



ORLANDO
**ADVANCED
AIR MOBILITY**

Tabletop Exercise

December 6, 2023



Overview

1. Welcome and Overview
2. AAM Overview
3. City of Orlando approval process
4. Interagency Coordination
5. Tabletop Exercise
6. Report out



What is a Tabletop Exercise?

- A collaborative discussion where various roles and responsibilities walk through specific scenarios and plans
- Rooted in Emergency Management Planning



FDOT AAM Working Group Recommendation

Infrastructure and Zoning Recommendation 2: Host tabletop exercise of what vertiport development looks like for a local government from beginning to end, using **existing FDOT and FAA rules, regulations, and procedures.**

- a. As a resource for municipalities across the state, the FDOT AO should host a tabletop exercise which walks through the process of vertiport development with an early entrant municipality. The exercise should detail **initial coordination between the municipality and the developer; public education; coordination with FAA and local airports; and applicable zoning requirements.** This tabletop, along with the produced materials would allow for municipalities to better understand the development process and serve as a reference for future development and necessary guidance to be developed.



What are our intended outcomes?

- Understanding of different agency roles and responsibilities
- Understanding of review and approval process
- What are the local codes and regulations that need to be updated?





**Federal Aviation
Administration**

A New Era of Aviation: An AAM Webinar Series

Advanced Air Mobility
Overview

12/6/2023

Advanced Air Mobility (AAM)

 DELTA





UNITED 











American Airlines 





FedEx 





 BOEING





- First electric vertical takeoff and landing (eVTOL) aircraft expected to be FAA certified in 2025
- Predicted to be a \$30B market by 2030
- New venture capital funded “disruptive” manufacturers backed by traditional operators
- Initial business cases
 - Air taxi (airport to city pair)
 - Cargo (small market to hubs)
 - Medical transport
- Initial operations look like traditional helicopter/GA piloted aircraft, but plan rapid shift to autonomous
- Unique, yet-to-be-built “ecosystem” needs to support vertiports, charging, routes, & automation

Balancing the Pace of Innovation and Safe Operations



Federal Aviation Administration

FAA Integrated Team

Requirements Definition and Portfolio / Program Management

Federal, State, Local, Tribal, and Territorial (FSLTT) Government
Ongoing since Jan. 2023

Industry and Local Community Engagement
Ongoing since Sep. 2022

Team Development
Innovation Teams (iTeams) also tie into DOT AAM IAWG sub-groups
Ongoing since Sep. 2022



Aircraft Certification	Airspace Management	Environment	People	Security
Airspace Infrastructure	Community Engagement	Operations Certification	Safety	Vertiports

Advanced Air Mobility Implementation Plan
Jul. 2023



Safety Focused Approach

- Whole of government approach needed to support integration of new class of aircraft, flying in constrained airspace, needing new support infrastructure, and accelerating to autonomous operations environment
- Updating a regulatory framework to address the unique aspects of new hybrid, non-traditional aircraft
- The FAA created a programmatic portfolio approach called Innovate28 that integrates all cross-agency-efforts toward user initial entry into service goals
- DOT-led AAM interagency working group developing national strategy for AAM, identifying key national issues for implementation: security, power/energy, infrastructure, community impacts, spectrum, and supply chain. Request For Information published in the Federal Register (comment period closed Aug 2023)



Significant Activities

Recent

- May 3, 2023: UAM Concept of Operations published
- June 14, 2023: Powered Lift NPRM published
- July 18, 2023: AAM Implementation Plan published
- August 2-3, 2023: FAA-hosted AAM Summit
- August 2023: AAM Interagency Working Group (IWG) Request for Information (RFI) closed
- October 25, 2023: FAA/AFWERX MOU signed
- December 2023: Autonomy Working Group Kickoff

Upcoming

- Airspace Integration Impact Assessments (Modeling and Simulation) Webinar (March 2024)
- National Strategy Report anticipated in 2024
- Update Vertiport guidance with performance-based information



FAA Ongoing Engagement



We work with partners across the federal government to implement the AAM Coordination and Leadership Act to coordinate policy for integrating AAM operations.



AAM
Interagency
Working
Group



Office of
Science and
Technology
Policy

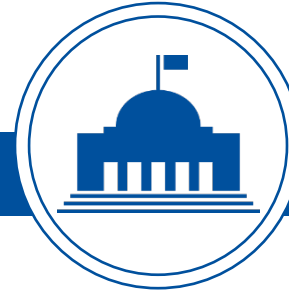


AGILITY PRIME



Joint test team with Agility Prime and NASA leverages knowledge and resources to collect performance data to develop policy and standards.

Federal Government and
Workforce Partners



We encourage state, local, and tribal communities to be informed about AAM technology and how these new operations will affect them. These meetings help us to better understand local sentiment about AAM operations.



Houma-Terrebonne
AIRPORT & INDUSTRIAL PARK



LA 2028



GREATER ORLANDO
AVIATION AUTHORITY



National Association of State Aviation Officials



LOS ANGELES WORLD AIRPORTS

Local/State/Tribal Governments and
Community Organizations



We engage with industry stakeholders, including aircraft manufacturers, operators, and airport/vertiport companies to understand their vision and implementation plans. Our current priority is U.S.-based eVTOL piloted-passenger manufacturers undergoing FAA certification. Examples include the following stakeholders:



TEXTRON



overair



ferrovial

BETA



Industry



Federal Aviation
Administration

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Key Innovate28 Activities

Aircraft Type Certification

Air Traffic Policy Review and Updates

Concept of Use (general and local)

Hazardous Materials

- Fire/smoke procedures
- Cabin safety
- Emergency training
- Cargo requirements

Procedure Development

- Scoping
- Solution development
- Environmental review
- Safety Risk Management (SRM) process

Community Engagement

Operational Certification

- Part 135 Operational Approval
- Operational Suitability (to establish aircraft type ratings, pilot training programs, maintenance programs, master equipment lists)

Local Vertiport Activities

- Determine vertiport locations
- Local zoning
- Construction
- Charging infrastructure

Local ATC Activities

- Controller training
- Update Standard Operating Procedures (SOP) and Letters of Agreement (LOA)

Cybersecurity

Physical and Operational Security

Site Selection

Site-Specific AAM Forecasting

Wake Separation Requirements

Crew Preparation

- Rulemaking for pilot training
- Train and certify crew

National Vertiport Activities

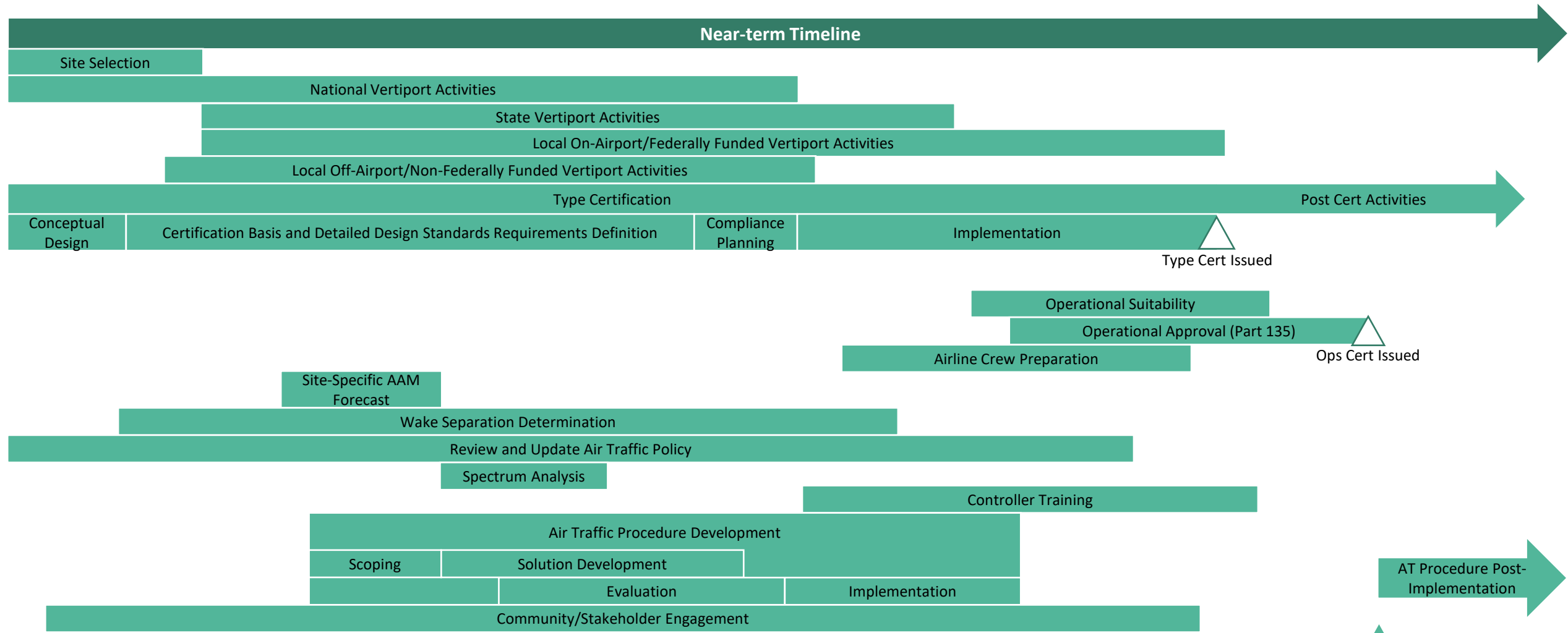
- Flight testing
- National guidance
- Rulemaking

➤ The list includes the FAA, other federal government agencies, FSLTT government, industry, and other stakeholder activities.



