



Summary Report of Stakeholder Engagement

Airspace Change Request ACP-2021-032

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1 Introduction

Altitude Angel (the change sponsor) is developing a technology it proposes can be utilised as a method for safely integrating drone traffic safely into airspace, including unsegregated airspace.

As part of this, under the current regulatory landscape, it is necessary for us to seek an airspace change to support the area described in the ACP as an 'Arrow Drone Zone' so we can carry out testing.

The Arrow Drone Zone will be operated & managed by Altitude Angel and will demonstrate how manned and unmanned aircraft are able to harmoniously share the sky, safely and securely.

For clarity, Arrow Drone Zones places no special or different equipage requirements on manned aircraft operating in the vicinity, and the ultimate aim of the programme is to prove the efficacy of Altitude Angel's ground-based DAA technology to support the inclusion of drone operations safely in an integrated sky.

The proposed zone has been put forward following support of the CAA's Innovation Sandbox under the moniker 'Project Arrow' and will be situated south of Reading, Berkshire. It will be approximately 8km in length and 120M wide and will serve to extend enhanced DAA capabilities to drones flying within the Zone.

Our technology is also being utilised under Future Flight; a government funded initiative to demonstrate how BVLOS in uncontrolled airspace can be achieved with GuardianUTM – Altitude Angel's unified airspace management software.

2 Methodology

2.1 Stakeholder Identification

Altitude Angel has conducted two rounds of engagement with stakeholders it had identified via the NATMAC List provided by the CAA, and additional stakeholders within the vicinity of the proposed TDA.

Stakeholder Engagement Phase 1 Dates 07/06/2021- 26/06/2021

Stakeholder Engagement Phase 2 Dates 07/12/2021-07/01/2021

Our initial outreach was to the 55 stakeholders identified on the list below which expanded to a total 66 with phase 2.

Table of Stakeholders Contacted by Altitude Angel

Airlines UK
Airspace4All
Airport Operators Association (AOA)
Airfield Operators Group (AOG)
Aircraft Owners and Pilots Association (AOPA)
Airspace Change Organising Group (ACOG)
Association of Remotely Piloted Aircraft Systems UK (ARPAS-UK)
Aviation Environment Federation (AEF)
British Airways (BA)
BAe Systems
British Airline Pilots Association (BALPA)
British Airline Pilots Association (BALPA)
British Balloon and Airship Club
British Business and General Aviation Association (BBGA)
British Gliding Association (BGA)
British Helicopter Association (BHA)

British Hang Gliding and Paragliding Association (BHPA)
British Microlight Aircraft Association (BMAA) / General Aviation Safety Council (GASCo)
British Model Flying Association (BMFA)
British Skydiving
Drone Major
General Aviation Alliance (GAA)
Guild of Air Traffic Control Officers (GATCO)
Honourable Company of Air Pilots (HCAP)
Helicopter Club of Great Britain (HCGB)
Heavy Airlines
Iprosurv
Isle of Man CAA
Light Aircraft Association (LAA)
Low Fare Airlines
Military Aviation Authority (MAA)
Ministry of Defence - Defence Airspace and Air Traffic Management (MoD DAATM)
NATS
Navy Command HQ
PPL/IR (Europe)
PPL/IR (Europe)
UK Airprox Board (UKAB)
UK Flight Safety Committee (UKFSC)
United States Air Force Europe (3rd Air Force-Directorate of Flying (USAFE (3rd AF-DOF))
Burghfield MOD Duty Inspector 01189 837204 or Superintendent on 01189 837375
Brimpton Airfield
White Waltham Airfield

Whittles Aerodome

Chiltern Airpark

Blackbushe

Hampstead Norris

Harpsden

Air Ambulance/HEMS - Babcock

Network Rail PDG Helicopters

NPAS - Babcock

SAR - Bristow

Pipeline Patrol - HeliAir

Powerline Patrol - Western Power

Powerline Patrol - National Grid

Pipeline Patrol - Helicentre

3 Engagement Material

Altitude Angel on its latest engagement updated the initial stakeholder letter with the changes mentioned from the first round of feedback (see 8.10) outlining the airspace change request, the updated changes from the initial stakeholder engagement , maps detailing the proposed area of change, and concluded with an explicit request to those stakeholders to engage with Altitude Angel around the ACP.

Materials were presented in a format which would be easy to read and understand and with a clear offer to provide further, more detailed, information in a timely fashion should it be requested.

We have continued to update our documentation from the relevant feedback from the stakeholders and uploaded those to the ACP.

4 Communications

Altitude Angel shared engagement material with stakeholders by uploading copies to the CAA Airspace Change portal (ACP-2021-032) and providing a copy by email, which was completed on 7th January 2022.

Altitude Angel also engaged previously with appropriate media such as *Flyer Magazine* and *Flyer.co.uk* which regularly report on TDA applications.

Altitude Angel proactively encouraged stakeholders to provide feedback, even if they had already provided feedback during the informal engagement process or, if there was no impact, to confirm that they would see no impact.

5 Summary of Feedback

We acknowledge the timeline was shorter than the typical six weeks, we highlight that we also ran a previous round of stakeholder engagement which ran for an advertised three weeks, but Altitude Angel proactively continued responding to enquiries and hold meetings.

Altitude Angel in error on the first round of engagement displayed incorrect engagement dates, which gave the impression of a three-week window. Altitude Angel proactively continued engagement after this time. After discussions with the CAA Airspace team, Altitude Angel opened up the stakeholder engagement again for a further five weeks. In total, Altitude Angel has undertaken eight weeks of stakeholder engagement.

In total, the first phase of engagement generated 11 direct responses followed by ten direct responses in the second phase. Altitude Angel highlight there was only 1 new respondent, who saw no impact with the TDA. We also highlight we had two meetings with stakeholders at AWE and Brimpton Airfield. These have been included in this report along with the LOA created between Altitude Angel and Babcock.

Altitude Angel responded to all of those who wrote to it within the three-working day goal and were quick to follow-up with responses to any additional questions during those engagements.

Again, Altitude Angel thanks everyone who responded to its engagement request.

In the sections which follow briefly summarise key feedback. However, all received responses are included in the appendices for reference.

5.1 Military

We had a positive response from the MoD following engagement discussions with the Squadron Leader for the S02 Airspace Strategy (see Appendix 10) and highlight the following feedback specifically:

“Thank you for engaging with the MoD regarding ACP-2021-032. We fully support the aspiration to safely integrate unmanned platforms and negate the need for operating within segregated airspace”

“RAF Benson judge that the lateral and vertical limits and notification mitigations for the TDA are sufficient as to not significantly impede our operations”

Furthermore, it was noted that no other MoD functions had raised objections.

We have responded to the MoD's questions regarding management and visibility of activity to a satisfactory conclusion, the details of which are provided further in the document (see Appendix 10).

We thank the MoD for their time and support for our ACP.

5.2 Emergency Services

Police & Medical Ambulance Services

We identified that the operators of helicopter-medical and police helicopters in the Thames Valley region is Babcock. A video conference call with representatives at Babcock was held as a priority.

The conclusion of the call was that Babcock is very supportive of our goals and objectives, and a Letter of Agreement has been produced, the details of which were shaped on the call, where we agreed with the need to enable priority access for Babcock's operations, and to enable safe deconfliction and transit of their aircraft. Babcock expressed confidence in our preparedness and the provision of a telephone service that directly links to our control room, and that they have a means of viewing an online live flight management. The LOA has been included below

We are very pleased to have the support of Babcock, and wish to extend our thanks to those stakeholders with whom we were engaged, and look forward to working with them.

Police Service

Thames Valley Police are already a partner with us and have expressed interest in joining and trialling Arrow as soon as we open applications.

We have coordinated our work with Thames Valley Police via a SPoC at TVP.

We thank Thames Valley Police for its interest, encouragement and ongoing support and look forward to working with them.

5.3 Letter of Agreement with Babcock

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Confidential

**Letter of Agreement Between Altitude Angel and Babcock
Onshore pursuant to Airspace Change Request ACP-2021-032**

Author(s):	David Walters (david.walters@altitudeangel.com) Richard Parker (richard@altitudeangel.com)
Document Version:	2.0 (08 September 2021)

Background

Babcock Onshore operate both the Hampshire Air Ambulance and Thames Valley Air Ambulance services on behalf of the Hampshire & Isle of Wight Air Ambulance and Thames Valley Air Ambulance charities respectively.

The overall principle of this letter of agreement (LoA) is to set out between the parties the operating parameters to enable operational Babcock helicopters to transit the TDA, and to deconflict those helicopters with cooperative drone flights occurring within the TDA.

About the Parties

- Babcock is responsible for the operation of critical helicopter services on behalf of several charities serving the region;
- AA is the developer of an experimental technology currently in the process of certification by the CAA as a ground-based 'detect and avoid solution' for UAS, commonly referred to as 'drones'. The TDA covers the area in which cooperative parties will work with AA to conduct test flights, and in which third parties associated with AA may carry out commercial and/or emergency flights pursuant to their own operational safety cases (but always in coordination with AA as the Danger Area Authority).

Agreed deconfliction procedures

Both parties shall use their best endeavours to keep the other informed about their planned operations within the TDA with as much prior notice as possible. However, AA acknowledges that due to the nature of Babcock's operations, significant advanced notice may not always be possible.

With this in mind, the parties agree the following principles as the basis for the cooperation to ensure authorised HEMS operations and authorised drone operations within the TDA can be deconflicted:

- Altitude Angel will publish approved drone flights within the TDA at least 24 hours in advance on www.dronesafetymap.com (hereinafter referred to as "DSM").
 - Babcock's Duty Pilot check DSM at the start of a HEMS duty for any planned flight operations within the TDA. DSM is an up-to-date representation of flight operations as approved by Altitude Angel, and also contains other flights in other regions that Babcock may find useful.



- During the TDA's hours of operation, the HEMS Desk will call the Altitude Angel Arrow Regional Control Centre (ARC) control room to notify of its intent to either transit or operate within the TDA. AA acknowledges that this is a reactive service, and that it may not be possible to provide more than a few minutes' notice.
 - The ARC can be reached on 0118 466 1012 during operational hours. A prerecorded message will advise callers if the TDA is not currently operational.
 - The ARC is only staffed during the TDA's operational hours. Cooperative drone operations are not permitted outside of these hours.
 - Any authorised drones operating within the Arrow corridor and within the TDA will be instructed to divert or land at one of three specified locations upon entry of the TDA by the HEMS service and shall remain clear until the HEMS service has transited.
 - Babcock HEMS aircraft will transmit ADS-B while within and on approach to the TDA (if the aircraft is so equipped); Altitude Angel will track the HEMS aircraft using ADS-B receivers and its camera arrays. Our systems can also advise us if any aircraft equipped with ADS-B appears to be on a trajectory that will conflict with the TDA over an extended range, which can help mitigate any advanced communications.
 - If a HEMS aircraft does not carry or use ADS-B, we will not be able to detect it electronically; thereby raising the importance of a notification via telephone call to the ARC.
 - Altitude Angel will resume corridor operations when the HEMS aircraft has cleared the TDA.

Both parties acknowledge the possibility of the presence of other aircraft within the vicinity or boundary of the TDA, and potentially the unauthorised presence of other air traffic (which may include drones) within the TDA. Altitude Angel will use the array of sensors at its disposal to deliver enhanced situation awareness via the ARC to Babcock, but AA cannot guarantee that its detection capability will cover every possible eventuality while in research mode.

The appendices attach give an example depiction of the DSM service showing an active flight within the proposed area of the TDA, and also reiterate the proposed boundaries of the TDA.

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The parties below signed agree to work diligently to uphold the operating parameters described herein:

Babcock Onshore		Altitude Angel	
Signature		Signature	 849471B58114422...
Name	Hayley Belmore	Name	Richard Parker
Date	9/9/2021	Date	October 7, 2021
Position	Director UK Onshore	Position	CHIEF EXECUTIVE OFFICER

5.4 General Aviation

The view of the General Aviation Community has been positive on the whole, and we wish to extend our thanks collectively to all those who engaged with us throughout this process.

Through our engagement, we have been able to explain that our Arrow technology is working towards an integrated airspace and the ability to safely incorporate UAS into 'routine' operation of airspace, and the majority of stakeholders were in support of this, particularly since it may lead to a future where there is a need for fewer 'drone TDAs'.

Naturally, there have been questions raised during the consultation, but we believe we have addressed these fully such that, we hope, the community will feel safe transiting the airspace and, that overall, our proposal is stronger and better because of their engagement.

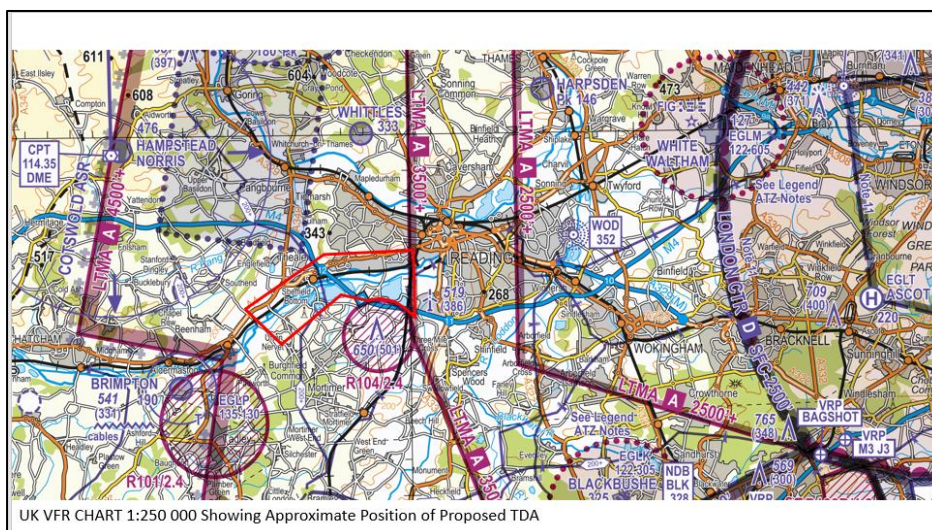
We thank the GA Community for its feedback.

Where feasible we have also acted on the feedback received. One such example is where concerns were raised about congestion within the airspace due to low cloud cover at or below 1,000ft. We agreed and have amended our operations (and safety case) such that the TDA and our flights would not be active when cloud cover is this low.

Our operational criteria include weather conditions, one of which is to seek to have ≥ 5 Km visibility between our towers during flight operations. In the scenario of cloud cover at or below 1,000ft AMSL, this could be a limiting factor, and as such will be incorporated into our safety case. We will utilise the Windy.com service for monitoring the cloud base

Some members of the GA community also asked for a 1:250000 UK VFR Aviation Chart highlighting the proposed area of the TDA. We are happy to provide this here but wish to note that we have also proactively shared this with those who have requested it and it has been also uploaded to the ACP Portal for the wider GA community to review.

We will take on board this feedback, and should we need to engage in this process again in the future, ensure that a VFR chart is included.



6 Finalised Airspace Design Concept

The TDA we have proposed was designed to reduce the impact on local airspace users and stakeholders. We have endeavoured to keep the extents of the TDA to a minimum whilst being able to maintain operational safety.

The initial design proposed by Altitude Angel was situated directly above the M4 in a low populated density environment for the purposes of this trial.

On receipt of feedback from stakeholders we have made minor changes to the extremities of the proposed area:

6.1 TDA Shape Design Change

The Cessna 189 Group operate several light aircraft from the Englefield Estate at Whittles Farm Airstrip. We have reduced our TDA dimensions accordingly to ensure we do not restrict their take-off and landing.

Our TDA is now south of the runway, and runs parallel to their runway, which runs E/W.

We also have ADS-B receivers deployed and note the aircraft operating from that location are EC-equipped and we will be able to identify these vehicles and track them in real-time to ensure separation.

We have also provided the telephone number for our Arrow Control Room and provided the details for DroneSafetymap.com so they can see our flight schedule in real time.

Our TDA also intersected with R104 at Burghfield initially: we have now made amendments to this, so the lower south corner now follows the outer edge of this piece of airspace.

6.2 Cloud base Monitoring

We have listened to the GA community response regarding congestion within the airspace due to low cloud cover at or below 1,000ft AGL. We have acknowledged this and agree that the TDA and our operations would not be active when cloud cover is this low.

6.3 Buffer Adjustments to TDA

We were asked if we could keep the TDA North of the M4, due to it being a navigation aid for GA Pilots. Due to land access and ground-based hazards, re-routing the TDA as requested would not be possible, but we have reviewed the buffer and adjusted areas to the co-ordinates below, which we believe to be a reasonable compromise;

6.4 TDA Operating Ceiling Limit

Some raised questions about the proposed upper limit of the TDA and requested we look to achieve 600ft AMSL, as opposed to 800ft AMSL detailed in our application.

The top of our Emergency Buffer Zone is 619ft AMSL. Taking into consideration that it is our

belief that the CAA Policy Team will want us to ensure we have a good buffer zone between manned air traffic and drone operations, we believe it is appropriate therefore to maintain 800ft AMSL, however are prepared to amend this if the CAA Policy Team is amiable to this and we believe it can be handled safely.

6.5TDA Outlined Design Dimensions

Below, we outline the current design dimensions:

Comments						
Activity: UAS Beyond Visual Line Of Sight.						
Operations: Scheduled in Advance Posted By NOTAM						
Live Operations Website: www.dronesafetymap.com						
Contact Altitude Angel Arrow Regional Control: TEL: 0118 466 1012 E-Mail: rdg.arc@altitudeangel.com						
		LAT	LONG		Upper Limit AMSL FT	Lower Limit (ft)
1	North West Point	51.416848°	-1.118742°	51°25'01"N , 001°07'07"W	800	SFC
2	Most North Point	51.446642°	-1.060493°	51°26'47"N , 001°03'38"W	800	SFC
3	North East Point	51.435025°	-0.992504°	51°26'06"N , 000°59'33"W	800	SFC
4	South East Point	51.415080°	-0.991375°	51 24 54 N 000 59 29W	800	SFC
5	Start of Arc	51.417181°	-1.003014°	51°25'02"N , 001°00'11"W	800	SFC
5A	ARC RADIUS	Clockwise by the the ARC 1NM From Centre on point 5 below			800	SFC
6	Centre	51.40666	-1.023611	51°24'24"N , 001°01'25"W	800	SFC
7	End Of Arc	51.422423°	-1.032000°	51°25'21"N , 001°01'55"W	800	SFC
8	Mid Point	51.427198°	-1.056763°	51 25 37 N 001 03 24W	800	SFC
9	South West Point	51.408918°	-1.102702°	51°24'32"N , 001°06'10"W	800	SFC

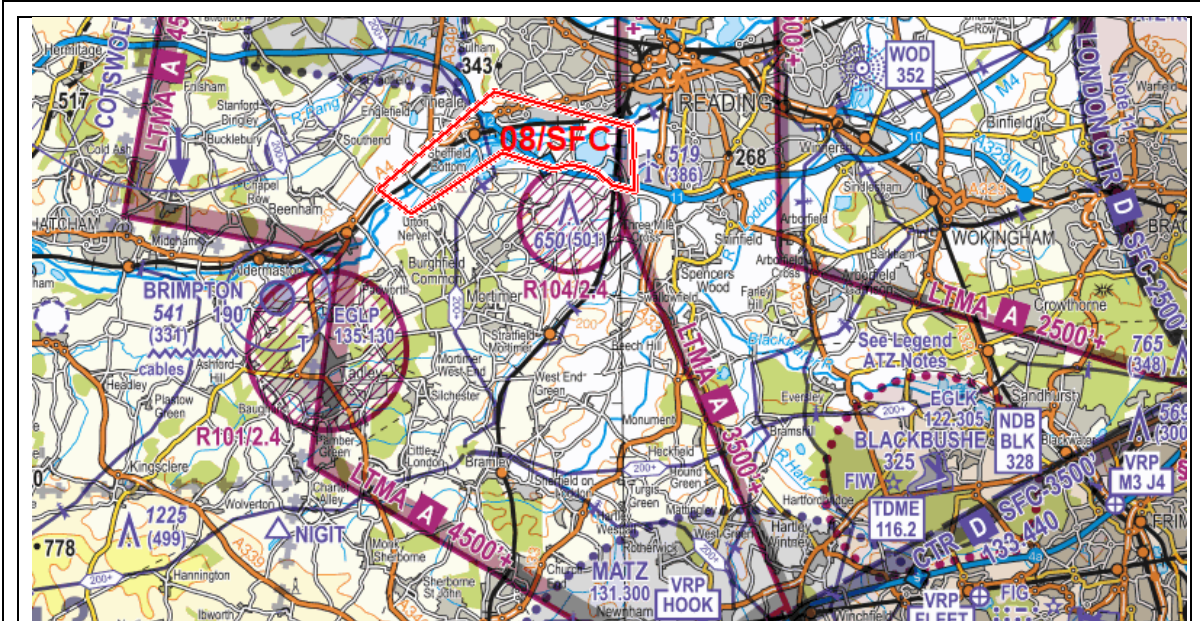


Figure 1 A Closer look at the Proposed Final TDA Shape at SFC-800ft AMSL Following Feedback ON CAA 1:250K England South Chart

Note: The Arc shape butts up next to the R104 Airspace of Burghfield

6.6 Airspace & Operations Notification

Initially we had hoped to offer a crossing service but as Altitude Angel are not an ANSP this was not possible. So our approach below highlights to openly sharing in advance ALL of our flight activity.

