



UTAH DEFENSE  
MANUFACTURING  
COMMUNITY

# Year 2 Program Update

October 25, 2022

# Program Overview

- In 2020, Utah Governor's Office of Economic Opportunity was designated as a defense manufacturing community under the first cohort of the Defense Manufacturing Community Support Program managed by the U.S. Department of Defense Office of Local Defense Community Cooperation
- There are now 17 designated communities across the country



# Objective/Purpose



- The Utah Defense Manufacturing Community (UDMC) is designated by the Department of Defense as a key partner in the support of our national defense through an integrated and tactical approach to defense manufacturing.
- The Utah defense community plays a critical role in the defense industry ecosystem and is a leader in innovation, both in alignment with national security and supply chain support for more than eight decades.
- This long-term investment and self-sustaining ecosystem, is invaluable to economic growth and support for the defense manufacturing community.
- The UDMC integrates and expands successful Utah programs and introduction of new offerings to prepare for the future of defense manufacturing, by creating a single integrated program incorporating all four pillars and more than 70 committed consortium members.

# Lead Organizations



## Governor's Office of Economic Opportunity (GO Utah)



**Governor's Office of  
Economic Opportunity**

- The Mission of the Utah Governor's Office of Economic Opportunity is to enhance the state's quality of life by increasing and diversifying Utah's revenue base and improving employment opportunities.
- Vision: Offer an exceptional quality of life by implementing sustainable economic development practices to:
- Promote a business-friendly environment that allows the private sector to create high-paying jobs.
- Align industry and education to produce a world-class workforce.
- Support entrepreneurship and small business creation and growth.
- Encourage collaboration and partnerships between state and local government and the private sector.
- Utilize sustainable incentives to attract and keep high-paying jobs and provide public benefit via infrastructure, workforce development, etc.



## Utah Advanced Materials & Manufacturing Initiative (UAMMI)- Administrator

- UAMMI is a non-profit public/private partnership with the mission to draw together public, private, community, industry and educational partners to assure the growth and sustainability of Utah's advanced materials and manufacturing cluster companies. UAMMI was formed in 2016 during the first advanced manufacturing designation selection by Investing in Manufacturing Communities Partnerships (IMAC, now AMCC). UAMMI's mission and vision significantly synergizes with the goals and vision of the DMCSP.



**America Makes**

## America Makes - DoD Institute

- America Makes is the nation's leading DoD institute in additive manufacturing (AM) and 3D printing (3DP) technology research, discovery, creation, innovation, and development of a workforce ready for emerging technology. America Makes will serve as advisors in integration and alignment with DoD modernization priorities specific to the additive industry as well as tactical engagement around leveraging key best practices in workforce programs. The Utah program has strong complementarity with America Makes.



# Program Areas

- Defense manufacturing is concentrated in the northern counties of Utah, surrounding the Wasatch Front. As the economic and population center of the state, this region offers many opportunities for defense manufacturing companies to thrive.
- Aided by multiple transportation options including two interstates, an international airport, and rail; a higher educational system including technical colleges and universities; and the most diverse economy in the nation, this geographical region is a principal driver of the defense manufacturing industry in the State of Utah.





# UTAH DEFENSE MANUFACTURING COMMUNITY

Utah Defense Manufacturing Community - [www.utahdefensemfg.org](http://www.utahdefensemfg.org)  
Lead Organization: Utah Governor's Office of Economic Opportunity  
Lead Sub-recipient: Utah Advanced Materials and Manufacturing Initiative

DoD Institute: America Makes  
(National Center for Defense Manufacturing & Machining)  
Key Programs: Workforce, Supply Chain, Research, Small Business Support  
Budget: \$5 million Federal, \$6 million Match = \$11 million total project

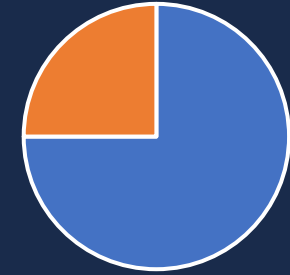


Governor's Office of  
Economic Opportunity



America Makes

Period of performance:  
September 1, 2020, through August 2025



■ Workforce ■ Business Assistance & Other

## Accomplishments

In total, UDMC programs have reached 8,200 students, worked with 156 schools, 170 apprenticeships/training, filled almost 500 jobs. assisted roughly 200 companies, offered 157 courses/workshops/seminars, assisted in submitting in at least 19 STTRs and 63 new research projects that support defense manufacturing.

