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ACP-2021-057 – Skyfarer BVLOS Demonstrations, Coventry

Targeted Engagement with Aviation Stakeholders. Version 1.3 – Dated: 10/05/2022

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Amendment Record

Version Number	Date	Amendment Overview
1.0	10/11/2021	Initial issue
1.1	31/01/2022	Minor correction to TDA 2 Figures (waypoints unchanged) Added stakeholders
1.2	23/03/2022	Change to proposed TDA activation date: was "early June", now delayed by approximately 8 weeks to 28 July: see Sections 1.1, 5 and 9.2 (changes highlighted in yellow). No other changes.
1.3	10/05/2022	Change to proposed TDA activation date: now delayed by approximately 2 ½ months to 15 October: see Sections 1.1, 5 and 9.2 (changes highlighted in yellow). No other changes.

Acronyms and Abbreviations

ACP	Airspace Change Proposal
AGL	Above Ground Level
ATC	Air Traffic Control
AMSL	Above Mean Sea Level
ANSP	Air Navigation Service Provider
BVLOS	Beyond Visual Line Of Sight
CTA	Controlled Airspace
GA	General Aviation
LL	Lower Limit
LOA	Letter of Agreement
NM	Nautical Mile
NPAS	National Police Air Service
OLS	Obstacle Limitation Surface
SFC	Surface of the earth
TDA	Temporary Danger Area
UAV	Unmanned Aerial Vehicle
UL	Upper Limit
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VRP	Visual Reference Point
WMP	West Midlands Police

Reference Documents

Document Title	Source	Edition/Version	Date of Issue
Licensing of Aerodromes	CAP 168	Eleventh edition	January 2019
Airspace Change	CAP 1616	Third edition	01/03/2021
Safeguarding of Aerodromes	CAP 738	Third edition	October 2020
Unmanned Aircraft System Operations in UK Airspace	CAP 722	Eighth edition	05/11/2020
Unmanned Aircraft Systems UAS Airspace Restrictions Guidance and Policy	CAP 722C	First edition	10/12/2020
Special Use Airspace	CAA Policy Statement	NA	22/08/2014

CAA Policy for the Establishment of Permanent and Temporary Danger Areas	CAA DA/TDA Policy 20200721	NA	21/07/2020
Topographical Air Chart 1:250 000	CAA, NATS, Ordnance Survey	Sheet 8 Edition 25	2021

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1. Statement of Need

1.1 Summary

Skyfarer Ltd, the airspace change sponsor, is seeking a temporary airspace change - a Temporary Danger Area (TDA) - in order to facilitate Unmanned Aerial Vehicle (UAV) Beyond Visual Line of Sight (BVLOS) demonstration flights. These would occur during a limited number of TDA activation periods spread over a 90-day period commencing 15 October 2022.

The aims are two-fold:
a) To progress the operational capability of drone technology into a logistical use case specifically for medical delivery in association with the NHS; and
b) to progress the operational capability of drone technology into use cases specifically related to policing activities in conjunction with the West Midlands Police (WMP).

A TDA is required in order to provide an appropriate, safe operating environment in which to conduct the BVLOS demonstration flights. Please note that there is no intention for this temporary change to become a permanent one.

1.2 Opportunities identified

Two opportunities have been identified in regard to this ACP. They are related to health care and policing.

a) **Health care**: The NHS has expressed an interest in the potential use of drones for delivery operations, specifically: pathology samples, surgical aides, pharmaceuticals and urgent blood products. Skyfarer have been selected to lead the UKRI sponsored project 84502 - 'enabling drone powered medical logistics in the UK'. Actual delivery flights are an essential component in the evaluation of drone based medical deliveries in the future. The University Hospitals Coventry and Warwickshire NHS Trust are working with Skyfarer to demonstrate drone deliveries between their two major hospitals in Coventry and Rugby (which between them serve a population of over a million people).

In addition to reduced delivery times (especially for time critical items), drone deliveries also have the potential to reduce road congestion and CO_2 emissions by replacing more traditional road transportation options.

Along with the University Hospitals Coventry and Warwickshire NHS Trust, the Coventry City Council and Warwickshire County Councils have also expressed their commitment to support this project, as described in their letters of support (see Appendix B).

b) **Policing**: There are numerous potential use cases for drones to assist in policing activities (e.g. surveillance activities), particularly where manned police aircraft may be unavailable due to timing or resourcing issues. The West Midlands Police (WMP) are working with Skyfarer to demonstrate

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and evaluate future drone use cases and capabilities. They have expressed their support for this TDA proposal in their letter of support (see Appendix B).

1.3. Objectives

Health care: Skyfarer would conduct delivery demonstration flights between Walsgrave Hospital (hereafter referred to as Coventry Hospital) and the Hospital of St Cross (hereafter referred to as Rugby Hospital). Some flights would be 'point to point' i.e. between Coventry Hospital and Rugby Hospital; some flights would use an intermediate 'staging' area (near the hamlet of Feldon or Easenhall depending on the route being flown) in order to demonstrate 'hub and spoke' operations. Items to be transported would include, but not be limited to, those described in the section 'Opportunities Identified' above.

Policing: Skyfarer would conduct demonstration flights including but not limited to surveillance equipment evaluations. Primary demonstration examples will be around 'first on scene' response and vehicle pursuits in controlled locations and environments. There will be no surveillance of uninvolved persons and Skyfarer will be liaising with the local councils (Coventry and Warwickshire) as well as West Midlands Police and Highways to ensure safety, awareness and ethical operations that do not infringe on the general population's privacy.

In order to minimise disruption to other airspace users, these flights would be limited to the routes established for the NHS demonstration flights described above.

1.4 Letters of Support

Letters of support (see Appendix B) have been received from parties involved including:
- NHS Hospitals Coventry and Warwickshire;
- Warwickshire County Council;
- Coventry City Council; and
- West Midlands Police.

2. Proposed Options for TDAs

Skyfarer previously proposed TDA options in support of the NHS demonstration flights described in the Statement of Need for ACP 2021-038. Based on the stakeholder feedback received during the formal engagement period for ACP 2021-038, Skyfarer have redesigned the proposed TDA options for this ACP. The revised options include: changes to flight routes, changes in the hours of activation, changes to the number of activations, and establishing Letters of Agreement (LOAs) with key stakeholders prior to finalising the proposal. These revisions seek to address concerns related to:

- Manned aircraft operations to/from Coventry Airport, especially:
  - Those via the Draycott Water Visual Reference Point (VRP)
  - Those along the extended runway 05/23 centreline
- The TDA's proximity to Birmingham Class D airspace (in the vicinity of Coventry Hospital) with regard to the CAA Special Use Airspace buffer policy.
- The prioritisation of emergency services flights.
- See Section 7 for a more detailed description of the known issues and the mitigations proposed to address them.

Skyfarer is proposing the use of two TDAs in order to ensure the volume of airspace requested, and the activation hours, are minimised in such a way as to allow for the intended BVLOS operations whist minimising the potential effects on other airspace users. The TDAs are temporarily designated as TDA 1 and TDA 2 (see Figures 1 & 2).

Skyfarer has prepared two different options for TDA 1:

- TDA 1, Option 1: prioritises minimising the volume of airspace needed to facilitate BVLOS on the identified route, however this comes at the cost of a requiring a relatively large number of waypoints to define the TDA volume.
- TDA 1, Option 2: prioritises minimising the number of waypoints required to define the TDA volume, however this comes at the cost of a slightly larger volume of airspace required for the TDA.

Only one proposed option for TDA 2 is presented, since it is a smaller area and does not have the same scale of potential waypoints as exists for TDA 1.

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2.1 Overview

An overview of the routes required for the demonstration flights, and the associated TDAs proposed is shown in Figures 1 & 2 (depicting TDA 1 Option 1 and TDA 2).

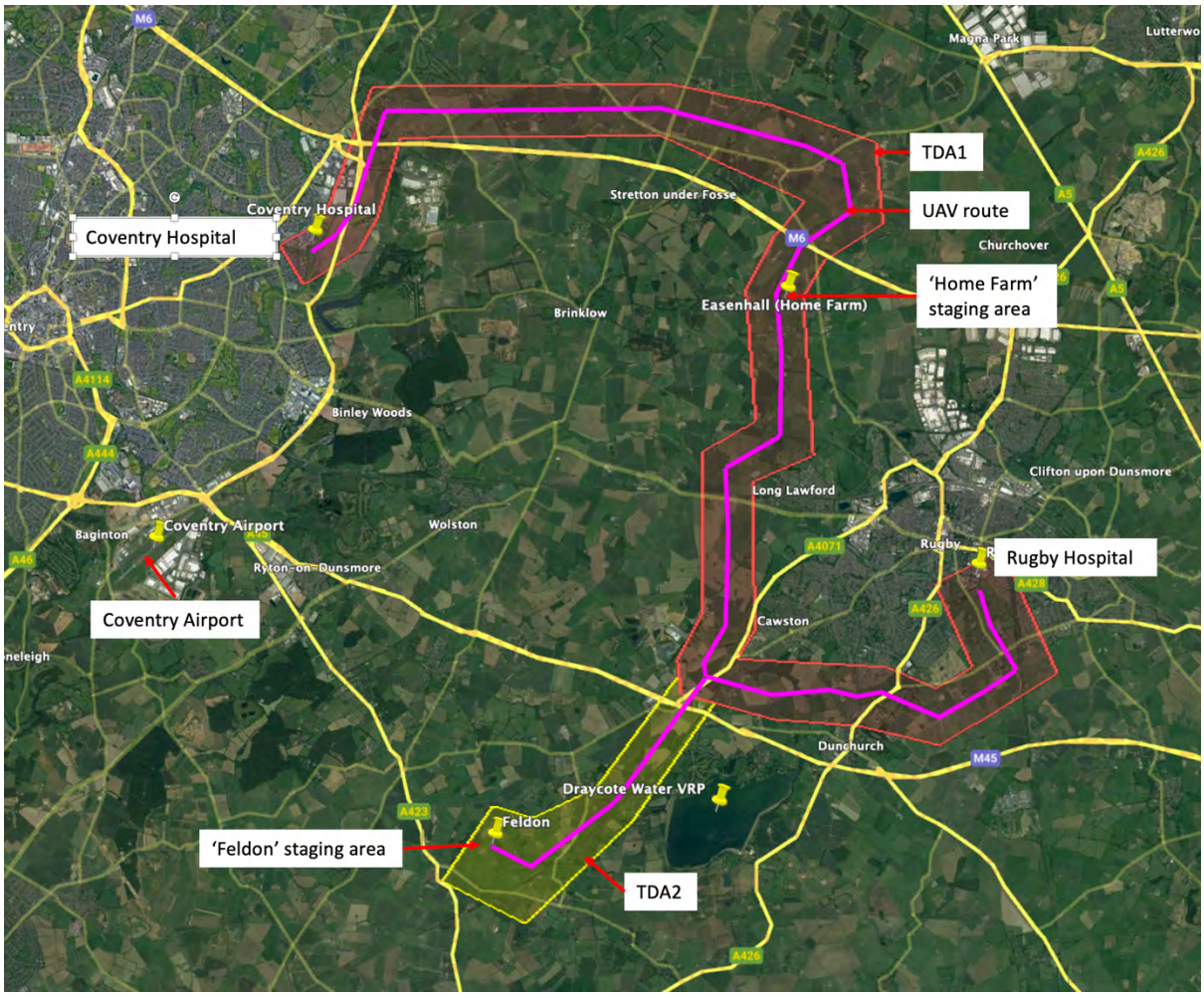

Figure 1: Proposed TDAs overview (shows TDA 1 Option 1 shaded in red and TDA 2 shaded in yellow (UAV routes shown in magenta)

