

2017 FINAL REPORT



TECHCONNECT
WEST VIRGINIA

ScaleUp
West Virginia

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More than 125 participants gained valuable insights from business and technology leaders at TechConnectWV's 2017 Women & Technology Conference.



Several exhibitors and attendees joined Woody Thrasher, Cabinet Secretary, West Virginia Department of Commerce, for a group photo at TechConnectWV's 2017 Innovation and Entrepreneurship Day at the State Capitol.



Senator Joe Manchin and Senator Shelley Moore Capito emphasized the value of broadband connectivity at TechConnectWV's 2017 West Virginia Coding Summit.

TechConnectWV expresses deep appreciation to the U.S. Economic Development Administration, Philadelphia Regional Office, and the State of West Virginia for making the ScaleUp West Virginia project possible. This project allowed businesses to be launched, new products and processes to be developed, new jobs to be created and existing jobs to be retained, and people, families and communities to be placed on paths to a brighter future. Without this investment, these achievements would not have been possible.

Table of Contents

- 4** Executive Summary
- 6** Commercialization Optimization
- 8** Manufacturing Innovation & Integration
- 10** Commercialization Optimization Success Story
- 12** Entrepreneurial Support & Capacity
- 14** Commercialization Optimization Success Story
- 18** Manufacturing Innovation & Integration Success Story
- 20** TechConnectWV Executive Committee, Officers & Board of Directors
- 21** ScaleUp West Virginia Sub-Awardees
- 22** Manufacturing Innovation & Integration Success Story
- 25** TechConnect WV Business Incubators & Accelerators in West Virginia
- 28** Manufacturing Innovation & Integration Success Story

WV Coalition for Technology-Based Economic Development, Inc.
dba TechConnect West Virginia
Final Report
EDA Grant 01-79-14690
Submitted to the
U.S. Economic Development Administration
December 30, 2017

ScaleUp West Virginia, enabled by U.S. EDA and the State of West Virginia, allowed TechConnectWV to assemble a team of five outstanding sub-awardees that could help spur new entrepreneurial activity, help early-stage companies move new products and processes forward, support existing coal-dependent businesses take necessary steps toward entering new markets, and help prepare entrepreneurs and early-stage companies gain access to the investor market.

TechConnectWV's ScaleUp West Virginia sub-awardees were:

- **The Center for Applied Research and Technology (CART)**
- **The Chemical Alliance Zone**
- **INNOVA Commercialization Group**
- **Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI)**
- **West Virginia Manufacturing Extension Partnership (WVMEP)**

Each ScaleUp West Virginia sub-awardee brought its own unique expertise, experience, perspective, resources and facilities to the project. Each team's underlying goal was to help entrepreneurs move their ideas and products forward and to help existing companies become more innovative in their approaches to charting their future.

Certainly, if successful, new products and processes would be created and new jobs created and others retained.

TechConnectWV is pleased to report to the U.S. EDA and the State of West Virginia that ScaleUp West Virginia created tangible results in its underlying objectives to spur entrepreneurial and innovation activity, to help create and protect jobs in West Virginia, and to support West Virginia's continuing efforts to diversify its economy.

- **Entrepreneurs and Companies Assisted: 122**
- **Jobs Created: 59**
- **Jobs Retained: 87**
- **New Companies Helped to Launch: 30**
- **New Products Created: 35**
- **New Processes Created: 15**
- **Follow-on Funding Leveraged: \$5,035,240**

Without the investment by the U.S. EDA and the State of West Virginia these results would not have been possible. The following report describes the technical assistance and outreach performed by TechConnectWV and its sub-awardees.

ScaleUp West Virginia Sub-Awardees



Final Report

In its proposal to the U.S. EDA, TechConnectWV laid out a plan for success that was based on three key areas of need and opportunity in West Virginia:

- Commercialization Optimization
- Manufacturing Innovation & Integration
- Entrepreneurial Support & Capacity

The following describes TechConnectWV's and its sub-awardees' individual and collective work that produced real results for West Virginia.

Commercialization Optimization

Objective 1

Promote SBIR/STTR Program Opportunities

TechConnectWV set out to collaborate with the SBA Office of Investment and Innovation to hold one statewide event in each year of the grant (2016 and 2017) and to work with the state's institutions of higher education to co-host two or more regional campus events targeted to undergraduates, post-secondary students, faculty, and staff to increase awareness of the SBIR/STTR Program.



That objective was met.

TechConnectWV and the SBA held *SBIR Road Tour: Seeding America's Future Innovations™* on July 19, 2016. More than 120 West Virginia entrepreneurs, researchers, students and economic development professionals attended the event at West Virginia University's Media Innovation Center in Morgantown. For some attendees, the event was an introduction to the federal government's SBIR/STTR programs and how they can help accelerate a small business' development. For those who had direct experience or at least some familiarity with the SBIR and STTR

programs, the program updated them on the current the SBIR/STTR landscape. Participating agencies included the U.S. Small Business Administration; National Institute of Standards & Technology; Department of Agriculture; Department of Defense – Navy; Department of Defense – Defense Advanced Research Projects Agency; Department of Homeland Security; Department of Energy; Department of Health and Human Services – National Institutes of Health; National Science Foundation; and United States Patent and Trademark Office.

An important part of the *SBIR Road Tour* event was the opportunity for dozens of West Virginia entrepreneurs, researchers, students and business leaders to meet one-on-one with participating federal agencies' SBIR/STTR program managers. Those meetings allowed each entrepreneur and business leader to share with the agencies basic information about their companies and technologies and to get valuable feedback about which agencies they might target in an SBIR or STTR award application. NextGen Federal Systems, a Morgantown company, attended the 2016 event in Morgantown and has since received two SBIR Phase I awards. The first award was for work with the U.S. Army to develop the Autonomous Environmental Routing Onboard System to enable Swarming Drones to sense, react and learn from the environment. The other was for work with the U.S. Air Force Research Laboratory to research methods to optimize the Air Force Weather enterprise's weather modeling systems.

