Summary Report of Stakeholder Engagement

Airspace Change Request ACP-2021-032

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Contents

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 500m 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 engaged with stakeholders it had identified via the NATMAC List provided by the CAA, and additional stakeholders within the vicinity of the proposed TDA.

Our initial outreach was to the 55 stakeholders identified on the list below:

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 emailed all the relevant stakeholders with a letter (see 7.13) outlining the airspace change request, 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 31 July 2021.

Altitude Angel also engaged 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 feedback from some respondents who noted that our timeline for feedback in this case (four weeks) was shorter than the typical six weeks for other proposals.

Due to the timelines within the Government's Future Flight programme, and the time elapsed waiting for the CAA to respond to our initial application, it was only possible for us to run a 4-week engagement. However, we made a business decision to prioritise our return responses such that they would occur within 3 working days of receipt.

In total, we received 11 direct responses to our stakeholder engagement outreach activities. The majority were understanding of our intentions and/or positively supportive. Some feedback expressed reservations that this represented 'another' TDA for drone operators which effectively limits access to GA, and we note our disappointment that the purpose for the ACP and the underlying project it supports was missed by those respondents.

We responded to all of those who wrote to us within our three-working day goal and were quick to follow-up with responses to any additional questions during those engagements.

Again, we thank everyone who responded to our engagement request.

In the sections that follow we 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"*

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 we are collectively working through a Letter of Agreement, 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 map.

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 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.

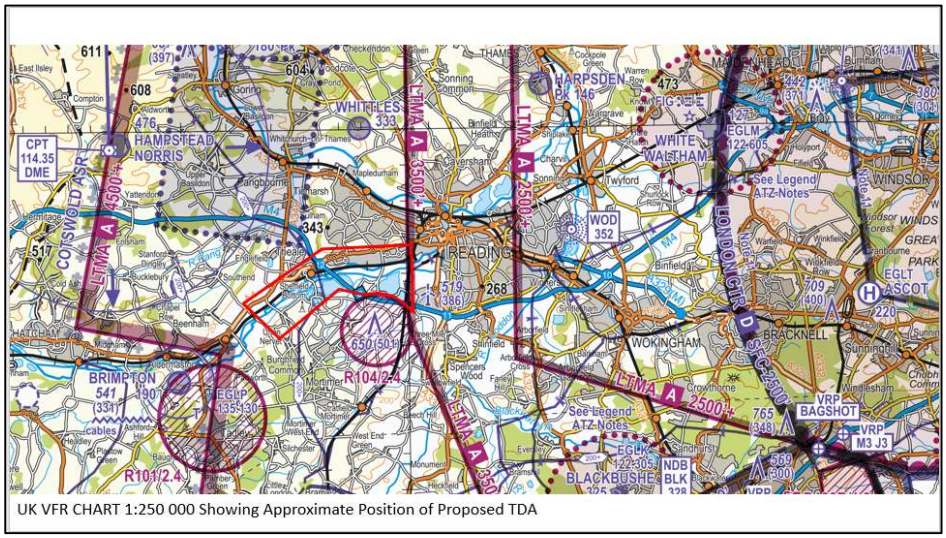
We thank the GA Community for its feedback.

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 >= 5Km visibility between our towers during flight operations. In the scenario of cloud cover at or below 1,000ft, this could be a limiting factor, and as such will be incorporated into our safety case.

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.



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

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:

1) 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.

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

3) 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;

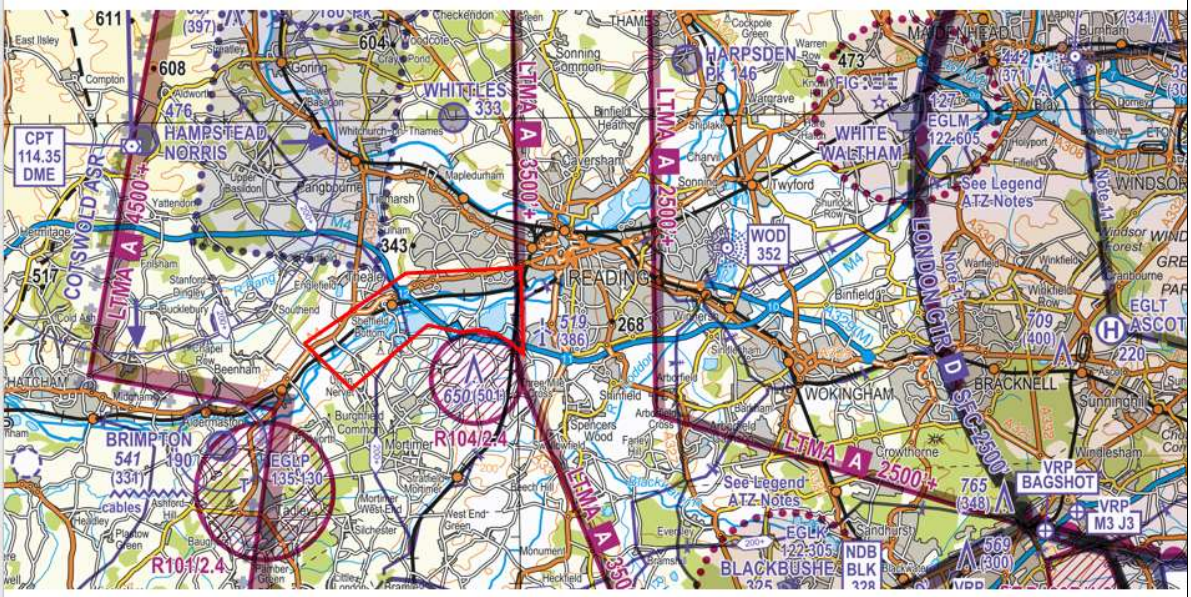
4) Some raised questions about the proposed upper limit of the TDA and requested we look to achieve 600ft AMSL, as opposed to 800ft AMSL detailed in our application.

