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Research on Future Air Mobility in JAXA

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Introduction of JAXA Aviation Research Vision

- The Japan Aerospace Exploration Agency (JAXA) is a **National Research and Development Agency.**
- In accordance with the **6th Science, Technology, and Innovation Basic Plan** (Japan Cabinet Office) and global **carbon-neutral** goals, JAXA's vision keyword is **SUSTAINABLE**.

Transport

Development of sustainable air transport

- Environmental compatibility
- Safety
- Efficiency

Integration

Contribution to sustainable society

- Future air mobility
- Airborne platform
- Disaster response

Industry

Transition to sustainable aviation industry

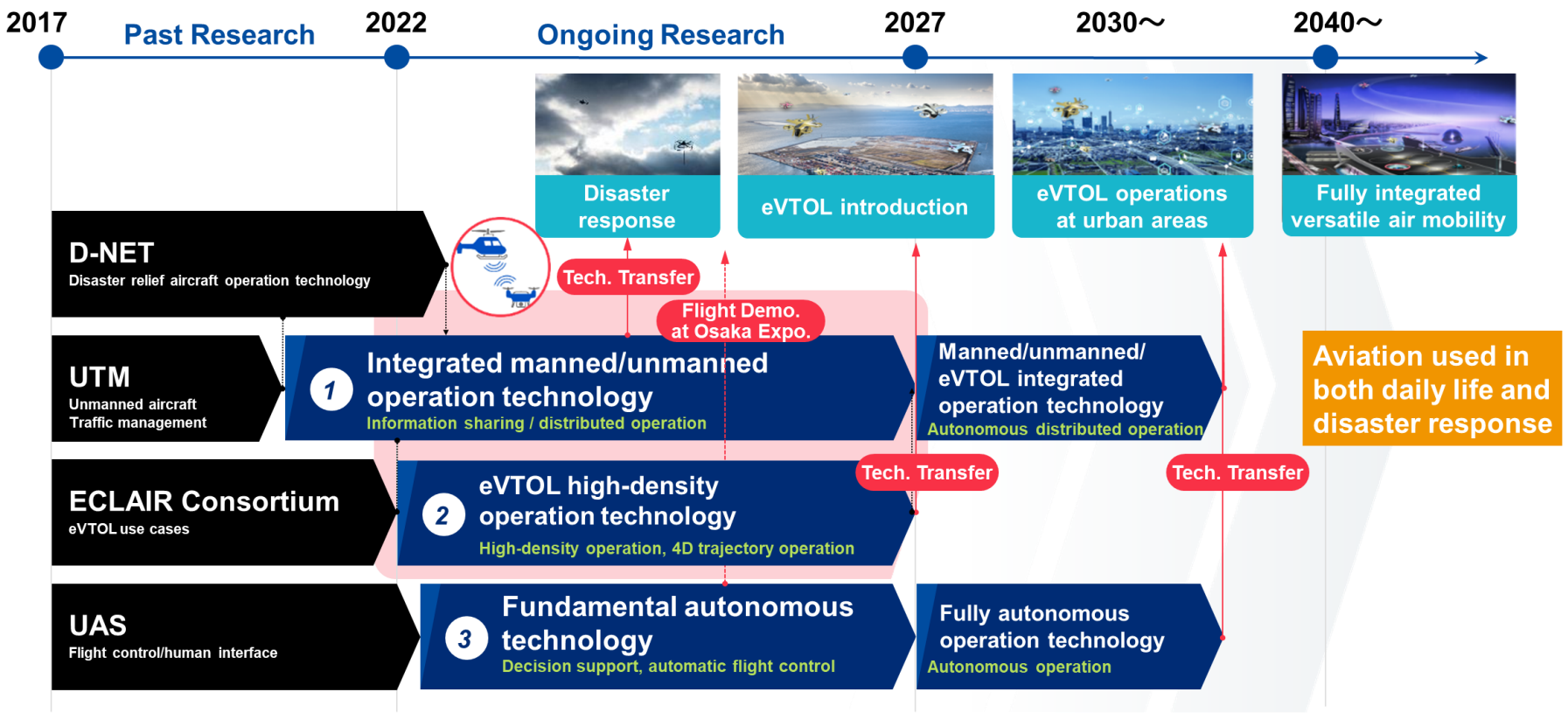
- Aircraft industry
- Airlines
- Maintenance, Repair & Overhaul

