





AEROSPACE INNOVATIVE TRAINING SYMPOSIUM

Emerging Workforce Session Summary

April 2, 2024

Table of Contents

Introduction

The Big Questions

- 05 Governance, Collaboration, and Ecosystem Support
- Workforce Attraction
- 09 Education and Training Alignment
- Soft Skills Development
- **14** STEM Education Enhancement
- Regulatory Awareness
- Diversity and Inclusion
- Next Steps
- Symposium
- Symposium Participants
- 24 Who We Are

Introduction

Global forces are converging in three key areas...rapid technological change, new attitudes about work and lifestyle, and economic pressures due to inflation. Technological change is exponential, forcing us to be smarter, more creative, and faster than our peers.

The pandemic accelerated and amplified generational differences in how we view work, our needs as working families, and our preferences in terms of job security and flexibility. This rapid evolution radically shifted how companies define their workforce, utilize their workforce most productively, and pursue advancement through innovation.

If Oklahoma intends to compete and succeed in a global marketplace, its businesses and communities can no longer rely on simply being the best individually...the best product, the best site, the most productive workers....it must combine forces to become a region leading global advancement and change through innovation, entrepreneurship, and creative talent.

UAS Cluster Initiative and the Oklahoma City Innovation District have created a remarkable partnership to convene stakeholders in the emerging aerospace industry throughout the State of Oklahoma. The partnership is inclusive of industry, government, education, workforce and economic development.

The partnership took a three-pronged approach: analysis into the current environment and potential for the aerospace industry evidenced through a series of interviews; reporting of findings from those interviews "Charting the Course: Workforce Dynamics in Oklahoma's Emerging Aerospace Industry"; and thirdly, an in person collaborative work session to consider potential projects addressing the Big Questions identified in the report facing the future of aerospace in Oklahoma.

Conversations during the Emerging Aerospace Workforce Work Session led to responses to the Big Questions that were BOLD, such as determining

"I just think we have to innovate, higher ed has to innovate, we have to stop doing the things the way we've always done them." a new formula for education funding to ensure all Oklahoma's children have a quality technical education; CREATIVE, such as, a soft skills enhancement program utilizing gaming and emerging technologies; DETAILED, such as multiple techniques for enhancing funding for aerospace entrepreneurship and innovation; and in some cases ASPIRATIONAL, such as, developing an aerospace workforce pipeline; but always serious ideas for change that demand thoughtful consideration.

This document summarizes those conversations and suggested actions, into major initiatives ready for adoption, development, and collaborative action. Those projects are potential Game Changers. Other projects could be stand-alone initiatives that any individual entity could tackle. Those project ideas provide Creative Intervention to a persistent challenge or represent Solid Gap-fillers where programming does not exist or is not universally available. Finally, there were a number of good ideas (noted throughout the document) needing a sponsor for more development and future implementation.



Big Questions

The following summary outlines the responses to each of the Big Questions as devised by the working groups during the Emerging Aerospace Workforce Work Session.

Combined Topics #1 and #8 – Governance, Collaboration, and Supportive Ecosystem

"How can Oklahoma create the structure and framework to embrace rapid technological change, enable industry collaboration, and support entrepreneurship over the long term?" "How can Oklahoma provide sustained workforce support for the emerging aerospace industry, providing the workers it needs today, while building toward a future yet only imagined?

Governance and Collaboration

Key Challenge:

 Fierce competition for skilled and experienced workers

Key Strength:

 Active interest and participation by industry, education, and supporting institutions

Strategies

- Use an associated 501 c3 to support the emerging aerospace industry to enable fund development from multiple sources; to encourage coopetition, networking, and problem solving; and to increase collaboration among a broad spectrum of entities outside of the competitive environment
- Creation of environments for networking and organic collaboration outside of individual competitive environments

Opportunity

- Rapid technological change and uncertain regulatory environment encourage greater collaboration
- > Tight and competitive labor market encourages coopetition

Big Question

How can Oklahoma create the structure and framework to embrace rapid technological change, enable industry collaboration, and support entrepreneurship over the long term? Governance and collaboration refer to the overall governance structure that allows organizations to work independently and together, competing when necessary and collaborating when there is opportunity, to best advance a program, project, organization, or industry to the benefit of all. A supportive ecosystem refers to the identification, incorporation, building and development of the individuals, businesses, organizations, institutions, and infrastructure of an industry such that it creates a universally supportive environment.

Strategy

Use of an associated 501 c3 to support the emerging aerospace industry to enable fund development from multiple sources; to encourage coopetition, networking, and problem solving; and, to increase collaboration among a broad spectrum of entities outside of the competitive environment

Opportunity

- Substantial need within industry for connectivity, knowledge sharing, problem solving, and collaboration
- > Rapid technological change promotes knowledge sharing
- Potential new availability of more diverse and flexible funding opportunities

Big Question

How can Oklahoma provide sustained workforce support for the emerging aerospace industry, providing the workers it needs today, while building toward a future yet only imagined?

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges to effective governance, collaboration, and a supportive ecosystem were identified.