Progenesis Technologies is a Huntington company that also benefitted from ScaleUp West Virginia's effort to encourage more SBIR/STTR applications from West Virginia companies and researchers. Progenesis received an award through National Institutes of Health in support of Progenesis' work

with seaweed bacteria, which includes modifying the bacteria's capabilities for drug and biologic tissue applications, such as wound healing. The company noted that theirs was the first NIH Phase I award for a West Virginia company in eight years, underscoring how innovative Progenesis' technology is and the highly competitive nature of the SBIR program.

On April 18, 2017, TechConnectWV joined RCBI and Marshall University in hosting a *SBIR Lunch and Learn* event at RCBI's Huntington location. Approximately 60 entrepreneurs, researchers, students, and economic development leaders attended an informational session that highlighted George Murray, the SBA's deputy district director, and Brian Joseph, founder of Touchstone Laboratories in Triadelphia (Ohio County). Mr. Murray shared insights on the steps that potential SBIR/STTR applicants should take in determining where their product would best fit among the participating agencies and the support that is available through the SBA. Mr. Joseph, having received several SBIR awards, offered his advice on how to prepare a successful application. Anne Barth, TechConnectWV's executive director, provided information on resources available through TechConnect WV to support potential applicants as they explore SBIR agencies' needs and the application process.

Objective 2

Launch of ScaleUp West Virginia Venture

In its request for the U.S. EDA's and the State of West Virginia's support through Grant 01-79-14690, TechConnectWV cited the need to support West Virginia's early-stage companies in developing their products and businesses. To address that need, TechConnect WV said it would create *ScaleUp West Virginia Venture* to provide direct technical and professional assistance to seed and support early-stage companies in need of product and business development support.

TechConnect WV's funding request for ScaleUp West Virginia designated the INNOVA Commercialization Group, based at the West Virginia High Technology Foundation in Marion County, to deliver that new business venture. *Specifically, the objective for ScaleUp West Virginia Venture, through INNOVA, was to assist up to 30 companies and entrepreneurs.*

That objective was met, with INNOVA assisting 30 companies through ScaleUp West Virginia Venture.

Those businesses ranged from one that has designed a premium breast support pillow for women who experience discomfort following breast surgery to an early-stage company that has created a sternum repair device to replace steel wire in primary sternal closure procedures. INNOVA's assistance included supporting early-stage companies through entrepreneurial education and training, technical proof-of-concept and market-potential validation, legal and financial support services, and guidance on how to access the continuum of available capital, including SBIR/STTR and other federal sources of support.

INNOVA's guidance in preparing ScaleUp West Virginia companies for follow-on investment was especially successful. The U.S. EDA's and the State of West Virginia's support allowed INNOVA to successfully guide four companies – Billow Global, SiOX LLC, Valtari Bio and Figure 8 – in securing \$2.16 million in follow-on funding.

Objective 3

Launch ChemAssist at the West Virginia Regional Technology Park

TechConnectWV said it would partner with the Chemical Alliance Zone, through its ChemCeption incubator at the West Virginia Regional Technology Park (WVRTP) in South Charleston, to launch ChemAssist, a program designed to support early-stage development of new technologies and products in both green and traditional chemistry and related areas. ChemCeption's strategic partner, the Mid-Atlantic Technology, Research & Innovation Center (MATRIC), would be the lead provider of on-site technical and commercialization assistance with supplemental assistance provided by the state's research universities.

The specific objective for ChemAssist was to provide technical assistance to at least two but as many as five or more entrepreneurs or companies, depending on the type of assistance needed and where along the commercialization continuum a product or technology lies.

That objective was exceeded. Much of the Chemical Alliance Zone and its incubator ChemCeption's technical assistance was focused on nine companies.

The Chemical Alliance Zone's assistance helped create one new product and two new processes. From a jobs perspective, that assistance helped retain approximately

36 existing jobs. The U.S. EDA's and the State of West Virginia's support also was leveraged to help attract \$1.09 million in follow-on funding.

That assistance ranged from guidance on positioning for market opportunities to facilitating meetings with potential partners, providing guidance on business and management organization, identifying sources of follow-on funding and preparing to pitch for that funding.

One of the lessons learned through ScaleUp West Virginia was the extent to which the Chemical Alliance Zone can use its technical, business planning, and networking expertise to help position and connect entrepreneurs, early-stage and existing companies from across the country with the unique chemical industry-related research, development and production expertise and capabilities available through MATRIC, the West Virginia Regional Technology Park, and other West Virginia companies and institutions. With those entities' demonstrated success in meeting national and international clients' research, development and production needs, the Chemical Alliance Zone was able to connect an additional 31 companies with MATRIC and other West Virginia companies and institutions that could lead to new contract opportunities for those West Virginia organizations.

Manufacturing Innovation & Integration

TechConnectWV also set out to help encourage more West Virginia manufacturers to pursue designing and launching new products, redesigning their existing products, and adopting more innovative manufacturing methods. ScaleUp West Virginia laid out a three-pronged strategy to enable the project's sub-awardees to deliver those resources. That strategy involved launching three initiatives:

- ScaleUp West Virginia Advanced Manufacturing
- ScaleUp West Virginia Design for Manufacturing
- ScaleUp West Virginia Transformational Manufacturing

Objective 4

In ScaleUp West Virginia Advanced Manufacturing, sub-awardee Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI) would provide direct technical assistance for up to 25 West Virginia entrepreneurs and companies to utilize RCBI's facilities and professional expertise.

That objective was exceeded, as RCBI provided direct assistance to 28 entrepreneurs and companies.

RCBI's technical assistance to those 28 entrepreneurs and established entrepreneurs and businesses create their initial product designs, helped them refine their own design, identifying the best materials to use in their products, creating 3-D drawings to improve production processes, and implementing valuable ISO processes and training needed to expand their markets.