Portfolio Management for Each AAM Project

Near-term Timeline



Type Cert Issued

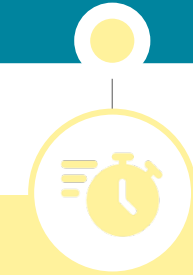
Ops Cert Issued

Operational Readiness Decision



AAM Workstreams

Cross Cutting Major Risk Areas: Wake Separation, Vertiports, Power, Security, Noise, and Community Impacts



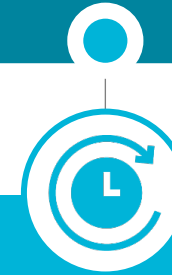
Near-term

- Engage with industry to determine operational needs and desired operations
- Research impacts to Air Traffic Services
- Tailor implementation plan to initial entries into service
- Perform research and engineering activities to support UAM ConOps maturity
- Establish workstreams for mid- and far-term, to include Autonomy Working Group



Mid-term

- Explore operational efficiency through strategic employment of modeling and simulation to effectively manage large-scale operations
- Develop policies and standards based on learned performance
- Establish standards and requirements for enablers such as information exchanges, Communications / Navigation / Surveillance, etc.
- Support industry development of supplemental services



Mature Stage

- Perform research and engineering to validate technological and procedural enhancements to separation management
- Refine policies and standards based on advanced aircraft capabilities
- Derive requirements for infrastructure and automation capabilities
- Refining the mature state of UAM ConOps, and incorporate findings from Autonomy Working Group to integrate autonomous operations



Summary

- AAM spans an array of concepts, from piloted to fully autonomous operations.
- We are building out an ecosystem to safely and efficiently enable the full range of a new way of flying so that it is beneficial and equitable to the public.
- The FAA has established a focal point for industry to coordinate with the FAA as they work through regulatory and operational aspects of their new services.





Advanced Air Mobility

Brian Stanger, P.E.

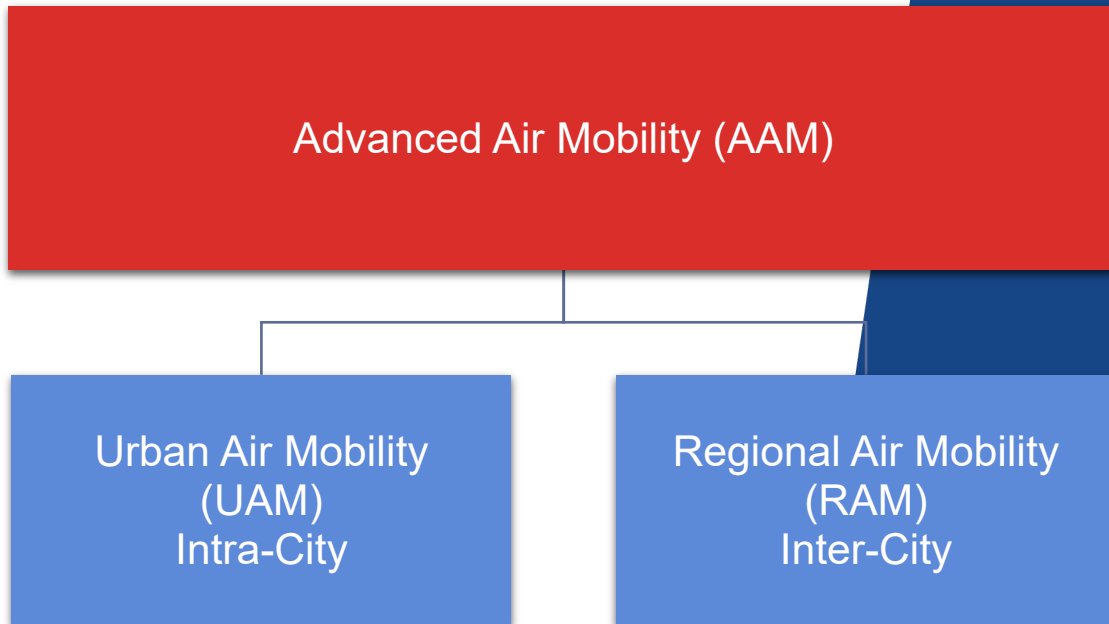
Modal Development Administrator

FDOT District 5

December 6, 2023

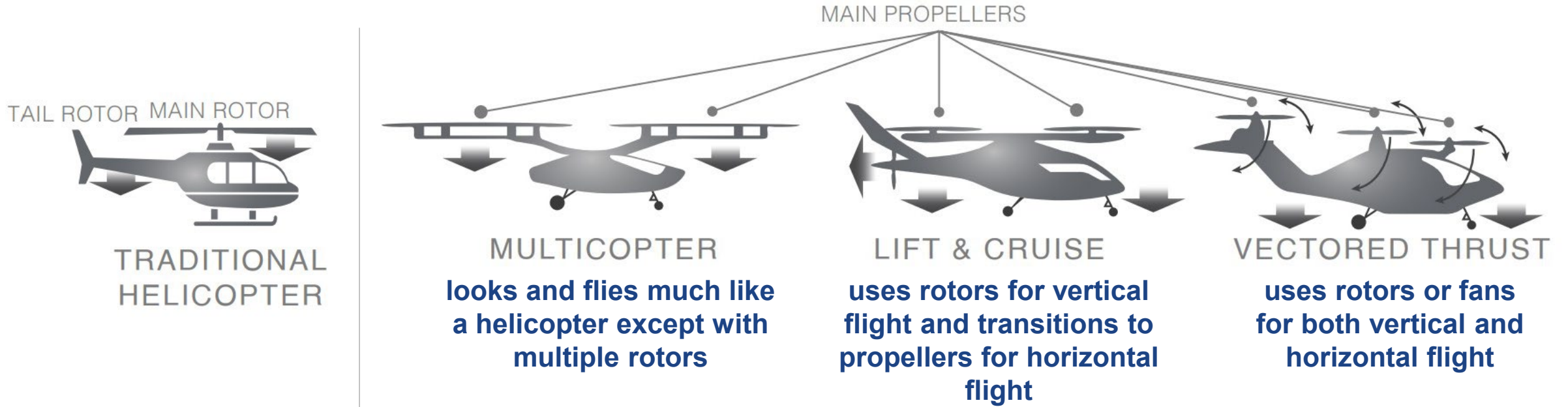


What is Advanced Air Mobility (AAM)?



- An air-based transportation system primarily utilizing *electronic vertical take-off and landing (eVTOL)* aircraft to carry passengers, cargo, or provide services in an urban or regional setting
- AAM market projected to reach \$1 Trillion by 2040

How are eVTOLs Different?



Most eVTOLs in development have a range of 200-mile range with up to 8 passengers

Typical take-off weight is up to 12,500 pounds

Benefits of AAM in our Communities



Air Taxi | Moving People

- Passenger travel in urban and regional areas



Air Cargo | Moving Goods

- “Middle mile goods” such as moving existing cargo between airports, cargo facilities, and distribution centers



Public Safety

- Supplementing existing air fleets for search and rescue, disaster relief, air ambulance, firefighting, etc.



