Stakeholder Engagement ACP-2022-031

1. Introduction

This document forms part of the Airspace Change Process (ACP) as defined in the Civil Aviation Publication (CAP) 1616. Apian, the change sponsor, is seeking to establish a Temporary Danger Area (TDA) complex during notified periods to enable the safe beyond visual line of sight (BVLOS) uncrewed aircraft systems (UAS) operations in Northumbria in partnership with the Northumbria Healthcare NHS Foundation Trust.

Apian is a medical logistics company, focused on the use of UAS to deliver faster, smarter and greener healthcare. Founded by a team of NHS doctors and ex-Googlers, Apian is building products and platforms that connect the healthcare industry with the UAS industry to improve patients' health outcomes and staff well-being.

For this project, Apian, in conjunction with the Northumbria Healthcare NHS Foundation Trust is looking to conduct feasibility flights using UAS between specific hospitals in Northumbria for the distribution of medical payloads such as chemotherapy drugs, urgent medical supplies and patient samples. Provisional dates for the feasibility flights are from 13th Feb 2023 and end on the 12th May 2023.

The aim of this letter is to inform all stakeholders of the proposed TDA details and to ensure that everyone has a full understanding of what, if any, effect it may have on them and to provide them with the opportunity to comment. This document forms part of the ACP engagement activity and is being sent to you as an identified stakeholder for comment (please see Annex B for a full list of identified stakeholders). Details of ACP 2022-031, including all supporting documents, can be found on the CAA's online Airspace Change Portal.

2. Improving healthcare services

Northumbria Healthcare NHS Foundation Trust provides CQC-rated 'outstanding' care to a population of over 520,000 across Northumberland and North Tyneside local authorities. In these areas, they are operating in one of England's most complex health and geographic contexts. In addition to significant health inequality, frailty and deprivation, over a third of their patients live rurally in either a village or fringe town. This makes Northumbria the most rural trust in the NHS and presents significant challenges including substantial additional miles travelled to provide care.

Apian has been requested by the Trust to conduct an evaluation project using UAS to transform their clinical services and lead to improved care to their local patients and population (please see Annex A for the letter of support). This would ensure essential services are provided in a more time critical manner to those who need them the most, and that issues created over the course of the pandemic such as dealing with the backlog of care are tackled as quickly as possible.

The table below highlights the payloads that Apian intends to transport, the issues with the current means of delivery and the potential benefits foreseen by the use of UAS in the delivery chain.

Table 1 – NHS challenges to be addressed and potential benefits of the trial	
1. Chemotherapy medication	
Problem	The Trust provides chemotherapy day units across a number of its main sites. Although chemotherapy is a planned service, there are complex clinical assessments required for patients throughout the course of their therapy which determine the correct formulation and dosage of powerful chemotherapy drugs. Northumbria manufactures these drugs at their main pharmacy manufacturing unit (PMU) which have a short shelf-life, requiring them to be administered to patients without delay. The impacts are as follows: ● Current logistics solution (van deliveries) is provided on a fixed schedule and unable to respond adequately to urgent requests. ● Shortening the time available to produce the correct formulation and dosing of chemotherapy drugs thus impacting the window of delivery. This ultimately leads to delayed delivery and patient care. ● Wastage of compounds costing many thousands of pounds per dose due to delays in deliveries meaning that a drug has reached its shelf life and expired.
Solution	The use of UAS would allow for a rapid, just-in-time logistics solution to alleviate the limitations with the existing supply chain. This trial will focus on delivering to Alnwick Infirmary and Berwick Infirmary from the PMU at Wansbeck General Hospital.
2. Patient blood samples for analysis	
Problem	Blood samples are currently taken from patients at each of Northumbria's ten secondary care facilities, and are analysed at either of their four sites (one of which is Wansbeck General Hospital). There are plans for the analysis to be centralised in 2024 with most of the other laboratory facilities being decommissioned. Once at the lab, a sample can be processed in as little as 4 hours. However, the biggest challenge is getting samples to the laboratory in the first place. Currently, the Trust uses a mixture of hospital couriers who perform regular runs around all the sites and two externally sourced couriers who perform routine and ad-hoc runs, at significant expense both in terms of finance and resources which could be used in other areas of clinical care. A combination of poor road conditions, traffic and round-robin pick-up structure means it can take a long and variable length of time for a sample to get to the lab before it can be analysed, and therefore a result communicated to a clinician to activate patient care.
Solution	The use of UAS would allow for a rapid, and certain delivery timescale to immediately correct for this. This would allow for pathology samples to be received and processed in a timely manner.

