



A green  
light to  
greatness.®

**UNT**<sup>®</sup>  
UNIVERSITY  
OF NORTH TEXAS<sup>®</sup>

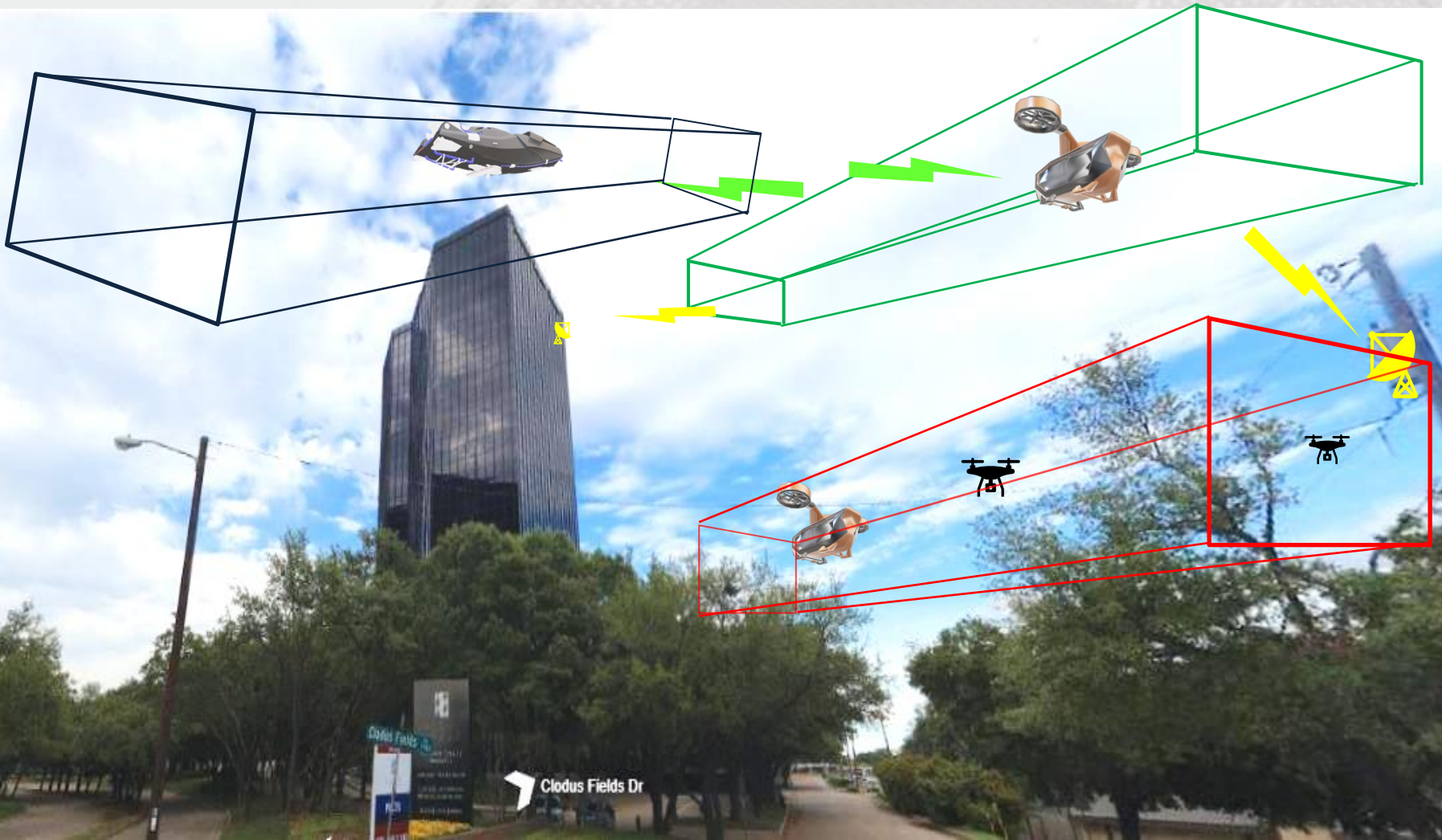
# Airspace Hazard Alerting Service

**Hermes Autonomous Air Mobility Solutions  
&  
University of North Texas  
December 6, 2022**

**Kamesh Namuduri  
Professor, Electrical Engineering  
University of North Texas**

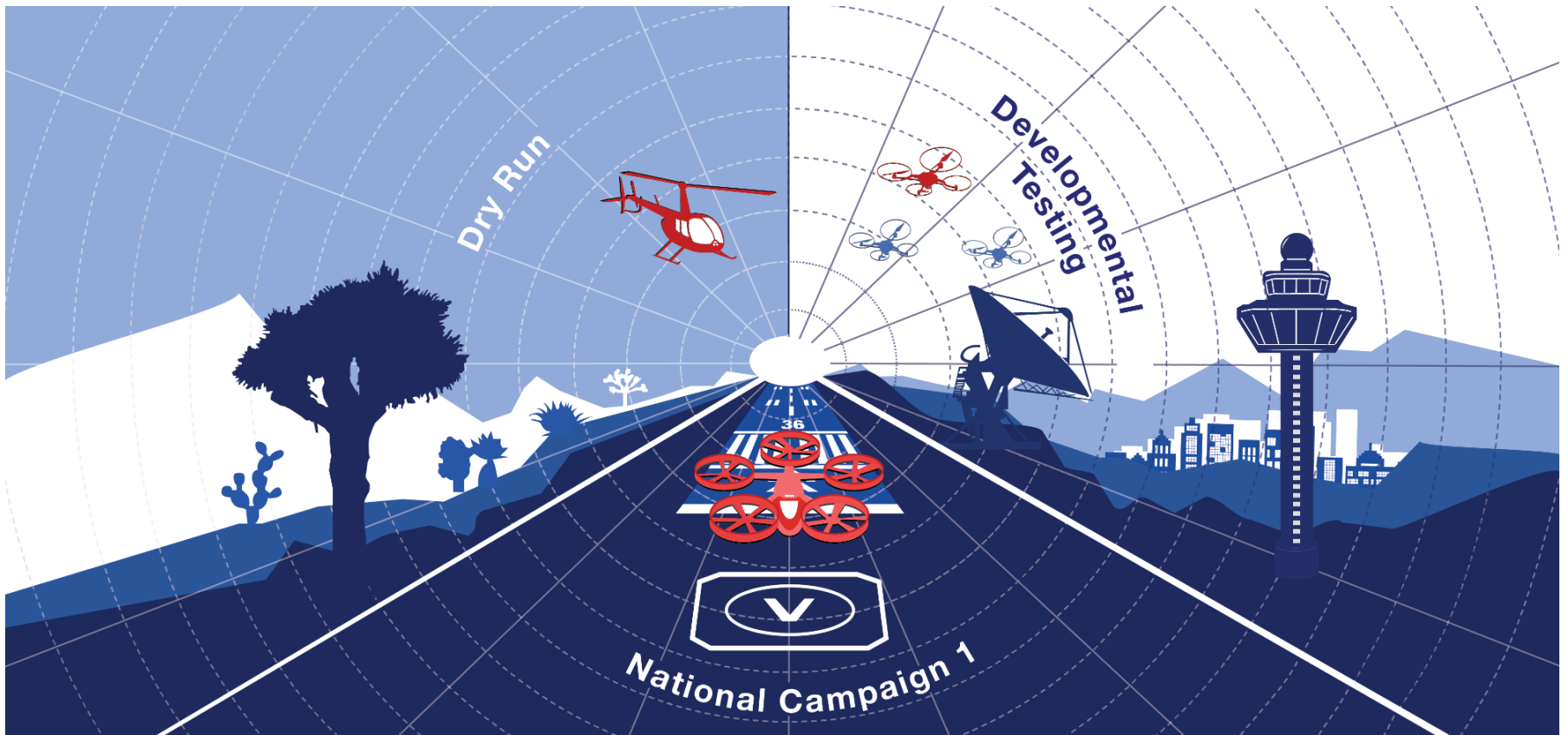


# Advanced Air Mobility



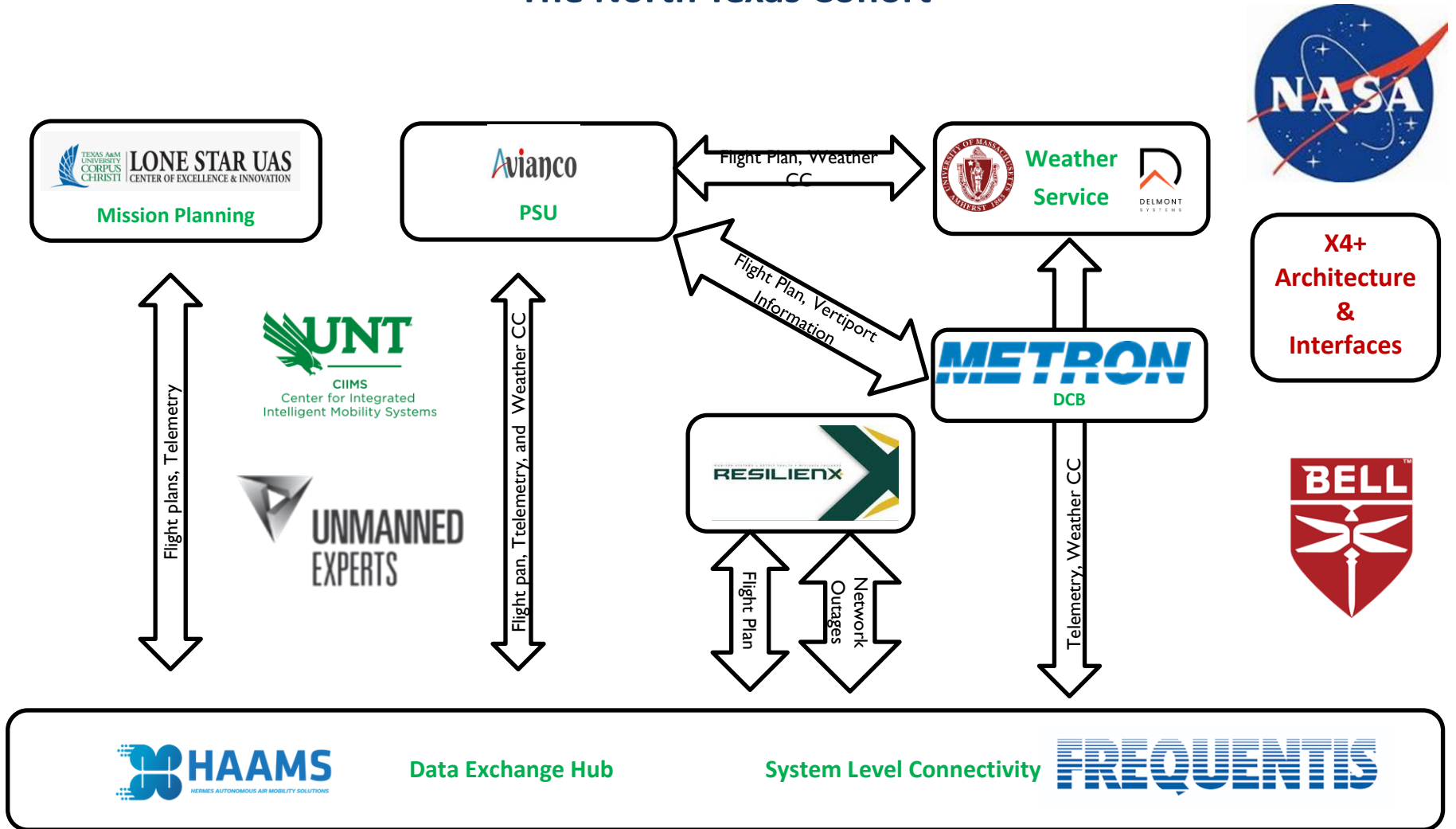