Additional Challenges

- Inadequate Seed Funding
- Education is behind the power curve (STEM)
- Workforce short in STEM fields
- Lack tax incentives to support entrepreneurs and start-ups
- None of the above are recognized as a priority

In response to the Big Questions the following strategies, actions, and tasks were identified during the Work Session:

Strategy 1.1: Recommend to the Governor that an Aerospace Advisory Council be created consisting of commercial, UAS, military, space, general aviation, and 501c3 supporting entities and institutions. The purpose would be to identify and support cross-cutting initiatives that benefit the aerospace industry as a whole

Strategy 1.2: Working with State and local government, business, education, chambers of commerce, and vocational-tech educators, develop a tax incentive program to attract angel investors and other funders for start-up businesses.

Action 1.21: Convene a task force including government, business, education, chambers of commerce, vocational-tech to study development of equity capital for Oklahoma entrepreneurs

Support Ecosystem

Challenges:

- emerging industry with many small and start-up businesses
- uncertainty in regulatory environment

Strengths:

- technological agility
- young industry with willingness to collaborate

Task 2.11: Identify gaps in the continuum of capital for entrepreneurs in Oklahoma

Task 2.12: Conduct a survey and analysis of State level incentive programs nationally to fund equity capital, including seed, angel, venture, growth, and crowd style funding

Action 1.22: Based upon successful programs elsewhere, develop initiatives to fill gaps in capital for Oklahoma entrepreneurs

Task 1.221: Draft legislative initiatives to fund Oklahoma entrepreneurs

Task 1.222: Conduct education campaign to gain state-wide buy-in

Task 1.223: Attract legislative authors and sponsors

Task 1.224: Support legislative process with expert testimony

Action 1.23: Capitalizing on existing programming at OU Oklahoma Aerospace and Defense Innovation Institute, OSU Oklahoma Aerospace Institute for Research and Education, and area incubators, develop a process for identifying companies for funding

Task 1.231: Identify the kinds of companies that will have the greatest impact on Oklahoma and the overall aerospace industry Task 1.232: Identify the companies that will benefit most from additional funding

Task 1.233: Develop a pitch competition using the "Shark Tank" format to select companies for funding

Strategy 1.3: Create an environment that allows tech industry and startups to flourish

Action 1.31: Using research from programs in other states, clearly articulate the environment within which tech companies flourish

Action 1.32: Identify the barriers present in Oklahoma that undermine an attractive and productive tech environment

Action 1.33: Educate government, business, education, and the general public on the environment needed to support a growing tech economy

3-5 Year Progress Benchmarks and Success Metrics

- New STEM graduates
- Improved State rankings for STEM graduates
- New technology jobs created or attracted to Oklahoma
- Access to adequate funding throughout the life of the business
- Oklahoma will be able to fill critical jobs
- Companies will want to move to Oklahoma

Topic #2 – Workforce Attraction

"How can Oklahoma attract the experienced workforce it needs to support the rapid growth, transition, and innovation of the emerging aerospace industry?"

Workforce Attraction

Key Challenges:

- Limited size of technical workforce and current pipeline
- Need for poaching among small pool of experienced workers within state
- Few mentors for entry level engineers
- Lack cohesive narrative
- Negative attitudes about Oklahoma as a location
- Educational funding inequities
- Key Strength:
- Rich history of aerospace innovation and burgeoning technology based ecosystem

Example Experience:

- Cherokee Nation Aerospace and Defense manufacturing
- WindShape, drone wind and weather testing lab
- Eista Innovation Park, Lawton Fort Sill, Oklahoma

Strategies

- Craft a cohesive narrative for the emerging aerospace industry and aerospace in Oklahoma
- Recruit adjacent industry experienced technical workers with transferable skills
- Target recruitment of experienced emerging aerospace industry and aerospace workforce from outside Oklahoma

Opportunity

Exciting industry with rich history in Oklahoma and active tech-based entrepreneurial environment

Big Question

How can Oklahoma attract the experienced workforce it needs to support the rapid growth, transition, and innovation of the emerging aerospace industry?

Workforce attraction refers to a method of growing the workforce through the identification and recruitment of new workers from outside the natural commuter pattern catchment area to relocate.

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges and opportunities were identified for effective workforce attraction.

Additional Challenges

- Industry stakeholders not interested in working together
- No government appropriation for workforce attraction programming

Additional Market Opportunity

- Aerospace is sexy, fast growing
- Oklahoma government has support for the industry
- Companies have advanced formal thinking

In response to the Big Question the following strategies, actions, and tasks were identified during the Work Session:

Strategy 2.1: Working with the FAA, airlines, and aircraft MRO, designate a state talent recruitment organization

Strategy 2.2: Create a Workforce Attraction Recruitment Program

Action 2.21: Develop a social media campaign

Action 2.22: Sponsor an Oklahoma booth for MRO Americas

Task 2.221: Conduct industry recruiter meetings

Task 2.222: Attract attention to booth, feature cool stuff, hold giveaways, such as a prefab Douglas jet in booth

Task 2.223: Include computer monitors for real time job search

Action 2.23: Create a website to search jobs and accept resumes for jobs in aerospace

Action 2.24: Request a legislative appropriation to support workforce attraction (there is state momentum already)

1-year Progress Benchmarks and Success Metrics

- Increased hiring rate
- Increased retention rate
- Increased number resumes received / interest
- Increase number of experienced workers hired

Topic #3 – Education and Training Alignment

"How can Oklahoma align education and training with industry to ensure a locally based pipeline of ready workers?"

