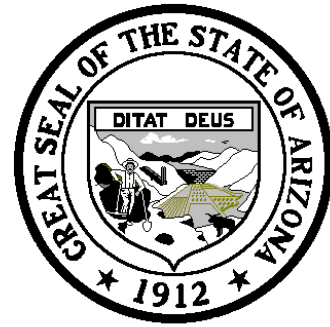


# Urban Air Mobility Study Committee



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**Final Report  
December 2022**

## **Committee Members:**

Senator Sine Kerr, Co-Chair  
Senator Rosanna Gabaldon  
Senator T.J. Shope  
Kate Conway  
Sarah Demory  
Mark Gaspers  
Mark Hagedorn  
John Halikowski  
Sharon Hettick  
Paul Keesler  
Brent Klavon  
Ian Linssen  
Dr. Gary Marchant

Representative Frank Carroll, Co-Chair  
Representative Jennifer Longdon  
Representative Justin Wilmeth  
Emilien Marchland  
Major General Kerry Muehlenbeck  
Nathan Pryor  
Chris Rodriguez  
Jack Sellers  
Mike Smejkal  
Nathan Trail  
Heath Vescovi-Chiordi  
Sandra Watson

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  - b. Committee Activity
  
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  - a. November 15, 2022: minutes and reference materials

## **REPORT 2022**

### **Background**

[Laws 2021, Chapter 197](#) established the Urban Air Mobility Study Committee (Committee) and outlined its duties and membership. The purpose of the Committee is to: 1) review current laws in this State that could impact the urban air mobility industry and discuss necessary revisions; 2) identify potential laws in this State that will create jurisdictional consistency for urban air mobility operations throughout the State; 3) foster public acceptance and awareness by creating an outreach campaign to educate the general public and lawmakers about urban air mobility technology and its benefits; 4) collaborate with local governments to identify the best ways to integrate urban air mobility into transportation plans; and 5) on or before December 31, 2022, submit a report regarding the Committee's activities and recommendations for administrative or legislative action to the Governor, the President of the Senate and the Speaker of the House of Representatives and provide a copy of this report to the Secretary of State.

### **Summary of Committee Activity**

#### ***Committee Hearing November 15, 2022***

Co-Chairman Carroll introduced the Committee. Committee members introduced themselves.

Representatives Brian Fernandez was announced as the temporary replacement for Representatives Jennifer Longdon.

The Committee heard the following presentations:

- Arizona House of Representatives Research Staff – Overview of Urban Air Mobility in Other States
  - Austin Correa, Research Analyst
- Supernal – Presentation on Urban Air Mobility
  - Nathan Trail, Director, International, State and Local Policy
- Arizona Commerce Authority - Presentation on Urban Air Mobility
  - Marisa Paula Walker, Senior Vice President, Infrastructure & Executive Director

The Committee discussed the presentations and Urban Air Mobility in Arizona.

A video recording of the committee can found at:

<https://www.azleg.gov/videoplayer/?eventID=2022111006>

Appendix A:

November 15, 2022

**Minutes and Reference Materials**

# ARIZONA STATE LEGISLATURE

## URBAN AIR MOBILITY STUDY COMMITTEE

**Minutes of the Meeting**  
**November 15, 2022**  
**10:00 A.M., House Hearing Room 1**

**Members of the public can access a livestream of the meeting here:**

<https://www.azleg.gov/videoplayer/?clientID=6361162879&eventID=2022111006>

### **Members Present:**

Senator Sine Kerr, Co-Chair\*

Senator Rosanna Gabaldon

Senator T.J. Shope

Kate Conway

Sarah Demory\*

Mark Gaspers\*

Anthony Casselman (John Halikowski Designee)

Sharon Hettick

Brent Klavon\*

Ian Linssen

Representative Frank Carroll, Co-Chair

Representative Brian Fernandez

Emilien Marchand\*

Nathan Pryor

Jack Sellers

Nathan Trail\*

Marisa Walker (Sandra Watson Designee)\*

Brigadier General Troy Daniels (General

Kerry Muehlenbeck Designee)

\* Participated remotely via a teleconference platform.

### **Members Excused:**

Representative Justin Wilmeth

Mark Hagedorn

Dr. Gary Marchant

Paul Keeser

Chris Rodriguez

Mike Smejkal

Heath Vescovi-Chiordi

### **Staff:**

Austin Correa, House Research Analyst

Jeremy Bassham, House Assistant Research Analyst

Luca Moldovan, House Assistant Research Analyst

Rachel Andrews, Senate Research Analyst

Kiyahna Araza, Senate Assistant Research Analyst

Co-Chair Carroll called the meeting to order at 10:03 a.m. and attendance was noted.

