

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.

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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

Executive Summary

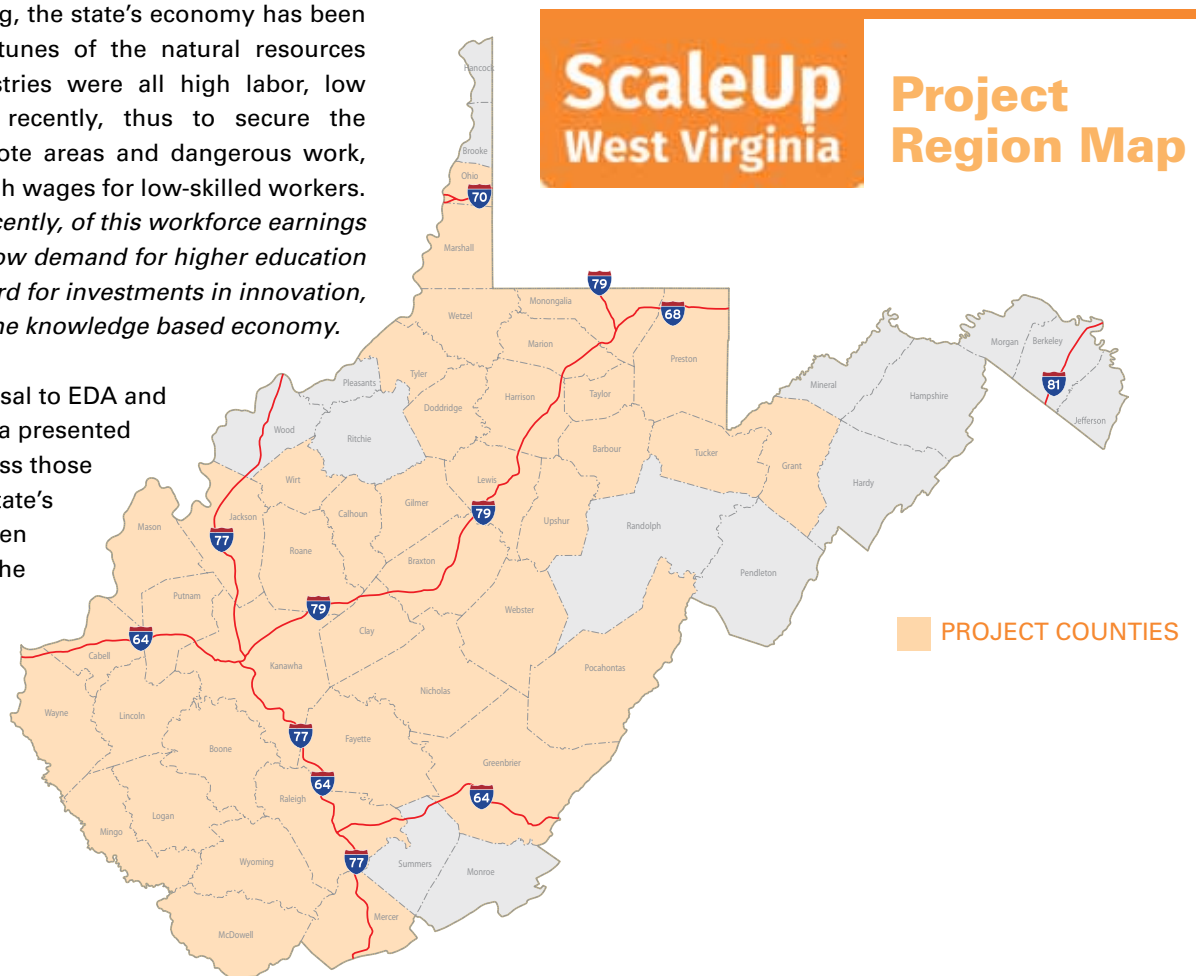
TechConnectWV's proposal to EDA for Grant 01-79-14690 described the state of West Virginia's origins. The state was born during the conflict of the Civil War and by Presidential decree on June 20, 1863, was carved from what then was considered the least productive, least valued areas of the Commonwealth of Virginia – the rugged mountains and steep river valleys west of the Shenandoah Valley. Its mean altitude of 1,500 feet is the highest average altitude east of the Mississippi and contains the Allegheny and Appalachian Mountains. West Virginia is the only state wholly within the Appalachian Regional Commission service boundaries.



Early discoveries of salt in the Kanawha Valley, special grade sand in the Ohio Valley, vast coal reserves, abundant natural gas reserves, crude oil, and old growth forests destined the state to have an “extraction” economy.

Thus, from the beginning, the state's economy has been directly tied to the fortunes of the natural resources industries. These industries were all high labor, low technology jobs until recently, thus to secure the necessary labor in remote areas and dangerous work, these industries paid high wages for low-skilled workers. *The prevalence, until recently, of this workforce earnings ability led to relatively low demand for higher education and low-to-modest regard for investments in innovation, entrepreneurship, and the knowledge based economy.*

TechConnectWV's proposal to EDA and the State of West Virginia presented a plan of action to address those conditions in 40 of the state's 55 counties that have been particularly affected by the decline in coal mining, West Virginia's main extraction industry.



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.

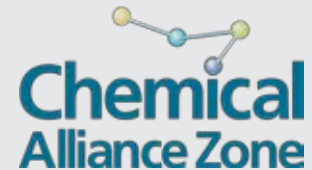
Certainly, if successful, new products and processes would be created and new jobs created and others retained.

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 sleeping position or rolled up towels when getting a massage. 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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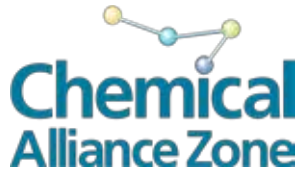
Stonewall Capital

ScaleUp West Virginia Sub-Awardees



Center for Applied Research and Technology

P.O. Box 2182 • Bluefield, WV 24701-2182
(304)327-4220 / www.cartinc.com



Chemical Alliance Zone

P.O. Box 18410 • South Charleston, WV 25303
(304) 720-1021 / www.cazwv.com



INNOVA Commercialization Group

1000 Technology Drive • Suite 1000
Fairmont, WV 26554
(304) 333-6769
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.

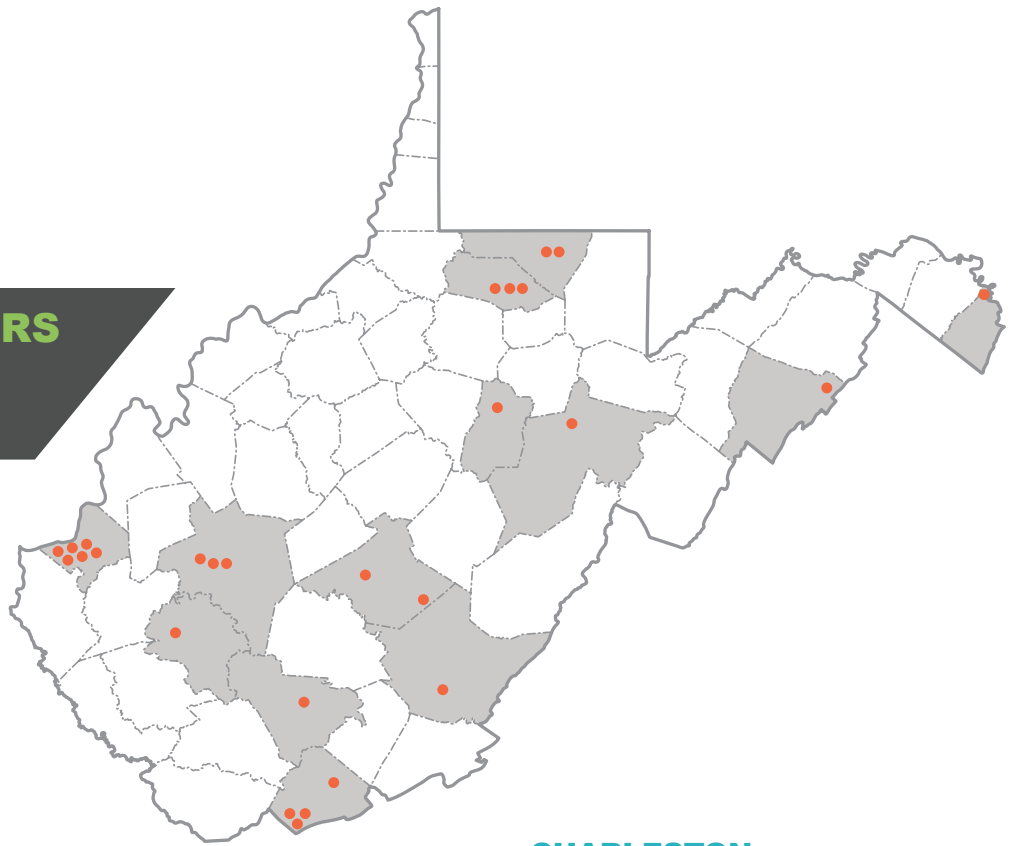


West Virginia University's Launch Lab Network hosted its first Women's Pitch Competition in 2017 to encourage female students to push the limits of their entrepreneurial, product development and business model ideas.



TECHCONNECT WEST VIRGINIA

BUSINESS INCUBATORS & ACCELERATORS IN WEST VIRGINIA



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CONTACT: Bruce Mutter
bmutter@cartinc.com

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<http://www.bscred.info>
f BSCRD
GrowBusiness
CONTACT: Gerald James,
Executive Director
gjames@bluefieldstate.edu

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Upshur County Business Development Center
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Buckhannon, WV 26201
(304) 472-1757
www.upshurda.com
CONTACT: Rob Hinton
rob@upshurda.com

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Charleston Area Alliance Small Business Incubator
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Charleston, WV 25301
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CONTACT: Roger Young,
Real Estate & Facilities Director
ryoung@charlestonareaalliance.org

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dusta@gaddyengineering.com

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Executive Director
robbie@rcdaww.org

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INNOVA Commercialization Group
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CONTACT: David Lieving, President
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muwww-new.marshall.edu/cegas/emi/
CONTACT: George Carico,
Environmental Manager
carico@marshall.edu

Marshall University Institute for Interdisciplinary Research

1676 Third Avenue
Huntington, WV 25703
(304) 696-3830
www.marshall.edu.miiir

Robert C. Byrd Institute For Advanced Flexible Manufacturing

The Maker Vault
RCBI's Huntington makerspace, the Maker Vault, extends RCBI's support of innovation and entrepreneurship to everyone.