Education and Training Alignment

Key Challeng

- rapid technological change
- higher ed and training entities exist in silos
- current training is slow and cost ineffective
- fragmentation, misalignment, and lack of accountabil workforce systems undermine ability to meet workford
- built in processes in educational institutions resist rapid response to changes in industry training needs

1/----

- depth of experience in technology fields and aerospace specifically
- Boeing Engineering and Manufacturing accelerated leadership programs and internshins
- Tulsa Community College Riverside Community Campus and Aviation Center
- Tanenbaum Aerospace and Cybersecurity Center at Rose Stat
- College
- Multiple additional collegiate aviation programs je_OU, OSU

Strategies

- Build a long-term transparent and seamless emerging aerospace workforce pipeline inclusive of K-12, non-traditional, and transitioning workers
- Create partnerships among non-degree and degree based training programs to provide more rapid and agile training responses to industry needs
- Engage industry in identification of education and training needs, and development of curriculum
- Create a searchable database of emerging aerospace education and training programming

Opportunity

Major restructuring of workforce system will enable those ready to quickly take action

Big Question

How can Oklahoma align education and training with industry to ensure a locally based pipeline of ready workers? Education and training alignment refers to the shared agreement, and ongoing collaboration, of educational institutions and training providers with industry on the necessary size, skills, and educational attainment of a creative and productive workforce necessary to support a thriving industry now and in the future.

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges and opportunities were identified for effective education and training alignment.

Additional Challenges

- Available aerospace education is not communicated
- Who picks up the bill / who is responsible
- The kids are not passionate about the work
- Programs for training and education are unknown
- Kids not interested in the projects
- Not enough volunteers
- Cost of funding prohibitive
- Staff availability and capacity is limited
- Need State level buy-in
- Competing priorities
- Resources are kept in separate silos, reducing efficiency
- Sovereigns, businesses, municipalities, non-profits are not communicating adequately
- Lack substantive investments in education, especially in STEM
- Lack of awareness of career opportunities
- Current education funding mechanisms result in inequity

Current relations between the state and tribes are not conducive to partnership, however partnerships between tribes and the state legislature are still possible

Additional Market Opportunity

- Multiple companies within Oklahoma are already doing training
- Smaller companies and young companies need training for their workforce
- The Oklahoma office of workforce is a new entity that could be where a database originates, is managed, and maintained
- There are a number of federal funding resources and opportunities that might make effective, collaborative, partnerships possible such as, the Department of Labor (DOL), Social Services Block Grant (SSBG), Economic Development Administration (EDA), local colleges and universities

In response to the Big Question the following strategies, actions, and tasks were identified during the Work Session:

Strategy 3.1: Working with State Department of Education, Office of Workforce, Employers, Oklahoma Career Tech, Oklahoma State Regents for Higher Education, Oklahoma Aerospace Commission, and State Chamber, build an aerospace education + training database to increase the awareness of programs that exist across the state

Action 3.11: All partners to convene and share lists of programs and where they exist (continue to update monthly)

Action 3.12: Develop plan for identifying gaps in training or education programs

Action 3.13: Determine plan for database creation

Action 3.14: Identify funding for database development, hosting and maintaining the database

Strategy 3.2: Develop a workforce pipeline with schools, colleges, and industry

Action 3.21: Create a nonprofit that connects the industry with colleges and public schools and partners with government as needed

Action 3.22: Identify gaps in existing education curriculum that threaten the workforce pipeline

Action 3.23: Communicate pipeline to others

Action 3.24: Make sure kids are not left behind, teach kids technologies that support aerospace

Action 3.25: Engage public schools and universities

Action 3.26: Identify volunteers and funding

Strategy 3.3: Oklahoma Takes Off - Working with partner tribes, municipal governments, Councils of Government (COGs), local education organizations, colleges and universities, state and federal agencies, local companies, aviation companies and consultants, angel investors, and technically qualified individuals, restructure public education funding mechanisms

Action 3.31: Identify immediate and sustained and substantial investments in education and partnerships that are committed to long-term systemic change Action 3.32: Restructure tech / cart programs with local colleges and universities

Action 3.33: Identify a lead entity

Action 3.34: Invest immediate dollars in direct partnerships that respond to current lack of STEM education opportunities; target investment to socially / economically disadvantaged individuals and communities

Progress Benchmarks and Success Metrics

- Timeframe 18 months for database
- Timeframe 5-10 years for pipeline
- Overall Goal: Increase in aviation

 aerospace economic impact,
 increased student engagement, career
 development, and education and talent
 retention; increased ancillary aviation
 careers
- 3-year goal: robust investments in education and development of educators; identify a lead entity or organization, establish a fund and strategic plan
- 5-year goal: invoke legislative funding mechanisms
- 10-year goal: analyzing numbers, active participation in education curriculum, increased aerospace in OK, federal and state funding opportunities are immediately available; but also, a significant and sustained investment from state legislature
- Other metrics: Data on usage and findings of our program, Constant updates of the database, Feedback from users (school counselors, industry, parents, students)

Topic #4 – Soft Skills Development

"How can Oklahoma embrace technology and modern learning methods while also enabling the development of soft skills in its future workforce"?