Among the 28 companies RCBI assisted, 11 are new West Virginia companies. From a jobs perspective, RCBI's assistance helped create 25 new jobs and retain 12 existing jobs. EDA's and the State of West Virginia's support also was leveraged to help attract \$1.75 million in follow-on funding among those companies.

RCBI's technical assistance through ScaleUp West Virginia Advanced Manufacturing enabled 19 new products to be developed that ranged from a traffic signaling system to alert drivers of an oncoming school bus to design and manufacture of a more durable livestock feed bucket for horse owners. RCBI's work also supported creating three new processes for West Virginia companies.

In ScaleUp West Virginia Design for Manufacturing, sub-awardee Center for Applied Research & Technology (CART) would provide direct technical assistance for up to 10 entrepreneurs and small businesses with services such as problem seeking, concept design engineering, manufacturability design, phased prototype development, initial production, marketing presentation support, and a full-range of other services and consultation needed for launching a new product into the marketplace.

CART exceeded that objective by assisting 14 entrepreneurs and small businesses. Of those, 11 are new companies. CART's assistance helped create 18 new jobs and retain 19 more. Nine new products and nine new processes also were

developed. EDA's and the State of West Virginia's support was leveraged to help attract \$35,240 in follow-on funding for those companies.

CART's work through ScaleUp West Virginia Design for Manufacturing involved developing advanced engineering and electronics designs and drawings, prototypes, drawings for manufacture, product testing, and guidance on supply chain sourcing. The products involved covered a range that included a heavy duty, remote-controlled vehicle to a GPS/satellite tracking device and a chimney cap/chimney cleaning unit.

Objective 5

In ScaleUp West Virginia Transformational Manufacturing, **sub-awardee West Virginia Manufacturing Extension Partnership (WVMEP) and West Virginia University would develop a model of an assessment tool or tools that would be piloted with up to 20 companies to validate its use and effectiveness.** The manufacturing assessment tool or tools would assess a manufacturing company's operational effectiveness, development of new markets and customers, innovations within current product lines, new product and application development, new business partnership and venture development, and export market development. **That objective was exceeded, with WVMEP developing and using a new interview-based questionnaire that WVMEP staff administered in the contacts with client companies.**

Objective 6

Beyond creating that assessment tool, **WVMEP's objective was to help up to as many as 20 client companies in developing specific strategies to effectively and efficiently respond to declining market conditions and to appropriately respond to any changes in market conditions that are having actual or potential negative impacts on supply chains.** WVMEP's expertise in helping companies in those areas included:

- Improving a company's use of technology and advanced manufacturing techniques
- Improving their business processes

- Obtaining assessments and assistance to expand customers and markets (both domestic and foreign), developing new products, and expanding existing products' utilization
- Obtaining assistance to diversify and innovate a company's products and services, especially for companies whose history has been in traditional heavy extraction industries
- Obtaining access and connections to the growing shale gas-based industrial development
- Obtaining access to funding for transformational and business improvement activities

WVMEP completed 23 separate projects with 12 companies through ScaleUp West Virginia Transformational Manufacturing, including two new West Virginia companies. That assistance helped create five new jobs and retain 18 others. One new product and one new process also were created.

A valuable understanding about helping companies transition to new markets or products was reinforced through ScaleUp West Virginia Transformational Manufacturing. Helping companies that have worked in a single industry - in some cases for decades - transition to new markets is different from helping entrepreneurs and early-stage companies in their formation or launch stages. Helping companies pivot from, or at least supplement, their work in an anchor industry often involves a systemic range of assistance that requires more time and attention in comparison to launching a company or product. Helping an established company make a transition also requires establishing a unique level of trust between the company and an assistance provider. All those factors often equate to an assistance project that can be longer in duration and deeper in scope than other projects.

A Success Story in Commercialization Optimization

Chemical Alliance Zone Helps Position Keen Process Technologies, LLC for Success

After completing his doctoral studies in organic chemistry at the University of Wyoming, Brian Keen spent the next four years as a professor of organic chemistry at the University of Wisconsin and Penn State University. Dr. Keen says his time in academia was a rewarding experience. However, his interest in actively developing and improving chemical processes led him away from the classroom and into industry. In 1980, Dr. Keen joined Union Carbide at its South Charleston, West Virginia, research and development park.

"I wanted to make more of a difference in chemistry," Dr. Keen says of his move from the classroom to industry. "Union Carbide gave me the opportunity to be involved with real chemical processes, and in improving those processes in ways that would benefit society."

Over the next 28 years, culminating as a senior technology manager and scientist for Union Carbide and its successor Dow Chemical, Dr. Keen was directly involved with developing and improving chemical processes for dozens of materials that go into consumer products from automotive brake fluids to high-definition televisions. He holds more than 35 patents, most related to chemical products and processes.

When he retired from Dow Chemical in 2008, Dr. Keen formed Keen Process Technologies with two goals in mind: 1) to continue his work in developing and improving chemical processes and 2) to focus on projects that can directly benefit West Virginia.

"I think we have an obligation to make things better while we're here," he said. "Being in West Virginia with the slow-down of the coal industry, I wanted to do something to help."

Clearly, the nation's shift away from coal has had a jarring effect on much of the state. However, that shift away from coal and, to some extent, oil has opened a window of opportunity for West Virginia and its abundant natural gas reserves.



Dr. Brian Keen, founder of Keen Process Technologies in South Charleston, has patented a method of manufacturing propylene from natural gas liquids. His process could play a significant role in growing West Virginia's chemical industry.

EDA's and the State of West Virginia's investments in ScaleUp West Virginia made it possible for Keen Process Technologies to make measurable progress on three projects that could make the state's natural gas more accessible and valuable to a wider market. Specifically, those investments allowed the Chemical Alliance Zone to provide critical business and technical assistance that have positioned the company to continue its growth. The Chemical Alliance Zone provided assistance for proof-of-concept studies, patent preparation, investor pitch preparation, partner facilitation, and more

One of the company's projects is focused on improving how propylene, a key precursor to many plastics, is produced. This innovation was recently validated when a U.S. patent was granted.