A green light to greatness.®

UNT



Advanced Air Mobility National Campaign

# Advanced Air Mobility National Campaign The North Texas Cohort

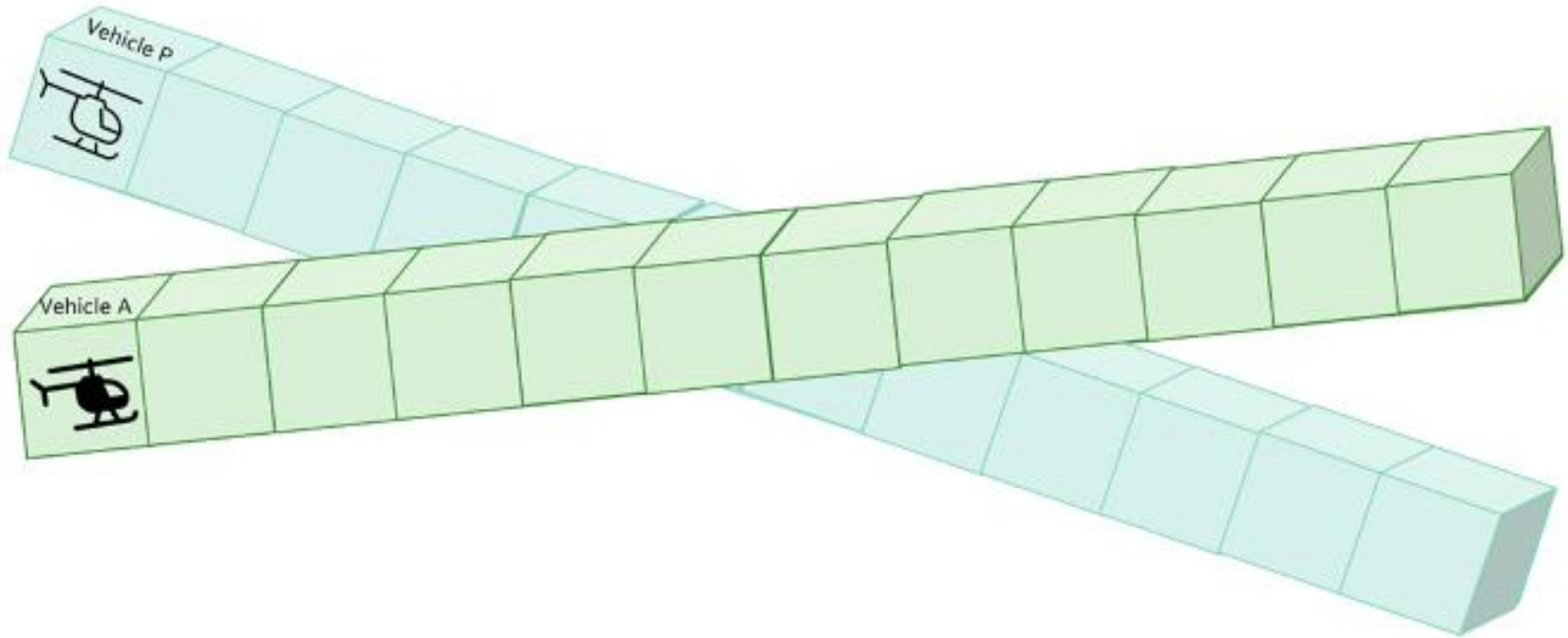


# Airspace Hazard Alerting Service

Quarter	Duration	Task	Objective	Deliverable #
Q1	From 11/15/2021 To 02/14/2022	Software Design	Initial product Development	AHAS Visualization Software
Q2	From 02/15/2022 To 05/14/2022	Interfaces	Establish Communications with partners	Interfaces with External Systems
Q3	From 05/15/2022 To 08/14/2022	Data collection, aggregation, and standardization	Build data storage, retrieval, and sharing capability	System that can acquire, aggregate, and share airspace hazard information in real-time
Q4	From 08/15/2022 To 11/14/2022	Cloud Deployment	Develop software as a service	System that can be accessed from anywhere
Q5	From 11/15/2022 To 02/14/2023	Testing	Validate the system thoroughly	Performance / Benchmarking Results

