

Results of Competition: Drone Solutions for COVID-19: Innovate UK EU Temporary Framework Strand

Competition Code: 2005_UKRI_IDEAS_COVID19_DRONES

Total available funding is £34,000,000 (from FFC Strand 1/2)

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
AIR CONTROL ENTECH LIMITED	Enabling the reduction of key site personnel through real time data transfer over 4/5G networks via Unmanned Aerial Vehicle (UAV) / Drones	£174,948	£122,464

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Project description - provided by applicants

Across the UK and Globally there has been a significant change in normal working practices across all industries and sectors as a direct result of COVID19. The importance of carrying out work and essential tasks safely has never been greater. New ways of working must be adopted that adhere to guidelines set out by the UK Government.

A key deliverable in this process is to design and implement a solution which allows key inspection and maintenance tasks to be carried out whilst maintaining and complying with ever changing legislation without affecting the quality of data being collected, and in many of these cases improving upon this data.

Air Control Entech have a team of in-house experts able to achieve the above through their knowledge and expertise on UAV related tasks stemming from technical requirements, business development, and operational implementation strategies. Our team of in-house experts have the knowledge, experience and capability to deliver UAV related solutions and managing such projects through from conception to completion. Educating and demonstrating the capabilities of UAV solutions to a variety of industries will show that the number of and time spent by key personnel on-site can be significantly reduced through the adoption of UAV based solutions which can be tailored to the specific needs of their business.

The study and project will focus on solutions which enables the marrying of two relatively new technologies in UAVs and their ability to livestream data directly from any site to any location where internet and/or 4G/5G is available. Delivering data in this way has the potential to impact a wide range of factors directly affecting peoples lives since the outbreak of COVID19. The positive impact of the technology adoption can be generalised into the following categories each with their own individual benefits:

- * Health
- * Economy
- * Social
- * Cultural

The project itself will demonstrate how adoption of two combined technologies and the unique way that these technologies can be utilised can allow the continuation of essential work to be carried out safely, effectively, and to an extremely high standard whilst keeping personnel in employment as well as having the potential to create further job opportunities as a result of the work being done through an innovative solution.

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UNMANNED SYSTEMS LIMITED	Autonomous Drone Delivery of Medical Supplies to Care Homes for Covid-19 Rapid Response	£207,131	£144,992
Oxfordshire County Council		£84,418	£84,418

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Project description - provided by applicants

Covid-19 has severely impacted all walks of human life. Emergency services, governments and law enforcement agencies are overwhelmed in tackling Covid-19 as well as implementing strict measures to reduce the spread of the virus. The healthcare sector has come under immense pressure to save the lives of affected citizens with doctors and nurses having to work double-shifts. Unmanned Life (UML) proposes to assist governments and the healthcare sector as a whole by deploying Autonomous Delivery of Medical Supplies to Care Homes. With Oxfordshire County Council as co-investigator. Together, we will collaborate to conduct industrial research on deploying autonomous UAVs that deliver medical supplies (including acute medicine and some lightweight PPE) from pharmacies, securely and timely to care homes for patients fighting Covid-19. This is expected to significantly decrease the risk of infection at care homes, which is one of the most impacted sectors from the COVID-19 pandemic.

Currently, COVID-19 medical supplies are delivered by dedicated courier services. This process of delivering medical supplies manually is slow and inefficient resulting in the lengthy turnaround time, potential contamination of couriers and patients when collecting the medication as well as lack of operational coverage for rural areas due to a high demand within urban areas. Adding all up, the cost of such operation can be quite high resulting in more limited accessibility for those ones with limited financial resources. By deploying autonomous drone delivery, we ensure a quick turnaround time for medical supplies, reduce the contamination of couriers, increase the number of supplies delivered at a lower cost and thus save more lives. The research will provide a scalable business model to increase the scope of the service (multiple drop-offs, multiple pharmacies, services to hospitals and homes) and bridge the knowledge and skills gap to use drones for delivery of COVID-19 vaccine being trialled at Oxford. UML's Autonomy-as-a-Service software platform has already been deployed by major enterprise customers like Verizon, Swiss Post etc. as well as governments like the City of Vienna for use cases ranging from indoor logistics to autonomous search and rescue.

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NEURON INNOVATIONS LTD	Medidrone	£140,212	£112,170
ARPAS-UK LTD		£0	£0
FLEET UAS LTD		£16,999	£13,599
FLOCK LIMITED		£20,049	£16,039
HEROTECH8 LTD		£79,126	£63,301

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Project description - provided by applicants

COVID-19 has created a need to better connect locations of care provision (e.g. hospitals, doctors surgeries, pharmacies and nursing homes), in order to improve the speed of delivery for time critical medication, to reduce transmissibility of COVID-19 to vulnerable patients and to help move care provision and testing closer to the patient via better distribution.

We propose to solve this problem using a network of small (micro) drones which follow pre-planned paths between medical facilities, and act as a high-speed shuttle for small medical packages. The solution is backed by a comprehensive drone safety case strategy which effectively mitigates ground and air risk in order to meet safety requirements and obtain approval from the CAA.

Most drone delivery solutions have focused on large, high risk drones, which present significant challenges when attempting to obtain approval from the regulator, and therefore normally require airspace segregation. This means that those operations are never able to scale effectively.

Neuron has approached this problem top down, by starting with an operational safety case strategy and complimentary matching medical need, and designing a solution using readily available off-the-shelf technology which can be scaled nationwide.

Using this approach Neuron is able to ensure that a solution is provided which not only solves a key medical problem, but which is feasibly able to provide value to its users beyond the limited time frame of a trial.