Most of the nation's propylene has been produced as a byproduct through a process in which naphtha, a component of oil, is "cracked" into ethylene at large "cracker" facilities. Those facilities increasingly are shifting away from an oil-based feedstock in favor of ethane, which is derived from natural gas, now highly abundant in the United States thanks to Marcellus shale and other shale formations. While that shift has created an advantage for making ethylene in the United States, the process does not generate large amounts of propylene as a byproduct, causing a supply issue for propylene in the United States.

With the help of the ScaleUp West Virginia project and the Chemical Alliance Zone, Dr. Keen also has made measurable progress in demonstrating proof of concept technologies for safe, efficient production of both high-octane fuel and oxygen containing hydrocarbon liquids from natural gas streams. These technologies could potentially be carried out at smaller facilities scattered across the nation, including in West Virginia. At the very least, Dr. Keen's innovations offer potential for alternative markets for stranded natural gas and natural gas liquids.

There is still work to be done on all three of Keen Process Technologies' process-development projects, but the feedback Dr. Keen is receiving from the industry indicates he is on the right track on all three. And EDA's and the State of West Virginia's support through ScaleUp West Virginia have been instrumental in moving each forward.

"I think we have an obligation to make things better while we're here."

"I would not have been able to prove the feasibility of these process improvements without this program," he said.

TechConnect West Virginia, Chemical Alliance Zone, and stakeholders across the state look forward to seeing Keen Process Technologies continuing to build on this progress.



Entrepreneurial Support & Capacity

In its proposal for EDA Grant 01-79-14690, TechConnectWV described the need to inspire, support, and facilitate a rebirth of West Virginia's entrepreneurial culture. The next generation of students, workers, and business owners can help shape this new chapter in our state's history as they devise new products and solutions for a new era in business and industry.

TechConnectWV identified four areas of opportunity that could produce valuable results in the effort:

- Foster the Next Generation of Entrepreneurship
- Support Women and Minorities in Business/Technology
- Support Entrepreneurship in Secondary & Post-Secondary Education
- Support Entrepreneurship in Communities

In its proposal to EDA, TechConnectWV laid out specific action items within each of those areas of opportunity.

Foster the Next Generation of Entrepreneurship Objective 7

TechConnectWV set an objective to co-host seminars and forums with regional service providers that would be designed to increase awareness and provide information on topics relating to creating, launching and sustaining a new enterprise.

For example, topics could include:

- Basics of Starting a Business
- Protecting Intellectual Property
- State and Federal Research Tax Credits
- Access to Capital: traditional/non-traditional

TechConnectWV co-hosted three events designed to increase interest in entrepreneurial opportunities and resources among the state's next generation of business leaders:



Brad Smith, Chairman and CEO of global software company Inuit and a native West Virginian, addresses the audience on April 6, 2016, at TechConnectWV's "Growing Innovation in the Mountain State" event.

• Growing Innovation in The Mountain State

TechConnect organized and hosted *Growing Innovation in The Mountain State*, a statewide discussion on growing innovation in West Virginia that featured West Virginia native and Chairman and Chief Executive Officer of global software company Inuit Brad Smith. He was joined by Jim Clifton, Chief Executive Officer of Gallup. More than 100 key West Virginia business leaders, entrepreneurs, local and state economic developers, higher education administrators, and community thought-leaders attended the event at the West Virginia Regional Technology Park in South Charleston. The event produced an interactive discussion on specific strategies for increasing entrepreneurial activities in the state. ScaleUp West Virginia, and EDA's and the State of West Virginia's enabling support were noted as a part of the event.

In addition, contacts made at this event led to the establishment of Core10, a financial technology company, which opened on Nov. 3, 2016 in Huntington, WV. The forum created an opportunity for the new firm's founders to meet with West Virginia investors, which led to the funding needed to launch the new business.

• West Virginia Business Accelerator Bootcamp

TechConnect WV, the West Virginia Jobs Investment Trust, INNOVA, WVU Health Sciences Innovation Center, WVU Women's Business Center, and the Bioscience Association of West Virginia hosted an event that delivered a unique opportunity to hear from experts and specialists who shared information and strategies on intellectual property, capital formation, business plan development, corporate structure/formation, and pitching for funding.

Thirty-nine people participated in the event and represented start-up and mid-sized companies. Students from the BrickStreet Center for Innovation and Entrepreneurship at West Virginia University also attended.

In addition to hearing about inventor and entrepreneur resources available through the U.S. Patent and Trademark Office and tips for giving an effective presentation for funding, participants learned about venture capital funding being developed in West Virginia.

• West Virginia Bioscience Summit

TechConnectWV joined West Virginia University, Bioscience Association of West Virginia, VWR International, the West Virginia Jobs Investment Trust, PhRMA and Amgen to host the 7th annual West Virginia Bioscience Summit.

The summit, held in Morgantown, brought together representatives from West Virginia's research universities, biotech companies, technical assistance providers and others to hear from experts in the field on how to grow the state's life science industries.

Dr. Mary Hendrix, President of Shepherd University and a national recognized leader in cancer research, joined Marshall University President Jerome Gilbert and West Virginia University President Gordon Gee for a panel discussion to discuss university and industry collaborations that can drive growth in the state's life science industry.

Support for Women and Minorities in Business/Technology

In its proposal to EDA, TechConnectWV cited the American Express OPEN 2015 State of Women-Owned Business Report. That report showed the number of women going into business at a rate 150% of the national average. TechConnectWV identified that trend as a unique opportunity to grow West Virginia's start-up culture.

Objective 8

To specifically encourage more West Virginia women to consider entrepreneurial, science and technology paths, ***TechConnectWV set an objective to support two annual conferences designed specifically for women, with a focus on entrepreneurship, technology and innovation.***

TechConnectWV met that objective by hosting two TechConnect WV Women & Technology Conferences, one in 2016 and a second in 2017.

