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Leeds Bradford Airport ACP

Proposal for Revised Airspace and Instrument Flight Procedures

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Executive Summary

The Issue

Leeds Bradford Airport (LBA) has identified the need to introduce new Instrument Flight Procedures by reducing reliance on conventional navigational aids that are due to be withdrawn. In addition, the Airport is participating in a wider airspace program known as Future Airspace Initiative (North) (known as FASI North) which aims to harmonise the control procedures between NATS Prestwick Centre and a number of other airports in the north of England, Scotland and Northern Ireland. The project to introduce new procedures will improve efficiency at the Airport by broadly replicating the existing Standard Instrument Departures (SIDs) that utilise satellite technology, and introduce new Instrument Approach Procedures (IAPs) that will provide an alternative approach to and reduce the reliance on the existing Instrument Landing System (ILS). It was hoped to introduce Standard Arrival Procedures (STARs) within this submission that would complement the IAPs and allow controllers at Prestwick to present aircraft to LBA in a more efficient way. However, this program is extremely complex and has taken several years to develop. The FASI North program has yet to deliver and therefore LBA will submit a separate application for the STARs post 2019. This proposal includes details of what was proposed to provide the context to the IAPs and the SIDs and the interactions with Prestwick Centre.

Justification

LBA currently has a Class D Control Zone (CTR) and associated Control Areas (CTAs) that protect aircraft during the critical stages of flight and allow connectivity with the UK Airways network. Whilst the airspace contains the existing procedures, it is not sufficiently large to facilitate the sequencing of mixed arrivals and departures without either delaying aircraft in holding patterns or holding them on the ground prior to departure. The new procedures will facilitate more efficient operations, reduce the requirement for aircraft to hold, and will improve the likelihood of aircraft achieving Continuous Descent Approaches (CDAs) or Continuous Climbs (CCs). Additional airspace is required to contain the procedures in accordance with ICAO PANs Ops Doc 8168 and the CAA policy on containment.

One of the main constraints to the program was the planned withdrawal of ground-based infrastructure. LBA is currently reliant upon Doppler very High Frequency Omnidirectional Range (D-VOR) equipment for aircraft to fly current publish SIDs. The GAMSTON D-VOR is scheduled to be withdrawn under a program led by NATS, so LBA, and other airports in a similar position, must develop new procedures to retain the existing capability. Furthermore, the UK has signed up to the European Union Implementing Rule (EU IR) 2018/1048[1] that states that airports with an instrument runway should have Performance Based Navigation (PBN) in place by January 2024, and that airports should have at least one SID and one STAR by January 2024, and that all SIDs and STARs should utilise PBN by 2030.

As explained above, the STARs for LBA will be subject to a separate application post 2019 once the FASI North project deliverables are clearer; these additional changes are required for LBA to comply with the EU IR.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1048&from=EN

Consultation Response

LBA conducted a Public Consultation in June 2017. In accordance with CAA Publication (CAP) 725 Airspace Change Process Guidance Document, the minimum consultation period is 12 weeks. However, LBA extended the period to support an Addendum and second issue of the Consultation Document providing clarification and further information that was omitted from the initial issue. It came to light that a small area of the proposed airspace encroached on a council area that had not been included in the initial distribution of consultation notification; the consultation period was extended until 29th December 2017 to capture responses from that area. The consultees who responded fell into two specific categories: residents concerned about noise issues and members of the general aviation community.

The main concerns from residents related to the perceived change to the departure profiles. However, the new SIDs have been designed to broadly replicate the existing profiles (as far as practicable) and all the new SIDs comply with the existing Noise Preferential Routes (NPRs). Whilst there will be some slight change to the tracks overflown, the truncated element of the SID means that aircraft can expect to receive clearances to climb higher than the existing SID clearance limit sooner than at present, therefore promoting a continuous climb profile which is seen to be beneficial in terms of noise exposure.

