Advanced Air Mobility: State Perspective

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FDOT AVIATION

ADVANCED AIR MOBILITY (AAM)

Tampa Bay Smart Cities Alliance (TBSCA)

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AGENDA

- Introduction to AAM
- AAM in Florida
- Next Steps

WHAT IS ADVANCED AIR MOBILITY?

- An air transportation system primarily utilizing electric vertical takeoff and landing (eVTOL) aircraft
- AAM is possible due to advances in automation and distributed electric propulsion.

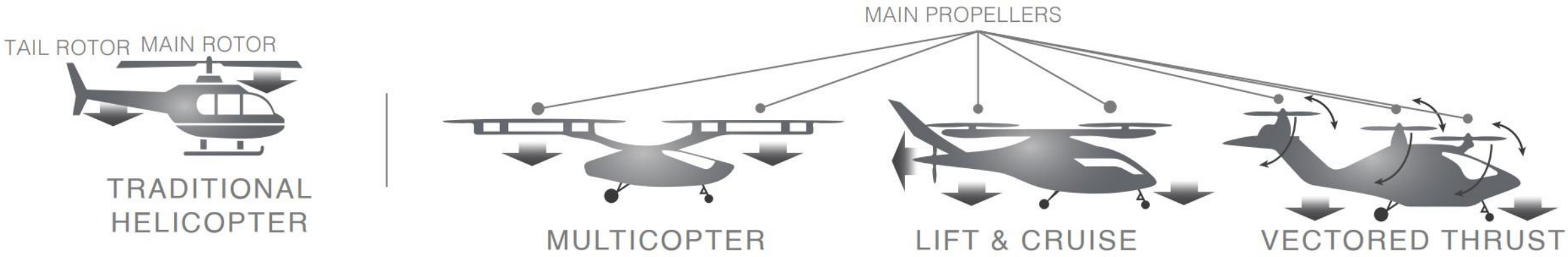
Morgan-Stanley projects a $1 trillion AAM market by 2040, but numerous hurdles to overcome including:

- Lithium battery constraints
- Pilot/mechanic shortage
- Reactive regulatory environment
- Airspace management
- Charging infrastructure and grid capacity
- Public demand and acceptance

- **Multicopter** – looks and flies much like a helicopter except with multiple rotors
- **Lift and cruise** – uses rotors for vertical flight and transitions to propellers for horizontal flight
- **Vectored thrust** – uses rotors or fans for both vertical and horizontal flight

- Most eVTOLs in development have:
  - < 200 mile range
  - < 8 passengers
- < 12,500 lb. Maximum Take-off Weight

eVTOL AIRCRAFT



USE CASES FOR AAM

AIR TAXI

Passenger travel in urban and regional areas, likely under part 135 certificate

Generally <200 miles and <8 passengers

AIR CARGO

"Middle mile," i.e., transporting existing cargo to/from airports or cargo facilities to distribution centers

High-value or time-sensitive cargo including medical cargo

PUBLIC SERVICE

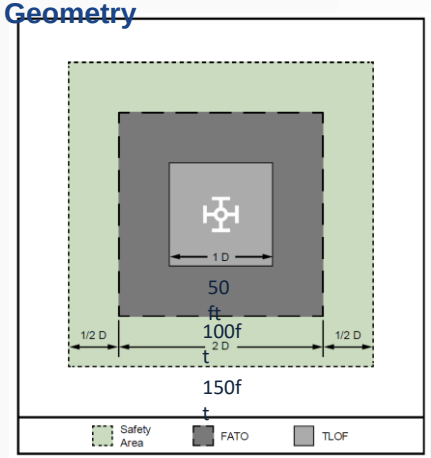
Supplementing or replacing helicopters for military, search and rescue, disaster relief, and air ambulance, among other uses

INFRASTRUCTURE DEVELOPMENT

- **Early stages of AAM** will rely on existing aviation/airport infrastructure
- **FAA Engineering Brief 105** provides interim design standards for vertiports, in the absence of an Advisory Circular, which is expected in 2025 to 2026
- **EB 105** is specific to visual flight rules (VFR), piloted eVTOL aircraft that are no more than 50 feet wide/long, ≤12,500 MTOW, and are capable of hover out-of-ground effect
- Provides the basic minimum safety elements needed for a vertiport

