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SOUTHWESTERN PENNSYLVANIA NEW ECONOMY COLLABORATIVE

Request for Proposals (RFP)

Robotics & Technology Innovation Fund

Consultation and Advisory Support

1. Introduction

The Southwest Pennsylvania New Economy Collaborative (The New Economy Collaborative (NEC)), a coalition under the Build Back Better Regional Challenge initiative, seeks proposals from esteemed consulting & advisory firms with relevant background and experience to develop a comprehensive blueprint and implementation plan for the Pennsylvania Robotics & Technology Innovation fund to implement as part of Southwestern Pennsylvania New Economy Collaborative's (SWPA NEC) broader vision. This work is expected to include technical writing assistance in the form of content generation, research, and program development advisement to support the concepts identified in the attached concept paper (and those yet to be identified).

All quotes should also provide a basis for calculating ongoing free-lance consultation follow-up that would conclude at the end of September 2026.

2. Background

The NEC is an 11-county coalition formed to apply for the Build Back Better Regional Challenge (BBBRC). The Collaborative includes 90+ organizations: community-based organizations, labor unions, educational and research institutions, economic development partners and leaders from the private, public and philanthropic sectors, led by a board of directors co-chaired by Stefani Pashman, CEO, Allegheny Conference on Community Development, and Farnam Jahanian, President, Carnegie Mellon University. We focus on communities that need support, adopting a hub-and-spoke approach designed to benefit not only the urban core but surrounding communities as well.

BBBRC is the marquee program of the U.S. Economic Development Administration's American Rescue Plan to boost economic recovery from the pandemic and rebuild American communities.

The Build Back Better Regional Challenge grant funds five projects focused on adoption, upskilling infrastructure, and commercialization in the robotics sector. As these projects grow the region's impact and leadership in the robotics, autonomy and AI sectors, NEC collaborates through continued public-private partnership to see each project from beginning to completion. For more information please visit www.swpanec.org.

A primary goal of the Pennsylvania Robotics & Technology Innovation Fund (PRTIF) is to expand on the existing programs and services that was funded through the Build Back Better Regional Challenge grant, and to introduce additional programs/services that were identified as gaps in our regions Tech Based Economic Development ecosystem that would advance and align with the coalition's' and its partners sustainability strategy. The Concept paper attached was developed by the NEC as programmatic opportunities that could be supported by the PRTIF.

3. Scope of Work

The selected firm will be responsible for:

- Defining; programs, tools, resources and services that would be deployed to support the concept paper provided.
- Develop a comprehensive fund blueprint with detailed sections covering the following:
    - Governance
    - Decision-making
    - Operations
    - Programs
    - Impact measurement
    - Sustainability and fund performance
- Stakeholder engagement

4. Performance Metrics

- Success will be defined by the NEC governing board and key stakeholder's formal adoption of the fund blueprint.
- Additional institutional investment in the PA Robotics & Technology Innovation Fund

5. Proposal Requirements

Proposals must include:

- An overview of the firm's experience in advising economic development strategies, philanthropy, with specific examples of past projects that demonstrate a commitment to equity and inclusion.
- A detailed plan outlining the proposed approach for the NEC campaign, including timelines, platforms, and key messages.
- An equity and inclusion strategy that describes how the campaign will reach and engage diverse communities, including racial, ethnic, socioeconomic, and geographic diversity.
- A proposed budget that itemizes costs for all aspects of the campaign. (**estimated budget range: $90,000-$200,000**)
- References from previous clients, preferably from similar projects focusing on community engagement and equity.

6. Evaluation Criteria

Proposals will be evaluated based on the following criteria:

Experience and Expertise (25%): Firm's track record in successfully delivering comprehensive marketing and community engagement campaigns, with an emphasis on innovative approaches.

Approach to Equity and Inclusion (30%): Clarity and effectiveness of the strategy to ensure the campaign is inclusive and equitable, reaching diverse populations and promoting active participation.

Quality of Proposed Plan (25%): Cohesiveness, creativity, and feasibility of the proposed marketing and community engagement strategy, including the ability to meet project timelines.

Cost-Effectiveness (10%): The proposed budget's alignment with the scope of work, demonstrating value for money and efficient resource use.