Future Innovations for eVTOLs

- Anticipate advancements in autonomous operations, guidance, capacity, and power systems

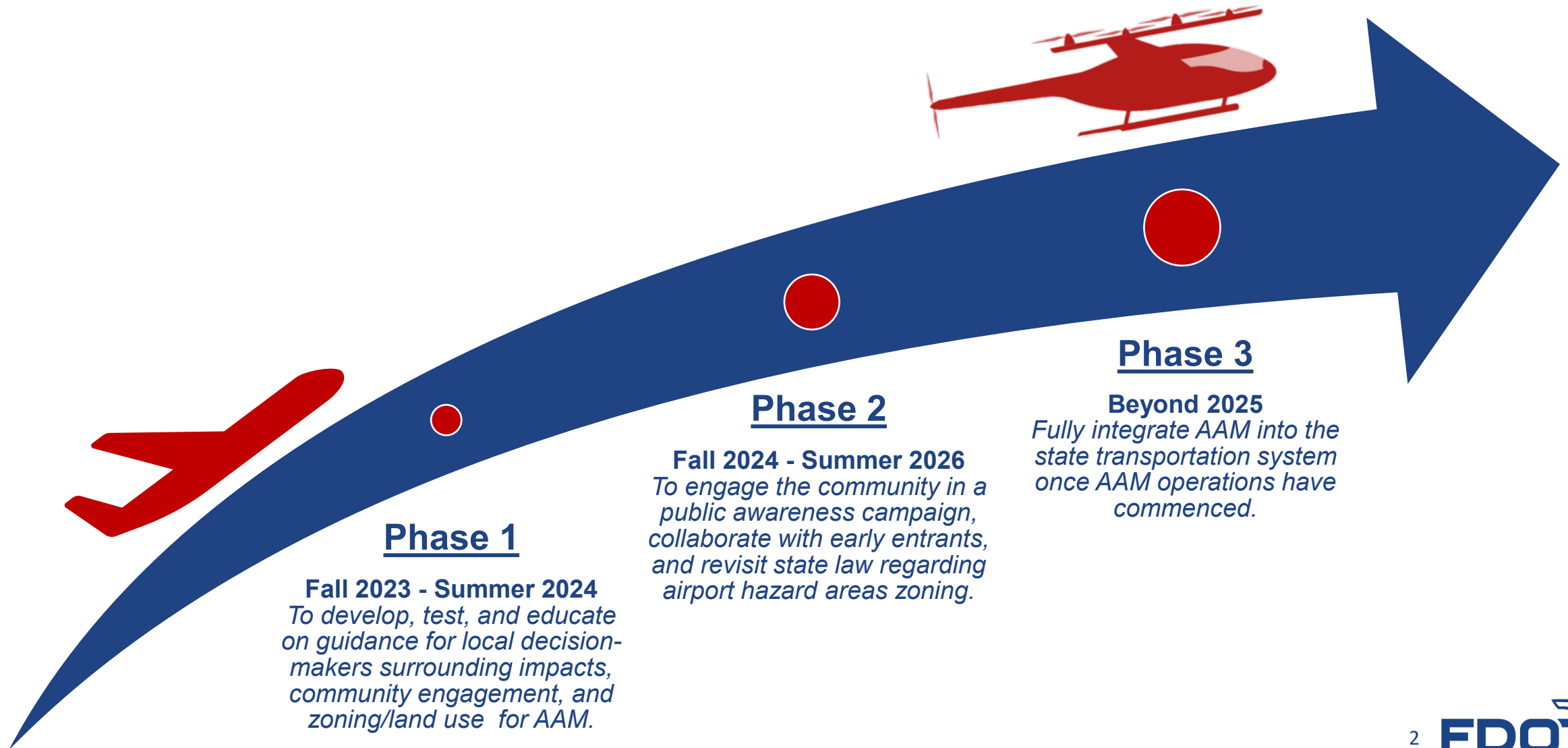
Florida Leads the Way

- **Actively engaged with a diverse, statewide Working Group of 50+ stakeholders**
- **Developed a Recommendations Report and corresponding Implementation Plan**
- **Published an AAM Roadmap with known best practices**

Working Group Members

- Airports & Airport Authorities
- Cargo & Logistic services
- Federal partners
- Higher Education Institutions
- Local Transportation partners
- Municipalities
- Modal partners (Transit, Rail, Seaport & Spaceport)
- OEMs & Industry Leaders eager to begin operations in FL
- Statewide Associations such as the FL Airports Council
- State Agency partners

