NASA AAM Mission Update for the ARTR

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April 26, 2022

Thank You, ARTR!

The NASA AAM team thanks the ARTR for their contributions towards NASA's advancement on AAM!!!

A few highlights include:

- UAM Market Studies
- Grand Challenge and then National Campaign strategy and objectives
- Creation of robust industry and government partnership strategy
- And many others including "rifle shots", noise noise noise, map out the automation dependencies, solve the fire problem, etc.

Overview

- NC and Airspace Portfolio Updates (30 mins)
- Partnerships (15 mins)
- Roundtable Member Discussion (45 mins)

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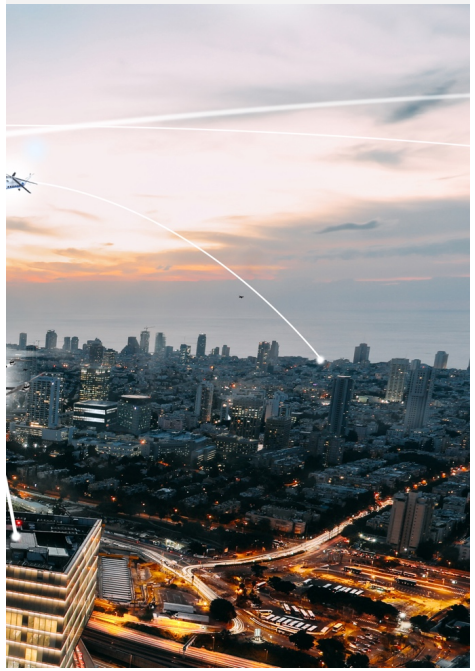
NASA Role to Address AAM Challenges

Vehicle Development and Operations

Airspace Design and Operations

Community Integration



NASA and key partners are collectively taking on the most difficult mission challenges to enable industry to flourish by 2030

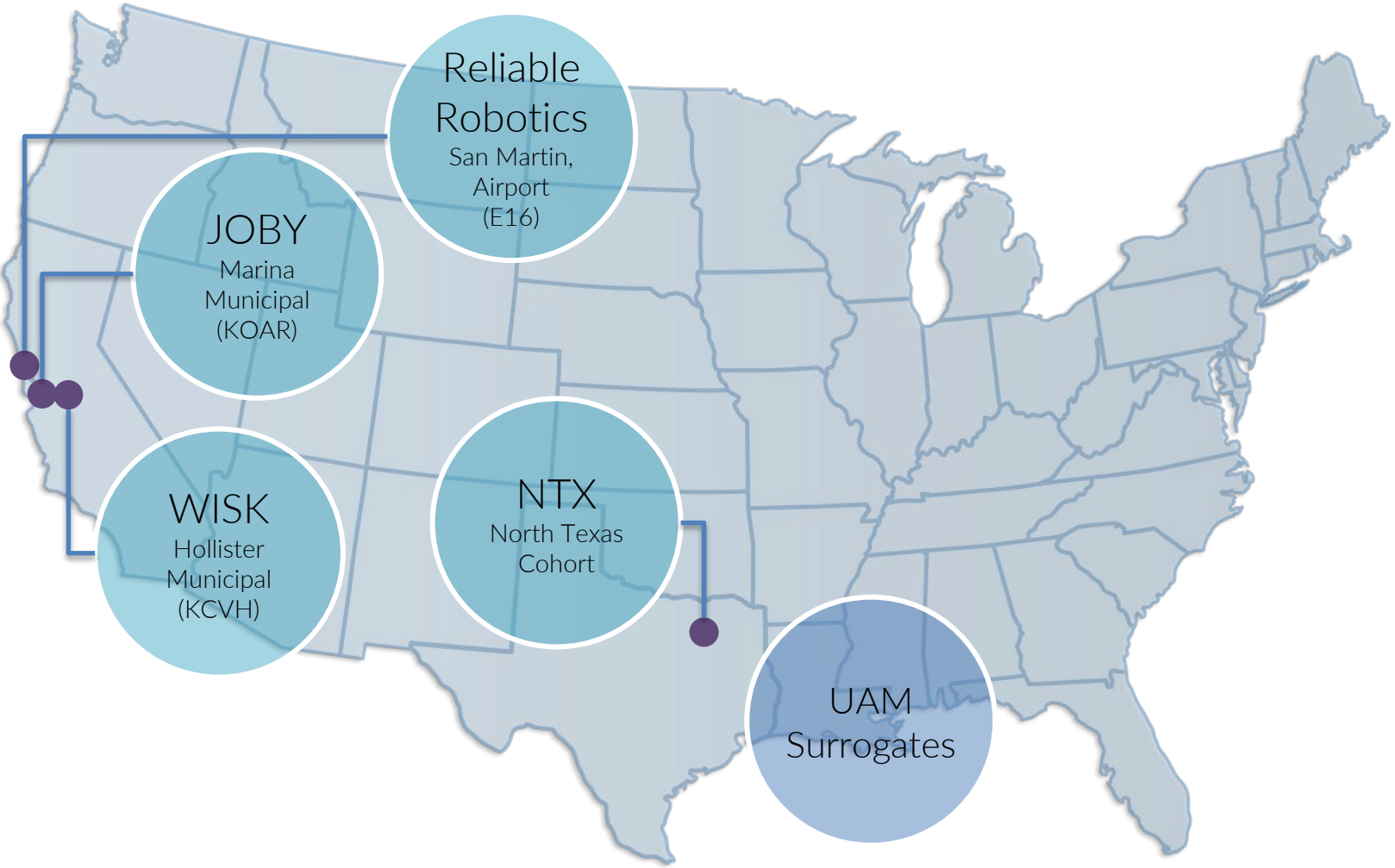
- **Research and Development Portfolio**
- **Robust Ecosystem Partnerships**
- **AAM National Campaign Series**