Soft Skills Development

Key Challenges:

- remote learning and remote work undermine soft skill development
- lack of work readiness and understanding of entrepreneurship, curiosity, and perseverance

Key Strengths:

 near universal awareness and consensus for change

Example Experience:

- Emerging Aviation Technology Center makerspace Choctaw Nation
- University of Central Oklahoma School of Engineering makerspace

Strategies

- Develop soft skills programming that can be integrated with youth oriented <u>FabLabs</u>, <u>MakerSpaces</u>, and after school curriculum
- Develop soft skills programming that can be integrated with K-12 curriculum

Opportunities

Soft skills are lacking in every industry thus development of programming will have broad support

Big Question

How can Oklahoma embrace technology and modern learning methods while also enabling the development of soft skills in its future workforce?

Soft skills development refers to fostering emotional intelligence and understanding of interpersonal relationships that support a safe, positive, and productive work environment.

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges and opportunities were identified for effective soft skills development.

Additional Challenges

- Attention to detail
- Listening + comprehension
- Networking abilities.

Additional Market Opportunities

 Rapid technological change and acceptance of Artificial Intelligence (AI) and Virtual Reality (VR)

In response to the Big Question the following strategies, actions, and tasks were identified during the Work Session:

Strategy 4.1: Working with early education, colleges, tech schools, big tech companies, daycares, after school clubs, industry experts in Small and Midsized Enterprises (SME), home school groups, military careers, and gaming entities,

identify gaps in soft skill understanding and usage

Action 4.11: Conduct pre-employment testing like the Armed Services Vocational Aptitude Battery (ASVAB)

Action 4.12: Develop school curriculum on soft skills that is age appropriate for each grade kindergarten through 12th grade (K-12)

Action 4.13: Provide incentives for good scores

Action 4.14: Government involvement to filter down information of what is needed for these skills

Action 4.15: Government benchmarks and policies

Action 4.16: Conduct community outreach to teach soft skills to adults

Strategy 4.2: Working with early education, colleges, tech schools, big tech companies, daycares, after school clubs, industry experts (SME), home school groups, military careers, gaming entities to change the belief that soft skills are not important in technical fields

Action 4.21: Conduct Data analysis of where results are higher in STEM + what they are doing well

Action 4.22: Set a standard of teaching kids these soft skills

Action 4.23: Secure ongoing resources to incorporate soft skill education in K-12 Curriculum

Action 4.24: Audit tax dollars to ensure monies intended for education are allocated to education

Strategy 4.3: Working with early education, colleges, tech schools, big tech companies,

daycares, after school clubs, industry experts (SME) home school groups, military careers, gaming entities to enhance soft skills of Oklahomans using gaming and emerging technologies

Action 4.31: Use VR training for soft skills to make soft skill training more of a game

Action 4.32: Be creative in training approached to help people improve interpersonal relationships

Action 4.33: Increase Al understanding and usage to support better communication

Progress Benchmarks and Success Metrics

- One year to develop / One year to implement /Target SME group first
- 6 years 13 years to show results
- Initial assessments of the soft skills at the end of the year
- Target specific grades
- Know and teach to the standards for industry
- Assess to ensure skill standards are met
- Use metric such as ASVAB
- Youth of Oklahoma are more soft skill savvy
- Know rules of engagement when learning a new position – make eye contact, take notes, maintain full attention



Topic #5 – STEM Education Enhancement

"How can Oklahoma ramp up Science, Technology, Engineering, and Math (STEM) education in K-12 schools to support the rapidly advancing need for technical workers?

STEM Education Enhancement

- Key Challenges:
- Oklahoma is ranked 50th for STEM related degrees
- 43rd in K-12 educational outcomes
- 45th in bachelor degrees acquired
- new hires lack technical skills
- retirement of experienced technical workers
- funding inequities limit quality interventions
- Key Strengths
- depth of technical expertise
- existing programming funded by Oklahoma Aerospace

Example Experience:

- OU / Norman Public Schools Aviation Immersion School
- Oklahoma Aeronautics AOPA You Can Fly curriculum
- Yukon Public Schools College and Career Center in partnership with Southwestern Oklahoma State

Strategy

- > Improve STEM education at K-12 levels
- Encourage partnerships between educational institutions and industry to expose youth to STEM activities and careers
- Develop aerospace oriented FabLabs and MakerSpaces, aimed at youth and all ages, with recently retired technical workers as volunteer support

Opportunity

- > Depth of technical expertise in Oklahoma
- Exciting industry with active entrepreneurial environment
- Longer lived boomers looking for part-time work and volunteer activities
- > Retirement of experienced technical workers

Big Question

How can Oklahoma ramp up STEM education in K-12 schools to support the rapidly advancing need for technical workers?

STEM education enhancement refers to support of science, technology, engineering, and math programming in the K-12 classroom, after-school programming, and unrelated activities that align with STEM fields.

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges and opportunities were identified for effective STEM education enhancement.

