



NAC Aeronautics Committee Report

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Member, NAC Aeronautics Committee
Marshall Space Flight Center
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Aeronautics Committee Membership

Dr. John-Paul Clarke, Chair
University of Texas at Austin

Mr. Peter Bunce
General Aviation Manufacturers
Association

Dr. Todd Citron
The Boeing Company

Mr. Jay Dryer
Office of the Secretary of Defense

Ms. Lisa Ellman
Commercial Drone Alliance

Dr. Nicole Key
Purdue University

Mr. Billy Nolen
Archer

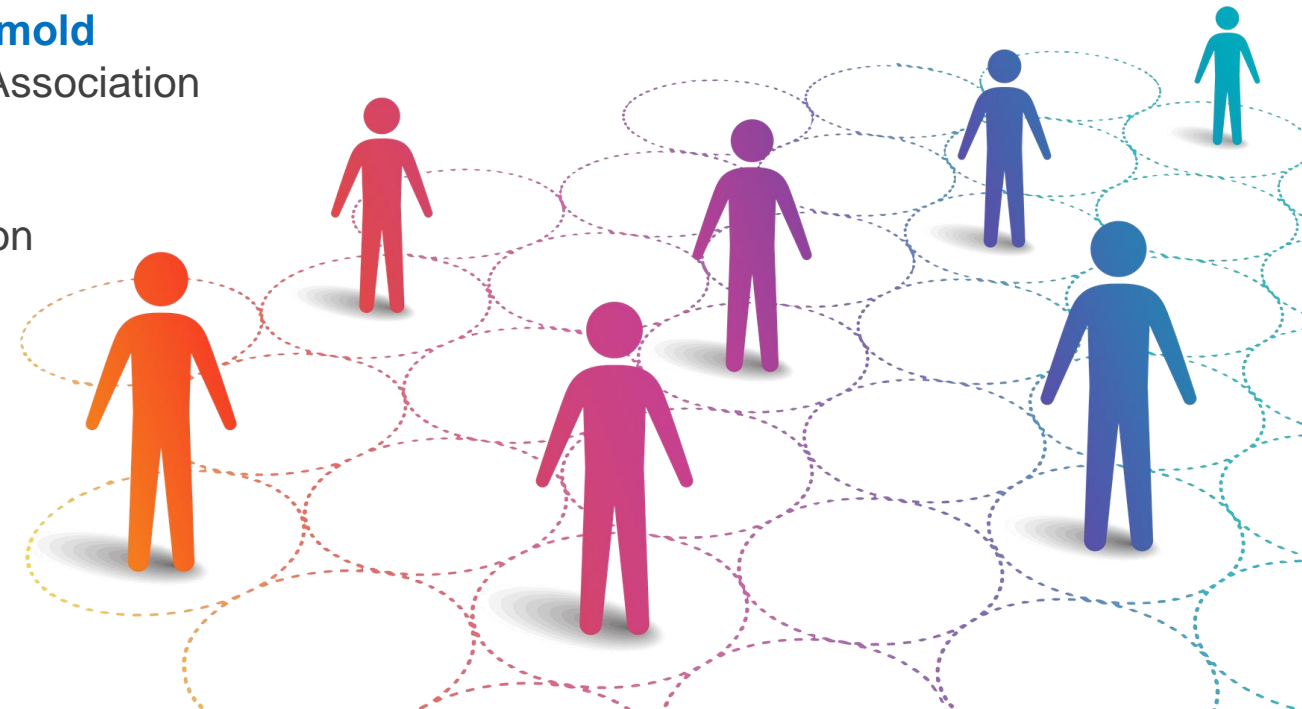
Ms. Susan Pfingstler
JetBlue

Dr. Helen Reed
Texas A&M University

Ms. Dorothy “Di” Reimold
Aerospace Industries Association

Dr. Hassan Shahidi
Flight Safety Foundation

Dr. Michael Winter
Pratt & Whitney





The NAC Aeronautics Committee met in June at the DFW Department of Public Safety



Topics Discussed

- NASA-FAA Coordination on Future of AAM
- UTM Beyond Visual Line of Sight - FAA/Industry Key Site Operations
- Sustainable Flight National Partnership Operations Demonstrations in North Texas (Dallas-Ft. Worth and Houston)

Given its prior leadership and valuable expertise, NASA has been called in to inform the development of necessary technologies and establishment of the supporting framework to enable progress toward routine BVLOS operations supported by UTM services and related functions.

