***This 3Q Report was prepared under contract with the Utah Governor’s Office of Economic Opportunity (Go Utah) as the lead organization of the Utah Defense Manufacturing Community (UDMC), with financial support from the Office of Local Defense Community Cooperation, Department of Defense (OLDCC). The content reflects the views of the Utah Defense Manufacturing Community (UDMC) and does not necessarily reflect the views of the Office of Local Defense Community Cooperation.***

***During the third quarter of the second year under the Defense Manufacturing Community Support Program (DMCSP), the objectives focused on program execution, program partner engagement, and continuing operations.***

***While working program engagements we placed special emphasis on any efforts that aid in the diversification of the defense supply chain, reduction of procurement costs and/or improvement of procurement processes and increasing the capacity of the defense workforce. The following activities describe those efforts.***

**Key Accomplishments:**

UMDC programs reached more than 2,000 students, worked with 150 schools, included over 49 courses/workshops/seminars, and assisted in submitting seven STTRs.

**Workforce**

Our various programs conducted courses/programs, reached over 2,000 students, included 150 schools, provided over 49 courses/workshops, and served 12 companies.

**Supply Chain**

Our supply chain efforts have reached over 100 companies. The CONNEX supply chain platform underwent a major update. This pulled previously reported functionalities and upgrades described in previous reports. As this migration completes, we will update the quantitative accomplishments.

**Research**

Under UDMC, 10 research projects that support defense manufacturing by Utah’s research institutions were identified a major UDMC-funded event was accomplished.

**Small Business**

Under the various small business programs, there were 124 attendees from 38 companies, and 20 workshops. Additionally, seven Small Business Technology Transfer (STTR) grants were submitted.

***Pillar 1: Workforce***

***Objective/task title: Task 1.0***

***Objective/task description:*** Utilize Utah Works to address the unemployed and underemployed through retaining and retooling, in order to meet the needs of the defense industry.

***Narrative of achievements so far:***

March-May 2022 have been very successful months for Salt Lake Community College’s (SLCC’s) Utah Works courses. There have been significant challenges with instructor availability, training, and hiring. In these three months, no classes have been canceled due to lack of instructors! Working closely with Sarah Schiff at Albany has ensured courses run smoothly and employees are held accountable for attendance and conduct in class.

Looking forward to the summer, Salt Lake Community College anticipates difficulty delivering Injection Molding courses since several part-time instructors will be leaving for extended summer holidays. Job postings are updated regularly for injection molding instructors, and we hope to hire 1-2 more part-time instructors in injection molding to fill our staffing gaps.

**Accomplishments:**

**Number of students served**

- Albany Composites Technician: 28

- Injection Molding Technician: 18

- Aerospace Assembly Metals: 5

- Aerospace Assembly Composites: 26

**Number of companies served**

- Boeing: 5

- Albany: 50

- ICU Medical: 13

**Pre-Employment Students Participating**

- Composites Technician: 2

**Courses conducted**

- Injection Molding Technician: 3

- Aerospace Assembly Metals: 1

- Composites Technician: 6

- Aerospace Assembly Composites: 4

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of students who participated in the Utah Works Program: 68 in the quarter

- Number of students who Completed the Utah Works Program: 72 in the quarter

- Number of students who received job placements through the Utah Works Program: Not available

- Number of Workers Trained: 72

***Objective/task title: Task 1.1***

***Objective/task description:*** Increase and expand Career Pathway Programs. Talent Ready Utah (TRU) contracts with Davis Technical College (DTC) to expand the Utah Aerospace Pathways program through the development of coursework at both the secondary and post-secondary level, program setup, and offer exploration experiences to increase student interest and engagement, culminate with a work-based learning experience in the form of an externship or project that is hands-on and has real-world application to increase capacity in the workforce for the defense manufacturing community.

***Narrative of achievements so far:***

Talent Ready Utah contracted with Davis Technical College to expand the Utah Aerospace Pathways programs through the development of coursework at both the secondary and post-secondary level, program setup, and offer exploration experiences to increase student interest and engagement. This UDMC effort culminates with a work-based learning experience in the form of an externship or project that is hands-on and has real world application to increase workforce for the defense manufacturing community. Talent Ready Utah also contracted with Davis Technical College to expand the Utah Aerospace Program (UAP) program to additional high schools within the region and to expand the UAP / composite programs within K-12 schools within the UDMC’s region. This effort benefits the DoD industrial base with increased availability of qualified workforce. Davis Tech worked with DSD to expand enrollment at two high schools, add the program to one high school and aim for 20-30% of students enrolled in the composites program to enroll in UAP. UDMC funding provides for expanding capacity, upgrading equipment, and curriculum development at both the high school locations and the Davis Tech main campus.

After many delays because of supply chain issues, UDMC partners received the pieces of equipment for the composites program. The chiller for the new autoclave and new heating/cooling elements for the old autoclave were installed this spring. The autoclave upgrades were completed, and students continued enjoying the updated equipment. We were able to open up a composites class on A-days at Northridge High School, which previously had only had B-day courses available. The goal is to have both A-day and B-day classes available starting in the fall, with an advanced composites class as part of the curriculum. Classes will also begin this fall at Clearfield High School.

At the end of last quarter, 113 secondary students enrolled between the high schools

and our main campus. No students completed the pathway or landed job placements during this reporting period as it takes 2-3 years for secondary students to progress through the pathway. Because of this timeframe, these goals depend on which grade the students are in when they enroll. The program is course-based and self-paced, so completion depends on how quickly a student completes coursework and will vary by student. While this report reflects secondary students in the FY22 cohort, it is worth noting the total of 73 adult students enrolled who also benefit from the equipment purchased under UDMC funding.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Total number of Pathway students: 113

- Total number of certificate completions: 0

- Total number of student job placements: 0

- Total number of schools: 3

***Objective/task title: Task 1.2***

***Objective/task description:*** Expand the Talent Ready Apprenticeship Connection (TRAC) to defense manufacturing companies and establish as the state’s youth apprenticeship center.

***Narrative of achievements so far:***

**CNC Machining Technician Apprenticeship:**

We approached this from a "what does the industry need" standpoint instead of "this is what education has". We wanted to have the companies in the driver's seat in how this looks, what the education is, and how long this apprenticeship needs to be.

The group came together in January 2022 and consisted of Matt Wardle from JD Machine Works, Brad Robsen owner of Clean Machine, and TJ Marshall from Parker-Hannifin. The men are all heavily invested in the machining industry and have been willing to engage with their peers in industry and other individuals in community government. The group collaborated to produce a list of skills and competencies that would be needed for the apprenticeship.

With the group's engagement with industry peers, the group has quickly gained interest from other industry partners. Such has Northrup-Grumman, Janicki, and US Synthetic. There continues to be interest from other areas of the state with plans to roll out the program to additional areas in the second phase.

We were able to start with a small group of three industry partners, but we soon brought in Utah Manufacturing Association and Talent Ready Utah. Specifically, Megan Ware from UMA (formerly of Stadler) and Peter Reed from Talent Ready Utah (formerly of SLCC). Peter and Megan were at Stadler and were crucial to them getting their TRAC Apprenticeship up and running. They have experienced the pitfalls and obstacles already.

We have been in contact with the Tech Colleges (Davis, Mountainland, and Ogden-Weber Tech) and the school district CTE directors (Davis, Ogden, Weber, Jordan, and Granite). Our goal is to pair an industry partner with a school, with a tech college. This keeps communication open, but the same basic curriculum can be used. The TRAC model has the capstone option to allow the student and company to construct a project that the student chooses, and the company has a need for.

The education and industry meeting was held May 4th at Davis Technical College and was attended by all listed above. The meeting consisted of the attached presentation outlining the TRAC model and the outline of the curriculum for the apprenticeship.

The following meetings were held with the education partners to further refine the classes and skills needed for the apprenticeship and where they best align within the current educational system. The Utah State of Higher Education is working towards becoming more aligned with the Tech School system so that the curriculum is uniform.

The apprenticeship itself is 600hrs-700hrs and approximately two years. It will be a TRAC apprenticeship in the machining industry. Current estimates believe there are 300 open well-paying machining jobs across the Wasatch Front. We are targeting Juniors in HS that are looking for a hands-on education and students that have thought about becoming an engineer. There will be multiple exit points for the student as well. They have the option to stop at that 2yr mark or they can continue with stackable credentials like an associate degree etc.

We are at the point where we are hoping to have everyone in the room on May 4th to hammer out the details and work out any kinks that any of the parties see as an issue. Shooting for a fall start with a cohort of 12-15 students.

Attachment\_8 Task 1.2 TRAC Presentation for more information.

**Salt Lake Community College:**

Salt Lake Community College Workforce & Economic Development personnel made several virtual and in-person presentations to employers in other manufacturing companies to share the benefits and necessary steps involved in creating new tracks in the Advanced Manufacturing apprenticeship program. Employers expressed interest and provided lists of skills needed in individual companies. These companies have not yet, however, maintained ongoing commitment to develop an additional strand of this apprenticeship program.

