



AIM HIGHER
CONSORTIUM

A ROADMAP FOR



GROWING A COMPETITIVE DEFENSE MANUFACTURING REGION IN SW PENNSYLVANIA & WV

AIM Higher Consortium plan for integrating metals & advanced materials manufacturing with artificial intelligence, additive manufacturing & robotics

A project by the AIM Higher Consortium led by Catalyst Connection

August, 2021

FOREWARD

The Southwestern Pennsylvania and West Virginia region is recognized as a growing “tech belt”. We’re a region where forward-thinking manufacturers are embracing technology, where entrepreneurs are pushing the envelope when it comes to innovative approaches to manufacturing, and where some of the country’s top university minds are developing new ways to improve manufacturing efficiency. That has resulted in business success and the creation of thousands of new advanced manufacturing jobs.

This is in stark contrast to our region’s past as part of the “rust belt” where large steel manufacturers closed their mills, major mining operations shuttered their mines, and communities experienced job loss and economic collapse.

We’re a different region today. Now is the time to capitalize on the new momentum in our re-energized and right-sized manufacturing sector by pursuing Department of Defense (DoD) contracts. If we do, our manufacturers will become more successful, and their current and future employees will continue to have well-paying, family sustaining jobs. Our region will grow and become stronger economically. The national defense strategy and national security will be boosted by made-in-America manufacturing supply chain innovation. While our region is already well-positioned to take advantage of these opportunities, there’s still work to do to make sure we’re ready to be a leader in supplying the DoD with the technologies, products and services the sector urgently needs.

THAT’S WHERE THE AIM (ARTIFICIAL INTELLIGENCE IN MANUFACTURING) HIGHER CONSORTIUM COMES IN

The consortium is led by Pittsburgh-based Catalyst Connection, a private, not-for-profit economic development organization that provides consulting and training services to small- and

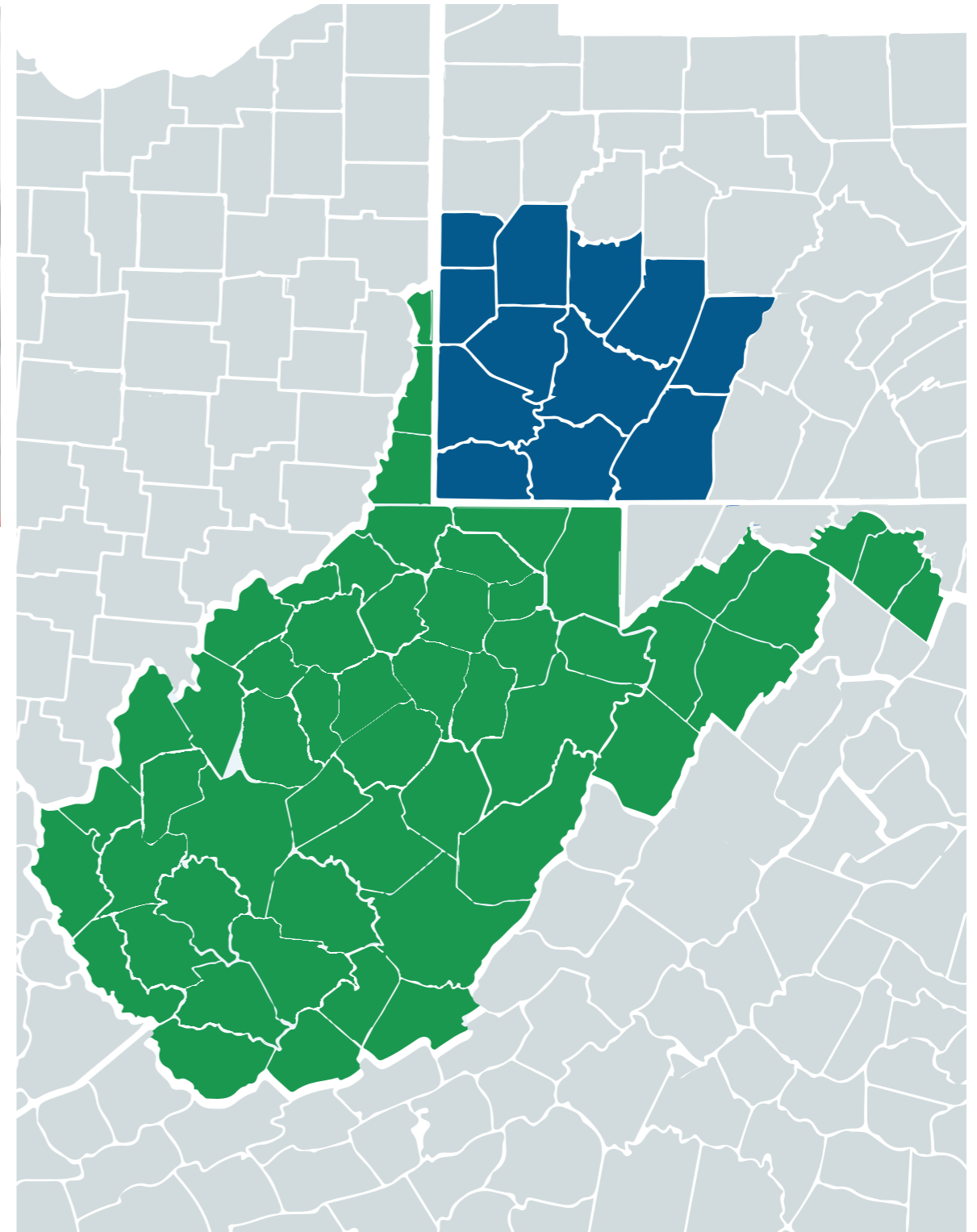
mid-sized manufacturers. AIM represents manufacturers in West Virginia and 12 counties in Southwestern Pennsylvania. It is supported by over 35 economic and workforce development organizations, Manufacturing USA Institutes, universities and manufacturing partners from around the region. AIM is funded by the Department of Defense Office of Local Defense Community Cooperation.