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SKYFARER LTD	Skyfarer - enabling drone powered medical logistics in the UK	£174,999	£166,249

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Project description - provided by applicants

The proposed Skyfarer project will move the adoption of drone solutions for logistics in the UK one step closer to reality, paving the way for this technology to be commercially viable, at home and abroad.

Through the creation of a flight testing corridor in the Warwick/Coventry region, the project will make history by providing the UK's 1st drone based medical deliveries in a populated suburban environment within unsegregated airspace, heralding a new age of aerospace innovation that provides positive lasting impacts for us all in the short and long term.

By setting up this flight testing corridor, we will enable testing of autonomous beyond visual line of sight (BVLOS) drone technology with detect and avoid capabilities in a suburban setting, providing a sustainable blueprint for gaining CAA approval and paving the way for commercial deliveries by drones to begin in the UK.

The framework for gaining CAA approval created in this project will allow us and our partners to begin implementing our vision of smarter supply chains powered by drones - enabling cost effective shared hospital inventories, Just In Time (JIT) deliveries of essential supplies, faster blood, sample-to-lab, vaccine and medicine deliveries.

In the process, the project will also allow for final development and implementation of the Skyfarer eco-system and service platform, which facilitates the adoption of drones for logistics operations by providing a turn-key service that integrates all of the different systems into one (including the drones), while also navigating around the legislative barriers currently preventing drone based deliveries.

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DRONEPREP LTD	UAV/Drone COVID19 Emergency Airbridge to the Isles of Scilly	£33,489	£26,791
CONSORTIQ LIMITED		£9,984	£6,989
WINDRACERS LIMITED		£134,962	£107,970

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Project description - provided by applicants

Cuts to Isles of Scilly ferry and air services due to the on-going Covid-19 crises is hindering medical and other logistics services.

Our consortia, led by DronePrep and supported by Windracers, University of Southampton and Consortiq propose to utilise the Windracers ULTRA UAV platform to deliver a range of payloads as required by the Council of the Isles of Scilly and Cornwall Council and Cornwall Council in response to time-critical Covid-19 challenges.

In gleaning the support these partners they have jointly stated to our consortia that:

'One of the main challenges facing CloS is that it is a rural peripheral region with dispersed communities. The ULTRA UAV provides a solution which could be used to connect remote communities across the region, enable NHS services to be delivered more effectively and overcome the limitations associated with traditional modes of transport.'

Validated CloS partners are supportive of offering their facilities for the test flights proposed. The Council of the Isles of Scilly operate St Mary's Airport, and Cornwall Council own and operate Cornwall Airport Newquay.

The Isles of Scilly Council are responsible for Social Care/Care Home provision on the Islands and it is proposed that these trials will focus on trial delivery of essential items such as PPE and Covid-19 tests to those in a Care setting and potentially thereafter extend to supplement NHS supply chains should CLoS partners request and enable this thereafter.

To achieve this we will be the first consortia to:

- 1) Demonstrate UAV capability in delivering supplies to the islands whilst comparing performance of this intervention to existing manned alternative
- 2) Explore the viability of securing multiple landing sites to allow dynamic and flexible goods transfer between islands
- 3) Work toward contributing to protocols research to test the transport Dangerous Goods via UAV

Our consortium were informed on 31st July 2020 that this application (submitted in May 2020) had been successful at the technical assessment phase of the UKRI COVID-19 Open Call Innovate UK response competition and a funding award is due on 26th August 2020 which would facilitate the commencement of this project for a period of upto 4 months starting 2 September 2020\.

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BLUE BEAR SYSTEMS RESEARCH LTD	AIR DRUIDS (Autonomous Intelligent Robotic DRones for Unmanned Integrated Delivery System)	£419,677	£293,774

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Project description - provided by applicants

It is clearly understood that a pandemic like COVID-19 can easily disrupt the normal functioning of almost any sector. During pandemic, there is a need to transport blood samples, swab tests, blood/plasma, and other urgent/critical medical products such as vaccines that needs to be delivered quickly from/to disparate locations in safe and efficient manner. Unlike other deliveries these are time critical, needs to be appropriately handled, i.e. Keeping samples and supplies at the correct temperature, and ensuring that they are not tampered with can also be key to the viability of the sample or vaccine. BB proposes AIR DRUIDS (Autonomous Intelligent Robotic DRones for Unmanned Integrated Delivery System), an autonomous drone delivery of critical medical products such as blood samples, swabs, vaccines, blood and plasma, enabled by an open systems architecture, with fully monitored payloads to ensure payload viability and integrity is sustained. The technology is scalable in size of payload, size of drones, and number of drones required. The intelligent payload system will be capable of monitoring the medical samples in real-time via the multiple onboard sensors. The information on the medical consignment will be live relayed on the mission control system with an interactive user interface. The BB's smart autopilot and deconfliction system will make the UAV assisted medical delivery autonomous and safe especially in BVLOS range, where safety is the main concern both for the operation of the UAV itself and the medical consignment. The BB's advanced mission control and monitoring system will allow operation of multiple drones, to various locations, all tasked and monitored from a central operations centre by just one person. The combination of all the above existing, modified and new technology will deliver a highly innovative cutting-edge drone management and delivery capability, combined with real time payload monitoring. The modular development route allows this to be deployed as a whole system or in parts to support other programmes, making the value realisable very quickly. BB will collaborate with Cranfield University for the demonstration of the AIR DRUIDS system, utilise NBEC corridor from BB HQ to Cranfield Airport (16km). This not only show the practical application of long-range drone delivery with easily swappable, fully monitored payloads, but will also further demonstrate the utility of the NBEC initiative as a national testing facility.

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