

Developing an Enhanced Capital Network for Manufacturing

*Insights and Recommendations from Manufacturing Roundtables held in 2021-22 in
partnership with Catalyst Connection's AIM Higher Consortium*



March 2023

Manufacturing Roundtables 2021-22

Insights and Recommendations

EXECUTIVE SUMMARY

According to a recently published book¹, *The Titanium Economy* (2022), authored by a McKinsey managing partner and two other experts, “the future of the American economy is hiding in an unlikely place: the manufacturing sector”. This book makes the compelling case that while Silicon Valley may still dominate headlines about technology advances, many of the fastest growing and most profitable companies in the U.S. are smaller firms that most people have never heard of. These are the small and medium-sized manufacturers, including industrial technology leaders and defense manufacturers, that provide the raw materials and component parts that go on to create products and or deliver services that are “critical to our daily lives”. These companies offer the promise of new jobs and advancement in current career pathways and can also deliver a solid return on investments from private equity and government programs and subsidies.

In the targeted region of southwest PA and WV, we are keenly aware that small and medium-sized manufacturers (SMEs) make up an estimated 85% of the sector and play an outsized role in supporting the more visible - and vital - productivity coming from the region’s largest energy and advanced manufacturing companies. By listening to these companies, and the Manufacturing Extension Partnerships (MEPs) and other organizations who support them, we have learned that **most SME leaders are focused on basic business operations and need assistance to recognize and act on opportunities to modernize**. There is a specific role in the region for defense manufacturers, whose vitality is critical not just to our region but to national security and economic productivity. It is important that we help SMEs understand they have a role in addressing issues of global importance, such as protecting our overall cyber security, contributing to lowering carbon emissions, and securing critical supply/value chains.

Many SMEs lack the time and capacity to look beyond their current operations and consider how important modernizing their operations could be to their competitiveness and their ability to grow and attract the dependable and skilled workers they need. Even though the Industry 4.0 movement, i.e., the integration of ‘smart’ technology into processes, is well recognized at this point, most SMEs have not embraced the idea of streamlining their processes this way, due to many factors including cost, wariness of new technology, and distrust or confusion about government programs that are subsidizing the modernization efforts.

Helping SMEs access capital to integrate new technologies into their operations is the goal of establishing an enhanced Capital Network in our region. In addition to traditional sources of working capital, there are significant federal funding initiatives underway currently that could directly impact local manufacturing capacity. Build Back Better, the Inflation Reduction Act (IRA), and the Bipartisan Infrastructure Law (BIL), all have resources in them to support manufacturing. The Roundtable sessions summarized in this report provided input directly from impacted stakeholders, to ensure the tools and programming put in place meets their needs.

¹*The Titanium Economy*, by Asutosh Padhi, Gaurav Batra, and Nick Santhanam. Subtitle: How Industrial Technology Can Create a Better, Faster, Stronger America, 2022.

BACKGROUND

In support of Pittsburgh-based Catalyst Connection's AIM Higher project, IN-2-Market (I2M), a 501(c)3 nonprofit organization, held three roundtable forums in 2021 and 2022 to explore ways to strengthen, diversify, and grow the region's defense manufacturing supply chain. In partnership with Catalyst and West Virginia University, I2M identified and convened three key stakeholder groups who could provide insights into the opportunities and barriers for small and medium-sized manufacturers to improve their awareness of and access to capital for modernization:

- November 2021 – Morgantown, WV – Invitation-only Executive Roundtable
- July 2022 – Virtual – Finance and Economic Development Experts Roundtable
- September 2022 – Virtual – Small and Medium-Sized Manufacturers (SME) Roundtable

ROUNDTABLE SUMMARIES

November 2021 – Morgantown, WV – Invitation-only Executive Roundtable

This working session was hosted at Blaney House, the residence of West Virginia University President Gordon Gee, with 40 people in attendance. The goal was to provide corporate executives with an open, interactive forum to engage in peer-company networking around shared challenges and opportunities in support of the defense supply chain (agenda is provided in Appendix 1, attached). Specific objectives were to:

- *Gain new insights* – Learn from others and discuss (non-confidential) needs and priorities in addressing defense manufacturing.
- *Identify shared needs & opportunities* – Surface shared challenges and needs in defense manufacturing, where future collaboration could lead to transformative solutions for participants and the region.