   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.

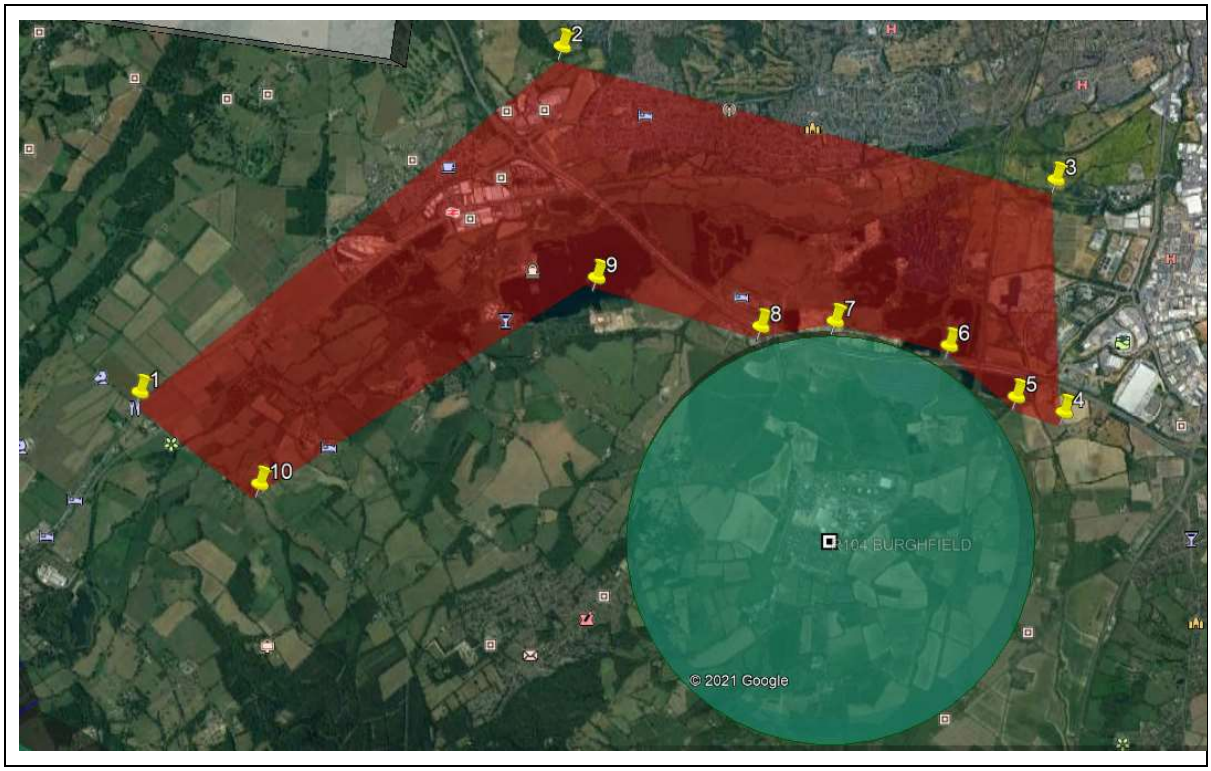
Continued…

Below, we outline the current design dimensions:

Identification	Lower Limit Upper Limit	Comments
TDA Area bounded by straight lines joining through points 1-10-1 1) 51°25'00"N 001°07'07"W 2) 51°26'47"N 001°03'38"W 3) 51°26'06"N 000°59'33"W 4) 51°24'54"N 000°59'29"W 5) 51°24'59"N 000°59'53"W 6) 51°25'15"N 001°00'26"W 7) 51°25'22"N 001°01'22"W 8) 51°25'21"N 001°01'59"W 9) 51°25'36"N 001°03'21"W 10) 51°24'32"N 001°06'08"W 1) 51°25'00"N 001°07'07"W	Lower Limit SFC Upper Limit 800ft AMSL	Activity: UAS Beyond Visual Line Of Sighe. 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



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



Airspace Notification

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

The TDA will be activated from **Thursday 21st of October to 19th January 2022**. Operations will commence during daylight hours Monday- Friday 30mins after sunrise and 30 mins before sunset.