The CAA Airspace team will publicise our TDA Activations via NOTAM on the days of scheduled operations.

The TDA will be activated from 10TH MARCH to 8TH of June 2022. Operations will commence Monday- Friday 9am 6pm.

Although potentially in effect for 90 days, we will be clearly publishing at least 48 hours in advance all flight activity. Flight durations are anticipated between 15 –60 minutes. The TDA will only be active for the flight duration at the times stated. If there is no flight activity listed on a particular day and time, the TDA will effectively be unused by us on those days. In addition, interested parties will be able to call our hotline number – published by NOTAM and on all our digital maps – to ascertain whether we are planning flying operations on any given day or not.

We wish to reiterate that we are, and will remain, open to engage with all aviation stakeholders and those in the local area. We are happy to accommodate meetings with any such party in person, via telephone or conference call. We also wish to note that live flight operations will be publicly available (without registration requirements or cost) on our web site at www.dronesafetymap.com, an example of which is below:

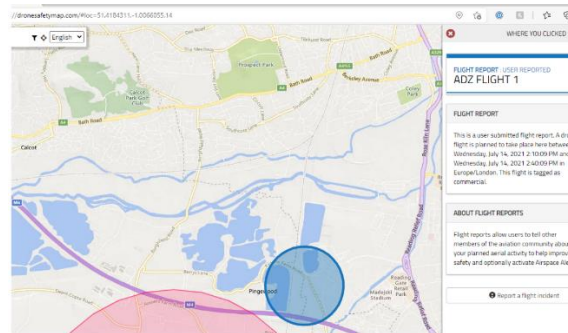


Figure 2 Dronesafety Map Showing Planned Drone Flights

We also have a dedicated live operational hotline setup within our Arrow Regional Control centre which will be staffed when operations are taking place.

Stakeholders will have an option to opt-in to our planned flight activity list. This will mean pilots who check a flight briefing in the morning and are informed we plan drone operations, which are later cancelled, will be able to receive an email from us stating so. As we do not hold a radio licence, we are unable to communicate with pilots by radio. To request to be added to the mailing can be done so via stakeholder_engagement@altitudeangel.com

7 Appendices: Phase 1 stakeholder engagement

The following are copies of emails and/or representations of news articles with public comments with numerous stakeholders. Note that reference numbers in the table below correspond with the following sections numbers. We have divided the respondents into two sections. The first section covers our first round of engagement, and the second section covers our latest engagement

First Round of Feedback from our Stakeholder Engagement is below.

Ref. #	Stakeholder		Overall Sentiment
7.1	Geoff Weighell		Supportive
7.2	Steve Slater	Light Aircraft Association	Supportive
7.3	Roger		Neutral
7.4	Geoffrey Lynch		Supportive
7.5	Rupert Dent	ARPAS-UK	Supportive
7.6	Colin Watt	Lasham Gliding Society	Supportive
7.7	Geoff Eammons	Pilot – CESSNA 189 Group	Supportive
7.8	Paul Wheal	Pilot	Not supportive
7.9	Jonathan Smith		Neutral
7.10	Sqn Ldr Kate Read	RAF	Supportive
	Ministry of Defence	Government	Supportive
7.11	Babcock	Aviation Service Provider	Supportive
7.12	Flyer Magazine Press Article		
7.13	Copy of Altitude Angel's initial Stakeholder Letter		

7.1 Geoff Weighell

Received From	Geoff Weighell & Adrian Whitmarsh
Date Received	02 July 2021
Date Responded	07 July 2021
Notes	

Good afternoon David.

Thank you for your email advising of your planned ACP.

- I note that you are only proposing a 4-week engagement period. The standard for an ACP is 12 and for a TDA recently 6. It is unlikely that we can inform members so they can respond within a 4-week period and so question the limited time.
- Reading the SON on the CAA website it appears that you plan a 6 month activity although the TDA can only be active for a period of 90 days. Can you clarify please?
- So that we can make members aware, some of whom may fly in the proposed area please provide a 1:250,000 aeronautical chart depicting the proposed area, this will help to identify any local activity which may be affected.

Our intention is to integrate with UAS activity rather than seek to prevent it. Your assistance with the points above will assist us in this.

Regards
Geoff

Geoff Weighell

Response from Altitude Angel:

Hi Geoff,

Thank you for your email.

After our first meeting with the CAA Airspace team, we updated the SON which is now on the ACP portal and now plan a 90 day window which should be sufficient. We plan to operate Monday – Friday and activate the TDA via NOTAM. Where possible, we aim to reduce the impact on other aviation stakeholders, and when operations are completed the TDA will be inactive.

We started engagement with the GAA prior to the ACP request to understand impact and also to discuss the project. We also issued our application to the CAA Airspace Team back in January 2021, and only recently did the CAA contact us to begin the discussion.

The project is time-critical and is part of a government funded project looking at Future Flight, with our organisation specifically looking at an integrated airspace future, not segregated. Our technology which is being tested will demonstrate this.

I will do my best to source an appropriate chart and upload it to the ACP.

We will continue to update on you the developments, and if you have any further questions please feel free to reach out.

Kind Regards,

David Walters
Project Arrow Lead

Hi David,

Thanks for your responses. I appreciate its after your formal engagement period end date but, especially considering the effectively shortened engagement period, hope that you can include my below comments (**shown in blue under yours**) as we consider your trials most important.

Looking forward to continued dialogue.

Best regards
Adrian Whitmarsh
BMAA Airspace Group

Dear Adrian,

Many thanks for the below questions. For ease, I have answered them in red below each question.

If you do have any further questions or queries, please don't hesitate to contact me.

Kindest regards,

David Walters
Altitude Angel
Project Lead

Dear Steve,

I've been away for a few days and I know you said you had a few things on your plate but we need to get together this week to find out more information about your projects so we can write up something for our magazine's next issue.

Meantime, I just realised your requested engagement submission date of 09:00 Monday 26 July is upon us and we wanted to get a submission to you on this ACP. I'll try to be brief:

1. Since your Stakeholder Engagement notice was only posted on the ACP portal on 08 July your requested submission date of 26 July gives just 17 days for engagement. This is somewhat short of the 4 weeks proposed and far shorter than the normally required minimum 6 weeks. Can you please justify why this is so short? Granted we are keen to see you push ahead with the technology trials but considering point 3 below we think the engagement period should be at least the 4 weeks from 08 July = 05 August, to allow time for stakeholders to consider the impacts.

The ACP went live on 02 July when our public engagement started. The date of 08 July was the last update to the ACP which was the uploading of our final stakeholder engagement letter. Apologies for any confusion.

The start of engagements is something we've brought up with the CAA and sponsors several times. Logic says that engagement periods should actually start once engagement material has been sent out to stakeholder end-users AND the date of upload to the portal. Otherwise the period is meaningless and these drone engagements have been shortened anyway. The CAP1616 does say engagement should be 'meaningful'. Even taking 02 July to 26 July it is only 24 days, so still short of the 4 weeks and well short of the 6 weeks minimum drone ACPs are supposed to be. The CAA say they can shorten if justifiable reasons are given by the sponsor. Whilst we are all keen to see your trials proceed, because they should progress the avoidance of TDAs in the future, it nevertheless sets a dangerous precedent so – to the CAA – we question this engagement start date and period.

We started engagement with the General Aviation Alliance (GAA) prior to the ACP request to understand impact and also to discuss the project. We also issued our application to the CAA Airspace Team back in January 2021, and who only recently contacted us to begin the discussion. The project is time-critical and is part of a government project looking at Future Flight, with our organisation specifically looking at an integrated airspace future, not segregated. Our technology, which is being tested, will demonstrate this.

Frustratingly (and this is not your problem) we have found that engagement material to NATMAC and even the GAA take time to filter down to the member Associations. For this reason we have challenged the CAA previously on why they don't provide applications with more comprehensive stakeholder contact information. After all, they deal with all the Associations regularly. We are disappointed (as surely you are) that the CAA took so long to respond to your initial application. We believe that the government had instructed the CAA to fast-track drone ACPs that were linked to NHS logistics trials. This rather debases the ACP process and, ironically, lengths the time that TDAs and the lengthy process to obtain approval for them are required for such logistics. So, I reckon you have been a victim of that. Perhaps we are wrong but that's the perception that has come across. From that perspective we agree that your project is time-critical.

2. We fully support efforts to develop DAA technology and systems to enable integration of UAVs and RPAS with all other existing airspace users with their existing equipment requirements in non-segregated airspace and your proposal is to be encouraged.

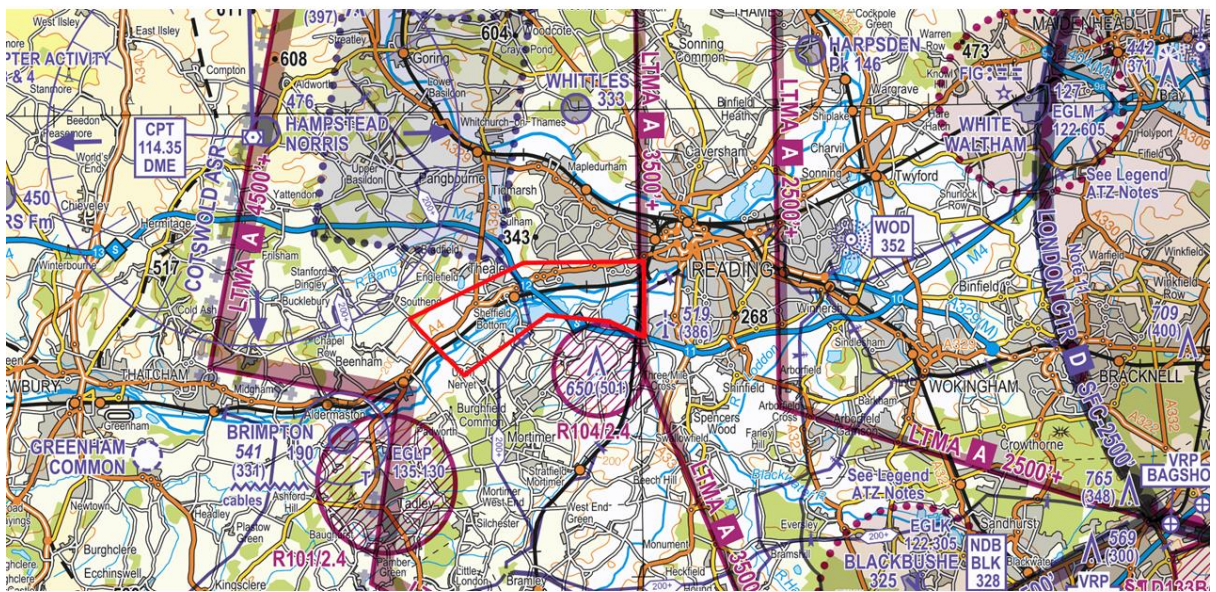
Thank you for the support. I hope we can keep you updated with our progress and developments.

3. Whilst you have given detailed information on the area required for the TDA we would always request that this be presented on a current airspace chart, preferably the 1/4mil scale, considering the size of this proposed TDA. We appreciate that your Engagement Notice includes some representation but the chart used is not an appropriate scale. Actually, this issue is something we have consistently lobbied all sponsors and the CAA for as a fundamental requirement. The clue is in the name; it

is an *Airspace* Change Proposal where you need to engage with aviation stakeholders so it seems obvious that it would be necessary to represent the proposed Change on an *airspace* chart. This provides a level of clarity with regard to the impact any TDA could have on airspace users relative to existing airspace. It seems this is a common failure with virtually all UAV ACPs and we feel shows a level of ignorance of airspace matters. We are puzzled why the CAA don't insist on this as we cannot see them accepting an ACP from a major airport for revised airspace on a satellite map. The process is the same irrespective of what the Change is for so it seems sensible the same rules should apply. It would certainly enhance your application in the eyes of the CAA, I'm sure.

We have added an aviation chart to the uploaded and updated Stakeholder Letter V4 on the ACP Portal. We took the feedback from our first responses and uploaded the updated version. Since then we have obtained a digital copy of the VFR chart for the south and will be uploading it shortly. I do agree it would be better on the ACP planning tool if the CAA had the VFR Charts back loaded so we could draw directly on to them. It would be easier for everyone, I think!

Thanks, the 1:250,000 chart representation is much clearer and we appreciate your prompt and positive response to that request. It immediately shows proximity to any other airspace and any airfields and would be so much better if more drone sponsors were so motivated! It almost seems some purposely want to hide such proximities. A lesson for the CAA we think.



UK VFR CHART 1:250 000 Showing Approximate Position of Proposed TDA

4. Whilst we support your efforts, in general terms, we would ask what your justification is for requesting a TDA in the location proposed, in particular because of the proximity to RAF Benson's MATZ stub, Restricted Airspace (RA) R104 and RA R101? We appreciate this may be close to your offices but that's not really a justification for potentially adversely impacting other airspace users. We appreciate that your TDA is proposed to be just 459ft AGL but that does only provide about 450ft clearance between the top of your TDA and the base of the Benson stub, where they appear to virtually contact. Again, this is where presentation on the appropriate airspace chart will add clarity. We understand that you wish to trial the

technology in an area where there will be other unconnected airspace users, but this does create a rather congested airspace area and, as we understand it, your technology is not approved for BVLOS operations in Britain thus far, although we are interested to understand more on that aspect.

We have had a very positive response from MOD and are working on a CONOPS to support them, in addition to supporting Babcock (who are also supportive of the application) transiting through with its helicopter services. The TDA is a requirement at the moment for all BVLOS operations authorised by the CAA in the UK. It's this process we have been working through for the last two years. The flight approvals system is currently the same as deployed in various airports across the world by Altitude Angel for supporting and enabling drone operations in controlled airspace.

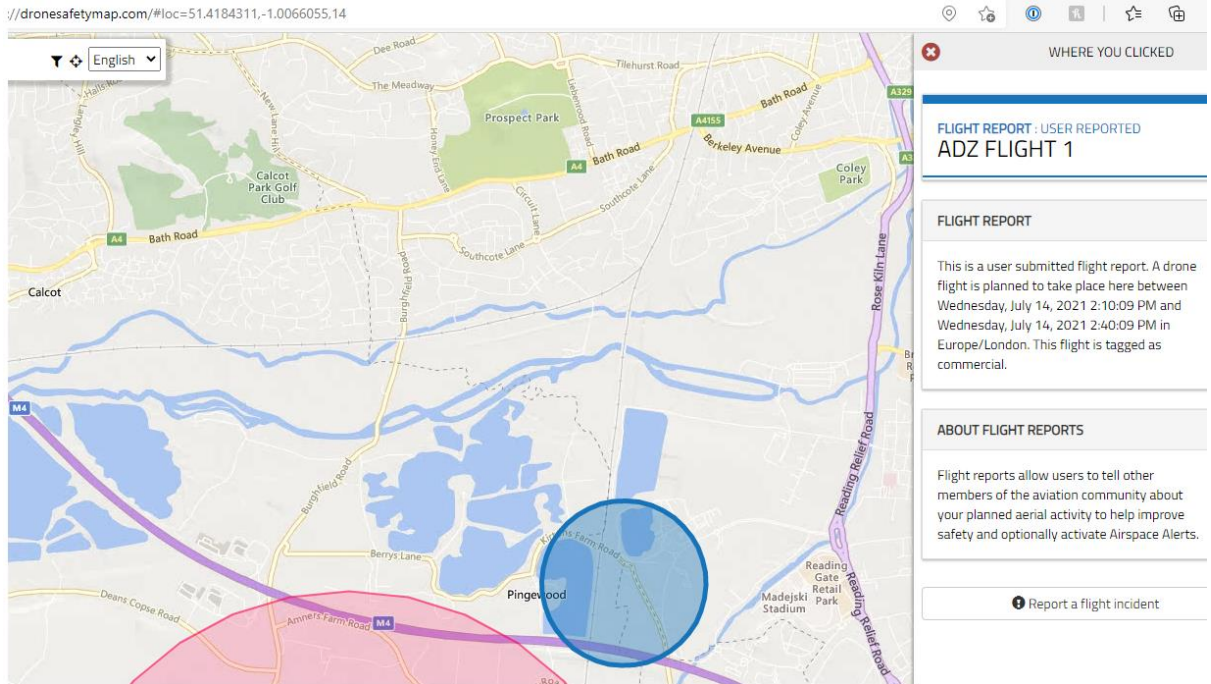
Not sure how this mitigates the restriction resulting from the proximity of your TDA to the RAF Benson stub as far as GA traffic is concerned?

The DAA solution has been tested at a small airfield where we were able to collect supportive evidence over a relatively short period of time. We now have the masts deployed in Reading which are actively monitoring and tracking aircraft as we speak. We are also testing the system in the Reading location under VLOS and EVLOS conditions. The BVLOS Part of the testing at this location is the final step. Our aim is to provide evidence to the CAA at the end of the flight trials which, in this environment, our DAA solution can provide sufficient safety mitigations that BVLOS Operations using our technology no longer require a TDA.

This will enable us to move to a more integrated sky whilst maintaining a high level of safety. In doing so, we will also allow us to provide more tools and services to GA pilots on the locations of drone activity. Anyone can currently visit our tool <https://dronesafetymap.com/> and see all of the drone flights which have been submitted to our GuardianUTM platform. This will also show all of the scheduled drone activity on the Arrow Drone Zone corridor. This is a great, free, tool for the GA Community to check pre-flight for any planned operations prior to take off.

I've looked at you drone safety map and interested to talk more about that. Not so sure whether its trying to reinvent the VFR airspace charts but with less accuracy on some areas of airspace boundaries, e.g. the RAF Benson MATZ. Certainly for the un-trained reading the existing NOTAM system is a nightmare. Even those of us used to it find it antiquated and illogical many times. There are international moves to update and improve it but it's a mammoth and international task. We are lucky these days to have the internet and digital representation of these. Certainly displaying drone activity independently avoids the overload which may result in including that data with moving existing map displays. Most GA pilots these days use a moving map system, such as SkyDemon (which is the leading such service), which I assume you are familiar with. Are you in communication with them to combine data at all?

An example of our test flight is below.



5. Can you please advise a list yet of the stakeholders you have contacted for the engagement process? As per the requirement to include this in your submission to the CAA, this only needs to be list of organisations/airfields, etc., and naturally not names/contacts.

We have contacted all of the stakeholders on the NATMAC List, with the addition of some of the local stakeholders and ones specified by the CAA. A full list will be made available on the Airspace Change Portal once the ACP is closed.

