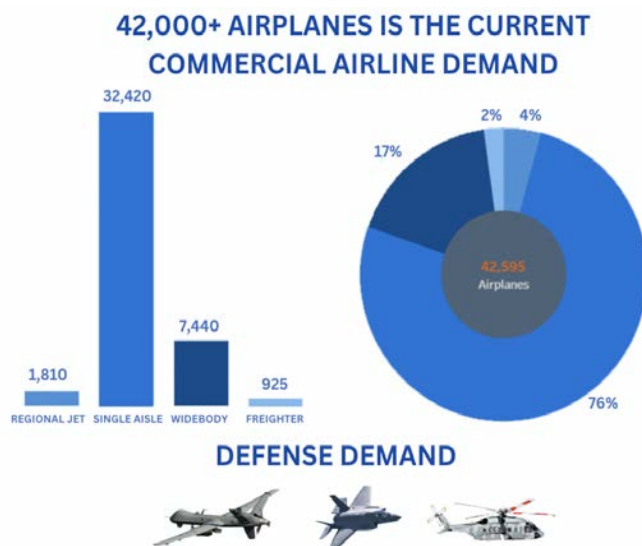


## OVERARCHING NARRATIVE: AMERICAN AEROSPACE MATERIALS MANUFACTURING CENTER

The purpose of the American Aerospace Materials Manufacturing Center ("AAMMC" or "Center") is to strengthen U.S. economic and national security through enabling advanced technologies and new domestic supply chains to meet the immediate and future demand for high-rate production of advanced thermoplastic composite (TPC) aerostructures in defense and commercial markets. The site is not for commercial serial production, but for full-scale fabrication of product certification. Under one roof, the Center will be the only U.S. location



with the tools and equipment needed to advance manufacturing technology and accelerate production. Success is measured by production facility replications in the U.S. and the ability for American suppliers to match and surpass competitors to this critical market. Over 40,000 single-aisle and widebody airplanes are projected to be delivered by American aerospace companies and global competitors over the next 20 years, requiring production of 70-100 new aircraft a month. This intense pressure on the current supply chain presents a unique opportunity for American suppliers to catch up to global competitors. While American industry has proven the reduced cost and weight of TPCs in both

commercial and defense applications, the U.S. lacks the infrastructure to demonstrate scalability, meet domestic demands, and compete globally for high-rate composite fabrication of larger aerostructures. This next-generation of lightweight materials is imperative for meeting net-zero carbon emissions by 2050. Technology development, validation, and scalable manufacturing are imperative to meet immediate and next-generation domestic production demands. American capabilities for large TPC fabrication are far behind other nations, and planned expansions of large scale fabrication facilities in Europe and Asia over the next two-four years will only serve to further widen this gap. The U.S. can surpass global competitors by partnerships and shared resources. Industry partners Boeing, Spirit, Raytheon, and Lockheed Martin, with our new materials partners Toray America and Syensqo, will lead defense and commercial TPC goals to bring multiple large sized materials to market within the first 10-years. New domestic supply chains promote our self-reliance and security. The testbed and training center will accelerate the aerospace domestic supply chain by hardening technologies at initial low production rates of new programs in Tier 1 and Tier 2 supplier work. High production rates will be fulfilled through new domestic suppliers supported by private investment in the Impact Fund, loan guarantees, and regional support in new entrepreneurs and small supplier growth.



***Global Leadership*** This testbed and training center will advance new, market-disrupting large TPC aerospace materials like ribs, beams, doors, bulkheads and stiffened skins. High production of TPC is a key enabler to accelerate the aerospace industry’s goal of net-zero carbon emissions by 2050, and presents a unique opportunity to upskill the regional workforce, coordinate with labor, Tribal nations and workforce leaders, to utilize best-practices to attract and support underrepresented communities, in both Washington and Idaho, and build the next-generation of American aerospace jobs. Shared equipment, infrastructure and expertise of TPCs will bring together American industry engineers, federal labs and top researchers with the common goal of breaking new ground on these advanced materials. A parallel approach is cost prohibitive, disables the collaborative environment, and would leave the U.S. behind foreign competitors.