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:

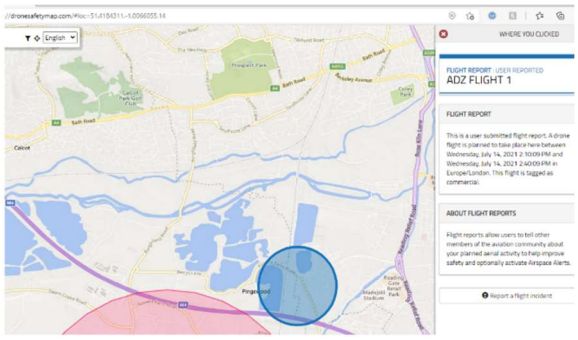


Figure 1 Dronesafety Map Showing Planned Drone Flights

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

7 Appendices

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.

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	Copy of Altitude Angel's initial Stakeholder Letter		
7.13	Flyer Magazine Press Article		

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 drones 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.

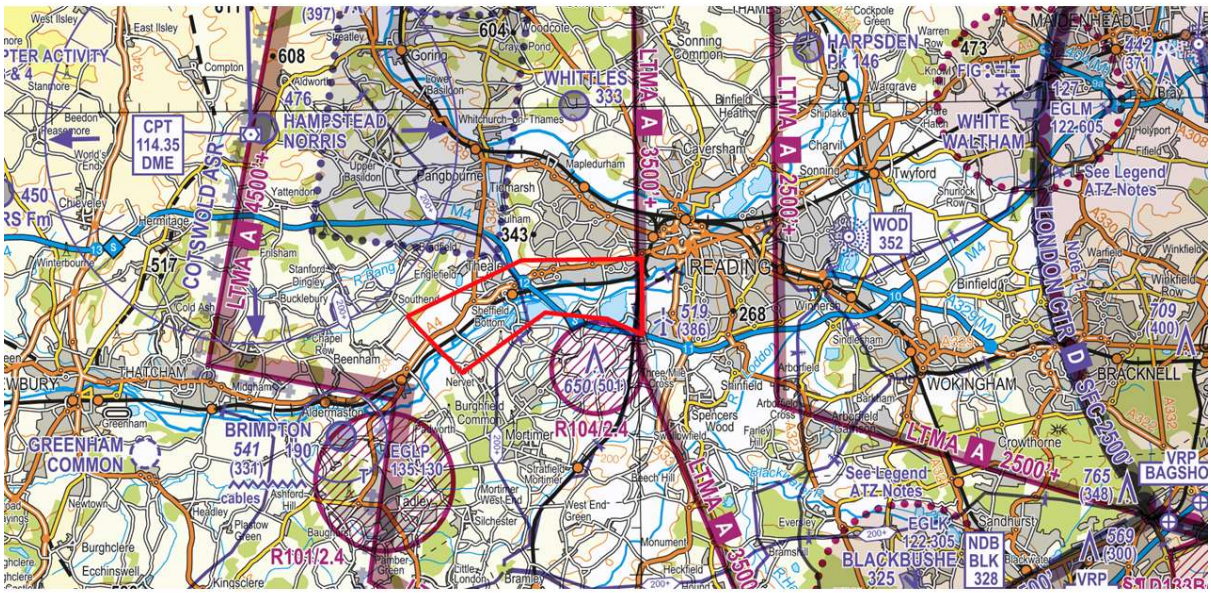
   Thank you for the support. I hope we can keep you updated with our progress and developments.

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.

