



Introduction to the ENRI and UAM/AAM Research Activities

ICAS Emerging Technology Forum 2023
2023/9/12

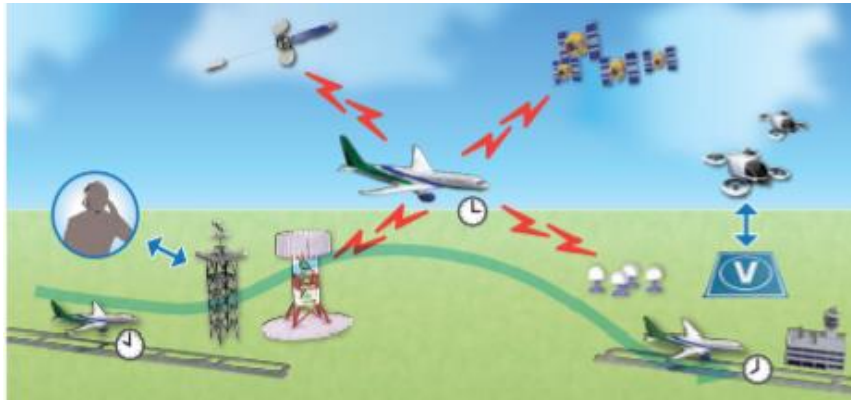




Electronic Navigation Research Institute (ENRI):

- Responsible for research and development in the field of ATM/CNS in Japan
- Covers the basic technologies of avionics, including electronic navigation, air traffic control, satellite navigation, and related fields that support governmental needs and social demands

ATM: Air Traffic Management CNS: Communications, Navigation, and Surveillance



ENRI Website

<https://www.enri.go.jp/eng/index.html>



About ENRI

National Institute of Maritime, Port and Aviation Technology (MPAT)



- National Maritime Research Institute (NMRI)

- Port and Airport Research Institute (PARI)