***Enable New Domestic Supply Chains Through Demand*** The Center will be a testbed for maturing “lab to market” TPC to TRL nine, transitioning research into the initial low production rates of new programs. High rate production will then be transitioned to suppliers with newly established TRL/MRL nine equipment to meet industry demand. Achieving this production scale will drive market change, expanding domestic capability by a factor of more than 20x. For both economic and national security, the U.S. cannot miss this inflection point. The Center will cultivate new domestic suppliers to meet these high-production rates in the U.S.; enable innovation from characterization to validation, assembly to packaging; incorporate best-practices in workforce and education programs; and foster rapid supply chain growth by attracting an influx of buyers, venture investors, and entrepreneurs. Coordinating from the outset with our educators, workforce and economic development partners, the Center will incorporate and multiply proven systems of hands-on training, recruitment, and upskilling for our rural and underrepresented communities, supporting new jobs at every skill and experience level.

## AN INTEGRATED TESTBED AND TRAINING CENTER: COMPONENT PROJECTS 1 & 2

### Component Project #1:

Testbed and Tech Maturation: Operations, Equipment, Partnerships

**Lead:** AAMMC

**Applicant Implementing:** AAMMC

- Operations and Security RIO, Engineers, Technicians
- Cutting Edge Equipment (two Subrecipients)
- AAMMC Grants for Research, Workforce, Additional Services

### Component Project #2:

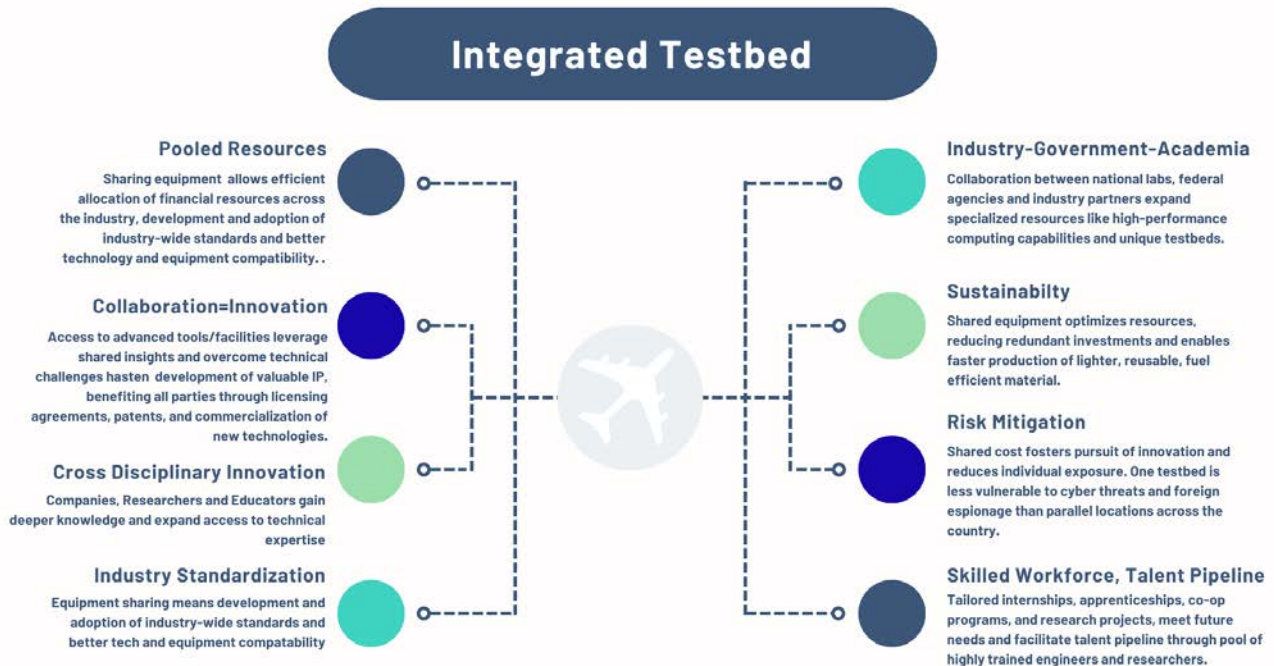
Industry-Led Technical Education, Workforce, and Economic Development

**Lead:** AAMMC

**Applicant Implementing:** AAMMC

15 Coordinated Subrecipients (“Spokes”) in WA and ID for new and expanded programs: Technical Education; Workforce Training; Labor-run Training; Wrap-Around Services; Programs for Underrepresented Communities; Tribal Workforce; Economic Development Teams; Latino-outreach programs; recruitment