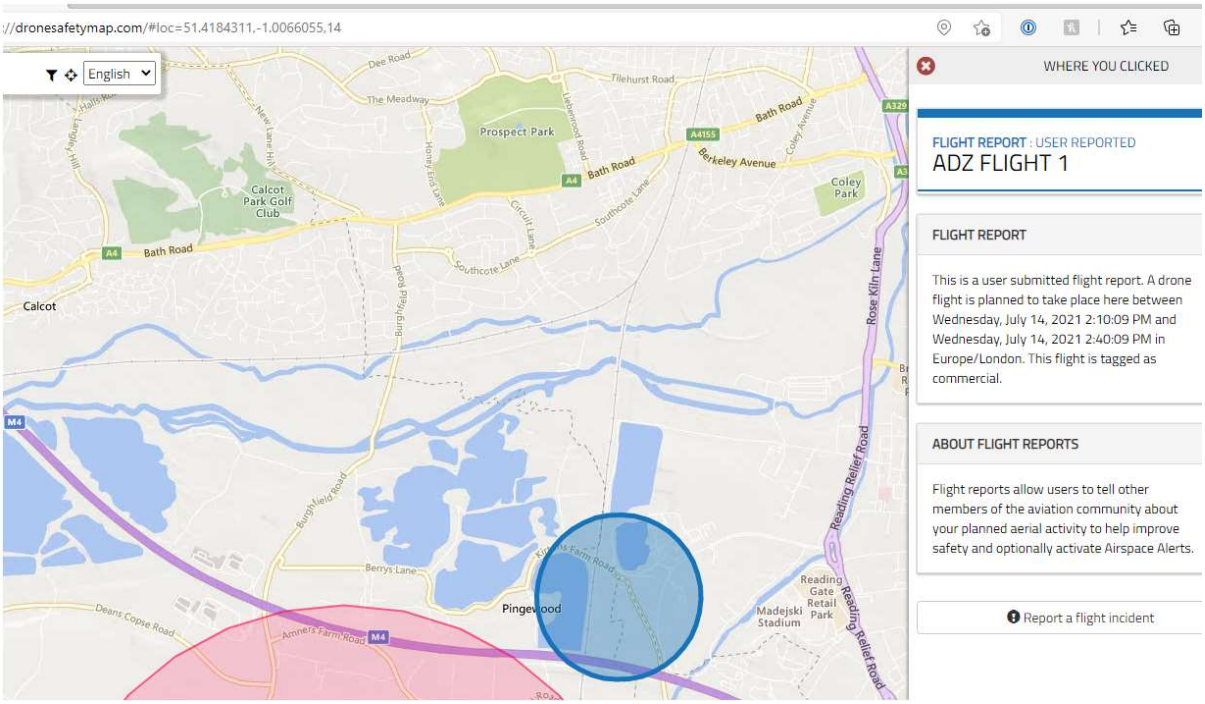
Not sure how this mitigates the restriction resulting from the proximity of your TDA to the RAF Benson stub as far as GA traffic is concerned?

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 the 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 effectivly ?

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,

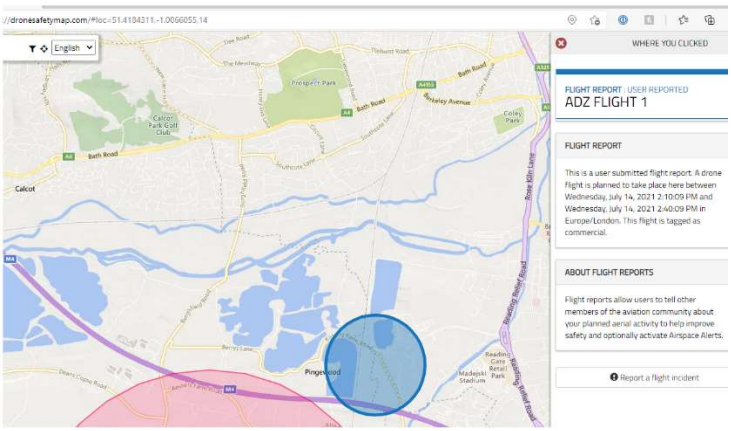
I hope you're well and things at [REDACTED] are progressing nicely.

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

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 | SO2 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.

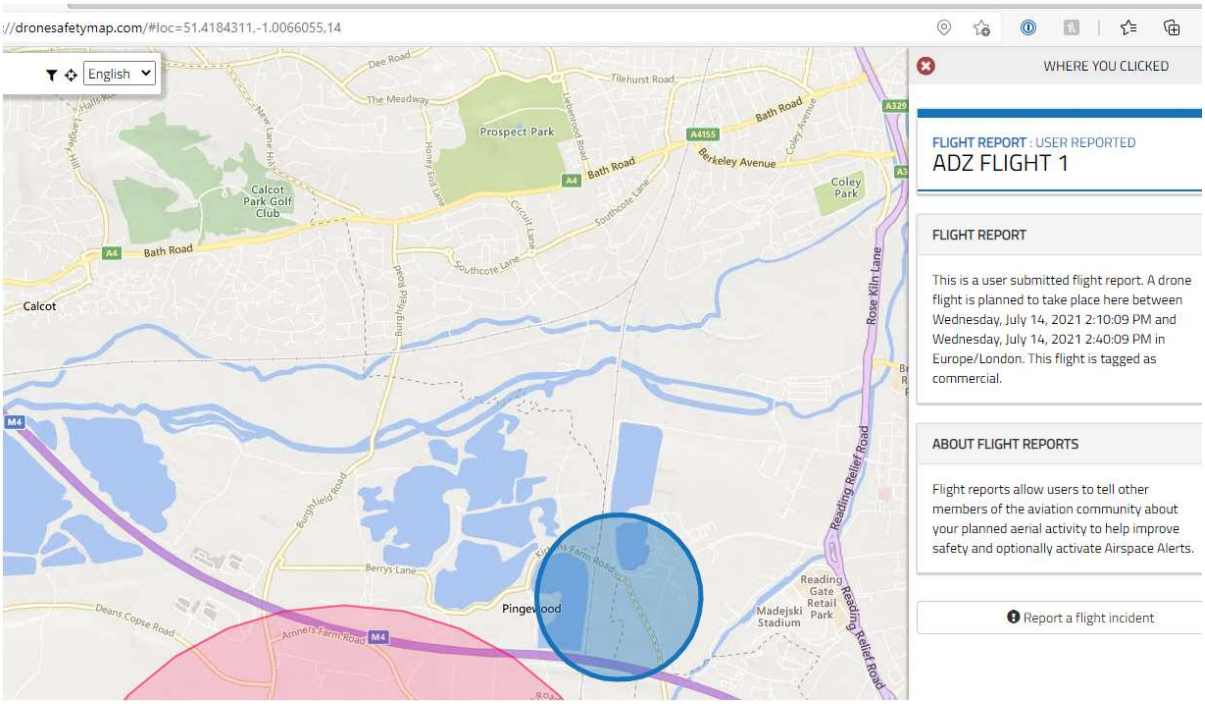
Who has access to Guardian UTM? Is this something military aircraft could use and what cost would be associated?
GuardianUTM is available in various forms. For example: https://dronesafetymap.com/ is powered by our GuardianUTM platform. This displays all of the submitted drone flights. We process thousands 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 ¼ 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 dronesaferymap.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 HIOW 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