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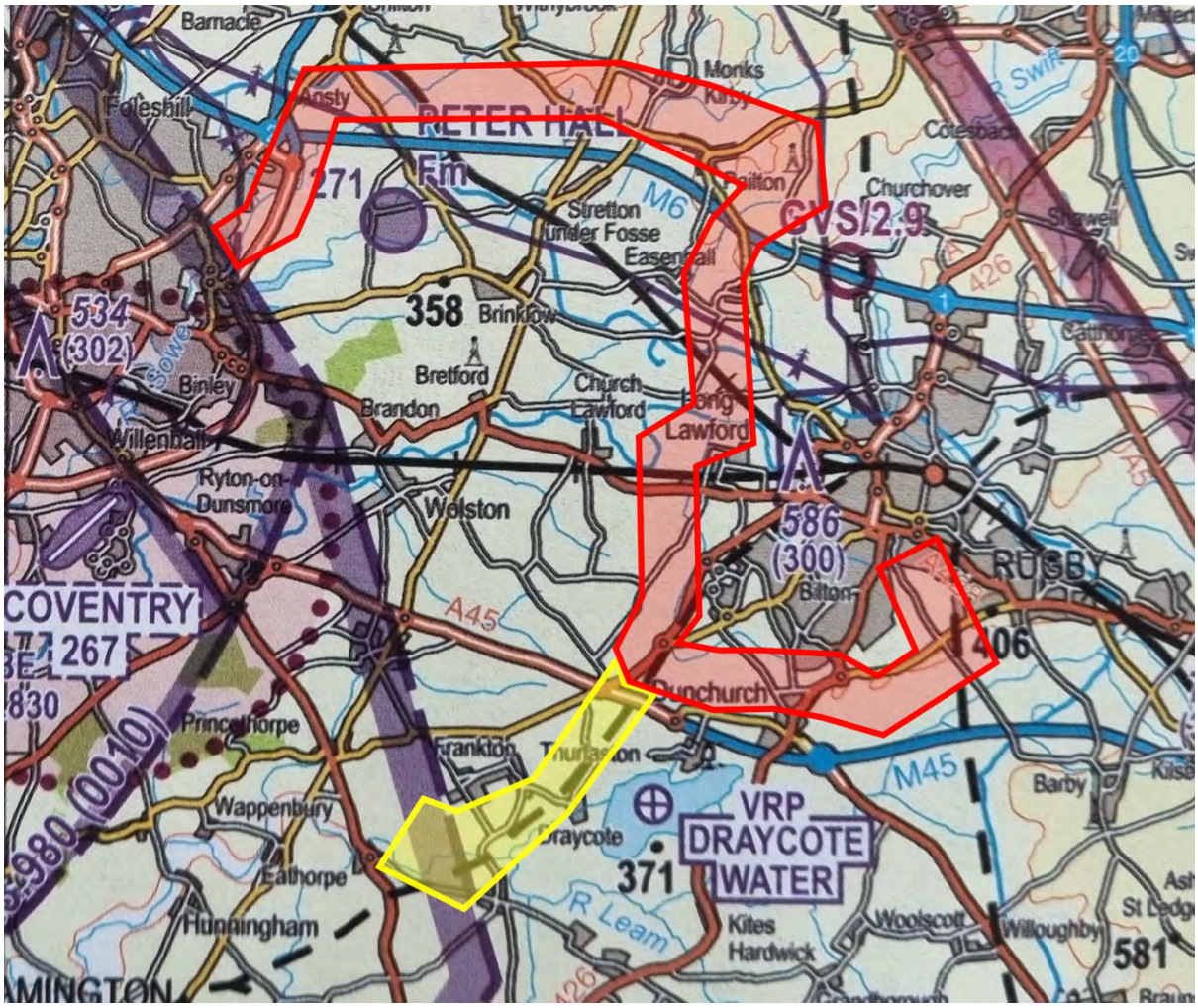

Figure 2: Proposed TDAs overview - shows TDA 1 Option 1 shaded in red and TDA 2 shaded in yellow (on Topographical Air Chart 1:250 000)

There are three specific routes for the demonstration flights:

- Route A: Feldon staging area (near the hamlet of Marton) to Coventry Hospital.
- Route B: Feldon staging area to Rugby Hospital.
- Route C: Coventry Hospital to Rugby Hospital (with option to operate into/out of the staging area known as 'Home Farm' near the hamlet of Easenhall).

The specific TDAs required for each route are shown in Table 1.

Route	TDAs required
Route A	TDA 1 and TDA 2
Route B	TDA 1 and TDA 2
Route C	TDA 1 only

Table 1: Routes and applicable TDAs

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2.2 TDA 1, Option 1

TDA 1, Option 1: prioritises minimising the volume of airspace needed to facilitate BVLOS on the identified route, however this comes at the cost of a requiring a relatively large number of waypoints to define the TDA volume (see Figures 3 & 4).

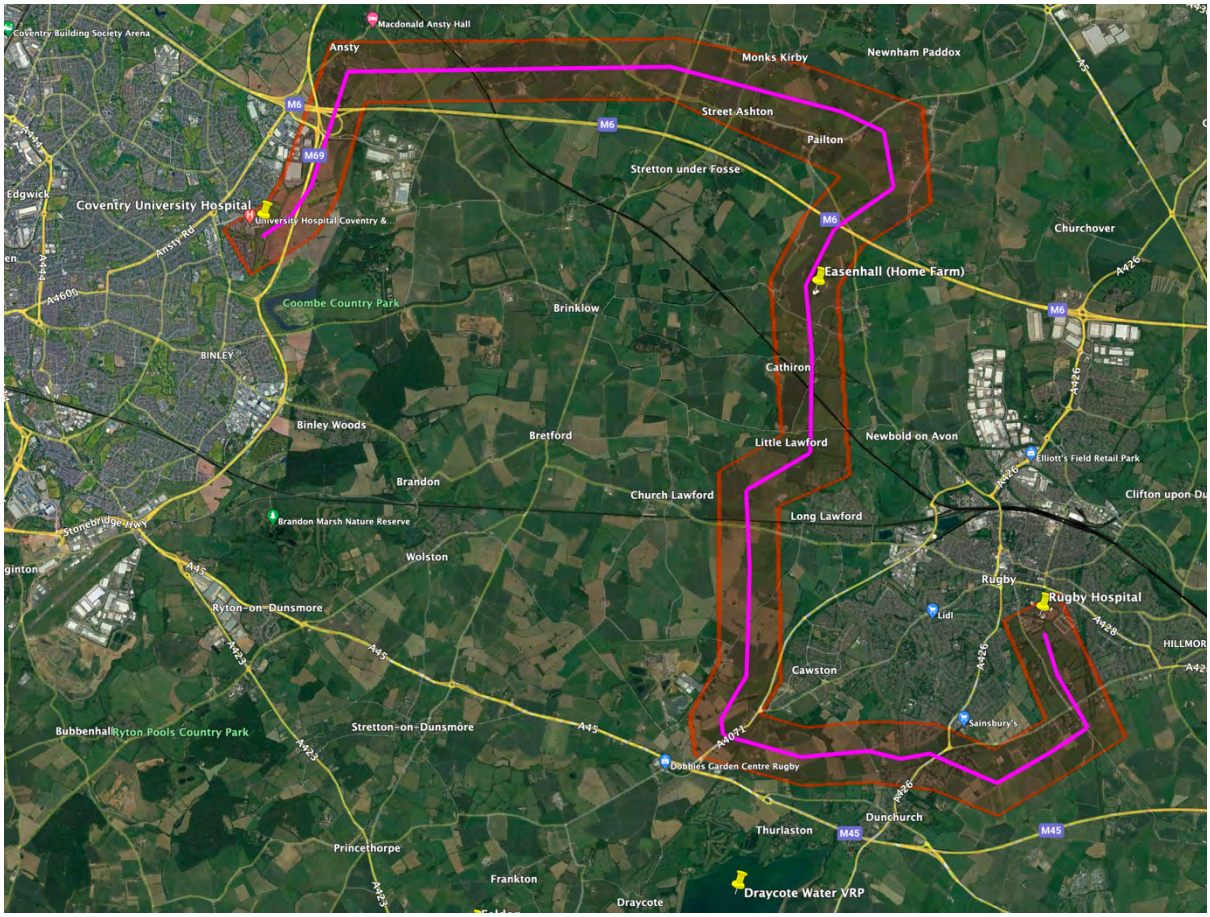

Figure 3: TDA 1, Option 1

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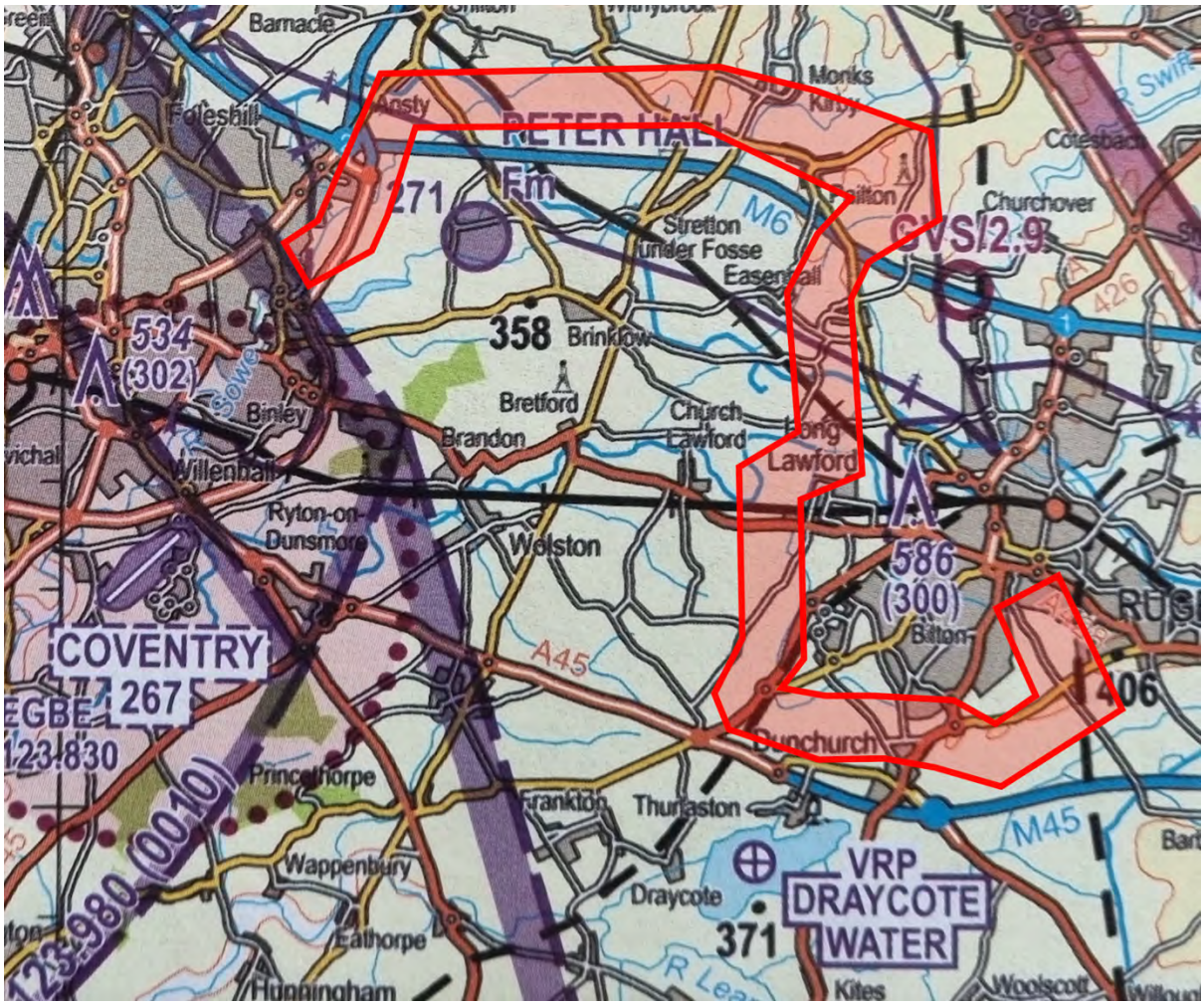

Figure 4: TDA 1, Option 1 (on Topographical Air Chart 1:250 000)

The lateral dimensions of TDA 1, Option 1 would start at a point located at N52°25'13" W001°26'43", thence a straight line joining the points:

- N52°25'26" W001°26'06"
- N52°25'39" W001°25'54"
- N52°26'48" W001°25'12"
- N52°26'50" W001°20'21"
- N52°26'37" W001°18'37”
- N52°26'14" W001°16'58"
- N52°25'26" W001°16'51”
- N52°25'03" W001°17'48"
- N52°24'41" W001°18'09”
- N52°23'07" W001°17'59"
- N52°22'51" W001°18'59”
- N52°21'23" W001°18'56"
- N52°21'06" W001°19'13”
- N52°21'01" W001°16'47"
- N52°20'48" W001°15'58”
- N52°21'01" W001°15'24"
- N52°21'51" W001°15'59”

- N52°22'11" W001°14'55"
- N52°20'58" W001°14'00”
- N52°20'14" W001°15'55"
- N52°20'26" W001°17'15”
- N52°20'29" W001°18'39"
- N52°20'45" W001°20'08”
- N52°21'05" W001°20'13"
- N52°21'34" W001°19'48”
- N52°23'09" W001°19'49"
- N52°23'28" W001°18'56”
- N52°24'47" W001°19'05"
- N52°25'19" W001°18'38”
- N52°25'39" W001°18'08"
- N52°26'19" W001°20'30”
- N52°26'17" W001°24'44"
- N52°25'29" W001°25'07”
- N52°25'09" W001°25'25"
- N52°24'49" W001°26'20”
- N52°25'13" W001°26'43"

The vertical dimensions of TDA 1, Option 1 would be:
- Lower Limit: SFC
- Upper Limit: 800ft AMSL

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2.3 TDA 1, Option 2

TDA 1, Option 2: prioritises minimising the number of waypoints required to define the TDA volume, however this comes at the cost of a slightly larger volume of airspace required for the TDA (see Figures 5 & 6).

