



Innovation Hub
RPAS Carriage of Dangerous Goods
Market Demand Summary

Introduction

These slides provide a high level summary of the CAA Innovation Hub's discussions with industry stakeholders regarding the carriage of dangerous goods by Remotely Piloted Aircraft Systems (RPAS).

These slides focus on three key aspects:

- Types of Goods (slide 3)
- Packaging Technologies (slide 4)
- Areas which would benefit from RPAS deliveries (slide 5)

These discussions have helped the CAA understand the current market demands regarding the carriage of dangerous goods by RPAS, by speaking with over a dozen stakeholders including:

- RPAS Operators
- Packaging Manufacturers
- Airports
- Intermediaries matching demand from bodies such as the NHS with RPAS operators



RPAS have the potential to deliver time-critical goods quicker and more efficiently than other modes of transport – saving lives, reducing waste and supporting remote communities.



Types of Goods

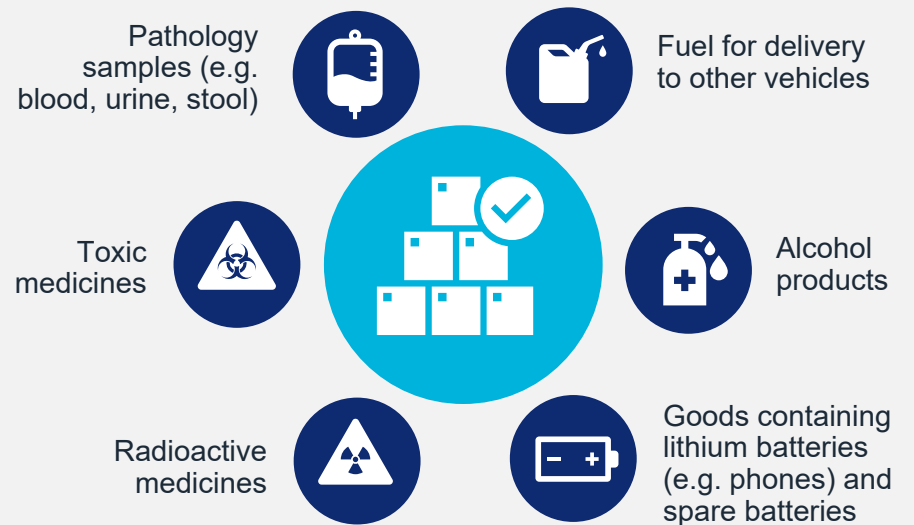
There is demand for RPAS operations to carry both medical and non-medical dangerous goods.

The demand from the end-user, such as the NHS in respect of medical supplies, currently exceeds what RPAS operators are able to deliver. We anticipate that RPAS operators will be able to scale up their operations, building on trials that have already taken place, in the coming years as technical and regulatory challenges are overcome. For example, RPAS operators will typically need to fly beyond visual line of sight (BVLOS) to conduct deliveries, which requires authorisation from the CAA.



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Dangerous Goods for which there is demand for carriage by RPAS.



Packaging Technologies

Packaging solutions are focused on both monitoring and protecting the dangerous goods.

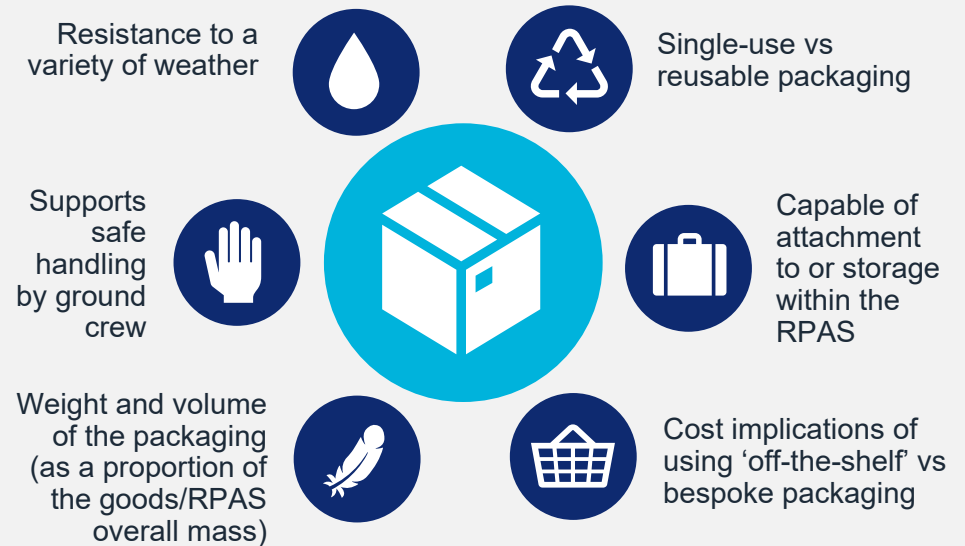
Monitoring is important to ensure that, for example, medical products can be used for their intended purpose upon delivery in accordance with medical regulations. Factors which can be monitored include:

- Vibration
- Temperature
- Pressure
- Location of the cargo

Containment is an important factor to ensure that dangerous goods are crash-protected, and does not necessarily require bulky and rigid materials. Technologies supporting crash-protection include:

- Self-sealing technologies using solvents
- Light-weight flame-proof materials

Considerations when choosing suitable packaging.



