



Project Profile: Southeast Michigan

Impact Statement

The Advance Michigan Defense Collaborative organized a regional coalition of partners to coordinate assistance to promote research, industrial development, and workforce development relevant to the defense industry. Efforts undertaken added resiliency and capacity to the nation's defense industrial base, particularly in the areas of autonomous transportation and connected mobility (e.g., electronics, sensors, and componentry), lightweight materials manufacturing, and information technology with a focus on increasing security of automated transportation systems and products.

Key Project Takeaways

Through its Industry Resilience grant, the Southeast Michigan IR team catalyzed the region's defense industrial ecosystem by forming the Advance Michigan Defense Collaborative (AMDC), an expansive group of partnering organizations including the Macomb/St. Clair Workforce Development Board, Macomb County Planning & Economic Development Department, Michigan Economic Development Corporation's (MEDC) Michigan Defense Center (MDC), Workforce Intelligence Network (WIN), Michigan National Guard, and the New Economy Initiative. The OEA grant proved critical in assisting regional efforts to provide retraining assistance for displaced defense industry workers, providing the workforce skills needed for critical, in-demand jobs in manufacturing and cybersecurity, and helping defense supplier businesses adopt/pivot into new cutting-edge innovation in light weighting materials manufacturing, autonomous transportation and connected mobility, and information technology such as cybersecurity for transportation systems and products.

Project Description

Rationale

Southeast Michigan, encompassing a 13-county region that includes Detroit, Flint, Pontiac, Lansing, and Ann Arbor, has long been a manufacturing center for automobiles. This concentration in vehicle production, along with the accompanying workforce's skills in design, engineering, and production, generated a niche market for manufacturing tanks and other armored ground vehicle systems. The region is home to the U.S. Army Garrison-Detroit Arsenal, employing more than 7,500 Department of Defense employees—97% of which are civilian employees. Housed at the Detroit Arsenal are TACOM Life Cycle Management Command and the Tank Automotive Research, Development and Engineering Center (TARDEC). As the drawdown of troops continued in both Iraq and Afghanistan, the demand for these vehicles declined. The region's subsequent designation as an Investing in Manufacturing Communities Partnership location made organizations aware of the IR grant and provided the impetus for a follow-on funding request.

Program Activities

Using OEA funds, Southeast Michigan advanced national defense priorities for Resiliency, Lethality, and Readiness outcomes through better overall regional organization and by supporting key technology focus areas: Connected Mobility, Light Weighting Materials, and IT Systems. The Advance Michigan



Defense Collaborative studied the existing regional landscape and assets using social network analysis, defense industry economic impact analysis, defense-related skills gap analysis, and asset mapping. These studies helped to identify and further the strategic alignment of partners and assets. Additional program activities stemming from the grant assisted dislocated defense workers and defense firms impacted by reduced budgeting and procurement; encouraged awareness and connection to contracting opportunities; and promoted commercialization, talent development, and economic development related to key defense relevant technology sectors.

The collaborative, for instance, organized to support resiliency and capacity building in *Autonomous Transportation and Connected Mobility* (e.g., electronics, sensors and componentry sector). OEA funds helped enhance the Michigan Automated Systems Collaborative, and supported vehicle connectivity asset alignment planning, supply chain mapping, automation/connectivity pilot projects using Applied Robotics for Installation and Base Operations (ARIBO), and provided support for the Michigan Alliance for Greater Mobility Advancement (MAGMA), a consortium that includes original equipment manufacturers (OEMs), tier suppliers, educational institutions, workforce organizations, and state government, whose goal is to address the automotive industry's skills and training needs, particularly around mobility solutions, connected, and automated vehicles.

In *Lightweighting Materials*, the OEA-supported collaborative increased resiliency and capacity building in the lightweight materials manufacturing sector by introducing the iBridge virtual innovation network, enhanced the Michigan Bid Targeting System, and created the Defense Contractor Transition Center. Finally, grant activities advanced *IT Systems* resiliency and capacity building, especially around increasing the security of automated transportation systems and products. The collaborative conducted supply chain mapping, worked with Opportunity Detroit Tech, supported Apprenti¹, an IT apprenticeship program, established the Connected Life Collaborative focused on the Internet of Things, created cyber ranges and testing sandboxes in the region, and supported the establishment of a Defense Regional Cyber Security Training Center.