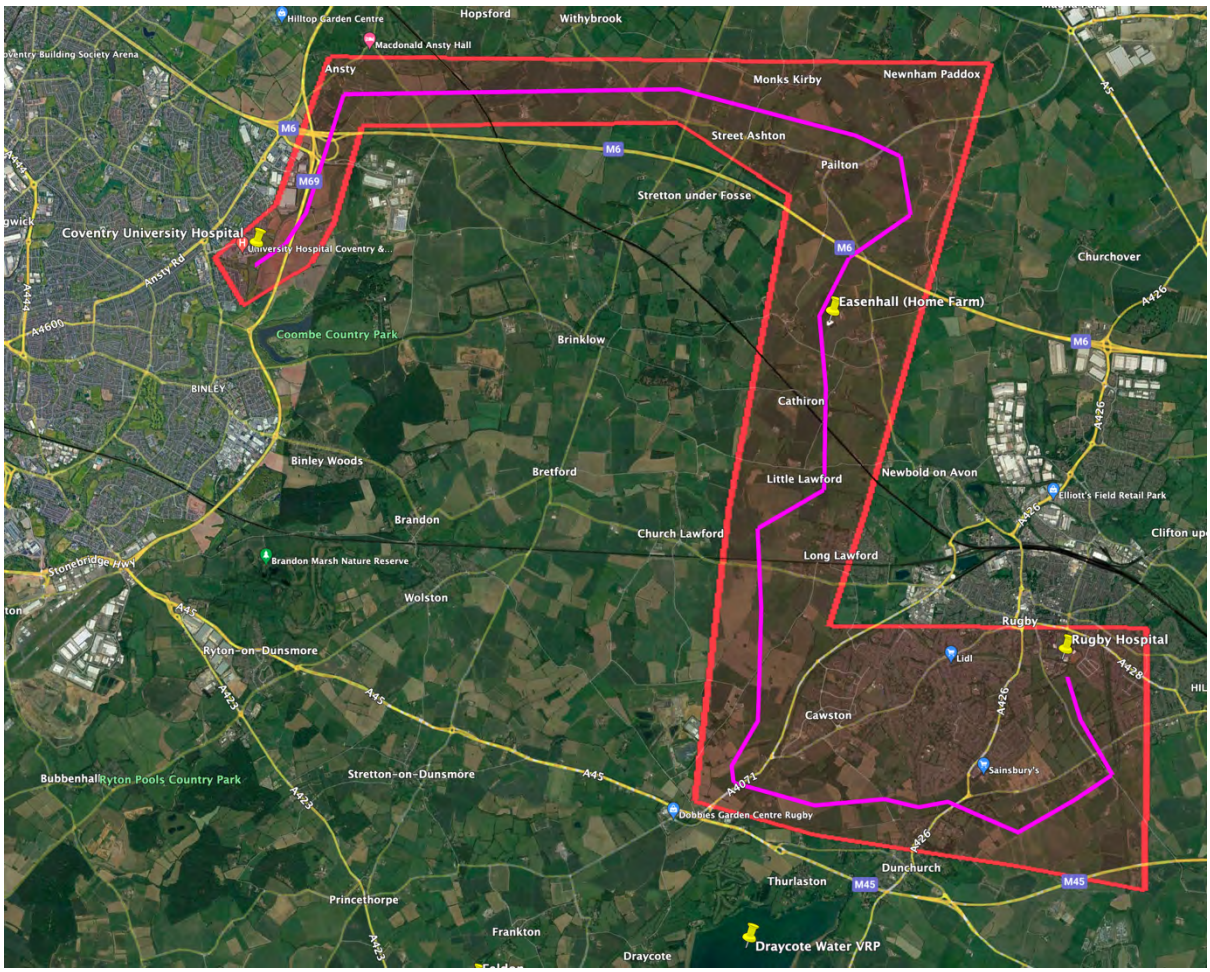

Figure 5: TDA 1, Option 2

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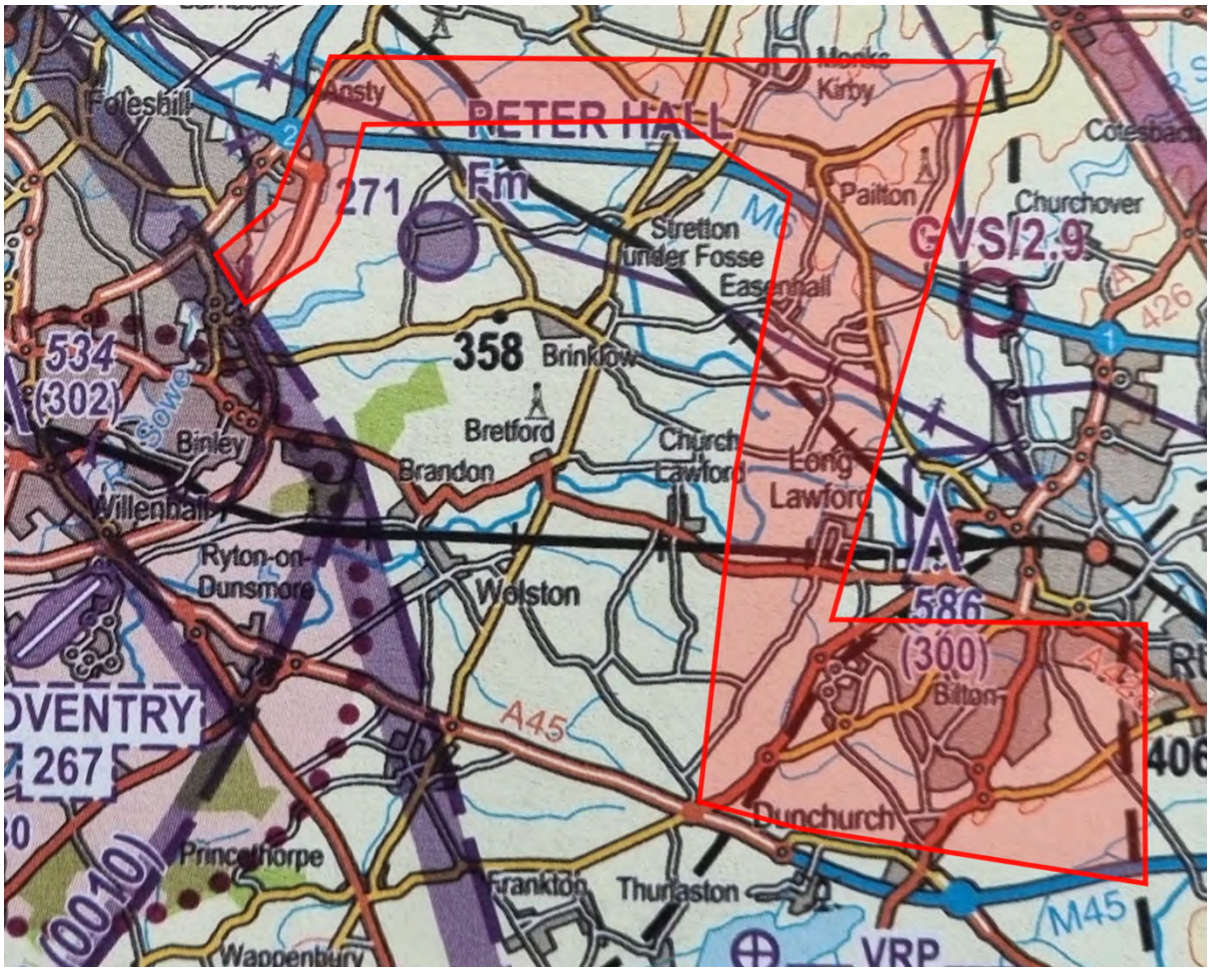

Figure 6: TDA 1, Option 2 (on Topographical Air Chart 1:250 000)

The lateral dimensions of TDA 1, Option 2 would start at a point located at N52°25'13" W001°26'43", thence a straight line joining the points:

- N52°25'39" W001°25’54”
- N52°26'51" W001°25’10”
- N52°26'48" W001°16’18”
- N52°22'12" W001°18’28"
- N52°22'11" W001°14’13”
- N52°20'03" W001°14’14”
- N52°20'29" W001°18’40”
- N52°20'46" W001°20’16”
- N52°23'11" W001°19’49"
- N52°25'43" W001°19’01”
- N52°26'19" W001°20’30”
- N52°26'17" W001°24’44”
- N52°25'30" W001°25’06”
- N52°25'10" W001°25’25"
- N52°24'50" W001°26’20”
- N52°25'13" W001°26'43"

The vertical dimensions of TDA 1, Option 2 would be:

- Lower Limit: SFC
- Upper Limit: 800ft AMSL

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2.4 TDA 2

Since it is a smaller area and does not have the same scale of potential waypoint numbers to identify it as exists for TDA 1, there is only one proposed option for TDA 2 currently presented, (see Figures 7 & 8).

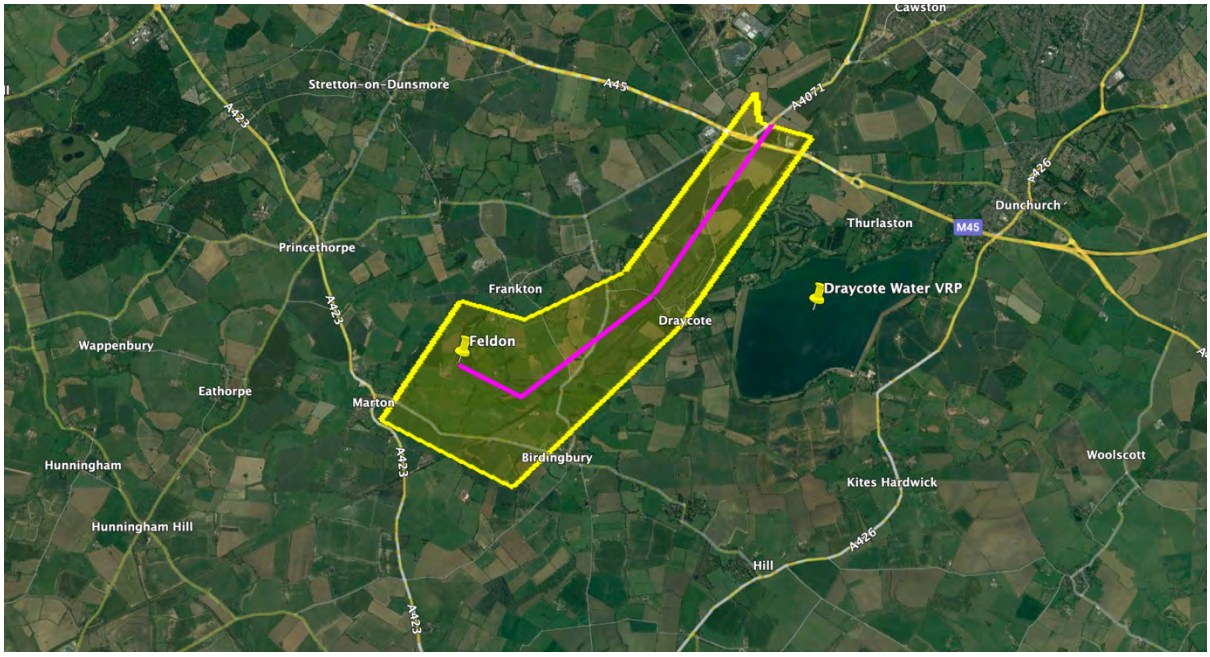

Figure 7: TDA 2

Figure 8: TDA 2 (on Topographical Air Chart 1:250 000)

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The lateral dimensions of TDA 2 would start at a point located at N52°19'38" W001°23'13" thence a straight line joining points:

- N52°19'31" W001°22'34"
- N52°19'49" W001°21'32"
- N52°20'56" W001°20'11"
- N52°20'45" W001°20'08"
- N52°20'39" W001°19'36"
- N52°19'29" W001°20'55"
- N52°18'27" W001°22'41"
- N52°18'52" W001°24'03"
- N52°19'38" W001°23'13"

The vertical dimensions of TDA 2 would be:
- Lower Limit: SFC
- Upper Limit: 800ft AMSL

3. Relationship to Other Airspace Structures and Areas of Manned Aviation Activity

3.1 Airspace Notes

- The proposed TDAs are wholly within Class G airspace.
- The western portion of TDA 1 (both options) is in proximity to Birmingham CTA (Class D) which has a Lower Limit (LL) of 2000' AMSL (see Figure 9) but is not overlayed by it. The design of the proposed options for TDA 1 ensure maximum practical separation from this portion of CTA by departing north-eastwards and achieving a minimum 3nm separation from this airspace as soon as practicable. Co-ordination with Birmingham ATC will form an important aspect of managing UAV activity whilst operating within 3nm of this Class D airspace and it is envisaged that an appropriate LOA would be established prior to the final ACP submission.
- The southern portion of TDA 2 is overlayed by Birmingham CTA (Class D) airspace which has a LL of 3500' AMSL (see Figure 10). The vertical buffer between the UL of the TDA and the LL of CTA is 2,700' and therefore it is not considered to be in such proximity that operations in this area require specific co-ordination with Birmingham ATC.
- Birmingham Airport (EGBB) lies approximately 11nm northwest of Coventry Hospital.

