Service requirements

LIFT pilot project for drone-based postal delivery and middle-mile connectivity in the Maldives

1 Introduction and background

1.1 Project overview

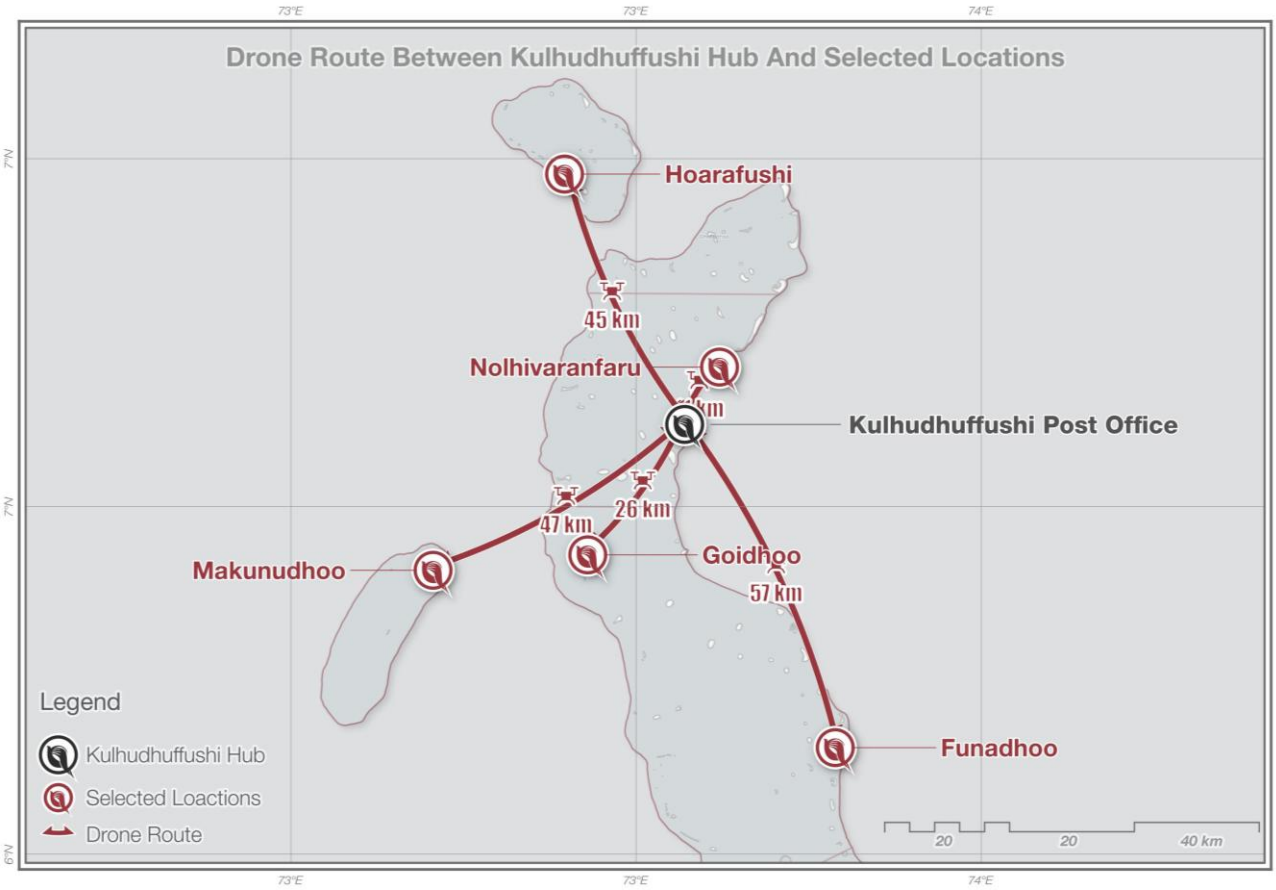
The UPU, as part of a project entitled “Last-mile innovation through flight technology” (LIFT), seeks to engage a qualified drone technology provider to plan, deploy and operate a postal drone delivery pilot project in the Maldives in partnership with Maldives Post, the designated operator of that country.