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800.469.RCBI (7224)
304.781.1625 (local)
f rcbimakervault
www.rcbi.org

CONTACT: Jamie Cope
jcope@rcbi.org

Ten50 Business Accelerator

Ten50 is a Business Accelerator targeting tech based endeavors, supporting early-stage, growth driven companies through seed funding, office space, software perks, education, mentorship, and ultimately preparing them for outside financing.

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304.781.1625 (local)
www.ten50.io
www.rcbi.org

CONTACT: Bryan Shaw
bshaw@rcbi.org

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CONTACT: Gail Patton,
Executive Director
ufi@unlimitedfuture.org

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launch.wvu.edu
CONTACT: Dr. Carrie White, Director
cwhite17@mail.wvu.edu

Health Sciences Innovation Center
Biotechnology wet lab innovation incubator, idea development, IP protection, commercialization services.

8 Medical Center Drive
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(304) 293-5116
f healthsciencesic
CONTACT: Richard Giersch
richard.giersch@mail.wvu.edu

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www.richwoodscientific.com
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www.shepherd.edu/innovation
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jkump@shepherd.edu

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CONTACT: Tina Metzger
tina.metzger@easternwv.edu
f NewBizLaunchpad
www.easternwv.edu/About-Eastern/IREED/Eastern-s-Entrepreneurship-Incubator.aspx
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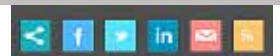
LIST AS OF: **JULY 2017**

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
1740 Union Carbide Drive, Suite 4203
South Charleston, WV 25303-2732

304.444.2918
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."



A SURVEY:

STEM Jobs in West Virginia in 2015

October 2016



Produced in partnership with the



WEST VIRGINIA
DEPARTMENT *of* COMMERCE



A SURVEY: STEM Jobs in West Virginia in 2015

“Regardless of educational attainment, entering a STEM profession is associated with higher earnings and reduced joblessness.”

— U.S. Department of Commerce

Science, technology, engineering and mathematics (STEM) workers drive the economy through innovation and increased competitiveness by generating new industries, new companies, and new job opportunities.

In collaboration with the West Virginia Department of Commerce, TechConnect West Virginia compiled this report outlining the number of STEM-related jobs in West Virginia in 2015. It is designed to present a new portrait of the STEM economy in West Virginia and to encourage conversation about strategies and policies that will lay the foundation to increase the number of STEM occupations in the state. It also establishes a baseline for measuring future growth in STEM-related jobs.

STEM jobs are highly desirable because they pay higher than average wages, are more recession-proof, and are among the fastest growing sector of jobs across the nation. The Bureau of Labor Statistics reports that STEM workers command higher wages, earning 26 percent more than their non-STEM counterparts. From 2012 to 2022, the Bureau of Labor Statistics projects that STEM employment will grow approximately 13 percent compared to a projected total job growth rate of 11 percent. For example, software developers—both in applications and systems—are predicted to have more than 350,000 positions open up by 2022. These positions paid a median annual wage of \$97,035 in May 2013.

In its report, *The Hidden STEM Economy*, the Brookings Institution reports that half of all STEM jobs are available to workers without a four-year college degree, and these jobs pay \$53,000 on average—a wage 10 percent higher than jobs with similar educational requirements.

Executive Summary

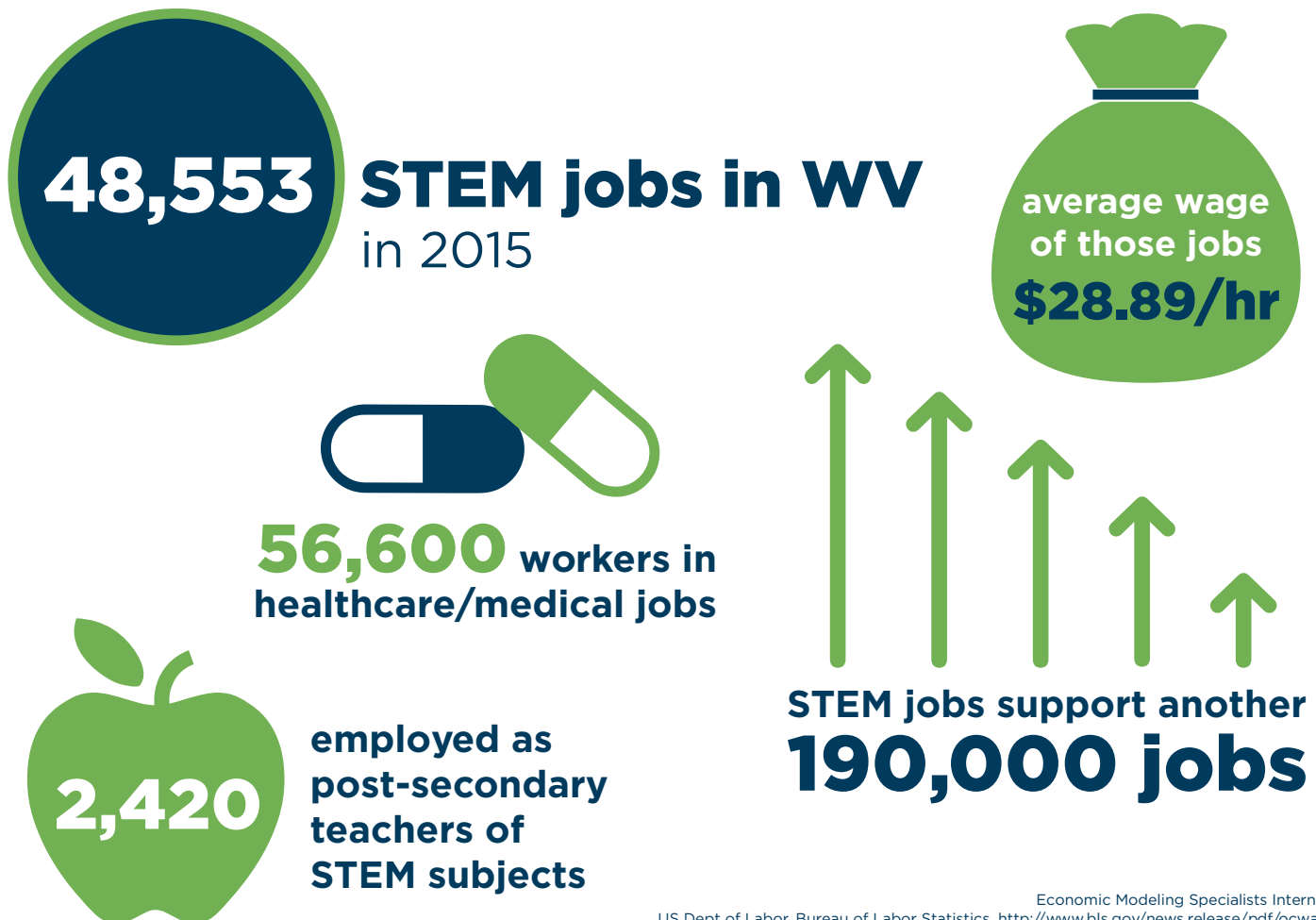
In 2015, West Virginia had 48,553 people working in STEM-related jobs. This represents 6.7 percent of the total number of jobs in that year—722,667.¹ Nationally, STEM jobs made up 6.2 percent of total employment in May.²

The survey found that West Virginia's **48,553** STEM economy jobs support another 190,000 jobs in the state and the average STEM job hourly wage in West Virginia is \$28.89 per hour.

While many of these jobs require a bachelor's, graduate and/or post-graduate degrees, others require less education, including one- and two-year degrees from community and technical colleges. It is important to not overlook the strong potential workforce of those with less than a four-year degree but substantial STEM skills. Sometimes called the "hidden STEM economy," these jobs are also critical to driving economic growth.

The common denominator is that in all of these jobs, workers use knowledge of science, technology, engineering and/or math to complete the tasks and duties of their jobs.

In addition to the 48,553 jobs identified in this survey, another 56,600 workers are employed in healthcare/medical jobs in the state, and yet another 2,420 workers are post-secondary teachers of STEM subjects.



Economic Modeling Specialists International
US Dept of Labor, Bureau of Labor Statistics, <http://www.bls.gov/news.release/pdf/ocwage.pdf>

Breakdown by STEM Discipline

Computer Science, Computer Related, Information Security	15,490
Engineering1	5,481
Chemistry	5,822
Other	7,010
Accountants & Auditors	4,750
TOTAL	48,553

Conclusions

STEM jobs are the jobs of the future. Although still relatively small in number—both in West Virginia and the nation—the STEM workforce has an outsized impact on our nation’s competitiveness, economic growth, and overall standard of living. They are essential for developing technological innovation and global competitiveness.

One reason it is difficult to define who is and who is not in the STEM workforce is that technical proficiency is becoming mandatory in a diverse body of occupations. As an example, automation and innovation have changed American manufacturing, where computers and robots drive production. Digital proficiency is a requirement for a majority of middle-skill jobs that require a high school diploma, but not necessarily a four-year degree. Understanding and optimizing digital technologies across a variety of platforms will be even more important to the workforce of tomorrow.

Thousands of jobs that are not typically understood to be STEM jobs will require STEM capabilities, and in order for businesses to be successful, the workforce must be prepared if we are to remain competitive globally. As a state, we must consider sound policies that prepare our workforce and advance growth in these jobs.

Methodology

2015 data collected through the Occupation Information Network (O*Net) was evaluated and ranked by STEM discipline. O*Net, an initiative of the U.S. Department of Labor/Employment and Training Administration, is the nation’s primary source of occupational information. Central to the project is the O*NET database, containing information on hundreds of standardized and occupation-specific descriptors. The database, which is available to the public at no cost, is continually updated by surveying a broad range of workers from each occupation. Information from this database forms the heart of O*NET OnLine, an interactive application for exploring and searching occupations.