**Key Technology Focus Areas (KTFA)** Advanced and next-gen materials (KTFA #10), which done at TRL 6-9 advanced production systems, uses model based engineering, machine learning (KTFA #1), and automation (KTFA #4). Failure to develop these supply chains threatens American access and market share of crucial, sustainable, aerospace and defense systems



**NASA’s Hi-Rate Composite Aircraft Manufacturing (HiCAM) Project** is developing technology for large composite primary airframe structures that enable high-rate production (up to 80 aircraft/month) at reduced cost, to meet 2030 market demands for single-aisle aircrafts. Rapid forming and assembly, low energy processing, greater durability, and easier recycling can bring AAMMC partners together on HiCAM large scale demonstrations to facilitate technology transition for future TRL 6-9 development at the AAMMC. NASA also prioritized TPCs for Advanced Air Mobility vehicles, in-orbit, and lunar surface fabrication of space structures.

**Component Project #1: Testbed & Tech Maturation: Operations, Equipment, Partnerships**

**Operations and Security** In addition to the RIO, the Center will phase-in an administrative assistant, controller, and small team of advanced engineers and technicians for daily management, including equipment delivery; time-share agreements between industry; support for individual programs; industry-led workforce programs; academic programs; and tracking metrics/benchmarks. **Equipment and Partnerships.** The budget reflects \$50m in state-of-art equipment at the cutting edge of the global industry, currently unavailable in the U.S. The equipment is designed specifically for the testbed to prove high rate capability for ribs, beams, doors, bulkheads, stiffened skins, etc. Global industry leaders will share a full range of thermoplastic processes to transition research into initial low production rates, propelling American leadership in technologies essential to economic and national security. Equipment and partnerships will advance stronger, lighter parts for use in defense and commercial aerospace. **Competitive Subawards.** The Board will make subawards based on specifications recommended by Advisory Councils to support research alignment with universities, coordinate technical education needs, and reduce barriers to access workforce programs.

**Scope of Work, Milestones, Deliverables**

The AAMMC will serve as the only U.S. testbed of its kind, enabling TRL 6-9 collaboration between industry, workforce, and academia, to qualify thermoplastic composites (TPC) for medium and large military and commercial applications. Our



technology and maturation objectives are fundamental to delivering medium and large aerospace parts with the highest standards of industry, NASA, FAA, and DoD readiness, in preparation for critical safety testing. The tech maturation milestones, aligned with the TRL scale, include development, manufacturing, and fabrication of prototypes and test elements. The Center will access pre-existing safety certification testing through National Institute for Aviation Research (NIAR), and other existing academic and U.S. institutions to reduce costly barriers.

**Academic Research and Higher Ed** Component Project #1 contains an internal grants budget to pursue related research and alignment with university partners, many of which are leaders in our KTFAs and have deep relationships with our industry and workforce partners. The higher education partners (1) further advance the historic role our institutions have played in the KTFAs; (2) expand partnerships and programmatic investment in innovation, entrepreneurship, and engagement; (3) increase collective workforce development; and (4) expand access and equity for all students. *\*Note Higher Ed current and planned programs in the commitment list.*

