Urban Air Mobility: Concepts and Challenges
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Assured Autonomy Workshop, Mobility Panel Discussion
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Urban Air Mobility: Passenger Carrying OV-1
1. Vehicle Design & Integration
2. Airworthiness Standards & Certification
3. Vehicle Noise
4. Weather-Tolerant Vehicles
5. Cabin Acceptability
6. Manufacturing & Supply Chain

Airspace Design
2. Operational Rules, Roles, & Procedures
3. CNSI & Control Facility Infrastructure
4. UAM Port Design

Community Integration
1. Public Acceptance
2. Supporting Infrastructure
3. Operational Integration
4. Local Regulatory Environment & Liability

Airspace System Design & Implementation
1. Safe Urban Flight Management
2. Increasingly Automated Vehicle Operations
3. Certification & Ops Approval
4. Ground Ops & Maintenance
5. Fleet Management
6. Urban Weather Prediction

Airspace & Fleet Operations Management
1. Safe Airspace Ops
2. Efficient Airspace Ops
3. Scalable Airspace Ops
4. Resilient Airspace Ops
5. Fleet Management
6. Urban Weather Prediction

Vehicle Development & Production
1. Vehicle Design & Integration
2. Airworthiness Standards & Certification
3. Vehicle Noise
4. Weather-Tolerant Vehicles
5. Cabin Acceptability
6. Manufacturing & Supply Chain

Individual Vehicle Management & Operations
1. Safe Urban Flight Management
2. Increasingly Automated Vehicle Operations
3. Certification & Ops Approval
4. Ground Ops & Maintenance
5. Fleet Management
6. Urban Weather Prediction

Regulations/Certification
Importance of Autonomy to UAM

• Industry needs precise, scalable operations under all conditions (e.g. low-visibility) to ensure dependability of service

• Traditional reliance on expert human operators would limit UAM feasibility and scalability:
  – Current ATC practices will not support scalable UAM operations due to controller workload considerations
  – Reliance on traditional pilots roles and training is not consistent with level of precision for closely-spaced UAM operations

• Highly automated airspace and aircraft operations provides a path for enabling scalability along with improved affordability/accessibility & safety

• While not “fully autonomous”, enabling certifiable UML-4 operations requires fundamental changes to human and automation roles, responsibilities, and authority (e.g. PIC does not need “stick & rudder” skills)
Questions?

https://www.xkcd.com

**It's 2016—Where's My...**

- **Flying Car**
  - They're called "helicopters"

- **Jetpack**
  - Turns out people are huge wimps about crashing

- **Moon Colony**
  - No one has put up the cash

- **Self-Driving Car**
  - Coming surprisingly soon

- **Floating Sky City**
  - Turns out cities are heavy

- **Hoverboard**
  - This question is now ambiguous thanks to a new scooter thing (and will lead to an argument about the meaning of "hoverboard" which is way less interesting than either kind of hoverboard)

- **Robot Butler**
  - He was called "Jeeves" and he wasn't that great

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