	This trial will focus on picking up pathology from Alnwick Infirmary and Berwick Infirmary and delivering to Wansbeck General Hospital.
3. Additional areas of need	
Problem	In addition, there are other time-sensitive items, such as vaccines, test kits and blood units that need to be transported. As described in items 1 and 2 above the current reliance on group transportation is both expeditious and resource hungry.
Solution	The use of UAS could enable urgent deliveries to be conducted more reliably and further, reduce the reliance on ground transportation. UAS delivery could allow for a rapid, just-in-time logistics solution to alleviate the limitations with the existing supply chain. As above, the trial will focus on delivering to Alnwick Infirmary and Berwick Infirmary from the PMU at Wansbeck General Hospital.

3. Requirement for airspace change

a. Segregated airspace and UAS

CAA guidance for UAS operations in UK airspace is set out in CAP 722, which states the criteria for beyond visual line of sight (BVLOS) UAS operation. One of the requirements is the presence of a detect and avoid capability that has been accepted as at least equivalent to the ability of pilot see and avoid, and ensures compliance with the Rules of the Air. Until UAS can comply with these requirements, BVLOS UAS flights may be accommodated through the establishment of segregated airspace. The most common way to implement such segregated airspace is in the form of a TDA.

As such, Apian has undertaken an airspace change request under CAP 1616. During the Assessment Meeting for this ACP with the CAA, it was agreed that a TDA would be the most suitable airspace to safely accommodate the flights.

Apian is conducting a stakeholder engagement exercise, where feedback will be reviewed before submitting our finalised proposed airspace design to the CAA for assessment, to ensure that all identified interested parties have had an opportunity to review the proposed changes and comment accordingly.

4. Routing overview

There are 3 hospitals that will be involved in the flight trial. These are:

i. Wansbeck General Hospital, Woodhorn Lane, Ashington, NE63 9JJ
ii. Alnwick Infirmary, Infirmary Drive, Alnwick, NE66 2NS
iii. Berwick Infirmary, Infirmary Square, Berwick-upon-Tweed, TD15 1LT