INFRASTRUCTURE DEVELOPMENT

Basic Vertiport Landing Geometry

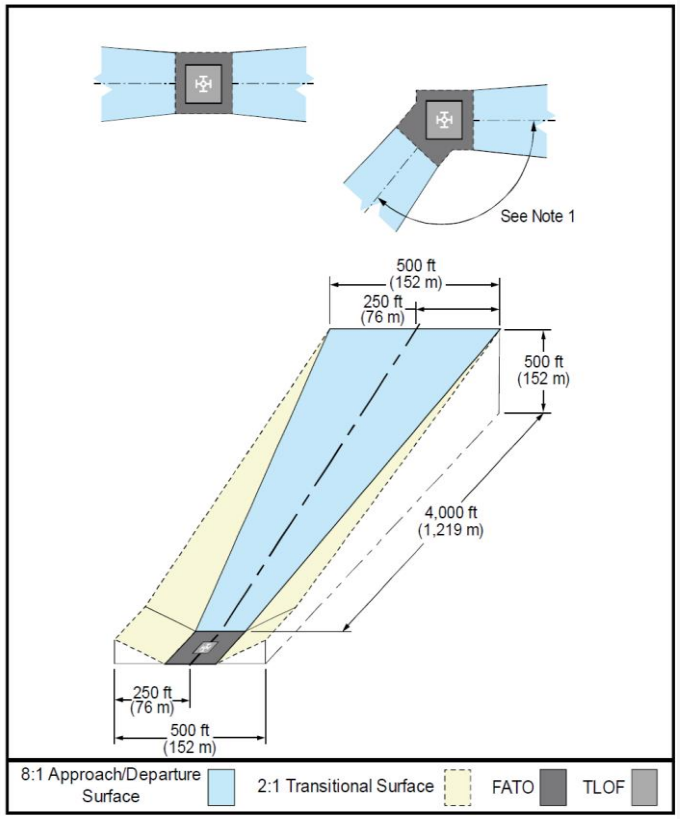


TLOF: Touchdown and Liftoff Area

FATO: Final Approach and Takeoff Area

Safety Area: Defined area surrounding the FATO

Basic Vertiport Imaginary Surfaces



Additional Considerations

- Charging Infrastructure or Battery Swap Capability
- Maintenance, repair, and overhaul (MRO) Services
- Battery cell recycling
- Airport Rescue & Fire Fighting (ARFF)
- High-speed data

Gaps in Design Guidance

- Piloted, VFR flights only
- Distance between TLOFs for simultaneous operations
- Taxiway hold lines and independent use of taxiways within the protected surfaces of a TLOF
- Operational requirements (e.g., activities permitted near charging aircraft)
- These gaps will need to be filled in with assumptions based on heliport and airport design criteria.

ADVANCED AIR MOBILITY PROGRESSION

Pilot on Board	Autonomous
All Electric	Hybrid & Hydrogen
Visual Meteorological Conditions	Instrument Meteorological Conditions
Traditional Air Traffic Management	Unmanned Aircraft System Traffic Management (UTM)
Low Tempo | Low Volume	High Tempo | High Volume

TRENDS AND TIMELINES FOR DEVELOPMENT

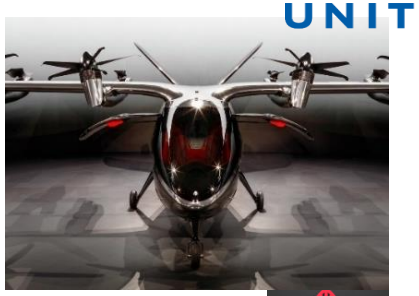
OEM	ARI	Use Case	Vehicle Type	Operation	First Flight	EIS	Country
Joby Aviation	8.7	Air Taxi	Vectored Thrust	Piloted	2018	2025	USA
Volocopter	8.6	Air Taxi	Multicopter / Lift + Cruise	Piloted	2021 / 2022	2024 / 2026	Germany
Archer	8.1	Air Taxi	Vectored Thrust	Piloted	2023	2025	USA
Beta Technologies	8.0	Cargo, Air Taxi	Lift + Cruise	Piloted	2020	2024	USA
Eve Holding	7.7	Air Taxi	Lift + Cruise	Piloted	2022	2026	Brazil
Wisk	7.5	Air Taxi	Vectored Thrust	Autonomous	-	-	USA
Ehang	7.4	Tourism, EMS, Firefight	Multicopter / Lift + Cruise	Autonomous	2018 / 2021	2023 / -	China
Elroy Air	7.4	Cargo	Lift + Cruise	Autonomous	2023	2024	USA
Pipistrel (Textron)	7.2	Cargo	Lift + Cruise	Autonomous	2023	2024	USA
Vertical Aerospace	7.2	Air Taxi, Cargo, EMS	Vectored Thrust	Piloted	2022	2025	UK
Airbus	7.0	EMS, Tourism, Air Taxi	Multicopter	Piloted	2024	2026	France
Supernal	7.0	Air Taxi	Vectored Thrust	Piloted	2023	2028	South Korea
Lilium	6.8	Regional, Cargo, Biz Av	Vectored Thrust	Piloted	2024	2025	Germany

ADVANCED AIR MOBILITY (AAM)

DELTA

Joby

UNITED



ARCHER

ups

BETA

American Airlines

VERTICAL

FedEx

ELROY AIR

wisk

BOEING

- First electric vertical takeoff and landing (eVTOL) aircraft expected to be FAA certified in 2025
- 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, “ecosystem” should support vertiports, charging stations, routes, and automation.