The general aviation community comprised non-powered and powered flying aviators. The non-powered community, predominantly the gliding community, consider any expansion of airspace a challenge to their operations. The difficulty lies in their reliance on the elements to gain lift and control direction, and many glider pilots do not carry radios or transponders. LBA has met on several occasions with members of the gliding community including the Regional Soaring Airspace Group (RSAG), a group that assembled to consider Airspace Change Proposals. A workshop was held and members of the gliding community (and the powered flight community) participated in a Hazard Identification workshop to consider the proposal. A Letter of Agreement (LoA) has been drafted to facilitate access to the gliding community to some of the proposed CTAs to the south the Airport, which would be an extension to the existing arrangements in place with Doncaster Sheffield Airport (DSA). Whilst DSA has agreed in principle to the LoA, the RSAG has yet to confirm agreement. A copy of the draft LoA that has been sent to RSAG and BGA, and the British Hang-gliding and Para-gliding Association (BHPA) is included within Enclosure 10 *Draft Letters of Agreement*.

The powered flight community responses were generally from local aerodromes who were concerned about having access to areas that they currently use. Several meetings were conducted by LBA ATC personnel and meaningful discussions about how to address their concerns generated a modification to the consulted airspace design. The proposed CTR has been reduced back to almost its current size, and the proposed extensions have been altered to become additional CTAs. This has facilitated access below the CTAs for Sherburn-in Elmet Flying Club and Leeds East Airport. Furthermore, the discussions have enabled LoAs to be drafted with each airport to facilitate access and operational agreements to support their respective operations. These have been agreed in principle and are included within Enclosure 10 *Draft Letters of Agreement*.

Proposed Solution

The proposed solution is an application to increase the volume of existing Class D Controlled Airspace, using a combination of CTRs and CTAs, to ensure the continued protection of flying operations at LBA, whilst facilitating access for other airspace users. The solution is designed to improve the efficiency of the Airport by utilising satellite technology to

introduce new SIDs, new IAPs, and the airspace required to contain them. Access to areas required by other airspace users will be facilitated either tactically via individual clearances, or via a formal standing agreement in the form of a mutually acceptable LoA. This is the surest way to facilitate access to areas not required for use (for example when a specific runway is in use) and ensuring that all airspace users are clear about who has access to the airspace and how safe separation can be provided if required.

This ACP initially intended to implement STARs in addition to the new airspace, SIDs and IAPs. This would improve the predictability for aircraft transiting from the en-route airspace structure freeing up controller capacity at LBA and improving the efficiency of the airspace overall. NATS PC is planning a major upgrade to its network and as a result there is an embargo in place to prevent changes to the system. This takes effect from AIRAC 6 2019 until 2021. The STARs require changes to the operational procedures and system interface between LBA and NATS PC, and since the project deliveries of the FASI North program are not yet clear, implementation of the STARs will be the subject of a separate application post 2019.

The proposed SIDs are a broad replication of the extant SIDs, and there is very little change to the system interface between LBA and NATS PC for the SIDs, therefore, NATS PC has agreed to accept a slight change that will allow the SIDs to be implemented (if approved by the CAA) on AIRAC 10 2019.

The IAPs, commencing from the Initial Approach Fix (IAF) do not interface with NATS PC, and LBA could reap some of the benefits of improved airspace efficiency and reduced reliance on conventional navigational equipment, by implementing the IAPs alongside the SIDs.

Due to the high number of airspace change proposals already in the system, the CAA cannot guarantee that an application to consider the implementation of the procedures and the additional volume of airspace can be achieved in time to meet the AIRAC 10 deadline. However, it may be possible to phase the implementation of the IFPs and airspace to take place in AIRAC 11, 12 or 13 2019. The implementation of these aspects of the ACP do not affect the network system upgrade that NATS PC is planning to undertake so these minor changes can be incorporated, if they are approved by the CAA.