NASA will deliver long term technical solutions through concept, requirement and architecture development for industry and the regulatory community

The AAM North Stars

- Automation
- Airspace
- Safety
- Noise

NC-1 Objectives and Partnerships



1 **Accelerate Certification and Approval**

- UAM Surrogate
- Joby Piloted - Urban Ops

2 **Develop Flight Procedure Guidelines**

- UAM Surrogate
- Joby Piloted - Urban Ops

3 **Assess Infrastructure & CNS Trade Space**

- Wisk Cohort - Automated Urban Ops
- NTX Cohort - Urban Ops
- Reliable Robotics - Regional Ops

4 **Demonstrate an Airspace Management Architecture**

- UAM Surrogate
- Wisk Cohort - Automated Urban Ops
- NTX Cohort - Urban Ops

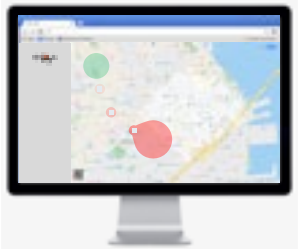
5 **Identify Community Considerations**

- Wisk Acoustics Test

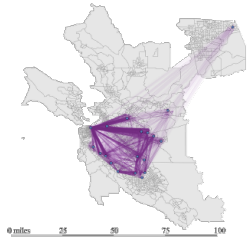
Moving Towards an Increasingly Automated Future

Assurance

Fleet Management and Vehicle Supervisors



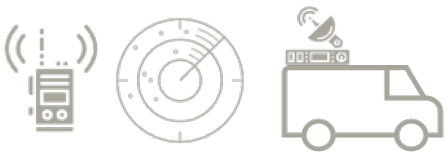
Airspace Management Architecture and Services



Safety Management Systems

Relevant Test Environment
(NC-Integration of Automated Systems, NC Ops Demos)