- Worked with the State Legislature to fund new graduate program in advanced materials.

- Based on research under UDMC related to Reshoring manufacturing, Utah Governor Cox adopted a program, "Reshore Utah" and the State legislature passed S.B. 212 Manufacturing Modernization Grant Program, which includes \$10million for grants to companies reshoring manufacturing to the United States.

- Stimulated discussion on the challenges of qualifying and certifying advanced materials for USAF and commercial aircraft. Released a white paper on the need for modernization of the processes to qualify advanced materials for USAF and commercial aircraft, highlighting the challenges and proposing solutions.

- Held a conference on Aerospace and Defense opportunities for small businesses, which attracted more than 200 attendees to hear presentations by the Nuclear Weapons Systems Center, Northrop Grumman, Space Dynamics Lab, AFWERX, Catalyst Campus, and a roundtable on winning USAF STTRs/SPIRs.

- Provided small business support services to more than 100 small businesses within our manufacturing community.

- Utah is most proud of the collaboration that has resulted from the creation of the UDMC Consortium, and the innovations stimulated by open discussions and exchanges amongst members.

- Overall, the UDMC has been successful in elevating the DoD defense manufacturing



# Pillar 1- Workforce



Primary Goal: Better access to skilled talent for defense companies, career mobility for workers, and pathway opportunities for Utah's workforce.

- Task 1.0 Expand **Utah Works Program (UWP)** to meet labor needs within the defense manufacturing industrial base. Utah Works, working with Salt Lake Community College, addresses the unemployed and underemployed through retaining and retooling to meet the needs of the defense industry. The program has faced challenges related to hiring instructors but continued to offer programs and provide job training for Albany and Boeing.
- Task 1.1 Increase and expand career **Utah aerospace pathway programs (UAP) additional schools. UDMC expanded the UAP** to include Syracuse High School with approximately 33 students, Northridge with approximately 44 students and Clearfield with approximately 7 students



# Pillar 1- Workforce



- Task 1.2 Encourage work-based learning and **apprenticeships. Talent Ready Apprenticeship Connection (TRAC)** updated curriculum for three courses in the existing Advanced Manufacturing Apprenticeship program.
  - Curriculum development for two 40-hour train-the-trainer workshops including the translation and publishing of development content: Manuals, handouts, and training materials for Supervisor Training and Industry Partner Apprenticeship Development Training.
  - Delivery of two, five-day train-the-trainer workshops for Company Apprenticeship Development Training to be coordinated with the Center to facilitate the participation of TRAC potential industry and education partners as well as those already working with Salt Lake Community College.
  - Delivery of two, three day follow up training sessions to provide additional coaching for Industry Partner Apprenticeship Development Training to be coordinated with the Center.
- Task 1.3 Expand **Systems Engineering** education and training in Utah.- WSU Systems Engineering job growth is expected to grow by at least 8% over the next 10 years. Under UDMC, WSU has increased System Engineering curriculum. The program emphasis is on systems engineering for undergraduate students and providing concurrent enrollment systems engineering pathways for high school.



# Task 1.4 – Master's Program

- An Advanced Composite Material and Structures Center in collaboration with Utah State University (USU) and Weber State University (WSU) and develop a **master's degree program** and training resources for practicing engineers with state-of-the-art laboratory facilities.
  - UAMMI helped to secure state funding in 2021 for program Program launched in Fall 2022

## Mechanical and Aerospace Engineering



## Master of Science Composite Materials and Structures

### Coursework Only Graduate Program

Directed at providing students and industry professionals the opportunity to become familiar with how composite materials are used in several areas of engineering research and design across multiple industries. Graduates will develop the ability to better understand the applicability of these materials in improving and advancing product design.