The session began with opening remarks by Petra Mitchell, President of Catalyst Connection, Pat Getty, President of IN-2-Market, and WVU President Gee. This was followed by remarks from Major General James Hoyer (ret.), VP of Economic Development at WVU, who pointed out how attendees could and should take advantage of the operationalization of WVU as a land grant institution to make headway in defense manufacturing. He noted that our region can address and contribute to national topics around "near peer" competition like defense and support the U.S. in continuing to compete and lead globally. A key issue will be working to re-shore the defense industry supply chain, and Maj. Gen. Hoyer expressed his belief that the tristate region can lead and expand the affiliated defense economic base.

This was followed by remarks from Colonel Beth Sweet, from the U.S. Department of Defense (DoD) Defense Innovation Unit (DIU). Col. Sweet explained that the DIU was established in 2015 to address defense modernization and figure out how to best utilize newly commercialized tech. She noted that the

DoD would like to see other regions in the U.S., beyond Silicon Valley, have greater public/private/academic innovation collaborations. DIU is seeking to increase the National Security Innovation Base (NSIB) by getting non-traditional companies to work with the DoD and accelerate DoD adoption of commercial tech (beyond prototyping). On behalf of the DoD, DIU can facilitate problem discovery within the military services and quickly engage industry with fully funded bids to generate solutions. She noted that DIU is opening a fifth regional office, so the tristate region of OH-PA-WV will have the advantage of access to multiple offices. There are several product areas through which to engage with the DIU, and Col. Sweet suggested that attendees should continue their engagement and conversation around these issues (e.g. through these roundtables) and encouraged everyone to follow and monitor DIU's social media and website for opportunities, thought pieces, and solicitations.

During this Roundtable discussion, eight private companies provided input, including Northrop Grumman, Aurora Flight Sciences (Boeing), and six other defense manufacturers of varying sizes. The companies were asked to discuss:

- How can our region work as an integrated ecosystem to develop and expand regional supplier capabilities in support of prime defense contractors and DoD?
- How can we better leverage the Tri-State's technological strengths in support of defense manufacturing?
- How can we attract new companies and new defense contracts to the region?

The facilitated discussion was far-reaching and touched on issues such as developing and growing new qualified defense suppliers in the region; attracting, retaining, training the workforce to support a regional defense ecosystem; addressing the challenge of cyber-security, accelerating the adoption of technologies in the defense supply chain, and improving value chain collaboration for defense requirements in the region. Subjects raised in this initial session laid the groundwork for the following roundtables that brought together finance experts and small manufacturers.

As a follow-up to this Executive Roundtable session, an AIM Higher collaborated effort brought together Northrop Grumman with suppliers located nearer to their WV facility than the supplier they were using at the time for production of parts for Northrop's equipment manufacturing. This session was facilitated by WVU and Catalyst Connection. The result of that discussion was that Northrop was able to identify a new supplier in closer proximity, saving money and time. All participants expressed significant satisfaction with this process and its appropriateness as a means to reach outcomes of shared benefit, in this case connecting a major manufacturer with a more local supplier. It was noted there is potential for such an approach (facilitated connection and strategizing) in addressing significant shared challenges such as reshoring, to address national security concerns.

Additional follow-up to the Roundtable by WVU has included efforts to address the challenges smaller manufacturers face in qualifying as a defense manufacturer, particularly in terms of cybersecurity requirements. Those discussions are ongoing at this time.