Florida's Implementation Plan





Barriers to Launching

Pending FAA Regulations & Certifications

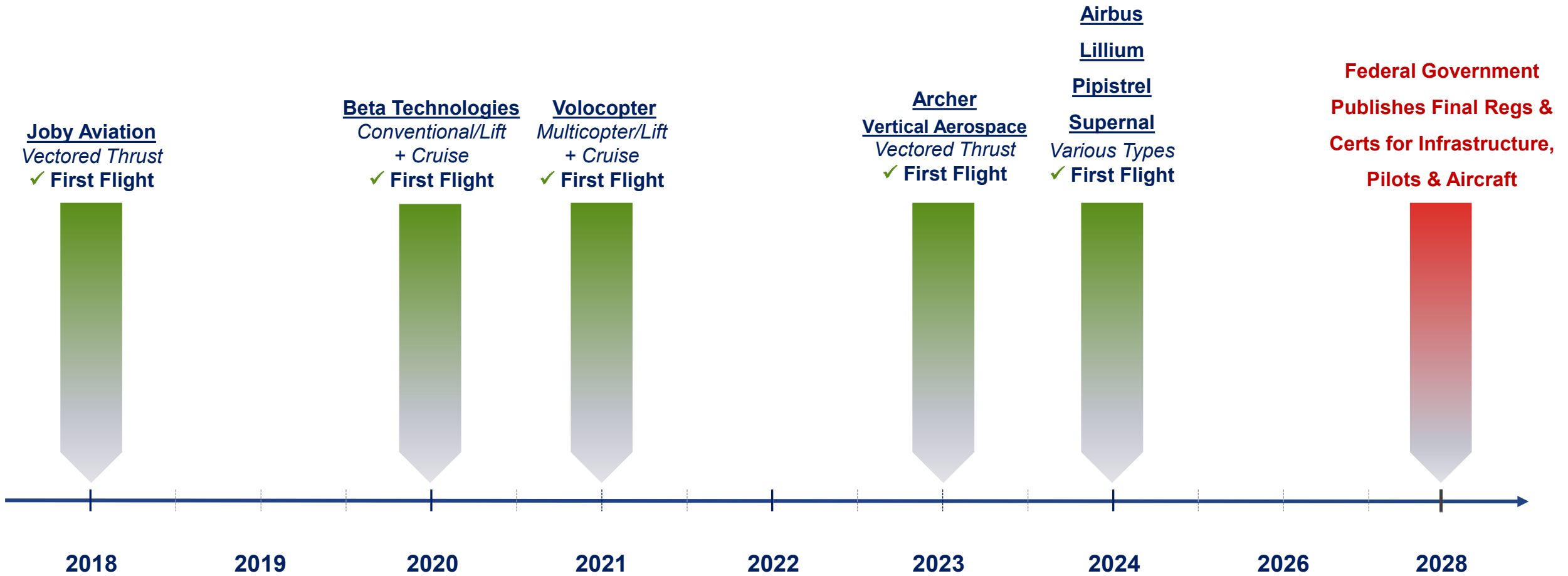
Vertiport Infrastructure Designs

Aircraft Certifications

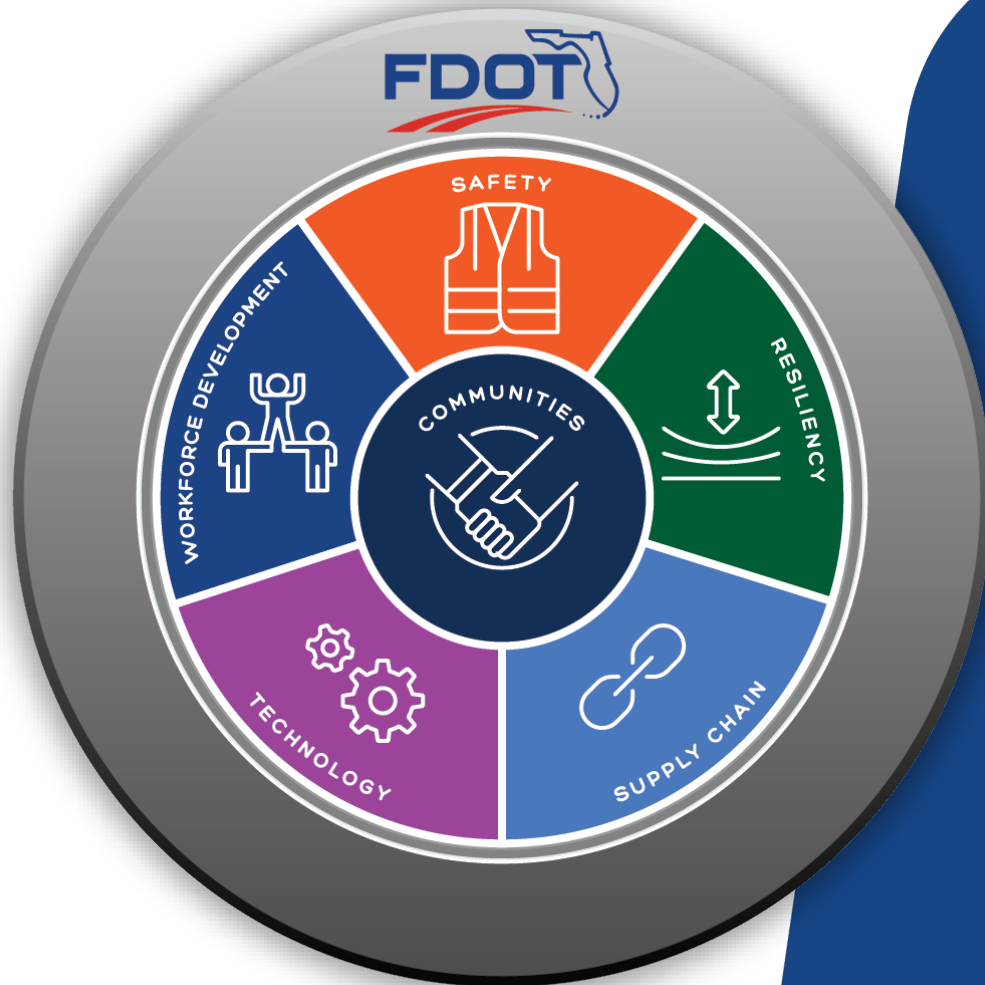
Pilot Training and Certification

Air Traffic Integration

The Time is Now



Thank You



Brian Stanger

Modal Development Adimistrator

fdot.aviation@dot.state.fl.us

<https://www.fdot.gov/aviation/advanced-air-mobility>



GREATER ORLANDO AVIATION AUTHORITY

Innovation Connecting the World

Envisioning the Future of Transportation

City of Orlando AAM Tabletop

December 6, 2023



Who are we?

MCO. Your Florida Airport of Choice®

- The busiest airport in Florida
- 4th largest U.S. airport by landmass
- World's largest rental car market
- 1st Airport in U.S. with High-Speed Rail Service
- Future connection to Sunrail service
- Access to major FL Highways (528 and 417)

ORL. Advancing Aviation, Business, & Community

- FAA-designated reliever for MCO
- 3 miles from Central Florida business and financial center
- Top 20 Airport in the State of Florida for aircraft operations

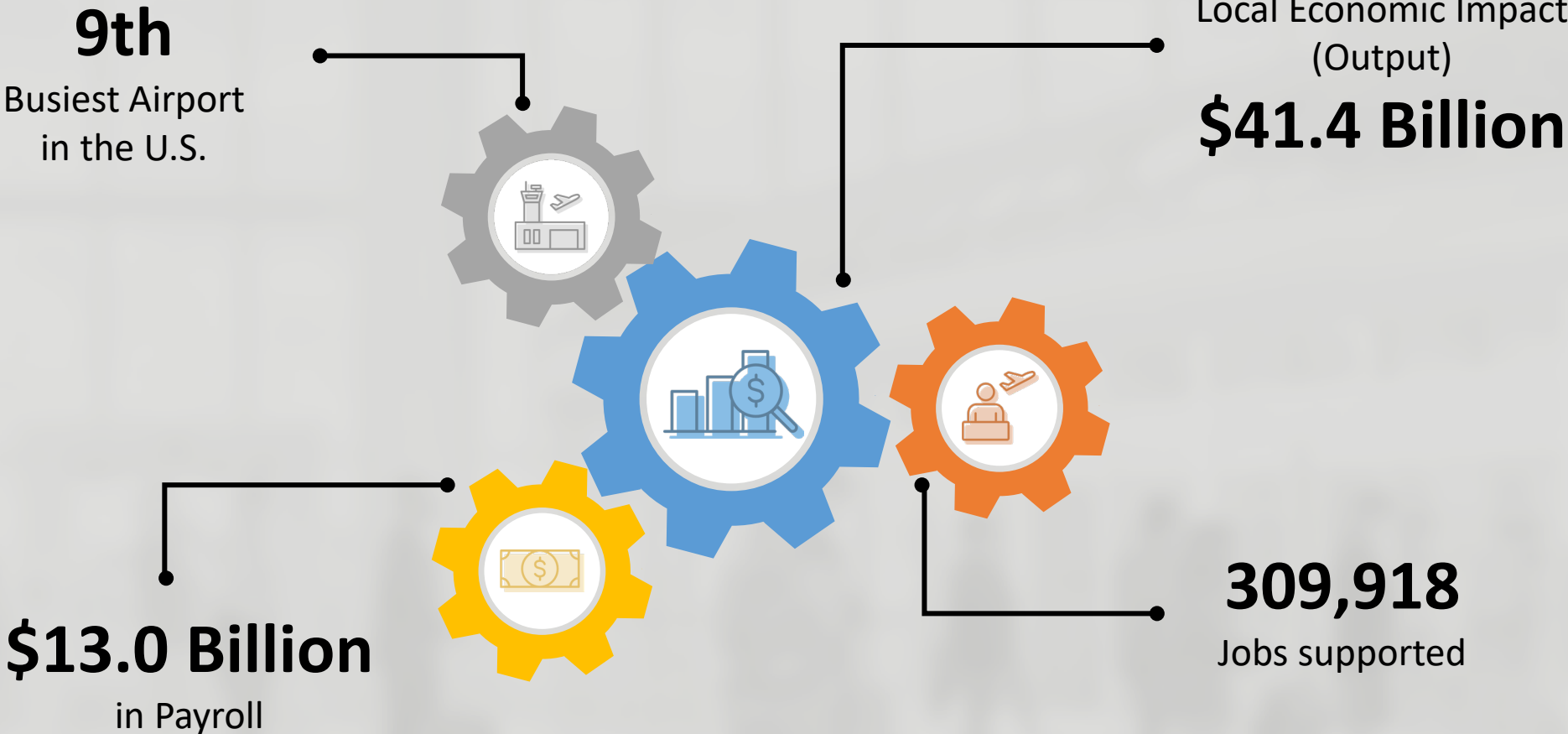


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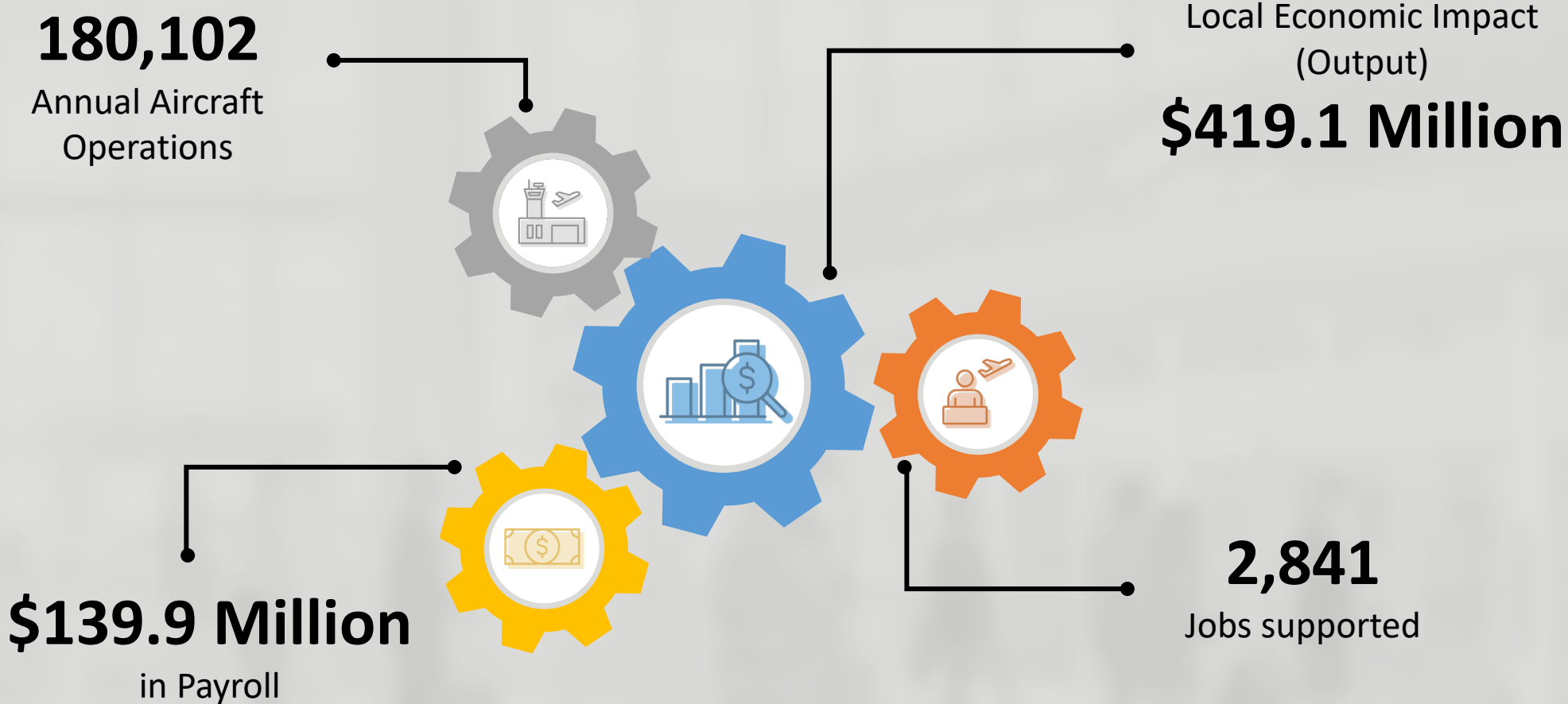


State of the Airport (MCO) – Economic Impact



SOURCE: Federal Aviation Administration, *CY 2022 Commercial Service Airport*, June 22, 2023, https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/cy22_commercial_service_enplanements (accessed July 2023); Florida Department of Transportation, *2022 Florida Statewide Economic Impact Study*, <https://www.fdot.gov/aviation/economicimpact22.shtm> (accessed October 2023).

