January 29, 2025

Advanced Air Mobility

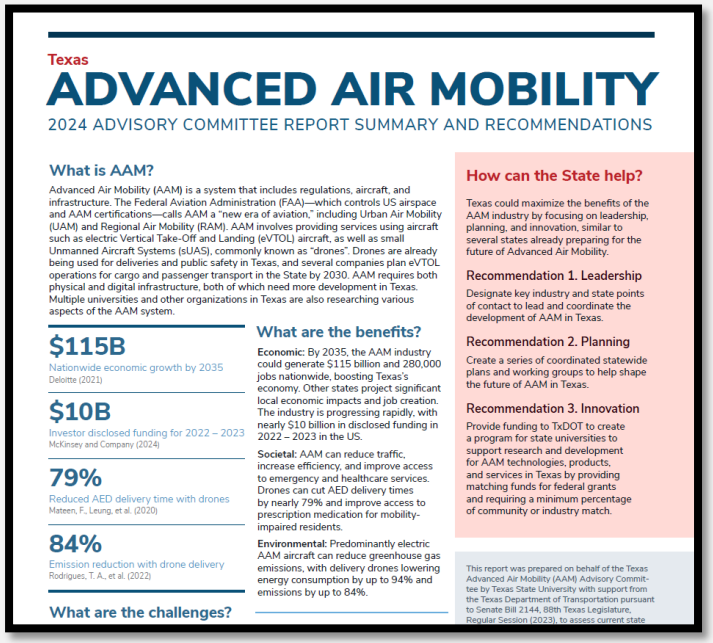
And the new Emerging Aviation Technology section

Emerging Aviation Technology Section

To safely and proactively integrate emerging aviation technologies into the Texas aviation system, fostering innovation, economic growth, and enhanced mobility while prioritizing safety, environmental responsibility, and collaboration with stakeholders. We look ahead to inform aviation planners what to plan for, and aviation engineers what to design for. Some of these technologies include:

- Advanced Air Mobility
- Vertiports
- Uncrewed Traffic Management
- Uncrewed Aircraft Systems
- Airport electrification
- Other emerging technologies

- Research
- Collaborations
- Grants and funding
- Outreach
- Project planning and mgmt



Texas

ADVANCED AIR MOBILITY

2024 ADVISORY COMMITTEE REPORT SUMMARY AND RECOMMENDATIONS

What is AAM?

Advanced Air Mobility (AAM) is a system that includes regulations, aircraft, and infrastructure. The Federal Aviation Administration (FAA)—which controls US airspace and AAM certifications—calls AAM a "new era of aviation," including Urban Air Mobility (UAM) and Regional Air Mobility (RAM). AAM involves providing services using aircraft such as electric Vertical Take-Off and Landing (eVTOL) aircraft, as well as small Unmanned Aircraft Systems (sUAS), commonly known as "drones". Drones are already being used for deliveries and public safety in Texas, and several companies plan eVTOL operations for cargo and passenger transport in the State by 2030. AAM requires both physical and digital infrastructure, both of which need more development in Texas. Multiple universities and other organizations in Texas are also researching various aspects of the AAM system.

$115B
Nationwide economic growth by 2035
Deloitte (2021)

$10B
Investor disclosed funding for 2022 – 2023
McKinsey and Company (2024)

79%
Reduced AED delivery time with drones
Mateen, F., Leung, et al. (2020)

84%
Emission reduction with drone delivery
Rodrigues, T. A., et al. (2022)

What are the challenges?

What are the benefits?

Economic: By 2035, the AAM industry could generate $115 billion and 280,000 jobs nationwide, boosting Texas's economy. Other states project significant local economic impacts and job creation. The industry is progressing rapidly, with nearly $10 billion in disclosed funding in 2022 – 2023 in the US.

Societal: AAM can reduce traffic, increase efficiency, and improve access to emergency and healthcare services. Drones can cut AED delivery times by nearly 79% and improve access to prescription medication for mobility-impaired residents.

Environmental: Predominantly electric AAM aircraft can reduce greenhouse gas emissions, with delivery drones lowering energy consumption by up to 94% and emissions by up to 84%.

How can the State help?

Texas could maximize the benefits of the AAM industry by focusing on leadership, planning, and innovation, similar to several states already preparing for the future of Advanced Air Mobility.

Recommendation 1. Leadership
Designate key industry and state points of contact to lead and coordinate the development of AAM in Texas.

Recommendation 2. Planning
Create a series of coordinated statewide plans and working groups to help shape the future of AAM in Texas.

Recommendation 3. Innovation
Provide funding to TxDOT to create a program for state universities to support research and development for AAM technologies, products, and services in Texas by providing matching funds for federal grants and requiring a minimum percentage of community or industry match.

This report was prepared on behalf of the Texas Advanced Air Mobility (AAM) Advisory Committee by Texas State University with support from the Texas Department of Transportation pursuant to Senate Bill 2144, 88th Texas Legislature, Regular Session (2023), to assess current state

TEXAS

ADVANCED AIR MOBILITY

Report and Recommendations of the Advanced Air Mobility Advisory Committee

Prepared for
The Texas Legislature

Prepared by
Texas State University

September 2024

Recommendation 1. Leadership

Designate key industry and state points of contact to lead and coordinate the development of AAM in Texas.