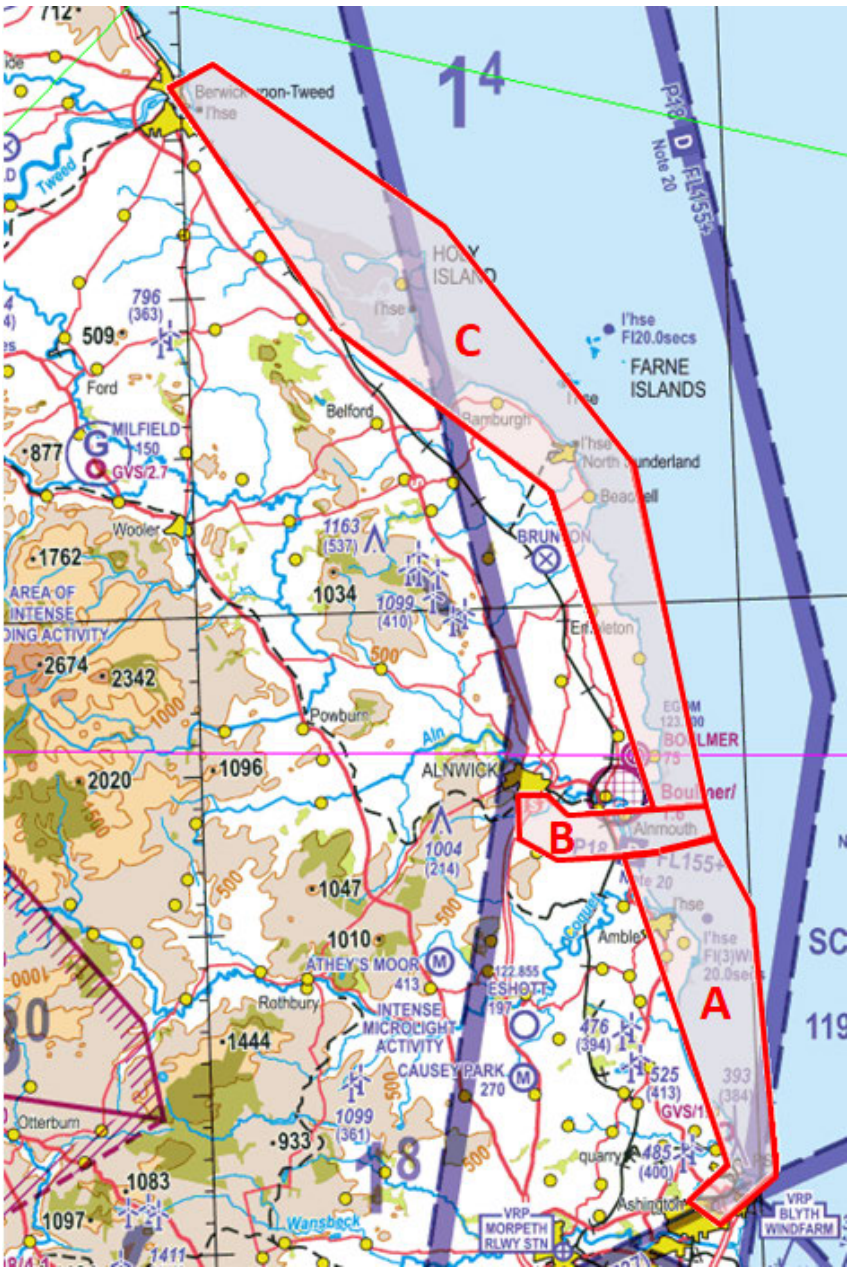

Figure 1: Proposed Temporary Danger Area Structure.
(NOT TO BE USED FOR NAVIGATION)

The proposed TDA structure which will provide segregated airspace between the three hospitals is illustrated above, within the area bounded in red, and is described in more detail below.

Table 2 – Route specification and nominated TDA segment			
Route	Distance	Altitude	TDAs Required
Wansbeck to Alnwick (and reverse)	18.4 nm	<400ft AGL	Areas A & B
Alnwick to Berwick	35.6 nm	<400ft AGL	Area B & C

(and reverse)			
Wansbeck to Berwick (and reverse)	43.7 nm	<400ft AGL	Areas A, B & C

5. Airspace change proposal

a. Overview

Apian requires the use of segregated airspace within which to safely conduct the proposed BVLOS UAS operations. The proposed TDA complex has been designed in segments to allow activation of specific areas for individual flights as appropriate. These segments have been attributed an Area identifier and are as follows;

i. Wansbeck segment (Area A)
ii. Alnwick segment (Area B)
iii. Berwick segment (Area C)

Proposed TDA complex

TDA Area A

Lateral Limits	**Vertical Limits**
Area bounded by straight lines joining: 55°10’22.00’‘N 001°32’15.00’‘W 55°12’02.00’‘N 001°28’52.00’‘W 55°20’29.00’‘N 001°29’55.00’‘W 55°22’37.00’‘N 001°31’45.00’‘W 55°22’13.00’‘N 001°34’05.00’‘W 55°22'07.00"N 001°36'49.00"W 55°12’19.00’‘N 001°31’32.00’‘W 55°11’10.00’‘N 001°33’45.00’‘W 55°10’22.00’‘N 001°32’15.00’‘W	Lower limit: SFC Upper limit: 600ft AMSL