Additional Challenges

- Limited individual opportunity based on location in Oklahoma
- Disincentivization to pursue a STEM education if classroom performance

is poor, even though hands-on experience may promote an interest n STEM fields

Disdain from students

In response to the Big Question the following strategies, actions, and tasks were identified during the Work Session:

Strategy 5.1: Working with Boeing, Federal Aviation Administration, Spirit, National Aeronautics and Space Administration, Oklahoma and Oklahoma City STEM entities willing to improve equity in educational opportunities between rural and urban schools and between those who are excellent at academic work and those who prefer hands-on work – Projects with Purpose



Action 5.11: Utilizing "free labor" of desiring youths industry leaders teach younger people to be enamored by science which creates a better workforce

Task 5.111: Contact outside entities

Task 5.112: Convince teachers to partner with extended projects with students

Task 5.113: Identify potential volunteers in retired industry professionals

Action 5.12: Using industry provided equipment, documentation, and materials establish specific STEM projects for each age grouping

Task 5.121: Train industry personnel and teachers

Task 5.122: Establish recurrent yearly implementation with Oklahoma Department of Education

Task 5.123: Organize progressively more difficult projects for each grade 7-12

Strategy 5.2: Deliver innovative STEM programming to boost stem education in K-12 levels under title – Transformative Pathway Partners

> **Action 5.21:** Overcome lack of K-12 educator bandwidth / training by utilizing retired industry workers

Action 5.22: Take advantage of industry knowledge and experience to mentor educators and next generation workers

Action 5.23: Provide summer externships for educators in area technology companies

Progress Benchmarks and Success Metrics

- Implementation 1-2 years private entity / 2-3 years government entity
- Increase number and percentage of STEM degrees
- Increase GPA
- Increased number of skilled / trained / prepared students for post-secondary opportunities

Topic #6 – Regulatory Awareness

"How can Oklahoma navigate a developing regulatory environment to quickly and accurately move its emerging aerospace businesses from product solution fit to product market fit, and ultimately to scale?"

Regulatory Awareness

Challenges:

- uncertain regulatory environment
- lengthy regulatory develop process
- cost of lengthy regulatory approvals

Strength:

specialized technical knowledge

Strategies

- Actively engage in regulatory development process with proposals, draft language, and education of stakeholders
- Survey industry to ensure clear understanding of needed regulations for development of safe technologies

Opportunity

Void in specialized knowledge in emerging technologies within regulatory agencies presents opportunity for leadership, streamlining of processes, and more favorable environments

Big Question

How can Oklahoma navigate a developing regulatory environment to quickly and accurately move its emerging aerospace businesses from product solution fit to product market fit, and ultimately to scale?

Regulatory awareness refers to the education, development, and support of regulatory initiatives that support a safe and productive environment for the emerging technologies and the aerospace industry as a whole.

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges and opportunities were identified for greater regulatory awareness.

Additional Challenges

- Uncertain regulatory environment
- Lengthy regulation development process

- Cost of regulatory approvals
- Cannot control partners they have to buy-in
- Glacial pace of some entities
- State budgetary constraints, politics, outdated mindset

Additional Market Opportunity

- Existing high school programs in 100+ schools will change the landscape in 3-5 years
- Significantly high percentage of high school grads do not go to or graduate from college so workforce sufficient

to fill some (non-grad) gaps in the overall need

In response to the Big Question the following strategies, actions, and tasks were identified during the Work Session:

Strategy 6.1: Working with Aircraft Owners and Pilots Association (AOPA) High School, Industry partners for training, FAA, and the legislature, develop a workforce pipeline that quickly and accurately moves aerospace business from product solution fit to product market fit to ultimately scale

Action 6.11: Develop legislation for a statewide apprenticeship program

Action 6.12: Develop legislation for a series of tax credits to support the emerging aerospace industry

Action 6.13: Develop legislation for micro-credentialing to recognize and stack industry required non-degree training **Action 6.14:** Develop legislation to fund emerging aerospace initiatives

Strategy 6.2: Working with AOPA High School, industry partners for training, and the FAA, to develop a marketing and communication campaign for emerging aerospace initiatives

Action 6.21: Develop initial campaign to focus on gaining legislative support for programming and funding

Action 6.22: Expand marketing after legislative success to attract interest and participation in programming

Action 6.23: Attract additional funding from industry and institutions

Progress Benchmarks and Success Metrics

 Over five years the percentage of unfilled positions decreases

Topic #7 – Diversity and Inclusion

"How can Oklahoma engage the creative talents of all its citizenry to better reach its economic potential?"

Diversity and Inclusion

Challenges

- lack of awareness of jobs and career pathways in technical fields
- lack of diverse mentors
- emerging industries often hire from those they know.

Strengths

 young industry with many youthful players welcomes diversity

Example Experience:

- Osage Skyway36 Drone Port and Industrial Park
- Choctaw Nation Emerging Aviation Technology Center
- Oklahoma Aviation & Aerospace Pathway Guide

Strategies

- Ensure K-12 STEM programming is open to and actively recruits students throughout Oklahoma, including rural, ethnically diverse, nontraditional, and neurodivergent learners
- Identify funding for non-degree and dual credential /degree programming
- Clarify pathways in education, training, and career advancement from training for entry level jobs to advanced degrees for engineering careers; include levels of effort, investment, and salaries
- Streamline education to work pathways to enable various entry points; include rural, ethnically diverse, older, nontraditional, and transitional students; and reduce overall cost

Opportunity

Competitive job market pushes more creativity in recruitment beyond standard sources

Big Question

How can Oklahoma engage the creative talents of all its citizenry to better reach its economic potential?

Diversity and inclusion refers to the active and intentional recruitment of individuals and groups that have been historically overlooked, underestimated, and excluded from active participation in the aerospace industry and its supporting institutions.