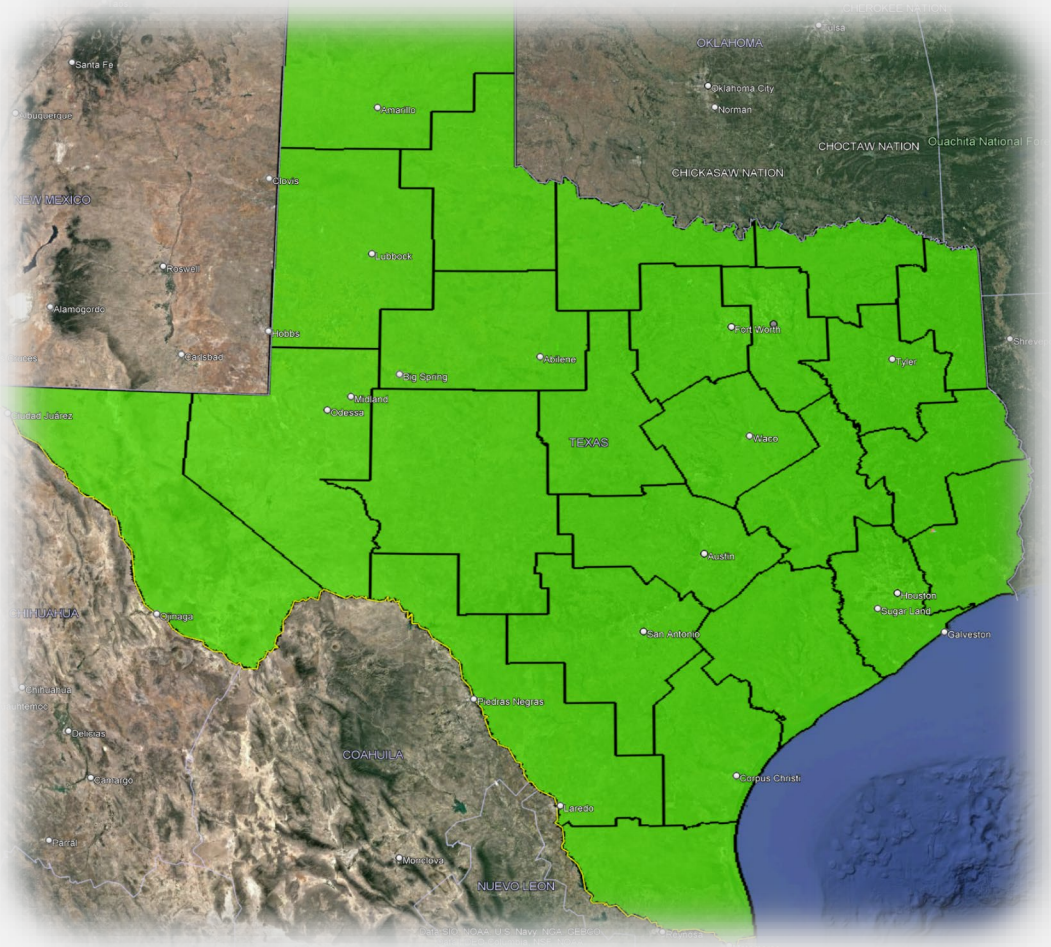
Recommendation 2: Planning

Create a series of coordinated statewide plans and working groups to help shape the future of AAM in Texas.

Recommendation 3. Innovation

Provide funding to TxDOT to create a program for state universities to support research and development for AAM technologies, products, and services in Texas by providing matching funds for federal grants and requiring a minimum percentage of community or industry match.

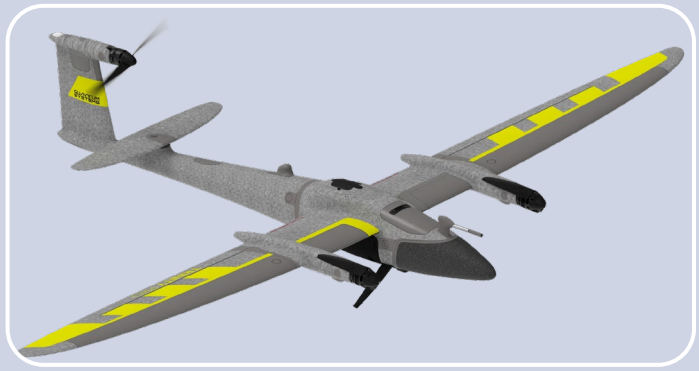
TxDOT UAS



- Integrating Drones into TxDOT's daily operations to increase safety, increase efficiency, and reduce costs.
  - All Districts and most divisions already have drones on hand for daily operations
  - All districts have Drone pilots in their districts. Many Divisions as well!
- Nationally recognized training program
  - 147+ pilots trained
  - Training 60 Pilots per year
- Successfully used for Planning, Inspection, Survey, Documentation, Emergency Response + more!
- The new way TxDOT will collect data in the field
  - Safer, Faster, and at a reduced cost! Remote sensing with drones and robots will be an everyday occurrence at TxDOT
- Supporting the Digital Twin and Digital Delivery initiatives
  - Drones will be used to create dense data models and maps of pre-construction through post construction conditions of projects. From change detection to real time monitoring, Drones will help digitize our infrastructure system.

The TxDOT Fleet

Skydio X10



Quantum Systems Trinity Pro

WISPR Ranger Pro

2025

43rd TEXAS AVIATION CONFERENCE

- May 5th – 8th
- Embassy Suites by Hilton Denton Convention Center

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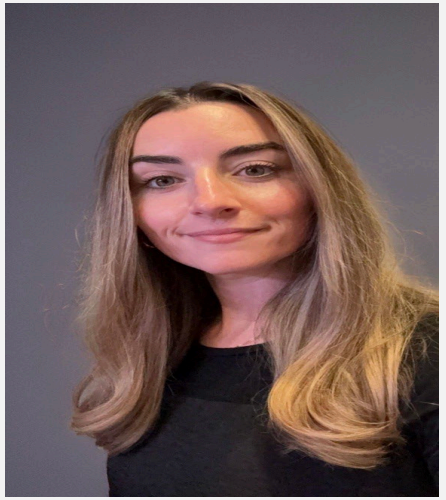

Emily Lambert
AAM Planning and integration
Emerging Aviation Technology
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Alice Coates, Founder and Mother Hen @ HATCHED Recruitment Group

HATCHED

Aerospace, Defense and VTOL Head-hunters

"Where STEM Talent Takes Flight"