Its immensely helpful to have a list of intended stakeholders that is updated as an ACP progresses as it enables the Associations to see what local clubs/airfields/groups are already being contacted or that need adding. As mentioned earlier, we have found that contact via the NATMAC list has been patchy and leads to delays and thus effectively shortens engagement periods with those most impacted. We don't understand why the CAA don't issue lists of all the direct national associations' contacts; after all, they have them and it would help everyone involved. Again, many of these comments are for the CAA to take onboard as well, to improve the ACP process, since we have found it fundamentally lacking in several respects. Frustrating for us and, ultimately, for ACP sponsors. Let's hope that with the contacts we develop with yourselves and some others involved in these processes we can effect improvements. Cooperation and mutual understanding is always the way to progress, in my experience.

Looking forward to hearing from you as soon as possible. Do call me if you need to.

I look forward to, hopefully, meeting up.

Regards
 Adrian Whitmarsh

7.2 Light Aircraft Association

Received From	Steve Slater
Date Received	02 July 2021
Date Responded	06 July 2021
Notes	

David

Thank you for offering the LAA the opportunity to respond on behalf of our members. As you may be aware we are the UK's largest powered sport flying organisation with around 7,700 members operating circa 2,700 light aircraft. The majority of these operate in the day VFR environment.

While we are keen to support any UAS trials which support the ultimate integration of such craft into Class G airspace we do have a number of reservations surrounding your TDA proposal, were it to lead to segregation. It would exclude traffic below 800 feet amsl from an area of the M4 corridor near Reading for up to 90 days commencing in September.

The low top level of the TDA (c.600 feet agl) should not create a significant impediment to fair weather operations. However the ACP does not appear to recognise the role of the M4 as a visual navigation feature for VFR traffic, nor cognisance of the SW entry route to White Waltham which generates significant traffic in the area.

Mitigation 1 which should be considered is to have a cloud base criteria, say 1,000 feet AGL, at which point trials should be suspended and the TDA reopened by NOTAM. This would enable traffic tracking the M4 greater freedom to navigate and reduce any risk of 'squeezing' which would increase the potential for airprox or collision.

Mitigation 2 should be to consider rerouting the TDA to ensure that east of the crossing point the TDA boundary stays north of the M4. This would enable a clearer visual definition of the TDA boundary and reduce risk of incursion.

Mitigation 3. We note there are no attempts to mitigate the timings of use of the TDA when the UAS is not being used. Recent TDAs from other operators have included the ability to activate and deactivate the TDA by NOTAM when it is not in use or when UAS activities for the day have ended. Given the fact that the current TDA proposal excludes daylight access, this does not seem an unreasonable proposal.

Happy to discuss these ideas with you if you wish. I have also engaged with local LAA members with a view to ascertaining their further comments, based on local knowledge. I'll relay any further comments to you in due course.

As part of your commitments under CAP 1616, please include these comments in your documentation pack.

Best regards

Steve Slater
CEO
Light Aircraft Association

Turweston Aerodrome
Nr Brackley, Northants NN13 5YD

Response from Altitude Angel:

Hi Steve,

Thank you for replying to our engagement letter. We appreciate your feedback and suggestions.

Mitigation 1 is a very valid suggestion and something I will raise internally as we utilise EC as well as visual sensors as part of the DAA Solution. The weather conditions have to be as minimum 'fair' with a visibility of 5km. We have two surveillance towers which are deployed at 5km, and as part of our safety case for the CAA we must be able to see those before operations can take place.

Due to land access and ground-based hazards, re-routing the TDA would not be possible, but we can certainly look at the extents of the buffer zones.

On our updated Statement of Need, although we stated Monday to Friday Daylight Hours only, we intend to activate and deactivate only when required to reduce the impact to other airspace stakeholders.

We have also offered to set-up a crossing service to enable the safe transition of aircraft and support traffic deconfliction in the area.

I appreciate your sharing the ACP, as the broader the feedback we can receive, the less impact we can hopefully have whilst we test and demonstrate our DAA solution. Our goal is to complete the testing and in doing so demonstrate the requirement to segregate between manned and unmanned can be reduced when this technology is deployed.

We very much support the *integration, not segregation* approach.

Kind Regards,

David Walters
Project Arrow Lead

7.3 “Roger” (GA Pilot)

Received From	Roger (GA Pilot)
Date Received	06 July 2021
Date Responded	07 July 2021
Notes	Email was received as an addition to Steve Slater’s email – see Appendices 2

David

Adding to the points made by Steve.

The applications seems to ignore the presence of Whittles Farm Airstrip – clearly identified on the standard Aeronautical chart some 3 to 4 NM north of the propose TDA. The proposed volume blocks off the southerly approach and exit when avoiding the extended Benson Stub to the west and Heathrow CAS to the East. To retain the CAA planning recommended 200ft clear of the TDA would require greater that 1000ft return/outbound south on “base leg” to both runways (29/11).

This need resolution

Roger

Response from Altitude Angel:

Dear Roger,

Thank you for your email.

The Englefield Estate are one of our project sponsors and are providing us with the land access in the area, so we know them well. They had made us aware of the flight strip, but we were told the activity was low, but we will do our best to find a resolution to support continued operations.

After our first meeting with the CAA Airspace team, we updated the SON which is now on the ACP portal and now plan a 90 day window which should be sufficient. We plan to operate Monday – Friday and activate the TDA via NOTAM. Where possible, we aim to reduce the impact on other aviation stakeholders, and when operations are completed the TDA will be inactive.

We have several surveillance towers deployed in the area which can detect EC equipped aircraft, but we also have visual based sensors to detect NON EC equipped aircraft. The purpose of this TDA is to actually test and verify this equipment to the regulator – to reduce the need for segregated airspace moving forward.

Are you able to share with us your ADSB Transponder ID if you’re EC equipped and we can flag them within the system? We will also be offering a TDA crossing service so we can ensure your flights are deconflicted, and to also provide visibility of our operations.

I would be more than happy to setup a call so we can discuss this further and find a way forward

Best wishes,
Kind Regards,
David Walters - Project Arrow Lead

7.4 Geoffrey Lynch

Received From	Geoffrey Lynch
Date Received	09 July 2021
Date Responded	09 July 2021
Notes	

Dear David,

Thanks for your email. I sit on NATMAC as the representative of the Airfield Owners Group. As most of our business will centre around GA flying, the threat to that activity from unmanned aerial vehicles looms large especially BVLOS operations.

It is very good news to hear of the sort of solutions which your initiative might bring. Thank you for your efforts and I wish you every success. Any of our member airfields which are likely to be affected by your trials will doubtless have been contacted directly as interested parties and will make their own responses. FWIW, none of them have been in touch looking for support from the organisation.

Best regards,
Geoff

Geoffrey Lynch O.B.E.
Chairman A.O.G.

Response from Altitude Angel:

Dear Geoffrey,

Thank you so much for your response and support. We understand the challenges these types of trials can bring, and we hope with support from people like yourself, we will be able to provide a successful demonstration which will lead to a harmonious, integrated sky.

I will keep you informed of any updates and, in the meantime, should you have any questions or queries then please don't hesitate to contact me.

Kind Regards,

David

7.5 ARPAS-UK

Received From	Rupert Dent, ARPAS-UK
Date Received	15 July 2021
Date Responded	
Notes	No response required

Dear David,

Thank you for your email regarding ACP-2021-032.

ARPAS UK on behalf of its membership and as a member of NATMAC and the Airspace Strategy Board, fully supports this ACP application. It is exactly the sort of work that is required in order to advance the use of RPAS in a BVLOS environment and integrated with all other airspace users, without the use of segregation via TDAs.

We very much look forward to being kept in touch with how this initiative progresses.

kind regards

Rupert

Rupert Dent
Regulation Director
ARPAS-UK

7.6 Lasham Gliding Society

Received From	Colin Watt, Lasham Gliding Society
Date Received	08 July 2021
Date Responded	08 July 2021
Notes	

Dear Altitude angel,

We have been made aware of the proposed ACP for a drone corridor on the west side of Reading. As gliders flying from Lasham Gliding Society are one of the largest users of the airspace in that area, we would like to be included in the list of stakeholders that are consulted.

I am happy to be the point of contact for Lasham Gliding Society and you can either use my work email, or office@lasham.org.uk.

Best Regards.

Colin Watt.
Chief Flying Instructor.
Lasham Gliding Society.

Response from Altitude Angel:

Dear Colin,

Great to hear from you and thank you for getting in touch.

For over two years we have been developing a new type of Detect And Avoid technology which we believe will support and enable manned and unmanned aircraft to be safely integrated into the same sky.

We understand not all manned aircraft are EC equipped so, as part of our solution, we have the capability of identifying non-EC and as well as EC equipped aircraft.

We have completed extensive testing of the technology outside of the Reading area and now, as part of a government Future Flight consortium - Project Xcelerate - we hope to finalise the testing and demonstrate to the regulator in a 'real environment' the technology can enable safe deconfliction between manned and unmanned aircraft.

In doing so, we hope the wider aviation industry, as well as other interested businesses and organisations, will adopt the technology to support safe integration, and reduce further segregation.

I have added your details to our distribution list to keep you up to date with the progress.

The link to the ACP is here <https://airspacechange.caa.co.uk/PublicProposalArea?pID=365>, along with the current live documents we have presented to the CAA.

FYI - I have also attached the latest draft of our stakeholder engagement letter.

If you or your members have any further questions or concerns, please do hesitate to email via stakeholder_engagement@altitudeangel.com

Kind Regards,

David Walters
Project Arrow Lead

7.7 Letter from Geoff Emmons

Received From	Geoff Emmons
Date Received	08 July 2021
Date Responded	12 July 2021
Notes	

Hi David

Many thanks for your email which I have read with interest, I have also looked at your submission to the CAA

I own operate and fly from Whittles airstrip. We have 4 aircraft based at Whittles, A Eurostar (mine), a Remos GX, a Foxbat and an RV6, and of course we do have occasional visitors.

To be honest I doubt we will be much affected by your proposal, but I do find it of interest. A couple of questions if I may :-

Will it be possible to make radio contact when you are active ?

Would your system see my mode S transponder ?

Is your ultimate goal to have drone activities operating in unsegregated airspace, but confined in specific corridors ?

In your submission you mention optical sensors, can you filter out birds effectively ?

In conclusion I am really interested in what you are doing and would be keen to keep in touch and learn more.

Regards

Geoff Emmons.

Response from Altitude Angel:

Hi Geoff,

Thank you for the email, I will happily share as much as I can. We very much want to be as transparent as possible. FYI - there is a presentation on the ACP web-portal which give you more information.

I have listed your questions below and responded in red.

Will it be possible to make radio contact when you are active ?

Unfortunately, we are not authorised to operate air-band radios, but we will provide a contact telephone number which will be available to query operations. We also are looking

to setup a crossing service. We may also be able to offer you access to a web portal where if you were to submit your flights into, we would see in real time

Would your system see my mode S transponder ?

Yes we have a locally deployed [redacted]. I have previously worked with the receivers and hyperlocal coverage is essential for us to see the real time local traffic. We'll be able to detect 978 and 1090 broadcasts. We will also be deploying Flarm receivers later in the year.

Is your ultimate goal to have drone activities operating in unsegregated airspace, but confined in specific corridors ?

Our goal is to reduce the requirement of segregated airspace and enable a more integrated sky. We also hope to be able to provide services to our GA Partners of drone activity etc in real time in the near future. Customers who end up deploying our solution have various use cases, such as a drone-in-a-box solution which monitoring the rail network, or a medical delivery service, and on-demand SAR resource which requires a pop up BVLOS capability. The DAA can be deployed to support corridor constructs or ad-hoc deployment.

In your submission you mention optical sensors, can you filter out birds effectively ?

Great question, I was actually experimenting with the visual sensors during lockdown and this was one of my goals. The flight characteristics of a bird are different to the likes of manned aircraft, but get a red tail kite soaring at 1000ft could be mistaken for a plane or helicopter with the human eye. The visual sensors we are deploying give us a 360-degree field of view in high resolution. We also have a high-powered visual sensor that can cover great distances. Utilising these visual sensors, along with our sensors enables us to capture a very rich picture of the sky.

In conclusion I am really interested in what you are doing and would be keen to keep in touch and learn more.

Absolutely and we would welcome any further comments. Your airstrip is local to us and we would not wish to impede you or your visitors flying so I am sure we can work up a CONOPS that enables continued flights. In fact, your activity could be really useful for testing out systems.

Kind Regards,

David Walters
Project Arrow Lead

7.8 Paul Wheal

Received From	Paul Wheal
Date Received	18 July 2021
Date Responded	19 July 2021
Notes	

Hi,

As a GA pilot who regularly transits the area of the proposed TDA I object on safety grounds.

The M4 is a line feature used for VFR navigation through very congested airspace with numerous pinch points.

The proposed TDA will just add another pinch point and another hole in the cheese!

Regards P. D. Wheal.

Response from Altitude Angel:

Dear Mr Wheal,

I hope this email finds you well.

Many thanks for your response to our ACP application. We will include your email and this response in our submission to the CAA.

In response to your email, we are expecting the height of the TDA to be set at 800ft with drone operations restricted to no higher than 400ft. As such we envision this not impacting GA traffic in the area which would be maintaining an altitude of around 1000ft (due to the airmanship considerations of operating close to the motorway and pylons also in the vicinity reducing options in the event of an engine failure)

As such I would expect our activity to be well below your flight activity and we will be monitoring the corridor to deconflict from your (or any other) flight if needed, for example, should the weather force you to descend.

If you have any other comments or queries, please do contact me at via stakeholder_engagement@altitudeangle.com

Kindest regards,

David

David Walters
Project Arrow Lead

7.9 Jonathan Smith

Received From	Jonathan Smith
Date Received	22 July 2021 Email 1 28 July 2021 Email 2
Date Responded	27 July 2021 Response 1 29 July 2021 Response 2
Notes	

David

I am struggling to understand what is the status of the volume of airspace you are proposing.

Is it a TDA and if so, are proposing to establish a DAAIS or DACS to support the airspace?

Regards

Jonathan Smith

Response #1 from Altitude Angel

Dear Jonathan,

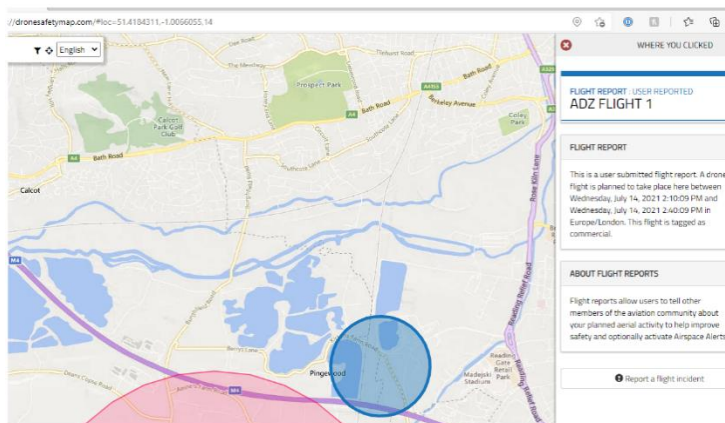
I hope you're well and things at [REDACTED] are progressing nicely.

We are currently undertaking public engagement activity which is due to conclude next week.

If, as we hope, we are granted the airspace change request, we will be implementing a service where other airspace users & stakeholders can call our Arrow Regional Control centre to check the status of operations.

dronesafetymap.com, a free and publicly available flight planning tool, will also display our live flight schedule (like the screen shot below). So we will be providing complete transparency of our operations.

If you require any further information please let me know.



Kind Regards,

David Walters
Project Arrow Lead

Follow-up Email received from respondent:

David

I have not worked for [REDACTED] for some time and this enquiry is as a GA pilot who regularly operates in the vicinity of the proposed airspace.

I remain slightly unclear as to what the status is of the airspace you are proposing. Can you confirm whether you are proposing to establish a Temporary Danger Area serviced by the activation information services you describe below or are you suggesting that this airspace will be simply Class G airspace accomodating full integration from the start of operations and simply subject to a Temporary Navigation Warning?

Kind Regards

Jonathan Smith
[\[REDACTED\]@me.com](mailto:[REDACTED]@me.com)

Response 2 from Altitude Angel:

Hi Jonathan

I wasn't aware. Congratulations on the move back to [REDACTED].

Our intent is to offer a Temporary Danger Area serviced by the activation information service. We want to accommodate GA as much as possible and also be transparent with our operations. So our flight schedule will posted on the dronesafetymap.com website so GA can see in advance of upcoming activities. We will also have a telephone service available also. This helps us to serve real time responses for TVAA, TVNPAS, MOD etc .

Due to the nature of the trials and the technology we're testing these have to be completed inside a TDA.

I look forward to hearing from you.

Kind Regards,

David Walters

7.10 Sqd. Ldr. Kate Read [MOD]

Received From	Sqd Ldr Kate Read
Date Received	23 July 2021
Date Responded	27 July 2021
Notes	

David,

Thank you for engaging with the MoD regarding ACP-2021-032. We fully support the aspiration to safely integrate unmanned platforms and negate the need for operating within segregated airspace. I have engaged across Defence stakeholders and have no objection to the location and dimensions of the proposed TDA but do have some questions about management of activity and interactions with other airspace users:

- Who has access to Guardian UTM? Is this something military aircraft could use and what cost would be associated?
- Is DAA testing only between participating aircraft?
- What provision is there for non-participating aircraft to cross through the TDA? Is there a DACS or DAAIS planned? TVAA/NPAS operate from RAF Benson and may need to coordinate transit through. In that situation, would the drone land?
- In the event of a drone link failure, how would other airspace users be alerted? Would the pilot communicate with Benson Approach or use Guard?
- Is the drone equipped with ADS-B/Mode C? If so, it would enable RAF Benson's Tutors to see the system on its Traffic Avoidance System.
- Given that Tutors may carry out aerobatic manoeuvres in the vicinity (remaining above the TDA), would the drone be able to avoid less predictable flight profiles if it did experience an excursion and conflict situation?
- Will all BVLOS activity be conducted within the TDA during this trial? Is there the expectation that this DAA trial will result in approval of the systems and immediately permit unsegregated operations?

I look forward to hearing feedback. If you have any questions for me, please do get in touch.

Kind regards,

Kate

K Read | Sqn Ldr | S02 Airspace Strategy | Defence Airspace and Air Traffic Management |

Response from Altitude Angel

Dear Kate,

Thank you for your email and supportive comments. It really is an exciting project which we hope will lead to the integrated sky we all want and need.

If it's OK I will respond to your email with two responses because of commercial sensitivity.

Who has access to Guardian UTM? Is this something military aircraft could use and what cost would be associated?

GuardianUTM is available in various forms. For example:

<https://dronesafetymap.com/> is powered by our GuardianUTM platform. This displays all of the submitted drone flights. We process thousands of flight reports each month.

Is DAA testing only between participating aircraft?