1.2 Objective

The purpose of the pilot project is to demonstrate the operational viability of drone-based middle- and last-mile deliveries, connecting five local post offices with the Kulhudhuffushi Post Office, which will serve as a local distribution hub (see figure 1).

This pilot project will generate data and insights to inform the potential expansion of drone logistics throughout the Maldives’ postal network.

Figure 1 – Illustration of potential route for the pilot project



The route depicted in figure 1 is for illustrative purposes only; the final routeing will be determined by the Vendor and must include all designated points listed in table 1.

1.3 Contract model

The contract model shall be “drone as a service”. The Vendor will own, operate and maintain the entire drone fleet and associated systems. Maldives Post will provide ground infrastructure, postal staff for cargo loading, unloading and battery changes/drone refuelling, if necessary, and site access.

2 Operational area and route description

2.1 Area of operations

– Country: Maldives

– Primary region: Northern Maldives

– Origin hub: Kulhudhuffushi local distribution hub

– Route configuration: multi-destination delivery scenario covering five post offices

2.2 Route details

The route forms a hub-and-spoke delivery model, originating and terminating at the Kulhudhuffushi local distribution hub, with the following stops:

Table 1 – Locations of all post offices to be included on the pilot project route

Post office	*Latitude*	*Longitude*
Kulhudhuffushi	6.6182	73.0705
Nolhivaranfaru	6.7006	73.121
Goidhoo	6.4306	72.9302
Hoarafushi	6.978	72.8965
Makunudhoo	6.4084	72.706
Funadhoo	6.1532	73.2888

If all relevant permissions cannot be obtained from Maldives Civil Aviation Authority (MCAA) and other relevant authorities, the Vendor will be obliged to propose an alternative route corresponding as far as possible with the project objectives.

2.3 Characteristics of the terrain

All legs will entail flying over water.

2.4 Airspace considerations

Some routes may cross restricted or excluded airspace zones; the Vendor must first confirm the presence or absence of potentially restricted zones, and then plan routes to avoid these zones or obtain clearance for them from the MCAA.

3 Drone platform technical requirements

3.1 Drone technical specification

The selected drone platform must meet or exceed the following minimum technical specifications:

Parameter	*Minimum requirements*
Aircraft type	VTOL[1] or multirotor
Propulsion type	All types
Cargo release	On-ground cargo loading and unloading
Payload capacity	Minimum 20 kg
Cargo volume	Minimum 0.25 m^3
Maximum take-off weight	Up to 150 kg
Range	Minimum 80 km (single charge/fuel load)
Endurance	Sufficient to fly a minimum distance of 80 km
Wind resistance	Preferably resistant to gusts up to 13 m/s
Operating temperature	Temperatures in the Maldives fluctuate around 30°C all year round
Landing pad requirement	7 m x 7 m to 20 m x 20 m
Navigation	Minimum: – GPS/GNSS[2] – RTK[3], VIO[4] or other positioning system – Cameras and vision processing – Downward LiDAR[5]/landing cameras/rangefinder
Communication	Minimum: – Radio – Cellular 4G/5G Preferably also satellite link
Safety systems	Minimum: – Detect and avoid system – Fail-safe protocol – Mandatory insurance
Certification	To operate a drone in the Maldives, the drone must be certified by an ICAO member state. Proof of drone platform certification must be provided as part of the tender.

[1] Vertical take-off and landing.
[2] Global Positioning System/Global Navigation Satellite System.
[3] Real-time kinematic.
[4] Visual-inertial odometry.
[5] Light detection and ranging.

4 Operational requirements

4.1 Assumptions

For this pilot project, it is assumed that the drone will operate point-to-point between post offices, carrying a mixed postal cargo, i.e. letters, documents, small parcels and packets. The drone will be based at the Kulhudhuffushi local distribution hub and will fly to each local post office to deposit the payload, with battery changes or refuelling occurring at selected local post offices, where necessary.