The Hatched Story and Team

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Principal Aerospace and Defense Consultant
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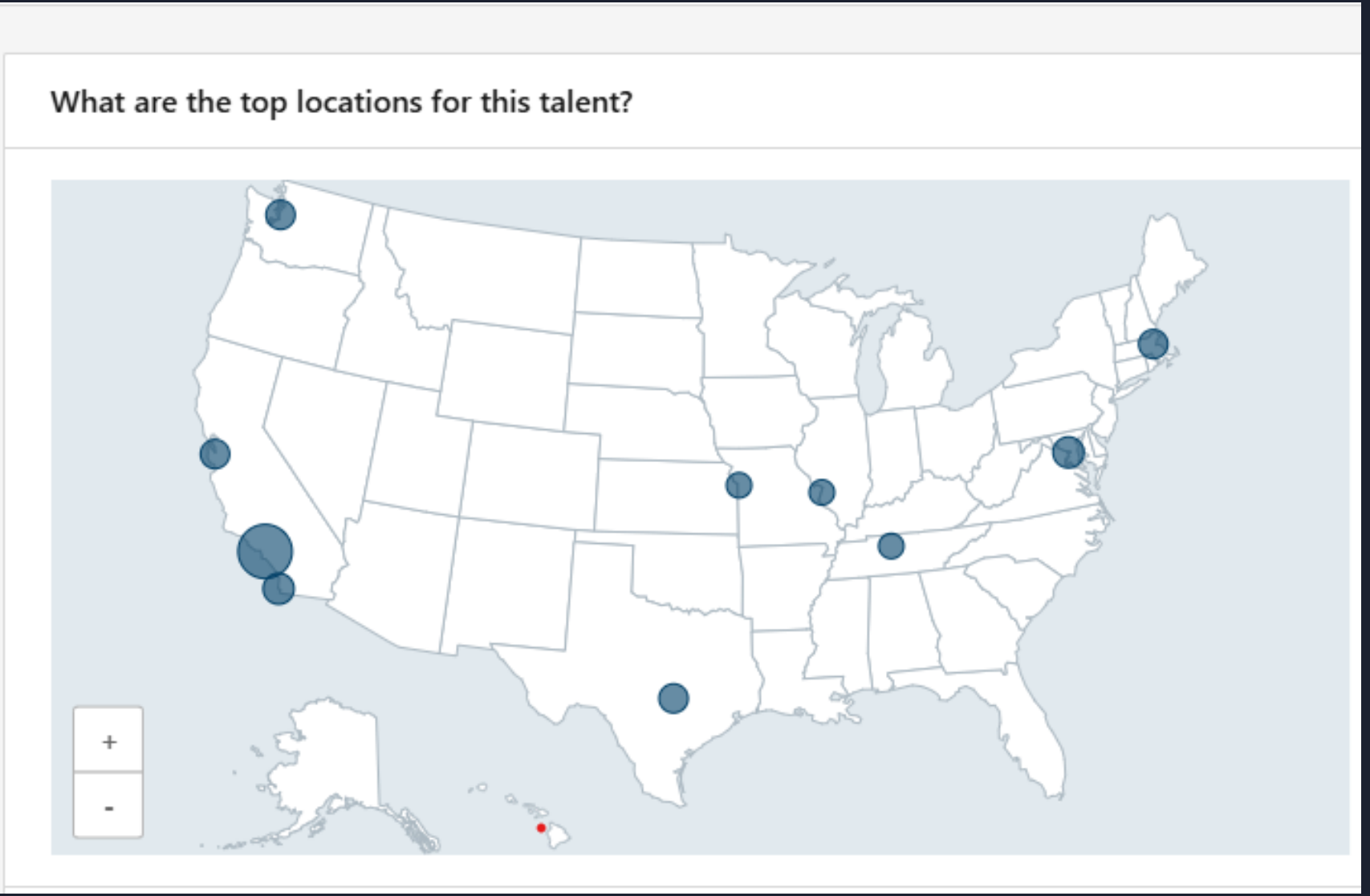
737 204 8180

Key Talent Acquisition Challenges for Emerging Aviation Technology

- Location of Talent and jobs
- Emerging aviation technology - Skills that are in demand
  - eVTOL
    - Electrification and challenges with battery storage
    - The trade off between EPU (electrical power unit) and battery density
    - Defense has a Preference for electrical power because its quiet
  - VTOL
    - UAV - Emerging innovation around Autonomous – how do you get this certified/ how do certifications keep up with innovation?
      - AI is very power hungry…
    - Hydrogen power ?

Top hiring trends

- Flight control (autonomous)
- AI for flight control (GNC)
- BMS (battery management systems) – specialist on how devices are turned on – manage power (transferable skills from Space)
- Airworthiness and Certifications – safety-critical
- Key hiring challenge is that most of these high demand skills rely on some in-office/in-lab requirements



Solutions for hiring

- Satellite offices/ relocate in/from European Hotspots – Germany, France, UK and Canada
- Acquire company with the expertise
- Hiring junior and rigorous training program
- Excellent talent partners who can map out an entire pool – ensure an excellent message to market, become a destination employer

What are the top locations for this talent?

Recommendations for job seekers

- Write your resume ensuring keywords are included – don't assume knowledge
  - Hiring managers may understand but most recruiters will just search for keywords and phrases – make your resume idiot-proof!
  - Keep up with the news! Companies that are making breakthroughs are generally always growing, even if they're not advertising
  - Include whether you've worked for Primes, OEMs, Tier Suppliers, VE or PE backed start-ups firms and at what stage
  - Career highlights, hook them into reading the rest of your resume in detail
    - How, what why you did/ achieved what you did.
    - What direct impact did you have?
    - Then quantify this.
    - Reach out to hiring managers directly

Questions?

I don’t know why the chicken crossed the road….

Advanced Technology Initiatives

Emerging Aviation Technology Center

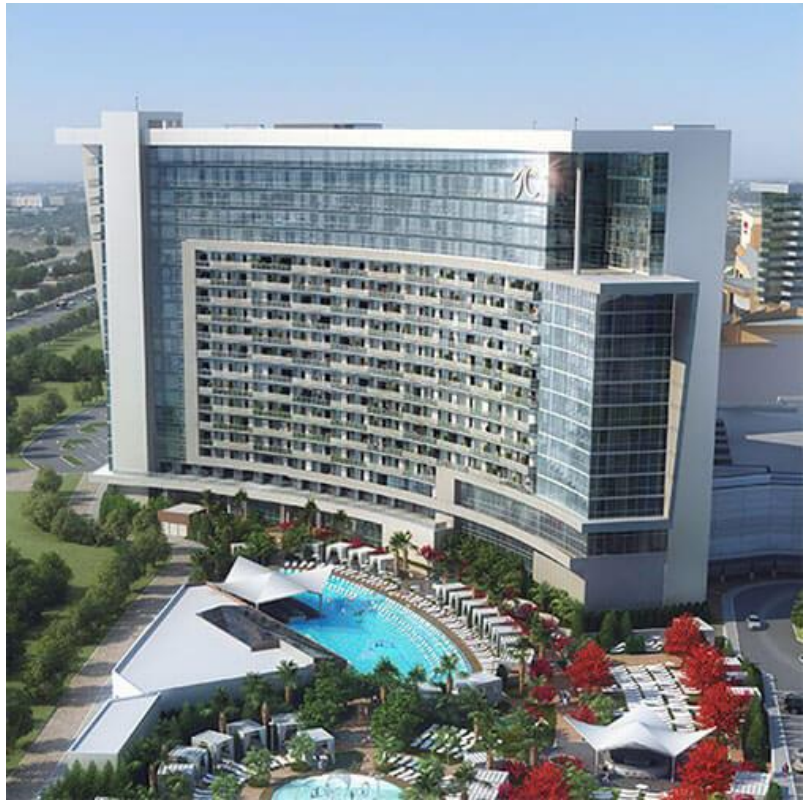
The Choctaw Nation of Oklahoma

The Choctaw Nation consists of 10½ counties in the southeastern part of Oklahoma. The Choctaw Nation is bounded on the east by the State of Arkansas, on the south by the Red River, on the north by the South Canadian, Canadian and Arkansas Rivers. The western boundary generally follows a line slightly west of Durant, then due north to the South Canadian River.