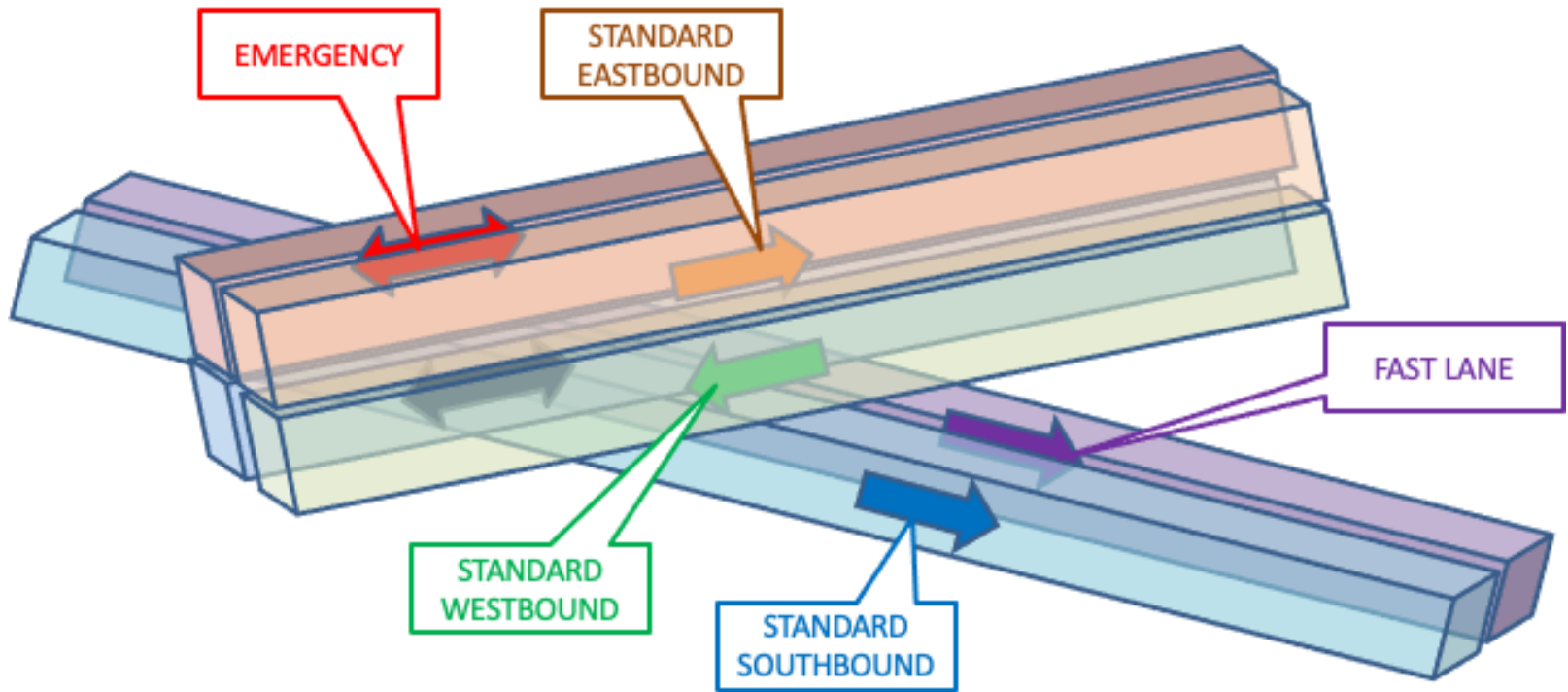
# Message Types

- ❑ **Operational intent** is flight plan data consisting of times and waypoints. The data contains a unique ID. An operator sends the operational intent to the Hermes web server, and Hermes forwards it to a PSU (Provider of Services to UAM).
- ❑ **Telemetry data** includes live flight positional data, with parameters like altitude, speed, latitude, and longitude included. An operator, sends the telemetry data to the Hermes web server, which then is forwarded to a PSU.
- ❑ **Weather constraints** refer to any weather advisories along the specified flight path during pre-flight or in-flight. Weather service providers sends the weather constraints to a PSU in response to operational intent and telemetry data, and the PSU forwards it to the Hermes web server, which then passes the constraints, if there are any, back to the operator.