Stadler Rail US is the current industry partner engaged in the apprenticeship program.

Program Accomplishments:

- The program saw a 95% passing rate for currently enrolled AMFG students in the Spring 2022 semester.

- AMFG 1100 has been re-developed to improve the math and hands-on skills of new apprentices

- Development of all AMFG courses was completed in Q2

**Key Activities:**

- Updating curriculum for 3 courses in the existing Advanced Manufacturing Apprenticeship A.A.S. 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.

- Delivery of apprenticeship education and training for 22 apprentices.

**The number of participants enrolled/Completed by course**

AMFG 1190 - First Year Advanced Manufacturing Apprenticeship Capstone: 8 enrolled, 0 completed Q3, 14 cumulative completed

AMFG 2290 - Second Year Advanced Manufacturing Apprenticeship Capstone: 6 enrolled, 0 completed Q3, 8 cumulative completed

AMFG 2390 - Third Year Advanced Manufacturing Apprenticeship Capstone: 8 enrolled, 0 completed Q3, 0 cumulative completed

AMFG 1100 - Orientation to Advanced Manufacturing: 8 enrolled, 0 completed Q3, 0 cumulative completed

AMFG 1200 - Technology and Professional Development I: 6 enrolled, 6 completed Q3, 0 cumulative completed

AMFG 1210 - Advanced Manufacturing Principles I: 7 enrolled, 7 completed Q3, 14 cumulative completed

AMFG 2240 - Technology and Professional Development II: 8 enrolled, 8 completed Q3, 8 cumulative completed

AMFG 2310 - Advanced Manufacturing Principles II: 7 enrolled, 7 completed Q3, 7 cumulative completed

AMFG 2240 - Technology and Professional Development II: 8 enrolled, 8 completed Q3, 8 cumulative completed

AMFG 2310 - Advanced Manufacturing Principles II: 7 enrolled, 7 completed Q3, 7 cumulative completed

AMFG 2320 - Carpentry and Fabrication: 5 enrolled, 5 completed Q3, 5 cumulative completed

AMFG 2330 - Fluid Power Systems: 5 enrolled, 5 completed Q3, 5 cumulative completed

AMFG 2220 - Tools and Their Uses: 3 enrolled, 3 completed Q3, 8 cumulative completed

AMFG 2230 - Fasteners and Assembly: 8 enrolled, 8 completed Q3, 8 cumulative completed

AMFG 2350 - Electrical Troubleshooting and Repair: 4 enrolled, 4 completed Q3, 4 cumulative completed

AMFG 2340 - Power Distribution Systems: 4 enrolled, 4 completed Q3, 4 cumulative completed

AMFG 1250 - Electrical Fundamentals for Advanced Manufacturing: 3 enrolled, 3 completed Q3, 6 cumulative completed

AMFG 1260 - IPC/WHMA and Motor Controls: 3 enrolled, 3 completed Q3, 6 cumulative completed

**Number of Courses Conducted**

AMFG 1190 - First Year Advanced Manufacturing Apprenticeship Capstone: 1 Q3, 3 cumulative

AMFG 2290 - Second Year Advanced Manufacturing Apprenticeship Capstone: 1 Q3, 2 cumulative

AMFG 2390 - Third Year Advanced Manufacturing Apprenticeship Capstone: 1 Q3, 1 cumulative

AMFG 1100 - Orientation to Advanced Manufacturing: 1 Q3, 3 cumulative

AMFG 1200 - Technology and Professional Development I: 0 Q3, 2 cumulative

AMFG 1210 - Advanced Manufacturing Principles I: 0 Q3, 2 cumulative

AMFG 1250 - Electrical Fundamentals for Advanced Manufacturing: 0 Q3, 2 cumulative

AMFG 1260 - IPC/WHMA and Motor Controls: 0 Q3, 1 cumulative

AMFG 2220 - Tools and Their Uses: 0 Q3, 2 cumulative

AMFG 2230 - Fasteners and Assembly: 0 Q3, 1 cumulative

AMFG 2240 - Technology and Professional Development II: 0 Q3, 2 cumulative

AMFG 2310 - Advanced Manufacturing Principles II: 0 Q3, 1 cumulative

AMFG 2320 - Carpentry and Fabrication: 0 Q3, 1 cumulative

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Total of 22 students across all three cohorts of the apprenticeship program.

- Stadler is hosting 22 current apprentices and 14 incoming in the next cohort.

- Year 3 (3rd year) apprentices: 8

- Year 2 (2nd year) apprentices: 6

- Year 1 (1st year) apprentices: 8

- Incumbent Year 1 (Not started yet) Apprentices 14

- Track number of Students that Participated in SLCC TRAC: 22

- Track number of Students that Completed SLCC TRAC: 0

- There are 14 apprentices that have completed phase 1,

- There are 8 apprentices that have completed phase 2

- Phase 3 has not been completed yet but will be completed in Q4.

- Track number of Students that had job placements because of SLCC TRAC: 0

***Additional information:***

Three of the 3rd year apprentices will be receiving a full-time offer letter from the host company in June. Another four will receive letters in July – August. As the Students work on the final term of the apprenticeship, they will be transitioning into being the next generation of employees and our first TRAC Graduates.

The program, known as Manufacturing Modernization Grant Program, was developed in May and opened for applications June 1. We will report the results.

Our last report noted that funding of $200,000.00 (4% of the full grant amount) was being moved from task 1.2 to task 2.1 Reshoring. This has been changed to $100,000.00 (2% of the full grant amount).

***Objective/task title: Task 1.3***

***Objective/task description:*** Expand Systems Engineering Education and Training in Utah.

***Narrative of achievements so far:***

Success story from a student that participated:

Elain Cope is halfway done with her masters and will be the first graduate. She has a new job at SAIC. Elain credits UDMC efforts for allowing her to pursue her passion and start her down a life changing path. She commented that "The workforce scholarship gave me an opportunity to try Systems Engineering essentially risk-free. It allowed me to go through the Certification without having to personally pay for the classes and books. It was the push that I needed to pursue Higher Education. Because of this scholarship, I have found my passion in Systems Engineering. This certification was a major milestone because 1/3 of the credits could be used towards the master’s in systems engineering."

The UDMC team is expanding the Systems Engineering program into a master's degree. The certificate was recently revised to allow up to 12 transfer credits to the master's program.

Both students and employers are interested in the master's degree program. The master's degree includes an application and acceptance into the program, so this will reinforce students' academic readiness and commitment to the program.

There are three students working towards a master’s in systems engineering.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of students participating: 8

- Number of students who completed: 5

- Number of workers Trained: 5

***Objective/task title: Task 1.4***

***Objective/task description:***Conduct outreach for an Advanced Composite Materials and Structures Center which would be a joint venture to be developed at Utah State University (USU) in association with Weber State University (WSU), to provide a Master of Science degree that is geared towards practicing engineers and will be taught through a hybrid model approach.

***Narrative of achievements so far:***

The UDMC coordinated support for the new Composites Degree Program. Even though this Task is officially completed, and funding is in place, the UDMC still continues our work to advance this program further.

In May, Greg Anderson was hired as the director of the program and has received approval for the curriculum. Greg retired from Northrop Grumman as a lead in composites and brings a wealth of real-world composites manufacturing to the program. He earned his doctorate degree from Virginia Tech in composites. Also in May, the program began to be advertised to recruit students with registration opening in June.

The program collaborated to leverage best practices from the DoD Institute, America Makes EWD library and engagement of members where applicable. America Makes organized strategic meetings with Utah State to start moving forward on new collaboration and ideas:

- leveraging the Additive Edge program to help build out additive manufacturing pathways in local feeder school districts to inspire the talent pipeline.

- facilitating the collaboration with RCBI to establish an additive manufacturing apprenticeship program within Utah State.

***Quantitative/qualitative output and/or outcome (accomplished or expected): Task Complete***

The director has been hired and registration will begin in June.

***Objective/task title: Task 1.5***

***Objective/task description:***Focus on involvement of women and girls, by building programs that amplify and create talent within the STEM fields to support more females from kindergarten through high school, advanced degree program, to the boardroom.

***Narrative of achievements so far:***

***Catalyst Campus Ogden***

The UDMC is currently working to add Catalyst Campus Ogden as an UDMC subcontractor to provide career women mentoring sessions to meet and listen to industry in the defense manufacturing workplace. An initial partnering effort proved so successful that the UDMC team determined that Catalyst Campus will be a strong addition to our DMC.

UAMMI partnered with Catalyst Campus, Northrop Grumman, Silicon Slopes, and Women Tech Council to hold a mentoring session for career women interested in defense manufacturing and software development. This event, "Think Like a CEO", reiterated to women that they need to sit at the table, mentor other women, speak up, and show how to lead with emotional intelligence.