- **Electronic Navigation Research Institute (ENRI)**



 - Air Traffic Management Department

 - Navigation Department

 - Surveillance and Communications Department

 - International Standardization Center

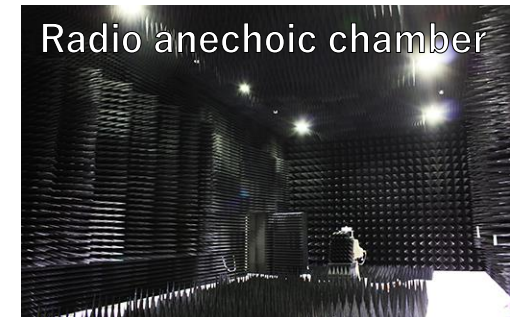
 - Iwanuma Branch



Experimental aircraft



SSR Mode S
ground station

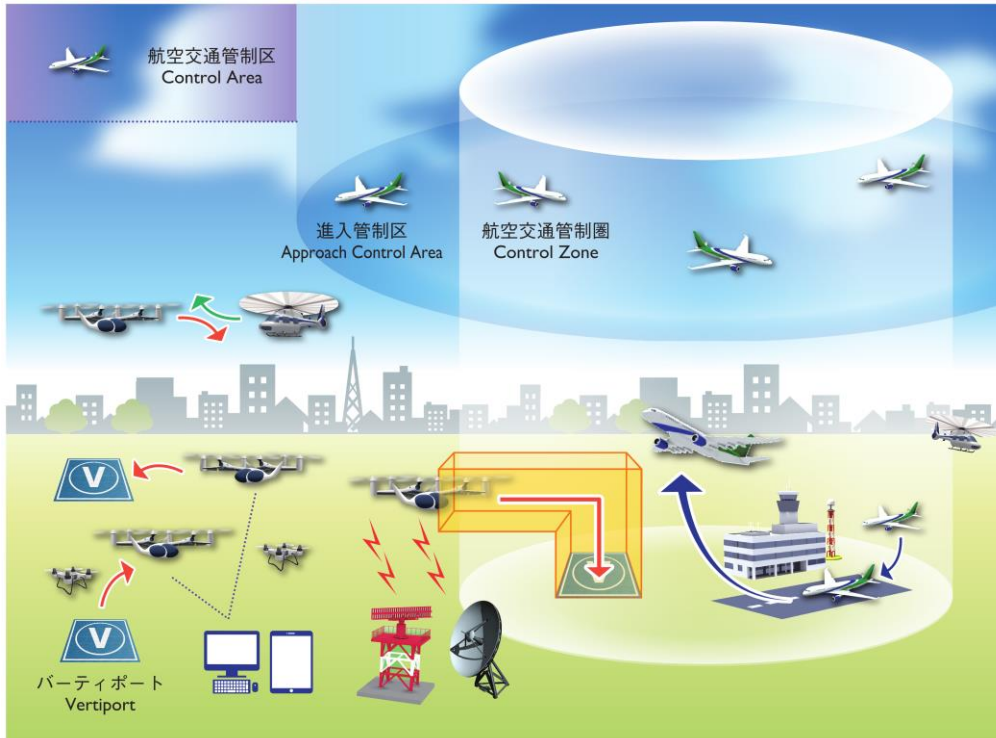


Radio anechoic chamber

UAM/AAM Research Activities



Research Project: Investigation of Operational Environment
for Advanced Air Mobility and Urban Air Mobility (FY2023–2025)



Research question:
What is the appropriate
operational environment for
advanced air mobility (AAM)
and urban air mobility (UAM)
in low-altitude air space?

Project goal:

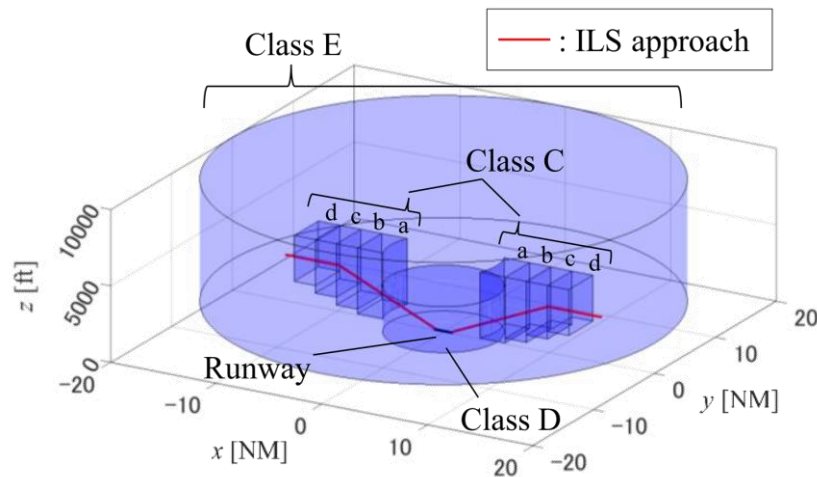
- ✓ Drafting several potential configurations of the operational environment
- ✓ Proposing a highly feasible operational environment