Both environment- and people-friendly sustainable aviation

SUSTAINABLE DEVELOPMENT GOALS

Research Roadmap on Future Air Mobility

- Using JAXA's research assets on disaster relief aircraft operation technology (D-NET) and UAS/UTM, **JAXA aims the integrated manned/unmanned operation in disaster relief mission**.
- Then, **JAXA expands its application to eVTOL's daily operations** together with Japanese industries leveraged by the **NEDO's ReAMo project** planning **flight demonstration at Osaka/Kansai Expo 2025.**
- JAXA also supports Japanese industries by providing **noise prediction tools enabling quieter eVTOL design.**

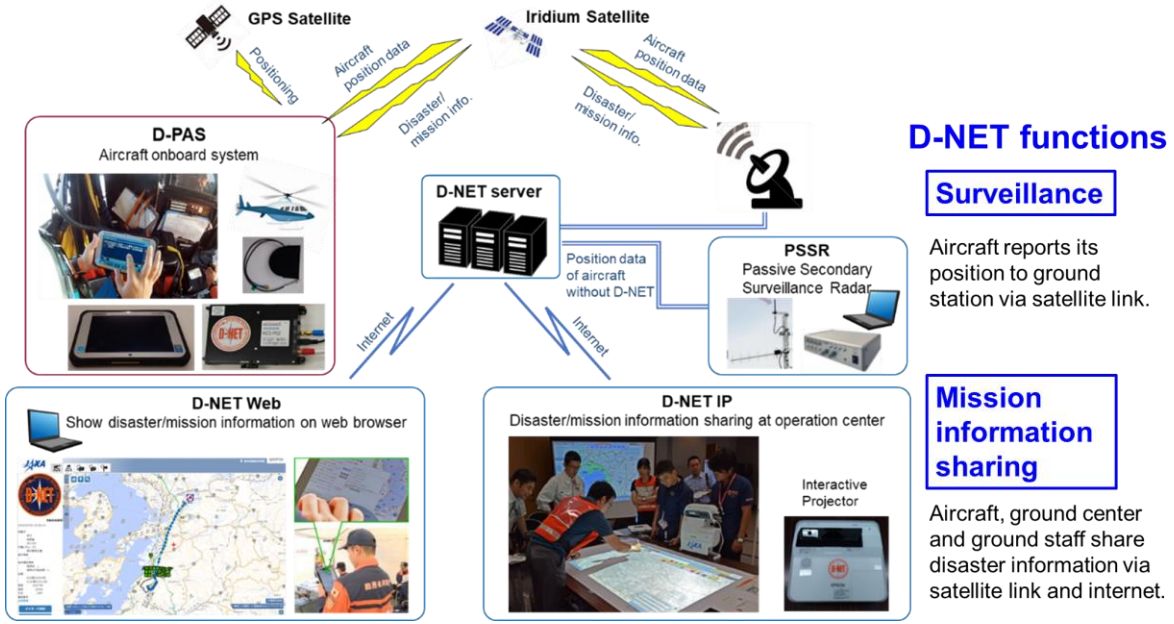


Integrated Traffic Management

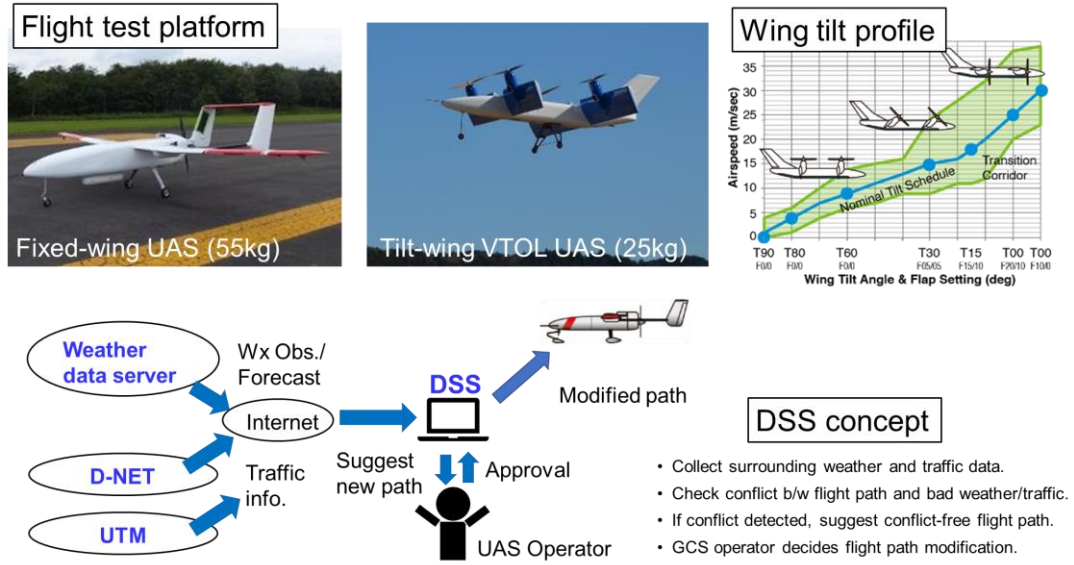
ReAMo Realization of Advanced Air Mobility Project