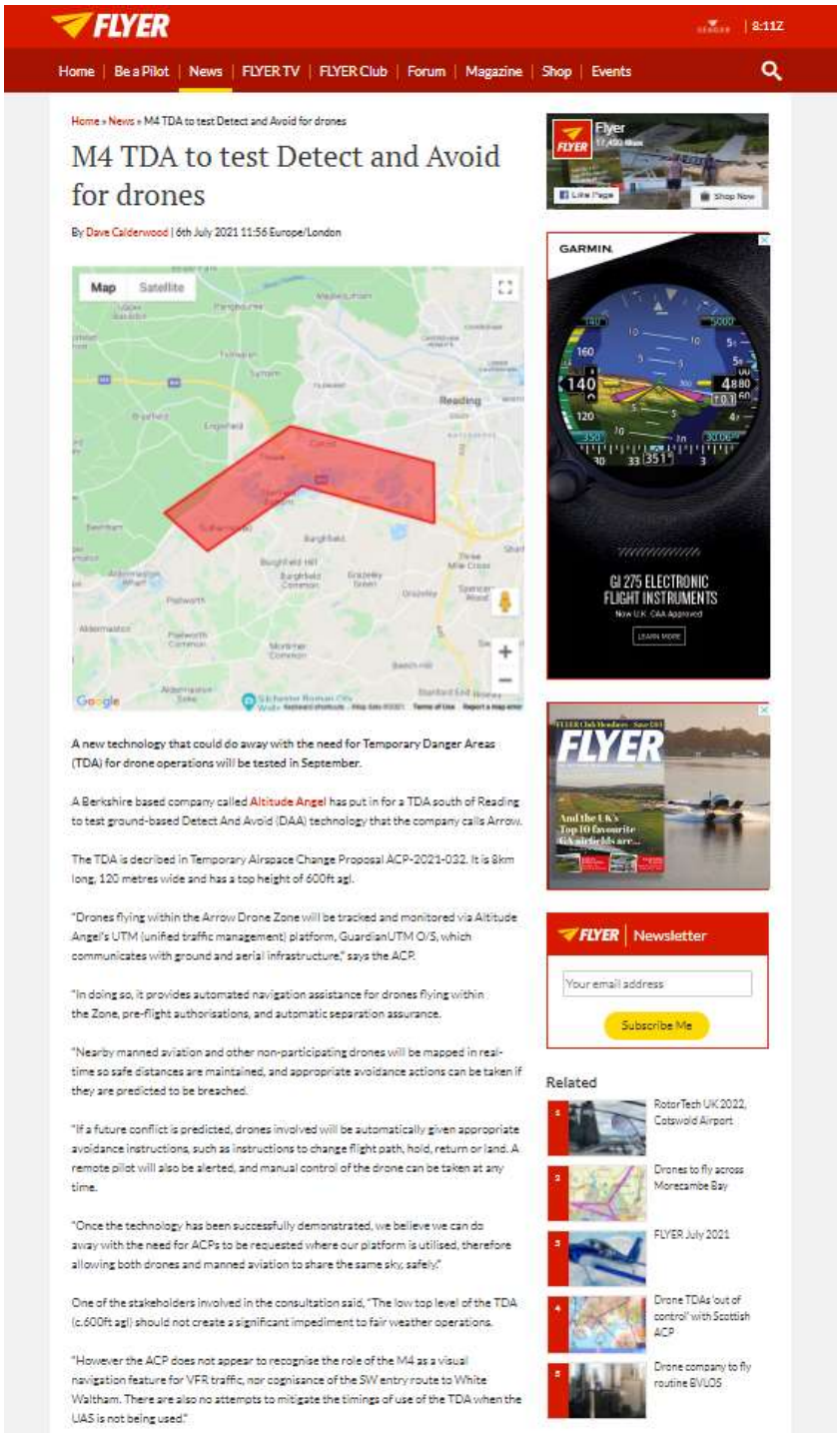
BW,

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 decribed 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.