## **INTRODUCTIONS**

Representative Carroll requested that the Committee members introduce themselves.

## **PRESENTATIONS**

### **Overview – Austin Correa**

**Austin Correa, House Research Analyst**, distributed and explained a PowerPoint presentation entitled "Overview of States" (Attachment A).

### **Supernal – Nathan Trail**

**Nathan Trail, Director, International, State and Local Policy**, distributed and explained a PowerPoint presentation entitled "Supernal, Arizona Urban Air Mobility Study Committee" (Attachment B). Mr. Trail answered questions posed by the Committee.

The Committee offered comments.

Mr. Trail answered additional questions posed by the Committee.

### **Arizona Commerce Authority**

**Marisa Paula Walker, Senior Vice President, Infrastructure and Executive Director, Institute of Automated Mobility**, distributed and explained a PowerPoint presentation entitled "Urban Air Mobility Study Committee" (Attachment C). Ms. Walker answered questions posed by the Committee.

## **DISCUSSION**

The Committee offered comments.

There being no further business, the meeting was adjourned at 11:25 a.m.

Respectfully submitted,

Brisa Roman  
Committee Secretary

(Audio recordings and attachments are on file in the Secretary of the Senate's Office/Resource Center, Room 115. Audio archives are available at <http://www.azleg.gov>)

# Overview of States

- Oklahoma
- North Dakota
- Texas

# Oklahoma

- *Ranked number one by [George Mason University](#) in UAM Readiness.*
- In May 2020, a state law created a drone program office—the Oklahoma Advanced Mobility Pilot Program—within the Oklahoma Department of Transportation. Among other things, the program office creates a nine-member advisory council that makes recommendations about drone and electric vertical-takeoff-and-landing aircraft.
- [The program](#) will provide grants to cities, counties and tribal governments for advanced mobility pilot projects. Funds for the program will be deposited in the [Oklahoma Advanced Mobility Pilot Program Revolving Fund](#) at ODOT.



# North Dakota

- North Dakota has created the [Northern Plains Unmanned Systems Authority](#), a six-member commission assembled to help advance North Dakota's UAS opportunities and to provide oversight for the Northern Plains UAS Test Site. The authority is chaired by Lt. Gov. Brent Sanford and includes representatives from the state's general aviation industry, University of North Dakota Aerospace, North Dakota Aeronautics Commission, North Dakota Department of Commerce and the Office of the Adjutant General.

# Texas

- Texas created an UAM advisory committee. Some recommendations from the [final report](#) of the committee:
  - 1) encourage the development of an urban air mobility/advanced air mobility sandbox by;
    - a. directing the preparation of a feasibility study to understand the market, differentiating factors from similar existing facilities, potential market/players, funding sources, revenue opportunities, locations, necessary digital and physical infrastructure, and potential use cases;
    - b. pursuing the development of a facility that will provide an opportunity for testing and commercialization that will attract business and move the industry and state forward; and
    - c. having the state take the initiative to work with industry to determine additional standards in terms of communications, technology, and environmental awareness systems to encourage consistency and harmony at all levels of government and stakeholders.

Other states  
to create a  
UAM study  
committee

- Arizona
- Michigan
- Utah



Arizona Urban Air Mobility Study Committee  
November 15, 2022

Nathan Trail  
Director of International, State & Local Policy  
[nathan.trail@supernal.aero](mailto:nathan.trail@supernal.aero)

# Advanced Air Mobility (AAM)

Technology is rapidly changing the way we live, and no technology offers more potential to revolutionize mobility than Advanced Air Mobility (AAM).

AAM leverages electric vertical takeoff and landing (eVTOL) aircraft to enhance connectivity, promote equity and accessibility, and reduce the current strain on infrastructure and carbon emissions.