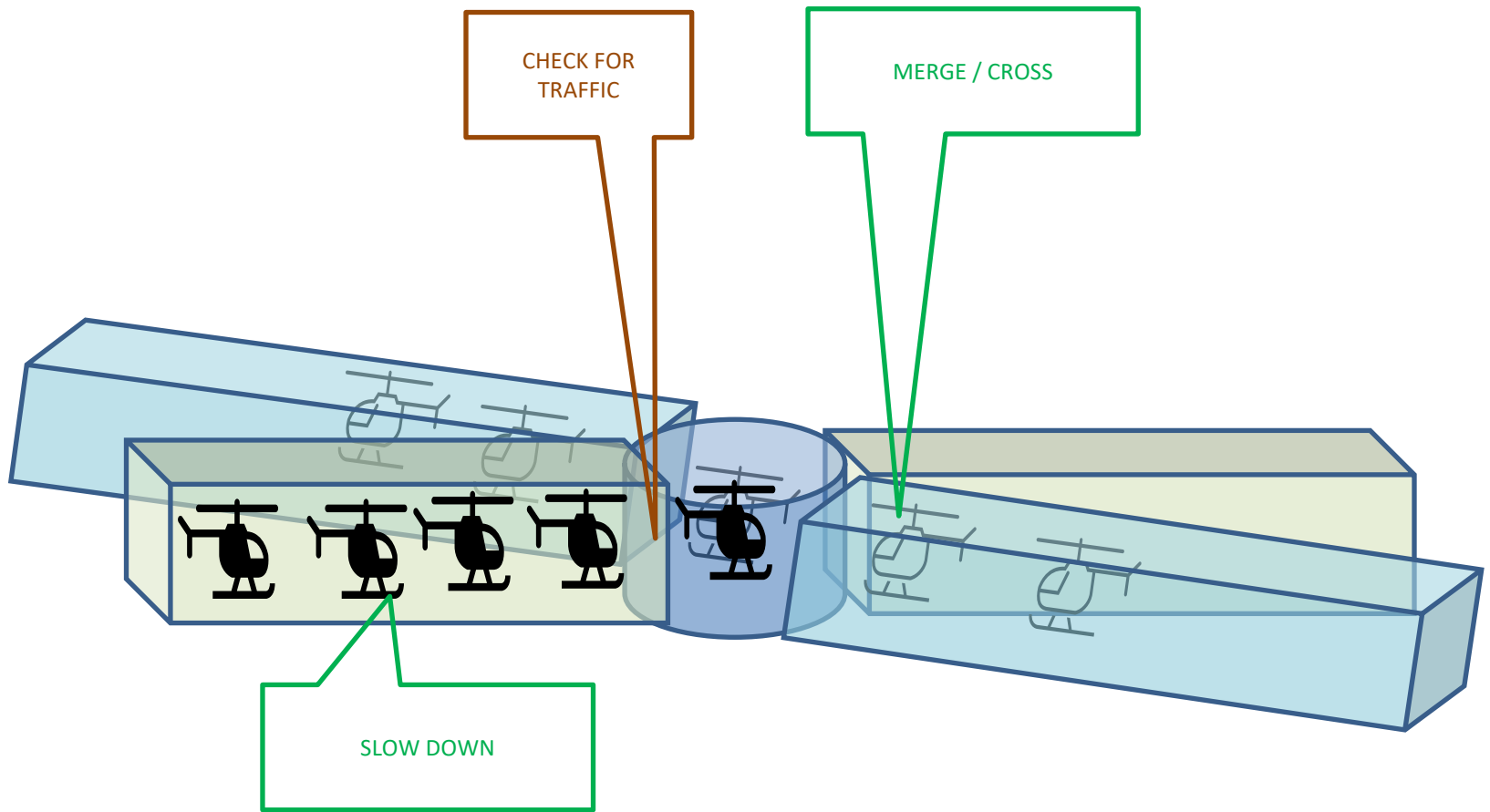


Air Tracks and Air Corridors

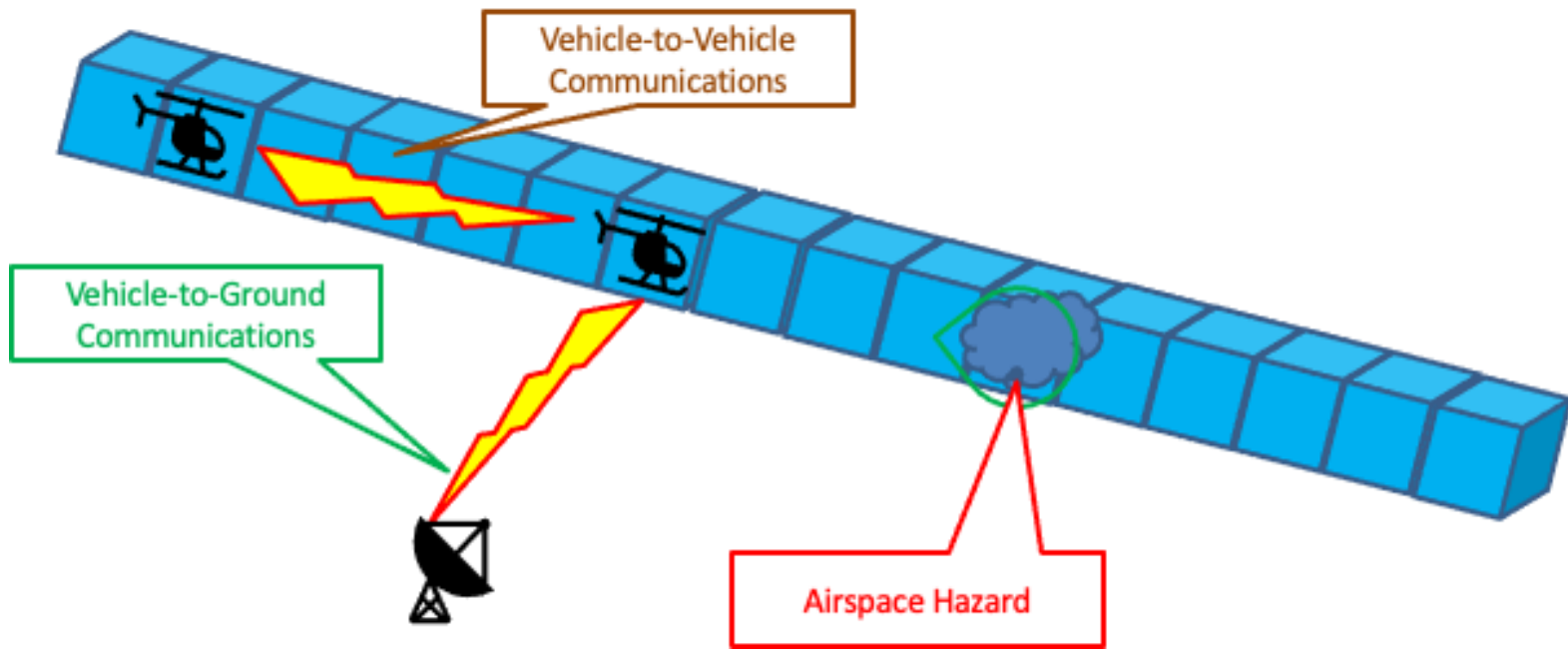




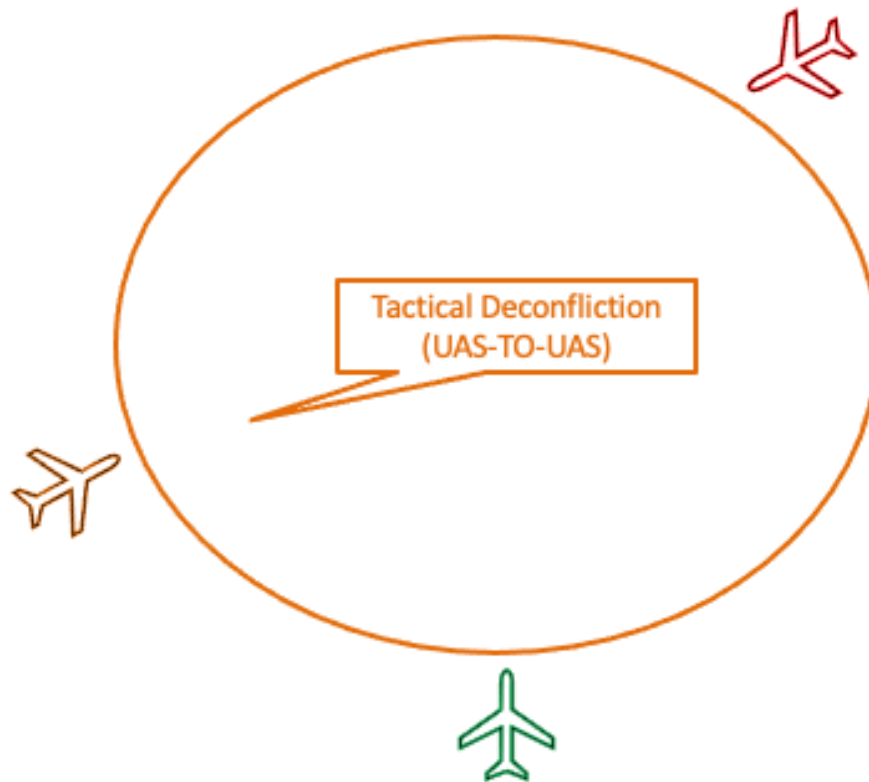
Air Corridors/Skylanes



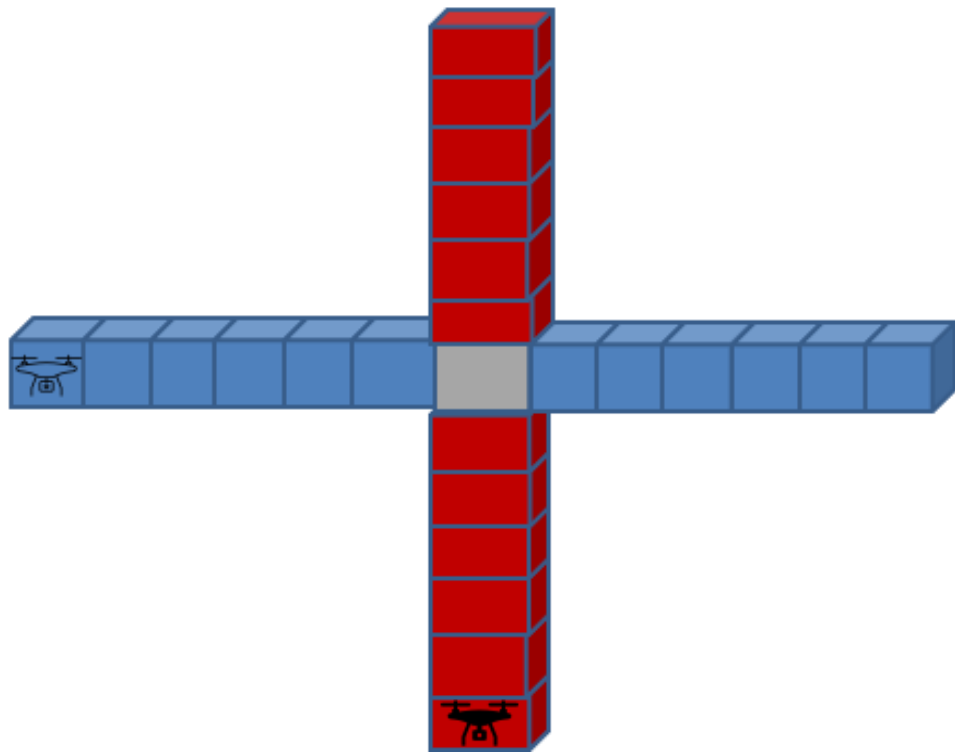
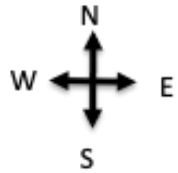
Circular Intersection (Roundabout)



Challenges: Detect and Avoid