State of the Airport (ORL) – Economic Impact

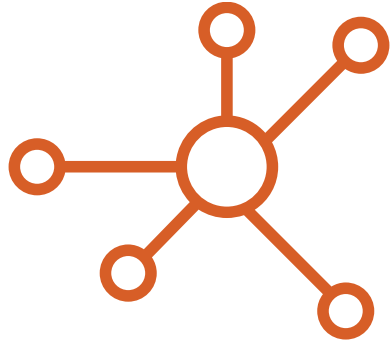


NOTE: Annual operations are based on rolling 12 Months ending October 2023.
SOURCE: Greater Orlando Airport Authority, Traffic Statistic Summary, <https://www.orlandoairports.net/about-us/#traffic-stastics> (accessed October 2023); Florida Department of Transportation, *2022 Florida Statewide Economic Impact Study*, <https://www.fdot.gov/aviation/economicimpact22.shtm> (accessed October 2023).



2023 STRATEGIC PLAN

Our Direction



MISSION

Seamlessly connect Florida and the world through exceptional experiences, collaboration, and creativity



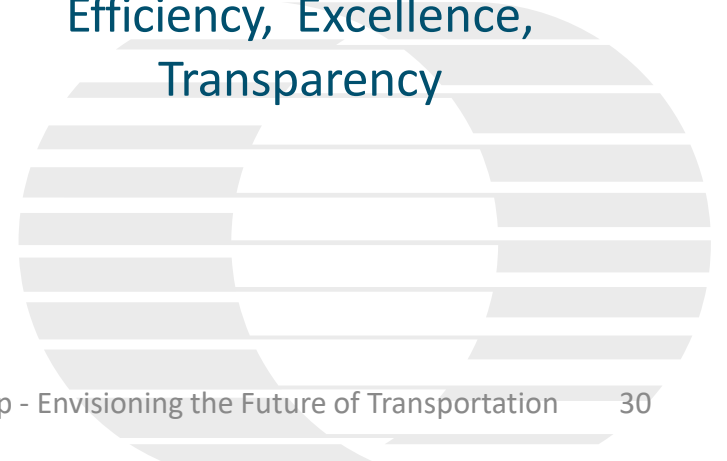
VISION

Be the global leader in the evolution of mobility



VALUES

Service, Integrity, Efficiency, Excellence, Transparency



Our Blueprint for the Future



PEOPLE

With millions more passengers today, we are exploring key amenities that will help customers better adjust when flights are delayed or canceled.



CONNECTION

Connectivity is important for the Central Florida economy. GOAA wants to lead the conversation on how we connect in the future via trains, planes, automobiles and beyond.



COMMUNITY

A dynamic workforce is critical to advancing the region. To compete with the best, we need to support programs that foster aviation interests.



INNOVATION

The Orlando Experience[®] is unique and we will continually explore new technologies and methods to elevate this experience.





GREATER ORLANDO AVIATION AUTHORITY

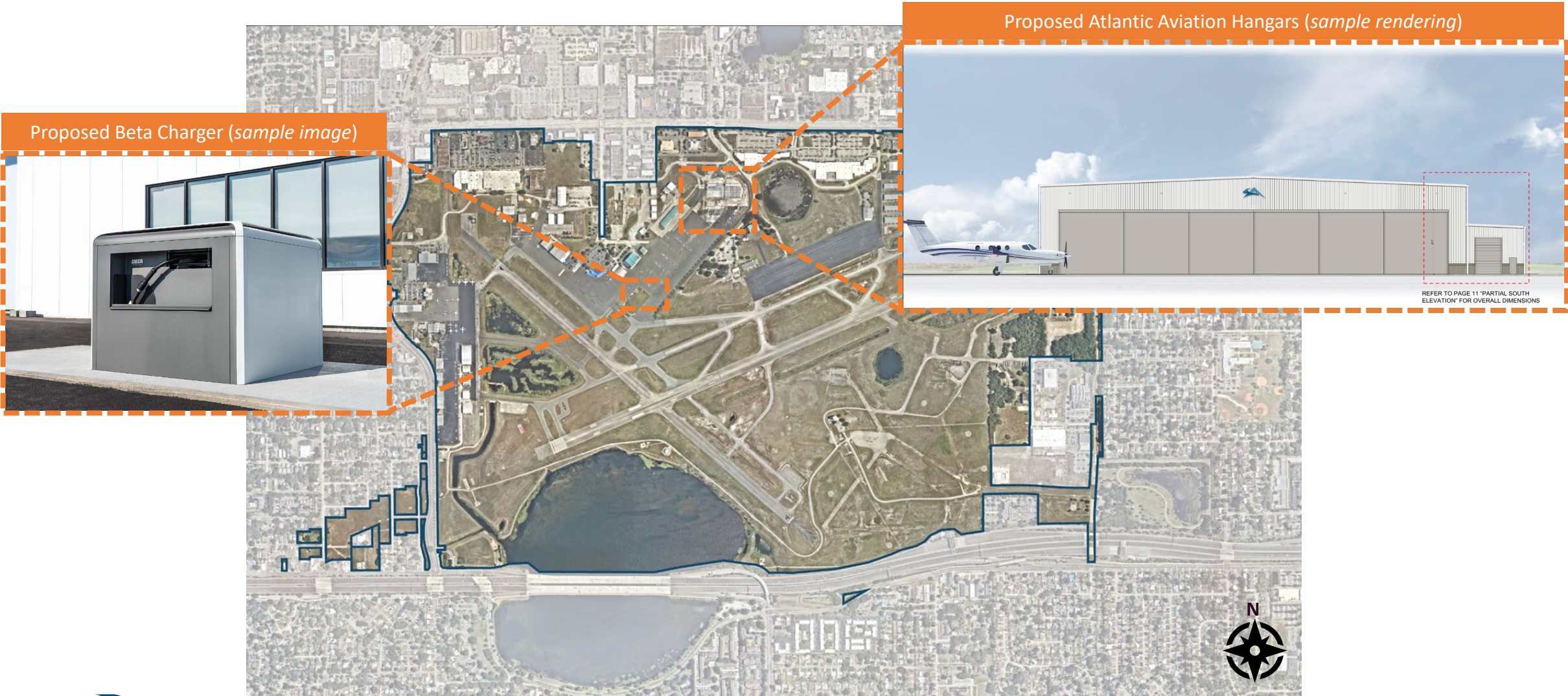
Innovation Connecting the World

New Developments

Orlando Executive Airport &
Orlando International Airport



Atlantic Aviation Expansion (ORL)





Train Station, Transit Rail Concept:

- 1** Airport Terminal Passenger Connector
- 2** High Speed Rail (Brightline) Regional Rail Connector
- 3** Commuter Rail (Future) SunRail Connector
- 4** Light Rail (Future) Connector

MCO Future South Terminal Complex





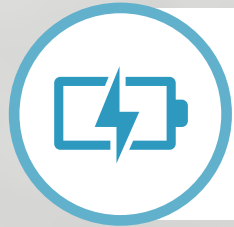
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Innovation Connecting the World

What is Possible?