References (10%): Strength of references, with a focus on previous projects that highlight the firm's commitment to community engagement and equity.

6. Submission Guidelines

Proposals must be submitted electronically in PDF format by close of business Friday, March 29th to Ben Pratt at bpratt@alleghenyconference.org .

Questions regarding this RFP should be directed to Ben Pratt by close of business Friday, March 15th.

Late submissions will not be considered.

7. Timeline

- RFP Release Date: February 27th, 2024
- Information Session webinar for Questions & Answer: Wednesday March 13th, 2024 12:00 pm
    - Topic: NEC Innovation Fund RFP Webinar Q & A
    - Time: Mar 12, 2024 12:00 PM Eastern Time (US and Canada)
    -
    - Join Zoom Meeting
    - https://us06web.zoom.us/j/85459368126?pwd=TZ5yCobb8Ddc7ZnkoZG9FkHbjnk7HZ.1
    - Meeting ID: 854 5936 8126
    - Passcode: 180936
- Deadline for Questions: March 15th, 2024
- Proposal Submission Deadline: Close of Business March 29th , 2024
- Expected Decision Date: April 12th, 2024
- Start Date: April 15th, 2024
- Project Conclusion: Initial Scope of Work should be completed by December 2024

The NEC is committed to fostering an inclusive economic future for Southwest Pennsylvania. We look forward to receiving proposals that not only meet our marketing and engagement needs but also embody our values of equity and inclusion.

Southwest Pennsylvania's Plan for Investment in the Technology-Based Innovation Ecosystem to Support the Robotics, Autonomy & AI Cluster

Led by the Allegheny Conference on Community Development

The Southwest Pennsylvania region, an established global leader in robotics, autonomy, and AI research, should catapult the Commonwealth's commercial enterprise in these industries through strategic matched regional investments.

In the last several years, a drumbeat of reports and studies have outlined an opportunity that lies in reach for Southwest Pennsylvania and the Commonwealth-at-large:

- "Pennsylvania has much of what it takes to be a winner on a national economic map characterized by a short list of "superstars" and a longer one of 'left-behind" places[1]."
- "By working to bridge existing political gaps and form a new consensus about inclusive innovation-oriented economic development, Pennsylvania can regain its competitive standing[2]."
- "If a region with a robust and well-supported technology ecosystem were to capture even 1% of the $1T global autonomous mobile systems market, it would equate to a $10B growth opportunity developing within the next decade[3]."

These same reports detail the many hurdles that the Commonwealth faces to achieve such outcomes, as well as the urgency to clear these hurdles to growth before competing states capture the lion's share of future advanced industry growth. Particularly in the Southwestern Pennsylvania region comprised of 11 counties that include the greater Pittsburgh area, leveraging the existing R&D leadership position in Robotics, Automation, and Artificial Intelligence into one that includes the "full value-chain from R&D through manufacturing of autonomous systems in Pennsylvania" must overcome the following risks and threats identified by regional stakeholders[4]:

- The region risks being an "R&D outpost" for major companies rather than a headquarters destination.
- Regional ecosystem intermediaries are generally aware of the market potential of Robotics, Automation, and AI and supportive of tech-based entrepreneurial activity in these areas, but have programs and initiatives which are too diffuse and not focused at scale.
- Local venture funding gaps persist despite the autonomy industry's success in attracting investment from outside the region.

[1] (Maxim and Muro 2022, 4)
[2] (Muro, Maxim and You 2019, 54)
[3] (Tripp, et al. 2021, ES-2)
[4] (Tripp, et al. 2021, ES-10)

- The talent supply base of the region is facing skill gaps and other growing pains in the wake of the success of the initial cohort of autonomous vehicles companies.