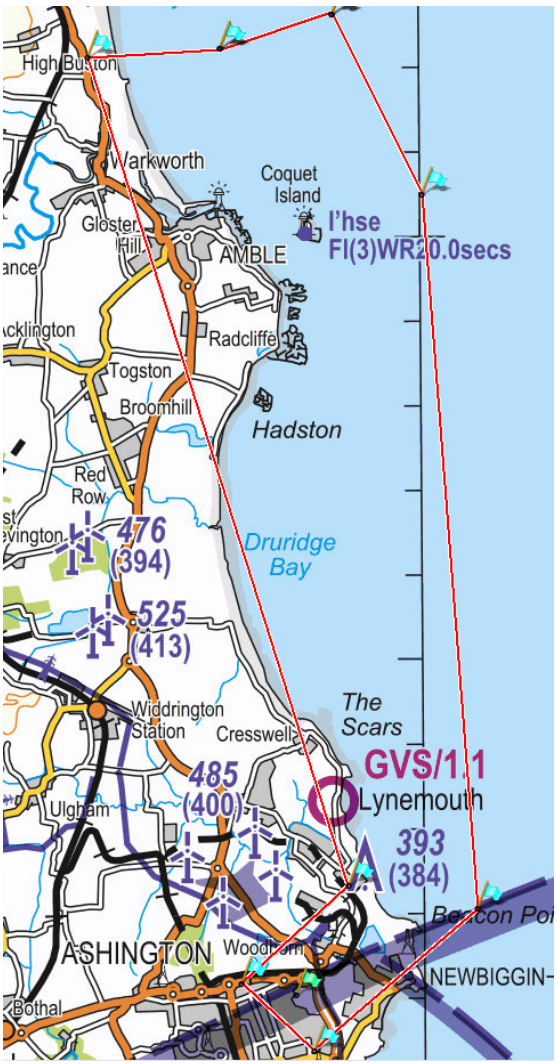

Figure 2: Proposed Temporary Danger Area Segment A.
(NOT TO BE USED FOR NAVIGATION)

TDA Area B

Lateral Limits	**Vertical Limits**
Area bounded by straight lines joining: 55°24'06.00''N 001°42'17.00''W 55°24'06.00''N 001°41'09.00''W 55°23'22.00''N 001°39'46.60"W 55°23'37.00''N 001°32'02.00''W 55°22'37.00''N 001°31'45.00''W 55°22'13.00''N 001°34'05.00''W	Lower limit: SFC Upper limit: 850ft ASML

55°22’01.00’‘N 001°40’25.00’‘W 55°22’40.00’‘N 001°42’28.00’‘W 55°24’06.00’‘N 001°42’17.00’‘W	

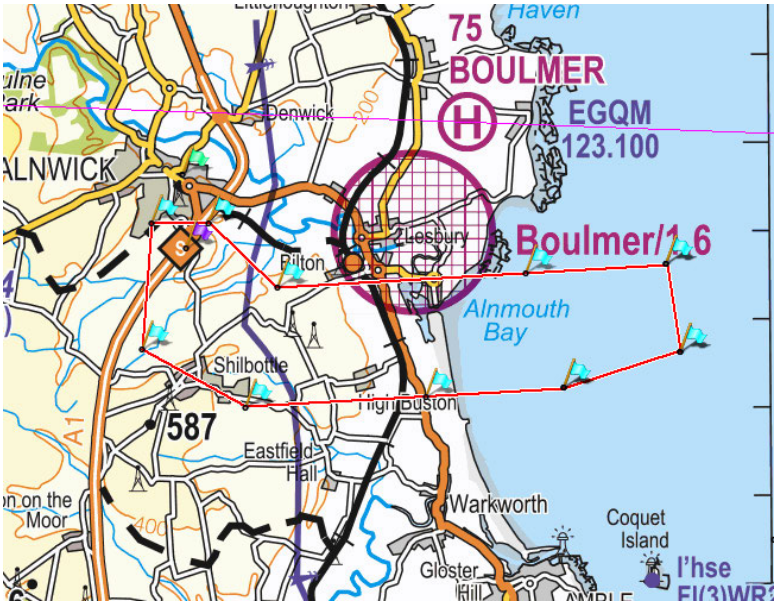

Figure 3: Proposed Temporary Danger Area Segment B (NOT TO BE USED FOR NAVIGATION)

TDA Area C

Lateral Limits	**Vertical Limits**
Area bounded by straight lines joining: 55°46’38.00’‘N 002°00’29.00’‘W 55°47’20.00’‘N 001°58’00.00’‘W 55°41’55.00’‘N 001°45’17.00’‘W 55°34’32.00’‘N 001°35’35.00’‘W 55°23’37.00’‘N 001°32’02.00’‘W 55°23’31.00’‘N 001°34’50.00’‘W 55°33'46.00’‘N 001°40'14.00’‘W 55°38’49.00’‘N 001°51’29.00’‘W 55°46’38.00’‘N 002°00’29.00’‘W	Lower limit: SFC Upper limit: 600ft AMSL