— Highlighting Two Transformations for a Future Airspace

Digital service-oriented framework to enable increasingly safe and sustainable operations for today and the future airspace system



Digital Services for Sustainable Aviation



Routine, safe, and extensible BVLOS operations in low altitude airspace enabled through the formalization and operationalization of ground-based services





SFNP Operational Demo for Departure Rerouting Partners and Tour Locations

DFW ATCTs

envoy
Envoy HQ

D10 TRACON

W ATCT

2 **Monitor**
Demand & Capacity

3 **Present**
Candidate TOS

DAL DFW

System continuously

North Texas Research Station

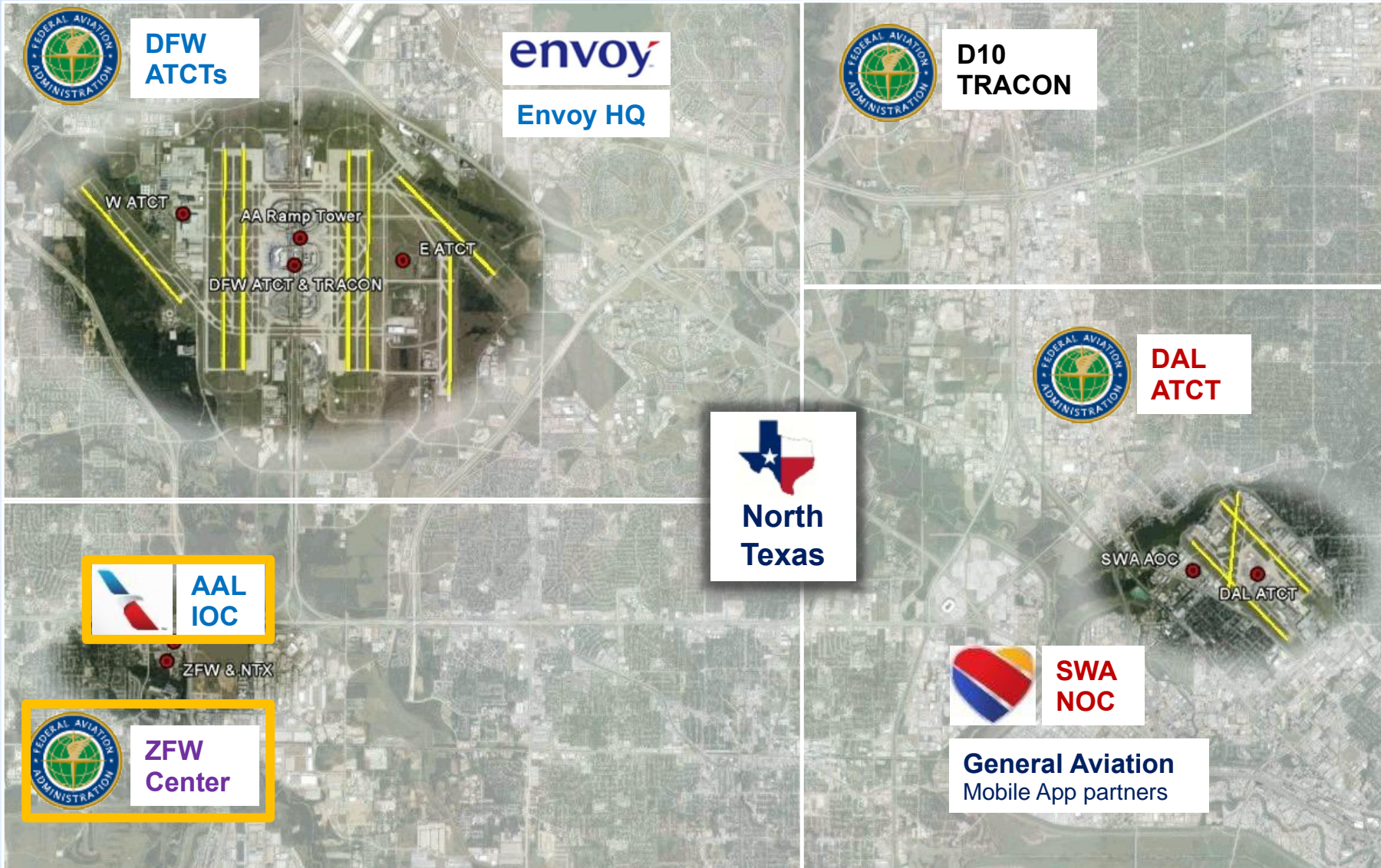
The NASA/Federal Aviation Administration (FAA) North Texas Research Station (NTX) is a field laboratory with unique capabilities to enhance the development, evaluation, and transition of advanced concepts and technologies for air traffic management (ATM) research. NTX represents more than 29 years of collaboration with the FAA on ATM research and technology transfer. The facility enables strong collaboration with the FAA, flight operator, and airport operator partners in the DFW metroplex.

This facility was instrumental in developing and field testing the demand/capacity algorithms and machine learning predictive services at the core of CDDR.