City of Orlando AAM Tabletop



Emerging Technologies



Improvement of battery efficiency and microgrids



Advancement of autonomous navigation capabilities



Enhancement of hydrogen fuel cell systems



Development of lightweight and composite materials



Development of sustainable aviation fuels



Operational testing of aviation technologies including airspace integration



Digital Twins



Artificial intelligence and autonomy research and development

GOAA Vision Statement: *Be the global leader in the evolution of mobility.*



GREATER ORLANDO AVIATION AUTHORITY

Innovation Connecting the World

The Future of Advanced Air Mobility

Opportunities

PEOPLE



Create new employment opportunities and high-wage jobs



Offer training programs, workshops, and educational opportunities in various fields related to aviation and aerospace

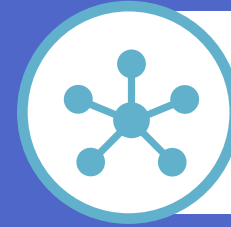


Serve as a hub for collaboration and knowledge sharing among researchers, engineers, aviation experts, and entrepreneurs

CONNECTION



Integrate new transportation options within the region and reduce travel time



Enhance connectivity by providing seamless connections with other modes of transportation



Establish more efficient and environmentally-friendly transportation options



The Future of Advanced Air Mobility

Opportunities



COMMUNITY



Garner financial investment and promote economic growth in the region



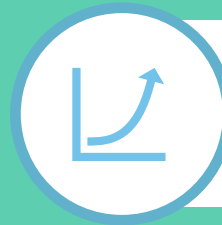
Attract mobility companies and related industries



Maintain Florida's position as a top leader in transportation



INNOVATION



Accelerate the development of zero-emission transportation options



Test the readiness for advanced technologies for integration into the existing aviation ecosystem



Promote collaboration among aviation, aerospace, mobility, innovation, and advanced materials industries

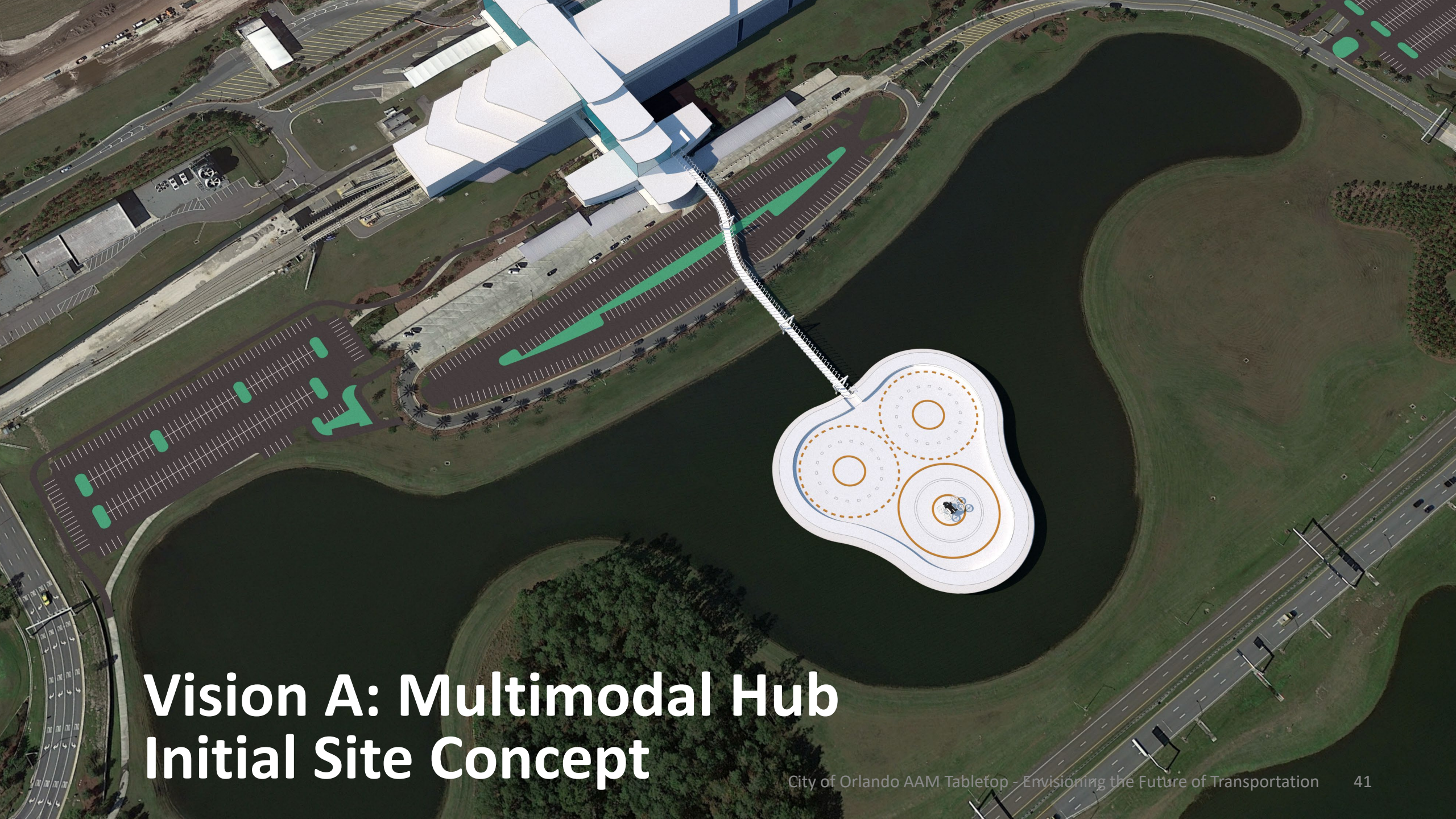


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Innovation Connecting the World

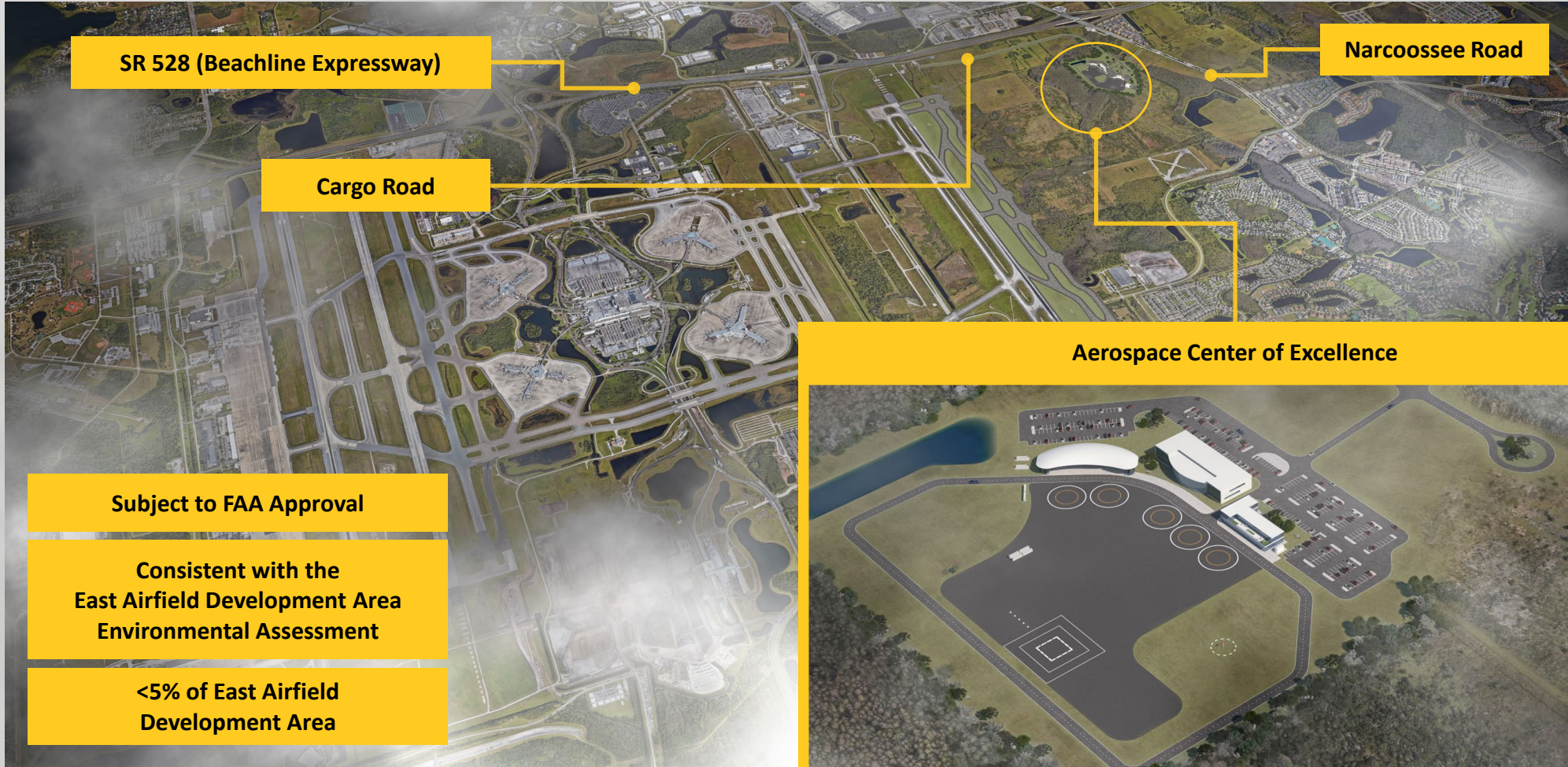
Potential AAM Development Opportunities (MCO)





Vision A: Multimodal Hub Initial Site Concept

Vision B: What is Possible?