DEFENSE MANUFACTURING COMMUNITY SUPPORT PROGRAM

The DMCSPP is designed to support long-term community investments that strengthen national security innovation and expand the capabilities of the defense industrial ecosystem.

The Defense Manufacturing Community Support Program (DMCSPP) is authorized under Section 846 of the Fiscal Year 2019 National Defense Authorization Act. The program was developed in collaboration with the Office of the Deputy Assistant Secretary of Defense for Industrial Policy and the Office of the Under Secretary of Defense for Research and Engineering.



AIM HIGHER CONSORTIUM PARTNERS

Consortium Lead: Catalyst Connection

Sector & Project Leads:

America Makes
ARM Institute
Carnegie Mellon University
Concurrent Technologies Corp. (CTC)
IN-2-Market
Innovation Works
JARI
New Century Careers
Robert C. Byrd Institute (RCBI)
Robert Morris University
TechConnect WV
University of Pittsburgh
WV MEP/West Virginia University

Supporting partners:

Community College of Allegheny County
Community College of Beaver County
Partner4Work
Southwest Corner Workforce Development Board
Tri County Workforce Development Board

Industry Members:

Belleflex Technologies
ExOne
Johnstown Welding and Fabricating Inc.
Mecco Marking and Traceability
Metal Solutions
RE Squared (RE2)
Schmidt Presses
Stellar Precision
Tronix3D
Universal Stainless
XPER, Inc.

The AIM Higher Consortium aims to accomplish four main goals by the end of 2023 during this three-year project:

- Create and retain 500 defense sector jobs in the region
- Support \$240 million in growth in the region's defense sector
- Foster \$40 million in new defense sector investments
- Lay a strong regional foundation for continued sector expansion

This Strategic Roadmap eBook outlines efforts already in place, and what regional leaders – political, business, and non-profit – need to do to make the region a center of DoD manufacturing excellence. This is a plan for the future for our manufacturers, those already in the segment, those who want to get in the game, and ultimately, for the economic health of our region's communities and families, as well as the security of our nation.

