

**SOUTHWESTERN
PENNSYLVANIA
NEW ECONOMY
COLLABORATIVE**

**2023
ANNUAL
REPORT**

Build Back Better: A Year in Review

The Collaborative

The Southwestern Pennsylvania New Economy Collaborative is an **11-county coalition of labor, nonprofit, and university partners** advancing the region's robotics and automation cluster through public-private-philanthropic partnership. The Collaborative is **one of 21 winners of the Build Back Better Regional Challenge**, the marquee initiative of the U.S. Economic Development Administration's American Rescue Plan, which aims to boost economic recovery from the pandemic and rebuild American communities. The Collaborative was awarded a \$62.7 million grant to fund **five regional projects** focused on **robotics adoption, commercialization, and workforce development**. Together, these projects are designed to provide long-term opportunities for individuals, businesses, and communities in southwestern Pennsylvania to participate in our growing robotics sector and succeed in our evolving economy. The Collaborative is led by a governing board co-chaired by Farnam Jahanian, President, Carnegie Mellon University, and Stefani Pashman, CEO, Allegheny Conference on Community Development.

Our Region

Allegheny County
Armstrong County
Beaver County
Butler County
Cambria County
Fayette County
Greene County
Indiana County
Lawrence County
Washington County
Westmoreland County

Projects & Partners

Small- and Medium-sized Enterprises Robotics Adoption

Catalyst Connection; Digital Foundry at Penn State New Kensington; University of Pittsburgh; Carnegie Mellon University; Johnstown Area Regional Industries (JARI); Pittsburgh Technology Council

Advanced Robotics Manufacturing Hub & Innovation Accelerators

Advanced Robotics for Manufacturing Institute; Regional Industrial Development Corporation (RIDC), Community College of Allegheny County, Digital Foundry at Penn State New Kensington, Westmoreland County Community College, IUP Research Institute, MADE in Johnstown

Expanded Pathways to New Economy Careers

Southwestern Pennsylvania Commission; Allegheny Conference on Community Development; Butler County Community College; Community College of Allegheny County; Community College of Beaver County; Westmoreland County Community College; Partner4Work; Southwest Corner Workforce Development Board; Tri-County Workforce Investment Board; Westmoreland-Fayette Workforce Investment Board; Indiana University of Pennsylvania; Pennsylvania State University New Kensington, Beaver, and Greater Allegheny Campuses; Robert Morris University; Pittsburgh Technical College; UMWA Career Centers; Carnegie Mellon University; University of Pittsburgh; BotsIQ; Pittsburgh Robotics Network

The Robotics Factory

Innovation Works; Pittsburgh Robotics Network

Expanded Pathways to Entrepreneurship

InnovatePGH; Riverside Center for Innovation; University of Pittsburgh; Equity | Impact Center, Carnegie Mellon University; Women In Tech PGH

Leadership

Board of Governors

Parag Batavia, Ph.D., Carnegie Mellon University Robotics Institute

Roger Davis, Community College of Beaver County

Mark DeSantis, Ph.D., Bloomfield Robotics

Rich Fitzgerald, Allegheny County

Edward Gainey, City of Pittsburgh

Juan Garrett, Riverside Center for Innovation

Ajei Gopal, Ph.D., Ansys, Inc.

Bryan Iams, PPG

Farnam Jahanian, Ph.D., Carnegie Mellon University, *Co-chair*

Laura Karet, Who Brew LLC

Darrin Kelly, Allegheny-Fayette Central Labor Council

Kim Miller, United Steelworkers

Leslie Osche, Butler County Board of Commissioners

Stefani Pashman, Allegheny Conference on Community Development, *Co-chair*

Jason Rigone, Westmoreland County Industrial Development Corporation

David Roger, Hillman Family Foundations

Bryan Salesky, Stack AV

Donald Smith, Ph.D., Regional Industrial Development Corporation (RIDC)

Vincent Valdes, Southwestern Pennsylvania Commission (SPC)

Regional Economic Competitiveness Officer

Benjamin Pratt, CEcD



From the Regional Economic Competitiveness Officer

It's an exciting time to be part of this community, as the Greater Pittsburgh region continues to emerge as a leader in robotics, autonomy, and artificial intelligence. Over the past year, we have made tremendous strides in delivering on our coalition's goal of transforming our region through a robust robotics, autonomy, and AI industry cluster.