More than 125 participants attended the first event, held in October 2016 at Canaan Valley State Park. The conference addressed the under-representation of women in STEM fields and encouraged women involved in technology education and research, private enterprises, the public sector, investing and entrepreneurship. The conference keynote speakers and breakout sessions focused on how women and technology can help grow West Virginia's economy through innovation, entrepreneurship and collaboration. Breakout sessions addressed migration to technology fields, non-traditional career choices for women, and entrepreneurship.

In June 2017, TechConnectWV again hosted more than 125 people at the 2017 Women & Technology Conference in Charleston. U.S. Senator Shelley Moore Capito welcomed participants and stressed the importance of STEM education and the critical role of career and technical education, especially in terms of advanced manufacturing jobs.

Dr. Maura McLaughlin, a professor in West Virginia University's Department of Physics & Astronomy and Director of the university's Center for Gravitational Waves and Cosmology, spoke to the group about her research and the route she followed to pursue a career in science.

West Virginia native Dr. Anne Fischer, a Defense Science Office program manager for the Defense Advanced Research Projects Agency (DARPA), delivered the keynote address and spoke about how her interest in science was born while a student at Charleston's George Washington High School.

TechConnectWV secured sponsor support for the conference from Allegheny Science & Technology, the Division of Science and Research at West Virginia Higher Education Policy Commission, KeyLogic, NASA West Virginia Space Grant Consortium, Steptoe & Johnson PLLC, TransCanada Corporation, and West Virginia University.

TechConnectWV also participated in both the 2016 and 2017 West Virginia Minority Business Expo events. The expos were held at the Charleston Civic Center and were hosted by the State of West Virginia's Herbert Henderson Office of Minority Affairs to allow business and government representatives to promote minority entrepreneurship. The events gave TechConnectWV an opportunity to interact with approximately 400 attendees and fellow exhibitors and to share information about the technical assistance available to entrepreneurs made possible through ScaleUp West Virginia and EDA's and the State of West Virginia's support.



L-R: Anne Barth, Emily Rawlings, Brooke Albin, Dr. Michelle Foster, Sabrina Ridenour, Shanna Sanders at TechConnect WV's 2017 Women & Technology Conference.



More than 125 attendees from business, education and nonprofit backgrounds participated in TechConnectWV's 2017 Women & Technology Conference in Charleston.

A Success Story in Commercialization Optimization

INNOVA Helps a Charleston-based Entrepreneur Bring Comfort to Breast Cancer Patients



Marnie Rustemeyer is a former Wall Street professional, thyroid cancer survivor and breast cancer previvor. Breast cancer is particularly close to Marnie's heart as her mother cancer is particularly close to Marnie's heart as her mother was diagnosed with breast cancer at the age of 40 and she and her mother both carry the BRCA gene mutation. In August 2013 Marnie had a preventative double mastectomy and subsequent reconstructive surgeries to decrease her risk of getting breast cancer.

Following surgery, Marnie conducted an exhaustive search of products on the market in an effort to find a comfortable pillow for sleeping, recovering and getting a massage. During her many doctor visits, Marnie also saw the distress of other breast cancer patients trying to find relief post surgery, often resorting to a nest of pillows to find a comfortable pillow. Additionally, existing "breast pillows" on the market were uncomfortable and did not provide support in the areas that a patient needs post surgery – specifically the breast, lower back, under arm (due to lymph node removal) and neck.

Marnie found a positive and creative outlet during her recoveries to work on designing the Billow (breast+pillow). She made it her mission to create a product that offered supportive comfort and relief where a woman needs it most post surgery. After a year of research and development, the Billow was created. Keeping in mind the many sensitivities the skin and body go through during surgery, chemo and radiation, she designed the Billow with 100% organic, hypoallergenic, chemical free and cruelty free materials. The Billow gives women a soft yet supportive full body hug that helps them feel secure and comforted while sleeping, resting or getting massage therapy.

Five percent of Billow Global's profits are donated to breast cancer charities who allocate money towards research programs to help find a cure. With each purchase of any of the Billow pillow products, you can feel good knowing that you are contributing to improving a woman's life and helping to find a cure.

From <http://billowglobal.com/>

For most entrepreneurs and early-stage companies, getting their product designed and a basic business structure in place to make it possible to take a product to market is difficult enough. Positioning their product and business for success after launch and for outside investment requires additional specialized support.

That is where INNOVA, through ScaleUp West Virginia, stepped in to help.

INNOVA's role in ScaleUp West Virginia was to help entrepreneurs and early-stage companies identify opportunities in the market, complete thorough proof-of-concept and prototype development processes, create a solid management structure, and identify the right sources for early-stage funding.

Enabled by the U.S. EDA's and the State of West Virginia's investment in ScaleUp West Virginia, INNOVA helped Ms. Rustemeyer identify potential capital investors and then map out a strategy for approaching those investors. With INNOVA's support, Billow secured a total of \$100,000 in institutional and individual investments.

As Billow continues to grow its unique line of products and mission, so will the impact that the U.S. EDA's and the State of West Virginia's support through ScaleUp West Virginia.



"I am happy to report that I fell asleep on my stomach for the first time in over a year.

I am loving the Billow's design and I think it's going to give me great relief from the sciatica that I developed from sleeping on my back for over a year after my mastectomy.

I will be telling my plastic surgeon and oncologist about your Billow

Thank you for using your life experience to support others!"

Jill B., CA, USA

#billowfeedback

Support Entrepreneurship in Secondary & Post-Secondary Education

In its ScaleUp West Virginia proposal, TechConnectWV cited recent efforts in West Virginia to foster interest in entrepreneurship among the state's secondary and post-secondary students. These initiatives also have been designed to a) help raise levels of educational attainment and b) to encourage Millennial/Gen Y West Virginians to consider entrepreneurship as a path to starting careers that could allow them to remain and flourish in West Virginia.