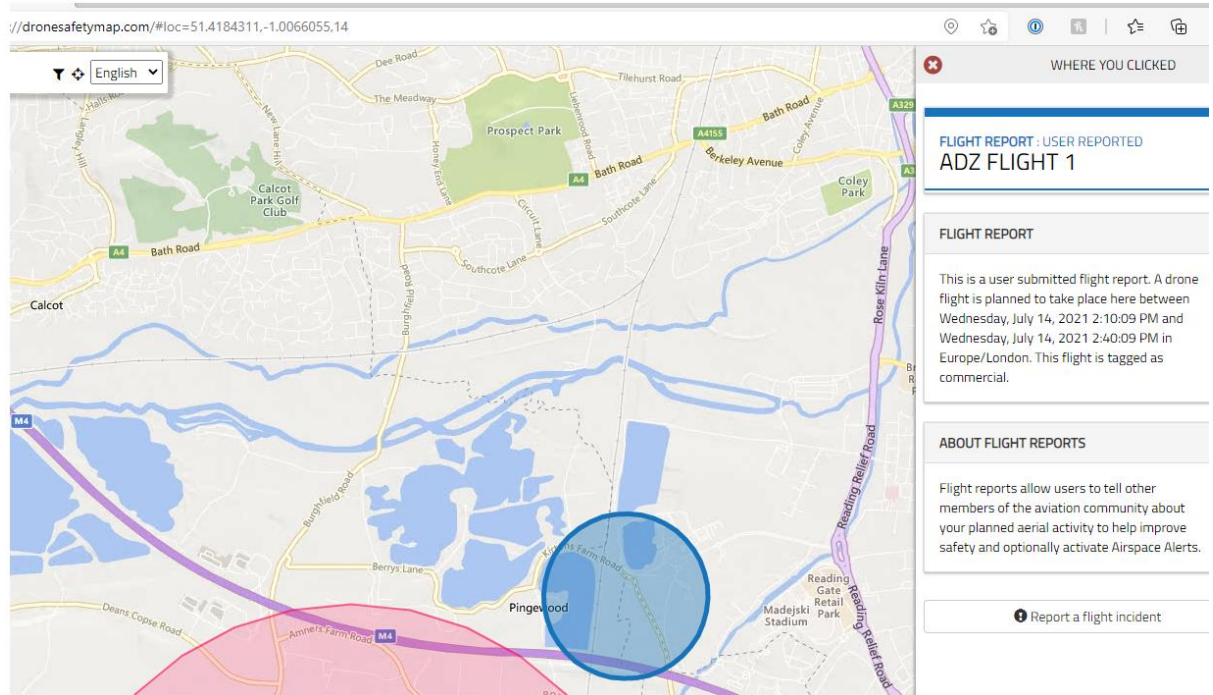
The only participating aircraft are our drone partners which, as of today totals four, who will be supporting our testing. To prove the viability of this DAA we need to keep it as real and unpredictable as possible whilst maintaining safety. As an example, last week we were testing our visual sensors and tracked the TVAA from Babcock coming in on the ADSB receivers and then picked it up with our visual sensors. It's these scenarios which are 'ad-hoc' which enable us to test all aspects of the system, especially those who are not EC equipped.

What provision is there for non-participating aircraft to cross through the TDA? Is there a DACS or DAAIS planned? TVAA/NPAS operate from RAF Benson and may need to coordinate transit through. In that situation, would the drone land?

We spoke last week with Babcock who operate the NPAS and TVAA and have an LOA in Draft. We have setup a direct line to our Live Operations Command Room so non-participating aircraft can get a real time updated of planned operations. Also, as mentioned above, <https://dronesafetymap.com/> will show all the scheduled flights happening in the corridor, so pilots can check prior to departure.

We have locally deployed ADSB receivers and soon we will be adding Flarm. For those non-EC aircraft, our visual sensors will be tested and trained to track them [non-EC aircraft], supported by a human-in-the-loop. All of this data is fed into our GuardianUTM platform where it can make an assessment of the trajectories to identify a potential conflict, or not. If a conflict is detected, the drone operator is notified and is either given a new vector to deconflict or is requested to return, to land, or to hold. If the system assessed there is no conflict within the parameters and buffer zones specified, the operation will continue.

We also have emergency landing sites identified in the event of an emergency.



In the event of a drone link failure, how would other airspace users be alerted?
 Would the pilot communicate with Benson Approach or use Guard?

The systems being operated on the corridor have failover systems supported with secondary comms links. All of the drones are geofenced into a tight area along the route which is actually only 1/4 of the TDA area. So if a link is lost there is a secondary fail over. In the event of a total comms failure the drone will be instructed to return and land and be confined to the geofenced area. So there should not be any of the 'fly-aways' as seen a few years ago on the older generation models. In addition, our Operations Command Room will be monitoring live and in real time the drone telemetry links and tracking locations, along with all other traffic. In the event of a catastrophic failure of all systems, which is very unlikely, our CONOPS states we will monitor and track the aircraft whilst notifying nearby effected airports/aerodromes. I hope this provides some reassurance.

Is the drone equipped with ADS-B/Mode C? If so, it would enable RAF Benson's Tutors to see the system on its Traffic Avoidance System.

A number of the systems are equipped, and some are not. This is deliberate for the purposes of the DAA testing. If all of our aircraft were EC equipped it could skew some of the results, especially as we need to test non- EC manned vs non-EC unmanned scenarios.

The dronesafetymap.com link above will be provide the latest up to date schedule of operations. Also, our operations room will be able to confirm if live operations are taking place. Previously on other operations I have been involved with military aircraft / training sorties, I would usually receive a phone call from flight ops notifying of intended flight paths and timings to ensure separation.

Given that Tutors may carry out aerobatic manoeuvres in the vicinity (remaining above the TDA), would the drone be able to avoid less predictable flight profiles if it did experience an excursion and conflict situation?

I had the pleasure of witnessing some of the aerobatics only last Thursday whilst we were deploying the towers. Our sensors will have detected those aircraft and would have been monitoring them when they left Benson, if they were EC equipped. If they were not, the visual sensors will see them coming into the area. In this instance we would more than likely halt operations and give way to the high-risk manoeuvres occurring. I know the limit is 1500ft AGL for civilian aerobatics, but for military I don't believe there is one. If you can advise it would be appreciated.

- Will all BVLOS activity be conducted within the TDA during this trial? Is there the expectation that this DAA trial will result in approval of the systems and immediately permit unsegregated operations?

Whilst the TDA is live, BVLOS operations will be confined to it. Our aim is to provide sufficient evidence to the CAA which will result in the approval of the system and enable the unsegregated operations, not only in Reading but also by anyone who wishes to adopt the technology.

I hope the above answer your questions and please feel free to follow up if needed.

Kind Regards,

David Walters

Project Arrow Lead

7.11 Babcock

Received From	Nigel Thomson (Babcock Onshore)
Date Received	06 July 2021
Date Responded	Various (see thread)
Notes	

Classification:UNCLASSIFIED

Hi David,

Many thanks for contacting us in regards to ACP-2021-032. As you be aware Babcock Onshore is the Aviation provider for both the H10W AA Charity and also the TVAA Charity, operating two EC135 helicopters out of Thruxton and RAF Benson respectively. As you can imagine your proposed activity is of great interest to us as its location is in an area that our aircraft operate regularly, both landing and transiting through.

Therefore, we would like to propose that you create an LOA between ourselves and Altitude Angel so that we can insure that a HEMS aircraft responding to an incident can safely enter/cross and land within the TDA without any delay to our ability to deliver life critical assistance on the ground and, if required, subsequently transport patients to the relevant medical facility or respond to further tasking.

Within the LOA we would normally expect it to be very clear how we would agree to ensure both parties are aware of all UAV activity rather than just rely on information on a NOTAM, especially when faced with dynamic in flight re-tasking. We would also expect to have an ability to contact yourselves to ensure separation if need at short notice. As you will understand this is of particular importance on the recce, landing and take-off phases of our operations.

I hope you agree with my thoughts above and look forward to hearing from you.

Best wishes,

Nige

Nigel Thomson MSc cfs | Chief Pilot
UK Aviation | Aviation
Babcock International Group

Dear Nigel,

Thank you for responding. We absolutely recognise the importance of the services you provide.

It would be great if we could setup a meeting between our organisations to discuss the LOA and also ensure we enable a seamless service to yourselves and maintain separation between our activities.

I look forward to hearing from you.

Kind Regards,

David Walters
Project Arrow Lead

Classification:UNCLASSIFIED

Hi David,

Thanks for getting back to me and agree totally with the need for a meeting. What your availability like next Tuesday afternoon?

BW,

Nige

Hi Nigel, Apologies were deploying our surveillance systems this week for testing, so I have been out in the field.. Quite literally.

Do you have availability for Tuesday the 20th between 1pm-2pm?

If so I can happily setup a teams meeting and we can talk through the points you raised?

Kind Regards,

David Walters
Project Arrow Lead

Classification:UNCLASSIFIED

Hi David,

Great. See you on the 20th

BW,

Nige

Nigel Thomson MSc cfs | Chief Pilot

7.12 Public Article on Flyer

Received From	N/A – Public Article
Date Received	02 July 2021
Date Responded	Various (see thread)
Notes	Comments posted under the article and responded to as shown



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Home » News » M4 TDA to test Detect and Avoid for drones

M4 TDA to test Detect and Avoid for drones

By Dave Calderwood | 6th July 2021 11:56 Europe/London

A new technology that could do away with the need for Temporary Danger Areas (TDA) for drone operations will be tested in September.

A Berkshire based company called **Altitude Angel** has put in for a TDA south of Reading to test ground-based Detect And Avoid (DAA) technology that the company calls **Arrow**.

The TDA is described in Temporary Airspace Change Proposal ACP-2021-032. It is 8km long, 120 metres wide and has a top height of 600ft agl.

"Drones flying within the **Arrow Drone Zone** will be tracked and monitored via Altitude Angel's UTM (unified traffic management) platform, GuardianUTM O/S, which communicates with ground and aerial infrastructure," says the ACP.

"In doing so, it provides automated navigation assistance for drones flying within the Zone, pre-flight authorisations, and automatic separation assurance.


"Nearby manned aviation and other non-participating drones will be mapped in real-time so safe distances are maintained, and appropriate avoidance actions can be taken if they are predicted to be breached.

"If a future conflict is predicted, drones involved will be automatically given appropriate avoidance instructions, such as instructions to change flight path, hold, return or land. A remote pilot will also be alerted, and manual control of the drone can be taken at any time.






"Once the technology has been successfully demonstrated, we believe we can do away with the need for ACPs to be requested where our platform is utilised, therefore allowing both drones and manned aviation to share the same sky, safely."

One of the stakeholders involved in the consultation said, "The low top level of the TDA (c.600ft agl) should not create a significant impediment to fair weather operations.

"However the ACP does not appear to recognise the role of the M4 as a visual navigation feature for VFR traffic, nor cognisance of the SW entry route to White Waltham. There are also no attempts to mitigate the timings of use of the TDA when the UAS is not being used."



Related

-  RotorTech UK 2022, Cotswold Airport
-  Drones to fly across Morecambe Bay
-  FLYER July 2021
-  Drone TDAs 'out of control' with Scottish ACP
-  Drone company to fly routine BVLOS

ACP-2021-032 Consultation

ATC for drones

In other drone news, Air Traffic Control in The Netherlands (LVNL) has conducted a successful trial during which air traffic control instructions were issued to a drone pilot via the Altitude Angel developed GoDrone app.

The test took place in the controlled airspace around Rotterdam - The Hague Airport, and were supervised by the control tower.

Share    

Altitude Angel

drones

Temporary Danger Area

Cont'd

Public comments left on this article (and responses by Altitude Angel):

Comments



Peter Gristwood

says:

6 July 2021 at 16:46

Looking through the proposal it looks a very lightweight document (again) with little detail to help us. I see the sponsor wants to see how their systems work in a live environment, but with little idea of what that means. There is a sort of a mention that manned aircraft might use a crossing service – that will work, I don't think.

Now all we need is to respond to the detailed consultation, they don't want to do.

Reply



David Walters,
Altitude Angel

says:

9 July 2021 at 14:12

Dear Peter,

Many thanks for the above comment.

We have been working with the CAA Innovation Sandbox for over two years as we build and demonstrate our solution which will enable and support an integrated sky.

We have actively run trial programmes with SESAR in live environments and have deployed our platforms with ANSPs in mainland Europe. Furthermore, UK airports have also implemented our integrated solutions.

As a business, we understand there are challenges around EC and its adoption on both sides. Personally, I don't believe EC is the solution which will fix everything and think things can be done differently.

To be clear, the system is being deployed now will be monitoring the traffic in the area for approximately two months while we can gather a baseline of evidence. There will also be a build-up of activity and testing under Visual Line Of Site rules before we proceed to BVLOS in the proposed TDA.

Whilst we cannot provide all of the details of our operation, I would like to reassure you safety is primary concern and no operation or flight will be undertaken if it is not safe to do so.

I appreciate your comments and the time you have taken to post them

If you have any further concerns or comments could I ask you send them to stakeholder_engagement@altitudeangel.com

Kindest regards,

David



Nigel Hitchman

says:

6 July 2021 at 19:01

This would appear to be a test of an autonomous Detect and Avoid system based on visual technology, which is what is really needed for BVLOS drone operations and should be the final solution to remove any need for segregated airspace. That is mentioned in some of the documents but seems to get lost in others. This is a much preferred solution, much better than the other proposals such as the "pay to enter" class L airspace proposal which would mean airspace is only available to airspace users who have purchased some kind of equipment.

Some of the proposal documents suggest requiring a TDA upto 1000ft AGL which would be unacceptable, others suggest 600ft, more acceptable, but this needs to have weather minima, such as if the cloud base is below 1000ft, the TDA reverts to class G.

I really think this should first be being tested in a dedicated UAV area such as Salisbury plane or Aberporth, then once the visual detection system is proven, this sort of trial could take place- unless they have already done that.

Seems a lot better proposal than most of the others and actually has a positive end result.

Reply



David Walters,
Altitude Angel

says:
9 July 2021 at 14:14

Dear Nigel,

Thank you for the comments and we appreciate your support.

For the UK to move forward and break away from the segregated airspace approach, we believe there is a solution which can be deployed utilising our Unified Traffic Management platform.

This platform is what underpins the DAA solution. Also, unlike other DAA solutions for BVLOS, ours works on a one- to-many ratio, where as other solutions work in a silo/1-2-1 basis. We will be able to detect EC and NON-EC equipped aircraft in the area. We'll be conducting two months worth of trials before moving into the TDA environment. We have kept the TDA as tight as possible with the buffer zones, so our solution can be tested to detect beyond those buffers.

FYI - we have run trials with equipment (prior to COVID lockdown) at a small airport to test the detection capabilities which were successfully. Further testing has been done during lockdown, albeit limited due to travel restrictions etc. Other aspects of the solution have also been utilised and demonstrated over the past 18 months including drone delivery services in the UK and mainland Europe.

We hope, under the DfT Future Flight Challenge initiative, we can test and demonstrate this capability in a live environment with real-world use cases. In doing so, we will be showing the world how the UK can lead on what the future airspace management can look like.

You mention the cloud base and weather minima. We have a set of criteria we have to fulfil for operations to take place. The cloud base ceiling @1000ft is a valid point of consideration and it's something we are looking at. You're not the first to raise it and I thank you for doing so.

If you have any further concerns or comments could I ask you drop me an email at stakeholder_engagement@altitudeangel.com

Kindest regards,

David



Cath S says:
7 July 2021 at 13:28

This is pretty congested airspace (I live right here) What happens in an emergency? What if a drone goes AWOL and pops out of it's area? It will end up right slap bang in the middle of some seriously busy sky. What mandatory systems for inspections/standards of Maintainance and even of build are in place? What fail safes? A TDA doesn't solve that - proper oversight does. Not seeing that. I contacted the company to ask this but complete silence was the answer ... if transparency could be offered we could possibly get on with developing a system for sharing the sky safely but cloak and dagger secrecy and refusal to answer safety question on grounds of commercial sensitivity is not acceptable. We have reasonable grounds (like wanting to stay alive) to know about the stuff being put into the airspace we're using.

Reply



David Walters,

Altitude Angel says:
9 July 2021 at 14:10

Dear Cath,

Many thanks for the comment above.

I have checked with the wider team at Altitude Angel and we cannot find any emails or communications being made by yourself to us with regards to your concerns, but I am happy to address those made above. Should you have any other questions or queries then please feel free to email us at stakeholder_engagement@altitudeangel.com

I am the Project Lead and the person who has been working with the regulator for the last two years on the Arrow Drone Zone project.

As a professional, I have over ten years' experience working with the regulator, which has involved writing numerous safety proposals for unmanned operations to ensure proper oversight is being conducted and recorded. Some of which have involved simultaneous manned and unmanned operations.

In addition, Altitude Angel is the only organisation in the world to have safety integrated drones into congested areas and airports. We have a highly experienced team, many of whom have a background or significant experience in manned aviation, included a former RAF ATC.

To address your points; the systems being used are proven and already operate under Operational Authorisations by the UK CAA. The systems have redundant failovers to reduce failures in flight. In line with EASA operating principles, we have contingency and emergency flight volumes configured.

For further information I would recommend you visit the ACP Portal where we have posted a presentation which goes in to greater detail. We are, and will continue to be, as open and as transparent as commercially possible with the GA community.

We have on many, many occasions, spoken of our wish and desire to implement an eco-system which integrates all airspace users safely and securely, and not a segregated solution, which is why we work with the GA community and partners to actively share flight plans and provide services, and hope to expand on this during the testing of our DAA solution.

Kind Regards,

David Walters
Altitude Angel
Project Arrow Lead

8 Appendices: Phase 2 stakeholder engagement.

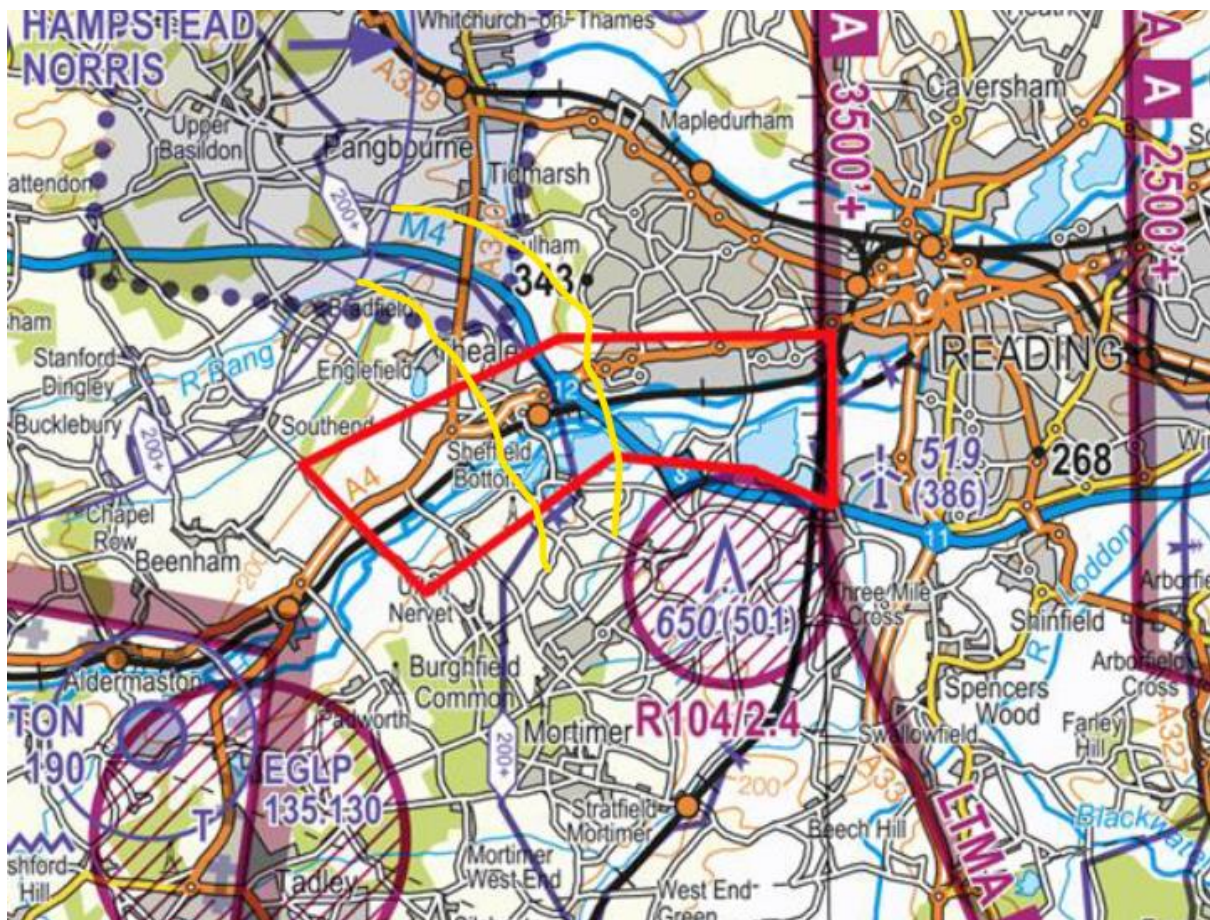
Ref. #	Stakeholder		Overall Sentiment
8.1	John Rigby	National Grid	Supportive
8.2	Marc Bailey	BBGA	Neutral
8.3	Stephen Webb	Brimpton Airfield	Supportive
8.4	Joji Waites	BALPA	Supportive
8.5	Geoffrey Lynch	AOG - NATMAC	Supportive
8.6	Adrian Whitmarsh	BMAA Airspace Group	Supportive
8.7	Rupert Dent	ARPAS UK	Supportive
8.8	Andrew Hoodby	RAF Benson	Supportive
8.9	Steve Thomas	Flyheli	Supportive
8.10	Copy of Altitude Angel's updated Stakeholder Letter		
8.11	AWE Meeting Minutes		
8.12	Brimpton Airport Meeting Minutes		

8.1 John Rigby

Received From	John Rigby
Date Received	07/12/21
Date Responded	08/12/21
Notes	

Hi,
National Grid have a need to inspect its powerline as shown in the diagram below, generally by helicopter SFC-600ft agl, but possibly by EVLOS drone SFC-400ft agl.