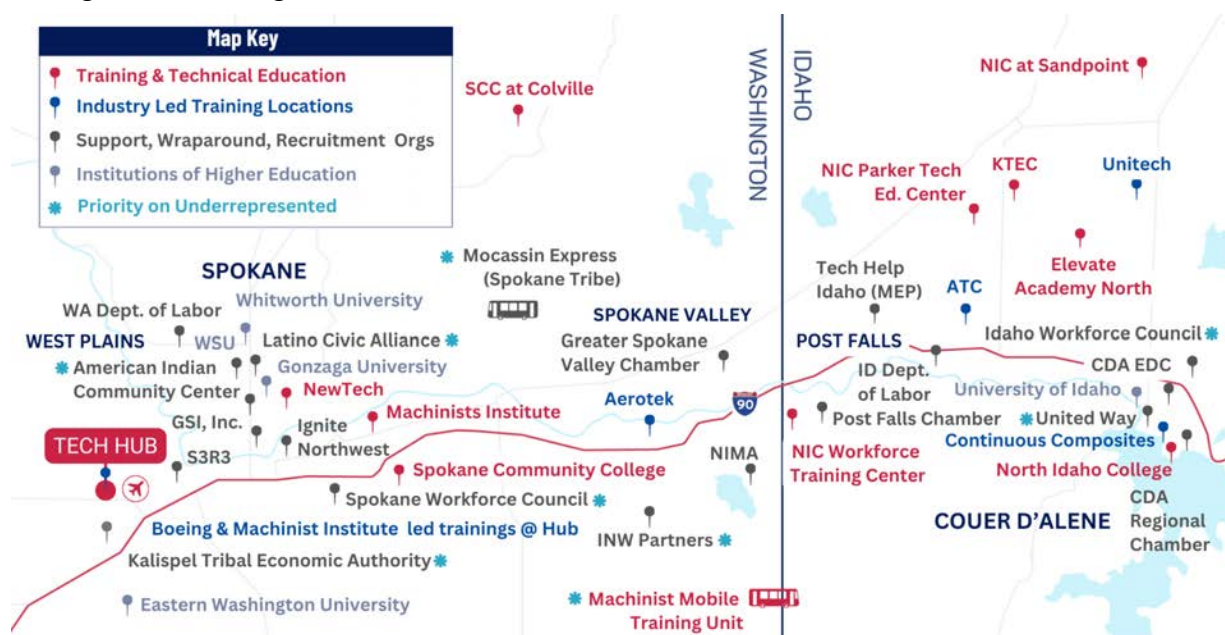
## Component Project #2 Title: Industry-Led Technical Education Training, Workforce, and Economic Development for Next-Generation Aerospace Jobs

**Hub and Spokes** The Center will serve as the “Hub” with coordinated “Spokes” among the technical education, workforce training, and economic development initiatives across the Inland Northwest. Subrecipients in Component Project #2 are enthusiastic to drive the supply chain expansion for a new and growing aerospace/aviation advanced manufacturing sector.

Since the Phase 1 designation, consortium members from labor, technical education and workforce partners have developed immediate, short, and long-term goals to attract, recruit and upskill the current workforce side-by-side with leading engineers and identified their best-practices for supporting underrepresented communities. Lakeside Companies has made the AAMMC site available to the Machinists Institute to begin new hand-on training. Tech schools, workforce training and small suppliers have planned new apprenticeships, internships and classes to begin training students and mid-career workers with industry’s forecasted aerospace jobs.

**Underserved** To combat the skills gap and uplift a trained workforce, our subrecipients' comprehensive training programs and educational initiatives specifically target historically underserved populations—women, minorities, veterans, low-income, and underemployed persons—thereby ensuring inclusive growth and diversity in the pipeline. New internships, apprenticeships, and scholarships are vital to increasing 'go on' rates and fostering practical, hands-on training and educational opportunities to encourage continued education and bridge the gap between academic learning and industry needs. Our programs include new non-credit, short-term technical certification, and stackable credit programs, acknowledging the need for flexible training options. This robust urban and rural growth network will significantly increase the region's ability to support high-rate aerospace production and U.S. competitiveness in thermoplastic composites, driving both job creation and sustained economic prosperity.

**Subrecipients** (1) Coordinate evolving industry TPC technical ed, workforce training, and upskilling; (2) Use cross-border, collaborative, multi-channel approaches for pipeline recruitment, business attraction, retention, and entrepreneurial interest in new TPC technologies; (3) Expand partnerships and vouchers for barrier-reducing wrap-around services; (4) Support central database platform to track data-based analysis, collaboration, joint strategies/solutions, goals, and metrics.



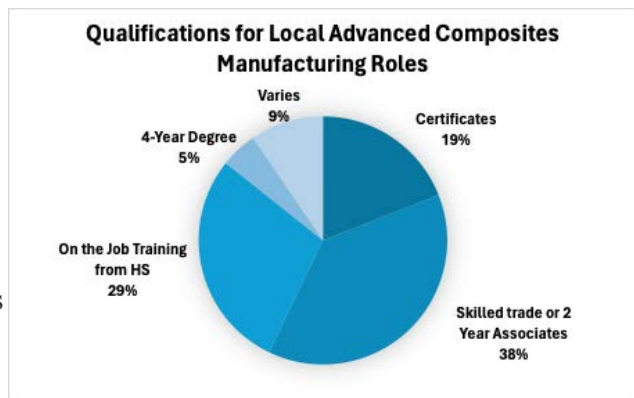
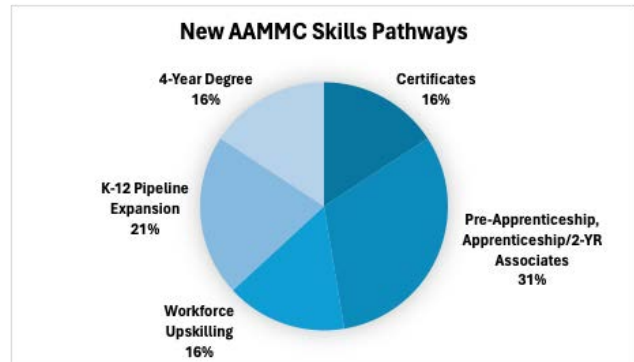
*Through a survey of regional composites suppliers and industry leaders, we identified the most predictable fields of growth in advanced TPC and current gaps straining employers today.*