Aircraft Technologies and Automation

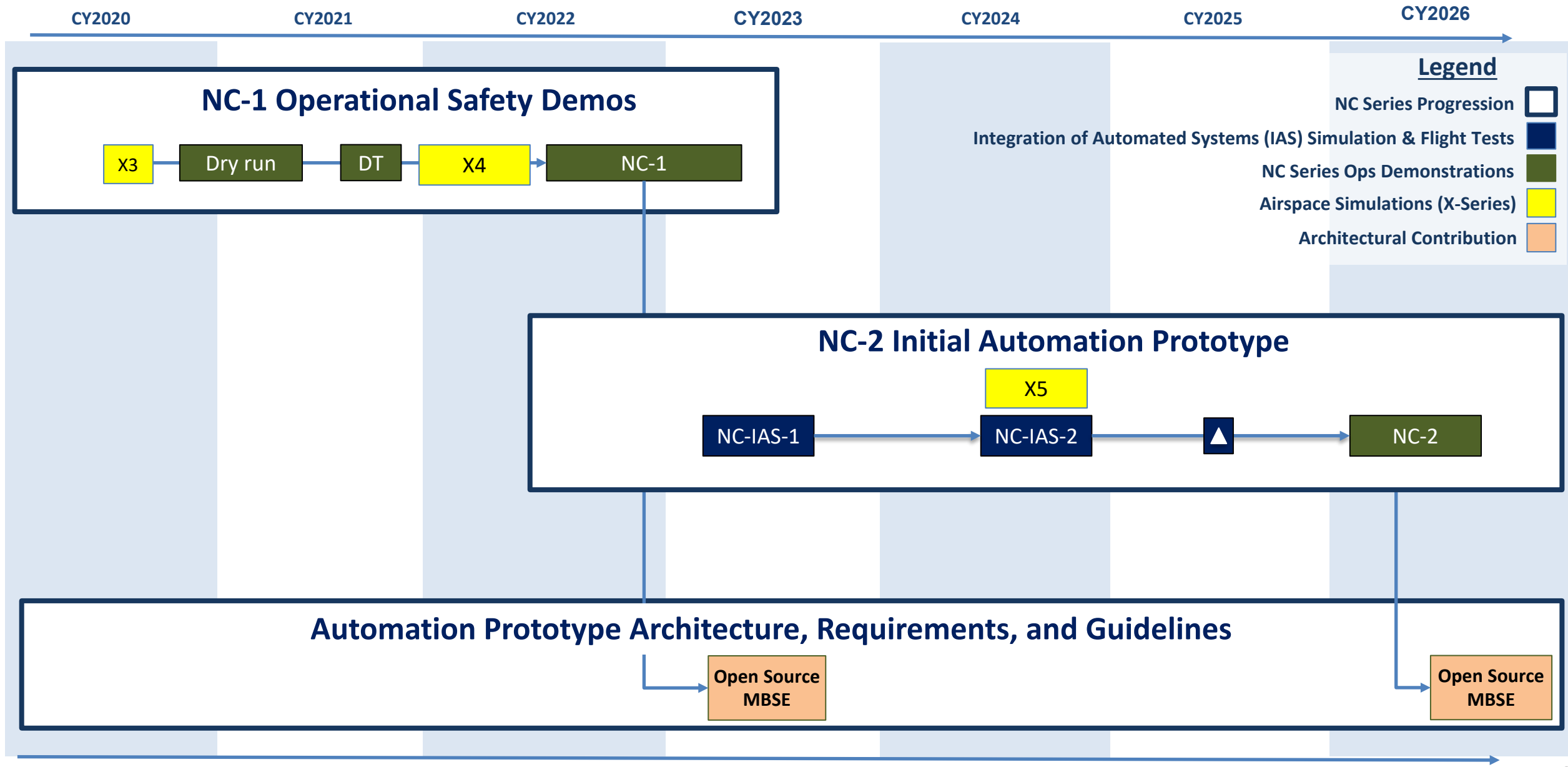


Communication, Navigation, Surveillance, Information

Vertiport/Airport Management

NASA's role emphasizes an enterprise approach towards assessing automated architectures and recommending requirements