Challenges: Collision Avoidance



Challenges: Handling Intersections



# Significant Challenges

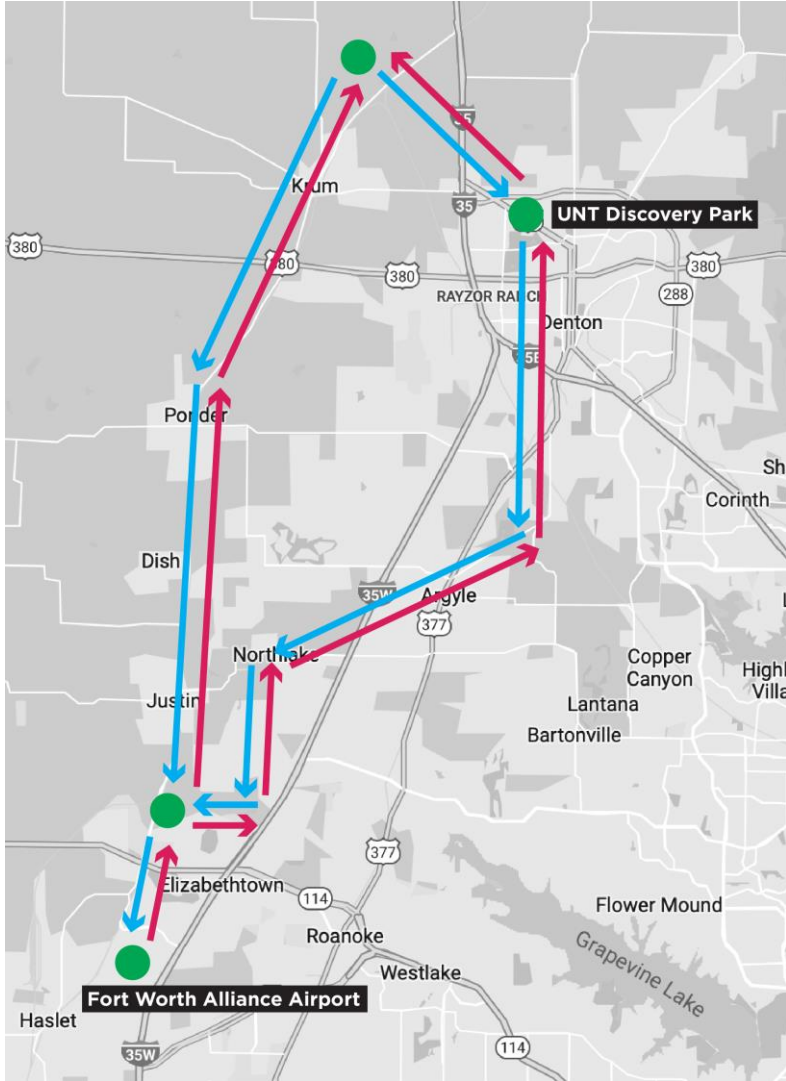
- Autonomy
- Traffic Management at Scale
- Communication Support
- Air-to-Air Conflict Management
- Security and Privacy
- Community Acceptance
- Regulations, Best Practices, and Standards