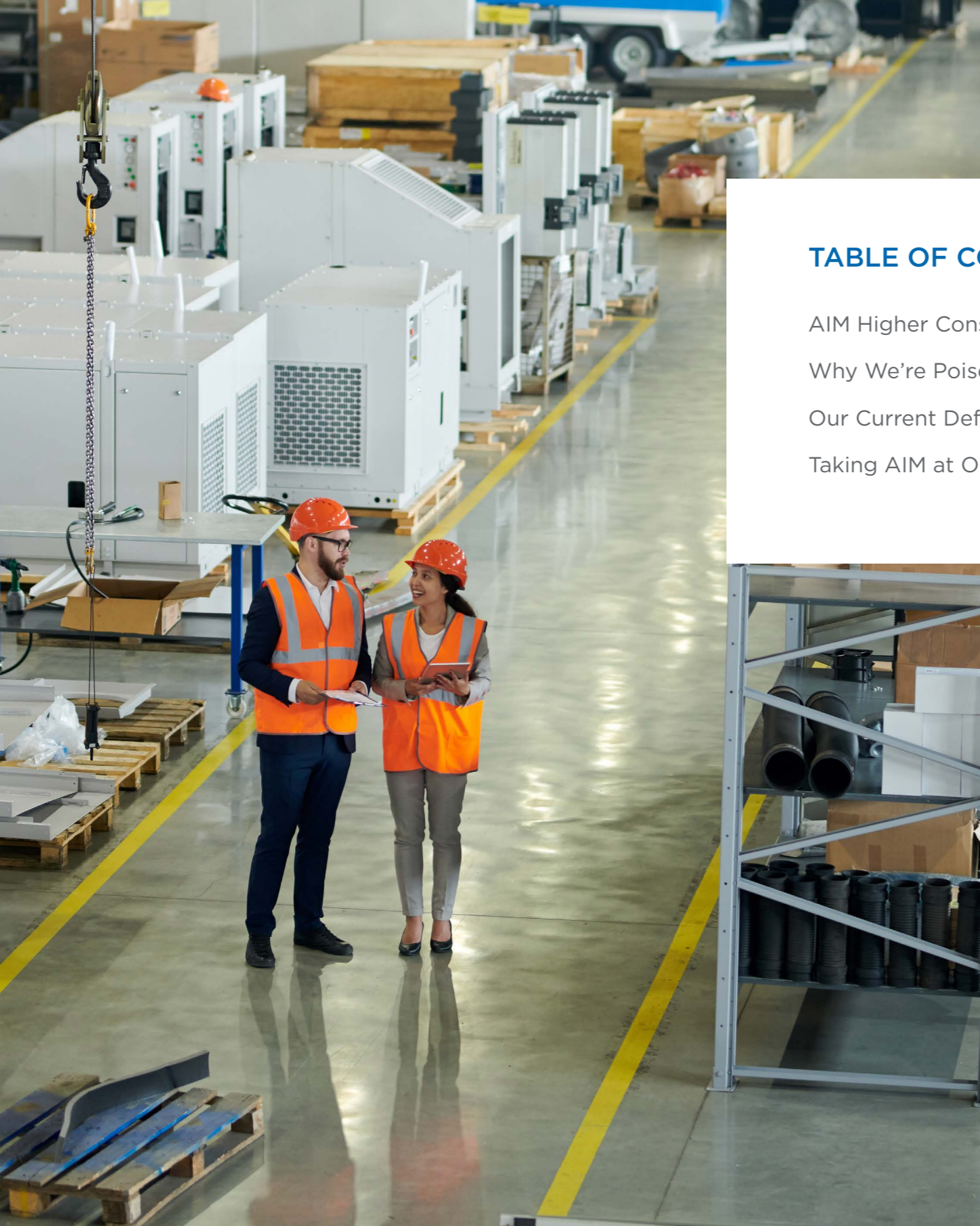


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AIM HIGHER CONSORTIUM: OUR PURPOSE

The AIM Higher Consortium's purpose is to support our region's small- and medium-sized manufacturers as they seek to launch, improve, and grow their defense supply chain businesses, in ways that support the National Defense Strategy and national security. AIM Higher is one of six organizations funded by the DoD Office of Local Defense Communities Cooperation's Defense Manufacturing Communities Partnership or OLDCC.

The AIM Higher Consortium provides comprehensive technical assistance to manufacturers in key technology sectors where our region is already strong and the Department of Defense has conveyed a need for more robust U.S. capacity. This includes Artificial Intelligence & Machine Learning, Additive Manufacturing, Robotics, and Advanced Metals & Materials.