Notional Schedule for Reference AAM Automation Architecture



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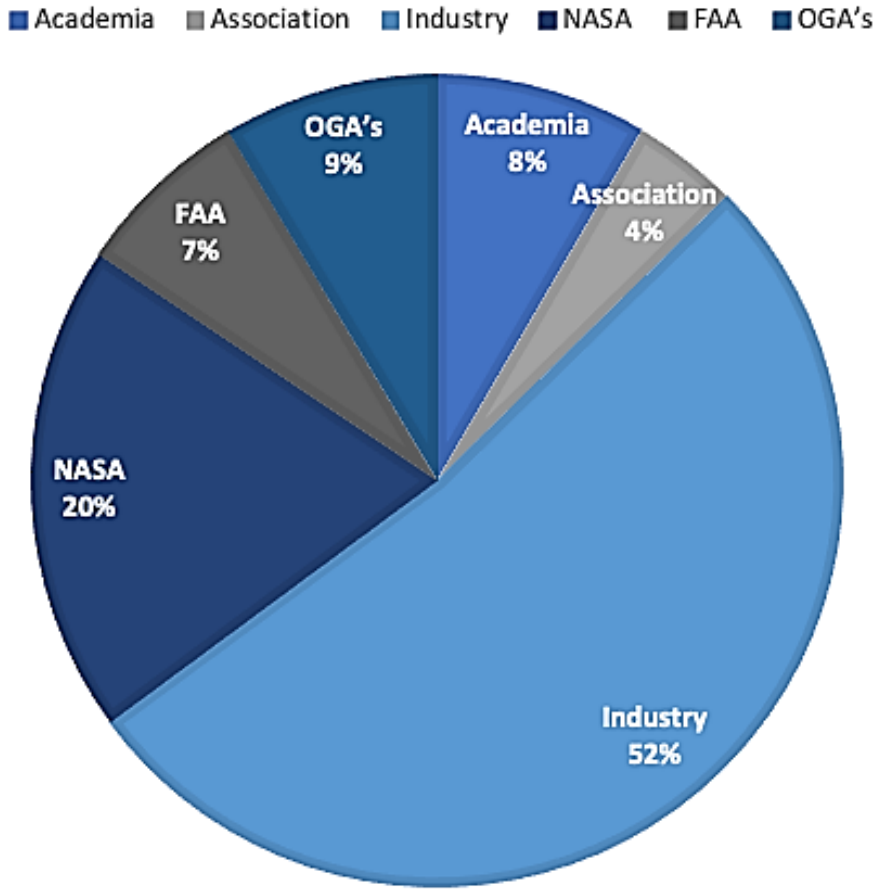
- NC and Airspace Portfolio Updates (30 mins)
- Partnerships (15 mins)
  - AAM Ecosystem Working Groups
  - Others including FAA, Standards Development Organizations (SDOs), International
- Roundtable Member Discussion (45 mins)

AEWG impacts

- Virtual WG sessions and workshops have been a success during the COVID environment.
- An easy way for NASA to share and listen
- AEWG has provided the opportunity for emerging AAM Ecosystem thought leadership, “level-setting”, and identifying constraints around challenging topics
- Productive 2+ yrs. developing and discussing ConOps and Concepts
- Surveys and polling
  - Data on expected timelines
  - Input on hard questions
- FAA personnel regularly participate in AEWG discussions providing attendees with insight on how AAM may integrate into the existing National Airspace System and aviation regulatory framework

AAM Ecosystem Working Groups (AEWG) Composition



AEWG Recent Events and Path Forward

- AAM Ecosystem Workshop (March 22-23)
  - Overview
  - UML Description and Panels:
    - Near-term (UML-1/2) – Certification Challenges
    - Scalable (UML-3/4) – Increasing Automation
  - Ecosystem Goal Breakouts:
    - Review the ecosystem goal definitions
    - Discuss major barriers associated with the ecosystem goals
    - Define the different ecosystem stakeholder roles
    - Discuss the priorities and sequencing for achieving the goals