# Partners of NTX-Cohort



- Jim McNatt Institute for Logistics Research
- College of Engineering
- College of Business
- College of Health and Public Service
- College of Information
- College of Science





**An experimental air corridor,  
extending from Alliance Fort  
Worth (AFW) Airport to UNT's  
Discovery Park and back.**

# What is UNT's Role?

- Work with Unmanned Experts (UMEX) to provide overall leadership
- Lead the design and development of use cases, security, spectrum requirements and standards for vehicle-to-vehicle (V2V) communications
- Develop the minimum operational requirements, e.g., latency, security, and data rates for V2V communications







# North Texas UAS Safety & Integration Task Force Meeting

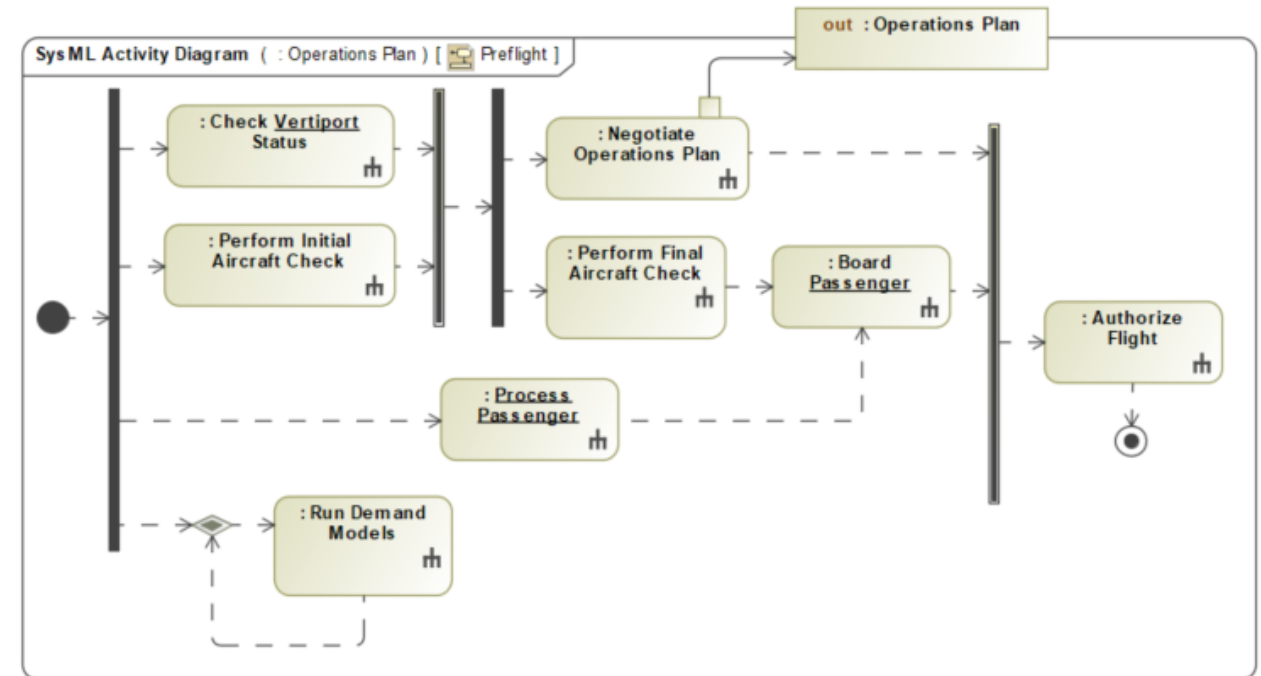
*December 6, 2022*



# NASA AAM Integration Annex #2



- Multi-modal planning workshop
- Model Based Systems Engineering (MBSE) training
- Review AAM public good use case ConOps document
- Review modeled public good use case.
- AAM Ecosystem Working Group (AEWG) session updating ecosystem on efforts under the Annex.
- Series of meetings to develop other public good use case ConOps documents and models
- Jointly identify and contribute to opportunities to advance AAM ecosystem MBSE maturity.
- Publish document covering efforts and lessons learned under the annex.
- AEWG session updating community on results of efforts under the Annex.