“Think Like a CEO” provided career women in defense an opportunity to hear from successful women who climbed that ladder to CEO and network. We were honored to hear from Dr. Tulinda Larsen, Sarah Lehman and Mandy Rogers. After initial speakers there was a mentoring 3x3 session to hear more about first hand experiences about obstacles women are running into.

Dr. Tulinda Larsen is Executive Director, Utah Advanced Materials and Manufacturing Initiative (UAMMI). UAMMI is a public-private partnership to elevate the advanced materials and advanced manufacturing industry in Utah. She serves as the key spokesperson for UAMMI at industry events and before government agencies.

She began her career in Washington, D.C. as an economist at the US Department of Transportation, where she gained experience in the air transport industry. For more than 40 years, she has been a practicing economist studying various aspects of the aerospace industry.

Sarah Lehman joined Zartico to implement its strategy and help realize the company’s mission of combining data, science and technology to positively impact the tourism and visitor economy.

Previously, Sarah served as CEO and President of ENVE Composites, successfully growing the company from start-up to one of the leading cycling businesses in the industry, and ultimately leading its acquisition. A Harvard Business School graduate, Sarah spent over ten years in various marketing, sales and operational roles in the biotech and pharmaceutical sector. Sarah was named CEO of the Year by Utah Business Magazine, Entrepreneur of the Year by Ernst & Young and earned the Women in Technology Award for her leadership at ENVE.

Mandy Rogers is currently the DevStar Systems Engineering Director in the Strategic Deterrent Systems Division at Northrop Grumman (NG). In this role, she leads, orchestrates, and facilitates integrated hardware-software functionality from conception, design, and execution of integrated functional capability. This allows NG to turn Model-Based Digital Design and Architecture into Agile capability that will provide demonstrable technology for the program’s major milestones, such as First Flight.

The following text includes the UDMC Press Release for the Think Like a CEO event:

**Think Like A CEO**

By: Catalyst Campus & UAMMI

An event coming this Friday, May 20th, will be unlike any other. "Think Like a CEO", will emphasize to women the need to sit at the table, mentor other women, speak up, and show how to lead with emotional intelligence.

At the event, we will be honored to hear from Dr. Tulinda Larsen (Executive Director, UAMMI), Sarah Lehman (CEO, Zartico) and Mandy Rogers (DevStar Systems Engineer Director, Northrop Grumman). After they speak there will be a mentoring 3x3 session to hear more about firsthand experiences about obstacles women are running into.

Women must be in all the rooms where decisions are being made, at every level and in every capacity. They should be a higher percentage of the technology workforce, especially in executive and leadership positions.

Catalyst Campus Ogden led by Executive Director, Aniza Brown, and UAMMI, led by Tulinda Larsen, are a driving force within the tech scene in Ogden, Utah. Both companies have brought together and continue to bring together great minds alike to further the industry in Northern Utah.

Catalyst Campus Ogden is a Non-Profit collaborative ecosystem that spurs innovation within the aerospace and defense industry and brings together a unique blend of entrepreneurs, industry, academia, and the Department of Defense. In partnership with Weber State, Northrop Grumman, Hill Air Force Base, Silicon Slopes, Women’s Tech Council, and others, the synergy that is created in Ogden is attracting tech companies of all varieties to Northern Utah. The development of this inclusive tech ecosystem is enabling innovation, collaboration, economic resiliency, and workforce development.

The Utah Advanced Materials and Manufacturing Initiative (UAMMI) brings together public, private, community, industry and education partners to assure growth and sustainability of Utah’s advanced material and manufacturing industry. The mission of UAMMI is to ensure that Utah is the global leader in value-added advanced materials, manufacturing, technology development, and design by integrating industry, academic and government contributors in ways that enhance collaboration, promote business opportunities, share knowledge resulting from relevant research and engage a skilled and trained workforce.

Women Tech Council (WTC) is a national organization focused on the economic impact of women in the technology sector through developing programs that propel the economic pipeline from K-12 to the C-suite. WTC offers mentoring, visibility, opportunities and networking to more than 10,000 women and men working in technology to create business environments focused on inclusivity and high performance. Through this work, WTC propels women in technology careers and the talent pipeline by ensuring a strong, diverse and entrepreneurial technology workforce.

Hypergiant Industries is an enterprise AI company focused on developing world-changing technologies to solve the world's biggest problems in the areas of space, defense, and critical infrastructure. Hypergiant offers a suite of AI services, software, and solutions that support companies and governments in preparing for the future of AI.

Northrop Grumman is a close-knit community of big thinkers collaborating to keep the world safe. Their passion, creativity and expertise bring next-level technology solutions to life in autonomous systems, cyber, C4ISR, strike, space, and logistics and modernization for their customers around the globe.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

Attendance – 120

See Attachment 1\_Task 1.5 Think Like A CEO for pictures.

***Ogden Weber Technical College (OTech)***

The UDMC has been prepping for the Women in Welding Summer Camp. UDMC partner OTech currently has the camp planned for August 9th through 12th, running from 8:30 until 2:30. Six students signed up for the camp and we expect as many as fifteen to attend the camp.

One of the UDMC welding instructors, Kathy Carpenter, offered to organize this year’s camp. She works with current OWTC welding students to test out potential projects for this year’s camp. So far, we have tested solar lanterns, wind chimes, yard stakes, and multiple types of flowers. OTech has a few other projects in testing phases before a final decision is made.

OTech invited four past students who are currently working in industry to attend the camp and work with our participants. One of our Non-Destructive Inspection instructors, who also holds a welding certificate, is going to be joining for one afternoon to share her career pathway story. The UDMC team will invite Weber State and other industry partners to speak with the girls about continuing their education in welding and what it would be like to work in industry.

***Davis Technical College (DTC)***

UDMC partner, Davis Technical College, was planning to hold an event in October 2021. Due to rising cases of COVID-19, their executive team decided to limit the number of people who could meet in person on campus. Because of these limitations, DTC postponed the “Spark Your Career” women’s networking event. The UDMC plans to hold this event on Monday, June 13th. DTC will host an open house style event where women who are looking for a career in manufacturing can learn more about our CNC, Composites, Automation, Welding, and Injection Molding programs. Representatives from the student services and financial aid departments will also give presentations on how to complete the enrollment and financial aid processes. DTC recruiters have been working closely with our community partners to find attendees who will benefit from this event.

Davis Technical College will also be hosting a 2nd Northern Utah Welding Camp on June 14-17, 2022. Registration for the camp is full, with 18 girls currently signed up to attend. This camp will follow the same itinerary as last June. They will work with our Welding Technology instructors to learn different processes, metal tolerances and design techniques to create beautiful and useful pieces. They will work on individual projects throughout the four-day camp. Lincoln Electric, one of our long-time industry partners, has again provided gloves and head wraps for each camper. ORE Designs will welcome the young women to their facility and give them a tour.

***College and Career Awareness Utah State University (USU)***

UDMC partner USU completed the development and pilot testing of the Project-Based Learning Plan for the College and Career Awareness educators. The PBL plan, Tool-Up Tech: First Aid for the Backcountry, has been published on the ccapbl.org website:

[*https://ccapbl.org/resources/tool-up-tech-first-aid-for-the-backcountry/*](https://ccapbl.org/resources/tool-up-tech-first-aid-for-the-backcountry/)

USU created a video (not part of our original proposal), to help teachers in executing the PBL plan. This video is in its final edit and will be linked within the plan next week. The new PBL plan will be shared at the College and Career Awareness Conference in July.

We are now working on three videos highlighting Utah manufacturing and composites. These videos will be finalized by the end of June. The playlist will be linked to the PBL plan to be shared at the College and Career Awareness Conference in July.

- Number of teachers implementing PBL within manufacturing: 45 in pilot testing, 25,000 in 2022-23

The following link includes the PBL highlighting composites: [*https://ccapbl.org/resources/tool-up-tech-first-aid-for-the-backcountry/*](https://ccapbl.org/resources/tool-up-tech-first-aid-for-the-backcountry/)

***Tech-Moms (WSU)***

Based on the success of the four last Tech-Moms cohorts, the UDMC plans for another starting September 2022. We anticipate 15-20 women participating in this 5th cohort.

In September 2022, Weber State University will launch 5th UDMC cohort of Tech-Moms. We look forward to serving 15-20 women in this cohort. The UDMC continues to find women who are looking to find new work in the world of tech. Our program continues to gain state-wide attention.