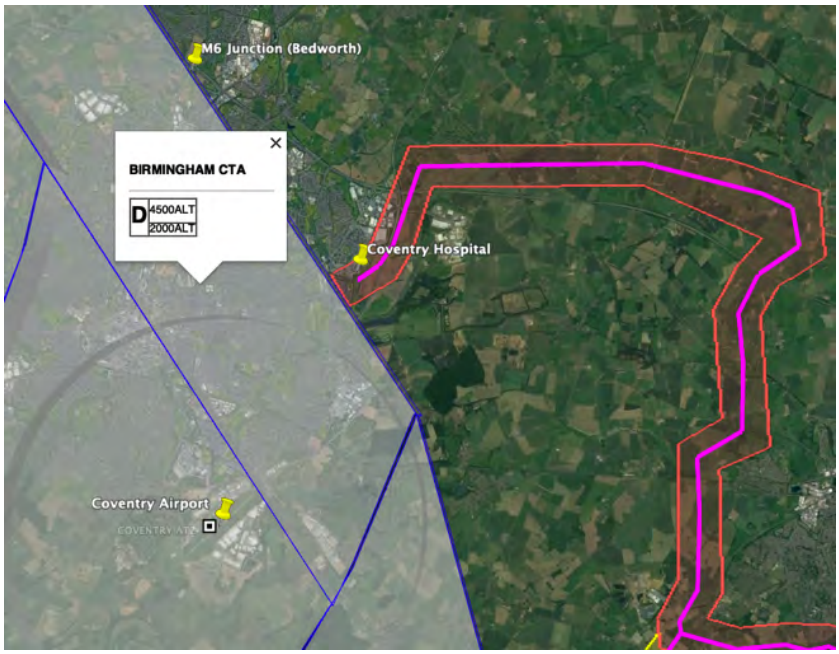

Figure 9: Birmingham CTA and TDA 1

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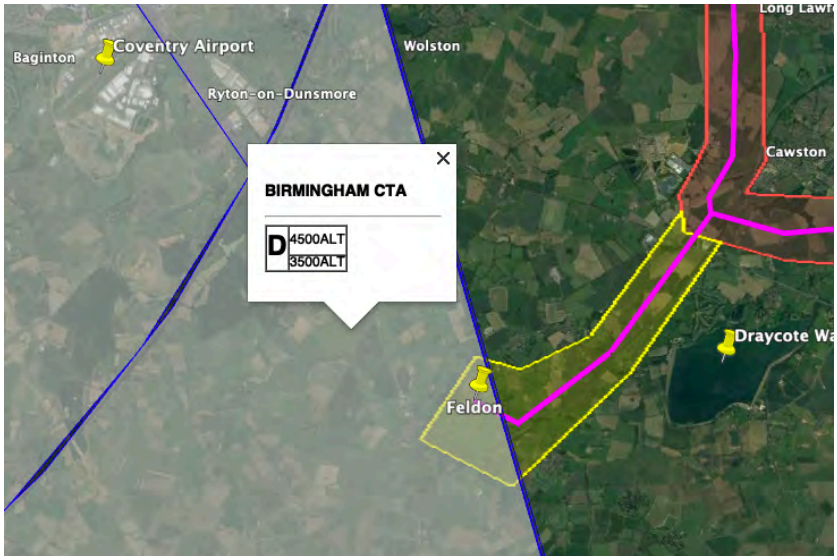

Figure 10: Birmingham CTA and TDA 2

3.2 Coventry Airport (EGBE) Notes

- Coventry Airport has an elevation of 267' AMSL and is overlayed by Birmingham CTA (Class D) airspace which has a LL of 1500' AMSL (see Figure 11).
- The Coventry ATZ covers a circle, having a 2.5nm radius and an UL of 2000' AAL (see Figure 12).
- Circuits on Rwy 05/23 are normally conducted to the southeast (see Figure 12).
- The fixed wing circuit height is 1260' AMSL
- The helicopter circuit height is 967' AMSL
- Visual Reference Points (VRP) are: Draycote Water (N52 19.57 W001 23.07) and Southam (N52 16.53 W001 23.07) (see Figure 13). Draycote Water VRP is normally used by aircraft arriving with Rwy 23 in use, and potentially, for aircraft departing when Rwy 05 is in use. Southam VRP is normally used by aircraft arriving when Rwy 05 is in use, and potentially, for aircraft departing when Rwy 23 is in use.
- The airport's opening hours (as published in October 2021) are:
    - Tuesday – Saturday 08:00Z-16:00Z (09:00-17:00BST).
    - Helimed traffic operating hours commence 30 minutes earlier at 08:30Z.
    - Sunday and Monday closed.
    - Outside the stated opening hours, individually approved flights are possible.

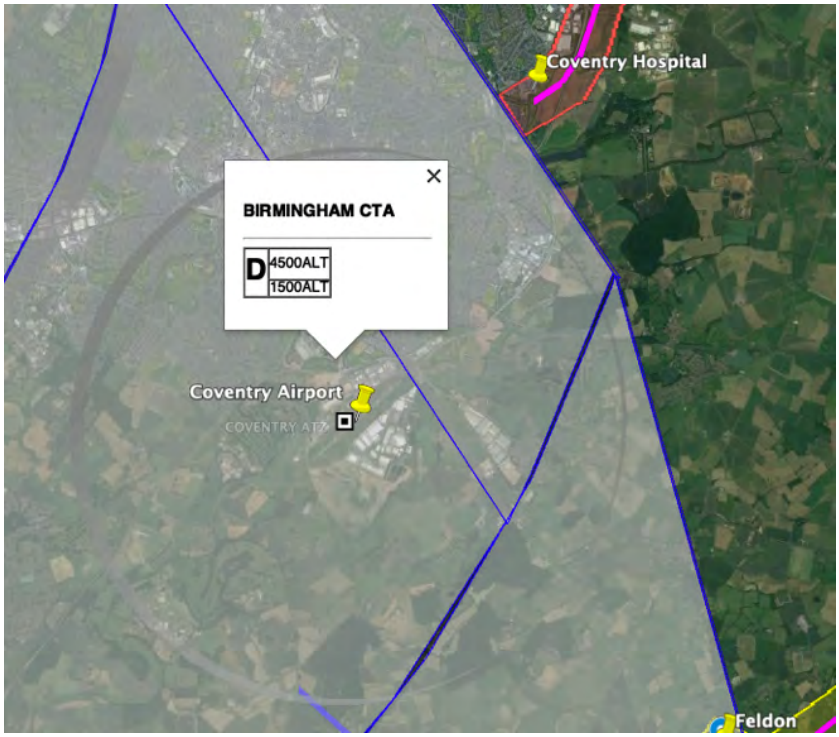

Figure 11: Coventry airport and Birmingham CTA

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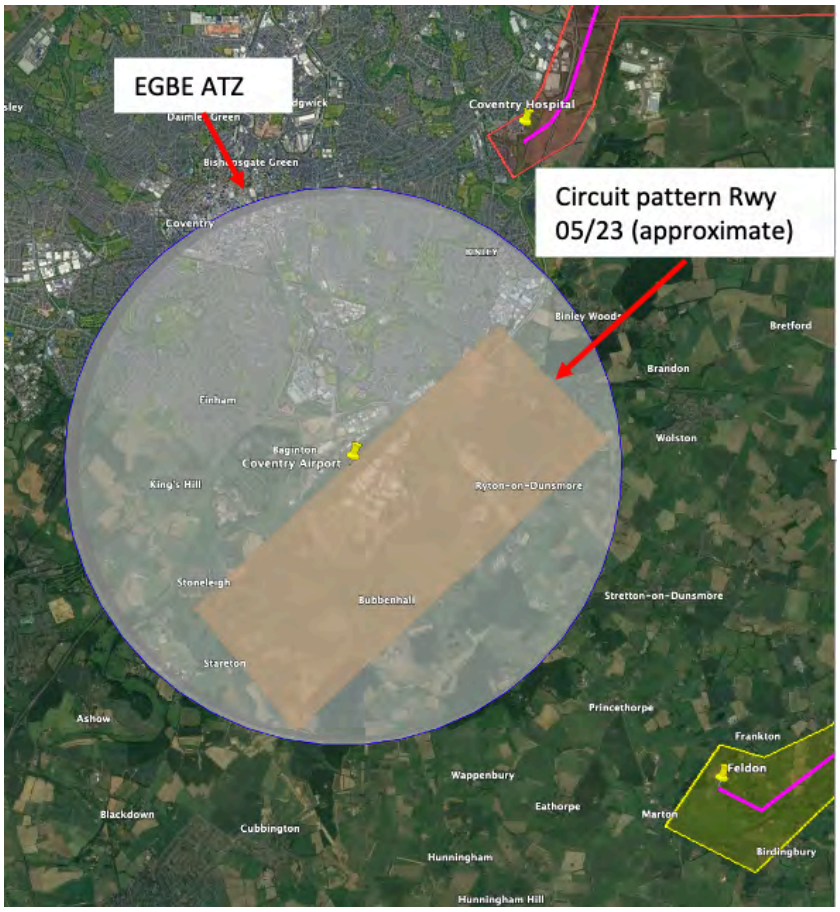

Figure 12: Coventry Airport ATZ and approximate circuit area

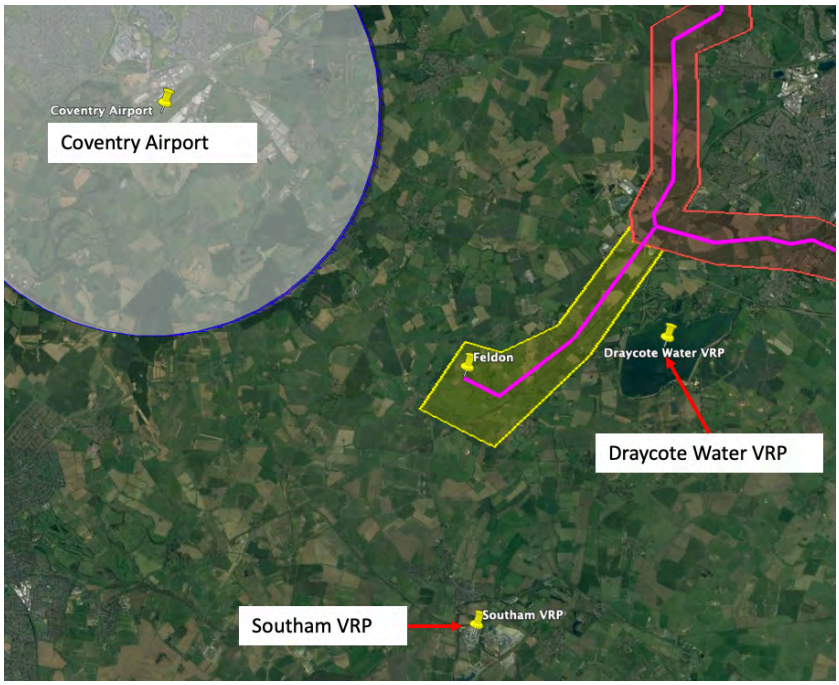

Figure 13: EGBE VRPs

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3.3 Relationship between TDAs and EGBE VRPs

3.3.1 Draycote Water VRP to/from EGBE

- TDA2: The route Draycote Water VRP to/from EGBE crosses TDA 2 (see Figure 14). Operating along this route, terrain encountered shortly after Draycote Water (and in TDA 2), has an elevation of approximately 360' AMSL. Given a TDA UL of 800' AMSL, an aircraft would need to be operating below 440' AGL in order to be affected by the TDA. Fixed wing aircraft inbound the EGBE approximately at the circuit height (at 1200' AMSL) would cross the TDA with a 400' vertical buffer. Rotary wing aircraft inbound the EGBE approximately at the circuit height (960' AMSL) would cross the TDA with a 160' vertical buffer.
- TDA 1 (both options): This TDA is separated laterally from the route by 0.7nm and vertically as per TDA 2 described above.

