and sensors, along with the advanced materials needed to withstand the harsh undersea environment and the AI/ML that will bring this technology into the future. STAC co-chairs serve on the Ocean Tech Hub consortium and were critical members of advancing this application and obtaining designation. The Ocean Tech Hub is a component of the Grow Blue



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Action Plan, a strategy developed with over 200 entities – including STAC – to invest in and continue to develop the Blue Economy.

Related to Life Sciences: The Rhode Island General Assembly, under Speaker Joseph Shekarchi's leadership, passed legislation in 2023 that creates the RI Life Sciences Hub (RILSH) with a \$45 million investment. This development comes on the heels of the construction for the new RIDOH State Health Lab, planning for the Brown University Life Sciences Building in the Jewelry District, the additional wet lab space being built out at 225 Dyer Street. STAC's Council members worked with RI Commerce to contribute best practice research for the legislation, helping to lay a strong foundation to jumpstart this critical investment.

[2023 Core Priority 3: Redouble STAC's communications efforts and redefine STAC as a central thought leader on science and technology in Rhode Island](#)

The promotion of science and technology communications remained a top priority of STAC throughout 2023. As investments continue in critical areas of science and technology, STAC took the moment to review our branding assets. In 2023, we updated our logo, created a new website, and developed new collateral. We also presented about STAC's work at events including RI Startup Week and the Greater Providence Chamber of Commerce Innovation Committee.

[Other 2023 Efforts:](#)

Since 2006, STAC has served as the Steering Committee for the National Science Foundation (NSF) EPSCoR Track 1 grant. In 2023, NSF announced changes to this program in that they are phasing out the Track 1 opportunity and introducing two new programs: E-CORE and E-RISE. Both of these programs have more involved Steering Committee requirements, including the ongoing tracking of jurisdiction-wide research, evaluation of the science and technology research infrastructure and additional investments towards centralizing efforts that impact the local community.

STAC spent time in 2023 assessing these changes and working with partners to align resources to appropriately meet the charge and ensure that Rhode Island remains competitive for these critical federal grants. This will continue to shift throughout 2024.

Finally, in 2023 staff conducted a detailed analysis of the Innovate Rhode Island Small Business Fund (IRISBF), and how this program compares with those in our neighboring states. IRISBF is the state's matching program for federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs, and is overseen by STAC. While Rhode Island's program is incredibly valuable to our innovation community, it does fall short of efforts in Massachusetts. STAC worked with RI Commerce to recommend changes to this program to help us become more competitive, which are presented as part of the Governor's FY25 budget request currently under review by the General Assembly.



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Programmatic Updates

STAC has programmatic oversight in the following areas:

Innovate RI Small Business Fund (IRISBF)

The federal SBIR and STTR Programs represent the largest source of early-stage, high-risk technology financing in the United States. Federal agencies participating in this program provide seed capital for early-stage research and development projects leading to commercialization of resulting products or services. The programs are designed to benefit entrepreneurs and small businesses – while increasing the competitiveness of the U.S. economy – by funding the development of innovative products and services. Agencies award grants to explore the technical merit of an idea or technology in response to a specific agency topical need.

In 2013, the Rhode Island General Assembly created the IRISBF to make available to Rhode Island businesses with 50 or fewer employees to defray the cost of applying for SBIR/STTR awards, match SBIR/STTR Phase I and Phase II awards and hire interns. The goals of the program are to:

- Leverage state funds to encourage and support Rhode Island entrepreneurial participation in the federal SBIR/STTR programs;
- Increase the amount of federal research dollars received by Rhode Island firms;
- Sustain companies through the early stages of product development;
- Encourage the establishment of high potential, high quality, high growth ventures in Rhode Island; and
- Enhance the talent pipeline in the biosciences and engineering fields.

IRISBF's four granting programs are:

1. Grants of up to \$3,000 to assist small businesses offset the costs associated with preparing a competitive Phase I SBIR/STTR application.
2. Matching grants of up to \$45,000 to encourage recipients of SBIR/STTR Phase I awards to pursue the more substantial Phase II awards.
3. Matching grants of up to \$100,000 to assist recipients of SBIR/STTR Phase II awards with commercialization efforts.
4. Grants of up to \$3,000 to assist companies in the life sciences and engineering sectors defray the cost of providing internships and mentoring to eligible Rhode Island residents attending a Rhode Island college or university.



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[IRISBF Year in Review | 2023 Matching + Internship Grants](#)

The IRISBF matching grants are provided non-competitively based on availability of funds. Staff tracks the SBIR/STTR awards to Rhode Island and opens a call 1-2 times per year for applications to receive the match. Funds are then awarded based on availability. Internships are required to be in the life sciences or engineering fields and show that the intern will work on R&D projects in a lab type environment.