There is urgency to overcome these threats because other states have been aggressively investing in advanced industry sector job growth, including Robotics, Automation, and AI, while Pennsylvania's investment has been stagnant for the past decade or more. Statewide investment in the technology based innovation ecosystem lags dramatically behind both its own historical funding levels ($90M budgeted in the early 2000s while only $45M in FY 2022 and since these are nominal figures, the decline is much larger in terms of impact) as well as peer states (Pennsylvania ranks 4th out of 6 peer states who report such data, spending only 20% of what Ohio spends per person, $3.20/person compared to $17.60/person)[5]. While regional assets Carnegie Mellon University was recently ranked first and University of Pittsburgh was ranked 21 in a ranking of universities for tech transfer and commercialization activity[6], the Commonwealth is not keeping these commercialization efforts in the state. Ranking last among high-growth states and lagging all but two peer states, Pennsylvania's flock of startup companies (4.9 per 1 million residents) is less than half the national average of 11.8 startups per 1 million residents.[7] Even in Pittsburgh and Philadelphia, new tech firm start rates lag Atlanta, GA and Charlotte, NC (high-growth state metros) and also the rates in slow-growth peer state metros like Boston, Chicago, and New York. "*This matters*," writes Munro et. al. at the Brookings Institution[8], "*because new businesses account for nearly all net job growth in the US, with innovative startups and growth companies having the potential to crack global markets and achieve high rates of growth.*"

Historically only a few regions (San Francisco, Boston) have organically achieved the level of transformative growth that Southwest Pennsylvania region is positioned to capture in Robotics, Automation, and AI. As a 2019 study co-authored by the Boston Consulting Group and the Detroit Mobility Lab[9] notes about the mobility industry: *"If they are serious about creating or expanding as mobility hubs to boost the local economy, cities and states must be willing to become the main orchestrators of the environments they want to create. They must collaborate with academic institutions to support educational and training programs. They must be open to working with companies that are looking for incentive, such as tax breaks, to move into the area, and help navigate regulations governing testing, safety, certifications, and AV operations."* The SWPA New Economy Collaborative is serious about evolving the technology-based economic development ecosystem for the Robotics, Automation, and AI sectors beyond an R&D center, and is aggressively pursuing state, regional, and private funds to do so.

How To Grow the Robotics, Automation, and AI Cluster in SWPA

Cluster leaders in SWPA have published a strategic plan in a document prepared by TEConomy Partners[10] that outlines the activities required to move the region from an R&D center to one that has captured a critical mass of the entire value chain in the Robotics, Automation, and AI sectors.

[5] (Maxim and Muro 2022)
[6] (Feldman, Gates and Ratnatunga 2022)
[7] (Maxim and Muro 2022)
[8] (Maxim and Muro 2022)
[9] (Boston Consulting Group and Detroit Mobility Lab 2019)
[10] (Tripp, et al. 2021)

The plan calls for 6 strategic pillars with 15 recommended actions to support these six strategies. Additionally, the document presents an estimate of $154M of investment required to carry out the recommended actions, which is estimated in the report to be about 25% of the total investment that the Cluster has attracted in the last several years. These six strategy pillars are shown in the table below, copied directly from the cluster's strategic plan.

Recommended Actions Under Each Strategy

Strategy 1: Advance a State Level Autonomy Program to Position the Region for Future Growth	**Action 1.1:** Develop and advance a framework for a signature state initiative in autonomy **Action 1.2:** Take a proactive stance in developing forward-thinking regulatory guidance for policymakers **Action 1.3:** Advance public-private smart infrastructure projects that support autonomous systems deployment
Strategy 2: Advance the Identity of the Region as a Leading Autonomous Systems Hub Serving a Diverse Set of Markets	**Action 2.1:** Develop a branding and marketing initiative that can increase both external and internal public awareness **Action 2.2:** Develop a business attraction initiative targeting scaling and mid-size companies in the technology stack **Action 2.3:** Attract several leading trade shows, conferences, and other high-profile showcase events
Strategy 3: Coordinate the Region's Innovation Ecosystem Assets to Support the Autonomous Systems Industry	**Action 3.1:** Support a dedicated organization that can be the nexus for regional innovation and cluster development activity in autonomous systems **Action 3.2**: Address risk capital stack gaps **Action 3.3**: Enhance regional support mechanisms for autonomy industry entrepreneurs
Strategy 4: Further Develop the Regional Autonomous Industry Supply Chain	**Action 4.1:** Build out a contract manufacturing and regional supply chain consortium **Action 4.2:** Identify shared, noncompetitive, technology areas for collaborative industry projects and attraction of supply base
Strategy 5: Create Demonstration and Testing Infrastructure Assets to Support Industry Scaling	**Action 5.1:** Explore the potential for shared testing and demonstration projects that can serve as industry assets **Action 5.2:** Implement a set of ongoing, public-facing autonomous systems demonstration projects
Strategy 6: Expand the Talent Pipeline to Support Growth of the Autonomous Systems Industry	**Action 6.1**: Expand the talent pipeline through coordination across regional institutions **Action 6.2:** Address current gaps in the region's autonomy industry talent base