Aerospace Center of Excellence

The MCO Advantage



Central Florida is home to numerous leading Colleges and Universities with specific educational programs designed for Aviation



Central Florida is home to established aviation and aerospace, advanced materials and manufacturing, innovative technology, and simulation companies

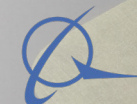


BLUE ORIGIN



SPACEX

LOCKHEED MARTIN



BOEING

NORTHROP GRUMMAN

GENERAL DYNAMICS



The Aviation Authority's vision aligns with the City of Orlando AAM Transportation Plan and the City's vision "to become a national leader in embracing and advancing air mobility options, including emerging eVTOL technologies and air taxi vertiports."

Thank you!

Kevin J. Thibault, P.E.
Chief Executive Officer
orlandoairports.net

2023 Strategic Plan:

To access the 2023 Strategic Plan document,
please use the QR code provided below.



GREATER ORLANDO AVIATION AUTHORITY
Innovation Connecting the World



ORLANDO ADVANCED AIR MOBILITY

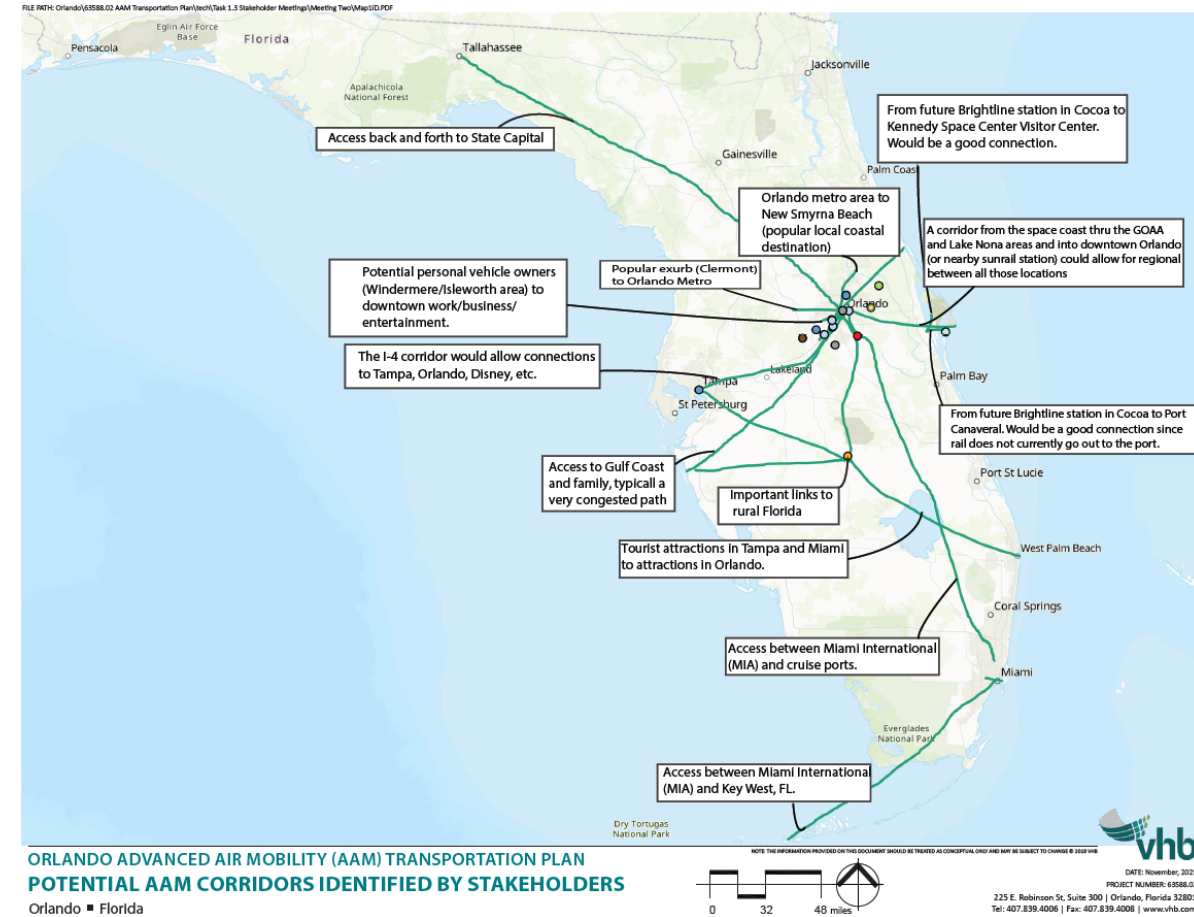
- **Purpose:** for the City of Orlando to plan for the anticipated impacts associated with AAM through a regional connectivity plan
- To position the City with additional future-ready mobility options by identifying the vertiport locations to support the movement of residents, businesses and visitors.
- To Implement a Mobility strategy from the Future-Ready City Master Plan





ORLANDO ADVANCED AIR MOBILITY

- Phase One
 - Technical Memorandums on Regional Transportation and Environmental Challenges and Opportunities
 - Economic Impact Study of Geico Garage
 - NASA Community Planning Annex
 - Stakeholder outreach and regional visioning
- Phase Two
 - Zoning and regulations review
 - Agency coordination
- Phase Three
 - Travel Demand Model
 - Vertiport target locations
 - Additional stakeholder outreach



FDOT Recommended Best Practices

1. Assign a lead staff member for AAM
2. Review FDOT State of AAM
3. Ensure zoning and land use are compatible for aircraft landing
4. Map out & coordinate with nearby aeronautical use facilities
5. Establish a benchmark for existing ambient noise levels
6. Establish waste, hazardous materials, and pollution prevention requirements, if within the airspace
7. Establish AAM Policies that put the community first
8. Update Zoning ordinances & Land Use plan, if needed



City of Orlando Vertiport Approval Process

1. Chapter 58, Part 4P Vertiports City of Orlando Land Development Code
2. Zoning Districts
3. Conditional Use Permit

1. Chapter 58, Part 4P Vertiport Standards

- Sec 58.850 – 58.853 of the Land Development Code regulates Vertiport permitting in the City of Orlando (Ordinance 9-16-1991)
- The classifications of vertiports defined in Chapter 8 of this City Code as Class I, II and III and the subclassifications thereof as Subclass A, B and C shall be deemed to be the **same respective classifications and subclassifications as are contained in the Federal Aviation Administration (FAA) booklet entitled "Heliport Design Guide," AC 150/53901A, dated November 5, 1969.** All recommendations set forth therein relating to the location, design, construction, visual markings, and fire protection for such vertiports shall be the requirements of this Chapter; provided, however, that a Variance therefrom may be granted in accordance with Chapter 65, Part 2J if the Federal Aviation Administration advises the City that such variance will not render such vertiports unsafe.



Sec. 58.851 - Standards for the Approval of Vertiports.

- No permit for any vertiport shall be approved unless the reviewing authority finds that the following standards have been met:
 - *Feasibility.* That the proposed vertiport is operationally feasible.
 - *Safety.* That the FAA considers the proposed vertiport to be safe for the conduct of the type and volume of aeronautical activity proposed to be conducted thereon.
 - *Location and Specification.* That the location and the plans and specifications of the proposed vertiport conform to the requirements of [Section 58.850](#).
 - *Frequency.* One landing and/or take-off in a twelve (12) month period shall not constitute a vertiport.
 - *Fire Prevention.* That such plans and specifications conform to all other requirements of law relating to construction and fire prevention.
 - *Air Turbulence.* That, if the proposed vertiport is to be elevated on a building or other structure, that air turbulence which may be created by rotorcraft landing and taking off there from will not cause dust, sand, water or other material to fall on any property other than that controlled by the applicant.



Sec. 58.851 - Standards for the Approval of Vertiports

- **Need.** That the applicant has a **bona fide need** for such vertiport and that the **public welfare will not be adversely affected** by the establishment and operation of the vertiport taking into account the following factors:

(a)The applicant's need to establish the vertiport;

(b)The **availability of other vertiports** which the applicant could use in lieu of the proposed vertiport and their proximity to the site selected for such vertiport;

(c)The proximity of the vertiport to areas which could be used as **emergency landing areas** in the event of mechanical malfunction of rotorcraft using such vertiport;

(d)The proximity of the vertiport to **fire stations**;

(e)The proximity of the vertiport to **tall buildings other navigation hazards** and existing uses which would present a **public safety hazard** in case of an aircraft crash;



Sec. 58.851. - Standards for the Approval of Vertiports.