The following are the total matching and internship grants awarded in 2023:

- 14 grants under the proposal incentive grant (Phase 0) totaling \$41,250
- 11 grants under the SBIR/STTR Phase 1 Matching grant totaling \$456,330
- 8 grants under the SBIR/STTR Phase 2 Matching grant totaling \$772,000
- 13 internship grants – totaling \$39,000

[IRISBF Case Studies](#)

[Audiance, Inc. | South Kingstown, RI](#) | Audiance revolutionizes implantable medical devices with novel rechargeable polymer electrolyte batteries, delivering exceptional safety and stability. This RI-based company was founded in 2019 by scientists, consultants and advisors at University of Rhode Island; University of California, Berkeley; Stanford University; Quantumscape and EaglePicher Technologies and is working to develop a suite of long-lasting lithium-ion batteries that can be used to charge active implantable medical device (AIMDs) such as cochlear implants, pacemakers, neuro-, gastric-, and bone growth-stimulators, implantable cardiac defibrillators and drug pumps. Audiance has received three SBIR Phase 1 grants and two SBIR Phase 2 grants from National Institutes of Health (NIH) and National Aeronautics and Space Administration (NASA), which was further leveraged by the matching grants from the Innovate RI Small Business Fund (IRISBF). This innovation support has helped Audiance conduct proof of concept and a battery cell prototype that safely goes through thousands of charge/discharge cycles without losing capacity. They were further able to produce 10 sample prototypes, handbuilt, to send to Cochlear, Ltd, the world's largest cochlear implant manufacturing company. Cochlear tested the cells and they meet initial performance metrics. With this, Audiance is now ready to scale production.

[CBC, LLC | Warwick, RI](#) | CBC, LLC has developed the Hidden In Plain Sight (HIPS) Wind Energy Structure as a transformative technology. CBC created an innovative enclosure with a dynamic chamber that allows for efficient use, resulting in a wind energy system capable of providing low-cost power, energy security and compatibility in a broad range of built environments ranging from homes, farms, commercial office buildings and airports. HIPS Wind Energy Structures survive environmental extremes; they produce energy through critical conditions making CBC Wind Energy the industry's innovation leader. The company has received two Innovation Vouchers as well as two IRISBF matching grants for their SBIR Phase 1 and Phase 2 awards, helping to fuel their



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momentum in Rhode Island. Working under their Air Force SBIR Phase 2 contract, CBC has the growth opportunity in Rhode Island to scale their business and expand their workforce.

[XMark Labs, LLC | Barrington, RI](#) Xmark Labs has developed Nosy™ which is an Internet of Things (IoT) sensor designed to improve energy efficiency and indoor air quality in commercial buildings. The company has received two Innovation Vouchers to work on research and development of this innovative product in Rhode Island. The company's expertise includes a wide range of digital technologies including mobile devices and applications, and other emerging technologies such as Blockchain, Augmented and Virtual Reality, and the Metaverse. Their team has a strong history of innovation in gaming, entertainment and technology development, including early adoption of VR as an animation production tool in the 1990's. Team members have previously delivered projects for Apple, Hasbro, HTC, Lego, Microsoft, multiple divisions of Sony and many others. In addition to the Vouchers, the company has received an IRISBF matching grant for their SBIR Phase 1 award and several internships to expand their workforce.

Note: All IRISBF (as well as RI Commerce's Innovation Voucher awards) are further detailed in quarterly reports submitted by the RI Commerce Corporation and available at <https://commerceri.com/about-us/open-government-transparency/>.

IRISBF efficacy since inception

Since the launch of the IRISBF in August of 2013, STAC has approved 109 state matching grants totaling \$6,414,414. Companies participating in IRISBF funding have reported they increased staff, expanded facilities, and attracted additional investment. IRISBF funds have leveraged over \$59 million in federal funding – over an eight time return on our state's investment.

To date, 190 internship grants have been awarded.

RI Research Alliance - Collaborative Research Grants

In 2006, STAC launched the RI Research Alliance to create a statewide platform to promote collaboration across the state's research organizations. The Alliance awards the Collaborative Research Grant Program, which provides funding to projects that focus on building research capacity across institutions and advancing the competitiveness of RI researchers to secure additional funding. Grants are also awarded to projects that contribute to current or future economic development of the state through technology development and commercialization or that demonstrate strong translational components. Since its inception, the Alliance has awarded over \$11 million in state funds through the Collaborative Research Grant Program, with the goal of stimulating cutting-edge cross-institutional research projects.

The Collaborative Research Grants are part of the state matching funds to the EPSCoR grant. STAC did not run the 2023 Collaborative Research Grants while assessing changes to the EPSCoR grant.



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STAC will run an expanded Collaborative Research Grant program for 2024 that incorporates goals related to the E-CORE and E-RISE programs.

Looking Ahead 2024

The Tech Hub designation and the RI Life Science Hub (RILSH) led us into 2024 with an active agenda. The beginning of this year has seen the Phase 2 application submission for the Ocean Tech Hub and we are staying abreast on the RILSH. Major changes are still to come with how STAC evolves its role as the Jurisdictional Steering Committee for the EPSCoR program, now through multiple applications to E-CORE and E-RISE. In the balance of this year, we will conduct a SWOT analysis of the research ecosystem, outline strategic goals for science & technology research and implementation, and work towards updating the State's Science & Technology Plan in 2025. Further, Collaborative Research Grants will be launched and awarded. And, pending updates in the 2024 legislative session, the Innovate Rhode Island Small Business Fund will continue to provide matching and internship grants.