Choctaw Ranch is:

- 135 miles to Plano, TX
- 115 miles to Tulsa, OK
- 118 miles to Ft. Smith, AR
- 150 miles to Oklahoma City, OK
- 155 miles to DFW Airport

THE CHOCTAW NATION



FAA Program History

- May 2018: Choctaw Nation of Oklahoma selected as only tribal government to participate in the FAA UAS Integration Pilot Program (IPP).

- October 2020: Choctaw Nation started the FAA BEYOND program as the UAS IPP ended. BEYOND program is 4 years.

- October 2024 and the future: Congress has made the program permanent and has expanded the authority of the BEYOND sites.

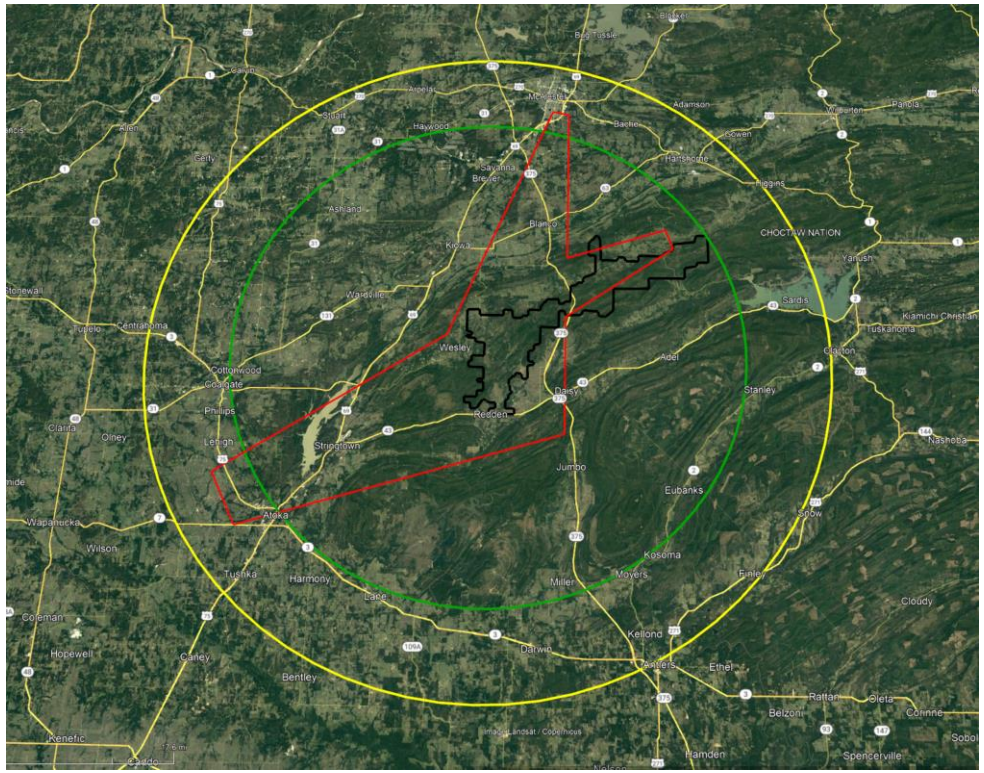
Choctaw Nation Selected to Participate in FAA Drone Program Known as UASIPP

by STACY HUTTO

Chief Gary Batton and representatives from the City of San Diego, California; Innovation and Entrepreneurship Investment Authority, Herndon, Virginia' Kansas Department of Transportation, Topeka, Kansas; Lee County Mosquito Control District. Ft. Myers, Florida; Memphis-Shelby County Airport Authority, Memphis Tennessee; North Caroline Department of Transportation, Raleigh, North Carolina; North Dakota Department of Transportation, Bismarck, North Dakota; The City of Reno, Nevada; and the University of Alaska –Fairbanks, Fairbanks, Alaska learned they had been chosen for the initial Unmanned Aircraft Systems, or drone, Integration Pilot Program, or UASIPP, when U.S. Transportation Secretary Elaine L. Chao made the announcement on Wednesday, May 9.

Choctaw Nation of Oklahoma Emerging Aviation Technology Center

- The test range is 25 miles long and can support a variety of testing scenarios for emerging aviation technology such as safe beyond visual line of sight (BVLOS) operations of unmanned aircraft and rapid access to flight testing for electric vertical take-off or landing (eVTOL) systems.
- CNO is making considerable investments in infrastructure (buildings, landing facilities, ground-based radar, communications links, etc.) to support a variety of test activities.
- The CNO was the only tribal government selected to participate in the Federal Aviation Administration (FAA) UAS Pilot Program (UASIPP) and is the only tribal government participating in the follow-on FAA BEYOND program.



Red outline:
–BVLOS corridor
Black outline:
– Ranch Boundary
Green and Yellow
– Radar coverage

Emerging Aviation Technology Center Complex

Launch Point Achvffa (01)

Achvffa

- Phase 0 site that started operations
- 2 30ft UAS launch pad
- 50ftx50ft helicopter landing pad
- On-site lodging
- 70ft tower with radio mounting locations
- Power, water, and bathroom facilities

Launch Point Tuklo (02)

Tuklo

- Expansion to phase 0 site
- 50ftx50ft fiber reenforced UAS launch pad with no metal
- Weather station with lidar ceilometer
- Optional access to CS1with storge, meeting space, and control room
- Power avalible

Launch Point Tuchina (03)