Resiliency Impacts

Enhancing Force Multipliers to Support the Defense Industrial Base

AMDC brought together a team of experienced partners to manage this initiative. This team includes the grantee, Macomb/St. Clair Workforce Development Board (M/SCWDB)—an entity of Macomb County local government—and a sub-recipient, the Workforce Intelligence Network for Southeast Michigan (WIN). Research products (e.g., defense industry economic impact analysis, skills-gap analysis, asset mapping, social network analysis) produced under the OEA grant helped to organize and promote collaboration among a number of actors and organizations in the region around the defense ecosystem.

¹ Apprenti is a program of the Washington Technology Industry Association (WTIA) Workforce Institute. The WTIA Workforce Institute is a 501c3 organization created to address the workforce shortage in the tech industry and identify diverse talent to meet industry needs. The Institute has partnered with the Washington Technology Industry Association, Washington state's unifying voice for the technology community to operate Apprenti. The program exists as a collaboration between Washington state and major employers including IBM, Microsoft, and Amazon. It actively and rapidly trains individuals for employment in these partner companies.



For instance, the Connected and Automated Vehicles Social Network Analysis identified more than 350 firms working in the autonomous vehicle market. Once identified, AMDC contacted these businesses and engaged them with the grant. Prior to the OEA grant, there were serious challenges to achieving this degree of engagement. Collaboration proved challenging among partners who have not traditionally worked together. The defense industry has frequently been siloed, rather than aligned with or complementary to other industries in the region. This includes the automotive industry, despite the heavy regional focus on DoD-related land systems. Moreover, prior to the grant, there were insufficient resources—human and otherwise—to support sustained partner facilitation and convening necessary to grow successful partnerships prior to the OEA grant.

The collaboration fostered by the grant led to a more sustainable, more interconnected defense industrial base. This affords DoD a reliable and ready cohort of suppliers to turn to when seeking to mobilize its forces.

Commercial Diversification of Defense Companies to Sustain the Industrial Base

Southeast Michigan is home to more than 3,300 businesses serving the defense industry. Together, they employ over 94,000 workers with average annual wages above \$90,000. Helping DoD sustain these businesses and workers promotes both regional resilience and strength across the entire nation's defense industrial base. ADMC supported this resiliency of the DoD by using OEA funds for enhancements to the state's existing Bid Targeting System and by creating a new Defense Industry Career Transition Center. The State of Michigan manages, via the Michigan Defense Center, a Bid Targeting System (BTS). BTS identifies firms and assesses their capability (aka 'health') to competitively bid for defense-related contracts. 'Health' is determined based on the financial standing of the organization, as well as the firm's ability to effectively supply the nation's defense industrial base. Drawing on several federal data sources for information (e.g., Federal Procurement Data System, FedBizOpps, Dunn & Bradstreet, and the Small Business Administration) the system helps firms identify how well a possible contracting opportunity matches their capabilities. With the OEA grant, ADMC provided the Michigan Defense Center with additional funding to augment its BTS. While the system currently includes contracting opportunities for DoD and the Department of Homeland Security, the MDC used funding to expand the number of agencies monitored for contracting opportunities and to enhance "matchmaking" between OEMs and suppliers. The expanded BTS makes it easier for businesses to connect with relevant partners and opportunities. Additionally, OEA funds supported a template library that firms can use for successful bid development.

These investments left contractors in Southeast Michigan better equipped to navigate the federal bidding process, providing contractors with the resources to expand into federal opportunities beyond the DoD and better apply for government contracts both in the DoD and other agencies.