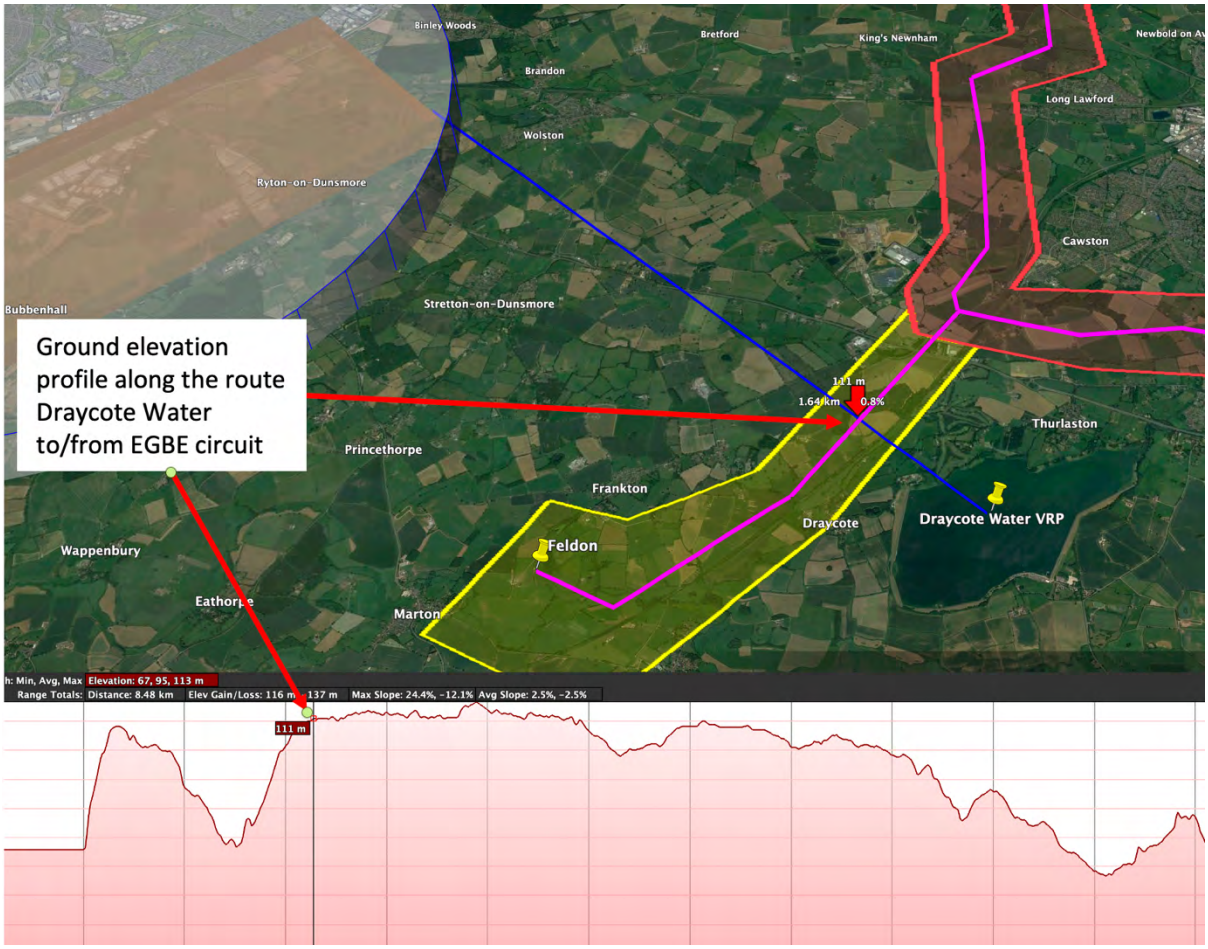

Figure 14: Draycote Water VRP to/from EGBE

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3.3.2 Southam VRP to/from EGBE

The route Southam VRP to/from EGBE is separated laterally from TDA 2 by 1.9nm and from TDA 1 (both options) by 4.5nm (see Figure 15).

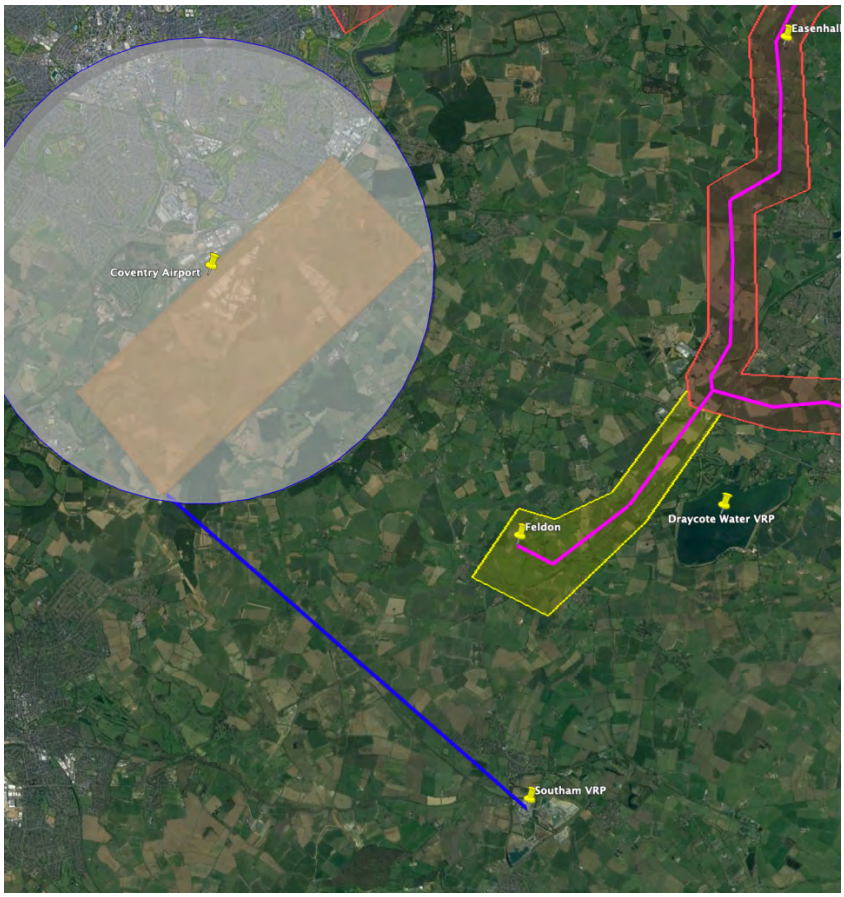

Figure 15: Southam VRP to/from EGBE

3.4 Relationship between TDA 1 and aircraft on the extended centreline of EGBE Rwy 05/23

3.4.1 Arrivals onto runway 23

All airspace that forms TDA 1 (both options) would be outside of the 'approach surface'[1] related to arrivals to Rwy 23 based on a standard 2.5% slope and a divergence of 10% each side of the inner edge, which extends 3000m from the inner edge[2] (see Figure 16).

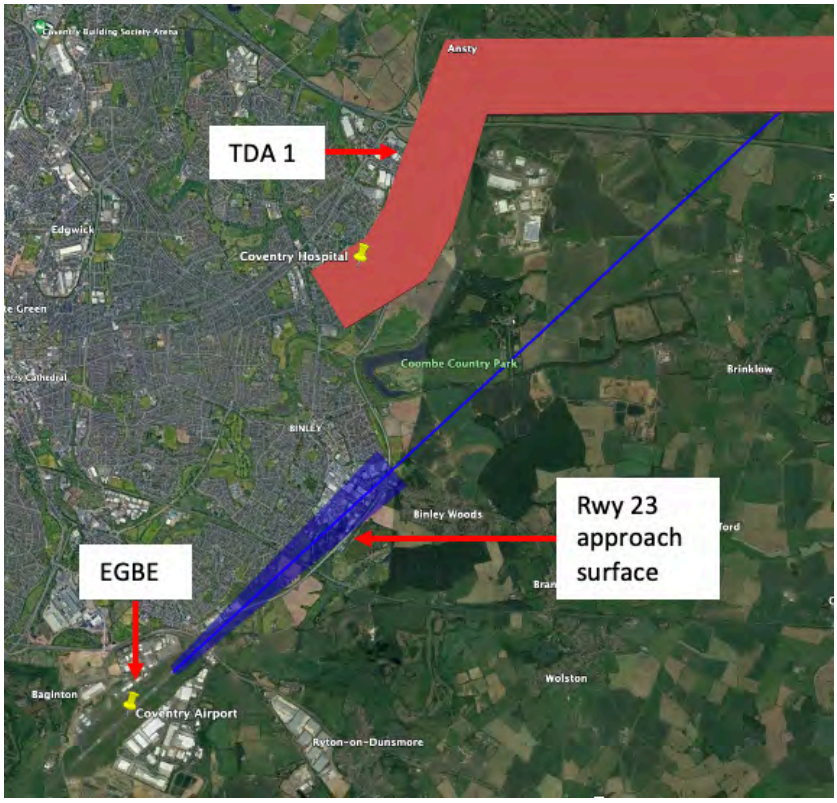

Figure 16: Rwy 23 approach surface

With regard to manned aircraft approaching Rwy 23 along the extended centreline (see Figure 17), the following would apply:

- Vertical Separation:
    - TDA 1 (both options) crosses the extended Rwy 05/23 centreline at 5.6nm at its closest point. For an aircraft on a 3-degree glidepath, this equates to an altitude of 2,050' AMSL. With an UL of 800' AMSL, a vertical buffer of 1,250' would exist between the UL of TDA 1 and an aircraft on the glideslope.
    - Terrain in this area has an elevation of approximately 390'. Given a TDA UL of 800' AMSL, an aircraft would need to be operating below 410' AGL at 5.6nm from the Rwy 23 threshold, in order to be affected by the TDA in this area.

[1] An approach surface is an inclined plane or combination of planes preceding the threshold. It is established for each runway direction intended to be used for the landing of aircraft for the purpose of establishing an obstacle limitation surface (OLS). The purpose of the OLS is to define the airspace around aerodromes that is to be maintained free from obstacles to permit operations at the aerodromes to be conducted safely.
[2] Based on CAP 168 'Licensing of Aerodromes', Issue 11.

- Horizontal separation:
    - The western portion of TDA 1 (both options) is separated from the extended centreline of Rwy 05/23 by approximately 14 degrees (approximately 0.8nm) at its closest point, which is at 3.2nm from the threshold of Rwy 23. An aircraft on a normal 3-degree glidepath would be at approximately 1280' AMSL (which represents a vertical buffer, in addition to the horizontal one, of 480' (see Figure17)). The terrain encountered in this area, has an elevation of approximately 260' AMSL. Given a TDA UL of 800' AMSL, an aircraft would need to be operating below 540' AGL at 3.2nm from the Rwy 23 threshold, and be displaced from the runway centreline by more than 14 degrees, for it to be affected by the TDA.

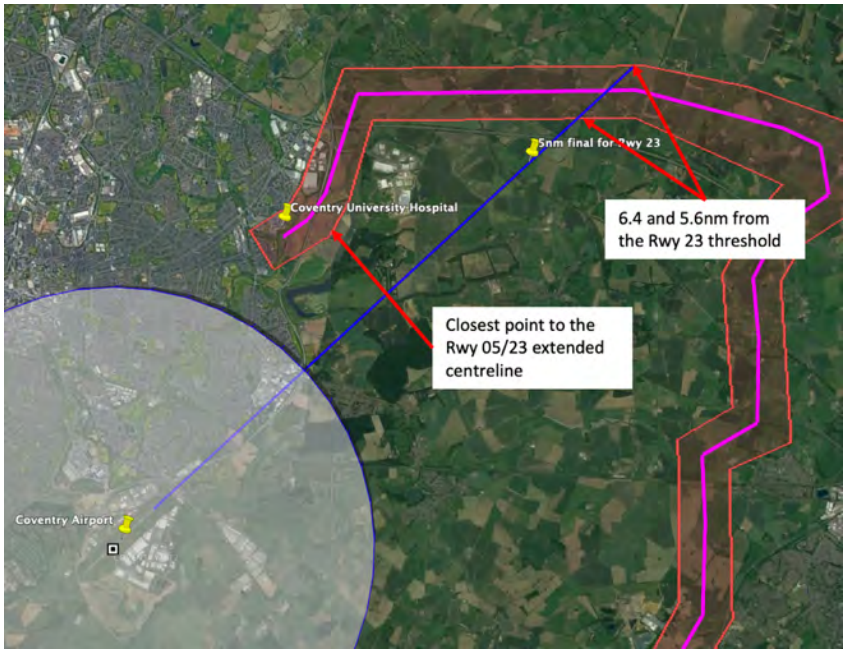

Figure 17: Extended centreline of Rwy 05/23

3.4.2 Departures from Runway 05

All airspace that forms TDA 1 (both options) would be either outside of, or below, the 'take-off climb surface'[3] related to departures from EGBE Rwy 05 based on a standard 2% slope and a divergence of 10% each side of the inner edge[4] (see Figures 18 & 19).