Based on discussions during the Emerging Aerospace Workforce Work Session, additional challenges and opportunities were identified for effective diversity and inclusion.

Additional Challenges

- More diverse and inclusive workforce
- Getting started has to have an owner
- Oversaturation of materials in the

market may be confusing or too much to coordinate

- Lack of education support
- Slow speed of the legislative process
- Need to improve the overall education system
- Existing workforce size too limited to fill jobs with adequate workforce

In response to the Big Question the following strategies, actions, and tasks were identified during the Work Session:

Strategy 7.1: Facilitate a work session with Industry, education, and legislature to discuss opportunities for greater diversity and inclusiveness in the workforce **Strategy 7.2:** Challenge diversity and inclusion with aerospace focused marketing materials for all Oklahoma schools

Action 7.21: Expose Oklahoma students to tech industry jobs through greater marketing

Action 7.22: Create awareness of training opportunities

Task 7.221: Develop videos for YouTube / TV commercials / flash drives w video

Task 7.222: Incorporate Quick Response (QR) code into all print materials

Action 7.23: Connect interested kids to mentors

Action 7.24: Hold a Career Day modeled on army recruitment (to show them a better way)

Action 7.25: Solicit funding from industry

Strategy 7.3: Working with state and local governments, tech industry, and local schools develop tax incentives to support higher paying jobs; attract more businesses to the State; and encourage citizens to start their own businesses

Progress Benchmarks and Success Metrics

- Must be iterative
- Decrease in job gap
- Increased opportunities for diverse population
- STEM ranking increase



III - Next Steps – Insights to Impact

The global emergence of technology hubs and regional innovation clusters, which bring together industry, academia, and government to accelerate technology development and commercialization, have the potential to spur massive restructuring of regional economies and rebuilding of lagging communities.

Such collaborations are also crucial for building the capabilities of the thousands of Oklahoma students who graduate annually with technology relevant degrees and giving them access to stateof-the-art facilities, quality technical instruction, real world experiences, and globally competitive employment.

Over the next several months, the partnership formed by the Oklahoma City Innovation District and the UAS Cluster Initiative will continue to convene, to listen, to analyze, and to share with governments, individual stakeholders, and institutions, the emerging opportunities that are poised for adoption and development.

The UAS Cluster Initiative will immediately begin work on the first of the recommended projects:

Developing multiple sources of financing and funding for aerospace focused entrepreneurs,

existing technology companies' innovation, and long-term growth.

Together, the Oklahoma City Innovation District and UAS Cluster Initiative will continue to engage and host working groups focused on gaps and opportunities identified by stakeholders and outlined in this report.

How can you be part of this exciting work? Moving from individual excellence to sustainable and inclusive regional growth is ambitious. We will need creative actors and strategic thinkers, researchers, teachers, volunteers, mentors, investors, and communicators. We are raising our hand for the above first project. We are asking you to collaborate with us on building the supportive ecosystem our entrepreneurs and innovative companies need. Additionally, we are asking you to raise your hand to develop the many standalone projects or good ideas identified in our work to date. Together we can achieve so much more.

"Oklahoma has the potential to become a robust hub for the emerging aerospace sector."

- Charting the Course: Workforce Dynamics in Oklahoma's Aerospce Industry

IV – Aerospace Innovative Training Symposium



April 2nd | 8 - 5pm | OKC Convention Center

The Aerospace Innovative Training Symposium was a day long national forum to explore the nexus of emerging technologies in the field of aerospace technical training. Rapid advances in extended reality technologies and artificial intelligence/ machine learning have created opportunities to gain efficiencies in how the current and future aerospace workforces are trained.

Stakeholders of the National Airspace System (NAS) utilized this Symposium to gain further understanding of the current state of emerging technologies and begin the path towards realizing how transformational change will benefit workforce development for current and future employees. Inspirational speakers from government, such as Lieutenant Governor Matt Pinnell and industry, such as NASA Administrator Jim Bridenstine were featured.

Through the interactive Working Groups, led by the UAS Cluster Initiative, attendees of this Symposium had the opportunity to work together alongside academia, government and commercial aerospace leaders to identify and problem solve solutions about Oklahoma's current workforce pipeline challenges.