For purposes of this survey, occupations were included that require the following STEM disciplines: Life Sciences, Computer Science, Engineering, Chemistry, Environmental Science, Geosciences, Mathematics and Physics/Astronomy.

To determine the total number of jobs supported by the STEM occupations identified in this survey, the database of the Economic Modeling Specialists International (EMSI) was used.

Occupations by STEM discipline, 2015:

Code	OccupationS	TEM Disciplines	Occupational Group	In WV	Median Hourly Earnings
13-2011	Accountants & Auditors			4,750	\$26.38
35-1012	First-Line Supervisors of Food Preparation & Serving Workers	Life Sciences		4,713	\$11.83
35-2012	Cooks, Institution & Cafeteria	Life Sciences		4,474	\$10.07
49-3023	Automotive Service Technicians and Mechanics			4,462	\$14.22
13-1199	Business Operations Specialists, All Other			3,078	\$29.54
15-1199	Computer Occupations, All Other			2,015	\$41.73
15-1151	Computer User Support Specialists	Computer Science	Computer and Mathematics	1,947	\$19.53
11-9199	Managers, All Other			1,318	\$36.23
15-1133	Software Developers, Systems Software	Computer Science, Engineering	Computer and Mathematics	1,287	\$35.21
17-2051	Civil Engineers	EngineeringA	Architecture and Engineering	1,254	\$32.44
13-1041	Compliance Officers			1,233	\$22.66
51-9011	Chemical Equipment Operators & Tenders	Chemistry		1,175	\$27.37
15-1142	Network & Computer Systems Administrators		Computer and Mathematics	949	\$27.61
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products		Sales and Related	855	\$28.51
15-1121	Computer Systems Analysts	Computer Science	Computer and Mathematics	799	\$32.33
15-1132	Software Developers, Applications	Computer Science, Engineering	Computer and Mathematics	793	\$40.63
11-3021	Computer & Information Systems Managers	Computer Science	Management	749	\$47.70
11-9021	Construction Managers	Engineering		728	\$39.76
15-1152	Computer Network Support Specialists	Computer Science	Computer and Mathematics	719	\$21.11
13-1051	Cost Estimators	Engineering		638	\$26.86
19-3031	Clinical, Counseling, and School Psychologists			625	\$23.25
19-2041	Environmental Scientists & Specialists, Including Health	Environmental Science	Life, Physical, and Social Sciences	588	\$20.83
15-1131	Computer Programmers	Computer Science	Computer and Mathematics	587	\$26.98
11-3051	Industrial Production Managers			581	\$42.16

Code	Occupations	TEM Disciplines	Occupational Group	In WV	Median Hourly Earnings
17-2071	Electrical Engineers	EngineeringA	Architecture and Engineering	517	\$40.70
49-3011	Aircraft Mechanics & Service Technicians	Engineering		504	\$25.47
27-1024	Graphic DesignersC	Computer Science		501	\$18.03
17-2112	Industrial Engineers	EngineeringA	Architecture and Engineering	494	\$39.50
13-2099	Financial Specialists, All Other			487	\$27.07
51-8091	Chemical Plant & System Operators	Chemistry		477	\$27.85
17-2199	Engineers, All Other		Architecture and Engineering	469	\$40.73
17-3023	Electrical and Electronics Engineering Technicians			448	\$24.23
45-4022	Logging Equipment Operators	Life Sciences		442	\$12.08
17-2141	Mechanical Engineers	EngineeringA	Architecture and Engineering	439	\$36.61
15-1141	Database Administrators	Computer Science	Computer and Mathematics	430	\$27.34
19-1020	Biological Scientists			429	\$30.20
19-4031	Chemical Technicians	Chemistry, Life SciencesL	Life, Physical, and Social Sciences	416	\$22.00
17-1022	Surveyors			398	\$24.12
17-3031	Surveying & Mapping Technicians		Architecture and Engineering	387	\$15.70
29-1031	Dietitians & NutritionistsL	Life Sciences		380	\$26.23
11-9041	Architectural & Engineering Managers	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Management	380	\$55.87
17-3011	Architectural and Civil Drafters			370	\$19.81
15-1143	Computer Network Architects	Computer Science	Computer and Mathematics	330	\$34.56
29-2051	Dietetic Technicians	Life Sciences		317	\$10.98
17-3026	Industrial Engineering Technicians	EngineeringA	Architecture and Engineering	277	\$25.77
17-2151	Mining & Geological Engineers, Including Mining Safety Engineers	EngineeringA	Architecture and Engineering	276	\$31.62
17-2081	Environmental Engineers	Engineering, Environmental Science	Architecture and Engineering	275	\$35.30
15-1134	Web Developers		Computer and Mathematics	267	\$21.45
19-2031	Chemists	Chemistry, Physics/Astronomy	Life, Physical, and Social Sciences	256	\$30.32

Code	Occupations	TEM Disciplines	Occupational Group	In WV	Median Hourly Earnings
19-4091	Environmental Science & Protection Technicians, Including Health	Environmental Science	Life, Physical, and Social Sciences	252	\$18.14
17-3029	Engineering Technicians, except Drafters, All Other		Architecture and Engineering	251	\$28.12
19-4021	Biological Technicians	Life SciencesL	Life, Physical, and Social Sciences	247	\$16.00
17-2041	Chemical Engineers	Chemistry, EngineeringA	Architecture and Engineering	240	\$51.30
19-4099	Life, Physical, and Social Science Technicians, All Other			231 \$	19.07
17-3022	Civil Engineering Technicians	EngineeringA	Architecture and Engineering	217	\$20.69
17-3025	Environmental Engineering Technicians	Engineering, Environmental Science	Architecture and Engineering	215	\$19.63
17-2171	Petroleum Engineers	EngineeringA	Architecture and Engineering	200	\$47.02
17-2111	Health & Safety Engineers, except Mining Safety Engineers & Inspectors		Architecture and Engineering	196	\$31.83
11-9121	Natural Sciences Managers	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Mathematics, Physics/Astronomy	Management	190	\$45.37
19-4041	Geological & Petroleum Technicians		Life, Physical, and Social Sciences	188	\$26.80
29-2033	Nuclear Medicine Technologists	Physics/Astronomy		180	\$27.89
45-4023	Log Graders & ScalersL	Life Sciences		179	\$14.80
19-1029	Biological Scientists, All Other			179	\$34.63
17-2072	Electronics Engineers, Except Computer	EngineeringA	Architecture and Engineering	168	\$41.32
15-2031	Operations Research Analysts	Computer Science, Mathematics	Computer and Mathematics	166	\$28.06
15-1122	Information Security Analysts	Computer Science	Computer and Mathematics	164	\$38.92
19-1042	Medical Scientists, Except Epidemiologists	Life SciencesL	Life, Physical, and Social Sciences	163	\$29.62
17-3013	Mechanical Drafters		Architecture and Engineering	162	\$23.80
19-4092	Forensic Science Technicians		Life, Physical, and Social Sciences	151	\$21.21
25-9021	Farm & Home Management Advisors	Life Sciences		147	\$21.42
17-1011	Architects, Except Landscape & Naval	Engineering		146	\$35.07
19-4093	Forest & Conservation Technicians	Life SciencesL	Life, Physical, and Social Sciences	144	\$16.54

Code	Occupations	TEM Disciplines	Occupational Group	In WV	Median Hourly Earnings
45-4021	Fallers	Life Sciences		141	\$13.02
43-9111	Statistical Assistants			139	\$20.76
17-2061	Computer Hardware Engineers	Computer Science, Engineering	Architecture and Engineering	138	\$49.95
19-2042	Geoscientists, Except Hydrologists & Geographers	GeosciencesL	Life, Physical, and Social Sciences	137	\$26.91
19-1032	Foresters	Engineering, Life SciencesL	Life, Physical, and Social Sciences	126	\$20.73
19-1023	Zoologists & Wildlife Biologists	Life SciencesL	Life, Physical, and Social Sciences	122	\$23.36
15-2041	Statisticians	Life Sciences, MathematicsC	Computer and Mathematics	120	\$25.49
41-9031	Sales Engineers		Sales and Related	117 \$	40.16
53-6051	Transportation Inspectors			109	\$30.02
11-9013	Farmers, Ranchers, & Other Agricultural Managers			92 \$	30.33
19-3039	Psychologists, All Other	Life Sciences		91 \$	40.16
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers			88	\$23.38
17-2131	Materials Engineers	EngineeringA	Architecture and Engineering	88	\$40.30
19-1031	Conservation Scientists		Life, Physical, and Social Sciences	83	\$31.21
17-3027	Mechanical Engineering Technicians	EngineeringA	Architecture and Engineering	82	\$22.97
51-3092	Food Batchmakers	Life Sciences		81 \$	11.73
17-2011	Aerospace Engineers	EngineeringA	Architecture and Engineering	77	\$48.02
45-4011	Forest & Conservation Workers	Engineering, Life Sciences		76 \$	18.13
19-2032	Materials Scientists	EngineeringL	Life, Physical, and Social Sciences	69	\$42.95
19-1021	Biochemists & Biophysicists	Chemistry, Life Sciences, Physics/Astronomy	Life, Physical, and Social Sciences	69	\$36.15
19-1013	Soil & Plant Scientists	Chemistry, Life Sciences, Physics/Astronomy	Life, Physical, and Social Sciences	68	\$24.92
19-2099	Physical Scientists, All Other		Life, Physical, and Social Sciences	64	\$38.60
17-3012	Electrical & Electronics Drafters		Architecture and Engineering	60	\$24.95
19-1022	MicrobiologistsL	Life SciencesL	Life, Physical, and Social Sciences	59 \$	24.19
19-1041	EpidemiologistsL	Life SciencesL	Life, Physical, and Social Sciences	55	\$25.62
17-2031	Biomedical Engineers	EngineeringA	Architecture and Engineering	50	\$37.11
17-2161	Nuclear Engineers	EngineeringA	Architecture and Engineering	49	\$42.85