Figure 4: Proposed Temporary Danger Area Segment C.
(NOT TO BE USED FOR NAVIGATION)

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b. Airspace utilisation

Table 3 shows the likely activation periods for the TDA complex and the predicted frequency of flights. The figures have been calculated using the NHS requirements for the distribution of medical payloads such as chemotherapy drugs, patient samples and urgent medical supplies. More details will be provided when available.

Table 3 – Likely TDA activation periods and predicted frequency of flights			
Sites	Day	Time (Local)	Total number of flights* per day
Wansbeck, Alnwick, Berwick.	Monday/Tuesday	09:45-14:15 16:00-18:15	8 flights
	Wednesday	08:45-14:45 16:00-18:15	10 flights
	Thursday	08:45-14:30 16:00-18:15	8 flights
	Friday	08:45-14:30 16:00-18:15	11 flights
	Saturday/Sunday	N/A	N/A

*A flight is one flight between two hospital sites, e.g. Wansbeck to Alnwick

6. Measures to Minimise the Impact on other Airspace Users

a. General

The proposed TDA complex will not be permanently active; specific areas will only be activated when flights are due to take place within those areas. Proven procedures will be adopted to ensure that the airspace is activated and notified as and when required. Apian will promulgate all TDA activation times and contact details of the Flight Operations Team by NOTAM at least 24hours before planned use.

Due to the heights of the proposed TDA complex, it is not anticipated that a Danger Area Crossing Service (DACS) will be provided. A Danger Area Activity Information Service (DAAIS) will be provided by Newcastle ATC as part of their Lower Airspace Radar Service.

b. How to provide feedback

Apian welcomes comments and feedback from all interested parties. All comments received regarding this proposal will be taken into consideration before a final design is submitted to the CAA. All the details of this airspace change proposal are available on the CAA's Airspace Change Portal. Feedback on the proposed TDA, or requests for further information should be sent to:

Head of Aviation at airspace@apian.aero

A feedback form is provided on the next page and a word document is attached to the email containing this material for your use if you wish.

Responses regarding the proposed TDA submission must be received by 4th November 2022.

Name	
Email	
Representing	
Address (including postcode if possible)	
Feedback:	

c. Post engagement

A copy of this letter has been uploaded to the CAA Airspace Change Portal. Apian will produce an engagement summary report which will be presented to the CAA to meet the stage 4 timelines. This will include details of how the engagement was conducted, all the feedback provided verbatim from the stakeholders and how the feedback has influenced the final airspace design. A redacted copy of this report will be uploaded to the CAA Airspace Change Portal at stage 4. Once the CAA has made a decision on the final airspace design, Apian will advise all stakeholders of the outcome.

As outlined in our Stakeholder engagement plan, which can be found on the ACP Portal, Apian is aware of a number of aviation stakeholders that may require approval to enter the TDA once activated, e.g emergency services. Apian will engage with those relevant aviation stakeholders separately to this document, and will work with those stakeholders to ensure a comprehensive and robust airspace deconfliction procedure is produced and will secure their written approval before operating.

While the TDA complex is in operation, Apian will monitor any feedback received on the CAA Airspace Change Portal or received directly by email or phone and collate the feedback and provide regular updates to the CAA when the TDA is activated and after it has been deactivated.

Annex A: Letter of support from Northumbria Healthcare NHS Foundation Trust

Northumbria Healthcare
NHS Foundation Trust

North Tyneside General Hospital
Trust Management
Rake Lane
North Shields
Tyne & Wear
NE29 8NH

31 August 2022

To whom it may concern

Support from Northumbria Healthcare NHS Foundation Trust for trialling the use of Uncrewed Aerial Vehicles (UAVs)

As the Director of Innovation for Northumbria Healthcare NHS Foundation Trust, I have a duty of care to improve the health outcomes of our patients whilst redesigning our services for the future. Northumbria Healthcare is seeking a faster and more reliable delivery service which electric UAVs can provide.