V – Symposium Participants

Whitney AlvisRoss State College Workforce DevelopmentJames EppersonSpirit Aero SystemsGrayson ArdiesOK Department of Aerospace & AeronauticsKraettli EppersonVigilant AerospaceEdward ArmitageEngineering Graduate StudentAllen GoforthCity of Oklahoma, Department of Airports2City of VinitaKim GozaShen Te EnterprisesDr. Alyssa AveryOklahoma Aerospace Institute for Research & Education (OAIRE)James GrimsleyChoctaw Nation of OklahomaAaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJay HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Carl Adams	SAIC	Carter Dention	Tinker Airforce Base
Workforce DevelopmentKraettli EppersonVigilant AerospaceGrayson ArdiesOK Department of Aerospace & AeronauticsMelissa FerbracheCity of Oklahoma, Department of AirportsEdward ArmitageEngineering Graduate Student 2Allen GoforthCity of Vinita2City of VinitaKim GozaShen Te EnterprisesDr. Alyssa AveryOklahoma Aerospace Institute for Research & Education (OAIRE)James GrimsleyChoctaw Nation of OklahomaAaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Whitney Alvis	Ross State College Workforce Development	James Epperson	Spirit Aero Systems
Grayson ArdiesOK Department of Aerospace & AeronauticsMelissa FerbracheCity of Oklahoma, Department of AirportsEdward ArmitageEngineering Graduate StudentAllen GoforthCity of Vinita2City of VinitaKim GozaShen Te EnterprisesDr. Alyssa AveryOklahoma Aerospace Institute for Research & Education 			Kraettli Epperson	Vigilant Aerospace
Edward ArmitageEngineering Graduate StudentAllen GoforthCity of Vinita2City of VinitaKim GozaShen Te EnterprisesDr. Alyssa AveryOklahoma Aerospace Institute for Research & Education (OAIRE)James GrimsleyChoctaw Nation of OklahomaAaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Grayson Ardies	OK Department of Aerospace & Aeronautics	Melissa Ferbrache	City of Oklahoma, Department of Airports
2City of VinitaKim GozaShen Te EnterprisesDr. Alyssa AveryOklahoma Aerospace Institute for Research & Education (OAIRE)James GrimsleyChoctaw Nation of OklahomaDr. Carla HackworthFAA CAMIAaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Edward Armitage	Engineering Graduate Student	Allen Goforth	City of Vinita
Dr. Alyssa AveryOklahoma Aerospace Institute for Research & Education (OAIRE)James GrimsleyChoctaw Nation of Oklahoma Dr. Carla HackworthAaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	2	City of Vinita	Kim Goza	Shen Te Enterprises
(OAIRE)Dr. Carla HackworthFAA CAMIAaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Dr. Alyssa Avery	Oklahoma Aerospace Institute for Research & Education (OAIRE)	James Grimsley	Choctaw Nation of Oklahoma
Aaron BakerDronePort NetworkBrent HakenOK CareerTechChuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces			Dr. Carla Hackworth	FAA CAMI
Chuck BaukalOklahoma Baptist UniversityBerbon HamiltonOsage, LLCEmily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Aaron Baker	DronePort Network	Brent Haken	OK CareerTech
Emily BellUAS Cluster InitiativeJoy HammonsForeword ConsultingEathan BillerRose State CollegeKallie HanischOK Aces	Chuck Baukal	Oklahoma Baptist University	Berbon Hamilton	Osage, LLC
Eathan Biller Rose State College Kallie Hanisch OK Aces	Emily Bell	UAS Cluster Initiative	Joy Hammons	Foreword Consulting
-	Eathan Biller	Rose State College Workforce Development	Kallie Hanisch	OK Aces
Workforce Development Nathaniel Harding Cortado Ventures			Nathaniel Harding	Cortado Ventures
Daniel Bolin Tinker Airforce Base Zechariah Harjo Muscogee (Creek) Nation	Daniel Bolin	Tinker Airforce Base	Zechariah Harjo	Muscogee (Creek) Nation
Michael Branch Metro Technology Melissa Hayt Rose State College Workforce Centers – Aviation Development	Michael Branch	Metro Technology Centers – Aviation	Melissa Hayt	Rose State College Workforce Development
Michelle Brown OU Price College of Business Denise Hensley Putnam City Schools	Michelle Brown	OU Price College of Business	Denise Hensley	Putnam City Schools
Peter Campbell Cortado Ventures Bonnie Herman Federal Aviation Administration	Peter Campbell	Cortado Ventures	Bonnie Herman	Federal Aviation Administration
Allyson Carson Oklahoma Defense Industry Estela Hernandez Office of U.S. Senator James Association Lankford	Allyson Carson Association	Oklahoma Defense Industry	Estela Hernandez	Office of U.S. Senator James Lankford
Tom Chandler Aircraft Owners and Pilots Association (AOPA) Rebecca Hockenbroch Federal Aviation Administration	Tom Chandler	Aircraft Owners and Pilots Association (AOPA)	Rebecca Hockenbroch	Federal Aviation Administration
Brett Chase Southwestern Oklahoma Brooke Hoehner Greater OKC Chamber	Brett Chase	Southwestern Oklahoma State University	Brooke Hoehner	Greater OKC Chamber
State University Ashley Honeywell Bizjet International			Ashley Honeywell	Bizjet International
Laramie Cochran Office of U.S. Senator Chelsea Hunt Rose State College James Lankford Workforce Development	Laramie Cochran	Office of U.S. Senator James Lankford	Chelsea Hunt	Rose State College Workforce Development
Michael Coffman Federal Aviation Administration Travis Hurst Rose State College Workforce	Michael Coffman	Federal Aviation Administration	Travis Hurst	Rose State College Workforce
Chandler Coleman Cortado Ventures Development	Chandler Coleman	Cortado Ventures		Development
Eric ColeyNIAR, Wichita State UniversityDr. Jamey JacobOklahoma Aerospace Institute for Research & Education (OAIRE)	Eric Coley	NIAR, Wichita State University	Dr. Jamey Jacob	Oklahoma Aerospace Institute for Research & Education (OAIRE)
Eddie Compton OK Career Tech Joey Jayachandran Skydweller	Eddie Compton	OK Career Tech	Joey Jayachandran	Skydweller
Maurice Compton Ready3 Jan Johansson MyDefense	Maurice Compton	Ready3	Jan Johansson	MyDefense
Lee Copeland Greater OKC Chamber Tim Jones Federal Aviation Administration	Lee Copeland	Greater OKC Chamber	Tim Jones	Federal Aviation Administration
Mandy Crockett OU Aerospace & Defense Innovation Institute Paula Kedy OK Department of Aerospace & Aerospaulics	Mandy Crockett	OU Aerospace & Defense Innovation Institute	Paula Kedy	OK Department of
Sean Crowell LumenUS Scientific, LLC Rick Keithley Cymstar	Sean Crowell	LumenUS Scientific, LLC	Rick Keithlev	Cymstar
William Curtindale FlightSafety Jonathan Kimmitt Alias Cybersecurity	William Curtindale	FlightSafety	Jonathan Kimmitt	Alias Cybersecurity