Code	Occupations	TEM Disciplines	Occupational Group	In WV	Median Hourly Earnings
15-1111	Computer & Information Research Scientists	Computer Science	Computer and Mathematics	47	\$45.30
51-2023	Electromechanical Equipment Assemblers	Engineering		46	\$15.38
19-4011	Agricultural & Food Science Technicians		Life, Physical, and Social Sciences	45	\$12.75
49-2091	Avionics Technicians	Engineering		42 \$	24.89
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal & Plastic	Computer Science		37 \$	20.44
15-2011	Actuaries	MathematicsC	Computer and Mathematics	35	\$32.78
19-2012	Physicists	Mathematics, Physics/Astronomy	Life, Physical, and Social Sciences	35	\$48.97
19-2021	Atmospheric & Space Scientists	Physics/Astronomy	Life, Physical, and Social Sciences	31	\$38.68
19-1012	Food Scientists & Technologists	Life SciencesL	Life, Physical, and Social Sciences	28	\$30.11
17-3024	Electro-Mechanical Technicians			27	\$22.86
17-3019	Drafters, All OthersA		Architecture and Engineering	27	\$23.02
19-1099	Life Scientists, All Other		Life, Physical, and Social Sciences	24	\$32.06
33-3031	Fish & Game Wardens	Life Sciences		23	\$14.58
19-4051	Nuclear Technicians		Life, Physical, and Social Sciences	20	\$32.30
17-2021	Agricultural Engineers	Engineering, Life SciencesA	Architecture and Engineering	19	\$33.23
19-2043	Hydrologists	GeosciencesL	Life, Physical, and Social Sciences	19 \$	35.43
17-2121	Marine Engineers and Naval Architects			18	\$31.66
49-9081	Wind Turbine Service Technicians	Engineering		17 \$	23.50
17-3021	Aerospace Engineering & Operations Technicians	EngineeringA	Architecture and Engineering	16 \$	26.77
15-2021	Mathematicians	Mathematics		12	\$34.15
15-2091	Mathematical Technicians	MathematicsC	Computer and Mathematics	<10I	nsf. Data
15-2099	Mathematical Science Occupations, All Other		Computer and Mathematics	<10I	nsf. Data
19-1011	Animal Scientists	Life SciencesL	Life, Physical, and Social Sciences	<10I	nsf. Data
19-2011	AstronomersP	Physics/Astronomy	Life, Physical, and Social Sciences	<10I	nsf. Data
19-3032	Industrial-Organizational Psychologists	Life Sciences		<10I	nsf. Data
45-2021	Animal BreedersL	Life Sciences		<10I	nsf. Data

Code	OccupationS	TEM Disciplines	Occupational Group	In WV	Median Hourly Earnings
45-3011	Fishers & Related Fishing Workers	Life Sciences		<10I	nsf. Data
			TOTAL	48,553	Avg: \$28.89
Source:	Economic Modeling Specialists, Inc.				
Potential Knowledge Providing Occupations					
25-1021	Computer Science Teachers, Postsecondary	Computer Science	Computer and Mathematics	310N	A
25-1022	Mathematical Science Teachers, Postsecondary	MathematicsC	Computer and Mathematics	240N	A
25-1032	Engineering Teachers, Postsecondary	EngineeringA	Architecture and Engineering	320	NA
25-1041	Agricultural Sciences Teachers, Postsecondary	Life SciencesL	Life, Physical, and Social Sciences	40	NA
25-1042	Biological Science Teachers, Postsecondary	Life SciencesL	Life, Physical, and Social Sciences	230	NA
25-1043	Forestry & Conservation Sciences Teachers	Life SciencesL	Life, Physical, and Social Sciences	50	NA
25-1052	Chemistry Teachers, Postsecondary	Chemistry	Life, Physical, and Social Sciences	90	NA
25-1053	Environmental Science Teachers, Postsecondary	Environmental Science	Life, Physical, and Social Sciences	30	NA
25-1054	Physics Teachers, Postsecondary	PhysicsL	Life, Physical, and Social Sciences	80	NA
25-1071	Health Specialties Teachers, Postsecondary	Life SciencesL	Life, Physical, and Social Sciences	780N	A
25-1072	Nursing Instructors & Teachers, Postsecondary	Life SciencesL	Life, Physical, and Social Sciences	250	NA
			TOTAL	2420	
Source: WorkForce WV. Retrieved May 6, 2016. (Information not available through Economic Modeling Specialists, Inc.)					

SOCM	Medical-Related Occupations in West Virginia	2015 Jobs	Median Hourly Earnings
29-1141R	Registered Nurses	19,361	\$26.92
29-2061	Licensed Practical and Licensed Vocational Nurses	6,603\$	16.76
29-2052	Pharmacy Technicians	3,088	\$12.47
29-1069P	Physicians and Surgeons, All Other	2,661	\$86.83
29-2041	Emergency Medical Technicians and Paramedics	2,512	\$12.45
29-1051	Pharmacists ²	,210	\$59.58
29-2034	Radiologic Technologists	1,541	\$22.19
29-2071	Medical Records and Health Information Technicians	1,345	\$15.00
29-2053P	Psychiatric Technicians	1,113	\$9.60
29-1123P	Physical Therapists ¹	,103	\$38.21
29-2021	Dental Hygienists ¹	,056	\$26.90
29-1071P	Physician Assistants ¹	,024	\$43.13
29-2011	Medical and Clinical Laboratory Technologists ⁹	95	\$25.45
29-1126R	Respiratory Therapists ⁹	28	\$22.54
29-1127	Speech-Language Pathologists	907	\$26.91
29-2012	Medical and Clinical Laboratory Technicians	892\$	18.05
29-1171	Nurse Practitioners ⁷	57	\$42.84
29-2055	Surgical Technologists ⁵	89	\$17.70
29-1122O	Occupational Therapists ⁵	44	\$34.96
29-9011	Occupational Health and Safety Specialists	510	\$36.41
29-1151	Nurse Anesthetists ⁴	98	\$78.48
29-2099	Health Technologists and Technicians, All Other	471\$	17.83
29-1062	Family and General Practitioners ⁴	52\$	80.62
29-2081	Opticians, Dispensing	447\$	13.19
29-2032	Diagnostic Medical Sonographers ⁴	19	\$26.90
29-1021	Dentists, General	388	\$73.72
29-1031D	Dietitians and Nutritionists	380	\$26.23
29-2031	Cardiovascular Technologists and Technicians	366	\$17.46
29-2051D	Dietetic Technicians	316\$	10.94
29-2056V	Veterinary Technologists and Technicians	315	\$12.17
29-1131V	Veterinarians	279	\$36.43
29-1061	Anesthesiologists ²	37	\$98.24
29-2035	Magnetic Resonance Imaging Technologists ¹	90	\$28.16
29-2057O	Ophthalmic Medical Technicians	187\$	14.80
29-2033	Nuclear Medicine Technologists ¹	75	\$27.89
29-1066	Psychiatrists ¹	71	\$68.08
29-2054R	Respiratory Therapy Technicians	136\$	20.95
29-1041O	Optometrists ¹	32	\$43.32
29-1199	Health Diagnosing and Treating Practitioners, All Other	131	\$32.26
29-9091	Athletic Trainers ¹	28	\$19.50
29-1181A	Audiologists ¹	24	\$29.80
29-9012	Occupational Health and Safety Technicians	106	\$22.64
29-9099	Healthcare Practitioners and Technical Workers, All Other	102	\$21.50

SOCM	Medical-Related Occupations in West Virginia	2015 Jobs	Median Hourly Earnings
29-1124	Radiation Therapists ⁹	9	\$31.84
29-1125R	Recreational Therapists ⁹	2	\$20.09
29-1067S	Surgeons	90	\$86.88
29-1065	Pediatricians, General ⁸	3	\$37.87
29-2091	Orthotists and Prosthetists	74	\$25.00
29-1064	Obstetricians and Gynecologists	67	\$93.97
29-1063I	Internists, General ⁶	1	\$82.64
29-1129T	Therapists, All Other	61	\$24.54
29-1029	Dentists, All Other Specialists	30	\$72.04
29-1128E	Exercise Physiologists	23	\$18.34
29-1023O	Orthodontists	21	\$86.74
29-1081	Podiatrists ²	0	\$46.32
29-2092	Hearing Aid Specialists	19	\$18.14
29-1022O	Oral and Maxillofacial Surgeons	19	\$93.81
29-1161	Nurse Midwives ¹	9	\$42.01
29-1024P	Prosthodontists ^{<}	10	Insf. Data
29-9092	Genetic Counselors ^{<}	10	Insf. Data
	TOTAL	56,678\$	29.74

For more information, please contact:

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Commercialization Optimization



ScaleUp West Virginia Sub-Awardee



Allegheny Genesis

Morgantown, Monongalia County

Allegheny Genesis has developed a greenhouse that grows microgreens, which are small plants, often the very young seedlings of larger plants such as beets. Microgreens are harvested early to take advantage of their strong taste, rich texture and high nutritional value. Typically found in higher-end restaurants, Allegheny Genesis seeks to develop a broader market.

Technical Assistance: Provided opportunity validation and management development guidance.



SustainU

Morgantown, Monongalia County

SustainU designs 100% recycled apparel that's made in the USA, the apparel is made from two types of staple yarn: recycled pre-consumer cotton waste and post-consumer recycled polyester (PET), which is derived primarily from plastic bottles and post-industrial polyester scraps

Technical Assistance: Provided opportunity validation and management development guidance.



HeartNexus

Morgantown, Monongalia County

HeartNexus provides specialized telecardiology services to health care providers in which they interpret EKG, ambulatory (Holter) monitor data, and non-invasive cardiac testing.

Technical Assistance: Provided opportunity validation and management development guidance.



ThruFocus Optics

Huntington, Cabell County

ThruFocus Optics is a biomedical research and development medical device company specializing in ophthalmic laser surgical technology. ThruFocus Optics has developed a patented new laser system which treats presbyopia, the gradual loss of near vision with age which results in the need for reading glasses. Presbyopia affects more than 1.6 billion people globally.

Technical Assistance: Provided opportunity validation and management development guidance.