# Why AAM, Why Now?

## 1940s - 1960s:

Transportation infrastructure



**1947:**  
Hyundai Engineering and Construction is founded



**1965:**  
Hyundai expands overseas to develop highways

## 1960s - 2010s:

Vehicle reliability and affordability



**1968:**  
Hyundai becomes a motor vehicle company



**1976:**  
Hyundai releases South Korea's first mass-produced car



**1999:**  
Hyundai releases the industry's best automotive warranty

## 2010s to Present:

Advanced ground and air mobility



**2018:**  
Hyundai successfully tests **autonomous vehicle** capabilities



**2019:**  
Hyundai invests in **alternative energy**, releasing the longest-range fuel cell vehicle



**2020:**  
Supernal unveils its SA-1 **UAM concept vehicle** at CES



# Guiding Principles

Supernal is taking a human-centered approach to mobility solutions and sees AAM as a path to inclusiveness in the future of mobility



## Safety

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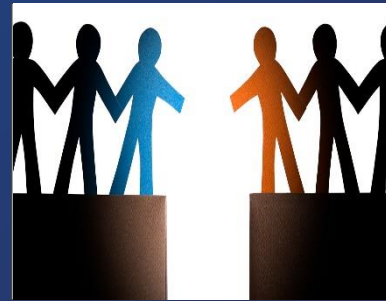
Safety is the top priority for Supernal. For the industry to scale and for the public to accept AAM, we must meet rigorous safety standards set by national CAAs for the aircraft, pilot and operations.



## Environment

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AAM will provide a sustainable mobility solution, leveraging electric propulsion. The infrastructure will also rely on renewable energy. AAM adoption will help lower carbon emissions and reduce congestion.



## Equity & Accessibility

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Traditional aviation has left many groups behind, including people with disabilities and racial minorities, but AAM can – and must – play an important role in righting those historical wrongs. Public infrastructure funding is the best way to ensure equity and accessibility across AAM.



## Economic Impact

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The AAM market will significantly contribute to workforce development, by adding 280,000 high paying jobs in the US by 2035. These jobs, in turn, could contribute \$30 billion in wages and benefits in 2035 (and \$8 bn in tax revenue).

# How AAM Can Achieve Its Full Potential

The Advanced Air Mobility (AAM) ecosystem will redefine how we move, connect, and live. However, to reach its full potential, we must scale the industry with a human-centered approach, designing our vehicles and infrastructure in a way that provides maximum benefit to society and the environment.



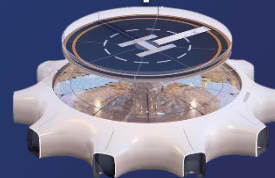
Safety



Multimodal



Accessibility



Open Access



Affordability



Public Acceptance



Workforce





# Safety in Our Skies



Safety is the top priority. For the industry to scale, the public needs to accept AAM as a safe transit option.



The industry must meet rigorous safety standards set by international CAAs



All components, systems, and technologies must be held to the highest aviation industry safety benchmarks



Supernal is designing our AAM aircraft to the highest safety threshold of  $10^{-9}$