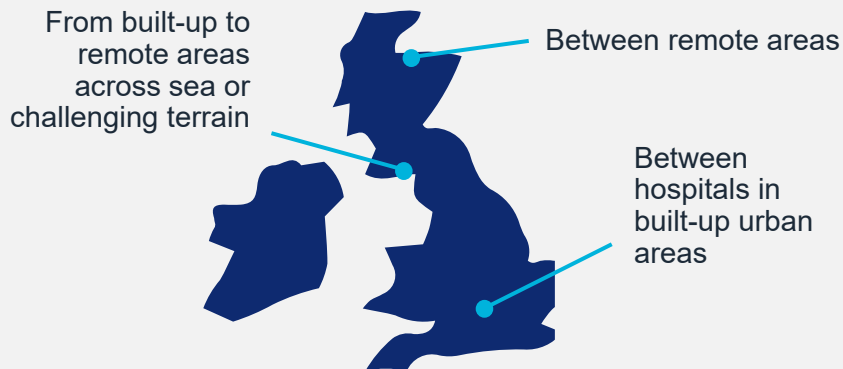
Areas which would benefit from RPAS deliveries

There is demand across the UK for RPAS carrying dangerous goods, in both remote and urban environments.

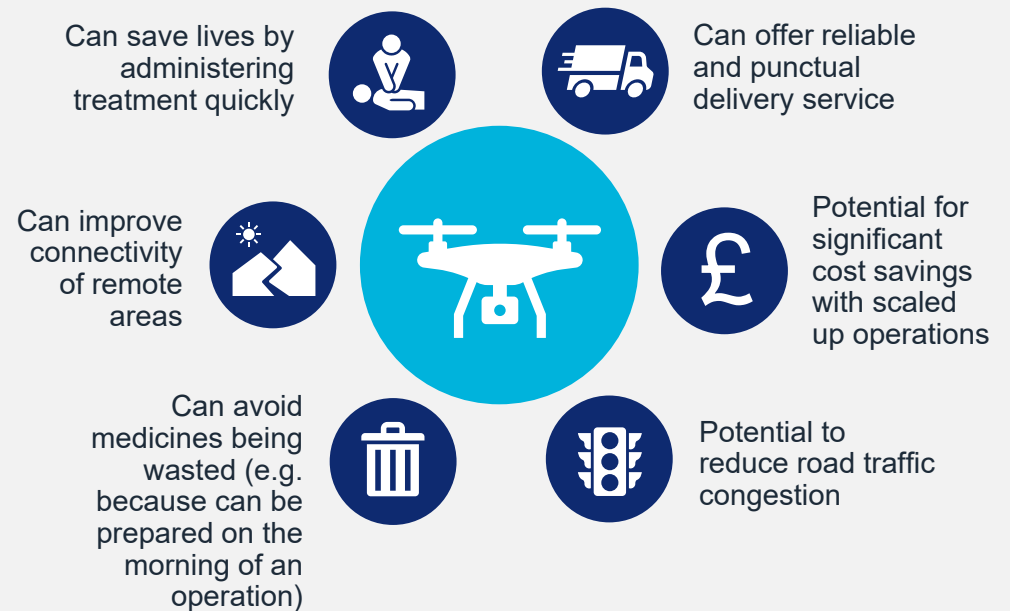
In built-up urban areas, RPAS are able to deliver goods faster than by road, especially at times of peak traffic. RPAS are also able to land very close to the place where the goods need to be delivered.

In remote areas, RPAS are able to operate more efficient routes than ground transport, which may require significant diversions due to terrain or multiple modes of transport (such as car and ferry).

Examples



The benefits of using RPAS for deliveries.



Further Information



Visit the CAA's Dangerous Goods web pages for the most up-to-date information on the requirements for dangerous goods approvals: caa.co.uk/dangerous-goods

Additional CAA guidance

- [CAP 2248](https://caa.co.uk/cap2248) – Fundamentals: Carriage of Dangerous Goods by Remotely Piloted Aircraft Systems
- [Example Dangerous Goods Manual](https://caa.co.uk/Our-work/innovation/Regulatory-toolkit-for-innovators-working-in-aviation) for RPAS operators carrying dangerous goods falling within UN3373 Biological Substances, Category B as cargo (available at: caa.co.uk/Our-work/innovation/Regulatory-toolkit-for-innovators-working-in-aviation)
- [CAP 722](https://caa.co.uk/cap722) – Unmanned Aircraft System Operations in UK Airspace



Visit the **CAA Innovation Hub** for latest updates, guidance and challenges
caa.co.uk/innovation



UK Research and Innovation

This guidance has been created by the CAA Innovation Hub in association with the Future Flight Challenge from UK Research and Innovation.

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