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Operationalizing an Advanced Air Mobility Ecosystem

Advanced Air Mobility (AAM)

- First electric vertical takeoff and landing (eVTOL) aircraft expected to be FAA certified in 2025

- Predicted to be $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

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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
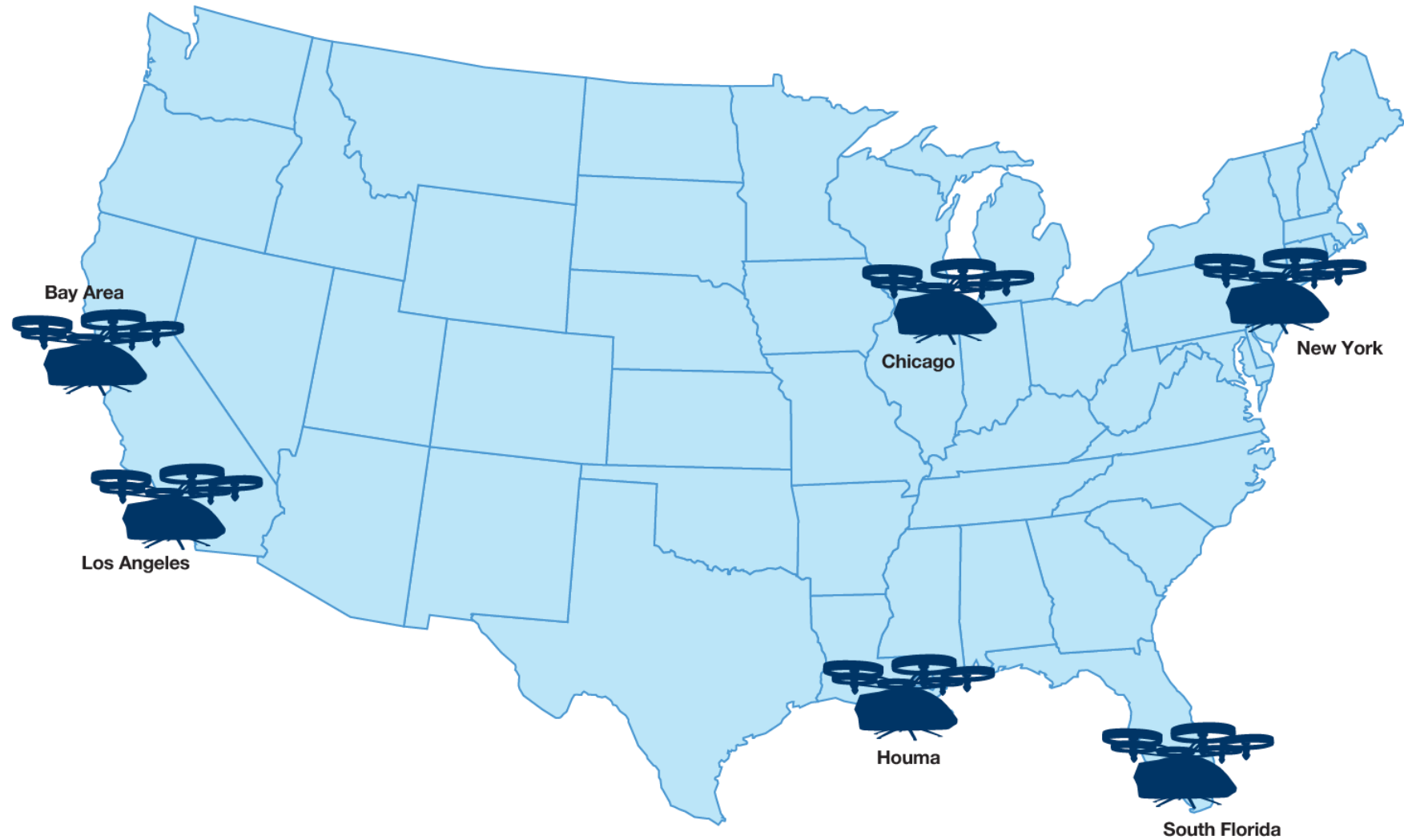
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Ecosystem Enablers

- Aircraft Safety Rulemaking

  o Recognition of pilot in command experience in military/air carrier operations
  (final rule Sep 2022)

  o Update to air carrier definitions
  (comment closed Feb 2023)

  o Airman certification standards
  (comment closed Feb 2023)

  o Notice of proposed rulemaking (NPRM), which proposes special federal aviation regulations (SFAR) for integration of powered-lift operations and associated pilot certification
  (published June 2023)

  o For type certification, the FAA is accepting established means of compliance as well as developing new means depending on unique design features/characteristics of vehicle

- Planning & Portfolio Management

  o Urban Air Mobility Concept of Operations v2.0
  (May 2023)

  o AAM Implementation Plan
  (July 2023)

  o Planning integrated simulations/testing in partnership with DOD, NASA

- Airports

  o Interim guidance published September 2022 through Engineering Brief #105; refined performance-based guidance planned through Advisory Circular in 2025

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Potential Initial Operations Locations

Map of the United States showing potential initial operations locations: Bay Area, Los Angeles, Chicago, New York, Houma, and South Florida.