AAM IN FLORIDA

Florida remains a target market for early AAM entry. Numerous OEMs are planning operations in Florida, including:

Joby

EVE MOBILITY REIMAGINED

VERTICAL

wisk

BETA

supernal

VOLOCOPTER

ARCHER

LILIUM

BLADE

WHY RELY ON EXISTING AVIATION/AIRPORT INFRASTRUCTURE?

- Provides the public perception of “safe aviation”
- Meets spacing requirements and supports early air traffic integration
- Has terminal-like facilities and potential built in support businesses (FBOs)
- Proximity to business cases and “high” dollar users
- Multimodal connections

FDOT's APPROACH TO AAM

AAM Roadmap Document

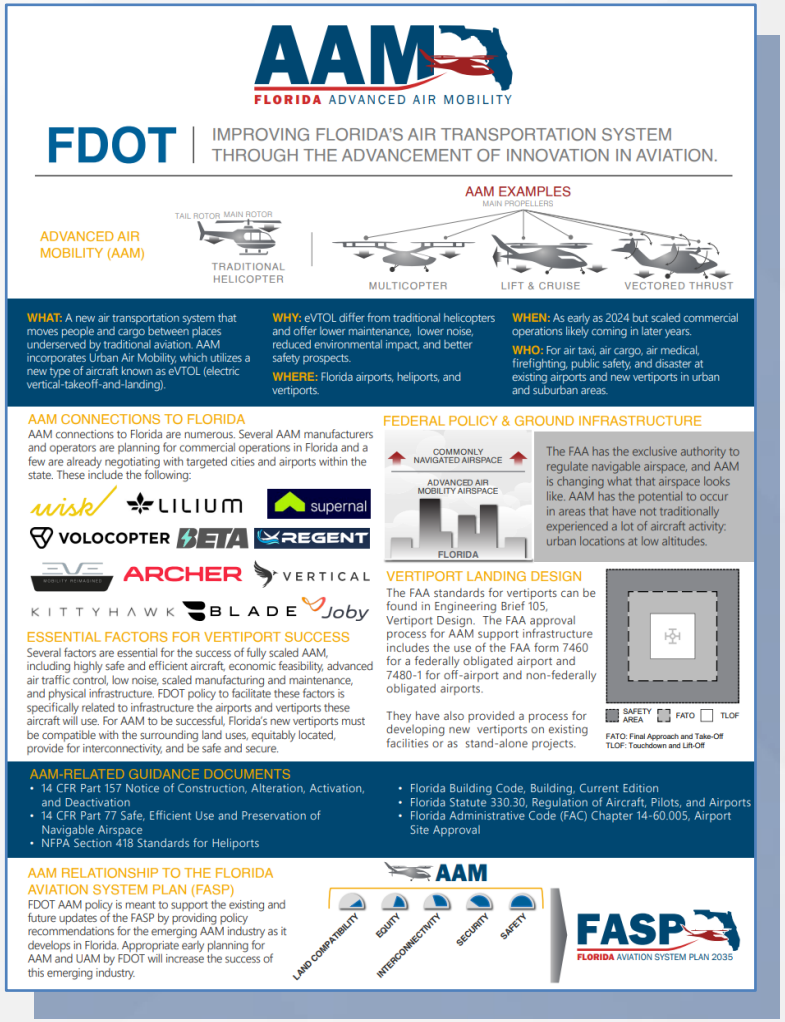
- AAM definitions and details
- Key stakeholders
- Guidance documents
- Timelines for certification
- Best practices for local government