FEDERAL AVIATION ADMINISTRATION

presented by the YIATF Task Force

**YOUTH ACCESS TO  
AMERICAN JOBS  
IN AVIATION**

---

Nicole Johnson



North Central Texas  
Council of Governments

**EARLY  
AWARENESS &  
ENGAGEMENT**

**INFORMATION  
ACCESS**

**COLLABORATION**

**ADDRESS  
FINANCIAL  
HURDLE**



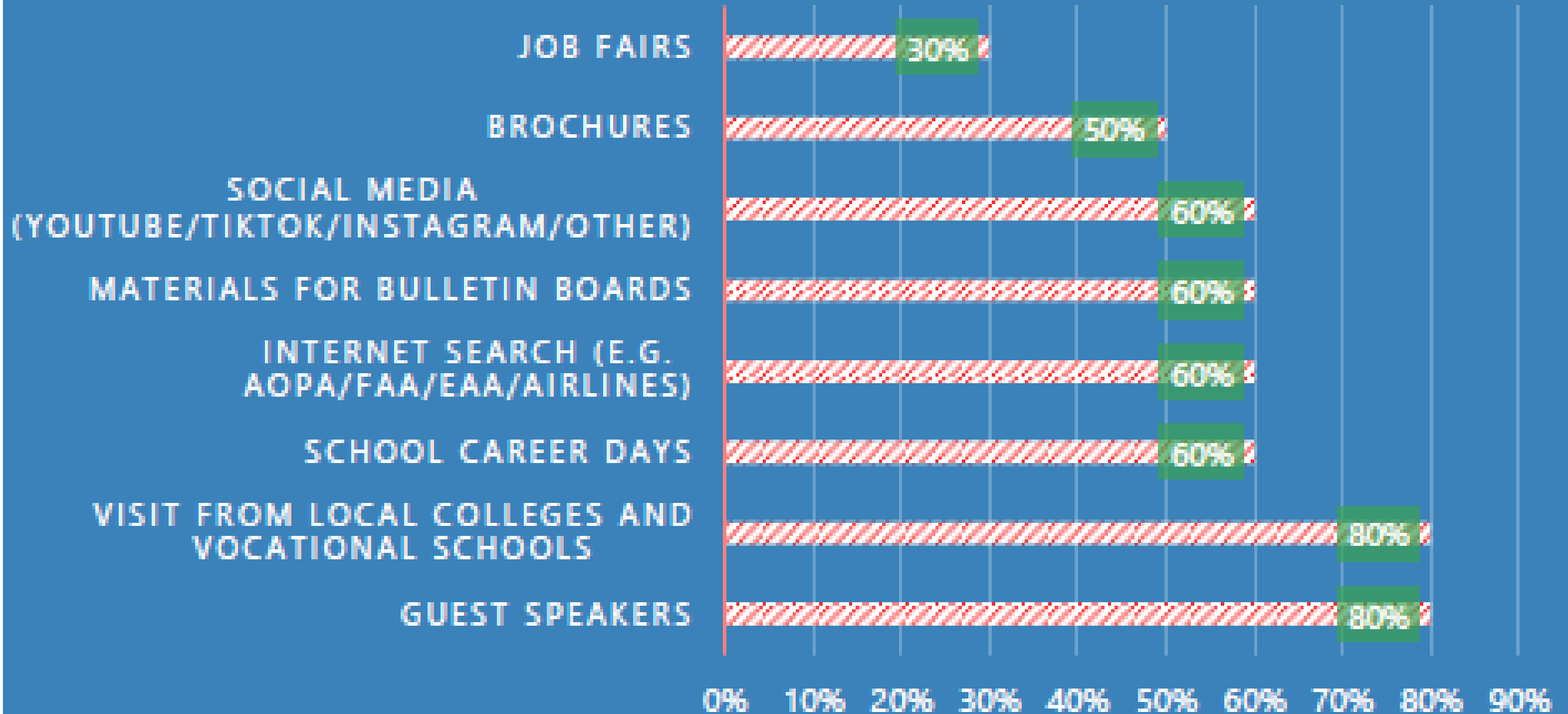
# EARLY AWARENESS & ENGAGEMENT

- Fund libraries to provide aviation and aerospace books and media
- Develop turnkey afterschool aviation and aerospace activities
- Launch early outreach to future teachers and guidance counselors
- Empower teachers to ignite student interest
- Meet the students where they are with gaming and social media
- Industry stakeholders can sponsor student competitions



# MIDDLE SCHOOL GUIDANCE COUNSELORS NEED THESE RESOURCES

- Pro  
ma





# INFORMATION ACCESS

- Create a “virtual counselor” component on the site
- Create a one-stop aviation/aerospace information portal
  - [www.nctaviationcareers.com](http://www.nctaviationcareers.com)



# COLLABORATION TO A CAREER PATH

- Create regional advisory councils
- Tap the power of college and career readiness platforms
- Establish dual enrollment programs between high schools and colleges/universities as well as workforce development grant programs to create well-aligned pathways



# COLLABORATION TO A CAREER PATH *cont.*

- Significantly increase the mentoring, pre-apprenticeships and apprenticeships that are available to grow future employees
- Build educational outreach to underrepresented groups, particularly at Minority-Serving Institutions, community colleges, technical institutions and nonaviation minority organizations



# ADDRESS THE FINANCIAL HURDLE

- Decrease the cost of flight training by increasing the allowable simulator time for pilot certification
- Increase the maximum Pell Grant for students
- Implement a multi-faceted aerospace workforce development program
- Increase donations to aerospace education programs by increasing the corporate tax benefit
- Aviation companies could consider several different financial options to assist in bringing underrepresented groups to the sector
- The FAA should review its regulations and guidance related to technical proficiency of industry personnel and certification standards





# ADDRESS THE FINANCIAL HURDLE cont.

- Develop a national aviation scholarship program



# QUESTIONS?

---

References:

[https://www.faa.gov/regulations\\_policies/rulemaking/committees/documents/media/YIATF\\_Taskforce\\_Report%209-22-22%20FINAL.pdf](https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/YIATF_Taskforce_Report%209-22-22%20FINAL.pdf)

[https://www.faa.gov/regulations\\_policies/rulemaking/committees/documents/media/Meeting-Packet\\_YIATF\\_Final-Public-Meeting\\_FINAL\\_09222022\\_clean.pdf](https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/Meeting-Packet_YIATF_Final-Public-Meeting_FINAL_09222022_clean.pdf)