Tuchina

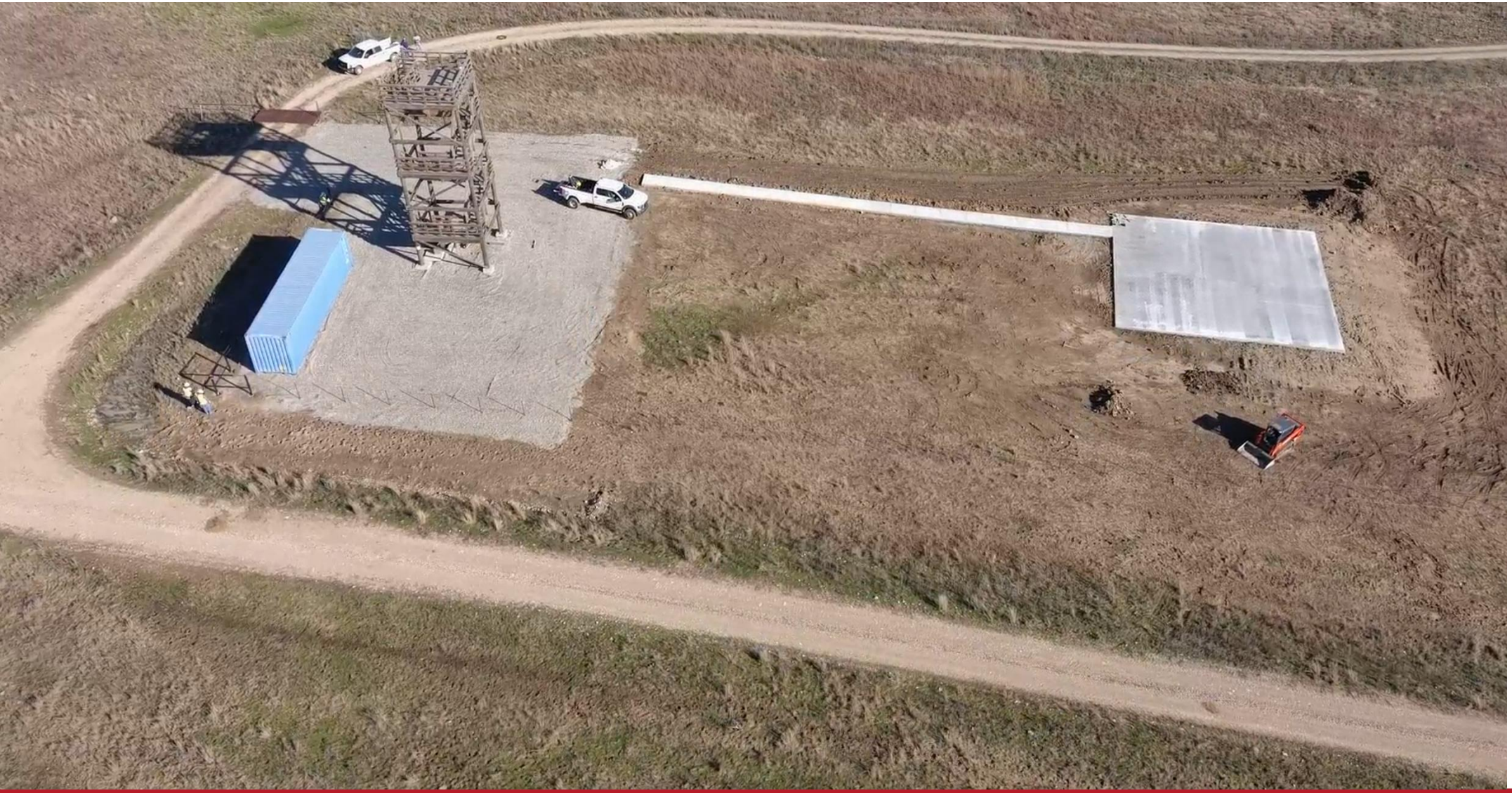
- 640ft x 60ft fabric UAS runway
- 2 30ft Drone launch pad
- 29ft toy-hauler camper with control room, power, and bathroom

Launch Point Ushta (04)

Ushta

- Located at the Operations Center
- 30ft UAS launch pad
- Classroom space, bathrooms, breakroom, high bay working space available

Launch Point Tahlapi (5)



Tahlapi

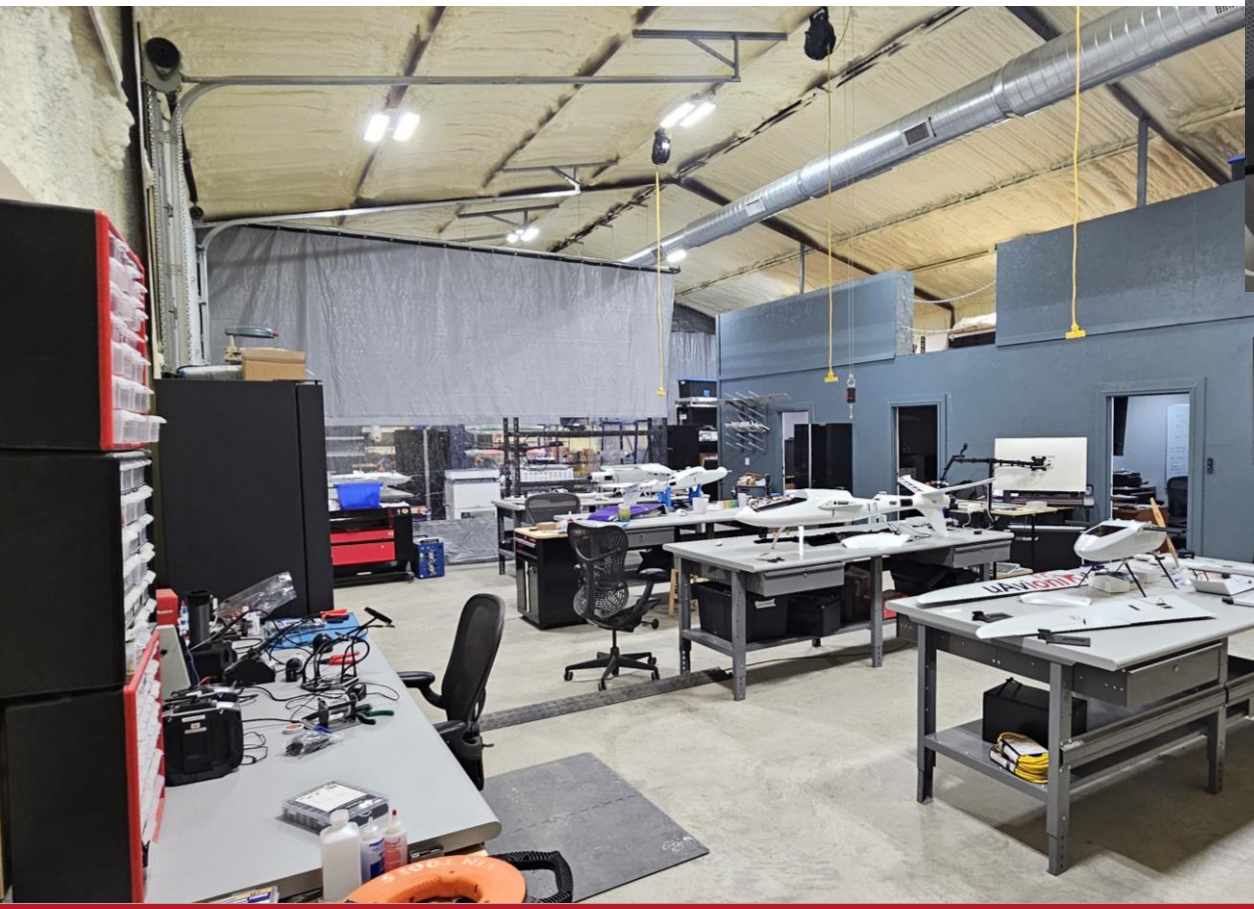
- Remote auxiliary launch point
- 50ftx50ft fiber reenforced UAS launch pad with no metal
- 45ft tower with radio mounting locations
- Power available via solar and generator