THE CONSORTIUM AIMS TO:

- **Ensure** that all manufacturers are aware of the opportunities for their organizations to participate in providing products and services to the Department of Defense
- **Support** small and medium-sized manufacturers already working in the defense industry as they seek to expand business and operational capabilities, strengthen supply chains, leverage investment, and create and retain jobs in defense manufacturing sectors
- **Encourage** and advise those companies not already in the defense sector on how to evaluate their products and successfully pitch their abilities in relation to the needs of the defense department
- **Coordinate** efforts among manufacturers, economic development agencies, R&D and institutions, lawmakers, policy makers and the DoD
- **Identify** areas for ongoing improvement in this effort

- Issuance of a **Strategic Roadmap** for the region in Summer 2021
- **36** AIM convenings & events
- **1,500** defense company engagements
- **150** defense suppliers secure technical assistance & support
- **72** Mini-Grants secure Manufacturing Technical Assistance Mini-Grants
- **50** defense companies secure investment from AIM Capital network
- **50** new defense technology prototypes
- **750** workers trained & upskilled
- Dedicated website, defense sector assessment, defense suppliers capabilities database, and AIM Higher newsletters

This strategic roadmap is provided for U.S. Department of Defense manufacturing sector leadership, policymakers, local and state lawmakers and other officials, the defense industry, R&D institutions, capital investors, and economic and workforce development entities, with a single-minded mission: to create a robust and innovative defense manufacturing ecosystem in the Southwestern PA-WV region.

OUR AUDIENCE

OUR “AIM”

Policy Makers

Provide policy makers in manufacturing/supply chain leadership, and key DoD offices, including the DoD Office of Local Defense Community Cooperation and DoD Office of Industrial Policy, a report on the progress, objectives and needs of the AIM Higher Consortium

Lawmakers

Provide congressional delegations and state legislators, especially those involved in economic development, with reports on objectives, needs and progress of the AIM Higher Consortium

Manufacturers

Increase regional & local awareness among manufacturing suppliers about opportunities, services and tools offered by the AIM Higher Consortium and DoD supply chain

Organizations

Promote engagement with the AIM Higher Consortium by research and development, workforce, and economic development organizations in the PA-WV regional defense ecosystem

Capital Investors

Encourage investors in position to provide financial support to this effort to reach out to the AIM Higher Consortium and individual manufacturers to support DoD supply efforts

All Audiences

Affirm and announce key future objectives & actions with respect to DoD actions and investments, congressional resources and policy, and state policies and investment to boost this region’s defense manufacturing sector