Objective 9

TechConnectWV set an objective to co-host and promote, with secondary and post-secondary education providers, four events designed to foster student interest and engagement in entrepreneurship. Those events could focus on a combination of:

- Business plan competitions
- Entrepreneurial forums
- 3-D printing camps
- Robotics competitions
- National Manufacturing Day activities
- FIRST® LEGO® League competitions

To help encourage more entrepreneurship among West Virginia's secondary students, TechConnectWV supported Learning Options, Inc.'s "Hour of Code Challenge" event for youth in Fairmont. Fifteen students met for an hour for five consecutive nights in December 2016 to learn about code's role in our day-to-day lives. Students also learned how to write code themselves. Several parents also participated.

TechConnectWV also supported Beckley Stratton Middle School's (Raleigh County) STEAM Technology Academy Afterschool Pilot Program. The program allowed Stratton students to be challenged in finding solutions to problems they believe a business could solve, and submit business plans reflecting their solutions. Students worked in simulated and innovative work settings to gain skills to help them become entrepreneurs and improve their soft skills to join the workforce themselves.

TechConnectWV supported two events involving post-secondary institutions to support the expansion of entrepreneurship education and awareness.

In March 2016, Anne Barth, TechConnectWV's executive director, served as a judge in the West Virginia University College of Business and Economics' BrickStreet Center for Innovation and Entrepreneurship's West Virginia Statewide High School Business Plan Competition.

The field of competitors represented 27 West Virginia schools. A three-student team from Buckhannon-Upshur High School won the competition. The three students split a \$10,000 scholarship to attend one of 10 participating West Virginia colleges and universities. In April 2017, Anne Barth joined 38 other business and community leaders in judging 227 pitch entries in the University of Charleston's inaugural I3 Innovation Showcase and Innovation Fair.

The participants competed for more than \$20,000 in prize money in 11 categories that encompassed innovations in product development, process improvement, services, art, and research. The participants were given 15-20 minutes to pitch their ideas and deliver their presentations, and the panelists were given opportunities to ask questions and give constructive criticism, feedback, and advice.

In July 2017, Anne Barth served as a judge in the 2017 Governor's School of Entrepreneurship's pitch contest. Twenty-nine students from across the state participated in the three-week camp at West Virginia University.



University of Charleston president Ed Welch presents an award to a winning team in the I3 Showcase's "Innovative Product" category.

Support for Entrepreneurship in Communities

Objective 10

In its ScaleUp West Virginia proposal to the U.S. EDA, TechConnectWV noted there are several new and ongoing entrepreneurship-related initiatives in ScaleUp West Virginia's 40-county project area. ***TechConnectWV committed to supporting and promoting entrepreneurial programs hosted by the following organizations:***

- ***The Hive, a business accelerator/incubator located in Beckley***
- ***The North Central West Virginia INNOVATOR incubator, located at the West Virginia High Technology Foundation in Fairmont***
- ***The Charleston Area Alliance Incubator***

TechConnectWV also committed to support efforts to development plans for a business support entity in southern West Virginia, with resources and expertise targeted to regional opportunities and workforce realignment.

TechConnectWV met each of those objectives.

The support for The Hive was directed to the incubator's *Common Grounds*, a monthly pitch competition for local entrepreneurs. The first winner was Nima ShahabShahmir, a West Virginia University Institute of Technology student. Mr. ShahabShahmir has developed a natural, environmentally responsible substitute for Styrofoam and plastics using Mycelium (mushrooms).

The support at The North Central West Virginia INNOVATOR incubator was through October 2016's *Rural Entrepreneurship: A Conversation with Practitioners of the Entrepreneurial Ecosystem at the West Virginia High Technology Foundation*. The event was held with the support of the U. S. Treasury's *State Small Business Credit Initiative*. Participants discussed top opportunities and challenges in the areas of finance, policy, support, culture, human capital, and markets.

TechConnectWV partnered with Charleston Area Alliance to leverage EDA's and the State of West Virginia's investment in the Chemical Alliance Zone's ChemAssist via the ScaleUp West Virginia. Charleston Area Alliance's board of directors approved a \$45,000 match of EDA's support. On an ongoing basis, Anne Barth serves on the Alliance's Economic Development Committee.

During both the 2016 and 2017 West Virginia Legislative sessions, TechConnectWV hosted Innovation & Entrepreneurship Day at the State Capitol. More than 40 exhibitors arranged displays in the hallways and rotunda of the Capitol building each year to showcase their innovative entrepreneurial and startup success to policy makers and opinion leaders. The events provided opportunities for entrepreneurs to spend a day at the Capitol talking with their legislators, sharing both their success stories and the challenges they've encountered in starting a new enterprise in the state.

Finally, TechConnectWV supported the creation of the City of Bluefield's "Commercialization Station" and its mission as a business-support entity in southern West Virginia, as well as the City's "CREATE Opportunity" program, which encourages entrepreneurship among youth and adults. TechConnectWV has attended several meetings and provided letters in support of Commercialization Station's development.

A Success Story in Manufacturing Innovation & Integration

CART Helps a Former Mine Security Worker and Team Develop Autonomous and Radio Controlled Equipment

Derek Dotson was a security worker in the mining industry in Southern West Virginia. Seeing an increasing number of layoffs in the industry and even mines closing, Dotson decided to pursue a degree in Electrical Engineering Technology at Bluefield State College.

Through courses at Bluefield State, Dotson and some of his classmates became interested in the growing field of remote-controlled equipment and their industrial applications. A natural entrepreneurial spirit led Dotson and his partners to create Autonomous and Radio Controlled Equipment (ARCE), a company that specializes in designing and building autonomous and radio-controlled systems for a variety of equipment and applications.

Dotson's background also includes work as a landscaper. Drawing on his perspective and a collective experience with steep topography in places like Southern West Virginia, Dotson and his partners set out to develop a radio-controlled mower that would be durable enough to handle the type of rugged terrain that can present safety concerns for operators using riding and walk-behind equipment.

The group had a solid concept in mind but would need help to move their ideas from the drawing board to a working prototype.

The U.S. EDA's and the State of West Virginia's investment in ScaleUp West Virginia allowed the Center for Applied Research and Technology (CART) at Bluefield State College to provide technical assistance that was critical to moving Mr. Dotson and his team forward.