DyNAmic Testing Labs

Morgantown, Monongalia County

DyNAmic Testing Labs is being developed as a DNA forensic laboratory to handle the nation's backlog of sexual assault evidence kits, which is estimated to be over 400,000.

Technical Assistance: Provided opportunity validation and management development guidance.



Vascular Access Technologies

Morgantown, Monongalia County

Vascular Access Technologies has developed the SAFECVAD™ central venous access device for use in the treatment of many common serious medical conditions, including cancer, kidney failure, infections and cardiovascular diseases.

Technical Assistance: Provided opportunity validation and management development guidance.



IstoVisio

Morgantown, Monongalia County

IstoVisio has generated an immersive virtual reality viewer, called syGlass, for viewing volumetric data in medical exams (MRI, PET, LM confocal, 2-photon, lattice light sheet) and meshed 3-D and 4-D objects and images.

Technical Assistance: Provided opportunity validation and management development guidance.



Universal Notes

Huntington, Cabell County

Universal Notes has developed an educational tool for health care professional students before engaging in clinical practice.

Technical Assistance: Provided opportunity validation and management development guidance.



Innovation Abounds LLC

Meadow Bridge, Fayette County

Innovation Abounds has developed the "Shake It Out" mixing container, which is made of food grade plastic, is BPA-free and disposable. The mixing design is patent pending, and the product has already been granted a trademark.

Technical Assistance: Provided opportunity validation and management development guidance.

Green Line Energy

Red Jacket, Mingo County

Green Line Energy is developing a method of producing energy with zero emissions or hazardous byproducts using heat produced during the generation process.

Technical Assistance: Provided opportunity validation and management development guidance.

Keystone Metals Recovery

South Charleston, Kanawha County

Keystone Metals Recovery is an early-stage company that has developed a process of recovering heavy metals from coal waste and coal ash.

Technical Assistance: Provided opportunity validation and management development guidance.

YXO

Rupert, Greenbrier County

YXO has developed a proprietary engineered composite structure that offers strength-to-mass ratio of carbon fiber-reinforced polymer and an energy-absorbing strength that is similar to metals. The technology offers a structural framing solution for a variety of industries.

Technical Assistance: Provided opportunity validation and management development guidance.



Pickatto

Wheeling, Ohio County

Pickatto has developed the world's first electronic guitar pick with Bluetooth capabilities that allows the user to see their practice performance in data form.

Technical Assistance: Provided opportunity validation and management development guidance.



Wanda Petunia LLC

South Charleston, Kanawha County

Wanda Petunia has created and manufactures the Wanda Petunia brand of plush toys and books that promote positive messages about self-esteem.

Technical Assistance: Provided opportunity validation and management development guidance.



Polyhedron Learning Media, Inc.

Wheeling, Ohio County

Polyhedron Learning Media (PLM) is a full-service technology development company that specializes in creating educational software, audio/video, and print materials for both formal (e.g., classroom) and informal (e.g., museum) settings for age groups from kindergarten through adult. PLM is creating a set of college-level virtual physics simulations. Each 3D simulation consists of virtual equipment that can be used by faculty while allowing them to integrate their own, unique laboratory procedures.

Technical Assistance: Provided opportunity validation and management development guidance.

Quality Image Group

Morgantown, Monongalia County

Quality Image Group has developed a method and software that quantifies the structure and size of arbitrary 2-D and 3-D images changes in a structure and size of an object over a period.

Technical Assistance: Provided opportunity validation and management development guidance.



SynTech Creative

Huntington, Cabell County

SynTech Creative provides small and medium business technology and creative solutions, and web and mobile applications.

Technical Assistance: Provided opportunity validation and management development guidance.



Greenbrier Valley Brewing

Maxwelton, Greenbrier County

Greenbrier Valley Brewing is a brewer and distributor of craft beers and the first beer to be canned in West Virginia in approximately 45 years, making West Virginia the last state to offer a canned craft beer.

Technical Assistance: Provided opportunity validation, guidance on proof-of-concept/prototype development, and management development services.



Billow

Charleston, Kanawha County

Billow has designed and is producing the first premium breast support pillow for millions of women who experience discomfort following breast surgery.

Technical Assistance: Provided guidance on business development in support of follow-on funding.



Morgan Rhea

South Charleston, Kanawha County

Morgan Rhea manufactures a line of personalized luxury lifestyle leather handbags, shoes, jewelry and other accessories.

Technical Assistance: Provided due diligence review for securing investments.

Care24/7

Morgantown, Monongalia County

Care24/7 provides care-coordination services to independent healthcare systems and physician practices.

Technical Assistance: Provided opportunity validation and guidance on proof-of-concept/prototype development and management development services.



Figure 8 Morgantown, Monongalia County

Figure 8 has designed a sternum repair device that is specifically developed to replace steel wire in primary sternal closure.

Technical Assistance: Provided opportunity validation and guidance on proof-of-concept/prototype development and management development services.



Blanchette Rockefeller Neuroscience Institute Morgantown, Monongalia County

Blanchette Rockefeller Neuroscience Institute is testing a blood-brain barrier drug delivery system in the treatment of Alzheimer's and other neurodegeneration diseases, as well as cancer, central nervous system disorders, and infectious diseases.

Technical Assistance: Provided opportunity validation and guidance on proof-of-concept/prototype development and management development services.



Valtari Bio Morgantown, Monongalia County

Valtari Bio is a spin-out of West Virginia University that is developing a next-generation precision stroke diagnostics and therapeutics test.

Technical Assistance: Provided opportunity validation and guidance on proof-of-concept/prototype development and management development services.

EnviroKure Morgantown, Monongalia County

EnviroKure manufactures and distributes pathogen-free, liquid organic fertilizers for agriculture, hydroponics, professional turf, and home and garden.

Technical Assistance: Provided opportunity validation and guidance on proof-of-concept/prototype development and management development services.



Rehydrate Morgantown, Monongalia County

Rehydrate is developing a sports drink that has no sugar or calories but with the proper dosage of electrolytes and vitamins for rehydration.

Technical Assistance: Provided opportunity validation and guidance on proof-of-concept/prototype development and management development services.

SIOX

Siox

Morgantown, Monongalia County

Siox is a spin-out of NETL in Morgantown that is transitioning \$10 million dollars of fluidized bed research to a new application: a simple, low-cost process for manufacturing high-purity synthetic magnetite.

Technical Assistance: Provided guidance on business development in support of follow-on funding.

ASPINITY

Aspinity

Morgantown, Monongalia County

Aspinity is developing sensing and data processing architectures to support ultra-low power applications.

Technical Assistance: Provided guidance on business development in support of follow-on funding.



ProDIGI

Hazelton, Preston County

ProDIGI specializes in delivering broadband connectivity in rural communities.

Technical Assistance: Provided guidance on business development in support of follow-on funding.



4LocalObits

Newburg, Preston County

4LocalObits is creating a single-entry site for all funeral homes to post their obituaries to create a comprehensive search site.

Technical Assistance: Provided guidance on business development in support of follow-on funding.

Commercialization Optimization



ScaleUp West Virginia Sub-Awardee



BioMatrix Energy MATRIC and WVRTP

BioMatrix Energy is a start-up that is developing coal gasification technology.

Technical Assistance: Facilitated discussions with MATRIC about a potential pilot plant.

CDS Global WVRTP

CDS Global provides environmental consulting and services to chemical and related businesses.

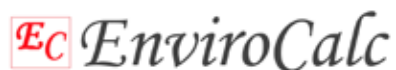
Technical Assistance: Facilitated discussions about potential opportunities in West Virginia.



Chemville WVRTP

Chemville purchases, analyzes, reformulates and sells unused surplus chemicals.

Technical Assistance: Facilitated exploration of a potential lab and/or chemical storage facility.



EnviroCalc South Charleston, Kanawha County

EnviroCalc provides environmental consulting across multiple industries.

Technical Assistance: Provided guidance and facilitated discussions on growth opportunities.

Interphase Materials MATRIC, WVRTP and West Virginia University

Interphase Materials develops antimicrobial and anticorrosion coatings and additives for use in marine and other environments.

Technical Assistance: Facilitated discussions about working relationship with MATRIC.

Keen Process Technologies

South Charleston, Kanawha County

Keen Process Technologies has developed several new chemical technologies, including one that converts shale gas to high-octane fuels.

Technical Assistance: Provided guidance on SBIR opportunities, corporate contacts, and pitch presentations.



Liberty Hydro

South Charleston, Kanawha County

Liberty Hydro has developed and owns a proprietary technology to remove heavy metals and contaminants from wastewater discharges at power generation facilities, industrial sites, and coal mine operations.

Technical Assistance: Facilitated venture funding and business development opportunities.



Nfluids

MATRIC and WVRTP

Nfluids provides unique microfluidics technology and services.

Technical Assistance: Provided guidance on potential joint opportunities and industry contacts.



NOHMs Technologies

MATRIC

NOHMs Technologies provides materials and chemistry for longer lasting, safer and more sustainable lithium-ion batteries.

Technical Assistance: Facilitated discussions about potential relationship with MATRIC.

Perseus

WVRTP

Perseus is developing vaccines and other immunotherapy products and technologies.

Technical Assistance: Facilitated discussions on potential West Virginia-based opportunities.



PolyPlexx

South Charleston, Kanawha County

PolyPlexx produces unique polyurethane that have utility in a variety of commercial applications requiring transparency and improved impact resistance.

Technical Assistance: Facilitated discussions around a potential pilot plant or small-scale manufacturing facility in South Charleston.



SGA Polymers South Charleston, Kanawha County

SGA Polymers provides green production of acrylic acid and acrylate esters from renewable raw materials.

Technical Assistance: Facilitated various venture capital and networking opportunities.



Siox Morgantown (Monongalia County), MATRIC and WVRTP

Siox is a spin-out of NETL in Morgantown that is transitioning \$10 million dollars of fluidized bed research to a new application: a simple, low-cost process for manufacturing high-purity synthetic magnetite.

Technical Assistance: Facilitated discussions around a potential pilot plant or small-scale manufacturing facility in South Charleston.



