

Joint Release

November 28, 2024

KDDI CORPORATION
KDDI SmartDrone Corporation.
Japan Airlines Co., Ltd.
East Japan Railway Company
Weathernews Inc.
MEDICEO Corporation

Verification of a Drone Logistics Model for Pharmaceutical Delivery
- Enhancing Operational Safety for Urban Implementation -

KDDI CORPORATION (Headquarters: Chiyoda-ku, Tokyo; President and CEO: Makoto Takahashi; hereinafter "KDDI"), KDDI SmartDrone Corporation (Headquarters: Chiyoda-ku, Tokyo; President: Masafumi Hirono; hereinafter "KDDI SmartDrone"), Japan Airlines Co., Ltd. (Headquarters: Shinagawa-ku, Tokyo; President and Group CEO: Mitsuko Tottori; hereinafter "JAL"), East Japan Railway Company (Headquarters: Shibuya-ku, Tokyo; President: Yoichi Kisei; hereinafter "JR East"), Weathernews Inc. (Headquarters: Chiba City, Chiba; President: Tomonori Ishibashi; hereinafter "Weathernews"), and MEDICEO Corporation (Headquarters: Chuo-ku, Tokyo; President: Kuniaki Imagawa; hereinafter "MEDICEO") (hereinafter collectively referred to as the "six companies") conducted a demonstration (hereinafter "the demonstration") from October 21 to November 7, 2024, in Hinohara Village, Nishitama District, Tokyo, aimed at realizing a business model for delivering pharmaceuticals by drone.

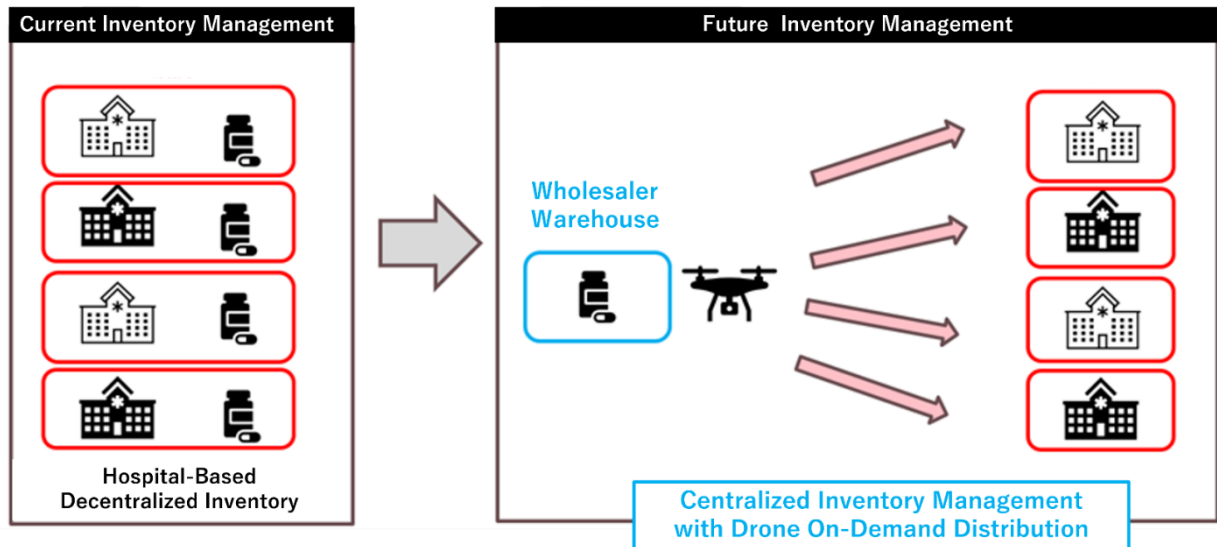
This demonstration is based on the Tokyo Metropolitan Government's "Demonstration Project for the Promotion of Drone Logistics Service Implementation in Tokyo" and aims to accelerate the social implementation of drone logistics services in urban areas. Launched in November 2021, this three-year project has focused on formulating and verifying the business model for a drone-based pharmaceutical delivery system.