Will access/deconfliction be easily provided on request?



John Rigby
Chief Pilot, Helicopter Unit
Electricity Transmission Engineering Services

RESPONSE

Good morning, John,

Thank you for getting in touch.

If our TDA is active whilst you're looking to cross or do an inspection, a telephone number will be posted within the NOTAM. This line is only active when the TDA is. We can discuss timings and hold operations until your clear or complete if needed.

We also have ADSB receivers deployed, along with other sensors that support our DAA of Manned Aircraft, so we should see you also.

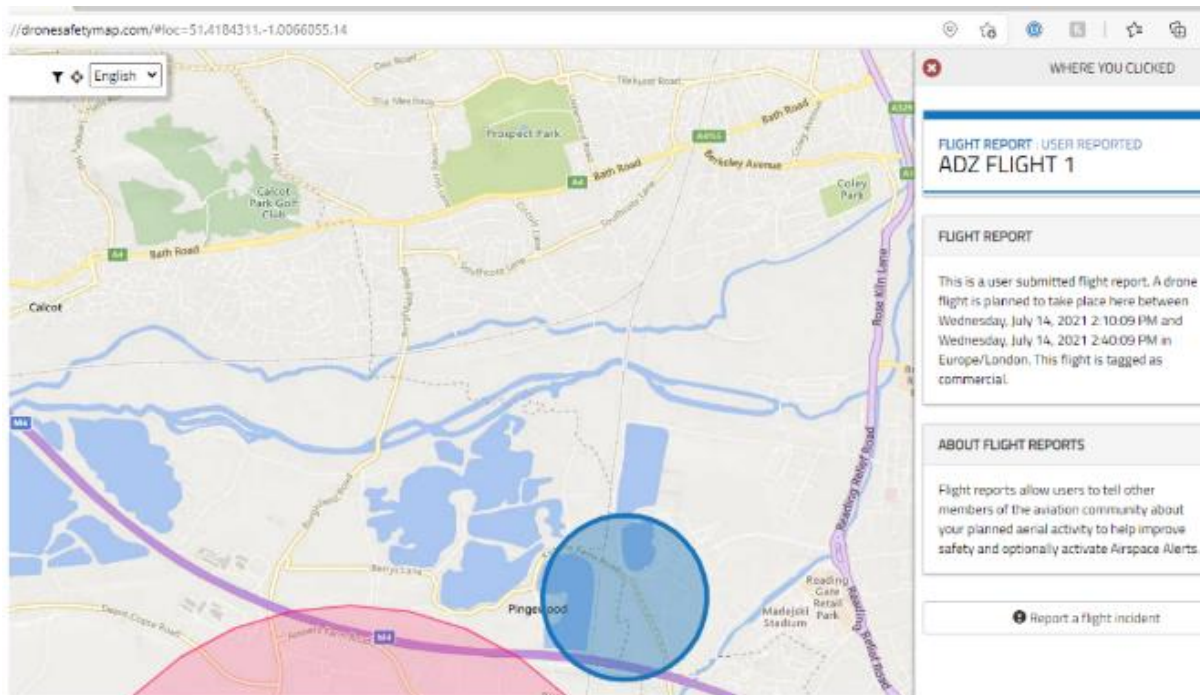
If you are operating either drone or a helicopter, I would highly recommend checking our free-to-view portal too.

All of our planned flights are posted 48hrs in advance. Our TDA is only active during the period of drone activity too.

All our activities can be viewed on www.dronesafetymap.com. We file all our flight plans, which will appear as blue circles.

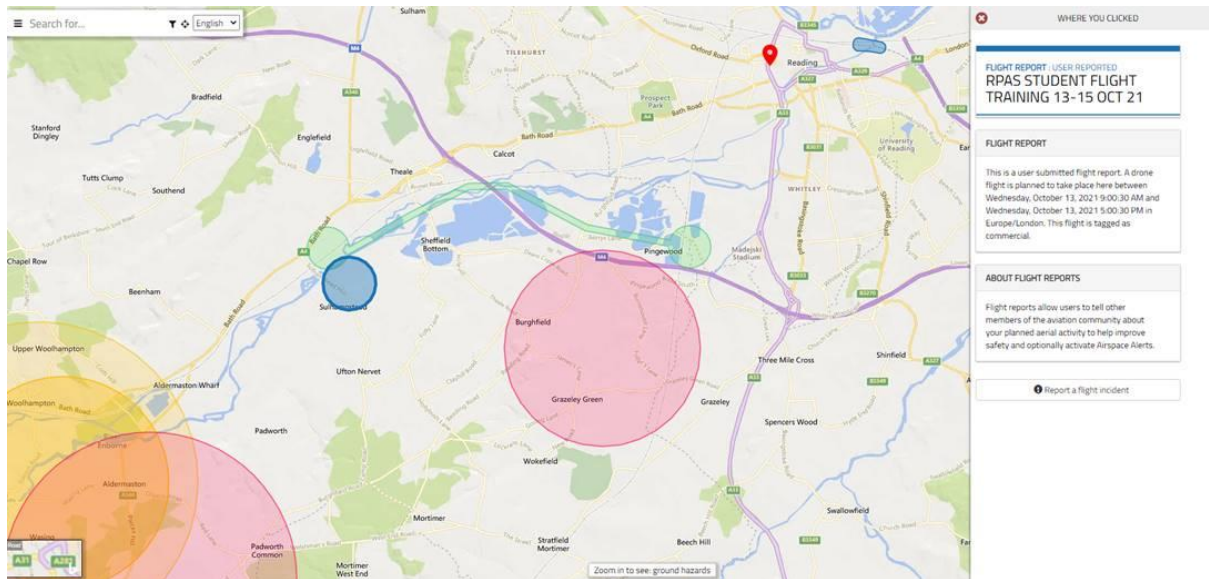
Just a note this map serves the entire UK and other Drone Operators. So if you wanted to carry a Helicopter Inspection, say in Milton Keynes, you could visit that on the map and see if any local drone operations are going on that may cause a conflict. Other Helicopter services have begun doing this and found it a handy tool

I suspect some of your pilots will be familiar with our system already if you operate drones. We have regular contact with Cyberhawk, who undertook operations near here this year doing powerline inspections.



We would ask if your flying drones in the area or your contractors are, that the flight reports are submitted via the Drone Assist or Guardian App. These can be found in the Appstore.

We will then get to see your planned drone flights also. As an example, this Blue Circle here is a training flight nearby at a facility.



If you have any more questions. please let me know.

Kind Regards,

David Walters

RESPONSE

Hi John,

I just wanted to follow up to ensure the below email answered all of your questions / concerns and if I could be of further help?

Kind Regards,

David Walters

Project Arrow Lead

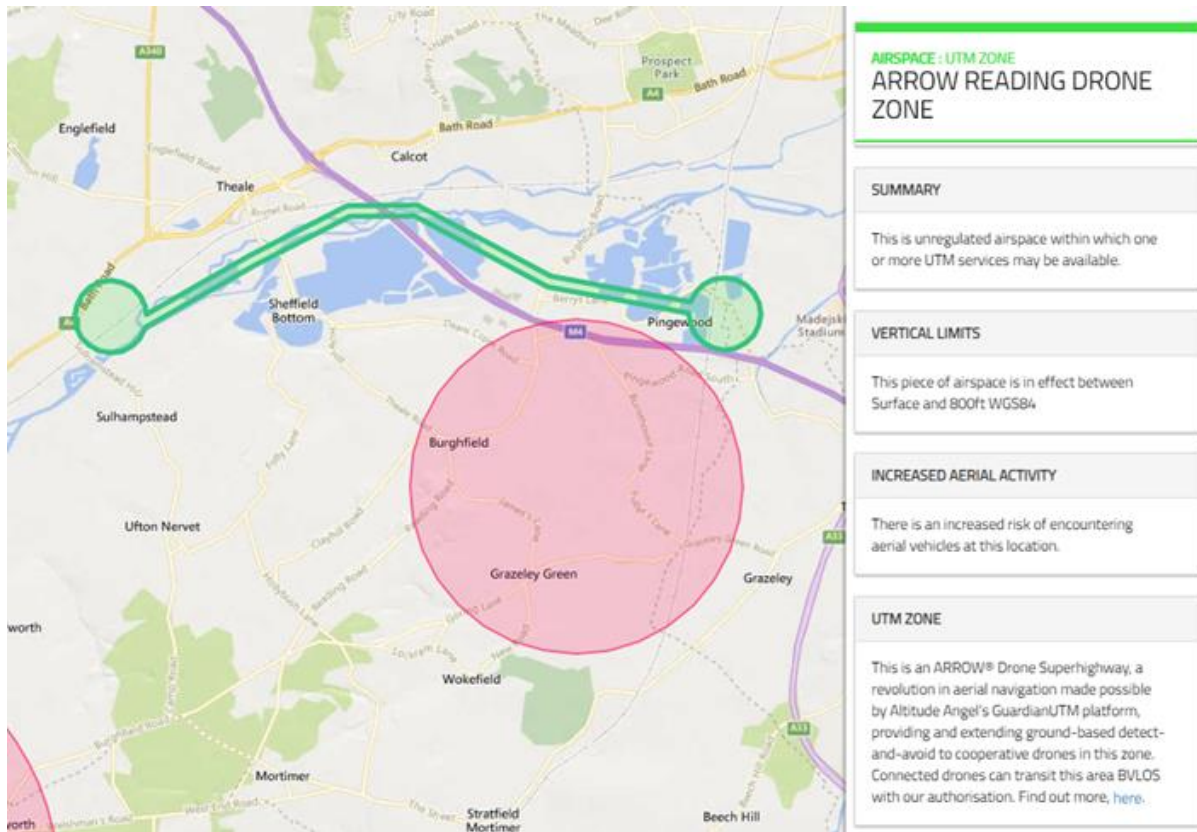
RESPONSE

Hi David,

That all seems manageable from our point of view, I've briefed our helicopter pilots on the availability of www.dronesafety.com, I think it's a very good resource if we had concerns but it's not something we regularly check at present. It would be very useful if it could be integrated into device aviation mapping platforms such as SkyDemon or Airbox's RunwayHD/ACANS.

The screenshot below could be interpreted as encountering drones up to 800ft agl without a TDA being activated. Have I read this right?

Out of interest, what have been the difficulties/costs of establishing this Drone Superhighway?



John

RESPONSE

Hi John,

Thank you for the response.

We are talking with several partners. Hopefully, we will share more on that in 2022.

The corridor on [dronesafetymap.com](#) is to alert other drone operators in the area of the drone activity and increased potential risk via our Apps.

If we are successful with our TDA this shape will appear around the corridor. Until the DAA is approved this will be the only time BVLOS activity on the corridor will be taking place.

Whilst I cannot share figures on development costs, the biggest challenge has been the regulation timeline and resources.

Thank you again for the support. I will keep you updated with the developments if successful.

Best Wishes & Kind Regards,

David Walters

8.2 Marc Bailey

Received From	Marc Bailey
Date Received	07/12/21
Date Responded	08/12/21
Notes	

David good evening,

Do you need anything specifically from the GA 4 Biz industry alliance? We are meeting with DfT tomorrow to discuss strategic issues of importance; do we need to reinforce anything?

Regards,

Marc

RESPONSE

Hi Marc,

Thank you for your email and your support.

I think both of our organisations and partners are aligned on the Vision of an Integrated Future Sky for all airspace stakeholders.

Highlighting the importance of the work both of our organisations are doing and the trials we undertaking to achieve the Vision would be appreciated.

I hope you have a positive meeting with the DFT.

I will continue to keep you updated with the progress

Best Wishes & Kind Regards,

David Walters

RESPONSE

Hi Marc,

How did the meeting go with the DFT?

I hope it went well.

If you have any further questions regarding the TDA please let me know

Best Wishes & Kind Regards,

David Walters

8.3 Stephen, Brimpton Airfield

Received From	Stephen, Brimpton Airfield
Date Received	07/12/21
Date Responded	08/12/21
Notes	

Hi, David

Happy to catch up with you this Friday or next Friday morning regarding this.

Does this work for you?

Thanks

Stephen

RESPONSE

Hi Stephen,

Great to hear from you again. Does Friday at 1 pm work for you?

I can send across a Teams invite if that works for you?

Best Wishes & Kind Regards,

David Walters

RESPONSE

Yep

Regards
Stephen

RESPONSE

Hi Stephen,

Great to speak with you today, along with Chris and Alan.

I have written up some high level minutes. Would you mind checking you are comfortable with what I have written.

Once completed I will upload to the airspace change portal.

Thank you again for your time today, and the support.

Have a lovely weekend.

Kind Regards,

RESPONSE

Hi Stephen,

Happy New Year to you and the team at Brimpton.

I just wanted to follow up and be sure you were happy with the contents of the minutes I sent on the 10th of December.

I am required by the CAA as part of this engagement to ensure all parties agree with the content.

Would you mind reviewing and coming back to me please?

Best Wishes & Kind Regards,

David Walters

8.4 Joji Waites, BALPA

Received From	Joji Waites, BALPA
Date Received	08/12/21
Date Responded	14/12/21
Notes	

Dear David,

Thank you for reaching out and providing this useful update. I wish you and the project team all the very best in this important evidence gathering exercise.

Kind regards,

Joji.

BALPA
Joji Waites

RESPONSE

Hi Joji,

Thank you for the positive feedback. If you require any further information about the TDA or the project, please feel free to reach out to me.

Best Wishes

Kind Regards,

David Walters

8.5 Rupert Dent, ARPAS

Received From	Rupert Dent, ARPAS
Date Received	27/12/21
Date Responded	04/01/22
Notes	

Dear David,

Thank you for your email regarding ACP-2021-032.

ARPAS UK, on behalf of its membership and as a member of NATMAC and the Airspace Strategy Board, fully supports this ACP application and would be pleased to help in any way we can. This sort of project is exactly what is required to develop the safe use of RPAS in a BVLOS environment, without the need for segregation via TDAs.

We very much look forward to being kept in touch with how this initiative progresses. Please do let me know if we can help.

kind regards

Rupert

RESPONSE

Hi Rupert, Graham,

A happy and prosperous New Year to you both.

Thank you for the support.

I will keep you updated with the progress

Kind Regards,

David Walters

8.6 Geoff Lynch

Received From	Geoff Lynch
Date Received	08/12/21
Date Responded	10/12/21
Notes	

Thanks David,

As Airfield Operators Group rep on NATMAC my concerns should relate to consultation with nearby airfields (I'm sure you've done plenty of that).

I continue to be enthusiastic about your work and wish you every success inn enabling safe airspace sharing.

I am surprised though that you haven't managed to arrange for radio contactability. You would only need the services of an Air/Ground operator or two and a frequency (or even Safety Com) to make it work. There are lots of licensed radio operators out there who would be glad to help I'm sure local airfields would be able to help.

Best regards,

Geoff

RESPONSE

Hi Geoff

Thank you as always for the support. Interestingly, I spoke with Brimpton today who were very supportive.

We spoke briefly regarding radio comms. For the test and the trials and to be transparent, the system needs to be sterile almost from any other inputs than from the DAA Sensors that could alert us to "traffic".

They also offered potentially some organised traffic for us when we are underway if needed to allow us to undertake visual testing of the system too.

I will keep you updated, and if you happen to be in the Reading area in the new year (restrictions permitting), maybe we could invite you to a look behind the scenes.

Have a great weekend

Kind Regards,

David Walters

8.7 Adrian Whitmarsh, BMAA Airspace team

Received From	Adrian Whitmarsh
Date Received	10/12/21
Date Responded	14/12/21
Notes	

Hi David,

Thanks for your message and keeping us (the BMAA) updated. Comments and questions are:

1. What is your present anticipated time line for this TDA 90-day period? I appreciate that delays have inevitably crept into your original plan.
2. Noted re the DACS. You could enlist the services of a local FISO (Flight Information Service Officer) from a local airfield to provide a Danger Areas Activity Information Service (DAAIS) for when the area is active, so that pilots already in the air can check by radio, if necessary.
3. What height above ground level (AGL) and altitude AMSL are you now proposing for the TDA? I know that you were originally proposing 800ft AMSL or was that AGL and note your proposal not to activate the TDA when cloudbase is at or below 1000ft AGL, which we support?
4. We will try to communicate your opt-in planned activity email address to BMAA members via our monthly magazine. Do you have any videos of your drones operating as we also have a monthly e-zine which we could possibly include that in along with the opt-in info?
5. We understand that the CAA do not yet have a mechanism for enabling RPAS pilots with an RT licence to use RT communications but support every opportunity to encourage the CAA to overcome their problems with this. It would add a significant safety advantage and should not be beyond the CAA's ability to arrange this. I gather it is an internal CAA issue and one that many RPAS operators are having problems with, although not exclusively. We know that one operator has at least 2 drones operating with G-registrations and thus, presumably, able to use radio call-signs. Anything we, as an association, can do to support you in this aspect we would be happy to do.
6. We note and support the other mitigations. Did you get any engagement from the operator of, or any pilots operating from, Brimpton airfield? I note that you listed them on your original engagement.
7. Overall we still support your trial aims to further development of DAA technology to enable drone operations in non-segregated airspace.

Kind regards
Adrian Whitmarsh
BMAA Airspace Group

RESPONSE

Hi Adrian, I have replied below in red.

Firstly thank you again for your continued support. We are waiting to hear on some upcoming projects being announced in the not to distant future. It may provide an opportunity for Altitude Angel and the BMAA to work a lot more closely on some of the

challenges being faced by ALL Airspace Stakeholders.

8. What is your present anticipated time line for this TDA 90-day period? I appreciate that delays have inevitably crept into your original plan.

The CAA has advised us that if successful, we could potentially activate the TDA from March the 10th, 2022. During the 90 Days, we would only activate as per our original plans when needed and share flight information 48hrs in advance via our website www.dronesafetymap.com

9. Noted re the DACS. You could enlist the services of a local FISO (Flight Information Service Officer) from a local airfield to provide a Danger Areas Activity Information Service (DAAIS) for when the area is active, so that pilots already in the air can check by radio, if necessary.

This is something I have been thinking about. My primary concern with this is it would require a huge rewrite of our CONOPS on our Safety case regarding communication messaging and, not to mention working through the legal regarding “responsibility and liability”. It is taken the CAA 12 months so far to work through our Safety case to get it to this point. I fear it could be another 6-12 months added at the current pace without the legal issues separately. I will consider if we are required to follow this route moving forward on another project.

10. What height above ground level (AGL) and altitude AMSL are you now proposing for the TDA? I know that you were originally proposing 800ft AMSL or was that AGL and note your proposal not to activate the TDA when cloudbase is at or below 1000ft AGL, which we support?

The altitude was looking at for the TDA is 800FT AMSL / 640FT AGL approximately. The corridor deviates in the terrain by about 8m across the entire 8km corridor. We will not activate the TDA when the cloud base is at or below 1000ft AGL; this is correct. Based on previous feedback, this makes absolute sense, so I have taken this on board.

11. We will try to communicate your opt-in planned activity email address to BMAA members via our monthly magazine. Do you have any videos of your drones operating as we also have a monthly e-zine which we could possibly include that in along with the opt-in info?