### New Skills and Training Pipelines

- Mechatronics Maintenance Technician
- CNC Mill Operator/CNC Programmers
- Engineering Tech
- PMP Project Managers
- Electronic Maintenance Technician
- HVAC Technician
- Industrial Maintenance Electrician
- Welder
- Safety Professional
- Non-Destructive (NDI) Test Specialist
- Numerically Controlled (NC) Operator
- Composite Fabricator/Layup Technicians
- Composite Rework and Repair
- General Machinist/Equipment Operators
- General Laborer (entry level/HS)
- Assembler
- Paint Prep & Painters
- Inspector Fabrication/QA Inspection
- Machine Mechanic
- Mechanical Engineer

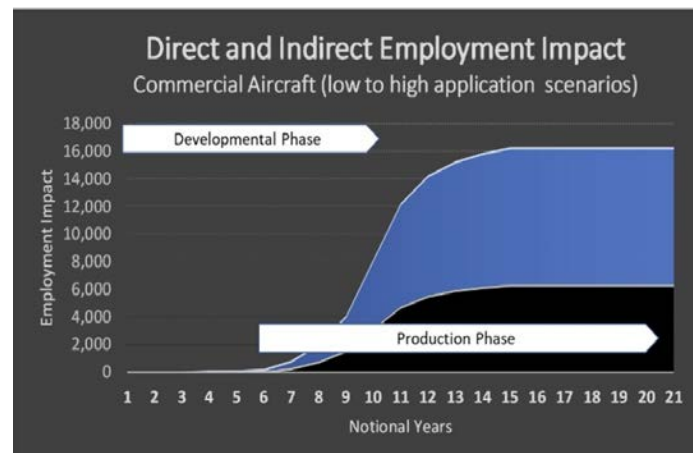
### Matching Jobs with Qualifications

- **4 New K-12 programs:** Aerospace composites manufacturing skills
- **6 New Apprenticeship:** Machinists Institute
- **2 year AA Science degrees:** N. Idaho College and Spokane Community College
- **3 Upskilling:** Boeing's+ Plus program, Gonzaga University, University of Washington
- **3 New Certificate Programs:** Spokane Community College and N. Idaho College
- **3 Higher Education Courses:** Supplement mechanical engineering, automation engineering, and computer science degrees.



This process was able to directly connect industry needs with updated curriculums. For example, North Idaho College will add a NDI/NDT training program, a role that all employers surveyed currently struggle to fill and would grow in demand as more advanced composites are added to airplanes.

**Redirect Aerospace Supply Chains to American Manufacturers** The potential impact on direct and indirect employment for increased adoption of TPC on a future high rate program would increase demand for domestic manufacturing by thousands of new jobs. Impacts would be magnified by the launch of a high rate airplane program with significant CO<sub>2</sub> sustainability and employment growth from design work to final assembly.



**Energy Efficiency** To achieve net-zero goals, construction will emphasize: Energy-efficient designs to minimize energy consumption; Solar energy infrastructure to generate clean, on-site power; Sustainable materials and minimal environmental impact during construction and operation. We prioritize recycled materials, efficient waste management systems, and employing eco-friendly building materials to reduce our carbon footprint by combining brownfield development with a net-zero carbon footprint. As a board member, Avista Energy is leading AAMMC plans for solar power and energy efficiency, under their Energy Efficiency Engineer.