See the following stories on the efforts:

https://www.ksl.com/article/50223146/massive-influx-of-utah-moms-training-for-tech-careers-with-local-nonprofit

<https://kslnewsradio.com/1957096/local-program-looks-to-help-women-break-into-tech-industry/>

<https://www.sltrib.com/news/2021/03/20/new-program-designed/>

<https://www.bestcolleges.com/bootcamps/features/rise-of-tech-moms/>

**She-Tech (WTC)**

SheTech is a non-profit, free STEM activation program helping girls in grades 9-12 recognize the opportunities they can pursue in STEM education and careers. As a year-long program, She-Tech provides monthly events that connect girls to real mentor connections in the industry, opportunities to serve on a Student Leadership Board, tools to launch SheTech clubs in their schools, tech competitions and awards, community events, and more. More than 2,000 girls attended the SheTech Explorer Day in 2022 and the program has reached beyond Utah, into neighboring states, and with international participants! In the State of Utah, SheTech is proud to bring girls together from traditional public, charter, and private schools, virtual schools, homeschooled students, and even girls from Native American communities where their first opportunity to attend an activity off the Reservation has been to attend the SheTech Explorer Day conference.

**High School Industry Mentoring Program**

The SheTech Explorer program provides girls a variety of opportunities throughout the school year to interact with industry mentors in group settings, 3x3 connections, and 1:1. For the 2022 school year, girls were able to interact directly with industry mentors, with the option to explore a new emphasis on Advanced Materials and Manufacturing, where previous categories had focused more generally on technology career tracks that might be used in AM&M but were discussed primarily in the context of software startup companies, such as software engineering, game development, general robotics, machine learning, and AI.

In September, at the Women Tech Awards, 75 high school girls were able to attend the awards and interact with female mentors in the manufacturing industry. Girls sat at tables hosted by industry mentors and were able to sit and eat lunch with women like Mandy Rogers from Northrop Grumman, women from Hill Air Force Base, Shari Mann from L3 Harris, Sherrie Cowley of 3M, Sujatha Sampath of Micron Technology, Julie Simmons from Swire Coca Cola, Aniza Brown from Catalyst Campus. Hill Air Force Base specifically hosted an education table for girls to interact with mentors and to better understand the technology and manufacturing tracks in the Department of Defense.

Mentors from many of these companies, and more, also participated in SheTech Explorer Day to host booths and workshops for girls (detailed below).

**SheTech Club Experiences – AM&M Experiences**

SheTech clubs were invited to explore the newly created Advanced Materials & Manufacturing tracks for workshops at Explorer Day and transportation support to attend events. Girls in SheTech clubs were selected to attend the Women Tech Awards to fill the dedicated seats at education tables where they interacted with mentors in Advanced Materials & Manufacturing organizations over lunch and saw women in these fields recognized for their contributions. SheTech clubs and Student Board Members are also part of the planning activities around selecting workshops and surveying site locations to explore the new tracks like the Advanced Materials & Manufacturing industries available for site visits and virtual sessions for the internship exploration. They give us input and feedback on what industries interest them, what areas need to be explored and better understood, as well as ideas for ways we can help develop an understanding of these career pathways for their club members and peers. The hope is that these group experiences within their respective SheTech clubs generate buzz and deeper interest, driving conversations within their schools and institutions to grow opportunities for further education and exploration in these topics.

**SheTech Internship – Advanced Materials & Manufacturing and Northern Utah**

Every year, SheTech holds an Internship Exploration program following the end of the school year. As SheTech girls are high school aged, they are not placed in a traditional internship. The Internship Exploration program is designed to show high school girls a day-in-the-life of various STEM careers and spark ideas for education and career paths to follow, inspiring internship opportunities that await them when they graduate high school.

We kicked off the program at Swire Coca Cola where girls had the opportunity to tour the facilities and learn more about how tech plays an important role in manufacturing and distribution. Other site visits over the next two weeks will include Vivint and exploring how they manufacture their own smart home equipment, Qualtrics, NuSkin, Overstock, Listen Technologies, and NICE CXone. To accommodate girls from Northern Utah, transportation was made available between sessions for in-person internship dates. We have had 36 girls attending each of the in-person sessions. Girls from all over Utah (approximately 53 virtual attendees) will also have the opportunity to attend virtual sessions hosted by Catalyst Campus, Pelion, Hill Air Force Base, Domo, Goldman Sachs, and more. We worked to have a specific in-person track for AM&M and Northern Utah, but we were unable to secure in-person site visits and mentor speakers from HAFB, Northrop Grumman. Many of these organizations, however, were able to join the girls from Zoom sessions this week and there will be a dedicated session next week on career readiness with contributions from Sara Groberg who has worked for Franklin Covey, Hexcel, and GE Healthcare (all in manufacturing). This session will cover organizations to follow on LinkedIn (like UAMMI), resources like [manufacturing.gov](http://manufacturing.gov/), resume/application and interview tips for getting their foot in the door to manufacturing careers. In August we are planning to have an additional event where we hope to still offer the girls an opportunity to explore GE Healthcare, Northrop Grumman, Hexcel, and more.

**Advanced Materials & Manufacturing Workshops & Site Visits**

At SheTech Explorer Day, manufacturing industry mentors taught workshops, hosted booth experiences, and mentored the girls in their collaborative TechChallenge. Many girls had never heard of Advanced Manufacturing and materials and were curious about the career opportunities and technologies involved in the field.

- Bridgerland Technology hosted a workshop on CNC Machine Programming. More than 75 girls attended this workshop (exact number is not known, due to the overwhelming attendance this year at Explorer Day and the need to add seats to every session for the additional girls who were not pre-registered.) Girls were introduced to CAD and CAM, learning about the machinery that goes into creating everything from household decor to national defense hardware.

- NuSkin hosted three workshops, including chemical manufacturing of products, blue light technology and optics, product development, and the science, marketing, and regulatory aspects of this work. More than 324 girls attended these workshops.

- Salt Lake Community College taught a workshop about the engineering challenges with developing, manufacturing, and building bridges. More than 90 girls attended these workshops.

- UVU taught a workshop that focused on robotics, automation, and the electrical technology involved in manufacturing and distribution industries where girls got to learn hands-on with unipolar motors and robotic arms. More than 93 girls attended these workshops.

More than 2000 girls and educators from around the state of Utah visited the Tech Zone at Explorer Day where they enjoyed interactive booths. Booths included industry representatives and hands-on activities for the girls to explore manufacturing in action:

- Swire Coca Cola brought products, talked about the product development, manufacturing, data science, research, and distribution of their product.

- Hill Air Force Base hosted a booth where girls explored defense applications for software, engineering, and manufacturing careers.

- UVU's booth ranged from robotics and aviation to scientific disciplines, materials and applications across many fields of study.

- Bridgerland Technology brought reverse 3D printing machines and CAD technology to show girls more about how these are used in manufacturing and development of products and other fabrication applications.

- Neumont College of Computer demonstrated practical applications of technology in 3D printing and manufacturing prototyping.

- Tesla brought a car to demonstrate technology in their EV automotive product and talked to girls about the manufacturing and assembly process, as well as Tesla solar products and photovoltaic materials at their gigafactories around the world.

- USU representatives chatted with girls about many programs including their relationship with the Space Dynamics Laboratory and their ASPIRE NSF-funded program around developing EV technology and electrical engineering materials for charging while in transit.

**Advanced Manufacturing and Materials program track includes two to three industry-mentor experiences during the school year**

The industry mentor experiences are detailed above as the new and specific AM&M related mentor connections from this year's (1) Women Tech Awards, the (2) Explorer Day workshop track, and the (3) internship exploration site visits and virtual sessions.

**School SheTech Club programming.**

SheTech Club Programming is the support the UDMC provides to the students to help them establish SheTech clubs in their schools. UDMC partners provide marketing materials to the girls, leadership opportunities, industry opportunities and specific track exploration in the programs listed above, swag, site visit activities and speaker sessions/workshops, incentives like pizza parties for participation and attendance of virtual speaker sessions, student board member representation and planning contributions, and transportation to events or between site visits. The UDMC also provides educators with information on community resources and events and marketing materials, and swag/incentives to help drive participation and contributions to support the SheTech clubs in their schools.

**The following section includes program-to-date updates for the activities of UDMC partner, SheTech**

***AUGUST, SEPTEMBER, OCTOBER (2021)***

The UDMC had the opportunity to accept and onboard the year’s new SheTech Student Board members. The UDMC held a hybrid meeting and invited girls to meet in person or dial in via Zoom to discuss the activities for the new year. Sixty-six girls from across the state participated in the kickoff meeting. The SheTech Student Board provides an opportunity for girls to develop leadership skills, collaborate and share input on program planning for events and activities, and share best practices for how they support SheTech in their schools and communities. Students explored STEM activities and heard from an industry mentor and speaker and had the opportunity to interact and ask questions, as well as prepare marketing materials for the upcoming school year. Throughout the year, Student Board Members help:

- Provide strategic input

- Act as school ambassadors

- Operate their school SheTech clubs

- Participate in local tech events

- Represent SheTech in media and news activities

- Help run SheTech Explorer Day

Photos from this event can be found here: <https://www.dropbox.com/s/d9p5ftydr15yjyh/P1200825.jpg?dl=0>

In September, 75 SheTech students were invited to attend the 14th Annual Women Tech Awards at the Grand America Hotel. This event recognized 21 women in industry and three college students making a difference in their communities and professional networks by innovating, advancing, educating, and lifting other women in their careers. Of the finalists, there were eight award recipients and one Student Pathways Award winner. You can read more about the event and the difference these women make on the Women Tech Council website (<https://www.womentechcouncil.com/awards/>).