CART has proven and wide-ranging expertise in systems engineering, automation and robotics, and design for manufacturing. Drawing on that expertise, CART and Mr. Dotson completed a design, identified specific materials that would meet the vehicle's specifications and manufacturing plans, and produced the first working prototype of the team's radio-controlled vehicle. The zero-turn vehicle is primarily set up as a commercial mower for terrain that would be considered unsafe for manually-operated walk-behind mowers or other standard power equipment.



Autonomous and Radio Controlled Equipment's radio-controlled, zero-turn vehicle. The Center for Applied Research and Technology, a ScaleUp West Virginia sub-awardee, is helping the company develop the vehicle's prototype and a strategy for moving the product to market.



Rep. Evan Jenkins (I) learns more about Autonomous and Radio Controlled Equipment's zero-turn vehicle at the City of Bluefield's Commercialization Station.

However, since ARCE's equipment can be controlled remotely, its potential extends beyond commercial lawn and property maintenance and into markets related to first responder and other public safety applications.

CART also has provided the ARCE team guidance on business development assistance, the ARCE team has demonstrated the vehicle to key stakeholders and potential customers, including the West Virginia Division of Highways.

The story of Mr. Dotson's path from security worker in the mining industry to college student and entrepreneur is a powerful example of West Virginia's potential to diversify its economy.

The technical assistance provided by CART also is an excellent example of EDA's and the State of West Virginia's impact through ScaleUp West Virginia. This could not have happened without their support.



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Center for Applied Research and Technology

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Chemical Alliance Zone

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(304) 720-1021 / www.cazwv.com



INNOVA Commercialization Group

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www.wvhtf.org/innova-commercialization-group



West Virginia Manufacturing Extension Partnership

317 Mineral Resources Building • P.O. Box 6070
Morgantown, WV 26505
(304) 293-3800 / www.wvmep.com



Robert C. Byrd Institute for Advanced Flexible Manufacturing

1050 Fourth Avenue • Huntington, WV 25701
800-469-7224 / www.rcbi.org

A Success Story in Manufacturing Innovation & Integration

In One Project, RCBI Moves One Entrepreneur Forward and Creates Opportunity for an Established Manufacturer



Dr. Greg Crews has been a horse owner for more than 15 years. Some of his worst frustrations were created by feed buckets that wouldn't stay attached to fences and stables. Horses constantly pulling feed buckets from a fence or stable wall presents a messy nuisance and eventually damages the bucket beyond repair. Also, a feed bucket on the ground or a stall's floor can create a dangerous situation for an owner who attempts to retrieve the bucket from their horse's space.

Dr. Crews knew he wasn't alone in his feed bucket frustrations. So, he set out to design a more stable and durable solution. With EDA's and the State of West Virginia's help through ScaleUp West Virginia, it would happen.



The LOCK-N-LOAD™ Feed System was developed by Dr. Greg Crews with technical assistance from ScaleUp West Virginia sub-awardee Robert C. Byrd Institute for Advanced Flexible Manufacturing.

Dr. Crews knew he would need help to move his idea forward. Knowing about the Robert C. Byrd Institute for Advanced Flexible Manufacturing's (RCBI) product design and prototyping services, he approached RCBI's staff for help in perfecting his own initial design. RCBI also helped him identify the best materials to use for his product.

The LOCK-N-LOAD™ Feed System is manufactured from high density polyethylene, making it an extremely durable bucket that resists cracking and warping. It also can withstand both extreme heat and extreme cold conditions. The system's unique LOCK-N-LOAD™ attaching mechanism can be attached by to any type of fencing by hand.

With RCBI's technical assistance, made possible through ScaleUp West Virginia, Dr. Crews had designed a solution to a nagging and expensive problem that is common among horse owners. The next question was, Is there a manufacturer that could produce a high-density polyethylene bucket in the quantities and intervals that a young company would need?

RCBI introduced Dr. Crews to PTI, Inc., a compression and injection molding manufacturer in Point Pleasant, West Virginia. After Dr. Crews learned about PTI's capabilities, a match between a local entrepreneur and an established, local manufacturer was made.

PTI has a long history of manufacturing a variety of molded products using thermoset and thermoplastic compounds. Their customers are located across the country and contract with PTI to manufacture products that range from electrical boxes to Christmas tree stands. The opportunity to work with a young West Virginia-based company was welcomed by Rod Roush, PTI's plant manager. Mr. Roush says he can attribute at least one full-time position to his company's work to produce the LOCK-N-LOAD™ Feed System.

Dr. Crews sells his LOCK-N-LOAD™ feed bucket through his company's web site and a growing number of relationships with retail outlets.

The LOCK-N-LOAD™ Feed System project is an excellent example of how EDA's and the State of West Virginia's investment in ScaleUp West Virginia were leveraged to move an entrepreneur's idea forward and create an add-on opportunity for an existing manufacturer.

Rod Roush, plant manager at PTI, Inc., in Pt. Pleasant holds a sample of the LOCK-N-LOAD™ Feed System product that his facility manufactures for a young West Virginia company that benefited from ScaleUp West Virginia.





Arria Hines, President and CEO of Allegheny Science & Technology, speaks to the media at TechConnectWV's 2017 Innovation and Entrepreneurship Day at the State Capitol.



Students from Beckley Stratton Middle School in Raleigh County examine some of the figures they created using 3-D design and printing technology at The Hive, a business accelerator/incubator in Beckley.