AAL IOC

ZFW Center

SFNP Operational Demo for Departure Rerouting Partners and Tour Locations



The operational demo included many partners across multiple FAA facilities as well as both American Airlines and Southwest Airlines Operations Centers.

The tours focused on a demonstration at the **NASA North Texas Facility** located on the campus of **Fort Worth Center (ZFW Center)** and **American Airlines Integrated Operations Center (IOC)**.

— Critical Commitment for a Future Airspace

Digital service-oriented framework to enable increasingly safe and sustainable operations for today and the future airspace system



Digital Services for Sustainable Aviation



In support of the US Aviation Climate Action Plan, introduce aircraft operations technologies that can reduce emissions by 2% throughout the National Airspace System by developing, validating, and transferring a service-oriented architecture that enables digitally auto-negotiated optimum trajectories for gate-to-gate flight paths with consideration of pre- and post-flight events. (2032)

Integrated Advanced Air Mobility Portfolio

Concepts

System Engineering
& Integration

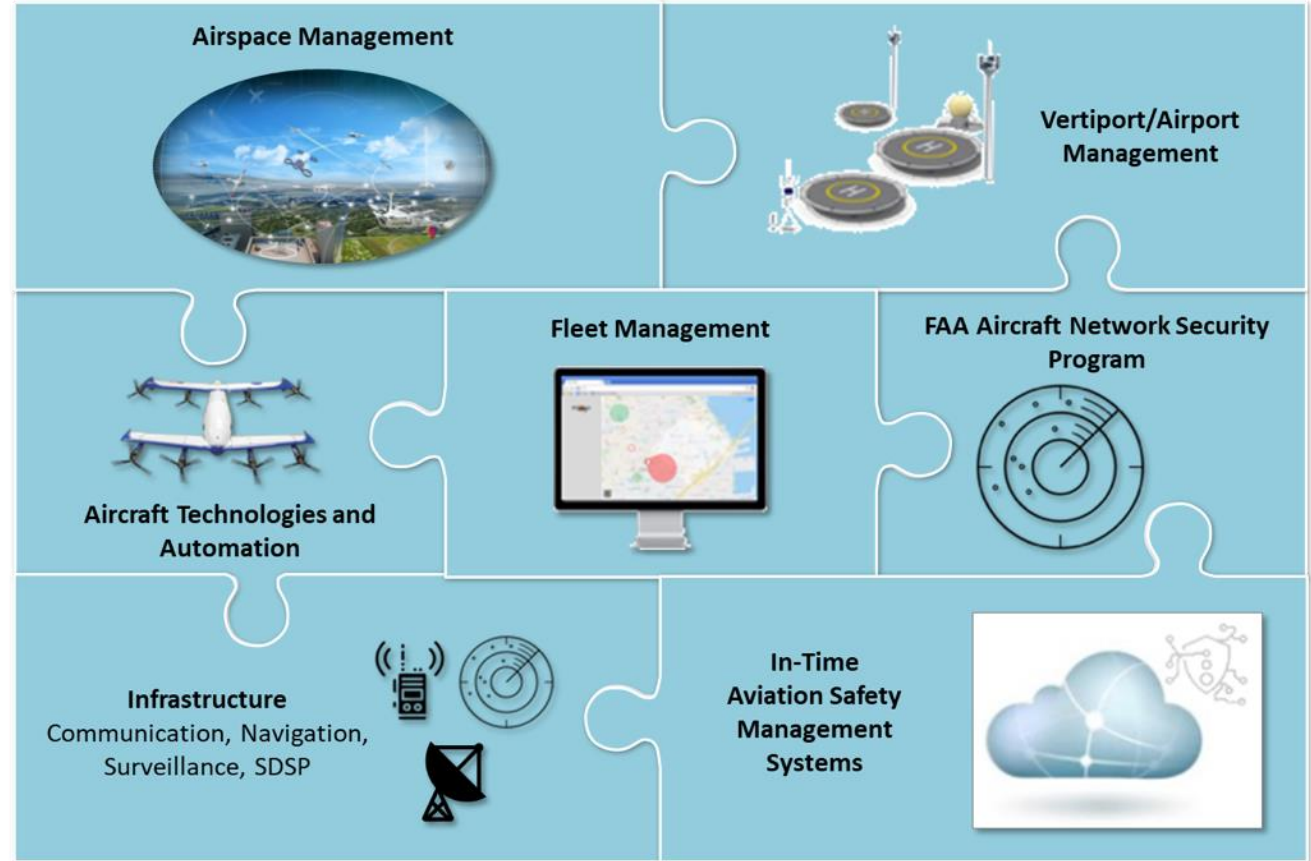
Deliver reference architecture(s), and integrated requirements...



...validated by data from the research, development, and testing of automation prototypes.

