Urban Air Mobility (UAM)
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UAM Vision & Framework

Urban Air Mobility (UAM) Vision
Revolutionize mobility around metropolitan areas by enabling a safe, efficient, convenient, affordable, and accessible air transportation system for passengers and cargo

Operations and maintenance of a single UAM vehicle, independent of the sharing of airspace or other system resources

Operations and management of multiple vehicles within a UAM system that enable safe and efficient sharing of airspace and other system resources

Societal integration and acceptance of UAM operations

Community Integration

Airspace & Fleet Operations Management

Airspace System Design & Implementation

Design, manufacture, and system readiness of UAM vehicles

Vehicle Development & Production

Vehicle Barriers

Airspace Barriers

Community Integration Barriers

Pillar number
UAM Maturity Levels (UMLs)

<table>
<thead>
<tr>
<th>UML-1</th>
<th>Vehicles</th>
<th>Late-Stage Certification Testing and Operational Demonstrations in Limited Environments</th>
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<tbody>
<tr>
<td>UML-2</td>
<td>Airspace</td>
<td>Low Density and Complexity Commercial Operations with Assistive Automation</td>
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<tr>
<td>UML-3</td>
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<td>Low Density, Medium Complexity Operations with Comprehensive Safety Assurance Automation</td>
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<td>UML-4</td>
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<td>Medium Density and Complexity Operations with Collaborative and Responsible Automated Systems</td>
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<td>UML-5</td>
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<td>High Density and Complexity Operations with Highly-Integrated Automated Networks</td>
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<td>UML-6</td>
<td>Community</td>
<td>Ubiquitous UAM Operations with System-Wide Automated Optimization</td>
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Grand Challenge Series

**Purpose:** To develop a robust proving ground through operational and safety scenarios emphasizing near-term UMLs to accelerate the UAM market.

- Builds knowledge base for requirements and standards
- Results in a UML – 4 scaled urban demonstration
Open Source Collaboration

NASA will rely on open source collaboration with the community to build out the following resources:

- **Book of Requirements**
  - Provide requirements, recommended practices, standards, regulatory guidance, accepted metrics and other information helpful for achieving UAM

- **Ecosystem Scorecard**
  - Measures industry performance against UAM milestones
Regional Modeling & Simulation

Regional authorities lack the tools to make decisions regarding UAM implementation and operationalization.
Regional Modeling & Simulation

NASA is developing a modeling and simulation tool for regional authorities and state Department of Transportation aviation departments.
Building the Ecosystem

Scalability is a fundamental need for UAM

- More licensed pilots (or acceptable and reliable autonomy)
- Spectrum availability
- Airspace operations (e.g. Unmanned Aircraft System Traffic Management type construct)
- Acceptable noise
- Mass production of electric or hybrid VTOLS
- Infrastructure (including recharging stations)
Collaborative Innovation

UAM Working Groups

Aircraft

Airspace

Community

Urban Capable Aircraft

Supply Chain

Grand Challenge

UTM

Simulations & Modeling

Infrastructure Requirements

Book of Requirements

Industry Scorecard

Ecosystem-wide strategy
What to expect next?

• Supply chain and manufacturing workshop Feb 4-5
• NASA-FAA coordinated meeting on Feb 6-7 focused on airspace concept of operations for near term use cases
• NASA’s concept of operations Deloitte arranged meeting Feb 12-12, LA
• NASA’s working group for aircraft, airspace, and infrastructure
• Grand Challenge series
• Many regional initiatives
• Support development of requirements for aircraft, airspace, and community – community of practice
Questions