UAM/AAM Research Activities

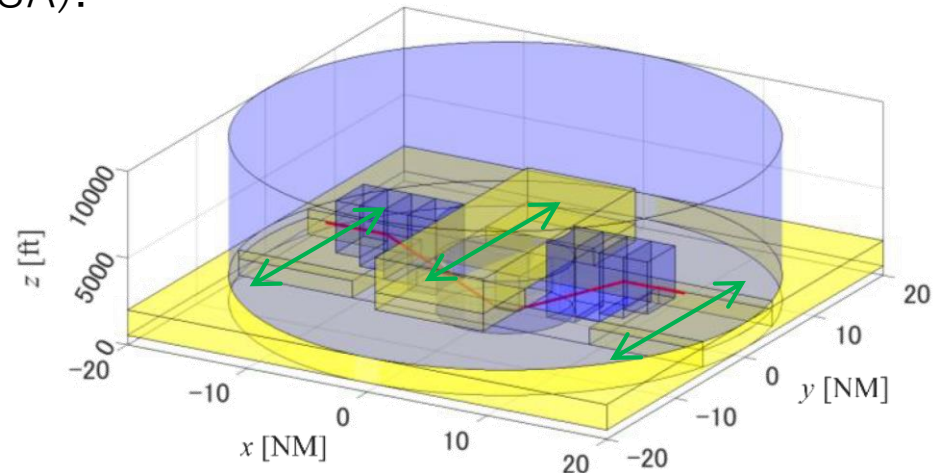


Airspace design for the UAM in the airport vicinity

- ✓ An increase in the volume of UAM flights near airports poses challenges to existing aircraft and air traffic control systems.
- ✓ This study investigates the potential constraints influencing the design of the UAM service airspace (UASA).



Imaginary airport and airspaces



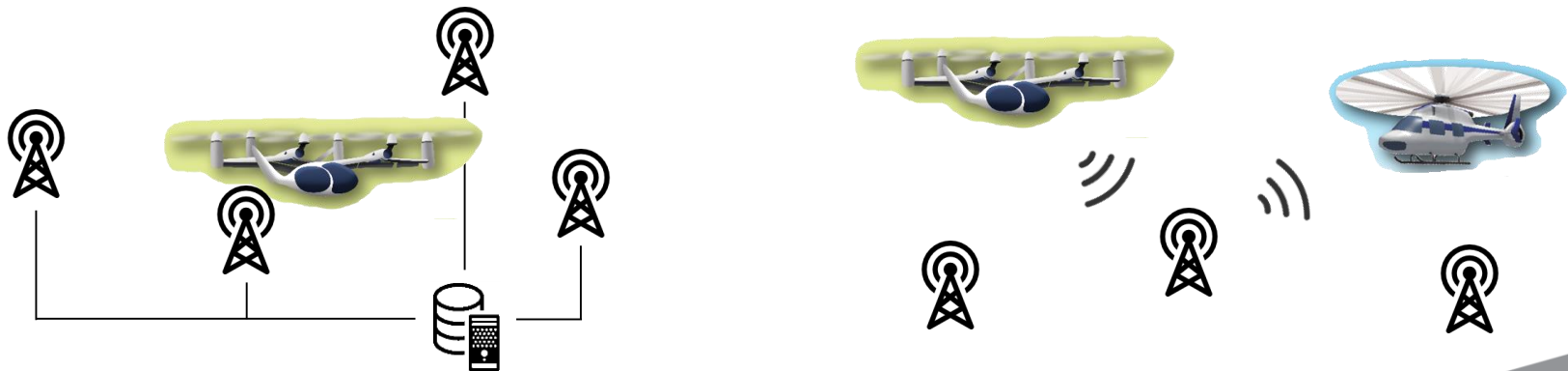
Example design of the UASA
(yellow: UASA; green: UAM flight directions)

UAM/AAM Research Activities



Surveillance and communication for the low-altitude airspace

- ✓ The UAM is considered to fly at lower altitudes than existing aircraft.
- ✓ Surveillance and communication systems for low-altitude airspaces are required because the existing air traffic control systems do not adequately support such a low-altitude airspace.
- ✓ This study investigates the efficient surveillance and communication environment and promising elemental technologies.



Summary



- The ENRI is a research institute dedicated to studying ATM/CNS.
- The ENRI started a UAM/AAM project, called the Investigation of Operational Environment for Advanced Air Mobility and Urban Air Mobility.
- The research project included the following:
 - ✓ airspace design for the UAM in the airport vicinity.
 - ✓ surveillance and communication for the low-altitude airspace.



ご清聴ありがとうございました

Thank you for your attention!