That would be really useful, and I appreciate the support. I will speak with the team internally and get a communications package for you with photos and some video. Our opt-in email address will be shared if the TDA becomes successful

12. We understand that the CAA do not yet have a mechanism for enabling RPAS pilots with an RT licence to use RT communications but support every opportunity to encourage the CAA to overcome their problems with this. It would add a significant safety advantage and should not be beyond the CAA's ability to arrange this. I gather it is an internal CAA issue and one that many RPAS operators are having problems with, although not exclusively. We know that one operator has at least 2 drones operating with G-

registrations and thus, presumably, able to use radio call-signs. Anything we, as an association, can do to support you in this aspect we would be happy to do.

This is a really valid point and maybe something we could look into as a separate project between our organisations. I will drop you a different email to discuss.

13. We note and support the other mitigations. Did you get any engagement from the operator of, or any pilots operating from, Brimpton airfield? I note that you listed them on your original engagement.

We did; I met with the Brimpton team last week, who was very supportive of what we were trying to achieve and offered, where possible, to potentially support some of our detection testings. The support overall from the GA community has been fantastic, to be honest. It's now down to hopefully working through the red tape. At some point. If airspace integration testing doesn't progress at pace, it will come to a head. I think we all agree that EC equipage on ALL aircraft, manned and unmanned, is not the answer. EC only solves a tiny portion of the problem and potentially create more elsewhere.

14. Overall we still support your trial aims to further development of DAA technology to enable drone operations in non-segregated airspace.

Thank you for responding, I look forward to speaking with you again soon.

Kind Regards,

David Walters

RESPONSE

Hi David,

Having got the Christmas and New Year holidays out of the way I'm revisiting our tasks of monitoring and responding to various ACPs so thought I'd drop you a line since your current engagement period is up tomorrow, 07 January. [I've added a few comments below yours in blue.](#)

Overall, as before we at the BMAA support your trials and need for a TDA in the hope that it progresses towards less segregated airspace for safe UAS operations.

Best regards
Adrian Whitmarsh
BMAA Airspace team
Bmaa.airspace@gmail.org

Firstly thank you again for your continued support. We are waiting to hear on some upcoming projects being announced in the not to distant future. It may provide an opportunity for Altitude Angel and the BMAA to work a lot more closely on some of the challenges being faced by ALL Airspace Stakeholders.

Do let me know if there is anything we can work on together.

What is your present anticipated time line for this TDA 90-day period? I appreciate that delays have inevitably crept into your original plan.

The CAA has advised us that if successful, we could potentially activate the TDA from March the 10th, 2022. During the 90 Days, we would only activate as per our original plans when needed and share flight information 48hrs in advance via our website www.dronesafetymap.com

Please keep us posted on timing. I'd then like to publicise your website for operational information in our March Microlight Flying magazine.

Noted re the DACS. You could enlist the services of a local FISO (Flight Information Service Officer) from a local airfield to provide a Danger Areas Activity Information Service (DAAIS) for when the area is active, so that pilots already in the air can check by radio, if necessary.

This is something I have been thinking about. My primary concern with this is it would require a huge rewrite of our CONOPS on our Safety case regarding communication messaging and, not to mention working through the legal regarding "responsibility and liability". It is taken the CAA 12 months so far to work through our Safety case to get it to this point. I fear it could be another 6-12 months added at the current pace without the legal issues separately. I will consider if we are required to follow this route moving forward on another project.

Have you considered using London Information on channel 124.750 for a Danger Area Activity Information Service (DAAIS)? Other sponsors of similar-use TDAs are doing so. I can't see that there should be any legal issues and, if that were the case, its concerning that such should create delays within the ACP process. Its something I suggest you speak to the CAA about.

What height above ground level (AGL) and altitude AMSL are you now proposing for the TDA? I know that you were originally proposing 800ft AMSL or was that AGL and note your proposal not to activate the TDA when cloudbase is at or below 1000ft AGL, which we support?

The altitude was looking at for the TDA is 800FT AMSL / 640FT AGL approximately. The corridor deviates in the terrain by about 8m across the entire 8km corridor. We will not activate the TDA when the cloud base is at or below 1000ft AGL; this is correct. Based on previous feedback, this makes absolute sense, so I have taken this on board.

We will try to communicate your opt-in planned activity email address to BMAA members via our monthly magazine. Do you have any videos of your drones operating as we also have a monthly e-zine which we could possibly include that in along with the opt-in info?

That would be really useful, and I appreciate the support. I will speak with the team internally and get a communications package for you with photos and some video. Our opt-in email address will be shared if the TDA becomes successful

Please do let us have any further information on this ASAP. Our March publication deadline should be 01 February.

We understand that the CAA do not yet have a mechanism for enabling RPAS pilots with an RT licence to use RT communications but support every opportunity to encourage the CAA to overcome their problems with this. It would add a significant safety advantage and should not be beyond the CAA's ability to arrange this. I gather it is an internal CAA issue and one that many RPAS operators are having problems with, although not exclusively. We know that one operator has at least 2 drones operating with G- registrations and thus, presumably, able to use radio call-signs. Anything we, as an association, can do to support you in this aspect we would be happy to do.

This is a really valid point and maybe something we could look into as a separate project between our organisations. I will drop you a different email to discuss.

By all means do so.

We note and support the other mitigations. Did you get any engagement from the operator of, or any pilots operating from, Brimpton airfield? I note that you listed them on your original engagement.

We did; I met with the Brimpton team last week, who was very supportive of what we were trying to achieve and offered, where possible, to potentially support some of our detection testings. The support overall from the GA community has been fantastic, to be honest. It's now down to hopefully working through the red tape. At some point. If airspace integration testing doesn't progress at pace, it will come to a head. I think we all agree that EC equipage on ALL aircraft, manned and unmanned, is not the answer. EC only solves a tiny portion of the problem and potentially create more elsewhere.

The big issue the CAA have to grasp is what frequency to use for EC devices in future. Current ADSB on 1090MHz will not work due to oversaturation. It really needs an international standard so that all of us can operate internationally with the same kit. There's a very good article on this on PilotAware's blog page on their website; <https://www.pilotaware.com/post/pilotaware-and-adsb-out>

Overall we still support your trial aims to further development of DAA technology to enable drone operations in non-segregated airspace.

RESPONSE

Hi Adrian,

Thank you for the points below. I will speak with the Airspace Team on the London Information channel for Danger Area Activity.

I will update you if we are successful.

Best Wishes

Kind Regards,

David Walters

8.8 Flight Lieutenant Andrew Hodby, RAF Benson

Received From	Flight Lieutenant Andrew Hodby
Date Received	07/01/22
Date Responded	10/01/22
Notes	

Project Arrow,

RAF Benson judge that the lateral and vertical limits and notification mitigations for the TDA are sufficient as to not significantly impede our operations. We have no further comment at this time.

Thank you.

Regards

Andy

Flight Lieutenant Andrew Hodby

RESPONSE

Andy,

Thank you kindly for your response. If at any point you have any questions, please reach out.

My details are below.

I will keep you updated on the progress

Kind Regards,

David Walters

8.9 Steve Thomas, Helicentre Aviation

Received From	Steve Thomas
Date Received	10/01/22
Date Responded	10/01/22
Notes	

Good afternoon, David,

Many Thanks for the information regarding the proposed TDA, sorry it has taken so long to reply. Helicentre Aviation do not operate in this area, the closest our pipeline survey flights would be is within the Benson MATZ. Therefore I see no issue with the proposal.

Good luck!!

Many Thanks

Steve Thomas
steve.thomas@flyheli.co.uk
Chief Pilot
Helicentre Aviation

RESPONSE

Hi Steve,

Many thanks for your response.

Best Wishes & Kind Regards,

David Walters

8.10 AWE Team

Received From	Dave Griffiths - AWE
Date Received	06 October 2021
Date Responded	06 October 2021
Notes	Engagement Post Phase 1 Review

Hi David

Thanks for your email. I'm very interested to understand how this proposal may impact our Restricted Airspace, for my part in the AWE organisation I manage the control of flights within or close to the restricted area.

We also operate UAV's within AWE Restricted area and I'm sure our Pilots would be keen to learn more about your proposals, new technologies etc.

Could we arrange a formal get together to explore your proposals.

Regards Dave

Response from Altitude Angel:

Hi Dave,

Great to hear from you.

That's interesting to know you also operate drones within your TDA. We have a variety of sensors deployed that will probably pick them up 😊

It might be short notice, but I have availability Friday if you would like to join a team call?

In the meantime, there are a few presentations etc., on the AIP Portal, which explains at a high level what we aim to achieve.

<https://airspacechange.caa.co.uk/PublicProposalArea?plD=365>

I look forward to hearing from you

Kind Regards,

David Walters

Project Arrow Lead

Hi David

I hope your well. Just following up on the below.

How does this Friday work for you? I can do either 1pm or 3pm

Kind Regards,

David Walters
Project Arrow Lead

Good Afternoon,
Unfortunately it is a non working Friday for us and Richard, Sam and I have other commitments.
Regards Matt

Matt King

Maintenance Delivery Manager UAV

Hi Matt,

Thanks for the reply

Would Thursday this week work better or Monday / Tuesday next week ?

Kind Regards,

David Walters
Project Arrow Lead

Hi David

Thanks for your offer, I'll try and make one of the calls when our Pilots confirm attendance. However, I do have a couple of questions if you don't mind, I've looked at the VFR Chart and noticed your FDA is extremely close to our Restricted Airspace do they intersect at any point?

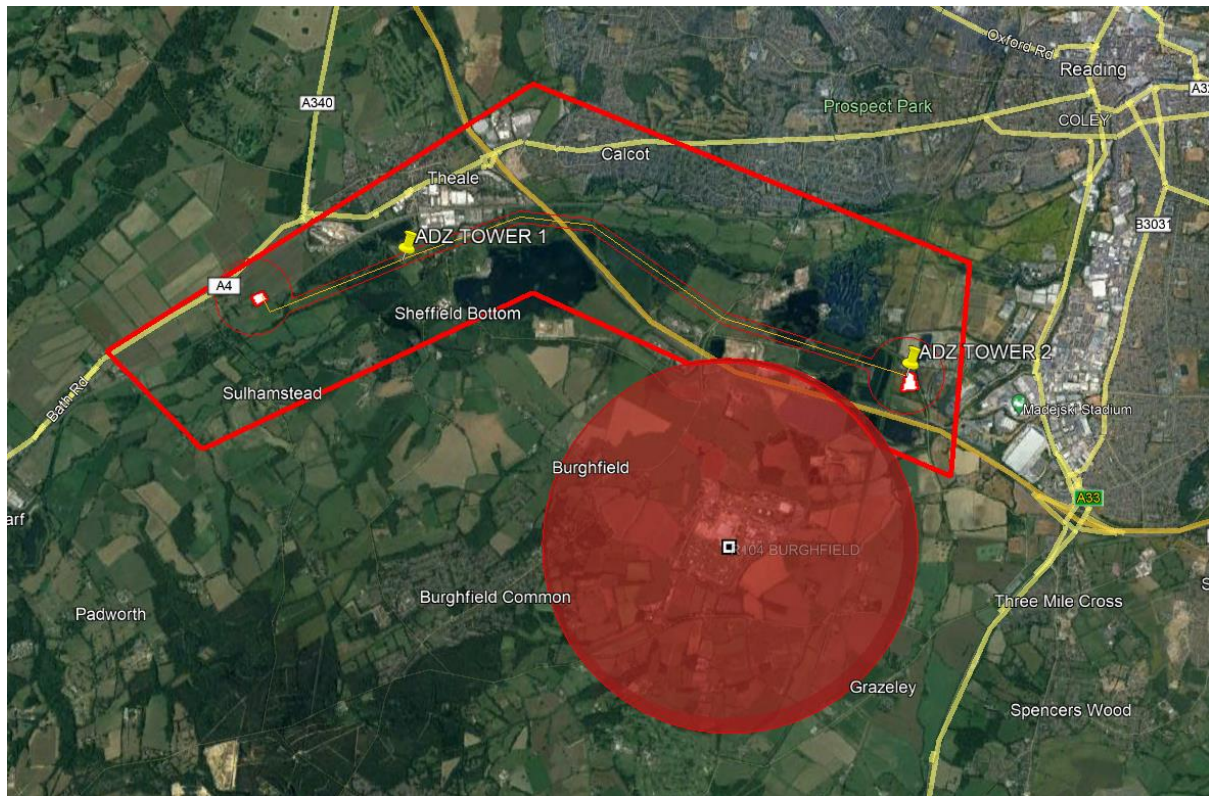
From Security point of view how will we know when you are flying? [REDACTED]

Thanks in anticipation

Regards Dave

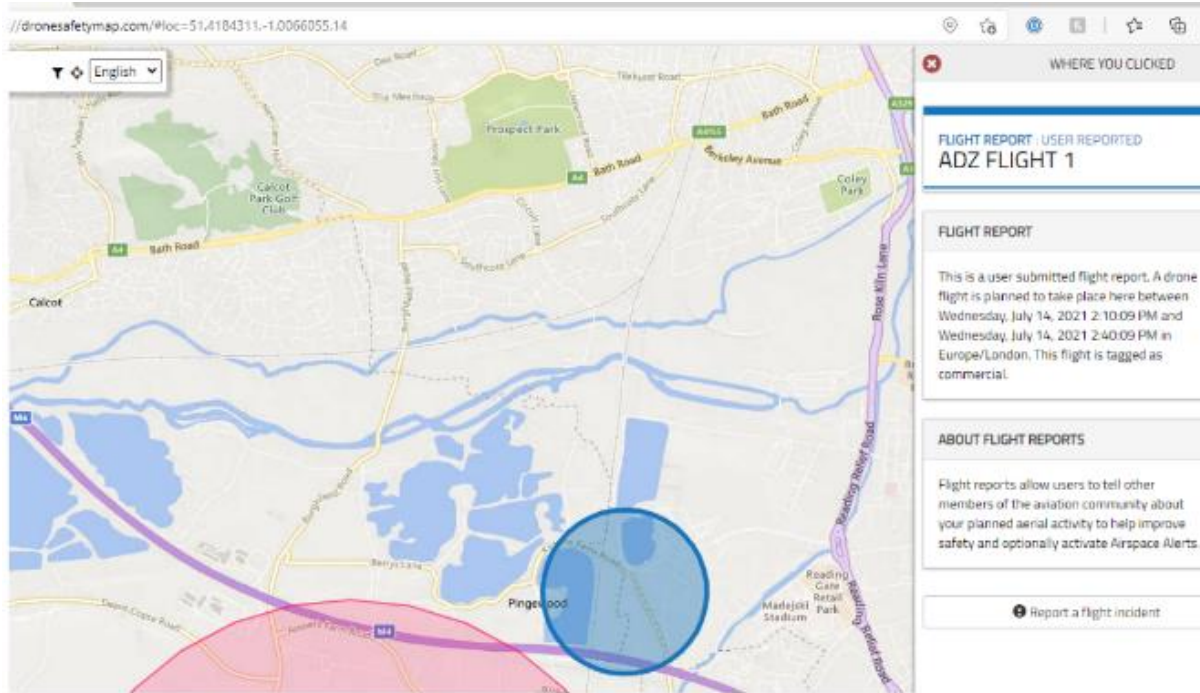
Hi Dave

Our TDA Proposes to follow the outer edge of your Curve on R104. On our first submission there was a slight gap which the CAA asked us to close. The actual route the drones will fly is the orange centre line which is a good 350m away from the R104 TDA. The Red lines which sit either side of that is our emergency buffer zone. Then we have our TDA over the top of that.



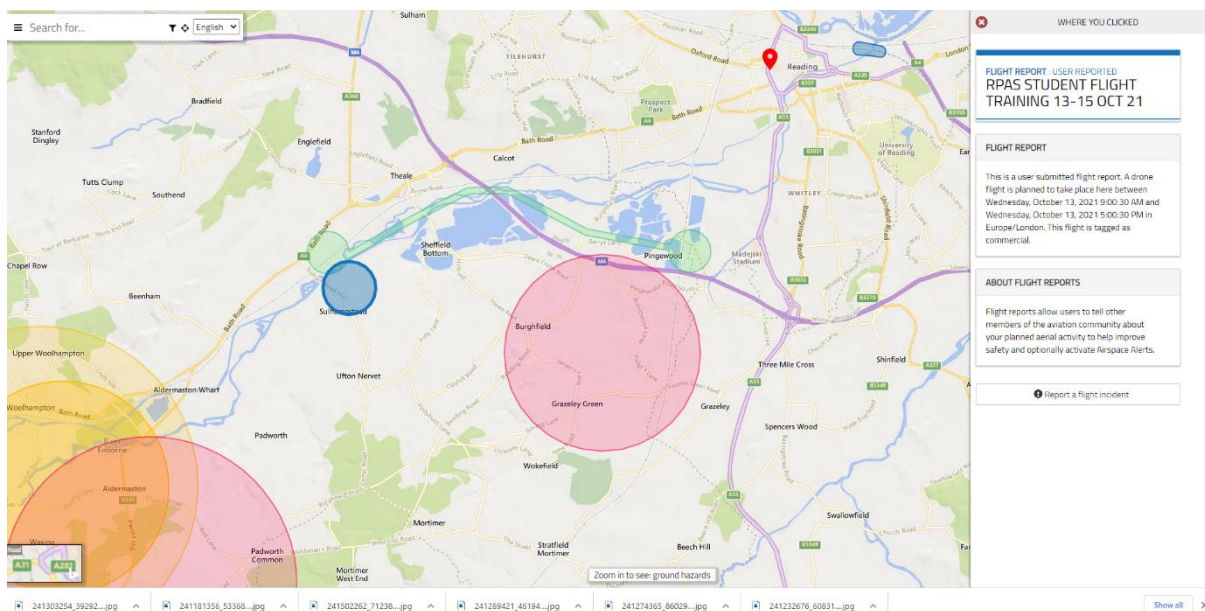
With regards to flight activity, all of our flights are posted 48hrs in advance. Our TDA is only active during the period of drone activity too.

All of our activity can be view on www.dronesafetymap.com . We file all of our flight plans which will appear as blue circles. I suspect some of your pilots will be familiar with our system already.



It might be worth sharing the above portal with your military police internally. As they will be able to see other operators flying in the area also.

As an example this Blue Circle here is Thames Valley Police doing a training flight near by at their facility.



If you have anymore questions please let me know. Hopefully we can discuss in more detail on a call.

Kind Regards,

David Walters
Project Arrow Lead

Hi All,

Tuesday 19th (pm) works best for us. Alternatively, Monday 18th after 10am and before 1pm.

Kind Regards,
Richard

Richard Hare
UAV Services Lead

Hi Richard

Tuesday 3pm? I will send over a Microsoft teams appointment if that's ok?

Kind Regards,

David Walters
Project Arrow Lead

3pm Tuesday good this end David. Look forward to receiving the Teams invite.

Thanks,
Richard

Richard Hare
UAV Services Lead

8.11 Altitude Angel's updated engagement letter to stakeholders



Dear [insert name]

I hope this letter finds you well.

You may recall we contacted you back in July with regards to ACP-2021-032, sometimes referred to as Project Arrow.

We refer to the area described in this ACP (Airspace Change Proposal) as an Arrow Drone Zone. The Arrow Drone Zone will be operated & managed by Altitude Angel and will demonstrate how manned and unmanned aircraft are able to harmoniously share the sky, safely and securely.

As a valued member of the aviation community, I requested your feedback to a temporary ACP we were in the process of submitting to the Civil Aviation Authority (CAA).

Since then, we have received feedback on our proposal from stakeholders and it is to this end I write. I would like to update you on where we are in the process and to draw your attention to a small number of amends we have made to the original proposal.

- Crossing service replaced with live flight portal showing flights
- TDA shape and size adjusted in response to feedback
- No operations will be undertaken when cloud base is at or below 1000ft AGL

Crossing Service Changes

In our original proposal we mentioned the desire to offer a crossing service. As we are not an ANSP we are unable to offer this service. Although the TDA will potentially be in place for 90 days, we will be clearly publishing, at least 48 hours in advance, all flight activity. Flight durations are anticipated between 15 – 60 minutes. The TDA will only be active for the flight duration at the times stated. If there is no flight activity listed on a particular day and time, the TDA will effectively be unused by us on those days. In addition, interested parties will be able to call our hotline number – published by NOTAM and on all our digital maps – to ascertain whether we are planning flying operations on any given day or not.