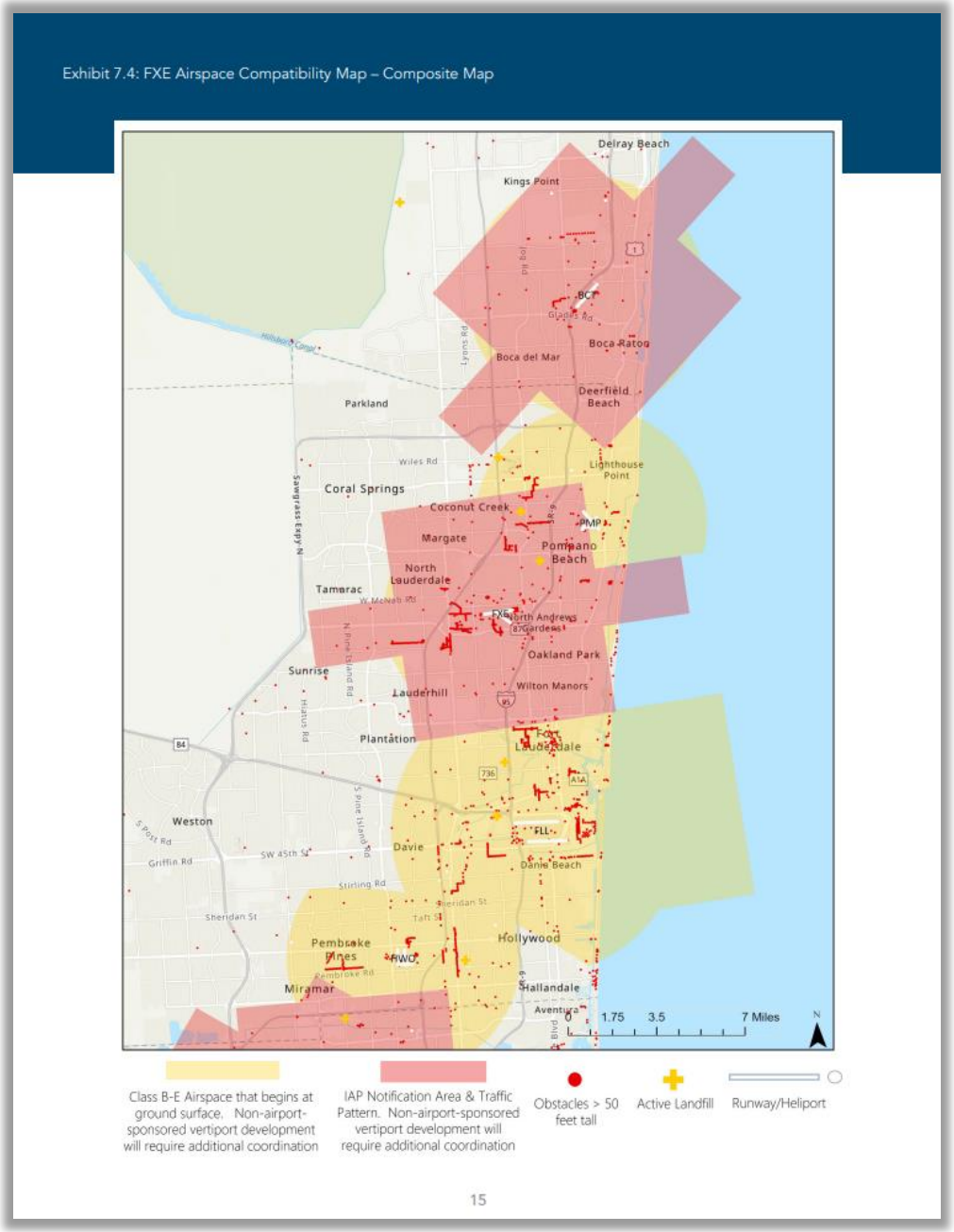
Companion Document

- Recommendations, suggested changes, GAP analysis

Executive Summary

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





FDOT AAM DOCUMENTS

Airport Compatibility Considerations

- Report was prepared for 31 public use airports
- Assists in identifying incompatible locations for vertiports relative to airports
- A starting point for how airports and communities should think about compatibility for vertiport development

AAM WORKING GROUP

Purpose

Assess and describe the current state of development of the AAM industry, specifically the deployment of eVTOL aircraft in Florida

Offer other comments and propose ideas that will be used to prepare a report which outlines policy and steps for integration that build on the work the FDOT Aviation Office has done thus far

Role

Act in a representative role for the AAM industry and its partners

Bring forward issues, concerns, and provide constructive input

WORKING GROUP REPORT

- Focus Areas:
  - Public Education and Community Engagement
  - Infrastructure and Zoning
  - System Planning and Access
  - Airspace and Safety
- Categories
  - Legislative
  - Regulatory
  - Advisory
  - Local Government

WORKING GROUP PARTICIPATION

- Working Group Members:
  - Airports
  - Cities
  - Operators
  - OEMs
  - State Agencies
  - FAA
- Four Statewide Meetings:
  - TPA, MCO, PBI, MIA

NEXT STEPS

AAM Phase III Launch

- Creation of an Implementation Plan
- Develop an Outreach Workplan

Public Education & Outreach

- Legislative Concerns
- Advisory Member Selection

FDOT | AVIATION

THANKY OU

www.fdot.gov/aviation

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