July 2022 – Virtual – Finance and Economic Development Experts Roundtable

This working session was held virtually, facilitated by I2M's Pat Getty and hosted in partnership with the AIM Higher Consortium. The goal of this Roundtable was to garner a better understanding of the capital marketplace and use the resulting observations and insights to develop recommendations on how to enhance capital products and access to services for small and medium-sized manufacturers (SMEs).

Roundtable participants included capital investment fund managers, commercial lenders, manufacturing advocates/financiers, such as MEPs and business development organizations. Other attendees included state economic development officials and reps from private economic development organizations. (Agenda is provided in Appendix 2, attached).

The consensus on recommendations fell into two categories:

- (1) The need to provide SMEs with a better understanding of and access to relevant information about access to capital, as well as technical assistance to SMEs to support modernization and full utilization of the financing options for those investments; and
- (2) The need for actions and tools that will prompt financial institutions and economic development entities working with SMEs to better communicate options to SMEs, and to better coordinate among themselves.

Recommendations for SME supports (#1 above) included:

- Finding a way to provide SMEs with better understanding of financing options and access to technical assistance, including potentially developing an online portal that contains comprehensive, curated information of interest and benefit to SMEs, including current financing options and a database of trusted advisors (e.g., MEPs). This would benefit financiers and intermediaries as well, giving them an outlet to raise awareness of their services.
- Finding ways to mitigate the lack of capacity within SMEs' own finance and production staff (e.g., to consider the return on investment on modernization investments), including perhaps developing a series of live and recorded technical assistance webinars that would convey basic financing information, e.g., application requirements or succession planning. These sessions could be posted and shared and directly accessed in a confidential way by SMEs.

Recommendations for financial institutions and economic development organizations included:

- These entities would benefit from better coordination among their peers, in order to augment and enhance current offerings and services. Perhaps develop an on-going forum for communication and exchange of information, such as quarterly Zoom meetings, to keep them current on new government financing options (for example).
- SMEs often rely first on in-house banking relationships but may not qualify for those commercial products, or if they do, may be missing opportunities for less expensive financing options. Recommend instituting a referral mechanism so banks know when/how to refer their commercial customers to obtain government grants/subsidies. A successful, growing business brings more deposits into the bank, so all would benefit.

September 2022 – Virtual – Small and Medium-Sized Manufacturers (SME) Roundtable

This session was held virtually, again facilitated by I2M's Pat Getty and hosted in partnership with the AIM Higher Consortium. The objective was to determine what financing options SMEs were aware of and utilizing, discuss what additional options might be helpful, and capture SME needs for information and technical assistance related to access to capital.

Invited Roundtable participants included food production, custom transformers, precision machining, large-scale fabrication, equipment repair services, chemical manufacturing, and transportation firms. Other attendees included a manufacturing association, Manufacturing Extension Partnerships (MEPs), and economic development organizations. (List of questions posed to participants is provided in Appendix 3, attached).

Consensus and conclusions:

- SMEs often default to their local bank when looking for financing, which can mean not getting the best deal or not qualifying for loans.
- SMEs are focused on day-to-day operations, are not aware of many financing options and supports, including government assistance. This leaves some grant and subsidy programs underutilized.
- The amount of information online is overwhelming and not organized in a way that is easily understood, and that is frustrating to SMEs.
- Intermediary organizations like MEPs do a good job of providing technical assistance, but many SMEs are not connected to them. All would benefit from showcasing those services to SMEs.

Recommendations:

- Develop an online portal that contains comprehensive and *curated* information of interest to SMEs, e.g., financing options and opportunities, and a database of trusted advisors. This came up in the previous finance provider roundtable as well and would benefit them by providing an outlet to promote their services.
 - SMEs often lack capacity and have a shortage of expertise within their staff that limits the time and effort they are able to spend researching and considering options. They noted that a tool to help sort credible options and benefits would streamline their search.
 - SMEs want information on training providers to upskill staff to new technology, options to support acquiring new equipment (which ones are appropriate and cost effective with ROI), and information on where to get technical assistance for operating new equipment.
- Continue to work with financing institutions and intermediary support organizations to help better coordinate their services, encourage them to provide education and guidance to SMEs, and share ideas on how to better support access to capital for SMEs.