With our unprecedented investment powered by the U.S. Economic Development Administration's Build Back Better Regional Challenge initiative's \$62.7 million grant, we put together a bold vision for our future to supercharge southwestern PA's globally recognized robotics and autonomy cluster and ensure that its economic benefits equitably reach individuals from all corners of our region. We set out to eliminate barriers and risks of adopting and integrating these technologies for our small- and medium-sized enterprises. We are creating the next-generation entrepreneurial ecosystem custom-designed to leverage the critical strengths of our cluster with the launch of the Robotics Factory in Lawrenceville; new incubators and fellowship programming; and a network of innovation accelerators located throughout our 11-county region. Finally, and arguably our greatest undertaking, we are on a mission to create and/or expand some of the most sophisticated and state-of-the-art workforce training programs, building new pathways to our new economy's careers. This is just the beginning.

Throughout this report, you will learn of some of the progress made to date, some of the goals for the year ahead, and, most importantly, how to get involved. I invite each one of you to engage with these programs, to embrace the opportunities they bring, and to contribute to the discussions that will shape our community's future. Let us celebrate the progress we've made and anticipate the wonders yet to come. Together, we will build a Greater Pittsburgh that is not only better but also brighter, bolder, and more resilient.

Small- & Medium-sized Enterprises Robotics Adoption

Upon receipt of a \$4.8M grant, Catalyst Connection hit the ground running providing regional coordination and leadership engaging our small- and medium-sized advanced manufacturers, launching the **Digital Bridge** initiative with academic, economic development, and technology partners across the region.

Digital Bridge hosted focus groups with over **150 participants representing 63 manufacturers** in counties across the region to gain insight into businesses' challenges in adopting robotics and inform the development of support services. The major barriers identified include:

- **Cost:** understanding or justifying the return on investment as it relates to the workload; lacking access to capital;
- **Implementation:** not sure where to begin with robotics; integrating with existing systems; cybersecurity requirements;
- **Workforce:** labor shortage and turnover of employees; need expertise and training in robotics; training time and costs; changing the culture.

Beyond the focus groups, the Digital Bridge initiative accelerated engagements with manufacturers, **engaging 140 small- and medium-sized enterprises (SMEs)**, including 14 women-owned SMEs and 9 minority-owned SMEs. The Digital Bridge Technical Assistance program provides matching funds to assist SMEs in the adoption and expanded use of Industry 4.0 technologies. Funds are awarded on a competitive basis in two categories:

- Manufacturing Engineering Projects (up to \$10,000): technical assistance for assessment and evaluation of Industry 4.0 investments and advanced manufacturing technologies, including manufacturing engineering, data analysis, and vendor selection services;

Project Lead: Catalyst Connection

Small- and Medium-sized Enterprises Robotics Adoption

- Production Simulation and Industry 4.0 Project Implementation (up to \$25,000): support for advanced manufacturing Industry 4.0 and technology implementation projects, which may include but not be limited to de-risking of deployments, prototyping, modeling, and simulation.

Transitioning these engagements to project activity has been challenging, but those manufacturers who proceed are **implementing fast**. Of 15 Implementation awards available, 10 are already allocated just one year into the three-year program.