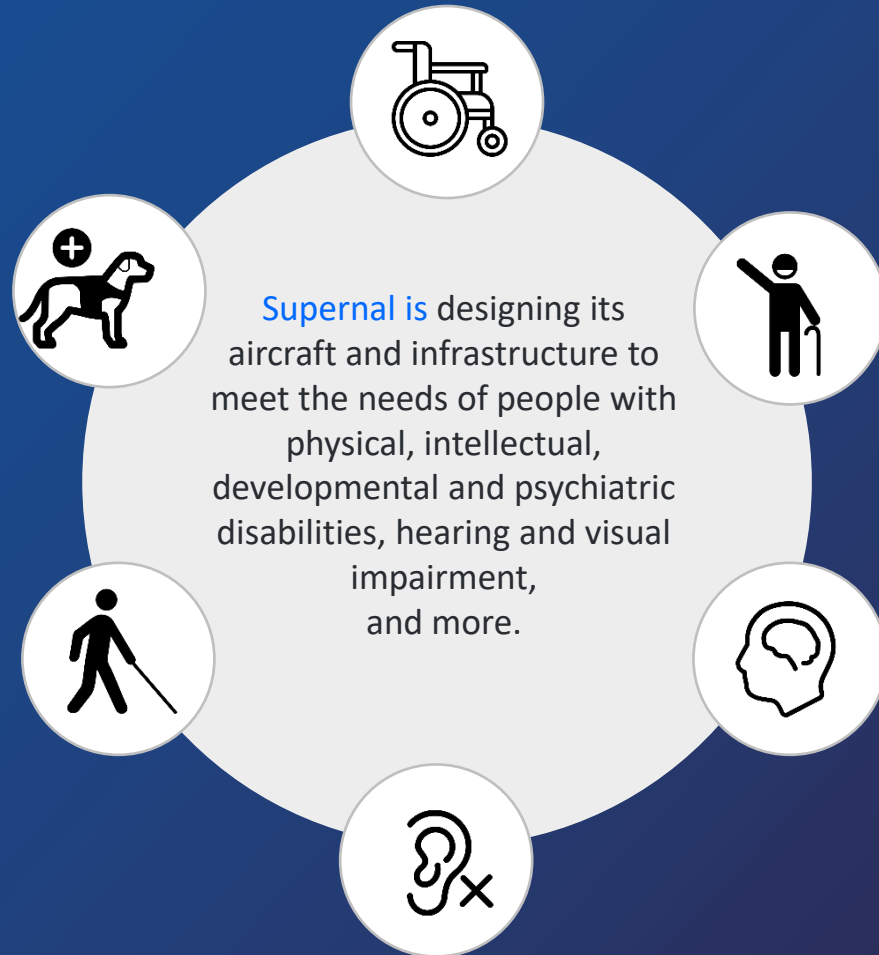
# Enabling Multimodal Connectivity

- A sustainable and equitable AAM ecosystem relies on multimodal connectivity
- AAM will augment, not replace current forms of transit, and will increase the efficiency and connectivity of our communities
- Multimodality will assist in first and last mile transit, and will create a more connected transportation ecosystem
- The AAM industry must work closely with city planners and governments to integrate AAM into current and future transit modes



# Inclusive and Accessible AAM

AAM can provide access and connectivity to many underserved communities and individuals with disabilities. Industry must work with communities to identify gaps in connectivity and ensure that AAM is the most accessible form of mobility for everyone.



# Promoting Open Access to Vertiports



The long-term success of AAM will rely on an open and competitive marketplace

Multi-use public vertiport access should be encouraged to ensure the AAM ecosystem is equitable and affordable

Monopolization of vertiports would increase cost and minimize routes offered to underserved communities

An open marketplace will lead to more routes and transit options in underserved communities



# Designing for Affordability

AAM must be designed to be available to everyone, not just the wealthy few

Providing AAM access to society requires innovative manufacturing techniques to drive down the prices

Supernal will leverage cutting-edge production techniques from the automotive sector to lower overall production costs



# Public Acceptance



Ensuring heightened standards, equity, and providing greener transit solutions is just the first step in public acceptance

Industry must also work with local communities to solve for noise concerns, flight paths, infrastructure placement, and to determine how AAM can solve for localized gaps in connectivity

We are committed to long-term engagements to make sure AAM best fits within individual communities



# Workforce of Tomorrow

- The AAM market will significantly contribute to workforce development by adding new jobs in communities throughout Europe
- Unlike traditional aviation, AAM will rely on a localized “auto body shop” model in which maintenance and repairs take place locally
- The maintenance, manufacturing, and systems management of AAM will require new educational programs in schools, universities, and technical schools



# Collaboration with Government and Community

- AAM companies must work closely with government and communities to ensure we are scaling our industry in a way that best meets the transportation needs of individual communities
- Ongoing collaboration is needed so that developments in technology can be adopted into state transportation plans
- States and cities must help inform industry where gaps in mobility are persistent
- Partnerships between government and industry is needed to ensure the advancement of AAM





# Proactive State Legislation and Measures to Foster AAM Industry



## Anti-Monopolization of Public Use Vertiports

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- Protecting against exclusive rights being granted to operators and ensuring the AAM industry can scale in a competitive manner
- West Virginia recently passed legislation which would prohibit exclusive rights being granted to operators for public use vertiports (WV HB 4827)
- States that protect against monopolistic measures are attractive early investment and operation prospects

## Educational Outreach and Study Committees

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- Arizona was the first state to enact legislation to establish a UAM study committee (AZ HB 2485), since then several states have followed its lead (TX, OK, UT, AR, FL, VA, PA)
- It is important for industry, government, and community to work together to understand AAM's implications and how it can best improve local transit systems
- Educational outreach is needed to inform the general public of what AAM is and how it can positively impact transportation systems



## Harmonization

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- As with any form of aviation, airspace rules and operations are the jurisdiction and authority of the FAA. In order for AAM to safely operate, we need a clear and harmonized set of national operational rules.
- Great effort is being made by the FAA to establish operational rules and guidelines for AAM, however several local governments enact airspace laws which directly challenge the FAA's authority over the NAS
- States which enact legislation to promote a harmonized landscape throughout the state will ensure safe operations for AAM within the state. So far Utah (UT SB 166) and West Virginia (WV HB 4667) have both passed harmonization laws.