- Work with banks that do commercial lending to advocate for them to offer referrals to other programming options, such as government subsidies and grants, when a company does not qualify for a bank loan.
- Disseminate and actively share/promote information on current subsidies, grants and other financing options and supports, to ensure full access to and use of government resources and programs, some of which are currently underutilized.
- Find ways to provide educational materials and information to SMEs in ways they can access confidentially and at times when it is convenient for them.
 - Production of a series of live and recorded technical assistance webinars that can then be shared via email and/or accessed online and viewed multiple times, on subjects such as financing basics and application requirements. This would allow SMEs to consider options without awkward conversations on subjects such as succession planning.
 - Combine this info with access to advice and supports in making cost-effective decisions on capital financing (i.e., connect them to technical assistance providers).

NEXT STEPS FOR ENHANCING A CAPITAL NETWORK

The ultimate goal in supporting Capital Network enhancements is to de-risk and streamline access to financing for modernization, including for defense manufacturers or those wanting to become defense manufacturers. Increasing awareness and utilization of capital to modernize operations will better position small and medium-sized manufacturers (SMEs) to remain competitive and to provide better and more abundant products for their customers.

IN-2-Market will continue to develop tools and improve access to information and capital for SMEs. Specifically, in support of the AIM Higher Consortium, I2M will work with its partners to explore the viability of and pursue resources to implement the recommendations outlined in this report. The intent will be to help SMEs stay competitive and understand market challenges and opportunities by accessing the information and technical assistance they need to grow and thrive.

Specific recommendations for next steps include:

1. Partner with experts to produce one or more targeted white papers that will help further ascertain the appropriate strategies for:
 - a. Augmenting current government and private-sector capital-related products with new and innovative options that better meet the needs of SMEs;
 - b. Helping financial institutions better understand what public products are available for which they can be the conduit (win-win), and when to refer a banking client to those products;
 - c. Addressing the specific barriers that SMEs have articulated that keep them from effectively accessing affordable capital to modernize.

2. Produce presentations that provide information and guidance on how to determine which financial products are a fit for their needs and connect them to technical assistance providers who can help them access a range of products and services. These may include any of the following, as determined by AIM partners:
 - a. Presentations at convenings of SMEs;
 - b. Recorded webinars and existing podcasts;
 - c. Produce virtual how-to sessions that can then be accessed by SMEs at their convenience.
3. In partnership with existing intermediary organizations (such as MEPs) who provide technical assistance to SMEs, explore the potential benefits of providing a *curated and regularly updated set of information* about capital-related products and options, *potentially developing an electronic tool with filters* to facilitate easy research by SMEs that could be accessed at their convenience. This will help provide user-friendly access for the companies and, using a database of trusted advisors such as MEPs, will guide and prompt SMEs to better utilize the products and services available to them.

ACKNOWLEDGEMENTS

This first phase of activities (2021-2022) aimed at identifying barriers to access to capital was supported by a great group of public and private partners and roundtable participants and we are grateful for the time they invested and the insights they provided. Thank you (in alphabetical order) to: Acutran Transformers, AC&S, Inc., Advanced Robotics for Manufacturing (ARM) Institute; Agile Additive, Allegheny Conference (Pittsburgh Regional Alliance), Appalachian Ohio Manufacturers Coalition (AOMC), Astrobotic, Aurora Flight Sciences (Boeing), Azimuth, Inc., Babst Calland, Bayer, Belleflex Technologies, Ben Franklin Centers, Blair Business Consulting, Bridgeway Capital, Carnegie Mellon University, Catalyst Connection, Conturo Prototyping, Enterprise Ventures Corp., FCX Systems, Inc., IN-2-Market, Innovation Works, Manufacturing Advocacy & Growth Network (MAGNET), Mecco Marking and Traceability, National Center for Defense Manufacturing & Machining (NCDMM), Natural Capital Investment Fund, New Century Careers, Northrop Grumman, Office of House Representative David McKinley (WV), Office of Senator Bob Casey (PA), Office of Senator Shelly Moore Capito (WV), Ohio Department of Development, Ohio Manufacturing Extension Partnership, Ohio State University South Centers (MEP), Ohio Third Frontier, Partners for the Advancement of Responsible Technology (P.A.R.T.), PA Department of Economic Development, Phoenix Trucking, Robert C. Byrd Institute, Schmidt Technology Corp., Southwestern Pennsylvania Commission, TechConnectWV, Universal Stainless, University of Pittsburgh, U.S.-China Commission, U.S. Department of Defense/Defense Innovation Unit (DUI), Vertex Partners, LLC, WV Department of Economic Development, WV High Technology Foundation, WV Jobs Investment Trust (JIT), WV Manufacturing Extension Partnership, and West Virginia University.