Northumbria Healthcare NHS Foundation Trust provides CQC-rated 'outstanding' care to a population of over 520,000 across Northumberland and North Tyneside local authorities. We operate in one of England's most complex health and geographic contexts with significant health inequality, frailty and deprivation across a rural population. Reliable and timely logistics are critical in delivering a safe and effective service for both patients and staff. The use of UAVs in these clinical settings will support a transformation for these logistics services, lead to improved care for our patients and aid our efforts to tackle the backlog of care caused by the pandemic.

Our principal area of focus for this trial is chemotherapy drugs. We provide chemotherapy services across a number of our main sites, where complex clinical assessments are required for patients throughout the course of their therapy to determine the correct formulation and dosage of these drugs. These medications often have a short shelf-life, requiring them to be administered to patients without delay. Our chemotherapy day services' supply chain has come under pressure since the demand for pharmaceutical products has increased due to the pandemic and local population growth. We believe that using UAVs for our chemotherapy supply chain has the potential to alleviate some of these pressures and provide a better service for our patients.

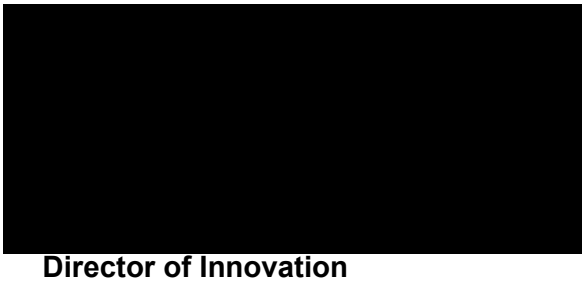
We also support a future UAV service for other items, such as pathology samples, aseptic pharmaceutical products, vaccines, personal protective equipment, medical devices and surgical implants, test kits, testing reagents, tracheostomy tubes, stroke kits, blood units and convalescent plasma.

The NHS in England is estimated to have produced 25 million tonnes of CO_2 equivalent in 2019. As with all organisations, the reduction of carbon footprints is a key climate priority and the NHS has committed to being the world's first net zero national health service by 2040. An environmentally friendly and cost effective delivery model in the health service is clearly

required and alternatives, such as UAVs, needs to be trialled and actively considered.

Northumbria Healthcare NHS Foundation Trust is grateful to the Civil Aviation Authority and the aviation community for supporting these NHS trials. Please do not hesitate to get in touch for further information.

Yours sincerely



Director of Innovation

Annex B: List of identified stakeholders to be contacted as part of this stakeholder engagement

2Excel (Pollution Patrol)
Aircraft Owners and Pilots Association (AOPA)
Airspace4All
Association of Remotely Piloted Aircraft Systems UK (ARPAS-UK)
Atheys Moor flying school
BAe Systems
Borders Gliding Club
Bristow (SAR)
British Airline Pilots Association (BALPA)
British Balloon and Airship Club
British Business and General Aviation Association (BBGA)
British Gliding Association (BGA)
British Hang Gliding and Paragliding Association (BHPA)
British Helicopter Association (BHA)
British Microlight Aircraft Association (BMAA)
British Model Flying Association (BMFA)
British Skydiving
Drone Major
Eshott airfield
Eccles Newton Farm Airstrip
English Heritage
Fishburn airfield
General Aviation Alliance (GAA)
Great North Air Ambulance Service (GNAAS)
Heliair (Pipeline)
Helicentre (Pipeline)
Helicopter Club of Great Britain (HCGB)
HM Coastguard and search and rescue offices
HMP Northumberland
Iprosurv
Light Aircraft Association (LAA)
Ministry of Defence - Defence Airspace and Air Traffic Management (MoD DAATM)
National Grid (Powerline)
National Police Air Service
National Trust
NATS (Enroute)
NATS (NSL - Airports)
Newcastle Airport
North Sunderland harbour
Northumberland County Council (Berwick)
Northumberland Estates (Alnwick)

Northumbria gliding club
Northumbria Healthcare NHS Foundation Trust (Wansbeck)
PDG Helicopters (Network Rail)
Region Airspace Users Working Group (North-West)
RSPB
UK Airprox Board