BVLOS Airspace Mitigations

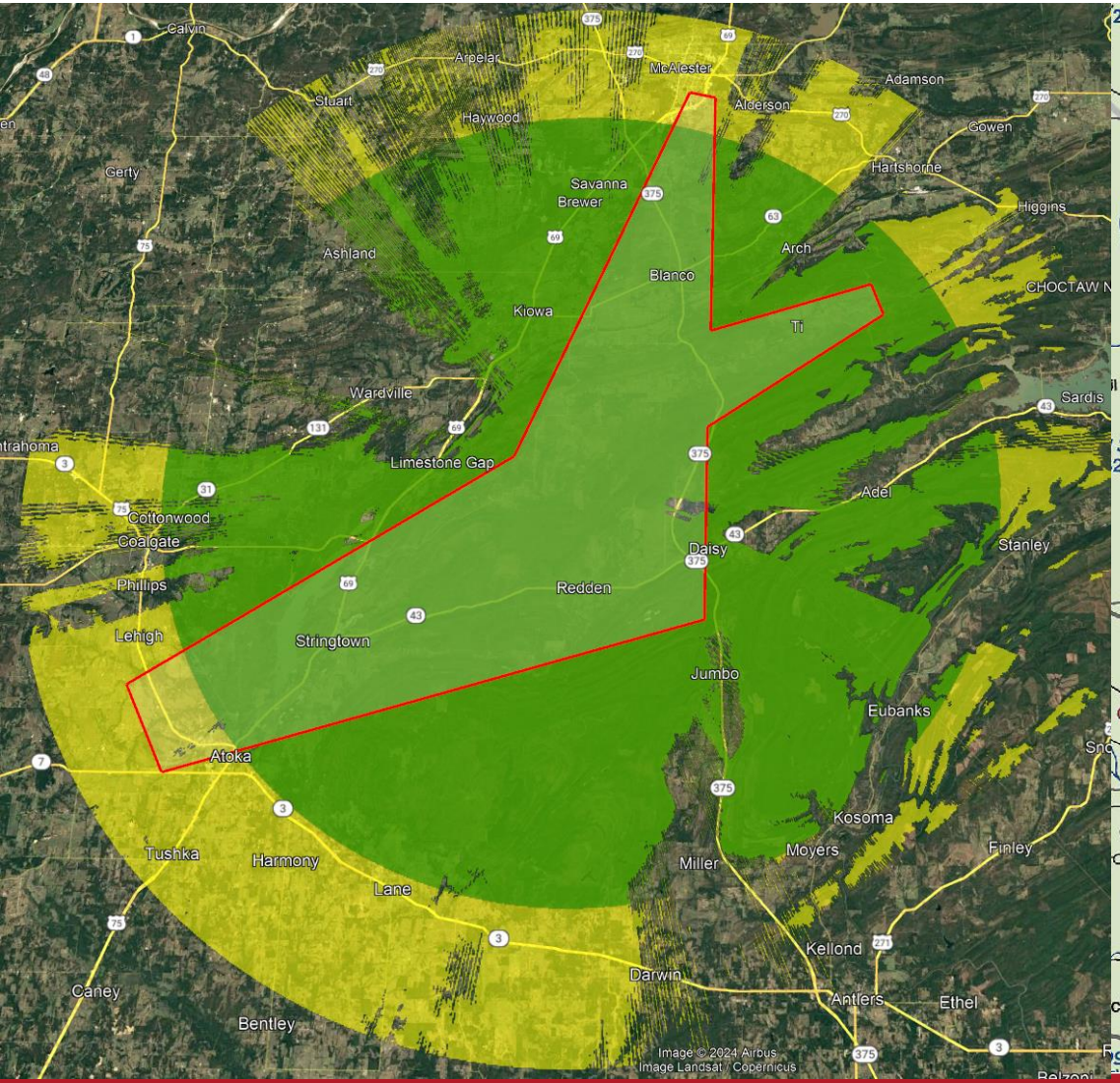
- 2D doppler shift Detect Harrier radar system
- 3D Fortem phased array radar system
- Network of Ground-Base ADS-B receivers