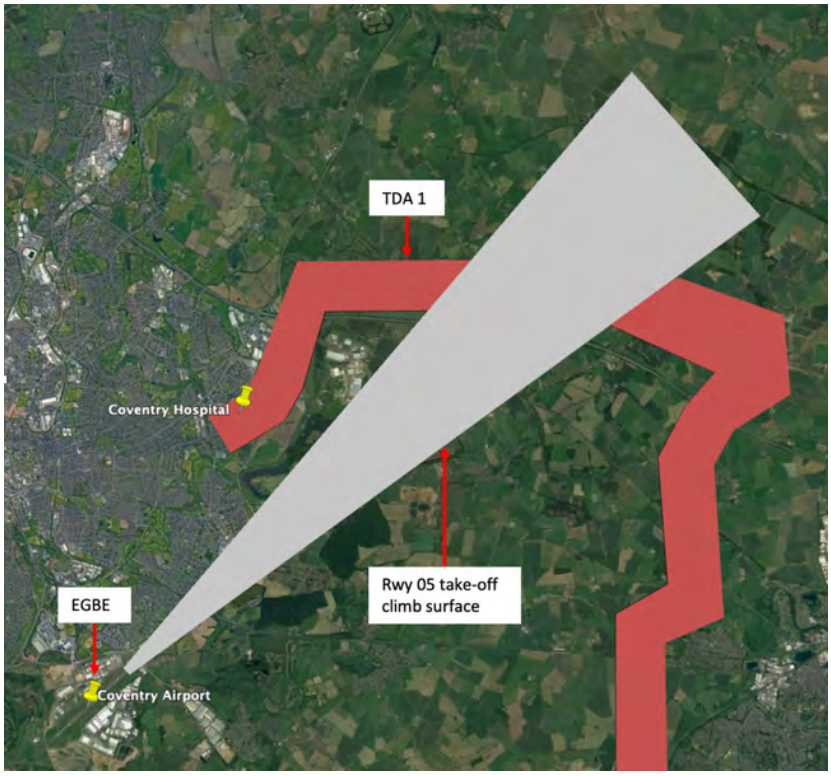

Figure 18: Rwy 05 take-off climb area along the extended centreline

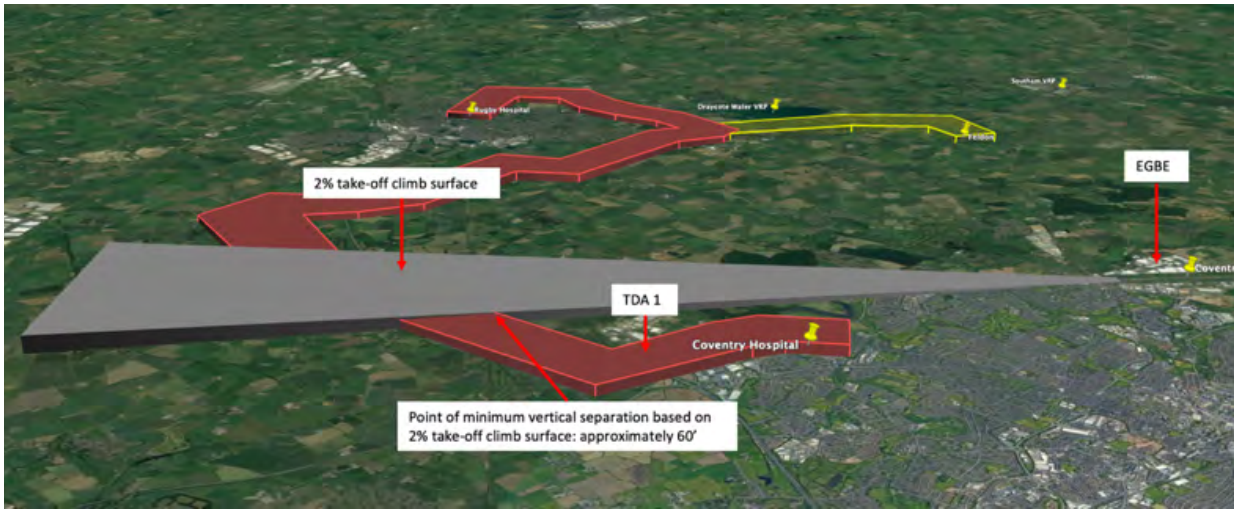

Figure 19: Separation with Rwy 05 take-off climb surface with a 2% gradient

[3] A take-off climb surface is an inclined plane located beyond the end of the take-off run available or the end of the clearway where one is provided and is established for each runway direction intended to be used for take-off. It is used in the obstacle assessment process for licenced aerodromes as part of the area which is 'safeguarded' from incursion by obstacles.

[4] Based on CAP 168 'Licensing of Aerodromes', Issue 11.

Using a minimum climb performance figure for a typical GA aircraft of at least 200'/NM (3.3%), and using the same dimensions as the take-off climb surface, the minimum separation for an aircraft on departure from runway 05, to the TDA UL would be approximately 400' (see Figure 20).

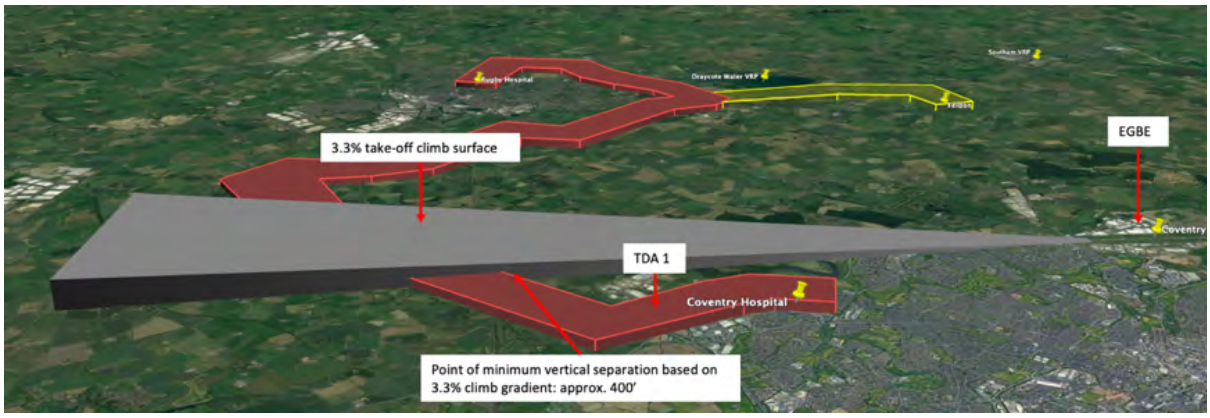

Figure 20: Separation with Rwy 05 take-off climb surface with 3.3% gradient

3.5 Relationship between TDA 1 and EGBB VRPs

The M6 Junction (Bedworth) VRP for Birmingham lies approximately 3nm to the northwest of the western portion of TDA 1 (both options) (see Figure 21). Manned VFR traffic may be anticipated to use this VRP particularly for arrival routing into Birmingham. An anticipated scenario would involve VFR traffic arriving from the southeast and maintaining an altitude below 2,000' in order to remain clear of the Birmingham Class D airspace as they overfly the Bedworth VRP. The terrain elevation at the VRP is 330' AMSL. Given a TDA UL of 800' AMSL, an aircraft would need to be operating below 470' AGL in order to be affected by the TDA in this area.

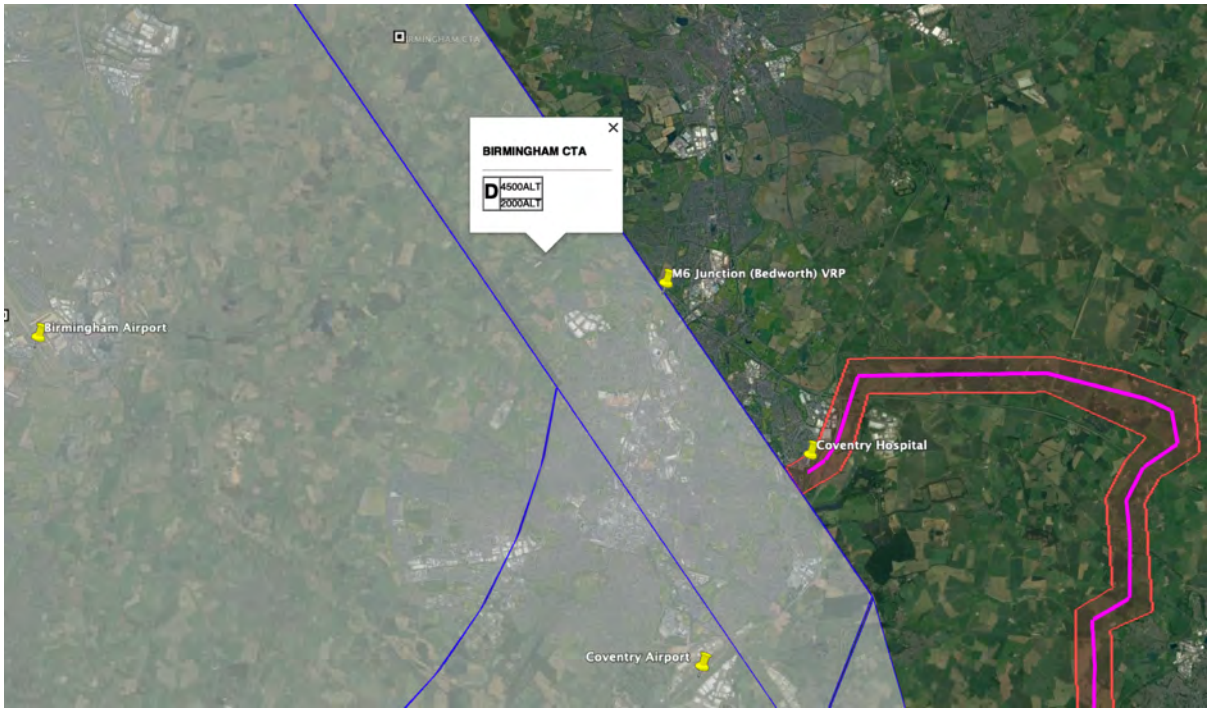

Figure 21: M6 Junction (Bedworth) VRP

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3.6 Relationship between manned aircraft traffic operating in the general area of the TDAs

Terrain elevations in the vicinity of the TDAs range from approximately 230' AMSL to 450' AMSL. With TDA ULs proposed at 800' AMSL, manned aircraft traffic would need to be operating between approximately 350' AGL and 570' AGL before the UL of the TDAs would be encountered.

3.7 Minimum meteorological criteria

In order to ensure manned aircraft operating under VFR are not compelled by meteorological conditions to operate at or below the TDA UL whilst a UAV is airborne, Skyfarer proposes the following minimum meteorological criterion for UAV flights to take place within TDAs that have already been activated by NOTAM:

- EGBB TAF does not forecast cloud greater than 4 octas cloud below 1,500'; and
- the most recent EGBB METAR prior to UAV flights commencing does not show greater than 4 octas cloud below 1,500'.

Where possible, the TDA's would not be activated by NOTAM for use where longer range forecasts (greater than 24 hours) indicate that the minimum meteorological criteria stated above would be unlikely to be available.

4. Impact on flight paths below 7000' and over inhabited areas

There would be little or no impact on the volume of air traffic flying below 7000' and over inhabited areas. This is due to the following reasons:

- The TDA Upper Limits are 800' AMSL therefore it is only low-level traffic that would need to change flight paths and the majority of aircraft below 7000' can overfly the TDAs
- TDA activation would not preclude the operation of low-level emergency services operators since UAV operations would be suspended when required.
- The TDAs are predominantly over rural areas.

