

(Joint Release)

KDDI Corporation
Japan Airlines Co., Ltd.

**KDDI and JAL Achieve Simultaneous Operation
of Three Drones with a Single Remote Pilot**
Utilizing the Drone Operation Management System for One-to-Many Operations

KDDI Corporation (Headquarters: Chiyoda-ku, Tokyo; President and CEO: Makoto Takahashi; hereinafter "KDDI") and Japan Airlines Co., Ltd. (Headquarters: Shinagawa-ku, Tokyo; President and JAL Group CEO: Mitsuko Tottori; hereinafter "JAL") successfully conducted a demonstration on May 15, 2024, in the Yoshida district of Chichibu City, Saitama Prefecture. In this demonstration, a single pilot located in Tokyo remotely operated three drones simultaneously to deliver disaster relief supplies and food. This demonstration was part of the "Realization Advanced Air Mobility Implementation Project (ReAMo Project)" promoted by the New Energy and Industrial Technology Development Organization (NEDO). The demonstration was carried out under Level 3.5 (Note 1), which, under certain conditions such as monitoring the presence of pedestrians by onboard cameras, does not require ground-based assistants or access control measures.



Scenes of Simultaneous Operation of Three Drones with a Single Remote Pilot

In this demonstration, KDDI and KDDI SmartDrone Co., Ltd. (Headquarters: Minato-ku, Tokyo; President: Masafumi Hirono) jointly developed an operation management system. This system was enhanced with safety operation features and operation procedures (Note 2) based on JAL's expertise and know-how in aviation business, enabling the safe and secure remote operation of multiple drones.

Both companies will continue to review operational requirements, develop and demonstrate the operation management system, and work towards establishing a business model for the commercialization of one-to-many operations. Furthermore, the insights gained from this

demonstration will be utilized to promote the establishment of rules for one-to-many operations, aiming for a safer and more efficient social implementation of drones.

■Background

The demonstration was conducted as part of the "Development of Element Technologies for Drones or Unmanned Aircraft and Systems Enabling One-to-Many Drone Operations" within the ReAMo Project. One-to-many drone operations, where a single pilot operates multiple drones, are expected to address various social issues in Japan, such as the logistics crisis of 2024, labor shortages due to the declining working-age population, aging social infrastructure, and depopulation and aging in rural areas.



Image of One-to-Many Drone Operations

■About the Demonstration

1. Overview

The operational management system and procedures have been examined and their effectiveness verified, establishing that a single operator can safely and securely control multiple drones remotely and simultaneously. While Remote operation requires accurate situational awareness and decision-making based on limited information, the operation management system enables real-time and precise monitoring of the drones' operational status and weather conditions, with the ability to manually intervene when necessary. The demonstration validated that a single pilot could safely operate three drones remotely and simultaneously deliver disaster relief supplies and food.



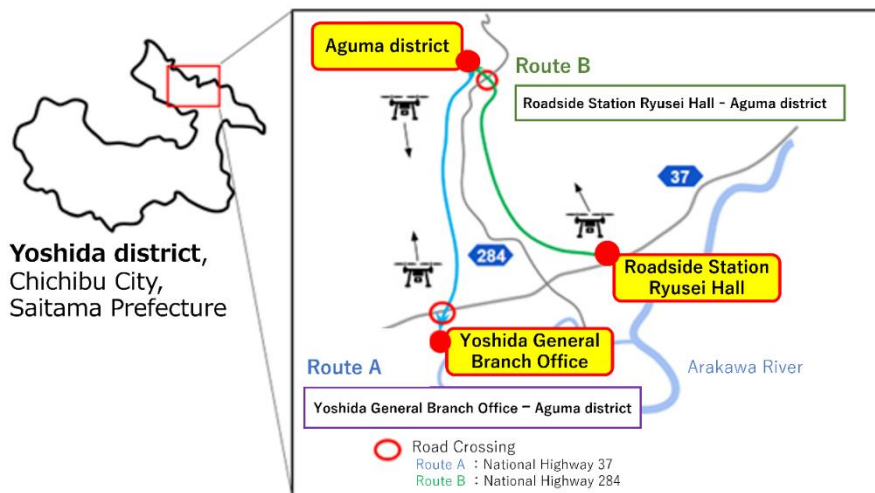
Operational management system screen: Develop an intuitive UI design for displaying information of multiple aircraft, with a layout that minimizes the need for shifting viewpoints.

2. Demonstration Location (Flight Routes)

Yoshida district, Chichibu City, Saitama Prefecture

Route A: Yoshida General Branch Office to Aguma district (approx. 2.5 km)

Route B: Roadside Station Ryusei Hall to Aguma district (approx. 2.5 km)



3. Drones Used

Length: 2,181 x 2,398 mm

Height: 676 mm

Maximum Flight Speed: 60 km/h

Maximum Endurance:

Approx. 35 minutes Maximum

Payload: 30 kg (Recommended 20 kg)



■Roles of Each Company

KDDI

- Lead implementer of the project
- Development of an operation management system for one-to-many operations
- Development of drones for one-to-many operations
- Business viability assessment for one-to-many operations

JAL

- Review of operation requirements for one-to-many operations
- Execution of application procedures associated with the demonstration
- Implementation of operations based on reviewed operation requirements
- Business viability assessment for one-to-many operations

<Reference >

•Press Release, DEC 20, 2023

“Japan Airlines and KDDI SmartDrone Announce Capital and Business Partnership to Accelerate Advanced Drone Utilization”

<https://press.jal.co.jp/en/release/202312/007836.html>

(Note 1)

A flight system established by the amendment of the Aviation Law in December 2023, which eliminates the need for access control measures under certain conditions.

(Note 2)

A set of procedures and rules for specific tasks, which standardize operations and improve consistency and efficiency.