In this final year of the project, the demonstration focused on enhancing the safety of the operational system for urban implementation by centrally managing rare pharmaceuticals and integrating CRM (Crew Resource Management) (*1) training, developed by JAL, to ensure safe and efficient drone operations.

The demonstration successfully confirmed the feasibility of delivering rare pharmaceuticals by drone with high safety standards. Building on these results, the six companies will work towards the social implementation of this business model, incorporating drone equipment that complies with legal regulations.

(*1) A concept that aims to enhance the team's operational capabilities by effectively utilizing all available resources and bringing together the strengths of team members for safe operations.

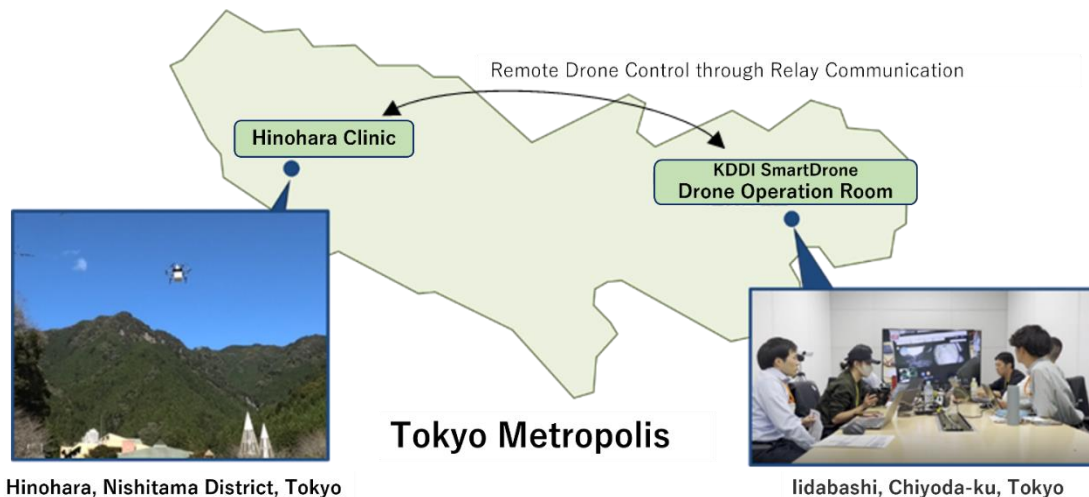
Business Model for Delivering Pharmaceuticals by Drone



■ About The Verification

1. Overview

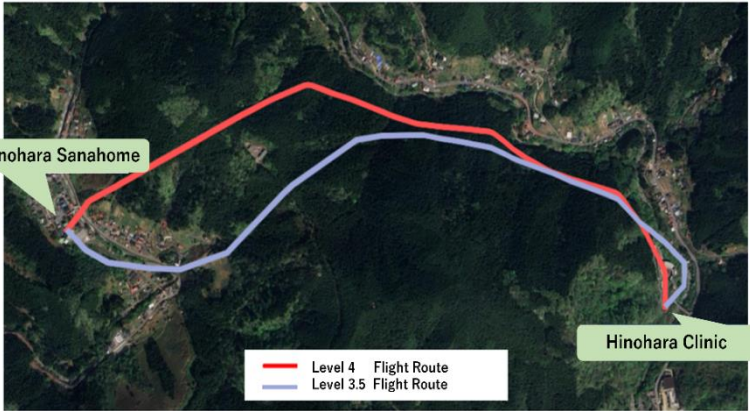


Logistics drones autonomously delivered ampoules used for storing rare pharmaceuticals along routes that included third-party airspace, connecting Hinohara Clinic (2717 Mitsugo, Hinohara, Nishitama District, Tokyo) to Hinohara Sanahome Special Nursing Home (3791-4 Hinohara, Nishitama District, Tokyo), and the operation was validated.



2. Details

The drone operations included both Level 3.5 and Level 4 flights. In Level 3.5 flights, a 1-to-2 operation was tested, where one operator simultaneously controlled two drones. This approach was designed to enhance efficiency by delivering multiple pharmaceuticals in a short time.

For Level 4 flights, CRM (Crew Resource Management) training was implemented for personnel, including remote pilots, to ensure higher safety standards in preparation for urban area implementation. All operations were remotely managed from the operation control room at the KDDI SmartDrone office in Chiyoda-ku, Tokyo.