NEDO New Energy and Industrial Technology Development Organization

- **ReAMo project** (2022-2026), launched by NEDO, aims to achieve **integrated traffic management technologies** for drones, eVTOLs and conventional VFR aircraft flying in low-altitude airspace.
- **JAXA joins the ReAMo project** together with Japanese industries and **provides core technologies** to enable **information sharing, conflict management, automated flight** and **UTM-based data sharing** based on existing expertise and technology such as **D-NET** and **UAS research**.



JAXA D-NET System

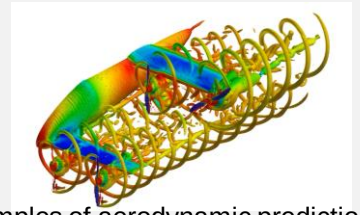


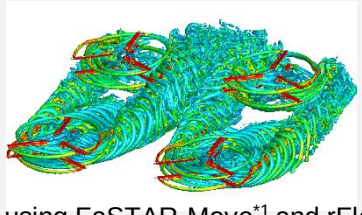
JAXA UAS Research

Predicting & Improving Aerodynamic Characteristics

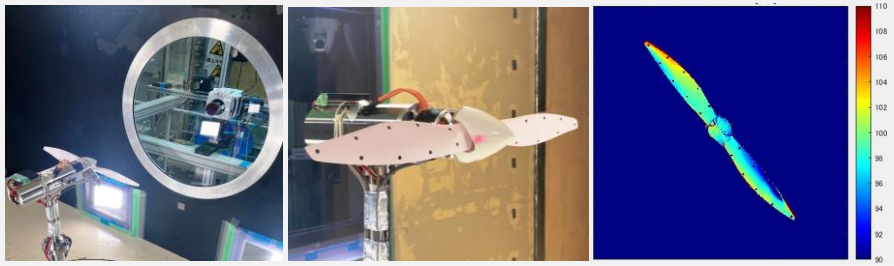
- In order to improve public acceptance of eVTOLs and expand its operation area, research activities about I) **predicting aerodynamic and aeroacoustics characteristics**, and II) **improving aerodynamic performance and quietness of eVTOLs** have been also conducted.
- JAXA's key technologies include (but are not limited to) :
  - **Aerodynamic prediction** (simulation and unsteady Pressure Sensitive Paint measurements)
  - **Aeroacoustics prediction** (simulation and noise source detection measurements)
  - **Rotor performance and noise improvements**
- JAXA eVTOL research model will be developed for technology demonstration.

Aerodynamic Prediction





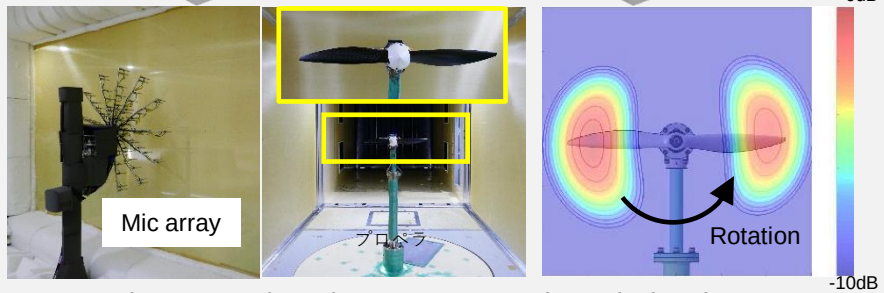
Examples of aerodynamic prediction using FaSTAR-Move*1 and rFlow3D*2



Unsteady Pressure Sensitive Paint measurement for an isolated rotor

Noise Prediction

Examples of noise propagation prediction using iAWESOME*3



Noise source detection measurement for an isolated rotor

Technology Demonstration

Key technologies will be demonstrated utilizing wind tunnel tests and flight tests of this research model configuration

Schematic illustration of JAXA eVTOL Research Model

*1 Unstructured CFD solver, *2 Structured CFD solver, *3 Aeroacoustics simulation solver