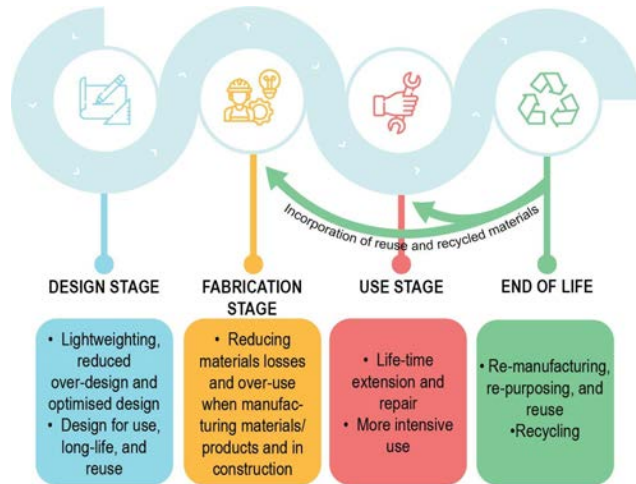
**Future factory and Product Sustainability** Adopting TPC in place of traditional thermoset technologies has significantly minimized factory footprints and operational complexities by streamlining production processes, such as press-based lamination and stamp forming, and eliminating the need for extensive HVAC systems due to TPCs' resistance to temperature and humidity changes. This shift also negates the requirement for cold storage for uncured polymers, reduces energy consumption through advanced polymerization techniques and efficient batch production, and eradicates the use of consumable materials destined for landfills. Remarkably, TPCs ensure 100% recyclability, enabling their repurposing for non-structural components and broader applications in various markets, thus offering a resilient and sustainable solution to the aviation industry's environmental challenges.

**Location and Construction Retrofit of the Testbed and Training Center** The facility consists of a 50-acre site on Washington State Highway 2 and Flint Road. It is situated on the edge of the city limits where they meet the city of Airway Heights, and is within a growing area of various manufacturing, industrial, retail and residential developments. The property owner, Lakeside Companies, will take on the construction plan reflected in the PER.



Developed to meet the needs of industry, educators, and workforce training, the retrofit is laser-focused on security. Intellectual property protection and sustainability are our top priorities, adopting a robust net-zero approach. Retrofit and design integrate the key elements to achieve security, environmental, hands-on workforce training, classroom space, manufacturing, and shared facility goals. To fortify site-wide security and safeguard intellectual property within discrete cells, the design is a closed operating environment where each cell ensures exclusive security- enabling both shared spaces for learning and collaboration, with also the highest levels of confidentiality within their designated spaces.

**Global Climate Goals** The International Energy Agency (IEA) highlights that the aviation sector is lagging behind its 2050 Net Zero Emissions (NZE) targets and must implement a range of technical strategies, including the adoption of low-emission fuels, enhancements in aircraft design and engines, operational efficiencies, and measures to control demand. IEA points to critical innovation in achieving sustainable aviation and enhancing global competitiveness in the



development of advanced TPC as pivotal for creating lighter and more fuel-efficient aircraft, with industry consensus pointing toward future narrow-body commercial airplanes featuring composite wings and possibly fuselages. The IEA agrees this transition requires a shift towards more efficient manufacturing techniques such as liquid compression molding, which reduces costs, environmental impacts, and streamlines production. NASA affirms these advancements will mitigate climate change effects, with TPC significantly lowering energy consumption and capital expenses compared to traditional composites.

**Linking EDA Tech Hub with NSF Engines Designation** NSF Innovation Engine awardee, Inland Northwest Center for Energy and Decarbonization (“INTENT”) is accelerating the equitable decarbonization of the power grid and energy systems in the region. INTENT and the AAMMC plan to collaborate efforts in at least two areas of alignment:

Workforce: Coordinate resources to map and design solutions to close regional workforce gaps.

Green Manufacturing: Through AVISTA, develop long-term strategies with industry and academic partners to lower manufacturing energy inputs and incorporate more sustainable power.

**Self-Sufficiency Plan** The Center will transition to a self-sustaining membership model like thermoplastic composite testing centers ThermoPlastic composites Research Center (TPRC) in the Netherlands and the National Composites Centre (NCC) in Bristol to push the boundaries of material innovation and application. The TPRC, renowned for its collaborative research model, provides a platform for companies to access cutting-edge knowledge, equipment, and expertise in TPC, facilitating the development of lighter, more efficient aircraft components while the NCC in Bristol acts as a hub of technological advancement, offering state-of-the-art manufacturing and testing facilities that enable aerospace companies to accelerate composite transition from concept to market. These centers are typically funded based on use and equipment in annual subscription with monthly membership fees, where members pursue joint research programs that may also receive governmental or academic support. Collaboration on such an agreement will begin after current discussions on confidentiality are finalized.