Date	① October 21 to October 25, 2024 : Level 3.5 flights (1-to-2 operation) ② November 5 to November 7, 2024 : Level 4 flights													
Flight Route	Hinohara Clinic → Hinohara Sanahome (approximately 2.4 km) 													
Drone	① Level 3.5 flight operation ACSL AirTruck 	Developed jointly by ACSL and Aeronext, achieving stable flight by suppressing cargo sway with 4D GRAVITY® <table border="1"> <tr> <td>Length</td> <td>1.7m×1.5m</td> </tr> <tr> <td>Height</td> <td>0.44m</td> </tr> <tr> <td>Max flight speed</td> <td>10m/s</td> </tr> <tr> <td>Max flight time (at max takeoff weight)</td> <td>35min</td> </tr> <tr> <td>Max payload</td> <td>5.0kg</td> </tr> <tr> <td>Max takeoff weight (including payload)</td> <td>24.9kg</td> </tr> </table>	Length	1.7m×1.5m	Height	0.44m	Max flight speed	10m/s	Max flight time (at max takeoff weight)	35min	Max payload	5.0kg	Max takeoff weight (including payload)	24.9kg
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	② Level 4 flight operation ACSL PF2-CAT3 	Based on PF2, certified with the 1st type certification <table border="1"> <tr> <td>Length</td> <td>1.2m ×1.1m</td> </tr> <tr> <td>Height</td> <td>0.60m</td> </tr> <tr> <td>Maximum flight speed</td> <td>10m/s</td> </tr> <tr> <td>Max flight time (at max takeoff weight)</td> <td>17.5min</td> </tr> <tr> <td>Max payload</td> <td>1.0kg</td> </tr> <tr> <td>Max takeoff weight (including payload)</td> <td>9.8kg</td> </tr> </table>	Length	1.2m ×1.1m	Height	0.60m	Maximum flight speed	10m/s	Max flight time (at max takeoff weight)	17.5min	Max payload	1.0kg	Max takeoff weight (including payload)	9.8kg
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Verification Items	<ul style="list-style-type: none"> •Building an operational system with CRM training and identifying challenges •Identifying challenges in pharmaceutical delivery with a 1-to-2 operation •Identifying challenges in a remote operational framework 													
Verification Result	Verified that the established procedures and systems ensure safe and efficient delivery operations.													

3. Collaborations

- Hinohara Village
- Hinohara Clinic
- Hinohara Sanahome
- Hinohara Mori no Omocha Bijutsukan (Hinohara Forest Toy Museum)
- FUREAI GLAMPING & BBQ
- Hinohara Village Lumber Industry Cooperative

4. Roles of Each Company

KDDI	Project leadership
KDDI SmartDrone	Provision of the smart drone platform Drone operation of Level 4 flights
JAL	Development and evaluation of drone logistics business Provision of CRM training Identification, evaluation, and countermeasures for risk scenarios in drone operations
JR East	Promotion of social acceptance among Tokyo residents
Weathernews	Provision of weather data and advice for safe operations
MEDICEO	Development and validation of procedures for pharmaceutical delivery using drones

■ Verification of the Business Model for Delivering Pharmaceuticals by Drone

Business Model For Delivering Pharmaceuticals By Drone	<ul style="list-style-type: none">•Pharmaceuticals are typically stocked and used in individual hospitals, but rare medicines with low usage often result in significant waste due to expiration.•By centralizing management in pharmaceutical wholesalers' warehouses, the stock of rare medicines can be reduced, minimizing waste and improving profitability.•Pharmaceuticals will be managed centrally, and a procedure for rapid on-demand drone delivery to hospitals will be incorporated to create an efficient pharmaceutical supply service system.
Verification Item	Verifying a streamlined end-to-end logistics process with drones
Verification Result	A detailed logistics procedure has been developed for pharmaceutical distribution, incorporating on-demand drone delivery from order placement to final receipt. Role-playing exercises have been conducted to refine this procedure, resulting in a business model that is highly feasible for social implementation.

Drone Delivery Logistics Flow