#### Courses

##### Required:

Mechanics of Composite Materials I  
Mechanics of Composite Materials II  
Advanced Composite Materials  
Manufacturing of Composite Materials & Structures  
Testing of Composite Materials

##### Electives:

Finite Element Methods in Solid Mechanics I  
Kinematics  
Fracture Mechanics  
Finite Element Methods in Solid Mechanics II  
Theory of Plates and Shells  
Advanced Aircraft Structures  
Continuum Mechanics  
Additive Manufacturing

# Task 1.5 – Women & Girls Programs

- Task 1.5 Focus on involvement of **women and girls**, by supporting and building programs that amplify and create talent within the STEM fields.
- SheTech used funds from UDMC to include girls from northern Utah and to offer additive manufacturing tracks at Explorer Day
- TechMoms trains Moms in coding, which can be applied to missiles and to prepare for careers in defense
- Catalyst Campus, Women Tech Council, & UAMMI held an interactive meeting for career women in aerospace and defense



# Women & Girls

- UDMC funded a program to provide hands-on, multi-touchpoint training to faculty members addressing unconscious bias, micro-messaging and engaged learning techniques to increase the number of females in STEM classes. Additionally, a model is developed to create self-sustaining, cost-effective on-going training. Training teachers to address unconscious biases is a critical element in the recruitment and retention of females in STEM curriculum. Changing these biases will support teachers in giving messages that cause students to feel valued, included and/or encouraged in STEM fields.
- UDMC is funding Girls Scouts of Utah working with America Makes and Girl Scouts of Ohio to launch the Additive manufacturing patch. STEM Action Center will provide the facilities for the first troop of girls in the new program.
- UDMC is funding USU 4H programs to introduce engineering careers and activities, including Engineer Everything, Innovation Stations (3,000 kits), and Young Problem Solvers Camp.





# Welding Camps

This 24-hour camp is for high school girls interested in exploring the art and science of metalwork through the medium of welding. Participants work with faculty and students learning different processes, metal tolerances, and design techniques while creating beautiful and useful pieces.

Featured on Fox 13 News!





# Task 1.6 STEM & K to 8 Programs

- Educate and inform **K - 8th** about the manufacturing industry.
  - UDMC funded STEM Action Center to develop introduction to additive manufacturing programs. Additive Manufacturing kit will impact an estimated 1,500 students statewide. Go Utah, Kamron Dalton & STEM Action Center Executive Director, Tami Goetz showing one of the kits
  - UDMC funded the development of curriculum introducing advanced manufacturing to Kindergarten through 8th grade by home school company, My Tech High. Three courses have been developed and are in beta teaching. More than 400 students have participated in the beta testing.



# Pillar 2: Supply Chain

Primary Goal: Continue development of the CONNEX supply chain tool to improve resilience, reshoring manufacturing, and creation of composites center of excellence.



# Task 2.0 – CONNEX Update



## New Platform

In March, CONNEX migrated to a new platform, which increased functionality and integrated states into a National Marketplace

## Research and Development Module

- New functionality and enhancements were released to the live environment on Aug 10, 2022:
  - Added “Areas of Expertise” field that a researcher can use to describe their own areas of interest and expertise. Besides making a narrative available to help improve an understanding of the researcher in the platform, this new field is indexed and searchable which will help to bring their organization to a higher position in search results if matching terms are used in a search.
  - Added “Personal Website” field that a researcher can add to link users to their own external profile page. This hyperlinks to the external profile page via a new tab as a convenience.