All handling tasks (unloading, battery change or refuelling) will be performed by Maldives Post staff. The entire operation will be coordinated closely with Maldives Post, with designated landing and take-off zones cordoned off during the agreed launch and landing windows.

4.2 Flight schedule

- Number of UAS: minimum one drone.
- Frequency: six flights per week, whereby one flight means that all post offices have been covered.
- Estimated flights per month: minimum 24.
- The actual flight frequency will be determined with Maldives Post and the MCAA during preparation of the pilot project. The determined frequency will be based on Maldives Post's operational needs, airspace availability, weather conditions and equipment capacity.
- Operating period: The Vendor must be prepared to execute drone deliveries in January, March, July, August or September, to avoid May, December and the Ramadan period. The detailed schedule will be contingent upon regulatory, operational and weather-related factors and must be adapted to the Maldives' climatic conditions, in full consultation with and subject to the approval of the UPU and Maldives Post.

4.3 Responsibilities

- The Vendor shall operate the drone end-to-end throughout execution of the pilot project, performing all actions required for safe, efficient and successful operation.
- The Vendor is obliged to obtain the appropriate insurance to cover potential risks associated with the operation.
- The Vendor is obliged to establish a comprehensive flight data management system, including a mission logging system, inter-flight tracking, incident reporting and a weather/flight log database.
- The Vendor is obliged to implement proactive environmental assessments and route planning to ensure ecological compliance. To this end, early engagement with environmental authorities is recommended.
- Maldives Post staff will handle the loading and unloading of cargo at each post office and will provide necessary support in remote locations.

4.4 Ground infrastructure assessment

The post offices are equipped with the ground infrastructure listed below. The Vendor shall be responsible for thoroughly evaluating these existing conditions and, where necessary or appropriate, implementing enhancements (e.g. landing pads, wind barriers) to ensure optimal operational performance.

Overview of currently available infrastructure:

Element	*Kulhudhuffushi distribution hub*	*Post offices*
Landing zone area	20 m x 10 m	Varies from 7 m x 6 m to 20 m x 15 m
Overhead obstructions	None	None
Surface	Sandy surface (natural terrain)	Sandy surface (natural terrain)
Shared use	Dedicated, unused area	Dedicated, unused area

Element	*Kulhudhuffushi distribution hub*	*Post offices*
Wind exposure	Open area exposed to wind	Open area exposed to wind
Lighting	Baseline lighting is available	Baseline lighting is available
Cargo handling space	Available for small parcels	Available for small parcels
Staffing	Available full time	Available part time
Electrical supply	Yes, charging and battery change station located approximately 590 m from the launch and landing area	No. A standard 220 V/10 A outlet can be facilitated. Dedicated high-capacity supply (380 V/16–32 A) would be difficult to provide.
Backup generator	No, backup generator is not available on-site and provision of such is not readily feasible	No, backup generator is not available on-site and provision of such is not readily feasible
Indoor space for battery charging	Available	Potentially available (to be confirmed with Maldives Post)
Indoor workspace for drone maintenance	A shelf or desk space near a socket is available	A shelf or desk space near a socket is available
Tools	Workbench available	No
Maintenance area access	Access via standard, narrow doors to post office building	Access via standard, narrow doors to post office building
Secure storage	Available for small drone	No
Security measures	Locked building	No
Connectivity	Mainly 4G/LTE and limited 5G	4G
Internet/Wi-Fi	Available through broadband and 5G/4G mobile networks. Network speed and stability may vary. Suitable for routine operations and small data transfers; large uploads may require off-peak scheduling or transfer to higher-capacity locations.	Available through 4G mobile networks. However, Wi-Fi connectivity is not currently established. Network stability may vary and high-volume data uploads may be constrained.