5. Dates and Hours of Activation

The proposed TDAs would be available from 15 October 2022 for a maximum of 90 days in order to conduct the demonstration flights and provide flexibility for interruptions e.g. due to weather or priority manned aircraft traffic.

The maximum number of activations within the TDA availability period would be capped at:

- For TDA 1: a maximum of 45 activations.
- For TDA 2: a maximum of 45 activations.

The specific dates for activation are weather dependent and therefore cannot be specified here, however promulgation would be via NOTAM with at least 24 hours' notice.

The hours of activation are also weather dependent. However, the following range of times would be applied:

- For TDA 1: any time within a 24-hour period.
- For TDA 2: only outside of Coventry Airport's published hours of operation.

The maximum activation periods for both TDAs would be limited to:

- For TDA 1, a maximum of 1 hour 30 minutes if any portion of the activation period is within Coventry Airport's published hours of operation.
- For TDA 1 and TDA 2, a maximum of 6 hours where the entire activation period is outside Coventry Airport's published hours of operation.

6. Airspace Management

The TDAs would be promulgated via AIC and activated as and when required via NOTAM (with a minimum of 24 hours' notice) in accordance with Section 5 above.

An Air Navigation Service Provider (ANSP), yet to be defined, would provide a Danger Area Activity Information Service (DAAIS) on a VHF frequency. The details of the ANSP and frequency to be used will be promulgated to stakeholders as soon as the specifics have been finalised (and prior to the end of the engagement period).

The DAAIS will, in addition to providing TDA activation times, be able to advise manned aircraft if a UAV is airborne within the TDAs, in real time, since they would be in continuous contact with the UAV's remote pilot.

Information on the TDA will also be available from the TDA controlling authority (Skyfarer) by phone on 07877946928.

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Website: www.skyfarer.co.uk

7. Known Issues

Skyfarer previously proposed TDA options in support of the NHS demonstration flights described in the Statement of Need for ACP 2021-038. Based on the stakeholder feedback received during the formal engagement period for ACP 2021-038, Skyfarer identified issues of concern to stakeholders. The main issues raised, and ways in which Skyfarer are seeking to address those issues in this application, are presented below.

7.1 Proximity to Coventry airport: effects on manned aircraft traffic to/from Coventry airport and continuity of operations at Coventry Airport

In order to minimise any potential effects of the proposed TDAs to manned aircraft traffic operating to/from Coventry airport, and the continuity of airport operations, the following design aspects/mitigations have been incorporated:

a) TDA 1 & TDA 2 have an upper limit of 800' AMSL (approximately 260' – 570' AGL within the TDA volumes) in order to ensure manned aircraft can safely overfly the TDA during normal operations (i.e. to establish vertical separation); and
b) TDA 1 and TDA 2 would only be in use when the forecast cloud base is such that manned aircraft are not required to operate at low level in order to maintain flight in accordance with Visual Flight Rules (VFR) (i.e. to facilitate vertical separation); and
c) in order to minimise potential effects to manned aircraft operating on the Draycote Water VRP – EGBE route, TDA 2 would only be activated outside Coventry Airport's published hours of operation (i.e. to establish temporal separation as far as reasonably practical); and
d) in order to minimise potential effects to manned aircraft operating on the extended centreline of Rwy 05/23, TDA 1 is designed to avoid the extended centreline as far as reasonably practicable and only crosses it at 5.6nm from the threshold of Rwy 23 (i.e. to establish vertical and horizontal separation); and
e) to promulgate periods of activation by NOTAM with at least 24 hour's notice (i.e. to provide awareness for manned aircraft planning flights in the area); and
f) establish a DAAIS staffed by suitably qualified personnel (i.e. to provide awareness for manned aircraft either planning flights in the area or already inflight); and
g) limit the time of TDA 1 activation during Coventry Airport operating hours to 1 hour 30 minutes (i.e. to minimise exposure).

7.2 Proximity to Birmingham CTA

7.2.1 Potential funnelling effects

In order to minimise the potential for funnelling effects due to the proximity of TDA 1 to Birmingham CTA (especially with regard to the Class D airspace highlighted in Section 3.1 with a LL of 2,000' AMSL), the following design aspects/mitigations have been incorporated:

a) The proposed option is designed to achieve separation greater than 3nm with the Class D LL2000' block in the shortest practicable distance; and
b) The UL of the proposed options for TDA 1 are as low as reasonably practical i.e. 800' AMSL; and
c) use of minimum meteorological criterion for UAV operations so as not to conflict with VFR traffic which may require low level operations due to the stress of weather; and
d) Skyfarer are seeking stakeholder input in order to identify specific areas of concern to stakeholders as part of the engagement process (as described in Section 9).

7.2.2 The proposed TDA 1 does not meet all aspects of the CAA Special Use Airspace – Safety Buffer policy for airspace design purposes

Since it is not possible to design TDA 1 in such a way as to allow for BVLOS operations to/from the take-off/landing area near to Coventry hospital and also meet all requirements of the CAA's buffer policy, a dispensation from the policy is sought based on the provision within the policy for such dispensations. Mitigations proposed by Skyfarer include the following:

a) The proposed options for TDA 1 are designed to achieve separation greater than 3nm with the Class D LL2000' block in the shortest practicable distance (i.e. to establish horizontal separation as far as reasonably practicable); and
b) limiting UL of the TDA to 800' AMSL (i.e. to establish as much vertical separation as is reasonably practicable); and
c) Skyfarer will seek to establish a LOA with Birmingham CTA which establishes adequate communication, notification and safety procedures in case of emergency (i.e. to achieve positive ATC management of potentially hazardous activities); and
d) the use of internal safety buffers for the activities (i.e. separation between the intended flight path and the TDA volume boundaries (horizontal and vertical) of the TDA).

7.3 Ensuring priority access for Emergency Service Operators (ESO)

Skyfarer's intention is to always prioritise ESOs and will seek to achieve this through:

a) Establishing LOAs with key stakeholders prior to the final submission of the application in order to define how prioritisation of their operations will be assured safely (i.e. establish procedural separation); or
b) restricting TDA activation periods to those outside the main ESO operating hours (i.e. establishing temporal separation).

7.4 Minimising the airspace requested

In order to minimise the airspace requested, Skyfarer has taken the following actions:

a) Limited the vertical extent, the UL, to a value as low as reasonably practicable in order to conduct the UAV operations safely i.e. with due consideration for the minimum operating height required for the UAV in order to provide the necessary obstacle clearance; and the provision of a safety buffer between the planned operating height and the UL of the TDA (i.e. minimising volume); and
b) since it is not possible to define the UL as an Above Ground Level (AGL) value (according to CAA requirements), the lowest possible AMSL value has been used. The UL value takes into consideration the different terrain elevations along the route (i.e. minimising volume); and
c) prepared two options for TDA 1 in order to address the conflicting goals of airspace minimisation and complexity of airspace definition (i.e. the number of waypoints required) (i.e. minimising volume); and
d) minimising the number of TDA activations, the time of day for activations and the period of activation (i.e. minimising the time the TDAs would be active); and
e) Skyfarer are seeking stakeholder input in order to identify stakeholder preferences with regard to points c) and d) above (as described in Section 9).

8. Safety Considerations

All BVLOS operations conducted by Skyfarer are subject to assessment and approval by the CAA who, amongst other considerations, review Skyfarer's Operating Safety Case. The safety case

includes provision for 'buffers' between the limits of the UAV's flight path and the TDA volume boundary in order to ensure that the UAV is contained within the TDA under all circumstances and does not pose a risk to other airspace users. Skyfarer is an established unmanned aircraft operator and will have conducted multiple BVLOS operations (at other locations) prior to the operations described in this ACP.

In addition to the use of a TDA airspace structure and its associated NOTAM and DAAIS provisions, all Skyfarer's UAVs will be equipped with CAA approved ADS-B out in order to improve their electronic conspicuity for manned aircraft which are suitably equipped.

9. Stakeholder Engagement

As part of this change request Skyfarer are engaging with aviation stakeholders (airspace users, air navigation service providers and aerodromes) on the safety and operational viability of the proposed TDAs. We welcome your comments, observations or questions with regard to safety and operational viability.

Without prejudice to any other considerations, we also seek your feedback on the following specific questions:

a) Would you consider TDA 1 Option 1 or TDA 1 Option 2 preferable?
b) Would you consider that shorter TDA activation periods (but a greater frequency of activation) would be preferable to the proposed activation schedule?
c) Would you consider that longer TDA activation periods (but a lesser frequency of activation) would be preferable to the proposed activation schedule?
d) Are you aware of any specific routes or areas which you think may pose a problem with regard to potential 'funnelling' effects to manned aircraft traffic due to the proposed TDA design and how it interacts with other airspace structures, and if so, where, when and why?

Where possible, it would be greatly appreciated if comments could be as specific as possible in order to facilitate any redesign to the proposed TDA options which may be necessary prior to finalising the proposed TDAs.

9.1 Stakeholder Identification

Skyfarer has sought to identify all aviation stakeholders who might be impacted positively or negatively by the proposed changes. They are shown in Appendix A.

Identified stakeholders are encouraged to inform Skyfarer if they are aware of any additional aviation stakeholders that they consider relevant, who are not already identified in Appendix A.

9.2 Engagement Period

9.2.1 Initial engagement period

Skyfarer has conducted a formal stakeholder engagement over engagement over a period of 14 weeks (a 12 week formal engagement period plus an additional 2 weeks since part of the engagement timeline will be over the Christmas and New Year period).

The initial formal engagement period commenced on 19 November 2021, and ended on 22 February 2022.

9.2.2 Additional engagement period

Due to the change in the proposed TDA activation start and end dates, Skyfarer are conducting additional stakeholder engagement to seek input regarding any potential issues which may arise due to the changed activation period. Since there are no other changes to the ACP, a 3-week engagement period has been selected as proportionate to the scope of the changes introduced. The additional engagement period commenced 11 May 2022, concluding 01 June 2022.

9.3 How to Respond

All identified stakeholders will receive this document via email or be notified by phone. It will also be publicly available on the CAAs Airspace Change Portal at:
https://airspacechange.caa.co.uk/PublicProposalArea?pID=384

Please provide any feedback, questions or comments before the end of the formal engagement period, either by:

- sending them to the following email address: TDA@skyfarer.co.uk ; or
- via the online survey accessed at: https://forms.office.com/r/V1RQ0JmXxP.

If you would like to arrange a meeting with the change sponsor, Skyfarer, during the engagement period in order to discuss any issues in more depth, please contact Skyfarer, initially via the above email.

Please note that all responses will be included in the subsequent report and made publicly available (with personal contact details of the respondent redacted).

9.4 Post Engagement

With regards to next steps at the completion of the engagement period:

- Skyfarer, as the change sponsor will review responses and produce a report summarising the results of this engagement activity. This report will be made available to the CAA as part of their decision process and will also be published on the CAAs Airspace Change Portal.
- If the TDA proposal is approved, Skyfarer will collate, monitor and report to the CAA on the level and content of related complaints/feedback once TDA has been implemented.