Photos from this event can be found here: <https://www.dropbox.com/sh/gsytowmng7wgpgu/AACxN2vcDMPhld6t-grWFjbKa?dl=0>

And here:

<https://www.dropbox.com/s/9l9ry744h7dcl8j/WTC_Awards_%20JesMyrickPhoto_106.jpg?dl=0>

In October, SheTech provided free tickets to students interested in attending the Silicon Slopes Tech Summit in Salt Lake City, UT. This event provided girls an opportunity to attend sessions and learn more about the tech industry, as well as contribute volunteer hours through a service project offered through the conference.

**NOVEMBER, DECEMBER, JANUARY (2021/2022)**

Due to COVID-19, we were unable to hold our traditional Holiday Social with the SheTech students. Typically, this event includes a 3x3 mentoring where girls are able to enjoy small-group conversations with women in STEM careers. We look forward to resuming this event during the 2022-2023 school year.

As pandemic numbers decreased in January, the Student Board Members met in January to continue their efforts to participate in the planning of SheTech Explorer day and learn techniques to help drive registration for the upcoming conference that is the cornerstone of the SheTech program experience.

Photos from this event can be found here: <https://www.dropbox.com/sh/gsytowmng7wgpgu/AACxN2vcDMPhld6t-grWFjbKa?dl=0>

**FEBRUARY, MARCH, APRIL (2022)**

The UDMC only expected 1500 girls to attend SheTech Explorer day and were happy to instead welcome 2000 students to Explorer Day 2022—and it was great to be back in person! From our Qualtrics registration form of 1,372 students registered, 311 were from Northern Utah. But with 2,000 girls attending, we estimate this year that approximately 25% of attendees hailed from counties north of the Salt Lake valley. The funds from UAMMI also helped us provide transportation for more than 100 girls from Weber and Davis counties who otherwise would not have been able to attend Explorer Day.

The buses came, the students flooded in, and we had a fantastic day with everyone at SheTech Explorer day at Mountain American Expo center on March 1st. Governor Cox joined the Women Tech Council and welcomed students from more than 150 schools across the state. Students attended sessions hosted by tech and STEM industry partners, enjoying hands-on activities in programming, engineering, robotics, manufacturing, supply chain, aerospace, biomedicine, web development, UI/UX, gaming and Esports, VR, and more. There was much to explore in the TechZone, from 360 photo technology to aerospace programs, the tech in soft drink distribution, defense manufacturing, consulting, museums, aquariums, and careers across local and worldwide software companies. Schools from around the state came to show off ways their programs help students create and innovate, and everyone learned how STEM is involved in everything we interact with and enjoy.

At SheTech Explorer Day, the Advanced Materials and Manufacturing track was supported by more than 25% of our booths and workshops by the following companies and organizations:

- Hill Air Force Base

- Swire Coca Cola

- Neumont University

- Tesla

- Utah State University

- Vivint

- Bridgerland Technology

- NuSkin

- Progressive Leasing

- Salt Lake Community College

- Utah Valley University

With the help of industry mentors, volunteers, and our SheTech Student Board (<https://shetechexplorer.com/about/student-board/>) members, girls in grades 9-12 worked in teams to compete for prizes in the TechChallenge competition. We celebrated our SheTech graduating seniors and awarded 15 scholarships to graduating seniors who demonstrated active participation and support of the SheTech program and their pursuit of STEM careers.

2022 Explorer Day, by the numbers (first in-person conference since 2019):

 - 2000 - girls from 150 Utah high schools

 - 400 - industry mentors

 - 170 - TechChallenge teams

 - 100 – volunteers

 - 66 - student board members

 - 75 - TechZone experiences

 - 40 - industry workshops

 - 40 - senior graduation cords presented

 - 15 - scholarships presented

Photos from this event can be found here: <https://www.dropbox.com/sh/gsytowmng7wgpgu/AACxN2vcDMPhld6t-grWFjbKa?dl=0>

**MAY, JUNE, JULY (2022)**

Each year in June, the UDMC welcomes students to participate in the SheTech Summer Internship Exploration. This year, we have 17 sessions scheduled (and others lined up asking for more dates). For the first time, SheTech will offer one dedicated day to advanced manufacturing and engineering. The hybrid approach to the internship program will also allow students from all over the state to participate, including those who are unable to join us in person to tour companies.

In July, following the close of each school year, the SheTech program selects 1-2 graduating seniors to participate as a paid intern, supporting the program for the next school year. For the first time this year, there is enough Northern Utah representation to justify a paid intern who will be dedicated to helping us continue to grow the SheTech program and reach north of Salt Lake County.

Reports, success stories, lessons learned, pictures, etc.

More photos from explorer day:

<https://drive.google.com/drive/folders/13ZTphhaSjtr7UBDIzszjhZwX4hqmkO6l?usp=sharing>

Here is a 3-minute video covering SheTech Explorer Day on March 1, 2022:

<https://youtu.be/r87ncvuP0NE>

Here is a short 30 second highlight video of SheTech Explorer Day 2022 for social that was also shared with the student board members to generate interest and exposure to the SheTech program:

<https://youtu.be/KrMu_ogT6tE>

The students participated in photoshoots to highlight their participation and the varying interests that are impacted across STEM. These posters were printed and used in their schools to raise awareness and promote registration for SheTech Explorer Day. Here are the digital copies:

<https://www.dropbox.com/sh/o58xd4fv5shd4fg/AADoMh8ZCCqYkN9z7cGHV8RUa?dl=0>

The SheTech program and its students has been highlighted all over the news across Utah. Here are some media interviews and articles with students:

- Fox 13 w student interview: <https://youtu.be/XtHJM4wZRbA>

- KSL interview with student Sara Greer: <https://youtu.be/43s1T_lnAcI>

- Tech Buzz article: <https://www.techbuzz.news/buzzworthy-march-4-2022/>

- Park City TV: <https://www.youtube.com/watch?v=D9621Fkrhq0>

- Fox 13 w Cydni Tetro interview: <https://youtu.be/9kJZTq2vTnE>

***Case Studies/Testimonials from Scholarship Recipients***

Attachment\_2 Task 1.5 Women Tech Council Testimonials to read them all.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of Industry and Academic Partners: 111 Industry Partners, 125 Teachers, 94 High Schools, 7 Universities, Northern Utah:31 Teachers, 22 Schools

- Number of new workforce programs created with advanced manufacturing: 5 internship sessions created focused on advanced manufacturing

- Number of programs enhanced with advanced manufacturing: 5 internship sessions

- Number of girls participating in dedicated track of SheTech for Advanced Materials and Advanced Manufacturing: 42 girls signed up for dedicated internship day

- Number of industry-mentor experiences during the school year: 25 industry-mentor experiences

- Number of SheTech internships with companies in this track: 5 scheduled (out of 17 total)

- Number of camps held: 1 SheTech Explorer Day Conference (Mar), 3 Student Board Meetings (Sept/Jan/Mar), 1 Women Tech Awards (Sep), 17 Internship Sessions (June)

- Number of participants per camp: 2,000 - SheTech Explorer Day Conference (Mar), 66 - Student Board Meetings (Sept/Jan/Mar), 75 - Women Tech Awards (Sept), 52 - Internship (registered for June)

- Tracking of participating females’ enrollment into college classes (track 1st and 2nd courses in pathway): 291 of 335 (86%), interested in STEM degrees - post Explorer Day survey

- Number of Case Studies: 15

- Number of Toolkits/Playbooks/Roadmap: 3 (in development)

- Number of Webinars/Workshops held: 23

- Number of Marketing & Communications Tools: 22+ email newsletters to students, educators, and industry partners/volunteers, 48+ social posts and stories, 100+ printed marketing materials, 1 podcast hosting SheTech students, 4 media interviews, 1 article

- Satisfaction survey: 335 girls surveyed following SheTech Explorer Day conference in March 2022., 304 – first time attending, 204 – know someone in STEM, 325 – want to know more about STEM, 291 – interested in pursuing STEM degrees

**4H Utah State University (USU)**

The UDMC continued our work on Engineer Everything Curriculum, with our current focus on implementing the developed curriculum pieces in afterschool and traditional 4-H clubs. This quarter’s participation included 392 girls in Salt Lake and Weber counties. USU does not yet have figures on how many more girls are being reached through these new collaborations but will include the information in our next report. 96% of participants said they have a better understanding of advanced manufacturing jobs, and 86% said they intend to pursue similar STEM activities in the future.