The Vendor is expected to supply all necessary equipment to support the ground infrastructure essential for the successful operation of the drone delivery pilot project. This includes, but is not limited to, portable landing pads, portable wind barriers, backup generators, spare parts, toolkits for routine drone maintenance and repairs, and redundant communication architecture. This list is not exhaustive, and the Vendor should assess the availability of ground infrastructure based on the information from the table above. Furthermore, during phase 1 of the pilot project, the Vendor shall coordinate with Maldives Post to identify and confirm any upgrades – particularly with respect to security, electrical capacity and other relevant infrastructure – necessary to ensure the seamless implementation and execution of the pilot project.

5 Regulatory and legal requirements

The Vendor shall comply with all applicable regulations governing unmanned aircraft operations in the Maldives:

– European Union Aviation Safety Agency – modelled regulatory framework;

– potential restrictions imposed by the Maldives National Defence Force;

– all other relevant guidelines and regulations.

Throughout the preparation and execution of the pilot project, the Vendor shall coordinate closely with the MCAA, other regulators, local bodies and relevant authorities.

Maldives Post and the UPU will lend their full support and cooperation to facilitate the timely acquisition of all necessary permits. Continuous engagement with regulators and proactive management of the permit process are mandatory to ensure uninterrupted and fully compliant operations.

6 Weather and environmental constraints

The Vendor shall take the Maldives' weather constraints fully into account in planning and executing the pilot project. All flight schedules, system specifications, maintenance routines and safety margins must be adapted to temperature extremes, high winds and seasonal precipitation patterns.

7 Training requirements

The Vendor must deliver training for the involved Maldives Post staff, to enable them to perform the necessary operations during the pilot project, including, but not limited to:

– drone technology and operational basics;

– safe loading and dispatch of the drone;

– battery upkeep, charging and change procedures (or potentially refuelling);

– safe drone storage procedures;

– ground handling and cargo handover protocols.

Important: An initial training plan will be provided by the UPU; however, the final scope must be verified and, if necessary, adjusted by the Vendor.

In addition, the Vendor will obtain training from Maldives Post to familiarize the drone operators with the necessary postal operations.

8 Timeline

The Vendor shall deliver the following during and after the pilot:

#	*Milestones*	*Deliverable*	*Phase*	*Duration*[6]
1	Stakeholder engagement	Confirmation from all relevant stakeholders of their engagement and involvement in the pilot project	Pre-pilot	6 months
2	Specific operations risk assessment	Operation risk assessment		
3	Submission of MCAA, flight authorization and other applications	Full package of documents required for flight permit and authorization submission		
4	Set-up of ground infrastructure and tracking system	Ground infrastructure assessment report with potential purchase/installation plan	Pre-pilot	
5	Staff training	– Delivery of training curriculum and materials – Attendance record and competency sign-off certificate	Pre-pilot	

[6] Given that the procedures for flight authorization and permit acquisition in the Maldives lack formal structure, the duration may fluctuate. This estimate is based on research and discussions with the MCAA.

#	*Milestones*	*Deliverable*	*Phase*	*Duration*[7]
6	One month for test flights, necessary updates/upgrades and one month for scheduled operating flights	– Weekly operational logs – Monthly progress briefs	Pilot execution	2 months
7	Draft of summary of operations[8]	– Performance report – Viability, practicality and business case scenario report	Post-pilot	2 months
8	Draft of recommendations for scale-up or route extension	Executive summary of scale-up options and implementation roadmap		
9	Final reporting	– Summary of operations – Recommendations for scale-up or route extension		

[7] Given that the procedures for flight authorization and permit acquisition in the Maldives lack formal structure, the duration may fluctuate. This estimate is based on research and discussions with the MCAA.

[8] The Vendor shall continuously monitor pilot performance and deliver detailed analytical reports encompassing comprehensive operational logs – including cargo volumes, flight metrics and incident records – alongside key performance indicators. These reports will provide the data-driven insights required to inform decisions on scaling up the drone cargo programme in the Maldives and assessing the cost-efficiency of operations.