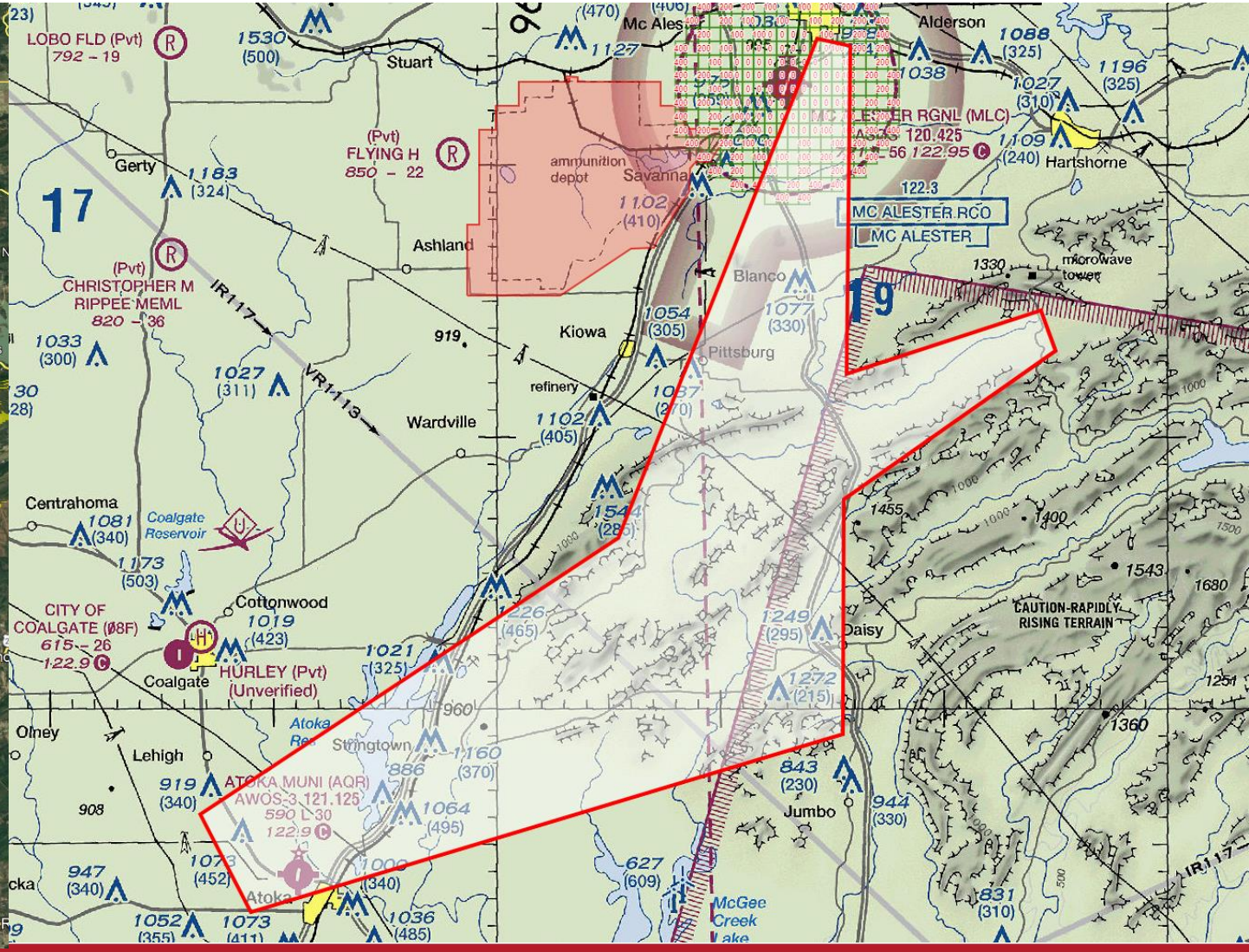
Emerging Aviation Technology Center Operation Control Rooms