Need (continued)

(f)The proximity of the vertiport to **residential areas, nursing homes, assisted living facilities and schools**;

(g)The proximity of the vertiport to **airports and to the flight patterns of aircraft** using such airports;

(h)The **benefits to be derived by the public** from the establishment and operation of the vertiport, if any;

(i)The **nuisance effect**, if any, of the vertiport and its associated rotorcraft operations on vehicular traffic;

(j)The **environmental impact** of the vertiport, if any, including, but not limited to, **noise pollution**; and;

(k)The proximity of the vertiport to **storage facilities for combustible or explosive materials** or to other hazards.



Sec 58: Procedural requirements

- **Submittal of Application**

- (a)The name and address of the applicant;

- (b)The **type, class and subclass of the vertiport** proposed to be established;

- (c)**Description of the rotorcraft support facility** proposed to be constructed, if any;

- (d)A study prepared by a **recognized aviation consultant** showing that the proposed vertiport is **operationally feasible**;

- (e)A **map** showing the location of the proposed vertiport and the **proposed approach zones, lateral clearance zones and emergency landing areas** referable thereto;

- (f)**Evidence that a notice of landing area proposal has been filed with the FAA and that the FAA considers the proposed vertiport safe** for the conduct of aviation activities proposed to be conducted thereon;

- (g)**A complete set of plans and specifications** for the proposed vertiport, prepared in conformity with the provisions of Section 58.850 of this Part; and

- (h)Statement by the applicant setting forth the **estimated number of monthly rotorcraft landings** proposed to be conducted thereon.

- **GOAA review** to “advise the City of its opinion respecting the desirability or non-desirability of issuing the requested permit, together with the reasons for its opinion”.

- **Certificate of Occupancy**



3. Conditional Use Permit

- Sections 65.280 – 65.288 of the City of Orlando Land Development Code provides **standards and procedures** for the granting of Conditional Use Permits where expressly authorized by the provisions of this Chapter, through a **legislative review** by the **Municipal Planning Board and City Council where they find that certain conditions have been met.**
 - Pre-application meeting
 - Submittal
 - Municipal Planning Board (MPB) hearing
 - City Council hearing
 - Conditions of Approval

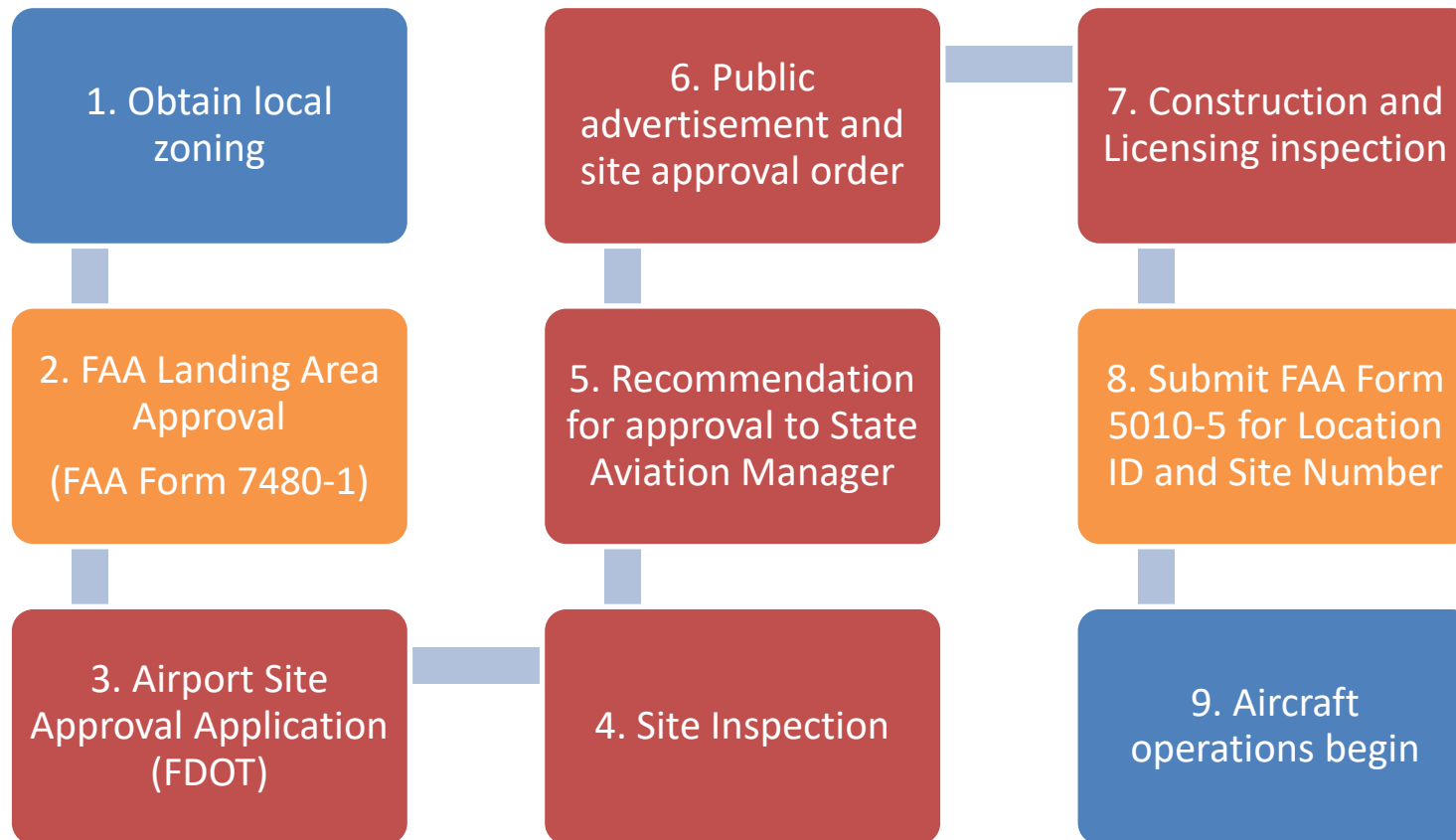


Interagency Coordination and Resources



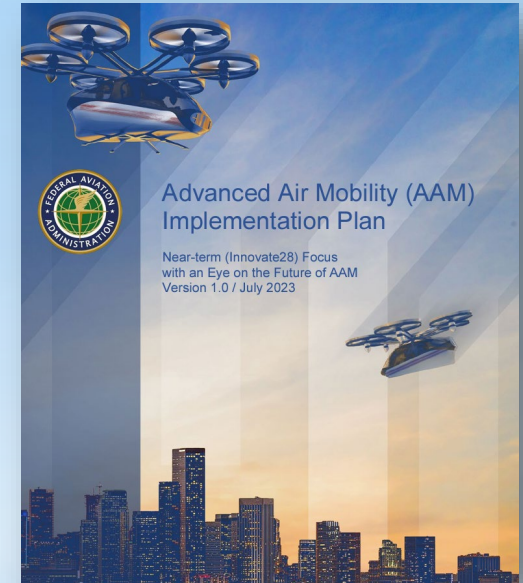
FDOT Permitting Process

- Section 330.30, F.S. requires a new airport, heliport, or seaplane base to receive site approval from FDOT



Regulation and Planning Guidance

- FAA AAM Implementation Plan (Innovate28)
- Title 14 CFR Part 77 Safe, Efficient Use and Preservation of Navigable Airspace
- FAA Engineering Brief 105: Vertiport Design
- FAA Advisory Circular 150/5390-2D, Heliports
- Airport Cooperative Research Program (ACRP) Research Report #236
- FAA Concept of Operations v2.0



Breakout Sessions



Tabletop Exercise Scenarios



1. New Private vertiport on greenfield property
 - Vertiport application, Rezoning, Conditional Use Permit
2. New Private vertiport on previously developed property
 - Vertiport application, Conditional Use Permit
3. New Vertiport on airport property
 - FDOT/FAA requirements
4. Existing heliport
 - Vertiport application, Conditional Use Permit



Participant Roles

- Local Government role
- FDOT role
- FAA role
- Airport role
- Community role
- Private role
- Facilitator/recorder



Questions for each Scenario

Approval Process

- Identify responsible party for submittal
- Identify responsible reviewer/approver
- Identify critical paths and timelines
- What can occur concurrently? Are there efficiencies to be found?

Vertiport planning questions for participants

- What are the mobility considerations (site access, connectivity, etc)?
- What are the environmental considerations (wetlands, species, noise, etc)?
- What are the community considerations (economic development, adjacent parcels, equity, etc)?



Report Out



Thank You!



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