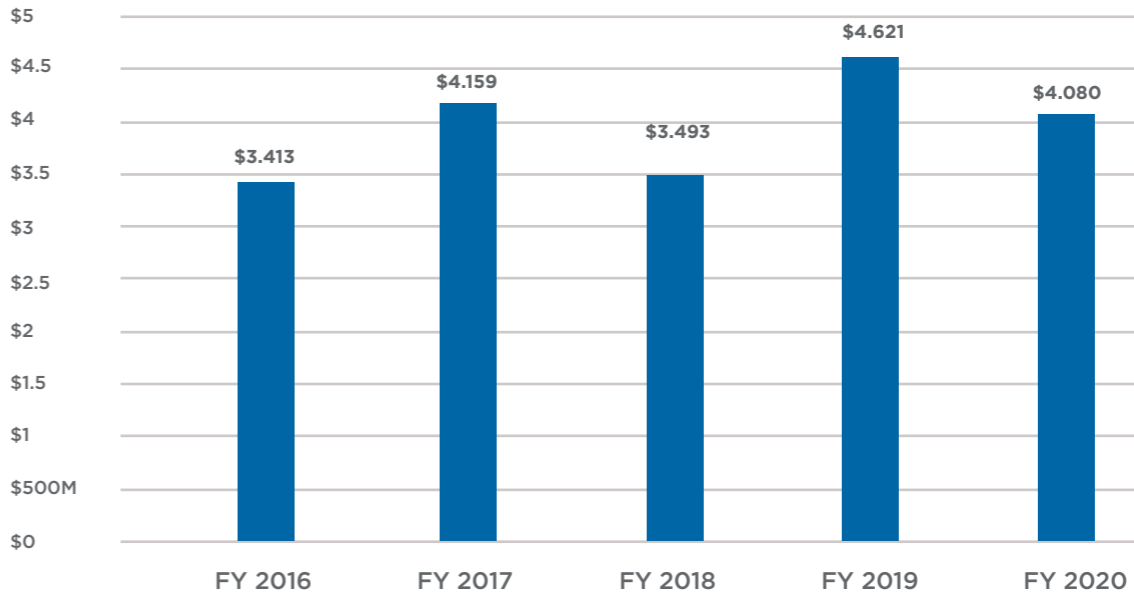
WHY WE'RE POISED TO BE A DEFENSE MANUFACTURING HUB

Is Southwestern Pennsylvania and Western Virginia really poised to be a defense manufacturing hub?

ABSOLUTELY YES!

We used the word “poised” because there’s still a lot of work to be done to make that happen. Our first step in building this defense manufacturing ecosystem must be a thorough evaluation of our current **strengths** identifying programming, training, support and investment **gaps**, and an exploration of the **opportunities** defense manufacturing creates for our organizations and how to capitalize on them.

Figure 1: Total DOD Contract Obligations, Southwest Pennsylvania, FY 2016-2020



Source: USASpending.gov, total DOD prime contract award transaction where place of performance is SW PA. Billions of dollars

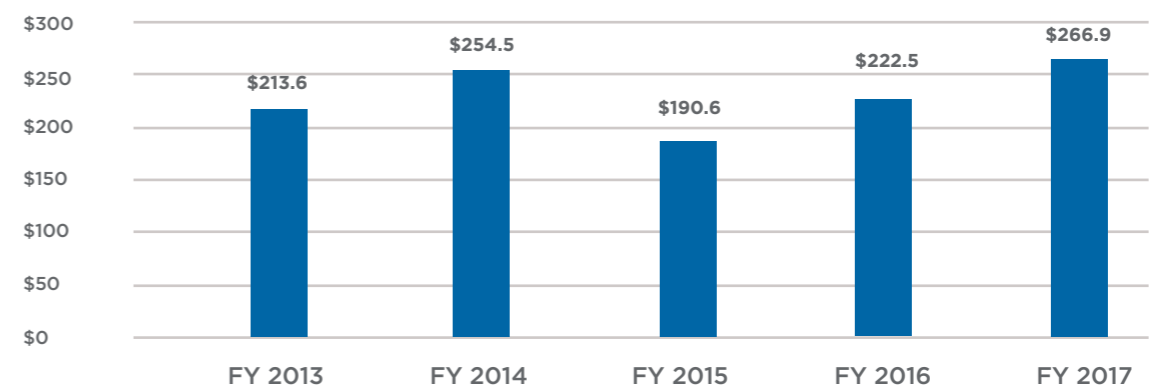




Regional leaders should come away from this assessment with a laser focus, ready to put in place next steps to attract our region's share of defense manufacturing contracts and jobs.

The AIM Higher Consortium has built a framework upon the four "pillars" on which we will build a coordinated plan that will boost defense business capacity and help companies success in DoD engagement. These pillars also aim to create and strengthen supplier network connections among companies, OEMs-suppliers and with economic development, workforce development, and R&D resource organizations.

Figure 2: Total Value of DOD Awards, West Virginia, FY 2013- FY 2017



Source: USASpending.gov, all DOD sources. Millions of dollars

SUPPLIER NETWORKS

Strengths

- Existing core group of influential companies & suppliers
- Companies with already established advanced innovation capacities

Gaps

- Lack of a regional defense manufacturing network or association in SWPA
- Insufficient southwestern PA-WV collaboration
- Weak connections between our region's defense supplier industry to large DoD programs, buyers, systems and associated Original Equipment Manufacturers (OEMs)
- Difficult for small businesses to navigate complex defense contracting and supply system

Opportunities

- Establish and grow a Defense Manufacturing Working Group, creating a network of like-minded southwestern PA and WV companies that can work together to attract new business
- Use the AIM Consortium's interactive supplier database network, AIM hubs, and ongoing convenings to grow ongoing sector interactions
- Take advantage of AIM suppliers network to connect with DoD industrial manufacturing & procurement organizations
- Provide support to manufacturers who need coaching on how to negotiate the DoD landscape, and need advice on how to develop required technology and create cyber-secure systems that will meet DoD requirements

