Review of Commercially Available

Drones for Medical Logistics

Aim

To identify suitable commercially available drones for medical logistics as part of the Solent Future Transport Zone (FTZ), assessing their capability to support time-critical deliveries of goods such as aseptic medicines, diagnostic samples and bloods.

Solent Transport
a partnership

Multicopter drone with an underslung payload of a Versapak medical carrier.

Methodology

The University of Southampton created a database of potentially suitable drone makes and models. This has been updated throughout the FTZ, with new drones being added and discontinued drones being removed. The database listed specifications such as payload capacity, range, endurance, propulsion type, and drone type (fixed-wing, multi-rotor, helicopter, hybrid). The information was sourced from manufacturer websites, industry articles and reports.

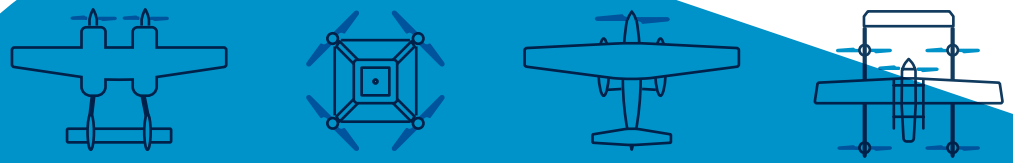
Key Findings and Recommendations

Over 140 drones were included in the database for consideration.

- The initial FTZ Covid-19 response trials identified that drones with a Vertical Take Off and Landing (VTOL) capability are preferred to avoid the need for a runway, so fixed-wing drones were excluded from further consideration.
- Eight drones with a cargo hold of 50 litres or more were identified.
- Twenty-four other drones were identified which did not have a cargo hold but had a payload capacity of 5 kg or more, with the payload typically attached underneath the UAV, or, rarely, on top of it.
- For reasons of practicality, a payload capacity of at least 5 kg and 50 litres is required for medical logistics purposes (e.g., a medium Versapak medical carrier plus contents has a typical mass of ~5 kg and volume of ~36 litres), meaning fewer than 25% of drones (32 out of the initial 140) were suitable for the required purposes.

The database has highlighted the varying availability of detailed information across manufacturers. Further engagement with manufacturers is recommended to clarify drone capabilities and operational readiness.

This research informed the design of a new drone, developed by UoS Soton UAV as part of the FTZ Airbridge project. This drone was designed with high gust tolerance, system redundancy, NHS-compatible payload capability, vertical take-off and landing (VTOL) operation, and a clear regulatory pathway to beyond visual line of sight (BVLOS) operations.



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