We also held four Young Problem Solvers camps in different low-income areas in Salt Lake, Davis, and Weber counties. 78% of participants reported a better understanding of problem-solving using engineering design, and 82% indicated interest in pursuing engineering activities in the future.

The highlight of this quarter has been our annual TRY Team training. Our northern Utah TRY teams traveled to Richfield in March to participate in training with youth from throughout the state. In preparation for this our STEM ambassadors designed a curriculum for clubs and camps that focused on Engineering Design. They chose to center the theme of the curriculum on Atlantis, and all of the activities and design challenges focused on travel to Atlantis and solving problems within Atlantis. Both youth participants and adult mentors LOVED the training! Camps and clubs are now taking place throughout the state based on this curriculum. Activities include drone flight (simulating underwater travel), boat design, city design and many other pieces. We are currently in the process of recruiting STEM ambassadors to plan next year’s adventures.

UDMC partners were invited to participate in Kids Code Camp this year, presenting ways to get more girls involved in coding. We presented activities: “Robotic arts” where robots were used to draw, and “quilted clipboards” which is an artistic activity teaching computational thinking. Pictures are included of these events.

The UDMC continues to work with the STEM Spots and are in the process of placing two new STEM Spots in Northern Utah. We have received some outside funding that is greatly increasing the number of kits available through each STEM spot. New kits are being assembled and will be placed in the STEM spots mid-summer.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of girls that were introduced to STEM programs in each of the 4 programs outlined. Engineer Everything 392, Young Problem Solvers 88, TRY Teams: 76 STEM Spots 596: 1152 girls

- Number of Young Problem Solvers Camps 4 (in form of afterschool clubs: 4 camps

- Number of Young Problem Solvers Camp participants: 129

- Engineering Everything Kits – Number of Kits created 1200

- TRY Teams – Number of Mentors 8

- TRY Teams – Number of Camps 6

- Number of girls that were supported to participate in TRY Team Training 22 girls

- Number of teachers implementing PBL within manufacturing 36

- 86% girls interested in pursuing STEM/manufacturing

- Number of Toolkits/Playbooks/Roadmaps: 1

- Number of Webinars/Workshops held: 6

- Number of Marketing & Communications Tools: 2

See Attachment\_3 Task 1.5 USU 4H for Pictures

**America Makes (UMDC DoD Institute partner)**

Objective: Focus on involvement of women and girls, by supporting and building programs that amplify and create talent within the STEM fields.

America Makes offered collaboration potential, Project Materials, Middle School Recruitment Toolkit, Middle School eLearning Modules, Micro Badges, Girl Scout Badges, High School Additive Edge Program, Scholarships available for self-paced AM eLearning courses. Continued offer of engagement of America Makes Members to provide Mentoring, Workforce, Education, Training, Outreach.

The America Makes team is preparing to assist in the launch of several key initiatives within the UDMC. Examples include deployment of micro-eLearning modules and a middle school recruitment toolkit for middle school students, deployment of Additive Edge in high schools, assisting high schools in the alignment to new industry credentialling programs, etc.

America Makes has aligned collaborative efforts with the programs selected to receive funding through UDMC as listed below:

- Mother Coders/Tech Moms – America Makes continues their support of Weber State in upcoming grant proposals to deploy our Additive Edge program to the Tech Moms future cohorts. While not initially chosen for grant funding, work continues to look for opportunities to work with the team at Weber State and Tech Moms.

- Code Camp for Girls – America Makes offered to leverage members for involvement.

- Welding Camps – America Makes participated in planning meetings for the summer girls welding camp and offered to coordinate a tech talk on Metal Additive to highlight the parallels between welding and metal additive manufacturing. America Makes’ Additive Edge program was offered as a potential camp activity.

- Career Awareness Course Development – program will be using videos to highlight women who work in manufacturing (as technicians, engineers). America Makes offered potential video/tech talk from member Fitz Frames and the Additive Edge project.

- Women’s Mentoring and Networking – America Makes offered to provide a tech talk on Additive Manufacturing and will engage members for mentoring opportunities.

- STEM Programs for Girls - 4H programs – America Makes leveraging the middle school modules.

America Makes together with the Girl Scouts of Northeast Ohio (GSNEO), continues plans to support the first expansion of the America Makes Additive MFG Patch, as shown in Attachment\_4 figure 1, with the Girl Scouts of Utah, with the support of UAMMI and the Utah Stem Action Center. The patch will be earned through engagement in the AM technical areas of Design, Manufacturing, and Post-Production. Planning meetings will continue early in Q4 to finalize activities to connect scouts with resources so that they can start earning their patches.

Based on industry recognized credentials, the America Makes Additive MFG Patch is aligned to many Girl Scout Badges, including STEM and others where AM can be applied and integrated. Badges are a key component of the Girl Scout Leadership Experience, which focuses on four content pillars of Outdoors, Life Skills, Entrepreneurship, and STEM, with the goal of fostering courage, confidence, and character in girls to prepare them for a lifetime of leadership. America Makes provided a Playbook for best practices on integrating AM into Girl Scout programming, GSLearn modules, and customized curriculum created to earn the patch, including fashion and game board design. To supplement the learning materials that accompany the America Makes Girl Scout patch, the Utah Girl Scouts and supporting partners have been provided with access to America Makes AMNation Pipeline Portal and our Middle School eLearning Modules, as shown in Attachment\_4 figure 2. These 11 microlearning modules feature a series of short interactive lessons to introduce students to basic elements of Additive Manufacturing (AM). Each module demonstrates a unique step in the AM process, beginning with an introduction to additive manufacturing, continuing through CAD software instruction, basic printer operation, trouble shooting and cybersecurity. To further enhance the scouting experience, incorporate boots on the ground, and facilitate mentoring opportunities, America Makes continues to support a collaboration with the Women Tech Council, Girls Scouts of Utah, America Makes, and UAMMI personnel. America Makes will continue to work to identify potential opportunities for collaboration to support the Utah Girl Scouts in their deployment of the patch activities, either through equipment or industry partner support.

See Attachment\_4 Task 1.5 America Makes for pictures and figures.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

As this task includes result from multiple UDMC partners, our quantitative results are included in the narrative for each partner above this section.

***Objective/task title: Task 1.6 STEM and K-8th Grade***

***Objective/task description:***Educate and inform kindergarten through eighth-grade students about the manufacturing industry, before they reach high school.

***Narrative of achievements so far:***

***STEM Action Center***

The STEM Action Center worked with youth groups and schools across the state to enroll them in the Additive Manufacturing curriculum. This quarter, the STEM Action Center began registration of the Additive Manufacturing (AM) kit for the 2022-23 school year. Currently, there are nine schools registered to use the AM curriculum, resulting in an estimated 1,350 students impacted.

The STEM Action Center discussed with Girl Scouts of Utah how to best use the STEM Action Center developed curriculum and supplies in conjunction with the America Makes Girl Scout patch to impact girls across the state.

The STEM Action Center and Girl Scouts of Utah will be launching Additive Manufacturing courses for girl scouts of all ages. Girl Scouts will enroll to attend a 3D printing course at the STEM Action Center, then check out a 3D printer to complete the program at home. This program will launch in September 2022.

- Number of Students Participated: Anticipated 1350

- Number of new courses/programs created: 1 new kit

- Number of new courses/programs updated: 1 new Girl Scouts Patch

- Number of Webinars/Workshops: Anticipated 2 all staff trainings for summer programs

***America Makes***

Objective: Results of a survey in June 2020 found that 73% of high school students in Utah do not consider manufacturing as a career. This project's objective is to educate and inform K - 8th about the manufacturing industry before they reach high school.

UDMC partners STEM Action Center and America Makes implemented new modules for additive manufacturing Additive Manufacturing/3D Printing activities-kit. Digital badging topic area outline and the AM Process Graphic was provided to the STEM Action Center to support building out the 3D printing kits. America Makes met with the STEM Action Center to review the America Makes AMNation Pipeline Portal and the educational outreach assets that will be hosted on the portal, including the Middle School Recruitment Toolkit, Micro-learning for Middle School Students, and Additive Edge – a high school awareness and inspiration program. In addition to STEM Action Center personnel being provided with access to America Makes AMNation Pipeline Portal and the Middle School eLearning Modules to support their efforts in assisting deployment of the America Makes Girl Scout patch, America Makes is continuing its efforts to align printing equipment assets to align with increasing female inclusion in STEM curriculum.

Working Group, American Makes, and My Tech High develop curriculum, Additive Manufacturing/3D Printing K-8 Modules, for K-8th grade. America Makes continues to work towards collaboration with My Tech High to leverage the America Makes Middle School Recruitment Toolkit and Additive Edge – a high school awareness and inspiration program.