WORKFORCE AND TRAINING

Strengths

- Well-established job training and workforce development organizations in the region focusing on advanced materials, manufacturing, and technology, including Community Colleges, Universities, Robert C. Byrd Institute (RCBI), New Century Careers, and Workforce Development Boards
- A precedent for bringing together workforce development, education, economic development organizations and manufacturers into regional consortium efforts to fulfill a common goal
- Growing, successful pre-apprenticeship & apprenticeship programs

Gaps

- Need for a stable, skilled workforce and tools to develop new and better ways of attracting, training, and retaining workers
- Resources to re-design the content of, and delivery mechanisms for, training curricula to match advanced defense manufacturing needs
- Ability to offer and deliver training at varying education levels: high school, trade school, community college/university, upskilling and training organizations
- Engaging enough companies to participate in establishing innovative, defense focused training programs

Opportunities

- Maintain an online AIM Consortium inventory of workforce training assets, offerings, and events in the region for sector training
- Establish a robust, region-wide Learning Management System to manage the training, certifications, learning journeys, career pathway steps, and other aspects of worker training and upskilling, ready to meet the region's defense manufacturing needs
- Deploy an Advanced Manufacturing Learning Lab approach which builds on Essential Skills training with advanced technology skills delivered in both classroom and hands-on laboratory settings.
- Establish one or more Advanced Manufacturing Training Centers with the facilities, equipment, trainers, and other resources to build a strong regional workforce in these and other advanced manufacturing sectors to serve the needs of the DoD. These Training Centers could be established at Neighborhood 91 at the Pittsburgh International Airport, at the Hazelwood Green/Mill 19 facility in downtown Pittsburgh, at West Virginia University, and other AIM Consortium Hubs

RESEARCH AND INNOVATION

Strengths

- Strong core of manufacturers who have been early adopters of the technology needed to fulfill defense department needs
- World-class regional university researchers and institutions who are developing new ways to improve defense manufacturing processes and efficiency
- Organizations that support continuing education and training as they relate to defense need

Gaps

- Lack of clarity in identifying how our region's technology innovation and assets fit into key defense systems and supply chains
- Need for stronger integration of company R&D needs with regional R&D assets & institutions, in ways which can also drive economic development and workforce training resources
- While early adopter companies are utilizing advanced manufacturing technologies in artificial intelligence, additive manufacturing, and robotics which are essential in the defense sector, widespread adoption has not yet occurred

Opportunities

- Encourage and train companies willing to embrace, invest in, and incorporate advanced manufacturing technologies (artificial intelligence, additive manufacturing, machine learning, robotics & automation, advanced materials & innovative integration) to serve the 21st Century DoD
- Establish a regional attitude that demonstrates we are ready and able to take advantage of emerging opportunities to produce products and services in defense readiness areas

OPERATIONAL IMPROVEMENTS/CAPITAL INVESTMENT

Strengths

- Well-established Manufacturing Extension Partnership (MEP) Centers in Southwestern PA-WV with robust outreach, technical assistance and training offerings, and opportunities to create relationships with manufacturers, including the DoD
- Effective technical assistance organizations targeted at this sector including:
- Innovation Works (helping to make our region a center for innovative startups and tech investors), RCBI, TechConnect (supports research, innovation, and making connections), CTC (applied research), JARI (non-profit economic development organization) and others.
- Multiple capital access and mini-grant resources for smaller to mid-sized companies, and assistance/advice on how to spend those dollars.

Gaps

- Need for resources to scale up MEP Centers' abilities to provide key counsel and information on how our manufacturers can service the defense community
- Slow adoption of Advanced Manufacturing Technologies (AMT) by many companies in the region
- Compliance with the DoD's Cybersecurity Maturity Model (CMMC) Company. The DoD's requirements are a hurdle and, in some cases beyond the abilities of many manufacturers
- Need for capital (at >\$250,000 levels) to fund company development, commercialization, and expansion needs