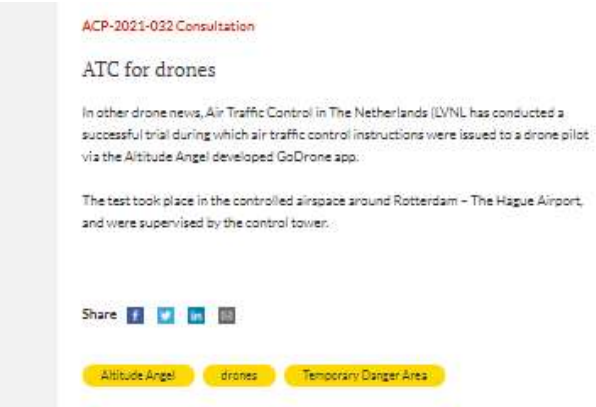
"Nearby manned aviation and other non-participating drones will be mapped in real-time so safe distances are maintained, and appropriate avoidance actions can be taken if they are predicted to be breached.

"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."

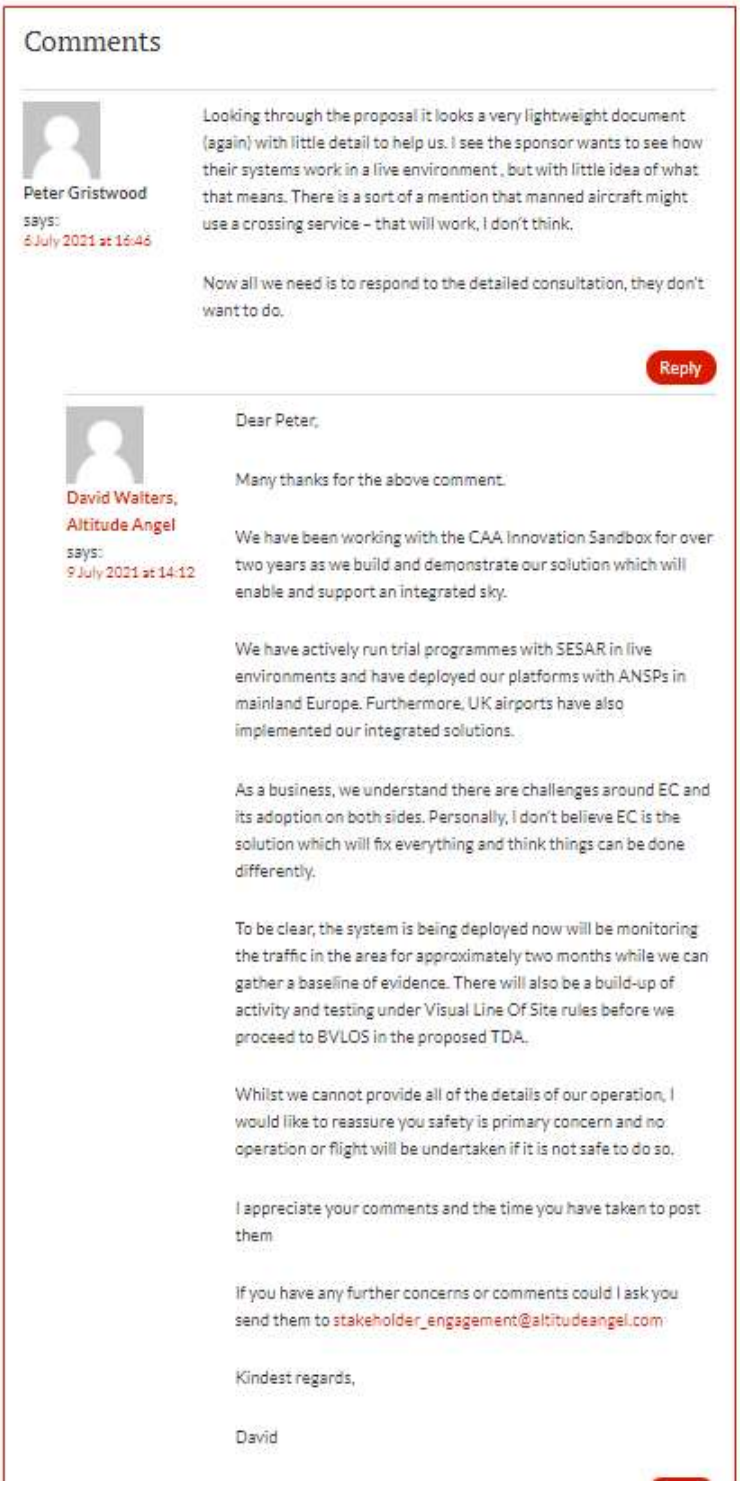
One of the stakeholders involved in the consultation said, "The low top level of the TDA (c.600ft agl) should not create a significant impediment to fair weather operations.