Vartega MATRIC and WVRTP

Vartega has developed technology to produce low-cost carbon fiber from recycled materials.

Technical Assistance: Facilitated business opportunity with MATRIC.

Prodigy Scott Depot, Putnam County

Prodigy provides water treatment chemicals and services.

Technical Services: Provided guidance on potential customers and industry contacts.

H-Quest Vanguard MATRIC and WVRTP

H-Quest Vanguard has developed coal-to-liquids technology.

Technical Assistance: Facilitated discussions on potential pilot plant locations.



Unit Cell Diamond South Charleston, Kanawha County

Unit Cell Diamond has developed technology to synthesize diamond for tool and die manufacturing.

Technical Assistance: Facilitated potential business opportunities with MATRIC and WVRTP.



AgriCarb

South Charleston, Kanawha County

AgriCarb is developing processes for the hemp-to-products industry.

Technical Assistance: Provided business guidance and facilitated networking opportunities.



EigenChem Technologies

MATRIC and WVRTP

EigenChem Technologies has developed a technology to recycle waste tire rubber for use as a slow-release fertilizer/soil conditioner.

Technical Assistance: Facilitated opportunity with MATRIC regarding tire technology and for technology scale-up and other collaboration opportunities.

Grapheno

MATRIC and WVRTP

Grapheno develops solutions and products using graphene, a graphene-based conductive coating that provides electromagnetic interference protection.

Technical Assistance: Facilitated opportunity with MATRIC and possibly WVRTP and other businesses in area for new-product testing.



Mystic Formulations

South Charleston, Kanawha County

Mystic Formulations makes various consumer products from natural materials, including lavender and acorns.

Technical Assistance: Provided business development assistance, referrals, guidance, conflict resolution, and gap funding assistance.



ElectroSep

MATRIC and WVRTP

ElectroSep specializes in amine reclamation and other technologies that achieve separation of components from streams.

Technical Assistance: Provided general business guidance.

Synovation Chemicals

South Charleston, Kanawha County

Synovation Chemicals provides contract manufacturing services in the chemical industry.

Technical Services: Provided business development assistance and guidance.



NuZone Medical

WVRTP

NuZone Medical makes adjustable airway devices for clinical and emergency situations.

Technical Assistance: Helped facilitate potential partnership with Charleston Area Medical Center.

Molecular Forges

MATRIC and WVRTP

Molecular Forges is a specialty chemicals manufacturer of glucoside molecules that are used in manufacturing detergents, surfactants, and research molecules.

Technical Assistance: Provided general business guidance and facilitated discussions regarding potential opportunities with MATRIC.



ReRefined Plastics

MATRIC and WVRTP

ReRefined Plastics converts municipal solid waste into plastics and other products.

Technical Assistance: Provided business development guidance and facilitated discussions regarding potential opportunities with MATRIC.



Pubstomper Brewing Company

Morgantown, Monongalia County

Pubstomper Brewing Company manufacturers craft beers.

Technical Assistance: Provided business development guidance.



BlastPoint

WVRTP

BlastPoint provides a system to more easily use big data sets to answer economic development and business questions.

Technical Assistance: Provided business development assistance and guidance and facilitated potential applications and extensions in WV.

GoodHemp

Charleston, Kanawha County

GoodHemp is a start-up that is developing hemp-infused cosmetics and other products.

Technical Assistance: Provided general business and networking guidance and facilitation.



Gas Analytical Services

South Charleston, Kanawha County

Gas Analytical Services provides gas chart interpretation and integration services.

Technical Assistance: Provided guidance and facilitation on business opportunities and development.

LFUEL

MATRIC, WVRTP and West Virginia University

LFUEL is pursuing several biomass-to-products technologies, working with West Virginia University on a potential pilot plant and opportunities with a several companies in the state.

Technical Assistance: Provided technical and business assistance, networking and other facilitation.

ECO USA

MATRIC and WVRTP

ECO USA is a recycler of industrial materials.

Technical Assistance: Provided facilitation and consulting on pilot scale opportunities.

MicroSystems

MATRIC and WVRTP

MicroSystems has developed a device and technology for cleaning water.

Technical Assistance: Provided guidance and consulting on business opportunities and product development ideas. Supported discussions with potential commercial customers.

John Osborne

MATRIC and WVRTP

John Osborne is an entrepreneur who is developing technology to convert coal to H₂-rich gas.

Technical Assistance: Provided general business guidance.

Nanocoating Plasma Systems

West Virginia University

Nanocoating Plasma Systems is developing plasma coating technology to make silicon nanotubes.

Technical Assistance: Facilitated discussions with West Virginia University regarding the technology's viability and provided guidance on approaching coal-based companies to present project ideas.



Progenesis

Huntington, Cabell County
South Charleston, Kanawha County

Progenesis has developed a process for producing alginate, using genetically modified bacteria, for medical and other applications.

Technical Assistance: Provided guidance and facilitation on various business development opportunities and regarding possible scale-up work at WVRTP and with MATRIC.



Advance Green Energy

MATRIC and WVRTP

Advance Green Energy is developing additives for cleaner coal gasification and similar applications.

Technical Assistance: Provided business consulting and guidance for follow-on support.



Protea Biosciences

Morgantown, Monongalia County

Protea Biosciences provides identification, quantification, characterization, and distribution of proteins and other biomolecules.

Technical Assistance: Facilitated introduction to a professor at Northwestern University who is a bio engineering expert (and a West Virginia native) for a potential resource relationship.



Parabon Nanolabs

Huntington (Cabell County), MATRIC and WVRTP

Parabon Nanolabs develops DNA-based therapeutic and forensic products and services.

Technical Services: Facilitated possible collaboration with MATRIC and the potential to access facilities and expertise at WVRTP.



NGInnovations

Cross Lanes and St. Albans, Kanawha County

NGInnovations provides clean water process and equipment technologies for the natural gas and other industries.

Technical Assistance: Facilitated discussion on possible venture capital and funding opportunities, provided guidance on employee wages and recruitment.

Manufacturing Innovation & Integration



ScaleUp West Virginia Sub-Awardee



Greenbrier Technical Services Ronceverte, Greenbrier County

GTS provides engineering and manufacturing and repair services to a variety of industries related to printed circuit boards and modules, parts sourcing services for both current and end-of-life parts, and reverse-engineering solutions.

Technical Assistance: Printed Circuit Board (PCB) for View-190 prototype development and shop drawings; and created drawings for manufacture, bill of materials, component supply chain sourcing, circuit tracing models, PCB supply chain sourcing, PCB modeling, test power supply development, business referral and consulting services, surface-mount PCB adaptation design, and sales referral and quotation support.

Innovation Marketing, LLC Charleston, Kanawha County

Innovation Marketing, LLC has developed an integrated chimney cap/chimney cleaning unit.

Technical Assistance: Provided advanced engineering drawings, prototyping and modeling assistance.

Autonomous and Radio Controlled Equipment, LLC Bluefield, Mercer County

Autonomous and Radio Controlled Equipment, LLC has developed a remote-controlled mower that is designed especially for rough terrain.

Technical Assistance: Provided as-built drawings, drawings for manufacture, and assistance in securing manufacturing space



i3 Engineering Sciences Bluefield, Mercer County

i3 Engineering Sciences provides design and manufacturing process development services, third-party independent testing services, and technical and scientific writing services to multiple industries.

Technical Assistance: Provided design, prototyping and testing services for new test equipment.



Tec5ive, LLC Princeton, Mercer County

Tec5ive, LLC provides web design, cloud hosting and productivity app design.

Technical Assistance: Assisted in designing new web app prototype and content management system in support of a new online course management product.



Custom Manufacturing Services Princeton, Mercer County

Custom Manufacturing Services manufactures metal enclosures, precision fabricated metal parts and weldments and electro-mechanical assemblies.

Technical Assistance: Provided shop drawings, drawings for manufacture, bill of materials, and 3-D modeling services.



Wright Wold Scientific Morgantown, Monongalia County

Wright Wold Scientific is designing and manufacturing RFID-driven animal tracking systems for laboratory environments.

Technical Assistance: Provided systems engineering, integration, testing, App development, initial database design, embedded computing design, and Mesh network coordination, applied research, bill of materials, and first generation prototyping of RFID-based smartphone-enabled tracking lab animal tracking system.

Gallagher Ventures Nitro, Kanawha County

Gallagher Ventures is designing two personal GPS/satellite tracking devices that are less complicated to use and less expensive than current GPS/satellite trackers.

Technical Assistance: Provided supply chain sourcing, test power supply development, GPS signal testing, android mapping API, surface-mount PCB adaptation design, and general business and marketing consultation.



Argus Robotics Hurricane, Putnam County

Argus Robotics designs robotic vehicles to detect and delete improvised explosive devices and supports military and commercial operations based on modifications to commercial-off-the-shelf designs.

Technical Assistance: Created drawings for manufacture, bill of materials, 3-D modeling, prototyping and modeling services.

COR925

Bluefield, Mercer County

COR925 provides customers with cutting edge technology to meet their waste and recycling challenges. Offers safe, cost effective equipment, financing, installation and service and provides turn-key solutions that turn commercial waste into revenue.

Technical Assistance: Provided drawings for plant layout, bill of materials, 3-D modeling, consulting, and drawing and modeling Services.

Nexus Terra

Bluefield, Mercer County

Nexus Terra designs, builds, installs and services high wall mining equipment positioning systems.

Technical Assistance: Provided applied research, patent search, bill of materials, 3-D modeling, consulting, drawings, prototyping, and modeling services for a remote and autonomously controlled solar recharging apparatus.

Regional Recycling Solutions (RRS) Bluefield LLC

Bluefield, Mercer County

Regional Recycling Solutions RRS Bluefield LLC provides customers with cutting edge technology to meet their waste and recycling challenges. Offers safe, cost effective equipment, financing, installation and service and provides turn-key solutions that turn commercial waste into revenue.

Technical Assistance: Provided drawings for plant layout, bill of materials, 3-D modeling, consulting, and drawing and modeling services.

Duffy Services Inc.

Bluefield, Mercer County

Duffy Services designs and manufactures fine woodworking casements and furniture.