Cost Savings to DoD through Business Diversification or New Products/Customers

New vehicle system integration and manufacturing techniques focused on lightweight and other advanced materials are already underway in facilities across Southeast Michigan. Advanced materials include metals, composites, and processes such as additive manufacturing, joining/welding, castings,



stamping/forming, digital design and rapid prototyping, modeling-simulation-visualization, testing, diagnostics, and repair. These technologies are critical to improving vehicle fuel economy, reduce CO₂-emissions, and for the efficient production of defense-related transportation systems, reducing the costs and improving the resiliency and self-sufficiency of vehicles and other equipment in the field. DoD made a major investment in advancing new lightweight materials technology in the Detroit area, with more than \$140 million (including 1:1 partner match) invested to establish the Lightweight Innovations for Tomorrow focus as part of the National Network for Manufacturing Innovation (NNMI). The region is also a partner with the national innovation institute focused on composite materials. With OEA funds, ADMC leveraged NNMI through the design and programming of a regional, defense-relevant microsite connected to the national iBridge Network. The network serves as a “LinkedIn for Innovation”, as the microsite provides a virtual meeting space and linkages to a national network of over 13,500 members and over 20,000 innovations across 176 organizations. Key iBridge stakeholders include university tech transfer managers, startups, angel networks, venture capital funds, economic development organizations, non-profits, and small-to-medium enterprises (notably manufacturers).

Lethality Impacts

Innovation through the Development of New Intellectual Property or New Technologies

OEA funds supported several efforts in Southeast Michigan intended to accelerate the manufacture and adoption of advanced technologies supporting defense operations. For Connected Mobility, ADMC filled an important gap by using OEA funds to commission a thorough analysis of connectivity efforts and opportunities relevant to the strategic interests of the defense industry. OEA funds supported the development of a regional plan that explores how best to align assets and efforts related to vehicle-to-vehicle and vehicle-to-infrastructure connectivity, and how efforts could support and align with the broader opportunities related to connected products, also referred to as the Internet of Things (IoT).

Additionally, ADMC supported the outreach work of the Michigan Automated Systems Collaborative (MASC). MASC is a robotics and automation cluster in Southeast Michigan. OEA funds provided by ADMC helped MASC build a directory and pilot a model known as Applied Robotics for Installation and Base Operations (ARIBO). ARIBO is a practical-to-tactical strategy created by TARDEC and Comet, a local Michigan robotics company. ARIBO uses military bases and public installations as “living laboratories” to address operational issues of automated mobility pilots. ADMC, via OEA funds, also supported the outreach efforts of the Michigan Academy for Green Mobility Alliance (MAGMA). MAGMA is a partnership of automotive manufacturing companies, educational institutions, and workforce development agencies, MAGMA’s mission is to ensure that the automotive industry has the engineering and technical talent needed to support hybrid, electric, lightweight, alternative fuel and other advanced vehicle technologies.

ADMC also worked closely with the New Economy Initiative – a partnership of ten regional foundations and the Detroit Innovation District – to convene the Collected Life Collaborative, a stakeholder group related to connected IoT products. With OEA funds, ADMC helped the collaborative to inventory current activities relevant to IoT in the region, convene stakeholders leading those efforts, engage partners that



could benefit from connected solutions, and develop a strategy and implementation plan for a physical lab to foster more product development and innovation in the IoT space. IoT is critical to DoD efforts to support operations, including movement of equipment and supplies, security and combat activities, and surveillance and communications. The overarching objective of the collaborative is to catalyze adoption of IoT solutions relevant both to military and civilian needs.

Readiness Impacts

Training and People Support

OEA grant funds supported the creation of a dedicated Defense Industry Career Transition Center within the Macomb/St. Clair Workforce Development Board. The Center is dedicated to assisting dislocated workers from defense-related employment, veterans seeking employment, and other job seekers interested in working in the defense industry. The Center collaborates with both employers anticipating layoffs due to the end of a defense contract, and those needing to grow their workforce to meet market demand for their products. OEA funding supported two full-time business support professionals dedicated to liaise with defense-industry employers.

The Defense Industry Career Transition Center assisted Burtek Enterprises Inc., an area fabricator of engineered metal components. Burtek shut down its operations, as the company was unable to remain profitable after years of providing highly engineered components to Northrop Grumman, Lockheed Martin, Raytheon, BAE, and other businesses in the aerospace, spaceflight, defense and energy markets. Transition Center staff went on-site to Burtek and helped find new positions for its more than 100 dislocated employees. Because of the Center and its staff, a highly skilled workforce trained in the skills needed to support the defense industrial base were relocated to operating businesses in the region.