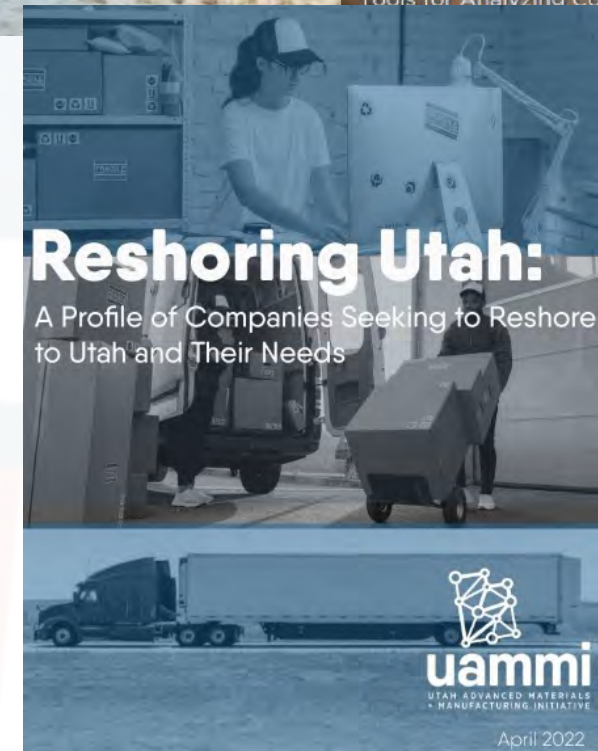
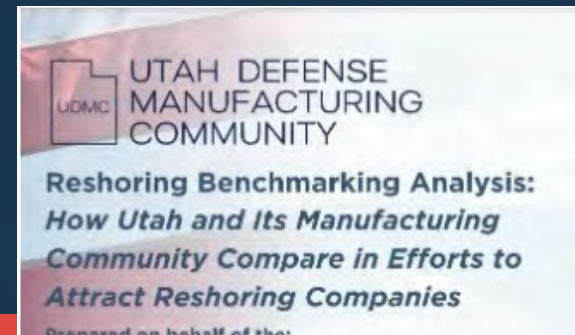
## Workforce Module

- Utah organizational data for Workforce from the retired platform was reviewed by UAMMI personnel, updated off-line for any needed adjustments, and then imported into Connex. Some highlights of the Workforce functionality in Connex includes:
  - A registration process has been developed for the Workforce organization type to enable the onboarding of new Workforce organizations. Currently having organizations updating listings.



# Task 2.1 Reshoring

- Primary Goal: Create a partnership between the state of Utah and the federal government to facilitate an advanced materials and manufacturing **reshoring** initiative.
- Based on research under UDMC related to Reshoring manufacturing, Utah Governor Cox adopted a program, “Reshore Utah” and the State legislature passed S.B. 212 Manufacturing Modernization Grant Program, which includes \$10million for grants to companies reshoring manufacturing to the United States. <https://www.uammi.org/resource-docs>
- The \$10 million Utah Manufacturing Modernization Grant incentivizes Utah businesses to modernize, establish, relocate, retain, or develop manufacturing in the state. Its goal is to modernize Utah companies’ manufacturing, increase supply chain resilience, and lessen American dependence on foreign manufacturing.
- Program was launched in June 2022. More than \$180million requested funds were requested 22 proposals were funded.
- Governor Cox is expected to request more funding for 2023.





# Task 2.2 Qualifying Materials for Aerospace

Primary Goal: Accelerate Adoption of New Material Systems Including New Carbon Fibers, Resin & Thermoplastic Chemistries, Material Architectures, Additive Manufacturing Materials

UAMMI issued foundational white paper identifying the need for innovation in qualifying materials and advanced manufacturing processes for aerospace



# Pillar 3 - Research



Primary Goal: Research programs better aligned to support the defense industry.

- STRATEGY 3.0 Foster collaboration among Utah defense manufacturing research programs and Utah's research institutions to better serve the needs of the defense community.
  - 2021 Defense Manufacturing Research Symposium – DOD program overviews
  - 2022 Defense Manufacturing Research Symposium – Utah research presentations
  - 2022 March CrossTalk *Aerospace & Defense Opportunities for Advanced Manufacturing*

# Task 3.1 - Plan for New Composites Research Center

UDMC contracted with NEXA Capital Partners & Weber State to produce a comprehensive business plan to create a new research center for composites to support AFRL

The plan has transition to addressing the USAF need for high temperature research and the creation of the Missiles & Energy Research Center (MERC) and a new private equity fund



Utah Aerospace Advanced Manufacturing Center

Business Plan

February 22, 2022



# MERC Vision

## A new resource is needed to:

- Advance the Technology Readiness Level (TRL) and Manufacturing Readiness Level (MRL) from Level 4 to Level 6-8 (ready for technology transfer) for lower cost, high throughput high temperature materials
- Automation and advanced manufacturing development
- Functional prototype fabrication
- High Temperature Material testing and qualification
- Develop next generation of Scientists and Engineers in High Temperature Materials and Evaluation
- Current Partners include: AFNWC, AFRL, INL, Boeing, Lockheed, NGC, WSU and UAMMI – working on Raytheon and Dynetics





# Private Equity Fund

Technologies requiring Advanced Materials and Manufacturing is currently being paced by SBIR, Title III and other government funding