Chase Kinder	Southwestern Oklahoma State University	Woody Smith	Oklahoma Aerospace Institute for Research & Education (OAIRE)
Barbara Kind	Federal Aviation Administration	Chad Smith	FlightSafety
Jordan Kinsley	Tripeak Performance Technologies	Matthew Taylor	Federal Aviation Administration
		Lily Terry	Greater OKC Chamber
Sarah Ligda	Federal Aviation Administration	Burke Thorpe	The Davis Thorpe Company
Travis Lightsey	Rose State College Workforce Development	Ricardo Torres	Federal Aviation Administration
Mel Louthan	Booz Allen Hamilton	Howie Vince	OK ACES
Diane Lupke	Diane Lupke & Associates, Inc.	Katelyn Wade	OK Department of Aerospace & Aeronautics
Brian Magers	Computer Systems Designers OK	Kristina Wadley	Oklahoma Center for the Advancement of Science and Technology (OCAST) OK Department of Aerospace & Aeronautics
Craig Mahaney	UAS Cluster Initiative		
Jennifer Martin	Greater OKC Chamber		
Joshua Mayo	OK ACES	Chris Wadsworth	
Robin Meyer	Innovative Technology Law Group	Luke Wagler	Tulsa Technology Center
Madeline Mitchell	Deloitte	Monique Walker	Greater OKC Chamber
Jeff Mulder	Will Rogers Airport	Jerry Walters	BizJet International
Victoria Natalie	Oklahoma Aerospace Institute	Jeanie Webb	Rose State College Workforce Development
Robert Owens, III	Cortado Ventures	Matt Weinrich	Rose State College Workforce Development
Mansi Patel	Cortado Ventures	Andrew Welch	Guide House
Leshia Pearson	OK ACES	Rob Wilcox	OK ACES
Rick Perrier	Osage, LLC	Kim Wilmes	Greater OKC Chamber
Steve Poston	Federal Aviation Administration	Cliff Woitalewicz	OU Aerospace & Defense Innovation Institute
Jeff Price	University of Texas at Dallas		
Senator Adam Pugh	State of Oklahoma	Doug Wood	OK Department of
Jeff Range	Wichita State University NIAR		Aerospace & Aeronautics
Shawn Ray	Oklahoma Aerospace Institute for Research & Education (OAIRE)	Brooke Woods Dr. Liu Yingtao	OK ACES OU Gallogly College of
Patti Ripple	Greater OKC Chamber	Nick Young	Engineering
Lindy Ritz	OK Department of Aerospace & Aeronautics – Commissioner		OK Department of Aerospace & Aeronautics
Dr. Shad Satterthwaite	OU Price College of Business		
Lacey Schley	OU Aerospace & Defense Innovation Institute		
Pete Selden	Tulsa Community College		
Jeff Seymour	Greater OKC Chamber		
Sandra Shelton	OK Department of		

Aerospace & Aeronautics

VI - Who We Are



UAS Cluster Initiative

The Unmanned Aerial System Cluster Initiative (UASCI) is a U.S. Small Business Administration Regional Innovation Cluster (RIC), facilitating access to critical resources for young companies in the unmanned aerial systems (UAS) industry, helping them promote their products to potential customers, license technologies and access financing. In practice, we are a first class mentoring and matchmaking hub that targets the specific needs of small businesses in the UAS industry. We address these needs through access to our diverse network of successful entrepreneurs, venture capital and private equity expertise and practical training in technology commercialization.



Oklahoma City Innovation District

We are a nonprofit dedicated to fostering cross-industry collaboration and innovation by bringing together diverse sectors, talents, and ideas. We strive to create a dynamic ecosystem where the boundaries between industries blur, and creativity knows no limits. Through inclusive partnerships and knowledge sharing, we aim to drive positive change, spark groundbreaking solutions, and make a lasting impact on Oklahoma.



Diane Lupke & Associates, Inc.

We are an economic development consultancy. We help you to see the opportunities ahead, overcome the challenges of a rapidly changes economy, and set a course on a sustainable path for your community. We specialize in industrial diversification and economic restructuring; talent development and entrepreneurship; and collaborative business networks. At Lupke, we believe there is no one solution to spur positive economic change. We develop customized strategies that advance local economies and reconnect them to the growth of the region. Lupke champions practical solutions for today that bring wealth for tomorrow



4045 NW 64th St Suite 405, Oklahoma City, OK 73116 email: info@uascluster.com www.uascluster.com



755 Research Parkway Suite 423, Oklahoma City, OK 73104 email: okcinnovation@gmail.com www.okcinnovation.com

Report published: August 2024