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Appendix 1: Defense Executives Roundtable Agenda (November 2021, Morgantown, WV)

Attendees: Agile Additive; Aurora Flight Sciences (a Boeing Company); Azimuth, Inc.; Belleflex Technologies; Mecco Marking and Traceability; Northrop Grumman (ABL); Schmidt Technology Corporation; Universal Stainless; Advanced Robotics for Manufacturing (ARM) Institute; Allegheny Conference (Pittsburgh Regional Alliance); Astrobotic; Babst Calland; Bayer; Belleflex Technologies; Carnegie Mellon University; Catalyst Connection; U.S. Dept. of Defense, Defense Innovation Unit (DIU) ; Innovation Works; National Center for Defense Manufacturing & Machining (NCDMM); New Century Careers; Northrop Grumman (ABL); Office of House Representative David McKinley (WV); Office of Senator Bob Casey (PA); Office of Senator Shelley Moore Capito (WV); Robert C. Byrd Institute; Schmidt Technology Corporation; State of West Virginia; TechConnectWV; Universal Stainless; University of Pittsburgh; U.S.-China Commission; WV High Technology Foundation; West Virginia University

AGENDA

1:00	Opening Remarks (15-20 min) <ul style="list-style-type: none">- Intro of Organizers (Petra Mitchell/ Pat Getty)- Welcome (WVU President E. Gordon Gee)- Opening remarks by Maj. Gen. James Hoyer (ret.), VP Development, WVU- Intro Col. Beth Sweet [by Maj. Gen. James Hoyer]
1:20	KEYNOTE: Col. Beth Sweet - DoD DIU (20-25 min w/ Q&A) <ul style="list-style-type: none">- Remarks on defense industry challenge/opportunity- Q&A with participants/guests

1:45	<p>Executive Roundtable, Facilitated by Mike Docherty, ED I2M (35-40 min)</p> <p>Topics:</p> <ul style="list-style-type: none"> ○ <i>Finding, developing and growing new qualified defense suppliers in the region</i> ○ <i>Attracting, retaining, training the workforce to support a regional defense ecosystem</i> ○ <i>Addressing the challenge of cyber-security (and CMMC requirements)</i> ○ <i>Accelerating the adoption of technologies in the defense supply chain</i> ○ <i>Improving value chain collaboration for defense requirements in the region</i>
2:20	<p>Q&A and audience engagement (15-20 min)</p> <ul style="list-style-type: none"> - Broader Q&A and audience engagement (10 min.) - Closing comments from participants (5 min.)
2:40	<p>Action Planning (15 min)</p> <ul style="list-style-type: none"> - Summarize outcomes - Potential framework for collaboration - Available resources in region
3:00pm	<p>Wrap-up/ Adjourn</p>

Appendix 2: Finance and Economic Development Experts Roundtable (July 2022, Virtual)