Technical Assistance: Drawings for shop layout, applied research, bill of materials, 3D modeling, consulting, drawing and modeling services for wood and plastics dust collection.

Hendrick Properties LLC

Rock, Mercer County

Hendrick Properties develops ATV trail properties and related businesses on the Hatfield-McCoy ATV & UTV Trails.

Technical Assistance: Applied research, design patent search and design patent drawings, design for manufacture, 3D modeling, consulting, drawings, prototyping for the development of an injection-molded ATV storage accessory.

Manufacturing Innovation & Integration



ScaleUp West Virginia Sub-Awardee For Advanced Flexible Manufacturing



New Vision Renewable Energy Philippi, Barbour County

NVRE develops training and resources for empowering families and communities to go from energy consumers to energy producers. The company also is developing a universal solar lighting system designed to attach to any outdoor pole or chain-link fencing.

Technical Assistance: Helped develop a more universal solar lighting system to be compatible with any outdoor pole or chain-link fencing.



Lock N Load Feed System Barboursville, Cabell County

Lock N Load has developed a livestock feeding container and associated fence attachments as a more durable alternative to existing livestock feeding.

Technical Assistance: Provided design and material selection services.

Knot Blocker Huntington, Cabell County

Knot Blocker is designing a safety device that prevents climbing ropes from knotting.

Technical Assistance: Created CAD modeling for design and prototyping.



JMac Customs Inc. Elkview, Kanawha County

JMac manufactures parts and accessories for firearms.

Technical Assistance: Provided design and prototyping services.



MarTek Charleston, Kanawha County

MarTek manufactures devices for protection against electrical arc-blast hazards in industrial environments.

Technical Assistance: Provided design assistance.

Webers Charleston, Kanawha County

Webers is developing kitchen tools that remove/save food from whisks and beaters.

Technical Assistance: Provided design and prototyping assistance.

Mzagri Charleston, Kanawha County

Mzagri is developing spinal surgery fixation tools and instruments.

Technical Assistance: Provided design and prototyping assistance.



Pettito Mine Equipment Morgantown, Monongalia County

Pettito Mine Equipment specializes in manufacturing heavy duty, crawler track-mounted longwall mining equipment.

Technical Assistance: Created 3D CAD files to improve production and new processes to improve products and communications for international market.

W.C. Bird Morgantown, Monongalia County

W. C. Bird is developing baseball/softball batting training equipment.

Technical Assistance: Provided design and prototyping assistance.



Wright Wold Scientific Morgantown, Monongalia County

Wright Wold Scientific is designing and manufacturing RFID-driven animal tracking systems for laboratory environments.

Technical Assistance: Provided design and prototyping services for a device that applies a RFID tag to the subject while also having the capability to extract a tissue sample.

Touchstone Research Laboratory Triadelphia, Ohio County

Touchstone Research Laboratory has developed a processing technique that utilizes composite production methods to fabricate state-of-the-art metal matrix composite components.

Technical Assistance: Documented current process and assisted with design, fabrication and prototyping of scaled-up processing system with enhanced capabilities.

Advanced Urethane Engineering Beckley, Raleigh County

Advanced Urethane Engineering provides wear-resistant products to the mining and aggregate industries that include conveyor scrapers, primary scrapers, secondary scrapers, urethane skirting and impact beds.

Technical Assistance: Developed prototype belt cleaner and instruments for the aggregate industry as part of plan to diversify from the coal industry.

Jeremy Miller Terra Alta, Preston County

Jeremy Miller developed a corner conduit box with a lid to make wire placement easier.

Technical Assistance: Provided design and 3D prototyping services.

Morgan Rhea South Charleston, Kanawha County

Morgan Rhea manufactures a line of luxury lifestyle leather handbags, shoes, jewelry and other accessories.

Technical Assistance: Developed and produced fixtures to make accessories for leather products.

Performance Coatings LLC Milton, Cabell County

Performance Coatings has created an EPA-compliant fitting for water from manufacturing facilities.

Technical Assistance: Provided design and prototyping services.

New River.io, LLC Huntington, Cabell County

New River.io creates animatronic robots, build plates and material spools for 3D printers.

Technical Assistance: Provided design services, produced parts for animatronic robots, and built build plate prototypes.

RoadSpan

Huntington, Cabell County

RoadSpan is developing a signaling system to alert drivers about an oncoming school bus that is not visible due to curves or hills.

Technical Assistance: Designed and created prototype of the road side signal device.

Robert Peyton

Boomer, Fayette County

Robert Peyton is designing a fold-up dolly that can be attached to an ATV and carry industrial equipment and supplies and used by hunters to carry harvested game.

Technical Assistance: Provided CAD design services.



Richwood Industries

Huntington, Cabell County

Richwood Industries designs and manufactures conveyor systems for bulk handling applications.

Technical Assistance: Provided ISO certification in support of expanding the company's market potential.

Kaydoor

Beaver, Raleigh County

Kaydoor manufactures wooden doors with hidden compartments in the doors' panel that can store jewelry, medicines, or kitchen items.

Technical Assistance: Provided engineering drawings and created prototypes.



Heisler Ventures

Morgantown, Monongalia County

Heisler Ventures has created a valve to redirect water while warming up water for a shower.

Technical Assistance: Created professional drawings and provided prototyping services.

Mountain State Outdoor Products LLC

Lost Creek, Harrison County

Mountain State Outdoor Products designs security devices for hunting equipment while in use in the woods or field.

Technical Assistance: Created drawings and machined parts.

Recognition Concepts

Huntington, Cabell County

Recognition Concepts has developed a device for cooling objects after the sublimation process.

Technical Assistance: Assisted with identifying the correct material for the outside of the device to withstand shipping and handling.

Marc and Shala Rigsby

Charleston, Kanawha County

The Rigsbys have designed a water bottle that includes a removable bowl on the bottom that can be used to water a pet during hiking and other outdoor activities.

Technical Assistance: Created professional drawings and provided a prototype.

Mining Controls

Beckley, Raleigh County

Mining Controls manufactures control devices for mining operations.

Technical Assistance: Provided ISO certification in support of expanding the company's market potential.



Cogar Manufacturing

Huntington, Cabell County

Cogar Manufacturing manufactures various mining equipment.

Technical Assistance: Provided ISO certification in support of expanding the company's market potential.

Mining Repair Specialists

Huntington, Cabell County

Mining Repair Specialists provides fabrication services, machining services, equipment rebuild services and component exchange services.

Technical Assistance: Provided ISO certification in support of expanding the company's market potential.



Mine Lifeline

Chapmanville, Logan County

Mine Lifeline Lifelines provides First Aid, Firefighting, Storage Solutions, Mine Rescue, Mod-Air Escape System, Custom Design, Fabrication, Scott Safety, Biomarine, Fire Hose Training, Lighting Systems, Cylinder Testing, Powder Coating, and 3-D Printing services to the mining industry.

Technical Assistance: Provided ISO certification in support of expanding the company's market potential.

Manufacturing Innovation & Integration



ScaleUp West Virginia Sub-Awardee



Huntington Plating

Huntington, Cabell County

Huntington Plating provides nickel, chrome and silver plating for several industries, hydraulic cylinder repair and customer on-site boring, and a full-service machine shop for general industrial work.

Technical Assistance: Provided several continuous improvement and transformational services, including value-stream mapping, process analysis, and ISO9001 installation.



Quality Magnetite

Kenova, Cabell County

Quality Magnetite processes magnetite for use in coal preparation processes and other applications.

Technical Assistance: Conducted market, competitive, and sales analysis for diversification from coal industry.



KSD Enterprises

Clarksburg, Harrison County

KSD Enterprises designs, manufactures and supports two products: 1) a methane generator that converts low-quality gas captured from decomposing waste into clean electric energy, and 2) a methane exhauster that removes methane from underground mines. The company also has a machine shop that repairs commercial and auto engines.

Technical Assistance: Assisted in creating business development, and marketing strategies and tools.



Cyclops Industries

South Charleston, Kanawha County

Cyclops Industries designs and engineers safety sight glass, sight flow indicators, spray rings, and sight lights for processing operations.

Technical Assistance: Converted the company's existing drawings to Inventor software (industry standard) and trained employees on the software.



Wanda Petunia

South Charleston, Kanawha County

Wanda Petunia has created and manufactures the Wanda Petunia brand of plush toys and books that promote positive messages about self-esteem.

Technical Assistance: Conducted workflow analysis, converted sewing patterns to CAD, and created instructional videos for work instructions.



J.H. Fletcher

Huntington, Cabell County

J.H. Fletcher manufactures equipment for the mining, oil and natural gas, and railroad industries.

Technical Assistance: Identified diversification opportunities.



Mountain Craft Wide Plank

Bruceton Mills, Preston County

Mountain Craft Wide Plank is a start-up company that will produce various types of hardwood flooring from local materials.

Technical Assistance: Conducted comprehensive safety evaluation and mock OSHA inspection in support of production start-up phase.

Smith Fastener

South Charleston, Kanawha County

Smith Fastener manufactures, prepares and distributes fastening devices for multiple industries but with a focus on mining.

Technical Assistance: Supported efforts to expand their markets by preparing the company for ISO certification, which is required by most other potential markets.



Precision Tool

Westover, Monongalia County

Precision Tool provides precision machining and fabrication of plastics and metals for a variety of industries.

Technical Assistance: Supported efforts to expand their markets by preparing the company for ISO certification, which is required by most other potential markets.

Jamie Senft

Morgantown, Monongalia County

Jamie Senft is an independent entrepreneur who is designing a new product to assist visual artists.

Technical Assistance: Provided design and 3-D prototyping assistance.



Progressive Industries Westover, Monongalia County

Progressive Industries provides fabrication and repair shop services for the coal, natural gas, and general industries.

Technical Assistance: Analyzed workflows and processes to improve throughput and volume; conducted value-stream mapping; and website redesign, rebuild, and relaunch to make the site more consistent and informative.



AMS Direct Huntington, Cabell County

AMS Direct provides direct mail services, specializing in nonprofits and small businesses.

Technical Assistance: Conducted an "Innovation Create" session with management team to identify new directions for the company focused on social media and the internet.