Table 1: Anticipated funding requirements for implementation of the strategy outlined in "Forefront: Securing Pittsburgh's Break-out Position in Autonomous Mobile Systems"

The report goes further to prioritize these Actions Areas, marking seven of them (1.1, 1.2, 1.3, 3.1, 5.1, 5.2, and 6.1) as the highest priority (critical). The Southwestern Pennsylvania region achieved a significant milestone by receiving a highly competitive federal award in the Build Back Better Regional Challenge Grant to grow the Robotics, Automation, and AI cluster. This one-time stimulus funding targets:

- Strategy 1 with The Robotics Factory, tasked to create, accelerate, and scale robotics startups in the region and The Digital Bridge Initiative supports manufacturers in adopting Industry 4.0 technologies, including robotics, digitization, additive manufacturing (AM), and cybersecurity, to enhance their processes and resources;
- Strategy 1 and 5 with the Robotics Manufacturing Hub, a shared testing and demonstration project site; and
- Strategy 6 with Expanded Pathways to New Economy Careers and Expanded Pathways to Entrepreneurship.

The SWPA New Economy Collaborative is eager to aggressively support these Action Areas, particularly those critical areas currently unfunded. The Collaborative requests state commitment of funding on the order of $50M to execute unaddressed portions of the strategic plan to enhance the Technology-Based Economic Development Ecosystem for Robotics, Automation, and AI as outlined below.

Actions that our region is prepared to take to nurture the industrial growth of robotics, automation, and AI

Action 3.1: Support a dedicated organization that can be the nexus for regional innovation and cluster development activity in autonomous systems (Priority: Critical)

Regions that are thriving with advanced industries sector growth have at least one common attribute: a well-developed innovation ecosystem. Although these ecosystems do form organically (San Fransisco, Boston) over the course of decades, there is evidence that state and regional investments can stimulate this development (Research Triangle region of North Carolina) and shorten the timeline. A significant need in the SWPA region is coordination of the many innovation intermediaries that exist, and a focusing of the various activities through the lens of Robotics, Automation, and AI[11]. The cluster should have a clear point of contact for those seeking to engage with the ecosystem, and a strong leading "hub" organization that can be supported by the many "spokes" (legacy and new) that currently serve the region across many sectors. Many successful place-based technology clusters have created this function through organizations with different structures and funding[12], but they all have in common a specialized knowledge of their sector and a dedicated focus to making their sector grow. To close this gap in the SWPA region, the stakeholders are optimistic that the **Pittsburgh Robotics Network** can serve as the foundation for such organizational focus, but at the present time its scope as a trade association engaged in marketing, branding, limited advocacy, and networking is too limited to achieve the broader outcomes required by the "hub" organization that coordinates and links the many existing ecosystem intermediaries in the region. The organization envisioned in the strategic plan would include functions such as: infrastructure development, capital access, regional marketing, business sites and facilities, education and workforce development, manufacturing and supply chain development, and public policy and regulatory affairs[13]. It would also be the home of the Cluster's Strategic Plan for growth as the plan evolves and have a dynamic board of senior corporate leaders, universities, and leaders of regional economic development organizations. An operational support fund of $2M to expand the capacity of the Pittsburgh Robotics Network is suggested in the strategic plan.[14]

Action 3.2: Address risk capital stack gaps (Priority: Significant)

1. **Provide Phase I and II SBIR/STTR matching grants, as well as expanded Phase 0 support**. As of July 2021, over half of US states[15] offer matching funds to firms who win a federal SBIR/STTR grant. The Commonwealth does not leverage these excellent sources to startup capital, however, it does offer proposal preparation funding (called "Phase 0" support) through the Innovation Partnership office. We are eager to create a program in our region to offer Phase I and Phase II matching grants to leverage not only the award itself, but also the established and rigorous grant selection process that takes