Opportunities

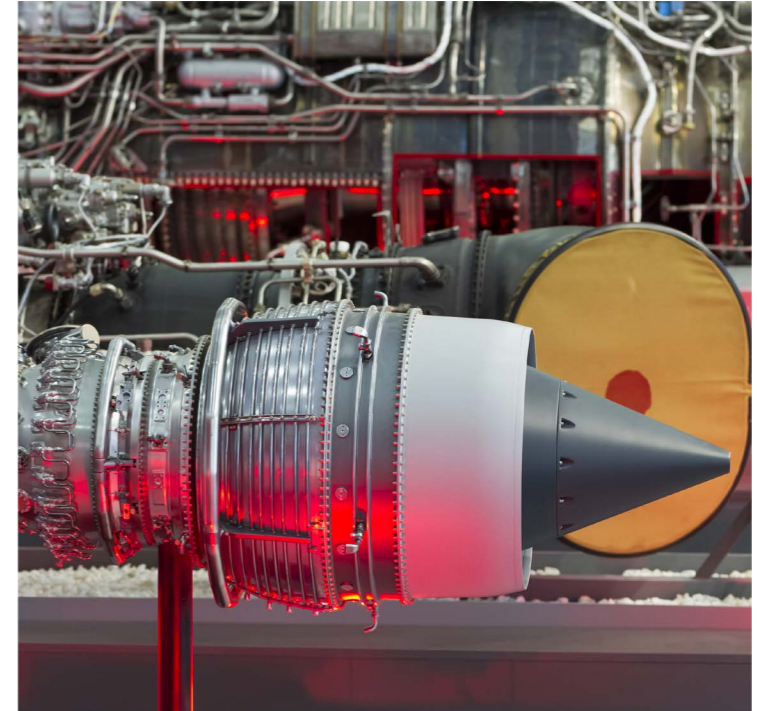
- Build the capacity and resources of the Catalyst Connection and WVU Manufacturing Extension Partnership centers to support the efforts of small and medium companies to adopt Advanced Manufacturing Technologies & DoD-compliance cybersecurity protocols
- Approach large-scale capital investors who can fund companies ready to jump into the space between growth and commercialization

TAKING AIM AT OUR FUTURE: A PLAN FOR GROWTH

Clearly there is much to accomplish in the three years that the DoD is funding the AIM Higher Consortium. But we have our pillars, and a roadmap to guide us.

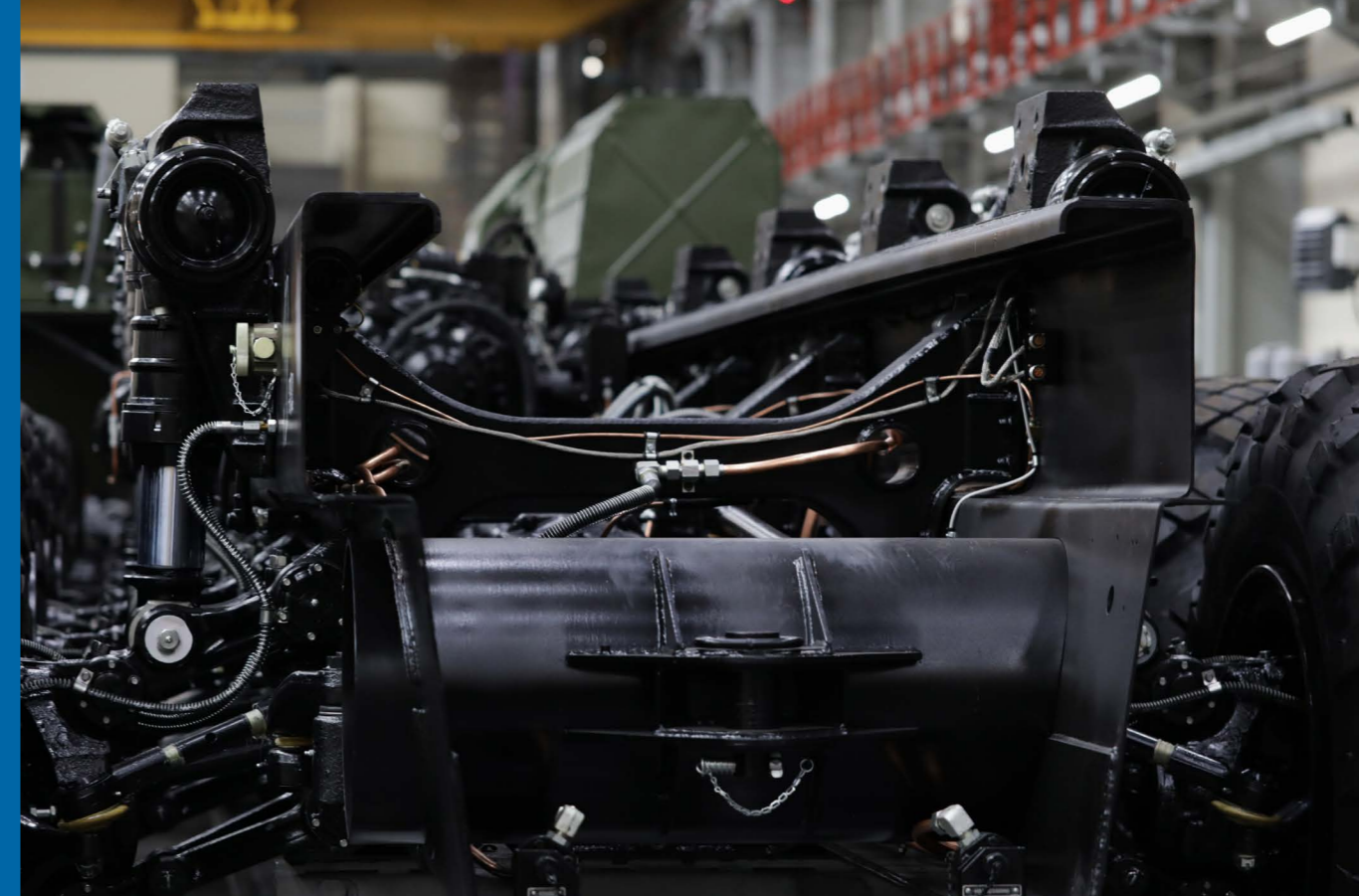
AIM Higher Consortium will focus on the following initiatives through 2023:

1. Utilize AIM Manufacturing Hub facilities and organizations to support the region's defense manufacturers
2. Launch and maintain a regional, sustainable AIM Defense Supplier database
3. Maintain an ongoing Workforce Training Inventory on the AIM website, and maintain a robust regional Learning Management System to track and boost job and skills training in the AIM region
4. Provide direct technical assistance, grants and access to investment capital for small and medium defense sector businesses
5. Use MEP and other organizational training and support to promote manufacturer adoption and use of Advanced Manufacturing Technologies (AI, additive, robotics, and DoD-compliant cybersecurity)
6. Boost regular and ongoing collaboration with DoD DMCP, Industry & Procurement units with meetups and virtual events
7. Leverage regional Research Universities and Manufacturing USA Institutes to help meet manufacturers' innovation needs.
8. Develop training to prepare the regional workforce to take advantage of the skilled, family-sustaining jobs that will be created.
9. Coordinate with lawmakers and policymakers for government support, including funding, grants, and legislation supportive of this effort
10. Create a regional trade or working group for southwestern PA and WV, to coordinate efforts, build relationships among suppliers in the region, and boost integration with key DoD organizations



The AIM Consortium has higher aims for boosting this region's defense manufacturing sector that will require resources and collaboration beyond the current DOD DMCP grant, but AIM will begin laying the groundwork now to:

- Launch an “Advanced Manufacturing Learning Lab”, to train and upskill workers in advanced technologies such as additive manufacturing, artificial intelligence and machine learning, automation and robotics.
- Establish one or more regional Advanced Manufacturing Training Centers to provide hands-on training for the Advanced Manufacturing Learning Lab
- Secure large scale financial support for defense supply needs for business expansion, technology adoption and implementation of the CMMC Cyber Security Certification.



With a comprehensive plan in place, we're certain our mission to create a robust and innovative defense manufacturing ecosystem in the PA-WV region will succeed. But this must be an all-hands-on deck effort: uniting federal and state government policymakers, local officials, the defense industry, R&D institutions, capital investors, and economic and workforce development entities. If we all work together, we'll make our manufacturers more successful, create family-supporting jobs for our workers, contribute to the growth and health of our region, and boost national defense readiness and the nation's security.



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