"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."


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 sugggest 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 utilsing 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.

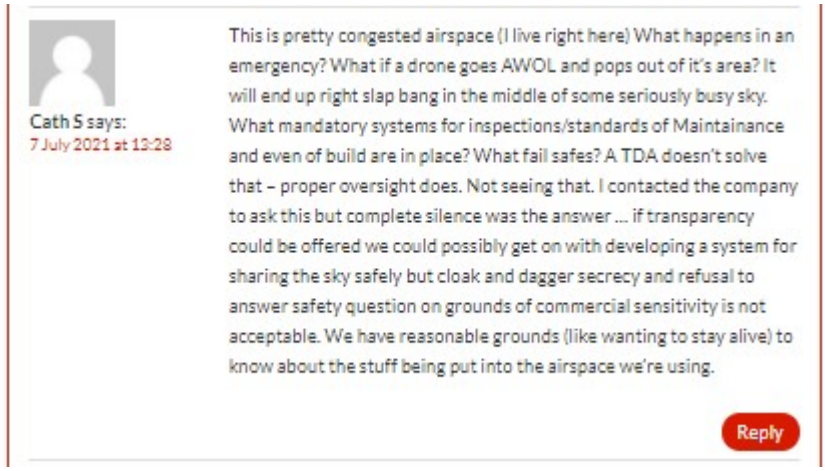
We hope, under the DfT Future Flight Challenge initiative, we can test and demonstrate this capability in a live environment with real-world use cases. In doing so, we will be showing the world how the UK can lead on what the future airspace management can look like.

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 is 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

7.13 Altitude Angel's initial engagement letter to stakeholders

Dear [insert name],

We are contacting you as a valued member of the aviation community to kindly request your feedback to the Temporary Airspace Change Proposal ACP-2021-032. The purpose of this project, and therefore the reason for this ACP, is hopefully 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.

This ACP process can also be reviewed in the Airspace Change Portal.

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 equipage 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 500m 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 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 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 out 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 is our strong preference the airspace remains unsegregated, thus allowing manned aircraft to still navigate the area. However, we need to demonstrate and collect evidence to the UAS Team the DAA system is sufficiently effective to enable BVLOS in unsegregated airspace. CAA Policy is BVLOS activity, which has not demonstrated the required DAA capability, be wholly contained in a Temporary Danger Area (TDA). The team will initially start with Visual Line of Sight (VLOS) flight trials, moving on to Extended Visual Line of Sight (EVLOS) flight trials finishing in August. We will then progress to Beyond Visual Line of Sight (BVLOS).

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.