America Makes launched the AMNation Pipeline Portal, a web-based education and workforce development landing page to better interact with our educational stakeholders in Q1 2022, with the UDMC educational partners as one of the first deployments. During Q3 America Makes continued working to add assets to the portal to facilitate more seamless knowledge transfer and best practice leveraging with the addition of the Additive Edge program to the portal for digital deployment, as shown in Figure 3 below.

See Attachment\_5 Task 1.6 America Makes for picture and figure.

**ADDITIONAL INFORMATION**

A success story this quarter was captured as part of the collaboration with Davis Tech in the creation of their new 3D printing course. America Makes suggested our Additive Edge program as a potential inspiration program to serve as the introduction activity to the new course. Additive Edge is focused on engaging students with education and career pathways in the advanced manufacturing sector. Students work in teams to identify a problem that, if solved, would benefit humanity; conceptualize an Additive Manufacturing (3D Printing)-based advanced product to address it; develop a business model around the product; and pitch it to a panel of representatives. This exciting partnership would introduce students to the unparalleled possibilities of additive manufacturing, inspiring them to then dive into the deeper learning to come in the course.

***My Tech High***

UDMC partners UAMMI and My Tech High held several meetings with various stakeholders, including:

- Course Developers

- America Makes

- Educators

- UAMMI leadership

- UDMC STEM Action Center

As part of this quarter’s meetings, the following items were discussed / completed:

- Completed full year of beta testing.

- Worked with Scott Brown of Brainmaker Games to host a pitch event where 6 students gave a professional pitch for their game.

- Met with Joe Larson (3D Printing Expert) to discuss plans for 2 additional semester long courses.

- Created and tested 3D models for course 2 badging.

- My Tech High Development Team continued brainstorming new course direction/content.

- Met with Hunter Young, a designer and branding consultant, to help with the integration between all UAMMI funded courses (that MTH has made).

- Met with Optimize Play (graphic design) and engaged with them to develop additional characters and backgrounds for the new course.

- Researched and tested 360 degree images for deployment in new courses.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of new courses/programs created: 1 new course in progress for Beta Fall 2022

- Number of courses/programs updated: 2 (both courses are updated in real-time)

- Number of Students who Participated & Completed: 137

***Pillar 2: Supply Chain***

***Objective/task title: Task 2.0***

***Objective/task description:*** The development of CONNEX for the UDMC will be expanded to allow for increased collaboration between academic institutions, Hill Air Force Base (HAFB), and the defense industrial base by furthering workforce initiatives and research and development (R&D), as well as the defense industrial base by increasing the number of organizations connected in the platform.

***Narrative of achievements so far:***

**America Makes**

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

Research: Objective: Research programs better aligned to support the defense industry.

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

America Makes attended UDMC Supply Chain Working Group meetings and will be engaging as a committee member to leverage both active and past projects as well as engage stakeholders on a national scale. Also, America Makes will assist in identifying correlations and alignments to national defense strategies where applicable.

**New functionality added to CONNEX:**

i5 Services launched the much-awaited CONNEX Marketplace (CM) platform, which brought all prior instances of CONNEX (by state) and the national Manufacturers Marketplace to one location and one database. Besides creating an environment where the manufacturing community in Utah and throughout the United States can more fully thrive, the underlying technology was built from the ground up resulting in infrastructure that will sustain any level of growth that the system may experience.

With the launch of CM, the following work was done in relation to the UDMC pillars:

**- Research and Development**: The R&D ecosystem created in CONNEX Utah was ported over to CM along with migrating all the Research organizational data and their associated research project information. The R&D module is live and has met the deadline in the contract. i5 Services is now entering the phase through December 2022 for adjustments based on live data entry. In addition to all that was mentioned above, several enhancements were implemented. These include:

 - Having both an organizational and researcher view of the Research community.

* Added Researcher's personal website for research
* Added ability for Researchers to add areas of interest

 - New features to identify collaborators on research projects.

 - New ability to attach documents/papers to research projects.

 - A clearer distinction of research organizations and other organization types (i.e. manufacturers) in the master search results.

 - Ability to search specifically on the researchers’ names, research project titles, locations, and collaborators.

 - Introduction of R&D related Exchange Center postings. This enables the R&D community to connect with the manufacturing community with proposed joint ventures, and vice versa.

**- Additive Manufacturing:**

 - All prior enhancements implemented in CONNEX Utah prior to the launch of CM were ported over to CM. These primarily centered around the addition of A.M. type of materials in manufacturers’ profiles.

 - With the launch of CM, a new feature enabling manufacturers to select their primary SIC was added. This was an identified need that came out of prior A.M. Working Group meetings.

- America Makes is working with CONNEX to edit meta fields to best represent additive manufacturing.

**- Workforce:**

 - A workforce module was implemented on the CONNEX Utah platform more than a year ago.

i5 Services and UAMMI meet most recently on Fri June 3, 2022 to sync up recent and near future updates to the Workforce module in CM.

 - This module is currently being ported over to the new CM platform with an anticipated early Aug 2022 launch.

 - All data built in the CONNEX Utah platform by Workforce participants will be ported over to CM to ensure a seamless transition

* In August, stakeholders in Utah’s workforce community will have the ability to update or add information about their programs.

Working user group meetings have been conducted this year for all three UDMC pillars and will continue to be scheduled and held throughout the year.

**Number of additions to CONNEX: 4**

- This quarter two new defense manufacturers were added bringing the total to 82.

- Due to the migration to the CM, updated numbers will be reported in the next quarterly report.

**Workforce programs currently in CONNEX:**

- Number of workforce programs: Nothing to report this quarter. Workforce currently in transition to new CONNEX Marketplace with re-launch in August 2022. Updated numbers will be reported in the next quarterly report.

**Workshops:**

- Workforce: Bi-weekly on Thursdays until August

- R&D: June 1, 2022 (just prior to submission of this report.)

- Additive Manufacturing: June 15, 2022

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

Will update in the next quarterly report*.*

***Objective/task title: Task 2.1***

***Objective/task description:***COVID-19 illustrated the national security risks that arise due to foreign dependency in manufacturing critical materials for defense. Based on the findings of the UAMMI study, which will identify Utah reshoring opportunities, the UDMC will develop an execution plan.

***Narrative of achievements so far:***

A UDMC consultant participated in the meetings of the UDMC Working Group that discussed the need for a reshoring initiative.

Four Projects were identified:

- Project One – Benchmarking to identify and assess reshoring initiatives in other manufacturing communities as well as at the state and federal level.

- Project Two – Economic Benefit Analysis of the total costs associated with reshoring from overseas (especially China) to Utah.

- Project Three – Identification of Utah companies actively reshoring or considering reshoring to Utah.

- Project Four – Attracting non-Utah companies to the state who are considering reshoring.

Following the finalization of the first two projects, as detailed in the previous quarterly report, Projects Three and Four were combined into a single Project Three but still with a focus on both Utah and non-Utah companies looking to reshore. The briefing memo on the findings culminated in legislation that authorized a $10 million grant program, the Manufacturing Modernization Grant Program (MMGP) which will provide funds “to incentivize Utah businesses to modernize, establish, relocate, retain or develop manufacturing in the state”. The MMGP’s goal is to “modernize Utah companies’ manufacturing, increase supply chain resilience, and lessen American dependence on foreign manufacturing.”

In the current quarter, Go Utah asked UAMMI to incorporate its briefing memo into a new report that took account of the new legislation, which was issued as “Reshoring Utah: A Profile of Companies Seeking to Reshore to Utah and Their Needs”, issued in late April. Simultaneously, Go Utah requested that UAMMI under its UDMC role provide on-going assistance with relation to reshoring efforts, including outreach and monitoring in relation to the MMGP. To this end, UAMMI in May provided recommendations on selection criteria and promoted pre-announcement of the MMGP (with opening to the public on June 1) among cluster members.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

The UDMC project’s expected outcomes were completed in the third quarter with the provision of the “Reshoring Utah” report. Moreover, expectations were exceeded based on the use of the report information in the elaboration of the Manufacturing Modernization Grant Program.

These efforts fully align with the UDMC goal to increase the capacity of the defense workforce and the diversity of the defense supply chain. Through the MMGP, it is expected that many of the applicants will be business that can better support the defense community in Utah by entering new areas of or enhancing their role in the supply chain. The increase in total businesses participating in the market also reduces procurement costs as an increase in total market supply lowers purchase price of inputs into the defense industry. This is true on both the product and service side of the industry.

***Objective/task title: Task 2.2***

***Objective/task description:***With the onset of new USAF Agility Prime programs of unmanned aerial systems (UAS); electric vertical take-off and lift (eVTOL); Advanced Air Mobility (AAM); ORBS for logistics, rescue, and troop movement and swarm warfare, lower cost and higher speed aircraft, new materials, and manufacturing methods are urgently needed. The UDMC will support small business and research institutions' Small Business Technology Transfer (STTR) Open Topic proposals for Agility Prime.