[11] (Tripp, et al. 2021, 47)
[12] (Tripp, et al. 2021, 48)
[13] (Tripp, et al. 2021, 49)
[14] (Tripp, et al. 2021, 68)
[15] (US Small Business Administration 2021)

place by the granting agencies. Matching funds provide a crucial path to success for awardees by funding business functions not allowed reimbursement by the federal award such as patenting expenses, business development, product marketing and more. Additionally, Innovation Intermediaries in our region should provide support to the awardees during the course of their SBIR/STTR grants for marketing studies, IP strategies, Pitch Deck review, and networking so that awardees can get to the next stage of development more quickly. We envision that the existing Innovation Partnership will be a valuable warm lead generator and match-maker for the matching grant program.

2. **Create a Robotic, Automation, and AI Accelerator Grants.** Access to early stage risk reduction capital is scarce in Pennsylvania's current innovation ecosystem, and we plan to address this gap with a set of targeted Robotics, Automation, and AI Accelerator Grants.[16] This suite of competitive grants would offer significant six-figure award levels to either private firms or universities (or teams of both) to position technologies for commercialization and scale. We envision award ceilings as high as $150k and $250k for individual projects are required to make significant impact. Research suggests that providing grants during the earliest stages of technology development has a stronger impact on the probably that a firm will receive venture capital, achieve revenue, and have a successful exit[17], and the suite of grants that we envision for this thrust address this fact.

3. **Alternative-to-VC Investment Avenues.** Despite being much discussed and celebrated, VC funding accounts for less than 1% of new business funding in United States[18]. Venture capitalists look for high-risk, high-reward businesses at the early stage of development that have a clear runway to large markets. Because the internet and software sectors fit this paradigm, they received 47% of the nation's VC investment in 2020 while the industrial sector received 4% and the energy/utilities sector didn't get above 1%[19]. Since there is plenty of supply for the venture capitalist, there are many viable businesses with smaller addressable markets, or are less capital-efficient, or have a longer development timeline, or are led by non-traditional entrepreneurs that are not considered as fundable: our region intends to pave new avenues for business ideas in robotics, automation, and AI to get the funding they need to grow. Growing local capital funds that use non-dilutive capped revenue- and profit-share models that will serve a much wider range of startup companies are a key part of our strategy.

4. **Manufacturing Readiness Grants Program**: Oftentimes, established businesses are unwilling to adopt new Robotics, Automation, or AI technology due to risks like high capital cost, talent shortages, integration risks, use case selection, and workforce training. Offering competitive capital grants to Commonwealth companies can de-risk the adoption of Robotics, Automation, and AI tools helping these companies grow and

[16] (Muro, Maxim and You 2019), Challenge 3, page 38
[17] (Sarycheva and Muro 2021)
[18] (Hwang, Desai and Baird 2019)
[19] (Sarycheva and Muro 2021)

strengthening the statewide ecosystem for these cluster technologies.

Action 3.3: Enhance regional support mechanisms for Robotics, Autonomy, and AI industry entrepreneurs: (Priority: Important)

1. **Allow PA companies to license PA university tech with favorable terms, including low-cost optioning.** Although Carnegie Mellon and Univ. of Pittsburgh are performing in the top tier for tech transfer, Pennsylvania is a laggard in new company formation. One way to address this gap is to offer statewide favorable licensing terms for companies who keep their operations in the Commonwealth. This could take the form of state subsidies for options or favorable initial licensing terms that phase out as product volume increases.

Action 6.2: Address current gaps in the region's Robotics, Autonomy, and AI industry talent base (Priority: Significant)

Stakeholders in the SWPA Robotics, Automation, and AI Cluster have identified crucial gaps in the current regional talent mix[20]:

- Lack of a broad base of experienced technology entrepreneurial executive talent who can help companies scale
- Shortage of product sales/marketing, customer experience, and UX/UI talent embedded within autonomous systems companies.
- Difficulties in finding embedded software and systems software engineers that are more specific to robotics and autonomy space.
- An anticipated need for an expanded supply of robotics technicians and a workforce trained in the maintenance of autonomous systems.