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

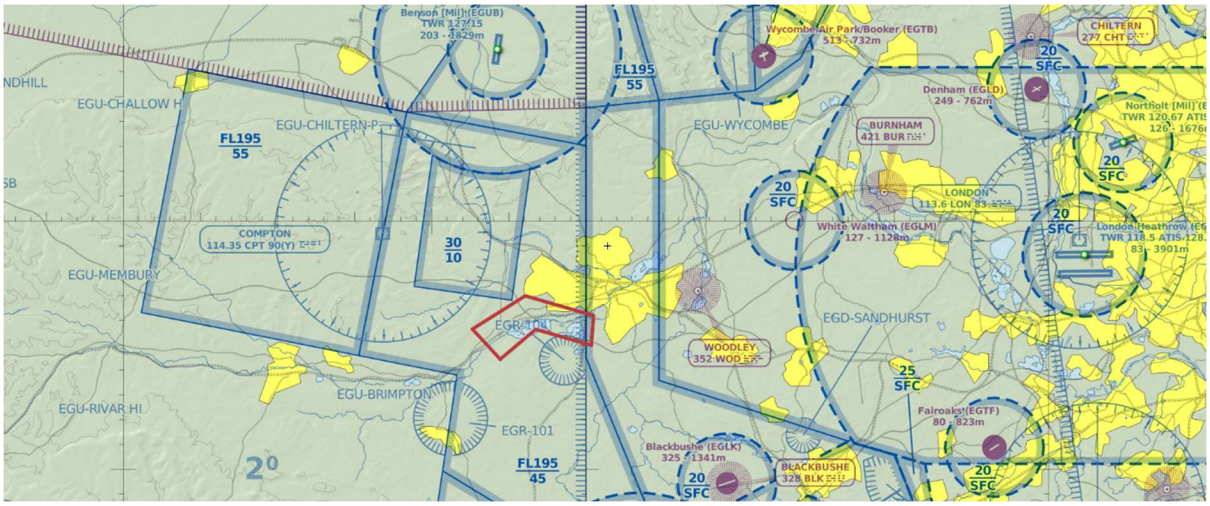


Figure 2 Proposed Arrow Corridor Area Displayed on Skyvector Aviation Chart

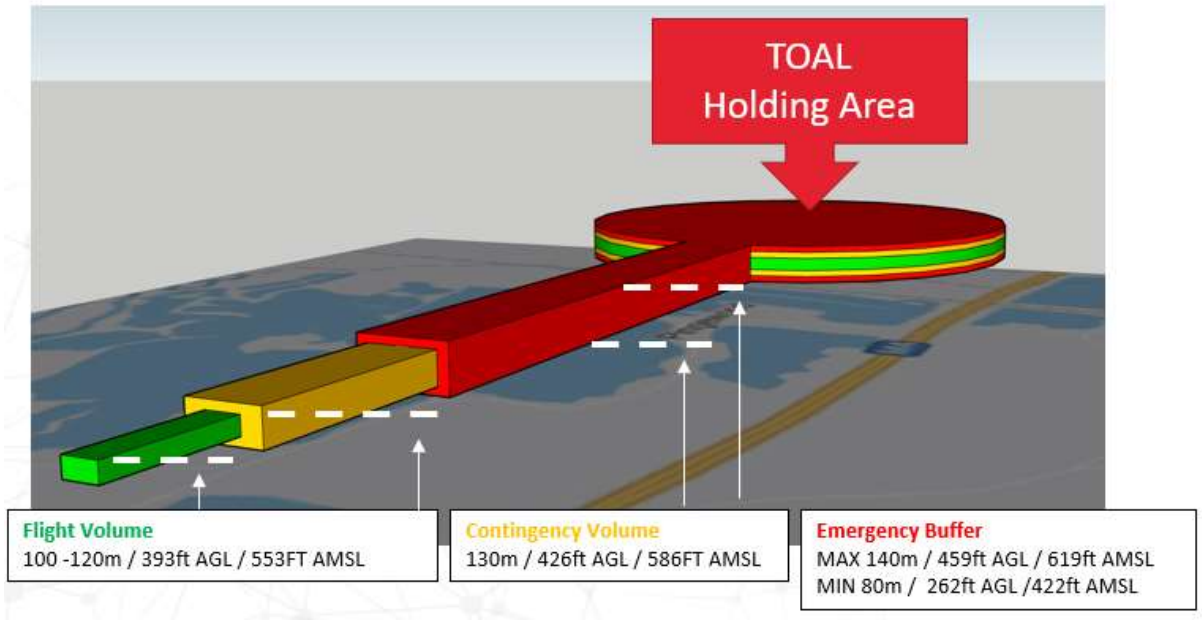


Figure 3 Flight Volumes Altitudes Of Arrow Corridor

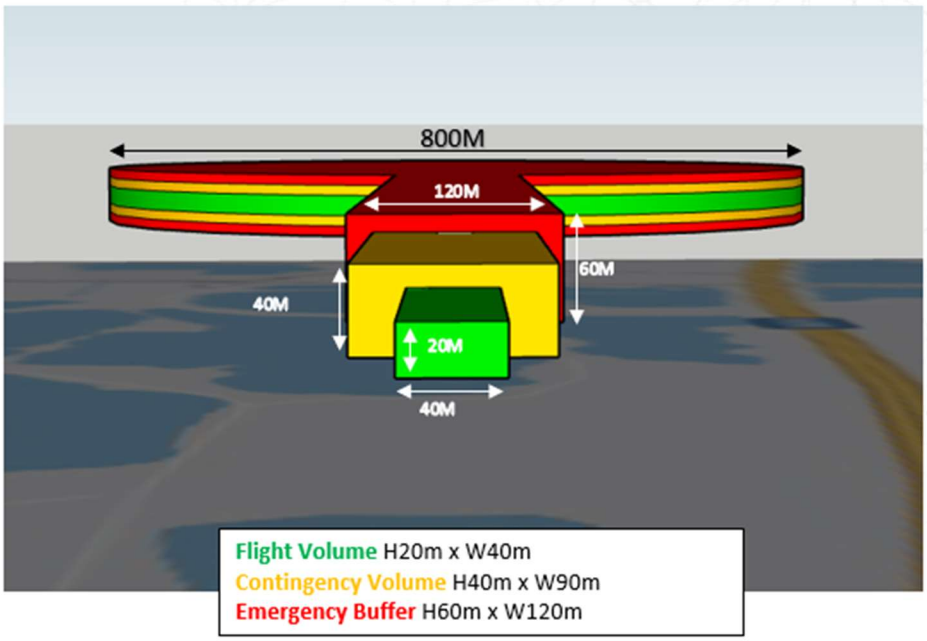


Figure 4 Flight Volumes Dimensions Of Arrow Corridor

It is anticipated the ACP will be activated via NOTAM 24 hours in advance and will operating Monday – Friday 9am-6pm / dusk (whichever is first). Prior to operations starting, Altitude Angels 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 September 2021.

Why are we contacting you?
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:

- 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

If you have any queries, please do not hesitate to include them in your feedback and we will aim to get in touch within three working days. Please submit your feedback by 09:00 on Monday, 26 July 2021.

We look forward to hearing from you.

Yours sincerely,

David Walters
Altitude Angel
Project Arrow Lead