Cybersecurity Preparedness

A significant shortage or mismatch of workforce talent can drive up business costs and inhibit growth strategies for companies, thereby weakening the nation's defense industrial base's ability to support DoD operations. One area of high workforce demand is for cybersecurity professionals, a field which is expected to grow by 35% in Michigan through 2026. To help alleviate this challenge, the Southeast Michigan IR team used grant funds to develop two new cyber range facilities and Merit Secure Sandbox² testing centers in the region. These ranges help build the skill level of the regional information technology workforce to meet the growing demands of defense and commercial cyber-opportunities.

One of the ranges supported with the OEA grant is the Pinckney Cyber Training Institute (PCTI), the state's only cyber range connected to a high school. Pinckney Community High School repurposed 5,000 square-feet to support the new cyber range facility. Now, students in high school and college, along with IT professionals, can complete hands-on cybersecurity coursework, exercises, and labs through the institute. High school students can earn 12 to 18 college credits toward a cyber degree through the

² Located in a virtual cloud, the Merit Secure Sandbox simulates a real-world networked environment with virtual machines that act as web servers, mail servers, and other types of machines. Users can add preconfigured virtual machines or build their own virtual machines. Access to the Sandbox is provided through a web browser or VMware's View client from any location.



institute, with credit-articulation agreements in place with Washtenaw Community College and Eastern Michigan University. The programs offered at PCTI lead to the attainment of 22 different government-recognized and required certifications. The facility will significantly increase the supply of qualified cybersecurity workforce talent in the region and across Michigan. The cybersecurity courses offered at the Pinckney Cyber Training Institute also align with DoD's 8140/8570 standards and the National Initiative for Cyber Security Education Framework. DoD contracts often mandate contractors employ cybersecurity professionals with DoD 8140/8570 certifications. Therefore, PCTI provides the means for any organization working to secure government contracts to complete the mandate. Connection to a secure sandbox provides businesses a platform for software and product testing that meets DoD cybersecurity standards and allows businesses to better secure their software.

OEA funds supported the establishment of a second cyber range, offering courses aimed at university students along with services to businesses, at Wayne State University. Besides ADMC, the Michigan National Guard proved an important partner in support of the state's new cyber ranges. Opportunity Detroit Tech (ODT), a partnership of 30-40 IT companies in Southeast Michigan that come together to explore talent needs and incubate career awareness and other solutions to address various IT-related skills gaps, proved another important partner. ODT is an important connection to IT employers in the region. Apprenti, a national IT apprenticeship program supported locally by WIN staff, also operated under the ODT umbrella in an effort to address workforce gaps in the southeast Michigan region. Together, these training centers can help grow the cybersecurity workforce in Southeast Michigan able to support DoD contractors.

These ranges and the accompanying training and coursework ensure a steady stream of talented individuals into cybersecurity jobs vital to ensuring the safety and success of DoD's mission. The sandbox and testing environments available to DoD contractors ensure well-tested, robust products for the DoD.

Lessons Learned

Challenges and Most Important Lessons Learned

The grantee faced hurdles in generating employer engagement. They successfully overcame these hurdles by bringing employers together around a very specific issue of concern – workforce. ODT and MAGMA, narrowed their focus to workforce issues, particularly the value of apprenticeship programs. This resulted in a meeting between the grantee and state of Washington on the possibility of deploying the Apprenti model for Southeast Michigan defense-related employers. Interesting features of the approach included how it handled worker diversity. In the white-male-dominated tech industry, the program model removes many demographic indicators and restricts a prospective employer's view to knowledge, skills, and abilities (KSAs) in the apprentice selection process. Apprenti claims that this helps filter out any intentional or unintentional gender or racial bias. The OEA grant funds helped seed the program in SE Michigan and the Ralph C. Wilson Foundation provided \$1.5 million to cover training costs for the first 100 apprentices accepted into the program to sustain the effort over the next three years.

Maintaining the momentum of progress among partners proved challenging as well. Each partner has their own priorities and functions beyond simply building the area's defense sector. However, the auto



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and defense sectors have a lot in common, so these synergies helped to keep partners engaged. The National Guard was a great supporter of the cyber-related activities in the region as this also advanced its priorities. Having contacts in the military actively engaged in the grant activities was identified by the collaborative as a best practice.