Flight
Operations

Airspace
Operations



Resulting **architecture(s)** will support safe, secure, and scalable Urban Air Mobility operations.



UTM BVLOS Key Partnerships



NASA

Cooperation with NASA sister projects to identify common needs and opportunities



Industry

Work closely with Operators and Service Providers at Key Site and beyond



FAA

Cooperation to inform rulemaking and alignment across activities



Public Safety

Account for the unique needs and priorities of PS community



Key Site

Close collaboration with local entities to support persistent BVLOS ops



Standards

Broad, dedicated engagement with standards organizations to ensure progress and impact



Wing

Meet the drone

Wing

The members

Delivery Dis
6 m
Carries

Key Site activities in North Texas will pave the way for future AAM operations by creating an operational mechanism to enable third party services and chart a collaborative path to enabling routine new entrant operations

UTM BVLOS

Sets the Stage for Future
Advanced Air Mobility
Operations



Unmanned Aircraft Systems Traffic Management Key Site Operations

1. The Committee finds there is a need to address the issue of **crewed aircraft that are not equipped with ADS-B** or do not have electrical systems as it pertains to enabling UTM.
 - Though drones are equipped with Detect-and-Avoid capabilities, the full value of commercial drones cannot be unlocked without a way to incentivize aircraft equipage across the National Airspace System. NASA could consider whether it could in the near term (i.e., relative to the timeline of proposed rulemaking) **inform effective low-cost solutions to make unequipped aircraft more conspicuous.**
2. The Committee finds that NASA has an opportunity to **inform policy decisions and tradeoffs** on the risks and opportunities for future airspace management through its work in North Texas.
 - By creating a **digital twin of the airspace** using gathered data and injecting new situations, NASA could quantify these risks and identify further opportunities to provide capabilities.

Unmanned Aircraft Systems Traffic Management Key Site Operations continued

3. The Committee finds that the current approach NASA is taking in the UTM BVLOS effort alongside the FAA and industry is excellent and commends the management team for its engagement and support.

- The Committee observed multi-party BVLOS flight operations in North Texas and received presentations from NASA demonstrating great progress and value.

4. The Committee finds value in furthering the **coordination between various advisory committees** between NASA and other agencies.

- Having this connective tissue can help leverage the strength of collaborative relationships and advance the pace of UTM.

Findings from NTX Meeting in June 2024 (3 of 3 slides)

Sustainable Flight National Partnerships Operations in North Texas

1. The Committee finds there is value in NASA understanding the benefits of its sustainable aviation portfolio from a time value perspective.
 - The various activities in the NASA sustainable aviation portfolio will provide benefits at different times. Earlier benefits have non-linear impact with respect to tackling the climate change challenge. **Understanding the relative benefits of different activities would be instrumental in better understanding the return on investment.**



Backup

2024 NAC Aeronautics Committee Work Plan

SPRING	SUMMER	FALL
Committee Ethics Training	NTX	AAVP Strategic Assessment
ARMD FY25 Budget Overview	BVLOS	AACES 2050 awards
TACP/CAS/UI Workforce Efforts	AAM Vision for FAA Deliveries	EPFD
NASA 2040		ATM – CNS workshop

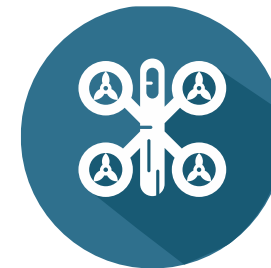
March 13, 2024 (HQ)



June 25-26, 2024 (NTX, Dallas, TX)



November 20, 2024 (HQ)



Acronyms

- AAIOC - American Airlines Integrated Operations Center
- AAM – Advanced Air Mobility
- AAVP – Advanced Air Vehicles Program
- AACES – Advanced Aircraft Concepts for Environmental Sustainability
- ADSB – Automatic Dependent Surveillance Broadcast
- ARMD – Aeronautics Research Mission Directorate
- ATCTs – Air Traffic Control Tower(s)
- ATM – Air Traffic Management
- BVLOS – Beyond Visual Line of Sight
- CAS – Convergent Aeronautics Solutions
- CDDR – Collaborative digital departure rerouting
- CNS – Communication, Navigation Surveillance
- DAL – Dallas Love Field Airport
- DFW – Dallas/Ft. Worth
- EPFD – Electrified Powertrain Flight Demonstration
- FAA – Federal Aviation Administration
- NAS – National Airspace System
- NTX – North Texas Research Station
- SFNP – Sustainable Flight National Partnership
- SDSP – Supplemental data service provider
- SWAOC – Southwest Airlines Operations Center
- TRACON – Terminal Radar Approach Control
- TACP – Transformative Aeronautics Concepts Program
- UI – University Initiative
- ZFW Center – Fort Worth Center