**Narrative of achievements so far:**

The UDMC delivered the investable plan for a Utah Center of Excellence for testing and qualifying advanced materials in Q1. This Task is closed.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

The UDMC delivered the investable plan for a Utah Center of Excellence for testing and qualifying advanced materials.

***Pillar 3: Research***

***Objective/task title: Task 3.0***

***Objective/task description:*** Increase collaboration between academic institutions, Hill AFB, and the defense industrial base by furthering R&D initiatives.

***Narrative of achievements so far:***

**Introduction**

A research defense symposium was held on 20 April 2022. UAMMI worked with the UMDC National Advisors, including America Makes, IACMI, and Idaho National Labs, to hold sessions with AFRL and Utah’s research community, to learn about projects and capabilities.

**Results**

A session was held on 20 April 2022 with Utah’s research institutions and industry to highlight defense manufacturing research projects and capabilities.

All known research institutions from across Utah state were requested to complete information in CONNEX for project information in the areas of defense manufacturing. Information was then gathered and evaluated based on:

- ABET accredited university (Space Dynamics is affiliated with USU thus met this criteria)

- Institution previously performed defense manufacturing research

- Novelty and potential impact to defense manufacturing

Ten research projects were submitted and down selected to six representing three universities (BYU, Utah, USU).

UAMMI invited industry and funding organizations from around the nation including but not limited to: Northrup Grumman, Idaho National Labs, America Makes, ARFL, Dustless Technologies, Go Utah, and Kori Ann Edwards Managing Director at Utah Governor's Office of Economic Opportunity. In all there were 101 participants attending the three-hour webinar.

Each institution provided an overview of the general capabilities and projects for the university for visibility to the attendees. Then, the selected individuals presented their research projects. Presentations (both video and slides) were uploaded to the Utah Defense manufacturing website for public consumption.

Besides showcasing the research done in Utah this event was targeting the creation of connections between industry or funding agencies and Utah researchers. Participant contact information was exchanged to facilitate connection. As a direct result from the symposium four of the six researchers were contacted for potential collaborations.

**Resulting Connections**

- Before the event was even completed, Dustless Technologies connected with Dr. Miles, Brigham Young University where meetings were set to look at collaboration opportunities!

- Wes Hobbs, from Davis Tech Composites Pathways reached out to Dr. George, Brigham Young University for information on new composite injection processes.

- Ansys has reached out to Dr. Crane about potential Advanced Manufacturing applications.

Evolve Additive Solutions has reached out to Dr. Whitmore, Utah State University, for application development of his research with some of their new manufacturing technology.

- Rick Neff, Director of Additive Manufacturing has a customer interested in helping commercialize some of the technologies.

- Northrup Grumman showed the presentations to their engineering department.

Additionally, the researchers were part of a focus group for CONNEX to help develop a better understanding of how to make the platform useful and maintainable for research and industry connections. As a result, 10 research opportunities were input into CONNEX which will allow industry, funding agencies and other researchers to contact them about these items.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

- Number of collaborative research events with a special focus that are geared towards advanced manufacturing and advanced materials: 1

- Number of attendees at each research event: 101

- Slides for each research: Found HERE: <https://utahdefensemfg.org/events?utm_medium=email&_hsmi=210697950&_hsenc=p2ANqtz--RozcoIZ_PB9FnPROCaazpqz5bTysO5tnbdFCvsQ8qrbsOfvBj1SpTJDwKLFn3SeZd3YEIH8LwHAAFh3NxZgSNHlIUZiYLWtRdJOnehW5hoHKGT_E&utm_content=210697950&utm_source=hs_email>

- Research opportunities to be incorporated into CONNEX: 10

***Objective/task title: Task 3.1***

***Objective/task description:***Research related to composites.

***Narrative of achievements so far:***

This task is closed with the Business Plan final deliverable for the Utah Aerospace Advanced Manufacturing Center, provided by the UDMC in February 2022. Despite the task being closed, the following activities are underway to support research related to composites.

- Positive support for creating a Private Equity Fund, leveraged with Federal Loan Guarantees by the Office of Strategic Capital, a part of AFWERX, has led to the decision to apply for an SBIR to fund the activities to create the fund structure.

- UAMMI has provided legislation to our federal legislators to provide money to AFRL for funding two of their directorates.

Total: $30 million per year for three years for research related to advanced materials

- A collaborative group of entities consisting of AFRL, INL, Northrop Grumman, WSU and UAMMI have come together to propose the creation of a high temperature materials research center - the Materials for Energy and Extreme Environments Research Center (ME3RC). This center is working on fund raising from both state and federal sources, including NDAA request above to Structural Materials Division.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

With the delivery of this business plan, this task is now complete.

***Objective/task title: Task 3.2***

***Objective/task description:*** Research related to converting coal to carbon fiber (C2CF).

***Narrative of achievements so far:***

We completed all the work on this task and attached our final report included in this report. See Attachment\_6 C2CF Business Case Analysis Final - Part 1 & Attachment\_7 C2CF Integrated Cost Model Final - Part 2.

***Pillar 4: Small Business and Incubators***

***Objective/task title: Task 4.0***

***Objective/task description:***Identify veteran owned defense manufacturing businesses and utilize existing outreach initiatives to increase awareness and access for veterans with a focus on veteran owned businesses in the defense manufacturing industry.

***Narrative of achievements so far:***

Our UDMC team worked to continue the advancement of CONNEX to facilitate the inclusion and identification of veteran owned defense manufacturers within the tool. Additionally, our team worked to enhance the tool’s usability for those companies as described under task 2.0.

***Quantitative/qualitative output and/or outcome (accomplished or expected):***

Veteran owned Defense Manufactures in Connex: Not Reported, due to the migration of CONNEX to the new platform.

***Objective/task title: Task 4.1***

***Objective/task description:***Outreach of existing programs for entrepreneurs and small businesses through the Utah Industry and Innovation Center under GOED. This will be accomplished by utilizing existing resources within the state, such as the SBIR/STTR, and working with UDMC to identify small businesses eligible for these programs.

***Narrative of achievements so far:***

The UDMC efforts under Task 4.1 continue to make a significant impact on the local supply chain. Three training workshops were held during the quarter to familiarize entrepreneurs and small businesses with the SBIR process.

- DoD virtual workshop specific to SBIR/STTR calls with 54 registrants

- Combined overview workshop with PTAC and LSI – 35 registrants

- NSF workshop – some overlap with UDMC companies – 35 registrants

Six small businesses under the UDMC umbrella received services from Center staff to submit seven SBIR/STTR proposals.

***Quantitative/ qualitative output and/or outcome (accomplished or expected):***

Six Utah companies within the UDMC submitted seven SBIR/STTR proposals during Y2Q3 which included five Phase I and two Phase II proposals.

Three companies received Dept. of Energy Phase I SBIR funding for technologies that support the defense industrial base during this quarter totaling $605,000. Companies include Alpha Tech Research Corp, Coreform, and Visionary Products, Inc.

***Objective/task title: Task 4.2***

***Objective/task description:*** Leverage UAMMI’s contract with Small Business Administration (SBA) for Regional Innovation Cluster (RIC) and Rapid Advanced Materials Program (RAMP) programs to assist in expanding and growing the defense industrial supply chain.

***Narrative of achievements so far:***

As shown in previous reports, RAMP is a key program for our RIC efforts. Through this program, our team can spend time with key Cluster Members and provide one on one training and mentoring. This program continues to provide the RIC cluster with significant accomplishments. The UDMC team continues to mentor RAMP participants and previous graduates.

***Quantitative/qualitative output and/or outcome (accomplished or expected):*** Through our RIC engagement we continue to meet our goal of providing individual counseling/training to at least 15 small businesses per quarter.

**UDMC Expected Impact Areas**

Please note the following additional key activities, meetings, and engagements focused on diversification of the defense supply chain, reduction of procurement costs, improvement of procurement processes, and/or increasing the capacity of the defense workforce. These events represent a sample of our efforts that span beyond any single task and focus on a larger programmatic perspective. While this is not all inclusive of every meeting or event, we want to be sure to illustrate the additional efforts under the UDMC.

**UDMC meetings not detailed above:**

3/01/2022: PTAC/ UAMMI Outreach (25 attendees)

3/21/2022: America Makes TRX (180 attendees)

3/23/2022: Building Utah

3/24/2022: UAMMI CrossTalk (203 attendees)

3/24/2022: Composites 101 – Brent Strong – 18 Attendees

4/20/2022: UDMC Utah University Defense Manufacturing Research Symposium – 49 attendees

4/27/2022: DMCSP Virtual Learning Forum

5/6/2022: Utah DoD SBIR/STTR Virtual Workshop

5/20/2022: Think Like A CEO (120 attendees)