ScaleUp West Virginia Media Coverage

The State Journal's October 2, 2015, edition included an article announcing U.S. EDA's award to TechConnectWV to enable ScaleUp West Virginia https://www.theet.com/statejournal/news/techconnect-west-virginia-awarded-in-grant-funds-to-boost-innovation/article_a206d1f9-4e46-5c12-b206-7e31072f6dc5.html

The Clarksburg Exponent-Telegram's October 9, 2015, edition included an article announcing U.S. EDA's award to TechConnectWV to enable ScaleUp West Virginia https://www.theet.com/prestoncountynews/news/techconnect-awarded-grant-from-u-s-eda-for-scaleup-west/article_a78be9e3-8888-55d0-9769-f07a3d7a7a26.html

The Times-West Virginian's October 12, 2015, edition included an article announcing U.S. EDA's award to TechConnectWV to enable ScaleUp West Virginia http://www.timeswv.com/news/grant-will-allow-techconnect-to-help-innovators/article_9b74727e-708e-11e5-b27b-ebc5c8d86f1a.html

The State Journal's October 29, 2015, edition included an op-ed by Brooks McCabe, a West Virginia business and community leader, that included mention of U.S. EDA's award to TechConnectWV to enable ScaleUp West Virginia https://www.theet.com/statejournal/news/matrix-wv-s-own-unique-research-environment/article_5ab3b4b1-f002-5b90-a588-b01c3c6f2da0.html

The Huntington Herald-Dispatch's January 24, 2016, edition included an article announcing RCBI's role in ScaleUp West Virginia www.herald-dispatch.com/business/business-news-in-brief/article_db7fe80c-e3bb-5e3a-8703-9b0f9e89fc65.html

On January 28, 2016, WOWK-TV's web site included a story announcing RCBI's role in ScaleUp West Virginia www.tristateupdate.com/story/31080867/rcbi-launches-scaleup-program-in-wv

The State Journal's January 28, 2016, edition included an article announcing RCBI's role in ScaleUp West Virginia https://www.theet.com/statejournal/news/rcbi-launches-scaleup-program-in-wv/article_2da818da-77ab-5f37-9c88-f01fec991cdb.html

HuntingtonNews.net's February 23, 2016, edition included an article that included mention of ScaleUp West Virginia and other programs available at RCBI <http://www.huntingtonnews.net/130767>

The April 6, 2016 Growing Innovation in The Mountain State event gained statewide attention and was covered by several media outlets. Video highlights from the event can be viewed at <https://www.youtube.com/watch?v=Fh0CafZCrDE>.

Media coverage of TechConnectWV's April 6, 2016, Growing Innovation in The Mountain State event included:

The State Journal <http://www.statejournal.com/story/31658916/strategies-for-tech-growth-in-wv-discussed-by-experts>

MetroNews <http://wvmetronews.com/2016/04/06/techconnect-west-virginia-hosts-innovation-forum-at-bridgevalley/>

An op-ed by Anne Barth that recapped the Growing Innovation in The Mountain State event ran in the Charleston Gazette-Mail's April 30 edition <http://www.wvgazette.com/daily-mail-opinion/20160430/anne-barth-taking-advantage-of-our-states-future-daily-mail>

A May 8 article in Huntington's Herald-Dispatch announced that Southern Economic Development Roundtable had recognized sub-awardee RCBI as a top resource for industry in WV http://www.herald-dispatch.com/business/rcbi-is-named-top-resource-for-industry/article_e189e39e-1f36-52fe-9959-319d1293b20b.html

On May 19, 2016, Anne Barth was interviewed by WCHS-TV as a part of the station's Life After Coal investigative report <http://wchstv.com/news/local/eyewitness-news-investigates-life-after-coal>

On June 19, 2016, the Clarksburg Exponent-Telegram included an interview with Anne Barth and representatives from two sub-awardees (West Virginia Manufacturing Extension Partnership and RCBI) about how ScaleUp WV is helping West Virginia companies adopt new manufacturing technologies and methods http://www.theet.com/news/business_finance/manufacturing-industry-works-to-diversify-west-virginia-workforce/article_71f942fa-a577-5629-b59f-7c650a81020d.html.

Anne Barth was an in-studio guest on WBOY-TV's July 12, 2016, noon news broadcast for an interview about ScaleUp WV and its work.

Letters to Editor written by Anne Barth that promoted the July 2016 SBIR Road Tour event appeared in Fairmont, Morgantown, Beckley, Bluefield, Martinsburg and Wheeling newspapers.

EDA's support for ScaleUp West Virginia was recognized throughout the July 19, 2016, SBIR Road Tour: Seeding America's Future Innovations™ event. WBOY-TV interviewed Anne Barth at the event. <http://www.wvalways.com/story/32481213/sbir-road-tour-makes-stop-to-aid-west-virginia-innovators>.

The State Journal's August 25, 2016, edition included an article on TechConnect WV's ScaleUp West Virginia SBIR/STTR Assistance Program <http://www.statejournal.com/story/32842667/techconnect-west-virginia-announces-program-for-state-businesses-entrepreneurs>

On September 9, 2016, the Charleston Gazette-Mail included an editorial that highlighted TechConnect WV's survey on STEM jobs in West Virginia and how those findings represent a foundation for future growth <http://www.wvgazettemail.com/daily-mail-editorials/20160907/daily-mail-editorial-wv-can-work-to-increase-stem-jobs>

SSTI posted an article on its site on October 6, 2016, about TechConnect West Virginia's survey of STEM jobs in the state <http://ssti.org/blog/techconnectwv-survey-finds-48500-employed-stem-jobs>

The Clarksburg Exponent's October 18, 2016, edition covered the first Rural Entrepreneurship Conference in Fairmont https://www.theet.com/news/free/fairmont-holds-small-business-conference/article_0e646c11-70bf-57a0-b443-320db8754ee0.html

The Huntington Herald Dispatch's December 11, 2016, edition included an op-ed about West Virginia Jobs Investment Trust's and TechConnect West Virginia's roles in spurring new investments and jobs in the state. The State Journal ran the same op-ed http://www.herald-dispatch.com/opinion/andrew-zulauf-michele-o-connor-and-jordan-lavender-forum-paves/article_f7124e92-9416-579e-89fc-f72e3070a9f9.html

The State Journal published an op-ed on January 9, 2017, by opinion leader Brooks McCabe on the need for more on technology-based economic development resources in West Virginia. TechConnect West Virginia posted the op-ed on its web site at <http://techconnectwv.org/now-is-the-time-for-technology-based-economic-development/>

The Charleston Gazette's Outlook 2017 publication included an article that describes some of the services available at RCBI that were enabled by U.S. EDA's investment in ScaleUp West Virginia <http://www.cnpapers.com/tabs/outlook-2017-engineering/#page/2>

The Charleston Gazette's March 4, 2017, edition included an op-ed from Anne Barth on opportunities created by coding-related jobs <http://www.wvgazettemail.com/gazette-op-ed-commentaries/20170304/anne-barth-how-we-are-driving-coding-workforce-for-wvs-future>

The State Journal featured the ScaleUp West Virginia program in its March 6, 2017 edition https://www.theet.com/statejournal/news/techconnect-s-scaleup-boosts-economy-one-innovation-at-a-time/article_dd93f3f4-8f6f-5739-916e-2720461f1cef.html

The Clarksburg Exponent-Telegram's March 7, 2017, edition included an announcement of an RCBI Lunch and Learn event that included discussion of services available at RCBI that were enabled by U.S. EDA's investment in ScaleUp West Virginia https://www.theet.com/statejournal/feb-chamber-notes/article_dd0b5894-0fdb-577a-b0e7-ce333e4a9043.html

A March 16, 2017, video from WCHS-TV describes some of the services available at RCBI that were enabled by U.S. EDA's investment in ScaleUp West Virginia <http://wchstv.com/community/river-cities-report/growth-where-once-was-decline>

The Clarksburg Exponent's March 20, 2017, edition included an article on TechConnect West Virginia's presentation of the 2017 Outstanding Woman in Technology Award https://www.theet.com/news/local/arra-hines-of-allegheeny-science-technology-honored-for-innovation/article_b05d569d-e1d1-5c0c-8ead-834d0aff019a.html

The Register-Herald (Beckley)'s March 28, 2017, edition included an op-ed by Anne Barth on TechConnect West Virginia's leadership in a statewide coding skills development and training initiative http://www.register-herald.com/opinion/columns/techconnect-spearheads-effort-to-get-west-virginians-trained/article_9274db97-c08a-5b7e-9c59-67171027f658.html

The Herald-Dispatch's (Huntington) April 2 edition included an op-ed by Anne Barth about the growing importance of coding skills and TechConnect WV's role in leading a statewide coding-skills initiative. http://www.herald-dispatch.com/opinion/anne-barth-concerted-effort-can-boost-coding-jobs-in-w/article_7f00d449-6f40-5019-992f-b5426cf9f1eb.html

The State Journal's April 3, 2017, edition included coverage of TechConnect WV presenting its Spirit of Innovation Awards to Allegheny Science & Technology's CEO Arria Hines and software development firm Core10. https://www.theet.com/statejournal/april-people-page/article_8ec9f1f2-96e1-595a-b30a-1479de47d8e4.html

The State Journal's May 9, 2017, edition included a story about TechConnect WV's Women & Technology Conference. https://www.theet.com/statejournal/charleston-conference-to-address-women-in-stem-careers/article_85f97b77-6d0d-5ee7-83b4-5ae3ea0ff33f.html

The State Journal's May 18, 2017, edition included a story on TechConnect WV's success in creating a map that lists the state's business accelerators and incubators. https://www.theet.com/statejournal/techconnect-compiles-statewide-listing-of-business-incubators-and-accelerators/article_b3c50573-7a23-5c3d-9cc3-cdaa0907f977.html

The State Journal's June 26, 2017, edition included a coverage about TechConnect WV's Women & Technology Conference. https://www.theet.com/statejournal/conference-encourages-stem-careers-for-women/article_d643994c-8770-5018-b476-afbc735815a0.html



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