The speed at which the technology of the sector is changing means that professionals in this space require access to educational offerings and specialized training that expands their knowledge, introduces them to new areas of inquiry and skill sets. Certification programs and formal graduate courses should be developed to meet industry needs in emerging areas that are available on nights and weekends to meet the needs of career professionals. Funding can be applied to close these gaps in the talent pipeline in the following ways:

1. **Eminent Scholar Program:** Through a targeted recruitment process that offers significant incentives such as endowed chair funding, mid-career faculty can be recruited to community colleges, universities, and technical schools in the region who will bring sector-specific knowledge, highly relevant research topics, sector-specific educational best-practice concepts. With long-term annual funding secured, these faculty be charged with a variety of outcomes like new course development, continuing education curricula, professional development support for students such as internship placement, executive training and more to meet the needs of small and medium-sized businesses in the sector.

2. **Innovation Post Doctoral Scholar Program:** Another way that funding can be applied to this problem is the establishment of Innovation Post-Doctoral Scholars at the major

[20] (Tripp, et al. 2021, 61)

research universities in the sector. These two year fellowships would be awarded to highly educated talent who, at an early stage of their career, remains open to working in several fields and can bring expertise to identified high-value IP that the university is interested in licensing but that still needs risk-reduction work. Since post-doctoral fellowships are not full-time positions (usually two years), this program would produce a continuous flow of talent, and the outgoing post-docs will in many cases have thrown themselves a forward pass and plan to stay in the region when their fellowship ends.

Other states are having success with actions similar to the proposed

Highlighted below are investments that Ohio, Massachusetts, Tennessee, Colorado and others have undertaken to increase competitiveness and strengthen their statewide Innovation Ecosystem.

1. Coordinating regional innovation intermediaries through a specific sector lens:

1. **Indiana's BioCrossroads:** Hailed by urban specialists Katz and Nowak in their book "The New Localism" as a global model for communities in structuring and governance of economic development activity, BioCrossroads has a two-decade-long list of incredible advancement of Indiana's life sciences sector. Started by Central Indiana's Corporate Partnership in collaboration with cluster corporate, government, academic, and philanthropic leaders and stakeholders, BioCrossroads has directly raised over $649M of market capital and philanthropic funding; created sector-changing initiatives with more than 10 enterprises focused on sector development; organized two Life Sciences Venture Capital Funds, supported over 500 startup companies, managed 3 seed funds that have invested in 32 companies. As a result, Indiana's Life Sciences sector has outperformed Indiana's economy over the last 20 years, increased by a factor of 10 the number of venture capital deals and dollars that went to Indiana Life Sciences startups, and in the last 20 years, 24% of all new jobs in Indiana are in the Life Sciences sector.

2. **Arkansas's Technology Transfer Assistance Grant Program**: This incentive program helps keep technology developed in Arkansas in the state for further development through modest grants to offset costs involving the transfer of IP between qualified entities in Arkansas.

2. Access to capital:

1. **MassVentures SBIR Support**: MassVentures, a private innovation intermediary that operates a venture fund with public support includes a robust SBIR support program with Phase 0 support as well as Phase I and II matching grants. Phase 0 teams who work with MassVentures enjoy a 52% win rate, more than 3x higher than the average win rate of 15%. They also offer competitive matching grants to Massachusetts SBIR Phase II companies through their START program that includes 10 "Stage I" grants of $100k each for the first year of their Phase II grant. If these, 5 of the most promising are offered "Stage II" grants of $200k, and from there, 2 "Stage III" companies are awarded up to $500,000 of seed capital for commercialization. The START program costs $3M/year and to date has provided $34.2M in grant funding to 115 companies. The investment has enabled more than $4B in follow-on funding for the sponsored

companies and catalyzed over 2500 new jobs in the advanced industry sector of Massachusetts. [21]