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Appendix A: List of Stakeholders

Organisation/party	Contact method	Reason for Engagement
AIRPORTS with an ATZ or CTZ within 30nm		
Birmingham Airport	[redacted]	Operator of nearby aerodrome
Coventry	[redacted]	Operator of nearby aerodrome
Derby Airfield	[redacted]	Operator of TDA aerodrome
East Midlands Airport	[redacted]	Operator of nearby aerodrome
Leicester Airport	[redacted]	Operator of nearby aerodrome
Northampton/Sywell Aerodrome	[redacted]	Operator of nearby aerodrome
Oxford Airport	[redacted]	Operator of nearby aerodrome
Tatenhill Airfield	[redacted]	Operator of nearby aerodrome
Wellesbourne Mountford Airfield	[redacted]	Operator of nearby aerodrome
Wolverhampton Halfpenny Green Airport	[redacted]	Operator of nearby aerodrome
RAF AIRPORTS		
RAF Brize Norton	[redacted]	Operator of nearby aerodrome
RAF Weston on the Green Airport	[redacted]	Operator of nearby aerodrome
RAF Cosford	[redacted]	Operator of nearby aerodrome
AIRFIELDS within 25nm		
Baxterley Airfield	[redacted]	Operator of nearby airfield

Bidford Gliding Site	[redacted]	Operator of nearby airfield
Bromsgrove Airfield (Stoney Lane)	[redacted]	Operator of nearby airfield
Buttermilk Hall Farm Airfield	[redacted]	Operator of nearby airfield
Enstone Airfield	[redacted]	Operator of nearby airfield
Finmere Airfield	[redacted]	Operator of nearby airfield
Feldon Helipad	[redacted]	Operator of nearby airfield
Fisherwick Microlight Site	[redacted]	Operator of nearby airfield
Hinton in the Hedges Airfield	[redacted]	Operator of nearby airfield
Home Farm (Ebrington) Airfield	[redacted]	Operator of nearby airfield
Hook Norton Airfield	[redacted]	Operator of nearby airfield
Measham Cottage Farm Airfield	[redacted]	Operator of nearby airfield
Osbaston Lodge Airfield	[redacted]	Operator of nearby airfield
Overgreen Farm Microlight Site	[redacted]	Operator of nearby airfield
Peter Hall Farm airstrip	[redacted]	Operator of nearby airfield
Pitsford Airfield	[redacted]	Operator of nearby airfield
Rothwell Airfield	[redacted]	Operator of nearby airfield
Shenington Airfield	[redacted]	Operator of nearby airfield
Shotteswell/Banbury Airfield	[redacted]	Operator of nearby airfield

Sittles Farm Airfield	[redacted]	Operator of nearby airfield
Snitterfield Gliding Site	[redacted]	Operator of nearby airfield
Stoke Golding Airfield	[redacted]	Operator of nearby airfield
Thornborough Grounds Airfield	[redacted]	Operator of nearby airfield
Turweston Aerodrome	[redacted]	Operator of nearby airfield
Twycross Airfield	[redacted]	Operator of nearby airfield
Wharf Farm Airfield	[redacted]	Operator of nearby airfield
ANSPs		
Birmingham ATC	[redacted]	ANSP in the region
East Midlands ATC	[redacted]	ANSP in the region
NATS	[redacted]	ANSP in the region
AVIATION OPERATORS / COMPANIES / PILOTS		
Airspeed Aviation Limited (derby Airfield)	[redacted]	Aircraft operator in the region
Babcock Mission Critical Services Onshore	[redacted]	HEMS operator Gloucestershire Airport
Banbury Gliding Club	[redacted]	Gliding club in the region
Bidford Gliding and Flying Club	[redacted]	Gliding club in the region
BIH Onshore (Birmingham Airport)	[redacted]	Helicopter operator in the region
Bristow Helicopters	[redacted]	SAR operator

	[redacted]	
Derbyshire, Leicestershire & Rutland Air Ambulance (DLRAA)	[redacted]	Emergency Services Operator in the region
Derby Aero Club and Flying School	[redacted]	Flight training school and aero club in the region
Enstone Flying Club	[redacted]	Flight training school in the region
GB Helicopters	[redacted]	Helicopter operator
Go Fly Oxford	[redacted]	Flight training school and aero club in the region
H. Cook	[redacted]	Requested information on previous ACP – Microlight pilot
Heliair	[redacted]	Pipeline patrol operator
Helicentre	[redacted]	Pipeline patrol operator
Hinton Skydive Centre	[redacted]	Skydive centre in the region
Kevin Walton	[redacted]	Requested information on previous ACP
Leicestershire Aero Club	[redacted]	Flying training school and aero club in the region
Leicestershire Microlight Aircraft Club	[redacted]	Microlight Club in the region
National Police Air Service	[redacted]	Police operator
PDG Helicopters	[redacted]	Network Rail operator
Rowan Smith	[redacted]	GA pilot, submitted comments on previous ACP
Sean Walters	[redacted]	Requested information on previous ACP - Pilot and aircraft owner operating from a non-identified private airstrip in Warwickshire
Shenington Gliding Club	[redacted]	Gliding club in the region

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SkyHarbour	[redacted]	MRO in the region
Specialist Aviation Services	[redacted]	Children`s Air Ambulance/HEMS operator Gloucestershire Airport
Stratford on Avon Gliding Club	[redacted]	Gliding club in the region
Tatenhill Aviation	[redacted]	Flying training school and aircraft maintenance organisation in the region
The Gliding Centre (Husbands Bosworth Airfield)	[redacted]	Glider operator in the region
The Microlight School Ltd (Fisherwick Microlight Site)	[redacted]	Flying training school in the region
Warwickshire & Northamptonshire Air Ambulance (WNAA)	[redacted]	Emergency Services Operator in the region
Western Power	[redacted]	Powerline Patrol operator
Coventry Airport Operators		
Aeros (Flight training & MRO)	[redacted]	Flying training school and aircraft maintenance organisation in the region
Aerotech Aircraft Maintenance	[redacted]	Aircraft maintenance organisation in the region
Almat Flying Academy (Flight training)	[redacted]	Flying training school in the region
Cat3C (Flight training)	[redacted]	Flying training school in the region
Coventry Aeroplane Club (Flight training)	[redacted]	Flying training school and aero club in the region
Helioride (Flight training)	[redacted]	Flying training school in the region
Midland Air Training (Flight training)	[redacted]	Flying training school in the region

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Patriot Aviation (MRO)	[redacted]	Aircraft maintenance organisation in the region
Sloane Helicopters	[redacted]	HEMS operator Coventry Airport
Tenencia Aerospace Design (MRO)	[redacted]	Aircraft maintenance organisation in the region
MOD / MILITARY		
DAATM	[redacted]	Military aviation
Defence UAS Capability Development Centre	[redacted]	Military aviation
Military Aviation Authority (MAA)	[redacted]	Military aviation
National Air Traffic Management Advisory Committee (NATMAC) members		
Airspace4All	[redacted]	A joint undertaking between Sports and Recreational Aviation, Military Aviation and Other Aviation stakeholders & NATMAC member
Airport Operators Association (AOA)	[redacted]	National Airport association & NATMAC member
Aircraft Owners and Pilots Association (AOPA)	[redacted]	National GA association & NATMAC member
Airfield Operators Group (AOG)	[redacted]	National GA airfield operator's association & NATMAC member
Airspace Change Organising Group (ACOG)	[redacted]	Co-ordinators of airspace change program & NATMAC member
Association of Remotely Piloted Aircraft Systems UK (ARPAS-UK)	[redacted]	National association representing UAS operators & NATMAC member

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Aviation Environment Federation (AEF)	[redacted]	National NGO campaigning on aviation's impacts for people and the environment & NATMAC member
BAe Systems	[redacted]	NATMAC member
British Balloon and Airship Club	[redacted]	National association representing ballooning stakeholders and NATMAC member
British Business and General Aviation Association (BBGA)	[redacted]	National GA association and NATMAC member
British Gliding Association (BGA)	[redacted]	National association representing gliding stakeholders and NATMAC member
British Helicopter Association (BHA)	[redacted]	National association representing helicopter operator stakeholders and NATMAC member
British Hang Gliding and Paragliding Association (BHPA)	[redacted]	National association representing sport aviation stakeholders and NATMAC member
British Microlight Aircraft Association (BMAA) / General Aviation Safety Council (GASCo)	[redacted]	National association representing sport aviation stakeholders and NATMAC member
British Model Flying Association (BMFA)	[redacted]	National association representing model aircraft stakeholders and NATMAC member
British Skydiving	[redacted]	National association representing skydiving stakeholders and NATMAC member
Drone Major	[redacted]	NATMAC member
General Aviation Alliance (GAA)	[redacted]	National association representing GA stakeholders and NATMAC member
Guild of Air Traffic Control Officers (GATCO)	[redacted]	National association representing air traffic control stakeholders and NATMAC member
Honourable Company of Air Pilots (HCAP)	[redacted]	National association representing GA pilot stakeholders and NATMAC member

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Helicopter Club of Great Britain (HCGB)	[redacted]	National association representing private helicopter owner and pilot stakeholders and NATMAC member
Iprosurv	[redacted]	NATMAC member
Light Aircraft Association (LAA)	[redacted]	National association representing light aircraft stakeholders and NATMAC member
PPL/IR (Europe)	[redacted]	NATMAC member
PPL/IR (Europe)	[redacted]	Relevant body for Airprox analysis in the UK NATMAC member
UK Airprox Board (UKAB)	[redacted]	National body representing commercial aviation stakeholders and NATMAC member
UK Flight Safety Committee (UKFSC)	[redacted]	National body representing commercial aviation stakeholders and NATMAC member

Appendix B: Letters of Support

NHS
University Hospitals
Coventry and Warwickshire
NHS Trust

University Hospitals Coventry and Warwickshire
Clifford Bridge Road
Walsgrave
Coventry
CV2 2DX

15 September 2021

RE: Skyfarer Partnership

We can confirm that University Hospitals Coventry and Warwickshire NHS Trust is supporting Skyfarer to explore use cases related to drone delivery within healthcare. We share Skyfarer's ambition and vision for future transport possibilities. The Innovation Team at UHCW are working closely with Elliot Parnham and his wider team at Skyfarer to explore the feasibility of using unmanned flying vehicles within healthcare, specifically; pathology sample delivery, surgical aides, pharmacy and urgent blood product transportation.

Within our partnership we are, and will continue to, involve all appropriate system partners to ensure that the use cases add value and that any flight trials involving UHCW are conducted safely. Coventry continues to be the city at the heart of transport innovation and we are looking forward to continuing to work with Skyfarer to explore and, one day, realise the potential of this new method of transportation.

Yours sincerely

[redacted]

Professor Andrew Hardy
Chief Executive Officer

Dr Lucy Gilbert
Innovation Lead

Chief Executive Officer: Andrew Hardy Chair: Dame Stella Manzie DBE

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Sunil Budhdeo
Transport Innovation Manager
Transport & Infrastructure
Place Directorate
Coventry City Council
Floor 10, One Friargate
Coventry, CV1 2GN
[redacted]

Date: 11th March 2021

Dear Elliot,

This letter is to confirm that Coventry City Council is committed to supporting Skyfarer LTD in enabling Medical Drone Delivery.

Coventry City Council see's the City of Coventry as being the "home of the drone" and as such greatly values Skyfarer as a vital enabler for urban air cargo transport, as well as Skyfarer's heritage to the City, as individual team members, and as a Coventry Company. We will work with Skyfarer to ensure that the vision of Drone Delivery set out by Skyfarer and verified by Coventry City Council is realised.

We believe this sector is a growth opportunity and see Skyfarer as being a company of significant interest. The future growth opportunity and employment potential for the city will come from innovations in Urban Air Mobility and will come from Skyfarer.

Yours sincerely,

[redacted]

Sunil Budhdeo
Transport Innovation Manager

CS-WHOLE-NOBRE

SKYFARER

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Warwickshire County Council

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5th November 2021

Elliot Parnham
CEO, Skyfarer
5 Whitefriars Street,
Coventry,
West Midlands,
CV1 2DS

Dear Elliott,

Re: Letter of Support for Skyfarer Ltd.

This is to confirm that Warwickshire County Council is supportive of Skyfarer Ltd and its efforts to create a pilot study to demonstrate a commercial market for 'time-critical' medical drone delivery.

Future transport technologies in aerospace and related sectors continue to be an important local industry in Warwickshire, and Coventry is increasingly being seen as the "home of the drone" in the UK. We believe this sector is a growth opportunity for the region and Skyfarer is representative of the type of company we hope to support to set up and grow in the region.

We believe this sector is a growth opportunity and see Skyfarer as being a company of significant interest. The future growth opportunity and employment potential for the county will come from innovations in Urban Air Mobility from companies like Skyfarer.

Warwickshire County Council will work with Skyfarer, Coventry City Council and other partners to support this industry to take off in the region.

Yours sincerely

[redacted]

Councillor Kam Kaur
Portfolio Holder for Economy & Place
Warwickshire County Council

Working for Warwickshire

SKYFARER

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OPERATIONS
West Midlands Police
199 Park Lane
Aston
BIRMINGHAM
B6 5DD

Mr Elliot Parnham
CEO Skyfarer Limited
via email

Telephone: 101
Reference: OPS/KB/AF [redacted]

Date: 4th November 2021

Dear Elliot

TEMPORARY DANGER AREA APPLICATION ACP-2021-057

West Midlands Police are looking forward to working with Skyfarer as you develop your case for a Temporary Danger Area (TDA) between Coventry and Rugby.

It is unlikely that the current use of slow moving, short range drones, operated on a singular basis by a corresponding pilot within a constant line of sight will remain an optimised model for deployment of police drones. A critical enabling factor in unlocking the potential for beyond visual line of sight flights is to work alongside industry. The national police aviation strategy is being developed on a next street, next town and next county basis to deliver police air support differently. Whilst accepting using police drones within a temporarily created restricted airspace is unlikely to be operationally practical, it is important to understand the processes required/safety case within a TDA to develop our approach incrementally to greater freedoms/convergence of other assets within the airspace.

By working with Skyfarer we are committed to developing how the future of flight incorporating police drones will look in the future.

Yours sincerely

[redacted]

Sallie Churchill
Superintendent
Operations