**Summary** The development and validation of new technologies and scalable manufacturing is crucial for U.S. global competitiveness. With every level of academia, local, state, tribal governments, small and medium manufacturers, global corporations, labor and regional workforce organizations, local chambers of commerce, and economic development groups, this consortium shares the common goal of multiplying American supply chains through good-paying jobs at all skill levels, with a priority on the underrepresented, in advanced 21st



century manufacturing. The AAMMC testbed and training center will promote U.S. self-sufficiency and international competitiveness in aerospace parts for both commercial and defense markets by centralizing resources for shared use and collaboration among federal researchers, academia, and workforce, cutting significant costs and time. The U.S. lags in global large-scale TPC fabrication today, with Europe and Asia's planned expansions threatening to widen this gap. As a national hub for advancing TPC technologies to readiness (TRL 9), the Center will facilitate the transition from research to production. This escalation to high-rate production is essential for transforming the market and could increase domestic capabilities by 20x, marking a critical juncture for U.S. economic and national security interests. The Center will spur innovation across all manufacturing stages and instill best practices in workforce development and education, driving supply chain expansion, attracting investment and entrepreneurship. Through hands-on, industry-led training, recruitment, and upskilling, especially in rural and underrepresented communities, jobs across various skill levels will thrive.

## **AAMMC TESTBED TRAINING CENTER: GOVERNING STRUCTURE & SUPPORT SYSTEM**

### **Governing Board**

- One lead from each EDA consortium member category: Industry, Venture, Education, Workforce, Economic Development, Government/Tribal, Community Leaders, Finance
- Board is responsible for fulfillment of goals of the tech hub, success, and compliance.
- Board seats may rotate among willing consortium members in the corresponding group.

### **Staff**

- RIO, Engineers, Technicians, Admin, Controller

### **Industry Advisory Council**

- Develop time sharing, program development priorities, equipment order/delivery, etc for approval by the board to comply with award and procurement rules.
- Support the workforce training team in developing education and training programs, including apprenticeships, internships, certifications and degrees to meet manufacturing, engineering, and technical needs of small and large industries across the supply chain.

### **Economic Development Council**

- Promote the goals of the AAMMC Tech Hub to attract industry and investors.
- Pursue incentives and financial resources to expand workforce programs, attract new and expanding businesses to the region through policymakers and local leaders.
- Raise additional capital from investors as the Tech Hub grows and identify ways to support entrepreneurs, new manufacturing in TPC, scholarships, etc.
- Advocate policies from local, state, federal to incentivize and support business growth, align existing research, expand workforce and technical education.

### **Private Investment**

- Raise and award education and job training scholarships, fund research needs of industry.
- Impact Fund- private investments in industry equipment, engineering, materials.
- Provide direct investments, incentivizing loans, and mentorship programs to support new companies and entrepreneurs in these new domestic manufacturing supply chains.

# AAMMC STRUCTURE & MEMBERSHIP

## GOVERNING BOARD

<b>INDUSTRY</b> 	<b>WORKFORCE</b>  MACHINISTS INSTITUTE <i>Machinists 151</i>	<b>FINANCE</b>  Washington Trust Bank <small>Member FDIC</small>	<b>COMMUNITY</b>  AVISTA Corp.
<b>VENTURE</b>  LAKESIDE COMPANIES	<b>TRIBAL</b>  KALISPEL TRIBE OF INDIANS	<b>ECONOMIC DEVELOPMENT</b>  CdA EDC	<b>EDUCATION</b>  GONZAGA UNIVERSITY

### ECONOMIC DEVELOPMENT COUNCIL

### AAMMC HUB STAFF

Innovation Officer  
Engineers  
Technicians

### INDUSTRY ADVISORY COUNCIL

### PRIVATE INVESTMENT

**Grants/Scholarships**

**Impact Fund**

### TECHNICAL EDUCATION & TRAINING

### FEDERAL AGENCIES & LABS

### STATE AND LOCAL PARTNERS

### HIGHER EDUCATION