Stakeholders will have an option to opt-in to our planned flight activity list. This will mean pilots who check a flight briefing in the morning and are informed we plan drone operations, which are later cancelled, will be able to receive an email from us stating so. As we do not hold a radio licence, we are unable to communicate with pilots by radio. To request to be added to the mailing can be done so via stakeholder_engagement@altitudeangel.com

TDA shape and size adjusted in response to feedback

As we have gone through this ACP process, we have received feedback which led us to change some aspects of the TDA parameters. The Cessna Group operate out of the Englefield Estate,

utilising a grass strip on the northwest corner. Due to the proximity of the TDA meant it would interfere with its monthly operations. After discussions with them, we have now reduced the top westerly corner, shown with the blue outline, to the new shape now highlighted with the red outline.

We also updated the shape around R104 Burghfield to ensure it followed more accurately the curve of the airspace shape.

On the east side of the proposed TDA we have utilised existing infrastructure to protect areas, such as our take off and landing area. With the windturbine standing at over 400ft tall, the Madejski Stadium, and other local tall buildings, we felt there was no reason to extend the TDA further into Reading.



Figure 1 Blue Depicts Original Proposed TDA. Red Line Shows Final Proposed TDA Shape with height of SFC-800FT AMSL

No Operations will be undertaken when cloud base is at 1000ft AGL

We received some feedback with regards to the cloud base. It was highlighted by a stakeholder when the cloud base is low, GA traffic reduce altitude, increasing the density of the activity within this area. We will not be operating when the cloud base is at 1000ft AGL or below. We will be utilising web base services, such as windy.com, to monitor this.

To recap, this ACP is different in its approach from others you may have seen. Ultimately, it aims to enable the safe integration of drones, sometimes called Unmanned Aerial Vehicles (UAVs), into unsegregated airspace in an area running parallel to the M4, south of Reading, in the conditions described in the following paragraphs.

The trial is to test ground based Detect And Avoid (DAA) technology we call *Arrow*® and is being tested & evaluated via multiple partners as part of the government's Future Flight programme.

We are working closely with the CAA Airspace Team and following the ACP process. It is the process for temporary changes to the notified airspace design as detailed in Part 1a of CAP1616.

This ACP process can also be reviewed in the [Airspace Change Portal](#). Here, all our documentation, engagement materials and diagrams can be found. Also, any results from the stakeholder engagement will be uploaded here.

Who is Altitude Angel?

Based in Reading, Altitude Angel is an aviation technology company which creates global-scale solutions to enable the safe integration and use of UAVs and autonomous drones into global airspace. Simply put, we build the digital infrastructure necessary to allow drones and manned aircraft to share the same skies together, safely, around the world.

You can find out more about Altitude Angel [here](#).

The Project

We refer to the area described in this ACP as an Arrow Drone Zone. The Arrow Drone Zone will be operated & managed by Altitude Angel and will demonstrate how manned and unmanned aircraft are able to harmoniously share the sky, safely and securely. To clarify, Project Arrow places no special or different equipment requirements on manned aircraft operating in the vicinity.

The proposed Zone has been put forward as part of the CAA's Innovation Sandbox under the moniker 'Project Arrow' and will be situated south of Reading, Berkshire. It will be approximately 8km in length and 120m wide and will serve to extend enhanced DAA capabilities to drones flying within the Zone.

Drones flying within the Arrow Drone Zone will be tracked and monitored via Altitude Angel's UTM (unified traffic management) platform, GuardianUTM O/S, which communicates with ground and aerial infrastructure. In doing so, it provides automated navigation assistance for drones flying within the Zone, pre-flight authorisations, and automatic separation assurance.

Nearby manned aviation and even non-participating drones will be mapped in real-time so safe distances are maintained, and appropriate avoidance actions can be taken if they are predicted to be breached. If a future conflict is predicted, drones involved will be automatically given appropriate avoidance instructions, such as an instruction to change flight path, hold, return or land. A remote pilot will also be alerted, and manual control of the drone can be taken at any time.

Drones flying within the Arrow Drone Zone need no specialist equipment, such as new sensors, to utilise the zone. However, we require all drone operators flying within the Zone cooperatively to be appropriately trained, insured and have the appropriate certifications.

Once the technology has been successfully demonstrated, we believe we can do away with the need for ACPs to be requested where our platform is utilised, therefore allowing both drones and manned aviation to share the same sky safely.

Further details of the intended route and operating times are discussed below or can be found on the CAA Airspace Change Portal.

About ACP-2021-032

The proposed ACP intends to create a corridor between a field (X) and (Y). Ultimately, decisions on the geometry, altitudes and schedule are made based on the feedback from all airspace stakeholders. The earlier we receive this feedback, the easier it is for us to come up with a solution which causes the least impact on everybody's operations.

We do wish to draw attention to the fact it was our strong preference the airspace remain unsegregated, thus allowing manned aircraft to still navigate the area. However, we need to demonstrate and collect evidence to the CAA UAS Team the DAA system is sufficiently effective to enable BVLOS in unsegregated airspace.

CAA policy states BVLOS activity, which has not demonstrated the required DAA capability, be wholly contained in a TDA. The team will initially start with Visual Line of Sight (VLOS) flight trials, moving on to Extended Visual Line of Sight (EVLLOS) flight trials finishing in August. We will then progress to Beyond Visual Line of Sight (BVLOS).

As has previously been stated, we have been working very closely with the CAA and were one of the initial parties to be invited into its 'Innovation Sandbox' programme in 2019-2020. Although no longer in this programme, we were actively encouraged to "...deploy our equipment as fast as possible" to be able to remain within the programme and to be able to start collecting important evidence for the CAA.

One of the questions the CAA asked us to address was 'why could the technology deployed for Project Arrow not be deployed in an existing TDA?' As our necessary equipment to support our activities proposed in this ACP was, particularly in 2020, in a much earlier state of research, we needed to site our equipment somewhere very close to our headquarters in Reading, so our teams could more easily travel to it daily. In addition, when selecting this precise location and route, we also needed to meet several other important constraints in order we may test the efficacy of our equipment in an environment which is as 'authentic' and 'non-artificial' as possible, i.e. one which closely represents the type of environment we hope to be able to deploy within.

This meant we had to find an area where we could (a) physically site our equipment, (b) was ideally not constrained legally by another airspace structure, (c) featured a complex mix of ground infrastructure, including rail and motorway, (d) where both ends of the corridor were surrounded by businesses and potential users/beneficiaries of drone technologies, and (e) where we could reasonably be expected to be able to negotiate safe passage to land which had minimal pedestrian traffic.

Given these constraints, we carefully selected our route and minimised its extent as far as possible to enable us to meet our design objectives, evidence gathering initiatives, all the while minimising as far as possible the impact to other stakeholders.

Our proposal is therefore requesting a narrow corridor over the lakes to the south of the M4 motorway, between junctions 11 and 12.

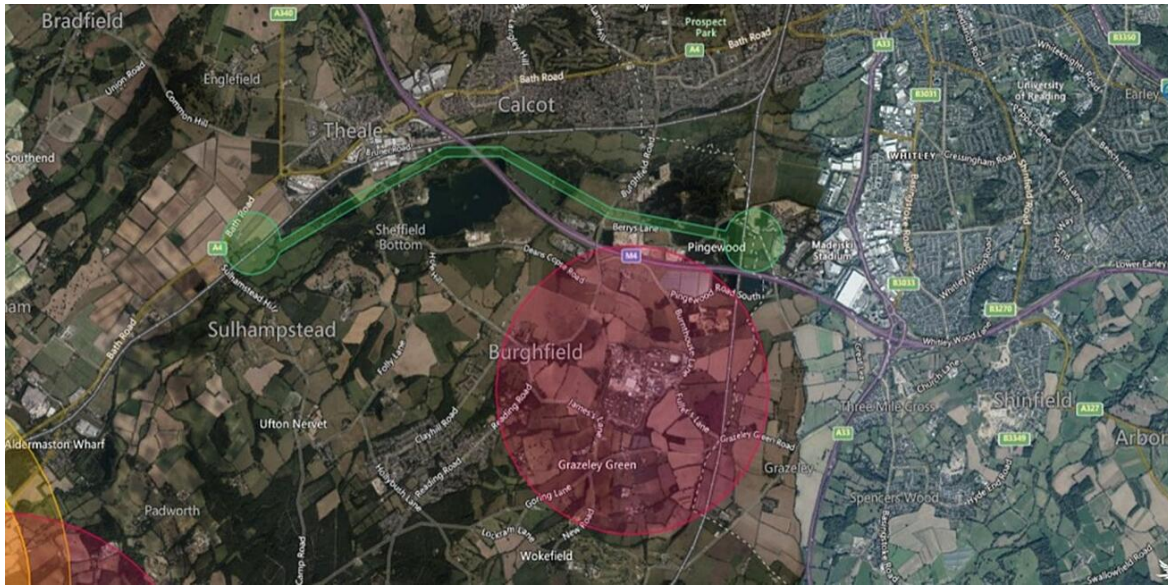


Figure 2 Proposed ADZ Route Shown In Green over the lakes along the M4

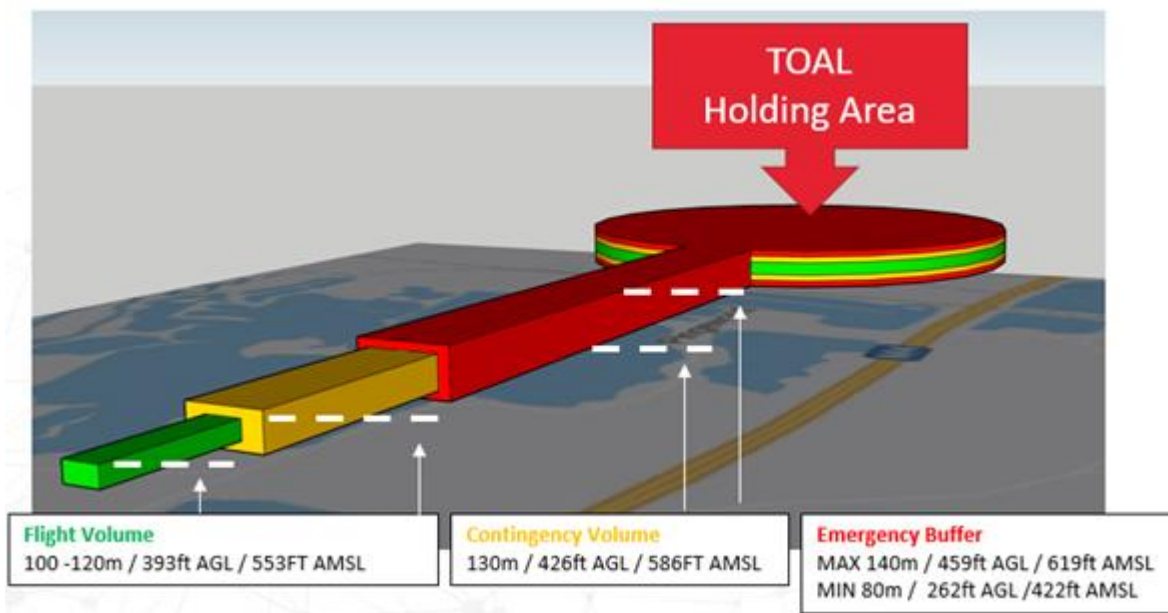


Figure 3 How Our Future ADZ Corridor Will Be Structured

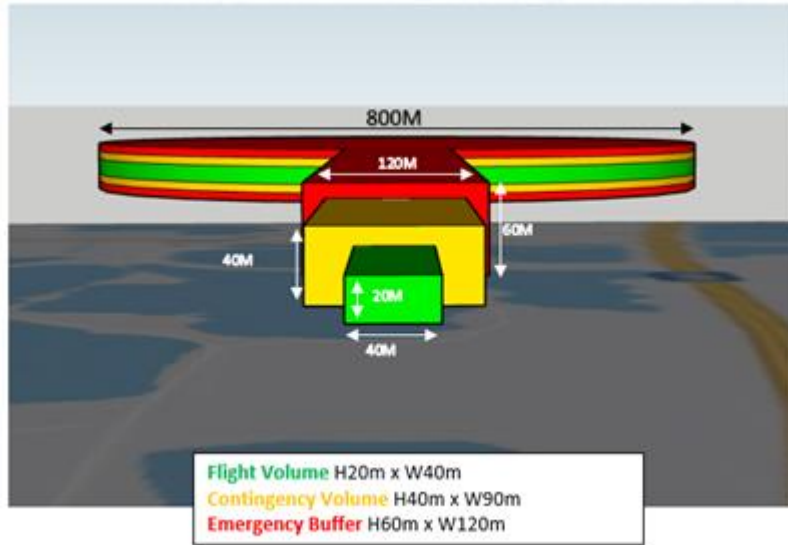


Figure 4 How Our Future ADZ Corridor is Dimensioned

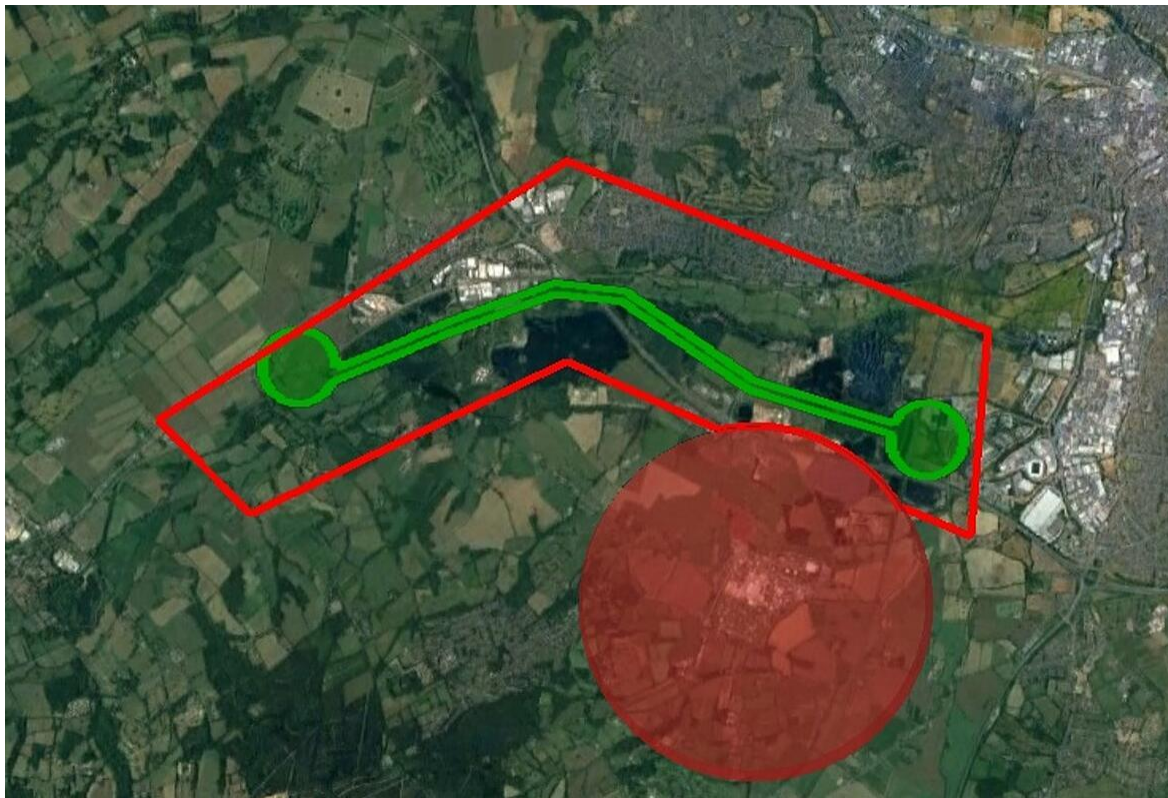


Figure 5 Whilst under testing our ADZ Corridor will sit inside this Dimensioned TDA at *SFC-800ft AMSL*

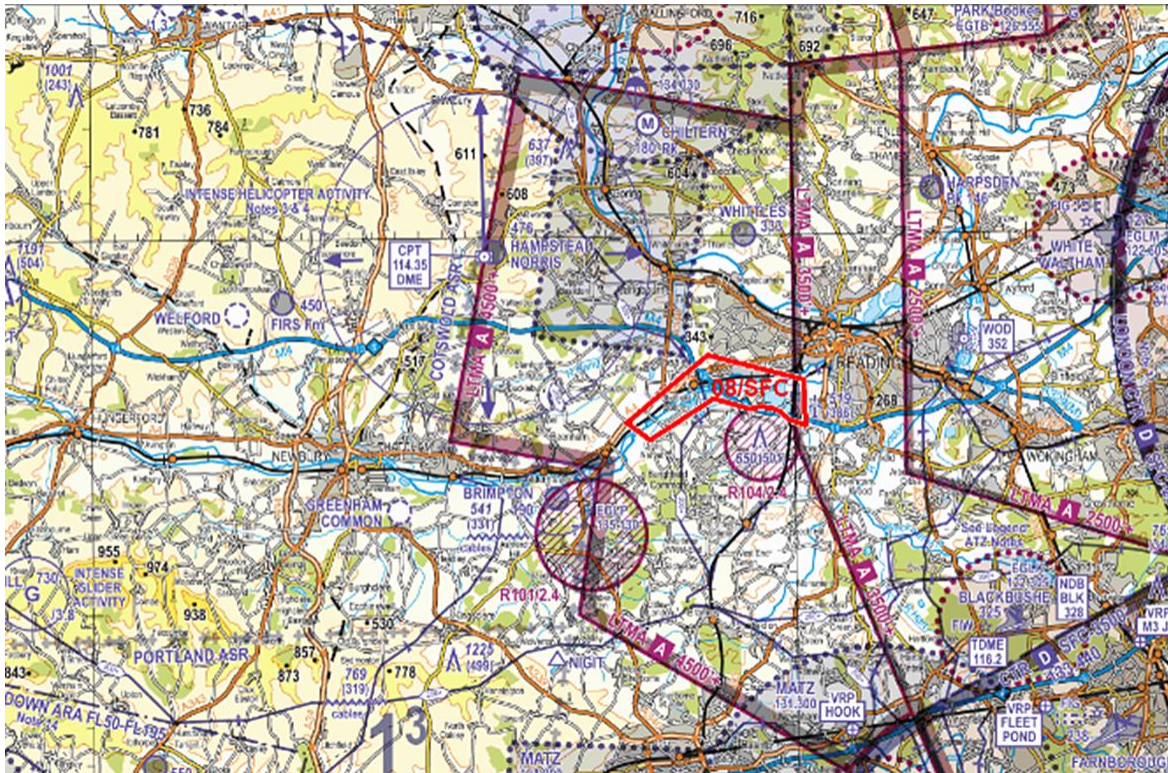


Figure 6 Proposed Final TDA Shape at SFC-800ft AMSL Following Feedback ON CAA 1:250K England South Chart



Figure 7 A Closer look at the Proposed Final TDA Shape at SFC-800ft AMSL Following Feedback ON CAA 1:250K England South Chart

		LAT	LONG		Upper Limit AMSL FT	Lower Limit (ft)
1	North West Point	51.416848°	-1.118742°	51°25'01"N , 001°07'07"W	800	SFC
2	Most North Point	51.446442°	-1.060493°	51°26'47"N , 001°03'38"W	800	SFC
3	North East Point	51.435025°	-0.992504°	51°26'06"N , 000°59'33"W	800	SFC
4	Start of Arc	51.417181°	-1.003014°	51°25'02"N , 001°00'11"W	800	SFC
5	Centre	51.404284°	-1.024849°	51°24'15"N , 001°01'55"W	800	SFC
6	End Of Arc	51.422423°	-1.032000°	51°25'21"N , 001°01'55"W	800	SFC
7	South East Point	51.415080°	-0.991375	51°24'54"N , 000°59'29"W	800	SFC
8	South West Point	51.408918°	-1.102702°	51°24'32"N , 001°06'10"W	800	SFC

Note: The Arc shape butts up next to the R104 Airspace of Burghfield

As you can imagine, if we are successful in this endeavour, this will open more of the sky nationally and hopefully reverse a trend of TDAs being issued for drone operations.