2. **Colorado's Advanced Industries Accelerator Programs**: Started in 2013, the State of Colorado offers four competitive grants to early stage companies in one of Colorado's seven advanced industries. These four anchor grants are targeted to different aspects of the Innovation Ecosystem in the state a) a **Proof of Concept Grant** geared for research institutions commercialize new technology, b) an **Early-Stage Capital and Retention Grant** that helps early-stage Colorado companies scale, c) **Advanced Industries Collaborative Infrastructure Grant** designed to close gaps in advanced industry collaboration between research organizations and commercial enterprise with large scale projects such as regional Innovation Intermediaries and d) the **Advanced Industries Export Grant** that helps small- and medium-sized businesses increase export activity. In 2022, Colorado awarded 57 Proof of Concept Grants, 54 Early-Stage Capital and Retention Grants, and 9 Collaborative Infrastructure Grants for a total commitment of $21M. Outcomes of the 2022 grant cycle include 234 jobs created, 326 jobs retained, 21 new companies created, $30M of follow-on capital, 28 patents filed, and $10M in project annual revenue added to Colorado's advanced industry sector. Over the 9-year lifespan of the program, Colorado has invested $128M through this program to create 4423 new jobs and retain 4597 jobs in their advanced industry sector. The state estimates that their $128M investment to date has enabled $2.5B of additional commercialization funding.[22]

3. **Greater Colorado Venture Capital Fund**: This privately managed $17.5M fund, to which the State of Colorado awarded an initial $9.1M of financing[23], focuses on providing capital to seed stage companies who do not fit into the VC mold. Specifically focused on companies located in rural Colorado, this fund uses a revenue-share financing structure. Using a strict set of criteria for companies considered for investment such as two full-time employees based in rural Colorado and committed to being in rural Colorado for at least five years, and serving customers well-beyond the company's locality, they have addressed a significant gap in business funding for rural Coloradoans.

4. **Indiana's Economic Activity Stabilization and Enhancement Initiative**: By offering Manufacturing Readiness Grants to incentivize companies to adopt a range of "smart" manufacturing technologies including Robotics, Automation, and AI, the state awarded $17.4M to gain a 7:1 leverage on investment with nearly $140M being invested in business operations technology modernization in 60 counties of Indiana[24]. Technology adoption spanned 15 categories ranging from Advanced Robotics ($3M), General Automation ($2M), Machine Vision ($900k), Advanced Sensor Technologies ($200k), and Autonomous Mobile Robots ($158k).

5. **One North Carolina Small Business Program**: This SBIR/STTR Matching program has

[21] (MassVentures n.d.)
[22] (Colorado Office of Economic Development and International Trade 2022)
[23] (Sarycheva and Muro 2021)
[24] (Conexus Indiana 2022)

two parts. Phase I Incentive program that provides reimbursement for costs incurred in preparing and submitting Phase I SBIR/STTR proposals. The Matching Funds Program goals are to help NC companies bridge the funding gap period between the final Phase I payment and the first Phase II payment in the Federal Program, and increase the intensity of the research conducted under Phase I, making NC small businesses more competitive in the competition for Phase II funds. The impact of the program as measured in 2018 created 287 direct jobs which secondarily created 452 new jobs and generated $5.5M in additional state and local tax revenue over the first 12 years of the program operation. In this same period, nearly 400 grants were given to 254 unique companies.[25]

3. Widening the Talent Pipeline:

1. **Vanderbilt's ASIPIRE to Innovate Fellowship:** This fellowship program has two primary objectives a) enable commercialization of technologies discovered at Vanderbilt, and b) provide a student with a structured training opportunity to learn how to transform a technology into a company. The expectation for the fellowship holder is to launch a successful start-up leveraging Vanderbilt University IP.

2. Georgia Research Academy of Scientists: The Georgia Research Alliance, charted in 1990 to advance economic development through commercialization of research at Georgia's universities, coordinates and funds three different categories of talent development: **Eminent Scholars** who are recruited to Georgia in permanently endowed chairs (supported by a 1:1 match with private funds), **Senior Fellows** are similar in stature to Eminent Scholars but do not hold an endowed chair, and **Distinguished Investigators** who, while more junior in academic level to Eminent Scholars, also hold a permanently endowed chair and whose research is deemed to have a strong market potential.

[25] (Smith, Ph.D. 2018)

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