Project sub-awardees were also hard at work engaging manufacturers this year:

- Pittsburgh Technology Council sponsored a NASA Technology Transfer Exchange event with NASA Glenn Research Center and supplier forums with Newport News Shipbuilding and New Flyer. A forum with Boeing is scheduled for November.
- The Digital Foundry at Penn State New Kensington assisted an SME in developing a digital transformation roadmap, an effort which is now receiving a Manufacturing Engineering Project award.
- Through the Pennsylvania Robotics & Technology Fellowship, University of Pittsburgh graduate students were partnered with local SMEs on robotics adoption projects, such as producing a market study supporting investments in automated systems for flame and induction hardening.
- Carnegie Mellon's Manufacturing Futures Institute is finalizing development of a robotic assembly testbed at Mill 19 in Pittsburgh's Hazelwood neighborhood, home to another Collaborative project, the Robotics Manufacturing Hub.

wemakeithere.org/digital-bridge

Robotics Manufacturing Hub & Innovation Accelerators

\$14.2 million invests in de-risking the adoption of advanced robotics and automation technologies by SMEs through a **Robotics Manufacturing Hub**, accelerating the commercialization of robotics technologies, and establishing a regional network of **Innovation Accelerators** to train students and workers in in-demand skills and give entrepreneurs access to tools and resources. The Hub will help make SMEs' operations more resilient and globally competitive while supporting new, safer, and more stable manufacturing career opportunities. The Innovation Accelerators, located across six campuses in Allegheny, Armstrong, Cambria, Indiana, and Westmoreland counties, use our hub-and-spoke model to connect historically excluded communities to all available expertise and encourage business creation in local communities. These accelerators serve as important physical presences for the Collaborative throughout our region, linking individuals, companies, and communities with other partners and programs.

The first half of the year, the Robotics Manufacturing Hub focused on the build out of **two de-risking cells** located at Mill 19, a former-steel-mill-turned-tech-site in Pittsburgh's Hazelwood neighborhood where several Collaborative partners maintain presences. Since the official launch in August 2023, the Hub has served 26 companies through:

- 14 consultative manufacturing site visits;
- 5 white paper analyses of automation opportunities and risk assessments;
- 3 solution development exercises with robotic system integrators;
- 2 successful reductions of automation/robotics adoption risk;
- 1 completed technical proof of concept project at Mill 19;
- 1 successful referral to the Promoting Emerging Entrepreneurs Fellowship (see page 14).

Project Lead: Advanced Robotics for Manufacturing Institute

Robotics Manufacturing Hub & Innovation Accelerators

The build out at Mill 19 is still underway. Four de-risking cells are planned for the Hub. The two operational cells now actively in use for de-risking projects give manufacturers access to a range of equipment including **3 collaborative robots, a 3D printer, and 2D & 3D vision kits**. Additional equipment for the remaining two cells is expected to arrive by December and all four cells are planned to be in use by early 2024.

The network of Innovation Accelerators was launched in May 2023 with an in-person kickoff meeting and press release to the region. The Innovation Accelerators, located in Allegheny, Armstrong, Cambria, Indiana, and Westmoreland counties in Pennsylvania, will provide students, regional manufacturers, and entrepreneurs with access to equipment, knowledge, and other resources. The Regional Industrial Development Corporation (RIDC) is in the process of creating a shared operating model for the Innovation Accelerators and conducting research on potential clients for targeted recruitment strategies. All Innovation Accelerators have hired necessary staff and conducted their first **entrepreneurial and technology workshops** in September 2023.

arminstitute.org/robotics-manufacturing-hub

arminstitute.org/makerspaces

Expanded Pathways to New Economy Careers

By far the Collaborative's **largest project** in terms of both funding and community partners is **investing in upskilling our region's workforce** for our growing robotics and automation cluster. With educational, labor, and industry partners, we will prepare faculty to effectively teach robotics and autonomy-related coursework; prepare workers with the necessary skills for robotics and advanced manufacturing careers; introduce high school students to these careers; and transition displaced or soon-to-be-displaced coal workers across the region to sustaining jobs in our growing robotics cluster.

Like many of the other projects, the first year was largely focused on staffing, program and curriculum development, and community outreach and recruitment efforts. Jumping right in on November 16, 2022, Pittsburgh Robotics Network hosted a pilot **Pittsburgh Robotics Discovery Day** at the David L. Lawrence Convention Center showcasing local companies and educational and nonprofit partners in robotics. It was a phenomenal success with over **4,500 attendees**, including **1,500 students**, and over **85 exhibitors**. Discovery Day is back a year later as an even larger event on November 16, 2023, featuring over 120 exhibitors including Collaborative project leaders and workforce training partners.