## Workforce Development

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- AAM will create a localized workforce
- State governments are encouraged to create and support workforce development and STEM programs for AAM
- Public/Private funding for workforce development programs will help foster the development of a new industry



## Infrastructure Development and Funding

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- Infrastructure development for AAM is equally as important as assessing and establishing airspace operations. Without a place to takeoff and land, operations cannot be enabled.
- Infrastructure development is largely under the authority of state and local governments
- Proactive measures can be taken to fund AAM infrastructure, including vertiports, charging networks, and citing near current multimodal transit hubs

## Review current legislation which could impact AAM industry – UAS bills

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- A full comprehensive legislative review is needed to see if current laws have a direct or unintended impact on AAM operations
- Several UAS or drone bills enacted were written broadly enough to have direct impact on AAM operations and will need to be modified
- Laws which have unintended consequence on AAM operations will need to be amended



# Areas of Concern

## Avigation Easements

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- Non-industry stakeholders are advocating for the advancement of “avigation easements” in which the airspace over state owned lands can be leased as airspace corridors and fees will be assessed for operating within
- If a state were to adopt such a system, AAM operations would be unsafe as state airspace laws would differ from FAA rules
- So far four states have considered avigation easement legislation, none of which passed

## Exclusive Rights Deals

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- Efforts are being made by some industry stakeholders to enter into agreements with municipalities which would grant them exclusive rights to operate
- This would shrink the AAM market and reduce the amount of people and communities able to access this mode of transportation
- In such a system, operators would be incentivized to only service the wealthiest communities



# Thank you

Nathan Trail

Director of International, State & Local Policy

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# **Urban Air Mobility Study Committee**

**Marisa Paula Walker, Senior Vice President, Infrastructure  
& Executive Director, Institute of Automated Mobility**

**Tuesday, November 15, 2022**



**Arizona Commerce Authority**



## **A public-private partnership**

- position AZ as a leader in safe commercial deployment of advanced mobility technologies
- transform use inspired research into economic development by supporting new startups and mobility breakthroughs
- support information and best practice sharing events

## **A “industry-driven, government supported, technology neutral” approach**

- provide access to infrastructure for entrepreneurs to prove their concepts
- minimize risks with new technology adoption and first look for public sector
- explore new market opportunities
- foster professional skills development for students





# Unmanned Aerial Systems (UAS) with ADOT & AZ State Lands

## Use Cases

- transportation (survey, bridges and communications)
- public safety (traffic incident management and responder safety)

## Information Sharing Events

- 2019 How to grow a UAS program & What UAS can work for you Forum
- 2019 UAS Regulatory Panel
- 2020 Pinal County, High Traffic Intersection Assessment, Brown Bag Luncheon
- 2020 UAS for Traffic Incident Management Session
- 2021 Arizona UAS 2-Day Virtual Forum with USDOT, OH, UT, CA, TX, NC + 8 Tribal Nations

## Engagement & Outreach

- Sierra Vista, Beyond Visual Line of Sight (BVLOS) approvals
- Navajo County, UAS Equipment and Application Demonstration-Holbrook Maintenance Yard
- Pinal County Public Works Drone Program e.g. logs, pilot certification, types of crafts & operations, data, and policies
- Arizona State Lands AGIC UAS Working Group statewide GIS Conference; Fly in & Fly out Demonstration; Website with Project Flight Info; Educational Outreach K-14
- Drone Deliveries in the Phoenix Region December 2022



# Advanced Air Mobility

## 2018 NASA & FAA Grand Challenge

- Study of 10 Metros Phoenix-Mesa Metro stood out with favorable regulatory and weather conditions & anticipated to be an early adopter.

## 2022 Honeywell's UAS and AAM Lab

- Headquartered in north Phoenix, goal to have air taxi make 100-mile trip in 45 minutes and provide same day package delivery to 20% of US that does not have this service.

## Key Areas for AAM Implementation

- Prioritizing Community and Citizen Integration
- Managing AAM Traffic
- Building Scalable Infrastructure
- Designing Robust Security
- Developing AAM Vehicles
- Bolstering Workforce Development



# THANK YOU

Marisa Paula Walker  
Arizona Commerce Authority  
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