Capital Network

Tristate Finance Roundtable

Hosted by IN-2-Market with ARC POWER grant and AIM Higher partners

July 22, 2022 1:00 – 2:30 PM ET

Virtual meeting

Attendees: Blair Business Consulting (OH); Ohio State University South Centers (MEP); Ohio Department of Development; Appalachian Ohio Manufacturers Coalition (AOMC); Manufacturing Advocacy & Growth Network (MAGNET); Ben Franklin, Central & Northern PA; Bridgeway Capital; PA Department of Community and Economic Development (DCED); Southwestern Pennsylvania Commission (SPC) ; Catalyst Connection; Natural Capital Investment Fund; WV Jobs Investment Trust (JIT) ; Vertx Partners, LLC ; WV Jobs Investment Trust (JIT); West Virginia University (WVU); WV Manufacturing Extension Partnership (MEP)

AGENDA

Goal: *Recommendations for an enhanced Capital Network for OH-PA-WV manufacturers.*

Agenda Items
Brief Introduction to the Proposed Capital Network
Existing financing options compared to SME needs Opportunities for improvement Issues with inconsistency across municipal and other borders Gaps in finance mechanisms or barriers to access
How to engage and inform SMEs Gaining SME attention as to opportunities, needs, and options for modernization Reaching SMEs with information about technologies and access to capital Need for technical assistance to select best options and adapt to individual operations
Other Funding/Financing Ideas Loan Forgiveness Program (based on performance metrics)? Revolving Loan Funds? Less traditional funding, e.g., “Green” funds, other equity options?
Next Steps
Open Discussion Comments, questions from all attendees

Appendix 3: Small and Medium Manufacturers Roundtable (September 2022, Virtual)

CAPITAL NETWORK **Tristate SME Roundtable** September 2022

Attendees: Acutran Transformers; Conturo Prototyping; Catalyst Connection; Innovation Works; Manufacturing Advocacy & Growth Network (MAGNET); Southwestern Pennsylvania Commission (SPC); West Virginia University (WVU); Phoenix Trucking; AC&S, Inc.; WV Manufacturing Extension Partnership

Questions for Participants

Our objectives in this conversation are to:

- (a) determine what modernization financing options you are currently aware of and utilizing;
- (b) determine whether there are additional options that could be useful but are not currently known or available to you; and
- (c) get your input on ideas for additional options for accessing funds and technical assistance for modernization.

Currently utilized financing options

1. How many of you have had occasion in the last few years to pursue financing for operational upgrades, including for replacement or enhanced machinery, equipment or technology?
 - a. What is your go-to source for securing finances for expansion or for upgrading equipment?
2. Are you aware of specific state and federal programs being introduced to encourage carbon reduction?
 - a. Have you ever partnered with larger companies or others in your region to try to get regional or federal grants?
3. Where do you look for information as to opportunities for modernization, access to markets, or other needs?
 - a. Where does your company turn for advice or technical assistance for selecting and adapting new machinery, equipment or technology?
4. Where does your company turn for advice or technical assistance regarding financial information/resources?
5. Where does your company turn for resources to support workforce development, i.e., hiring new employees, training, certifications?

(Continued)

Additional options that could be useful

6. Has your company used, or considered, non-traditional funding options such as "green" equity funds or other types of funding besides loans or grants?
7. Are there other potential improvements to the capital markets you would like to see?

Ideas for additional options for accessing funds, technical assistance, and other information

8. Would you find it helpful to have access to an on-line information website that could provide updates and information about items of interest such as:
 - a. Market opportunities;
 - b. Modernization options and opportunities;
 - c. Information on funding options and opportunities;
 - d. Consulting, advising, and other sources to provide help in identifying your modernization needs, including the best options for new equipment or technologies and advice on how to customize them to your specific operations and facilities? *(Such a site could provide for confidential communication as appropriate.)*
9. Some manufacturing companies have expressed an interest in access to information about planning for the future of their company after they retire. Would you find it useful if an online information site included advice and referrals for leadership succession planning, or for preparing your company for eventual sale? *(This is not implying either is imminent.)*
10. Are there any other ideas or areas of focus you'd like to talk about?

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