-Hypersonics

-Ballistic Re-entry vehicles

-Low cost materials and manufacturing methods for attritable and AAM applications

Solution: Large investment fund, leveraged with Federal Loan Guarantees

- \$1B Fund – 20% Equity/80% Debt (supported by FLG)
- Scoped to finance companies and technologies supporting advanced materials
- UAMMI & NEXA Proposed SBIR II to fund this first fund and road map was accepted by AFWERX as Selectable on technical merits, but not currently funded



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE

10/13/2022

PROPOSAL NUMBER: F2D-5289  
TOPIC NUMBER: X224-ODCSO1  
COMPANY: NEXA Advisors LLC

Subject: Notice of Selection Status: Air Force (AF) Direct to Phase II Proposal F2D-5289

This letter provides information concerning the subject proposal's outcome as evaluated against the published solicitation criteria. Upon evaluation completion, Phase II proposals are categorized as:

SELECTABLE: Proposal is recommended for acceptance if sufficient funding is available.

NOT SELECTABLE: Even if sufficient funding is available, the proposal should not be funded.

Once initial categories are determined, final selections are then based on proposed efforts' importance to agency programs and funds availability. Funding constraints preclude award of the subject proposal, though it was determined to be Selectable based on technical merit. The Air Force reserves the right to retain the proposal for 180 calendar days. Receipt of further SBIR/STTR funding is not anticipated for additional awards under the subject topic. However, if another AF organization or Department of Defense agency expresses interest in pursuing award, your company will be contacted to confirm continued intent and Cost Volume currency.

If proposal feedback is desired, click the "Request Feedback" button after logging into the website at <https://www.afsbirsttr.us>. The request shall be submitted within 30 calendar days after Not Selectable notification receipt. Feedback requests received more than 30 calendar days after Not Selectable notification receipt will not be fulfilled. AF will provide no more than one feedback response per proposal. As of the X22.4/D solicitations, the feedback process is automated and applicant feedback requests are fulfilled using standardized language for each evaluation criterion. Additional feedback will not be provided.

Your company's interest in Air Force SBIR/STTR Programs is greatly appreciated. If interested, there are/will be other opportunities to compete for Federal SBIR/STTR awards. Visit <https://www.dodsbirsttr.mil/submissions/login> to view current and future DoD and Air Force SBIR/STTR solicitations.

Daniel J. Brewer ("Daniel", He/Him/His)  
Contracting Officer  
Air Force SBIR/STTR  
AFRL/RGK  
AFWERX

Warfighter Acquisition... Innovation, Excellence, Victory!

# Task 3.2 - C2CF Market Research

UDMC engaged Weber State University Business School & Supply Chain Management Program to assess the market demand and commercial viability for the use of coal to create carbon fiber as a low-cost alternative to petroleum-based carbon fiber.

Francois Giraud-Carrier, WSU MBA Program Director & Associate Professor of Supply Chain Management presented findings at UAMMI CrossTalk on Sept 22 in Price, Utah



# Pillar 4 – Small Business



Primary goal: Support small businesses, the backbone of the defense manufacturing industry, by enhancing supply chain opportunities and providing innovation and rapid development of new products.

- STRATEGY 4.0 Leverage existing programs for veteran and small businesses to reach out to defense manufacturing businesses.
- STRATEGY 4.1 Outreach to existing programs for entrepreneurs and small businesses, through the Utah Industry and Innovation Center under GOED.
- STRATEGY 4.2 Leverage SBA RIC program to reach out and provide services to small businesses in defense manufacturing.



# Outlook for Year 3 - 2023

- Workforce
  - Tomorrow, Roundtable on Aerospace & Defense Workforce Issues
  - Continue to include defense manufacturing in TRU, TRAC, WSU Systems Engineering and the new Masters program
  - Continue programs for Women & Girls
  - Implement STEM Action Center and My Tech High programs
- Supply Chain
  - Populate the new Research and Workforce modules and finish additive manufacturing module with America Makes
  - Support Manufacturing Modernization Grant Program
- Research
  - Continue to foster collaboration to better match Utah's research institutions to defense programs
  - Complete market research on Coal to Carbon Fiber
  - Continue development of the MERC and Private Equity fund