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Innovate28 Goals for Near-term Operations

- Define and complete agency actions needed to enable AAM operations in locations determined by industry in the near-term leading up to 2028

- Provide an FAA focal point on AAM issues, and provide programmatic support that coordinates efforts across the agency on behalf of specific key projects

- Develop a repeatable process to allow ease of implementation in other locations

- Plan for permanent and scalable processes, procedures, infrastructure, and mechanisms to support continued AAM operations

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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

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.

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:

Industry

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Key Innovate28 Activities

| Aircraft Type Certification | Community Engagement | Physical and Operational Security |

| Air Traffic Policy Review and Updates | Cyber Security | Site Selection |

| Concept of Use (general and local) | Part 135 Operational Certification | Site-specific AAM forecasting |

Hazardous Materials

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

Local Vertiport Activities

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

Wake Separation Requirements

Crew Preparation

- Rulemaking for pilot training
- Train and certify crew

Procedure Development

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

Local ATC Activities

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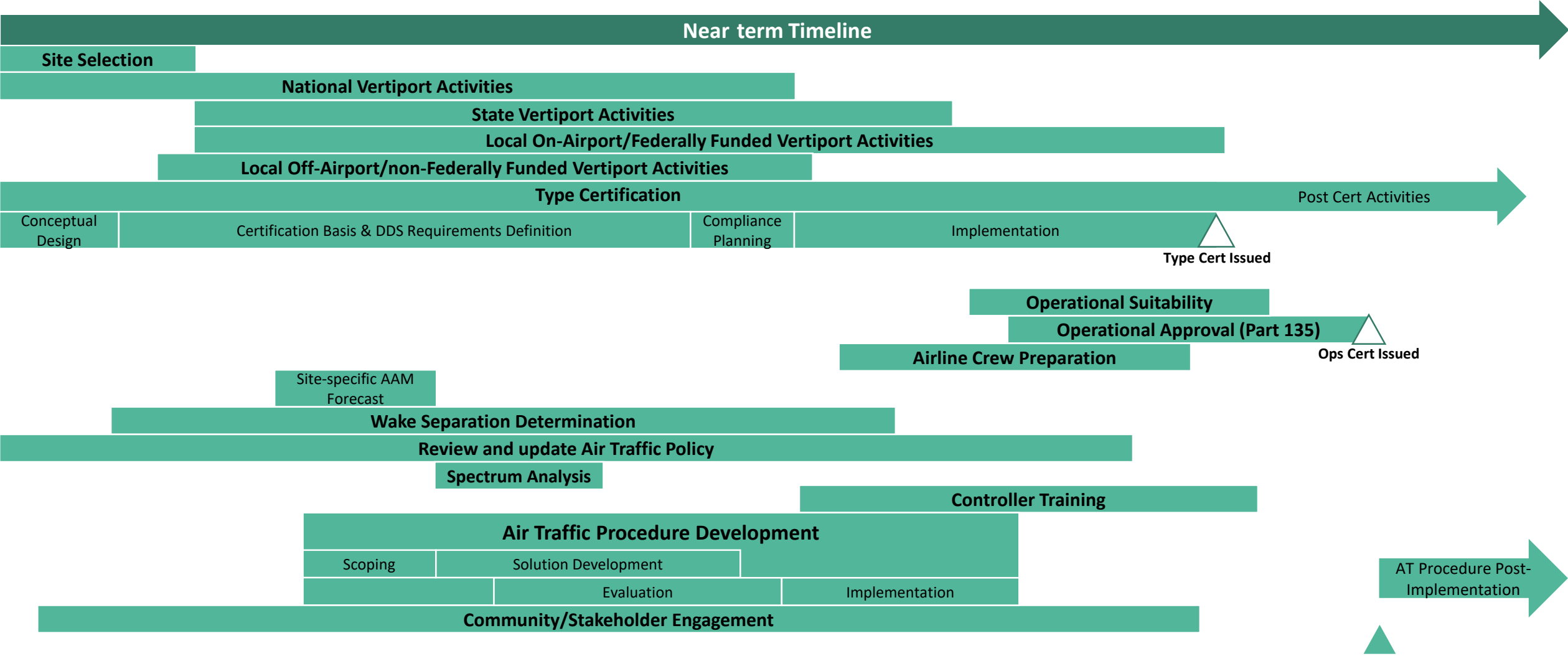
National Vertiport Activities

- Flight testing
- National guidance
- Rulemaking

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

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Portfolio Management for Each AAM Project

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 (CNS), etc.
- Support industry development of supplemental services
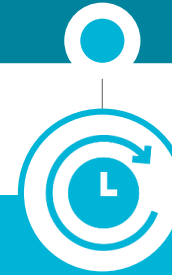
Mature Stage

- 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 autonomous WG to integrate Autonomous Operations

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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 though regulatory and operational aspect of their new services

- We strive to be one step ahead of industry

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Questions?

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Back Up

FAA Integrated Team

Requirements Definition and Portfolio / Program Management

- **Federal, State, Local, Tribal, and Territorial (FSLTT) Government**
  Completed 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

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