As a regional coordinator, the office of the Regional Economic Competitiveness Officer (RECO) is also housed under this project. The RECO guides the strategy of the Collaborative, facilitates cross-project collaboration, and identifies additional opportunities. Hiring the RECO was a top priority, and Benjamin Pratt was onboarded in March 2023 after an extensive search. He came to the Collaborative with more than 12 years of experience in economic development, most recently as Chief of Regional Economic Growth at Greater Louisville, Inc.

Project Lead: Southwestern Pennsylvania Commission

Expanded Pathways to New Economy Careers

The cross-project collaboration Ben helps facilitate is essential to the success of our **upskilling initiatives**, which **underpin the success of other Collaborative projects** by developing the workforce necessary for enterprises to adopt and benefit from robotics technologies and for startups to staff and scale in our region. With that in mind, in late May and early June 2023, individuals from our workforce development and training partners attended focus groups led by SMEs Robotics Adoption partners (see page 6) to assess the workforce needs of SMEs in our region, so that we can provide local workers with marketable skills and local businesses with local talent. A **Workforce Development Board Committee** was formed and meets regularly to align training priorities and policies across partners. All project partners have begun recruitment of students and trainees with a strong focus on assisting students from historically underserved areas.

In September 2023, Carnegie Mellon's Block Center for Technology and Society awarded **eleven educational partners** financial support for **nine skills-based training programs** developed to provide entry points to careers in the robotics sector outside of traditional four-year degree programs. With a special emphasis on research and pedagogy, these programs seek to leverage collaboration between educators and businesses to develop a workforce that meets the growing labor demands of the robotics sector.

In October 2023, The Future Readiness Academy at Penn State New Kensington held their **inaugural Education Vanguard Conference**, coming off the success of a March 2023 **Faculty Academy Workshop**. These events bring educators together to address the impact of cutting-edge technologies such as artificial intelligence and augmented reality on students, the classroom, and industry, to inform curricular decisions and cultivate a prepared, thoughtful future workforce.

spanec.org

The Robotics Factory

In September 2023, the Robotics Factory officially opened on “Robotics Row” in Pittsburgh’s Lawrenceville neighborhood, with an activation celebration attended by more than 215, including members of the Pittsburgh robotics and advanced manufacturing communities alongside representatives from other industries and government officials. The Robotics Factory serves as a physical home for the Collaborative, where you’ll often find partner organizations working together, or companies, entrepreneurs, and students referred by the Collaborative’s other four projects. The synergetic work of the Robotics Factory, however, began long before its physical activation.

The Factory runs three named programs, which **Create** new innovations by connecting problem-solving robotics experts with leaders from other industries; **Accelerate** startup growth with investment and training; and **Scale** entrepreneurial and manufacturing innovations for the market.

The Create program commenced with a **three-day Aviation & Robotics Summit** at Pittsburgh International Airport in April 2023. Aviation professionals from more than 25 airlines and airports joined robotics industry professionals in an interdisciplinary series of workshops, company site tours, and networking events to collaboratively address operational challenges in the aviation industry with robotics technologies. The summit will recur in May 2024 and additional industry-specific summits in other vital regional sectors such as agriculture are planned for 2024.

Project Lead: Innovation Works

The Robotics Factory

In June 2023, the Accelerate program announced its **inaugural cohort of six startups**:

- **Aquatonomy**, creating underwater intelligence with autonomous robots;
- **CellX Technologies**, revolutionizing stem cell processing by using a combination of robotics, imaging, and artificial intelligence;
- **Grasp Robotics**, developing robotic muscles with human-like strength and capabilities for advanced prosthetics;
- **Leaficient**, using computer vision and AI to revolutionize horticultural lighting within indoor farms;
- **Velo AI**, building a smart bicycle safety platform;
- **Voaige**, building AI vision software with physical intuition to address labor shortages across industries.