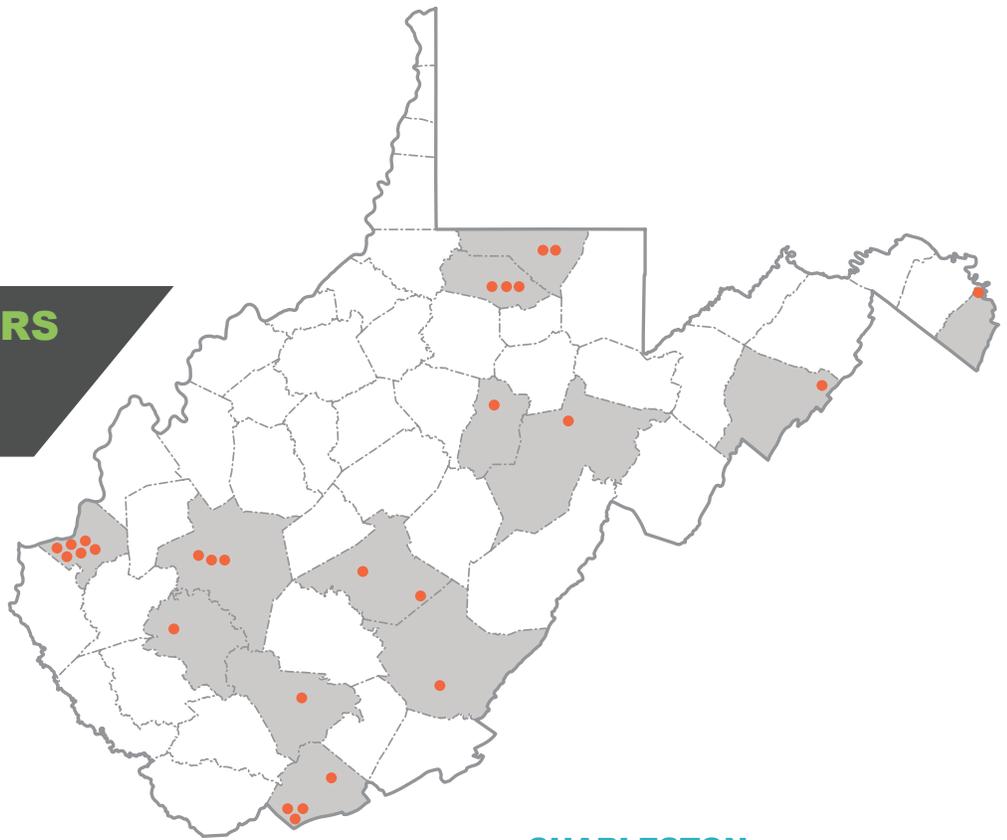


West Virginia University's Launch Lab Network hosted its first Women's Pitch Competition in 2017 to encourage female students to push the limits of their entrepreneurial, product development and business model ideas.



TECHCONNECT WEST VIRGINIA

BUSINESS INCUBATORS & ACCELERATORS IN WEST VIRGINIA



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gjames@bluefieldstate.edu

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Marshall University Institute for Interdisciplinary Research

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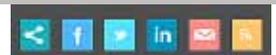
If you know of a facility that's not listed, or have updated information, please email info@techconnectwv.com.

TechConnectWV

West Virginia Regional Technology Park

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South Charleston, WV 25303-2732

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techconnectwv.org



A Success Story in Manufacturing Innovation & Integration

West Virginia Manufacturing Extension Partnership Helps Position Two Monongalia County Companies for the Future

Progressive Industries' history dates back to the late 1950s in Monongalia County as an underground mining equipment repair and rebuild shop. It was a great time to be in that line of work; the coal industry was booming in Monongalia County and across most of West Virginia.

Progressive Industries enjoyed decades of steady work. However, being largely dependent on a single industry can leave a company vulnerable when that industry hits difficult times. That certainly was the case for Progressive Industries when West Virginia's mining industry began to slow down.

Where we had been working on 30 to 40 pieces of equipment a year, we were working on four, and then three," owner Heather Cyphert said.

Consequently, her workforce went from 45 down to fewer than 10. The growth in West Virginia's natural gas industry has provided new work for the company, and there has been some level of new coal-related activity in 2017. That work has allowed the company to build its employee base back up in 2017 to approximately 20.

However, the slow-down in coal left few resources for positioning the company for a more stable future.

The U.S. EDA's and the State of West Virginia's investment in ScaleUp West Virginia allowed the West Virginia Manufacturing Extension Partnership (WVMEP) to help Progressive Industries find new processes efficiencies, ways to reduce the company's energy costs, strategies for replacing aging computer equipment, and to establish a more effective online presence. Ms. Cyphert says WVMEP's value-stream mapping work delivered critical help in optimizing the company's workflow and employees' roles. Ms. Cyphert says those efficiencies have played an important role in allowing the company to add employees.



(l-r) Anne Barth, Executive Director of TechConnectWV, Jerry Biser, Director of WVMEP, and Heather Cyphert, owner of Progressive Industries and Precision Tool

Progressive Industries' sister company, Precision Tool, targets its machining services to a broader range of industries. However, for several years, approximately 90 percent of Precision Tool's work came from Mylan Pharmaceuticals' Morgantown manufacturing facility.

Progressive Industries' experience through the coal industry's downturn made clear the importance of having a more diverse customer base.

Customers look for assurances that a manufacturer has the production and management standards and processes in place that will allow them to deliver the same high quality service or product on every order. ISO certifications are considered to be the gold standard for demonstrating a manufacturer's commitment to maintaining the highest quality production and management processes. The U.S. EDA's and the State of West Virginia's support allowed WVMEP to lead Ms. Cyphert and her employees in gaining an ISO 9001 certification. That work covered the full range of quality standards-related items, including conducting a gap analysis and management strategic planning, internal auditing training and creating written procedures for all quality-critical elements in the company's processes.

That is a level of quality control and management that Precision Tool had never thought possible prior to WVMEP's offer of assistance through ScaleUp West Virginia. It would not have been possible without support from the U.S. EDA and the State of West Virginia.

Looking at the full body of work that WVMEP did for both Progressive Industries and Precision Tool, Ms. Cyphert said none of it would have been possible but for the ScaleUp West Virginia program.

"This gave us a chance to do things that we couldn't have done otherwise," she said. "Things that I couldn't do for myself but have to be done."





ScaleUp
West Virginia

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