It is anticipated the TDA will be activated via NOTAM with a minimum of 24 hours in advance and will be available for activation between Monday – Friday 9am–6pm. Flights will be submitted to Altitude Angel 48 hours in advance and will be displayed on the free-to-access website www.dronesafetymap.com, This will allow all airspace users to check operations ahead of any planned flights.

The TDA will only be active when drone operations are taking place. Flight durations will be anywhere from 15 to 60 minutes. Prior to operations starting, Altitude Angel's DAA surveillance system will ensure there is low airspace activity before approving flights. This will continue over a period of up to 90 days. We are proposing operations will commence in March 2022.

Complaints whilst temporary change of airspace is in operation
 CAP 1616 (paragraph 303) asks we record, assess, and respond to complaints.

While the temporary change is in operation, the CAA requires the change sponsor:

“...to undertake regular engagement with stakeholders, and to collate, monitor and report to the CAA on the level and contents of complaints associated with any temporary airspace arrangement once it has been implemented and throughout its period of operation.”

Should you wish to make a complaint, please contact us via the details given below.

Why are we contacting you again?

During the planning of this airspace change we have identified several members of the aviation community which may be affected or may have interest in this airspace change, and we believe you

(or the organisation you represent) fall into this group. You have been contacted as part of a targeted stakeholder engagement outreach programme intended to:

- Update you on the project's progression,
- ensure the safety and operational viability of the project,
- keep you informed of any changes to the ACP-2021-032 process,
- make sure that the principles of design and the proposed ACP will not have a harmful on other aviation activities, and
- develop deconfliction procedures with selected agencies to preserve adequate separation between the Unmanned Aircraft and other frequent airspace users.

Additionally, we believe - as we are sure many of you do - the solution to integrating commercial drone aviation into our skies safely is not further segregation, but safe integration. We therefore welcome and encourage any feedback you have on this ACP and our endeavours. We look forward to engaging on any challenges you foresee such that we can resolve them in support of this goal.

How to submit your feedback

Feedback can be submitted either electronically to stakeholder_engagement@altitudeangel.com or by post to:

Project Arrow – Stakeholder Feedback
Altitude Angel,
6th Floor, The Blade,
Abbey Square,
Reading, RG1 3BE

Your feedback is very important to us, so please do respond (even if it is only to say, 'good luck!'). If you have any questions or queries, please do not hesitate to ask them and we will aim to get in touch within three working days. Please submit your feedback by midnight on Friday, 07 January 2022.

We look forward to hearing from you.

Yours sincerely,

David Walters

Project Arrow Lead
Altitude Angel
www.altitudeangel.com

8.12 Brimpton Meeting Minutes

MINUTES OF PROJECT ARROW: CAA AIP TDA DISCUSSION MEETING HELD VIA TEAMS MEETING ON 10/12/21

10/12/2021

Present	Appointment	Representing
David Walters	Head of Strategic Programmes	Altitude Angel Ltd (AA)
Alan Burrill		Brimpton Airfield
Chris Slade		Brimpton Airfield
Stephen Webb		Brimpton Airfield

	ACTION
<p>Item 1 – Introduction</p> <p>The purpose of this meeting is to engage with Brimpton as part of our stakeholder engagement.</p> <p>The attendees introduced themselves and outlined their respective roles.</p> <p>In accordance with CAA rules, AA must demonstrate the safety aspect case for new technologies, especially BVLOS. Currently we can only operate BVLOS inside a TDA.</p> <p>The aim is to test the DAA solutions so TDA's will no longer be required for BVLOS.</p>	
<p>Item 2 – Changes to TDA and Timeline</p> <p>DW advised of the changes made to the TDA to accommodate the Cessna Group activities.</p> <p>DW gave an update on the current timeline regarding the TDA and informed Brimpton of potentially March10th activation</p>	

<p>We discussed also discussed www.dronesafetymap.com and how they and GA could have visibility of all activity.</p> <p>SW Proposed being on the mailing list of scheduled flight activities, and reciprocating of their own mailing list of when the airfield was active.</p> <p>DW Highlighted that the TDA will be activated as and when required, not 24/7 to keep the airspace available for the GAA and other stakeholders. All flights will be posted 48hrs in advance with time of flights detailed.</p>	
<p>Item 3 – Next steps</p> <p>DW To keep Brimpton updated on the status of the application.</p> <p>Brimpton very supportive our AA Trials and where possible are willing to support testing.</p> <p>Brimpton also offered Open Invite down to the Airfield to meet the team</p>	<p>AA/AWE</p>
<p>Item 4 – Any other business</p> <p>No AOB noted.</p> <p>Meeting concluded at 1:59</p>	

ACTIONS ARISING FROM PROJECT ARROW: AIRSPACE CHANGE DISCUSSION ASSESSMENT MEETING

Subject	Name	Action	Deadline
Opening Statement	CAA	Provide Altitude Angel with the opening statement	28/5/21
Attendee list	CAA	Provide Altitude Angel with names and roles of CAA representatives attending this meeting	28/5/21
Minutes	Altitude Angel Ltd	Submit draft minutes to CAA	4/6/21
NATMAC	CAA	Share membership and distribution list with Altitude Angel for Stakeholder Engagement	28/5/21
Operational Safety Case	Altitude Angel	Present latest OSC to CAA. This will be reviewed within 2 weeks	TBC
TDA's post assessment email	CAA	Provide the standard email issued to sponsors of TDA's post assessment meeting detailing expectations of outputs	28/5/21
Documentation	Altitude Angel	Send PDFs of previous SoN presentation and current SoN version to CAA for audit trail	TBC

David Walters
ACP Sponsor

7.12 AWE Meeting Minutes

MINUTES OF PROJECT ARROW: CAA AIP TDA DISCUSSION MEETING HELD VIA TEAMS MEETING ON 19/10/21

01/11/2021

Present Appointment Representing

David Walters	Head of Strategic Programmes	Altitude Angel Ltd (AA)
Matt King	Maintenance and Delivery Manager, UAV	AWE
Richard Hare	UAV Lead	AWE
Samuel Husband	Support Pilot	AWE
Gary Bone		AWE

	ACTION
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<p>Item 1 – Introduction</p> <p>The purpose of this meeting is to engage with AWE as requested by the CAA.</p> <p>The attendees introduced themselves and outlined their respective roles.</p> <p>DW presented the ACP presentation.</p> <p>In accordance with CAA rules, AA have to demonstrate the safety aspect case for new technologies, especially BVLOS. Currently we can only operate BVLOS inside a TDA.</p> <p>The aim is to test the DA solutions so TDA will no longer be required for BVLOS.</p>	
<p>Item 2 – Statement of Need (discussion and review)</p> <p>DW advised the area TDA operation is a corridor north of AWE, with a buffer zone in place.</p> <p>Our TDA will be activated as and when required, not 24/7 to keep the airspace available for the GAA and other stakeholders. All flights will be posted 48hrs in advance with time of flights detailed.</p>	
<p>Item 3 – Issues or opportunities arising from proposed change</p> <p>Proposing the TDA has a maximum altitude of 800 feet to allow enough clearance for GAA.</p> <p>MK asked if a TDA is always required for BVLOS. DW advised it is the CAA's policy that any BVLOS operation in UK airspace must start in a TDA, unless you have specific exemptions.</p> <p>DW advised we have a drone detection system, visual sensors deployed with a capability of 6km and ADSB and a person monitoring the system.</p>	
<p>Item 4 – Options to exploit opportunities or address issues identified</p> <p>RH asked for more information to be sent over on sensors and counter UAV (detect and differentiate between friendly vs non friendly).</p> <p>DW asked if they could see if they are any concerns, issues etc</p> <p>MK advised that GB may have a question about the buffer zone.</p>	

<p>RH asked how secure our comms is. DW advised we have our own secure private APN linking the towers to the BT network (same security implementations as provided for the emergency services).</p> <p>RH asked if we have any encryption devices. DW said we have end to end encryption from mast to mast to the BT network and directly to our own servers.</p> <p>RH has discussed this with Gary Bone and David Griffiths and they have no objections and support the project.</p>	
<p>Item 5 – Provisional indication of the scale level and process requirements*</p> <p>No action required</p>	
<p>Item 6 – Provisional process timescales*</p> <p>No action required</p>	
<p>Item 7 – Next steps</p> <p>DW extended an invitation to AWE to view the Arrow Control room operations in the Reading office.</p>	AA/AWE
<p>Item 8 – Any other business</p> <p>No AOB noted.</p> <p>Meeting concluded at 15:44</p>	

ACTIONS ARISING FROM PROJECT ARROW: AIRSPACE CHANGE DISCUSSION ASSESSMENT MEETING

David Walters
ACP Sponsor

8.13 AWE Meeting Minutes

Received From	Dave Griffiths - AWE
Date Received	06 October 2021
Date Responded	06 October 2021
Notes	Engagement Post Phase 1 Review

Hi David

Thanks for your email. I'm very interested to understand how this proposal may impact our Restricted Airspace, for my part in the AWE organisation I manage the control of flights within or close to the restricted area.

We also operate UAV's within AWE Restricted area and I'm sure our Pilots would be keen to learn more about your proposals, new technologies etc.

Could we arrange a formal get together to explore your proposals.

Regards Dave

Response from Altitude Angel:

Hi Dave,

Great to hear from you.

That's interesting to know you also operate drones within your TDA. We have a variety of sensors deployed that will probably pick them up 😊

It might be short notice, but I have availability Friday if you would like to join a team call?

In the meantime, there are a few presentations etc., on the AIP Portal, which explains at a high level what we aim to achieve.

<https://airspacechange.caa.co.uk/PublicProposalArea?pID=365>

I look forward to hearing from you

Kind Regards,

David Walters

Project Arrow Lead

Hi David

I hope your well. Just following up on the below.

How does this Friday work for you? I can do either 1pm or 3pm

Kind Regards,

David Walters
Project Arrow Lead

Good Afternoon,
Unfortunately it is a non working Friday for us and Richard, Sam and I have other commitments.
Regards Matt

Matt King

Maintenance Delivery Manager UAV

Hi Matt,

Thanks for the reply

Would Thursday this week work better or Monday / Tuesday next week ?

Kind Regards,

David Walters
Project Arrow Lead

Hi David

Thanks for your offer, I'll try and make one of the calls when our Pilots confirm attendance. However, I do have a couple of questions if you don't mind, I've looked at the VFR Chart and noticed your FDA is extremely close to our Restricted Airspace do they intersect at any point?

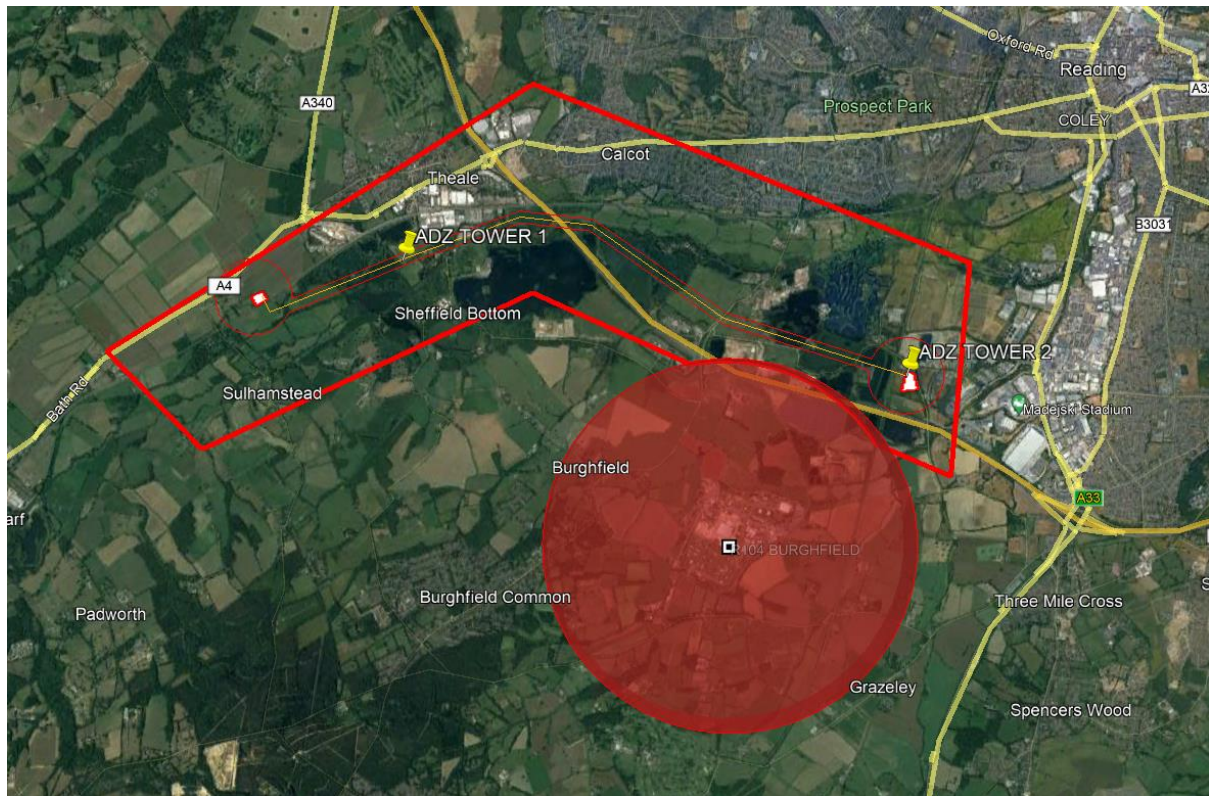
From Security point of view how will we know when you are flying? as we do have a Ministry of Defence Police response to unknown Drone Flights.

Thanks in anticipation

Regards Dave

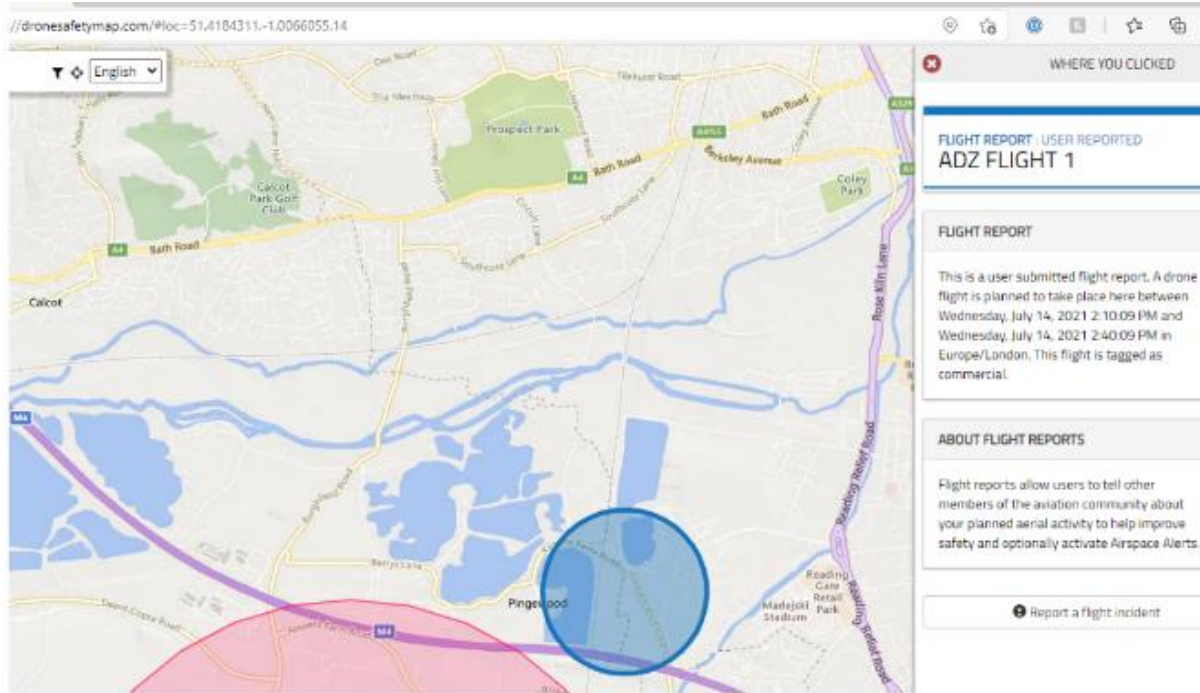
Hi Dave

Our TDA Proposes to follow the outer edge of your Curve on R104. On our first submission there was a slight gap which the CAA asked us to close. The actual route the drones will fly is the orange centre line which is a good 350m away from the R104 TDA. The Red lines which sit either side of that is our emergency buffer zone. Then we have our TDA over the top of that.



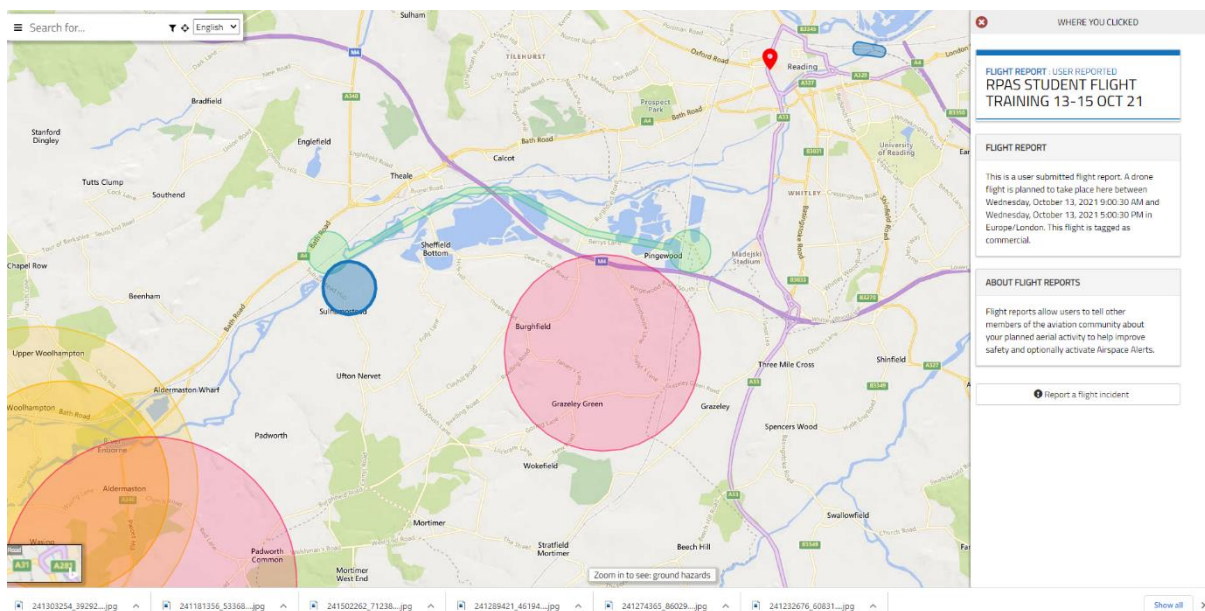
With regards to flight activity, all of our flights are posted 48hrs in advance. Our TDA is only active during the period of drone activity too.

All of our activity can be view on www.dronesafetymap.com . We file all of our flight plans which will appear as blue circles. I suspect some of your pilots will be familiar with our system already.



It might be worth sharing the above portal with your military police internally. As they will be able to see other operators flying in the area also.

As an example this Blue Circle here is Thames Valley Police doing a training flight near by at their facility.



If you have anymore questions please let me know. Hopefully we can discuss in more detail on a call.

Kind Regards,

David Walters
Project Arrow Lead

Hi All,

Tuesday 19th (pm) works best for us. Alternatively, Monday 18th after 10am and before 1pm.

Kind Regards,
Richard

Richard Hare
UAV Services Lead

Hi Richard

Tuesday 3pm? I will send over a Microsoft teams appointment if that's ok?

Kind Regards,

David Walters
Project Arrow Lead

3pm Tuesday good this end David. Look forward to receiving the Teams invite.

Thanks,
Richard

Richard Hare
UAV Services Lead