- Next Steps for AAM AEWG
  - Continue coordination towards AAM ecosystem roadmaps
  - Leverage construct as part of forum for Communities of Practice for fire, medical, etc.
  - Continually evaluate needs to progress into more formal Public Private Partnerships (PPPs)

NASA/FAA AAM Executive Board Administrative Framework

AAM Executive Board

FAA ANG, FAA-AIR, FAA-AUS, FAA-AFS, FAA-ARP, FAA-ATO, FAA-AEE

NASA-IASP, NASA-AOSP, NASA-AAVP, NASA-TACP

AAM Executive Board Principles

- Includes diverse NASA and FAA organizational leaders with AAM responsibilities
- Ownership of Joint Management Plan (JMP)
- Quarterly discussions to highlight progress and address emerging issues

AAM Working Groups

- **UAM Aircraft Design and Development**
- **Concepts & Transversal Activities**
- **Vehicle Automation Concepts and Technologies**
- **Airspace Design and Operations**

AAM Working Groups Principles

- Monthly working group cadence to coordinate progress on strategies and joint objectives
- Executing bodies of JMP Objectives in alignment with NASA research priorities, and FAA data needs
- NASA and FAA identify transition products that span regulation and policy, standards development, demonstration interfaces, technical reports, software, and other technical topics

NASA AAM SDO Relationships

- Scalable AAM requires industry standards, guidelines, and best practices for new technologies, airspace integration concepts, community considerations, etc.
- NASA AAM research identifies ASTM, RTCA, and SAE as a primary recipient of data and findings
- Efficiencies and long-term strategic alignment are required with ASTM, RTCA, and SAE to share AAM simulation, modeling, and flight data

Significant Alignment
Partial Alignment
Minimal/No Alignment

NASA Objectives	ASTM	RTCA	SAE
Overarching Objectives			
Vehicle Design Objectives			
Vehicle Automation Objectives			
Airspace Objectives			
Community Integration Objectives			

AAM stakeholders engage on mutual objectives and transition products to help standards meet the needs of the industry and regulator

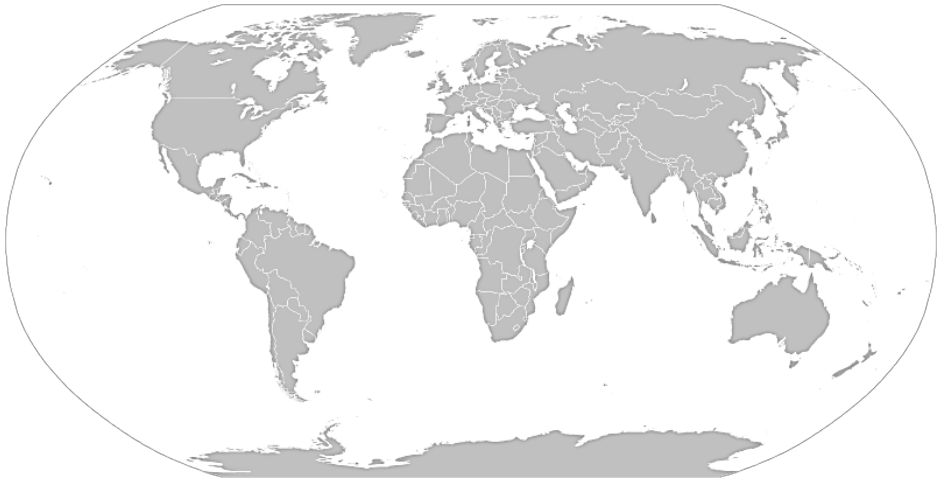
International Forum for Aviation Research

- IFAR includes ~26 world renowned research organizations solving challenging aviation problems

- IFAR and ICAO have formed a relationship to oversee, discuss, and mutually select innovation-driven areas for scientific assessment.

- UAM/AAM is the initial scientific assessment area and IFAR has delivered inputs that span an industry, technology, operational, and societal barriers

IFAR members



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