Cohort companies were partnered with mentors and began workshops on topics such as user testing and financial modeling before moving into the Factory and demonstrating their technologies for delighted attendees at the September 2023 launch event. Each will receive **up to \$100,000 in funding** from Innovation Works, who also operates neighboring startup accelerator AlphaLab Gear, where a Promoting Emerging Entrepreneurs in Robotics (PEER) fellow (see page 14) was referred in October 2023.

In the meantime, Robotics Factory staff were busy outfitting the Factory with advanced prototyping equipment in anticipation of the Scale residency pilot. Applications opened in September 2023 for companies to gain year-long access to the Factory's machinery, support staff, and office space to transform ideas into commercially viable products.

roboticsfactory.org

Expanded Pathways to Entrepreneurship

The accessibility of our robotics and automation cluster is essential for its continued growth and sustainability. Pittsburgh might be known as the robotics capital, but our 11-county region is home to a breadth of manufacturers and industries who can employ robotics innovations to stimulate economic growth and improve quality-of-life across our communities. This project seeks to provide avenues to entry and support systems for success for those who have been historically underrepresented in robotics, through two programs:

Training and Market Access for Entrepreneurs (TMACE) connects robotics companies and advanced manufacturers with rural, BIPOC-, women-, and veteran-owned suppliers, and will offer technical support services to small businesses to ready them for increasing opportunities in the robotics and automation industries. The first year of funding was largely devoted to staffing, program development, and initial recruitment and outreach efforts. Before the official launch of TMACE in July, relationships were built with local entrepreneurial support organizations to connect the Collaborative to local businesses. Outreach events were held in Beaver and Westmoreland counties in the late summer and early fall. Additional outreach events are being planned across the 11-county region, with efforts aimed at building a **regional supplier directory** for the robotics and automation cluster. Over **140 suppliers have been engaged** and over **340 technical assistance hours** have been provided by Riverside Center for Innovation and the University of Pittsburgh.

The Promoting Emerging Entrepreneurs in Robotics (PEER) Fellowship is a 9.5-month program designed to provide innovative entrepreneurs who specialize in robotics and automation with the resources needed to advance their ideas and solutions. PEER equips talented and promising entrepreneurs with the tools, resources, and learning opportunities needed to upskill, while also providing financial resources and opportunities to build relationships within the sector and grow their network. This program was created for and

Project Lead: InnovatePGH

Expanded Pathways to Entrepreneurship

by communities who are Black, Indigenous, People of Color (BIPOC) and women, co-designed by the Equity | Impact Center, Carnegie Mellon University, InnovatePGH, and Women In Tech PGH. In August 2023, the first class of PEER Fellows began:

- **Jocelyn (Joce) Mackay, a.k.a. Joce the Nerdy Baker**, who leverages baking to explain science, engineering, and technology on social media. She seeks to create food labs where people can interact with robotic technology to create nutritious meals;
- **Lori Paluti, Ph.D.**, the owner of Pittsburgh Drone Services and an accomplished academic, business owner, problem-solver, and policymaker in autonomous systems, infrastructure, and sustainability;
- **Maximillian Obasiolu**, a hardware enthusiast and the founder of Lead-In Record Co., an end-to-end vinyl record manufacturing platform for independent artists;
- **William (Will) Scott**, passionate about community-oriented robotics, explores the integration of robotics with education and artistic disciplines. He works to build curricula and frameworks for programs designed to educate underrepresented youth about robotic concepts, entrepreneurship, and art in a safe inclusive environment;
- **Jennifer (Jen) Urich**, the owner of Farmer x Baker and Root and Heart Farm, who built a commercial kitchen in a shipping container. She is working on a prototype container kitchen outfitted with a robotic arm to aid independent restaurateurs in the evolving post-pandemic hospitality industry.

Two planned fellowship slots will be reallocated to future years, one in 2023 and one in 2024, to better balance dynamics of the cohorts moving forward. All of the inaugural fellows reside in Allegheny County. Partners are working to build stronger recruitment pipelines at the regional level and are actively recruiting for the second fellowship cohort.

innovatepgh.com/tmace

peerfellowship.com

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