Emerging Aviation Technology Center Advanced Prototyping

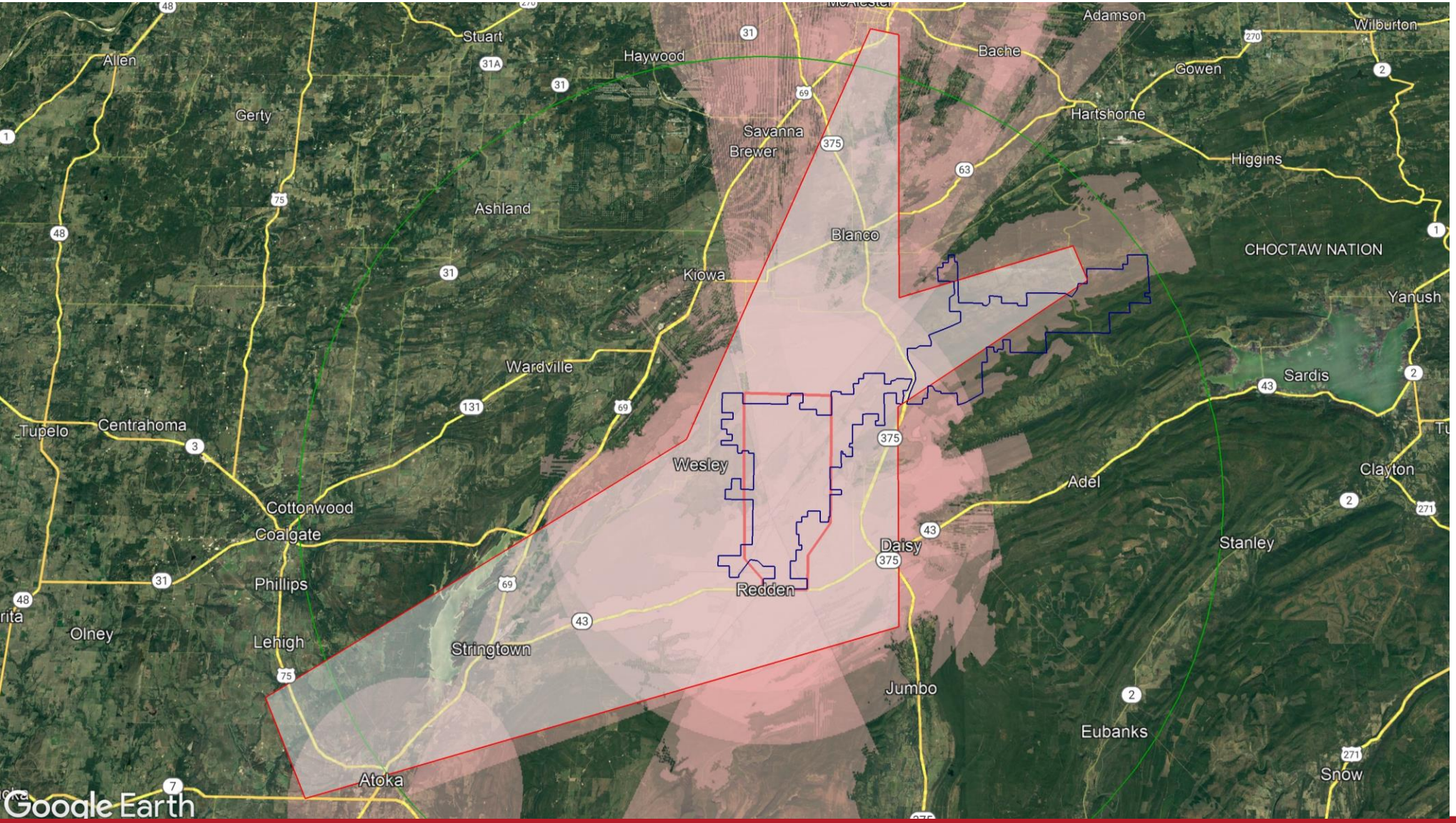


Emerging Aviation Technology Center 3,500ft BVLOS Airspace





Emerging Aviation Technology Center Command and Control Network

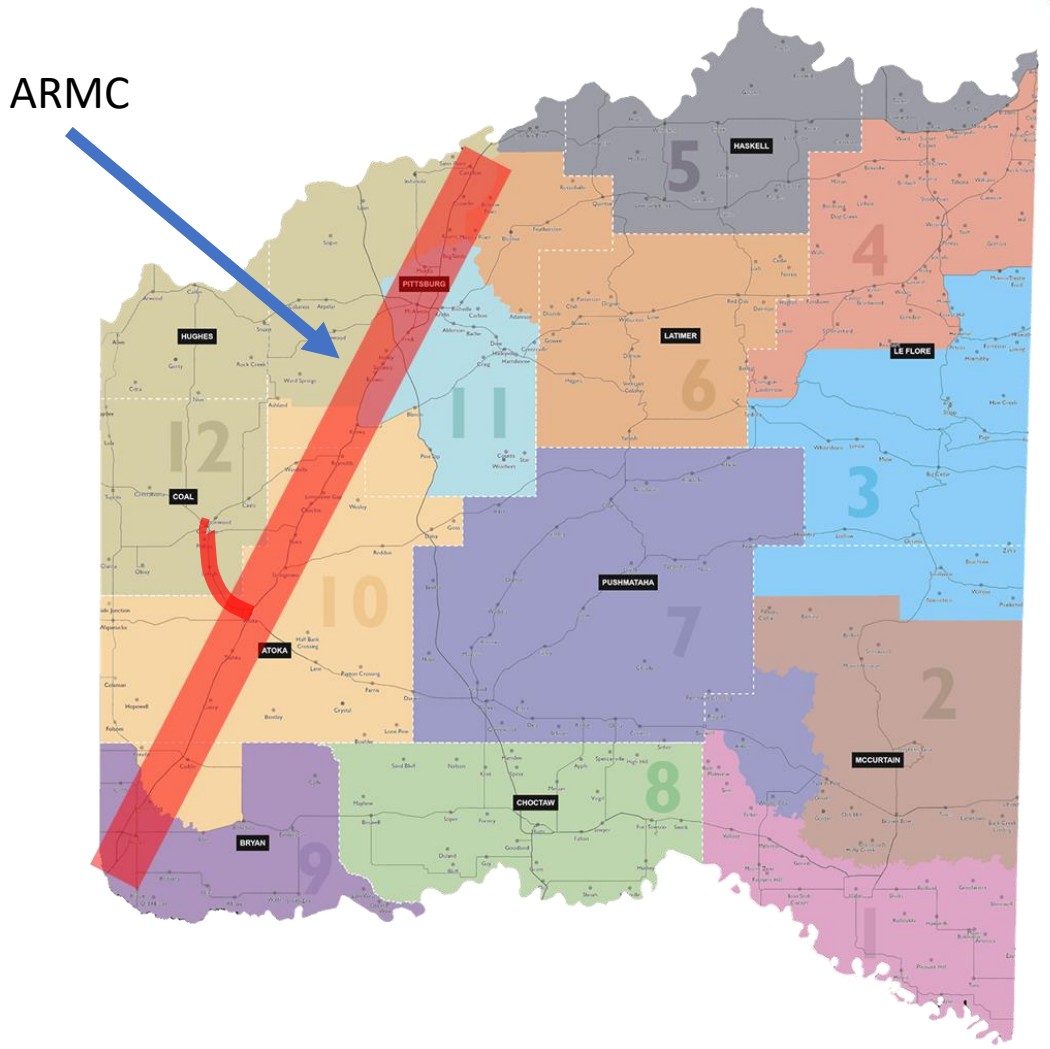


Radio Network

- Aviation Protected Upper C-Band
- S-Band
- L-Band
- Lower C-Band
- ISM

CNO Portion of Advanced Regional Mobility Corridor (ARMC)

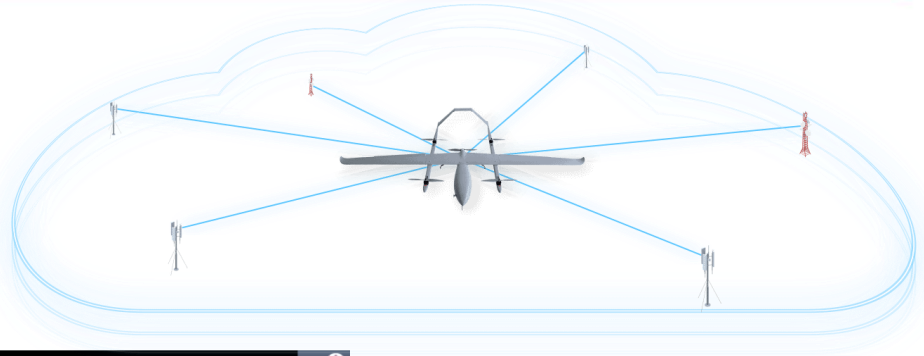
- The CNO portion of the ARMC will follow the U.S. Highway 69 multimodal freight corridor and link the cities of McAlester, Atoka and Durant.
- Corridor will leverage existing airports at each of the three cities, the existing rail service parallel to Hwy 69, and the Hwy 69 National Freight Corridor.
- The AMRC is just west and parallel to the Choctaw Nation's Emerging Aviation Technology Center (EATC) test site.
- CNO is working to build out infrastructure (radar, ADS-B receiver networks, C2 systems, etc.)



True Beyond Visual Line of Sight (BVLOS) without visual observers

Operations Trailer for Remote BVLOS Operations, STE(A)M, Etc.

Skyline- Airspace Awareness Tool



Red Area:
BVLOS Corridor

Green Ring:
18nm High confidence Radar Range

Yellow Ring:
24nm Extended Radar Range

Blue Dots:
Radar Targets

Yellow Planes:
ADS-B Targets

Yakoke!

(“Thank You”!)

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