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1 Introduction

1.1 General

Leeds Bradford Airport (LBA) is a thriving regional airport that served over four million passengers in 2017. The Airport is an important local asset as an employer to over 2,500 people and to support the local economy. In 2017, there were over 33,000 Commercial Air Transport flights to 75 destinations, and the demand for air travel in Yorkshire is rising. The capacity for handling aircraft is restricted by the airspace within which air traffic controllers can separate and sequence the arriving and departing aircraft. The current airspace was delegated to LBA over 30 years ago; since then aircraft numbers operating within and around LBA have increased, regulatory changes to the aviation industry and changes to how Instrument Flight Procedures are designed has all changed dramatically. LBA embarked on this Airspace Change Proposal to make changes to the volume of Controlled Airspace (CAS) and to introduce new Instrument Flight Procedures (IFPs) utilising satellite derived information. The new IFPs have been designed to complement the programme to harmonise the handling of aircraft by the Prestwick Centre (under NATS En-Route Limited – or NERL) known as Future Airspace Strategy Implementation – North (or FASI North). The CAA website states: "*FASI (N) is a combination of airspace redesign modules that comply with the UK's Future Airspace Strategy through the provision of Performance Based Navigation routes, Standard Instrument Departures and Standard Arrival Routes which facilitate continuous climb and continuous descent operations, user preferred routes, Flexible Use of Airspace and simplified boundaries between controlled and uncontrolled airspace. The redesign and modification will include the Manchester Terminal Control Area, Scottish Terminal Control Area, Belfast Terminal Control Area and Irish Sea sector operations*."

LBA has always been aware of the demands that are made on the limited resource that is UK airspace. The proposed option was derived from a combination of aims including:

- Using the minimal volume of airspace possible;
- Maintain aircraft flight profiles as close to existing tracks to minimise any changes in noise or pollution exposure;
- Ensure the designs would be acceptable to NATS at Prestwick Centre who handle aircraft once they are established within the en-route network;
- Facilitate access to other airspace users.

Updating the airspace and procedures would allow LBA to capitalise on the improved performance capabilities of modern aircraft and would facilitate the use of Continuous Descent Approaches (CDAs), and Continuous Climb profiles both of which are known to have a positive effect in noise and fuel emissions.

This document outlines the proposal from LBA to introduce new IFPs and to increase the volume of CAS to ensure containment of the procedures and to enhance the connectivity with the UK airways network whilst ensuring compatibility with the FASI North programme.

2 Justification for Change and Analysis of Change Options

2.1 Overview

This section provides the justification and rationale behind the proposed change, and a description of the options that were included within the Consultation Document, together with how the options derived.

2.2 Current Airspace Arrangements and Operations

Increased air traffic levels, changes in regulatory guidance, improved aircraft performance and enhanced navigational system accuracy (through satellite-based systems), combined with national infrastructure projects, have all contributed to the need for a re-design of the Instrument Flight Procedures (IFPs) operated by LBA and the airspace controlled by the Airport to contain those procedures. Although current operational issues are handled safely on a tactical basis by LBA ATC, any future increase in traffic may result in overload situations as controllers try to accommodate more aircraft in a limited volume of airspace to the west of the Airport.

2.2.1 Current Airspace

LBA operates a Control Zone (CTR) and Control Areas (CTA) of Class D Controlled Airspace. The present airspace structure at LBA has been in place for over 20 years and is depicted in Figure 1 below. The CTR is centred on a radius of 8 nautical miles (nm) from the airport; however, this is reduced to the east of the airfield to give only 5 nm of available airspace. The CTR extends from ground level to Flight Level (FL) 85 (approximately 8,500 feet (ft) above mean sea level (amsl)). To the north, west and south of the CTR, the CTA provides an additional area of average 6 nm laterally, which extends between 2,500 ft amsl to FL 85. This airspace connects to the main airway structure to the west and south of the airfield.

The CTR is relatively narrow which means that arrivals are de-conflicted with departures using the only airspace available which lies to the west of the airport. The lack of airspace to manoeuvre aircraft within means that arrival aircraft may be instructed to hold until departures are at a safe distance away, or alternatively, departing aircraft are held on the ground until the arrivals are established on the final approach. This not only affects traffic flow at the airport but also increases planning time and reduces the capacity of the controllers to concentrate on other tasks.

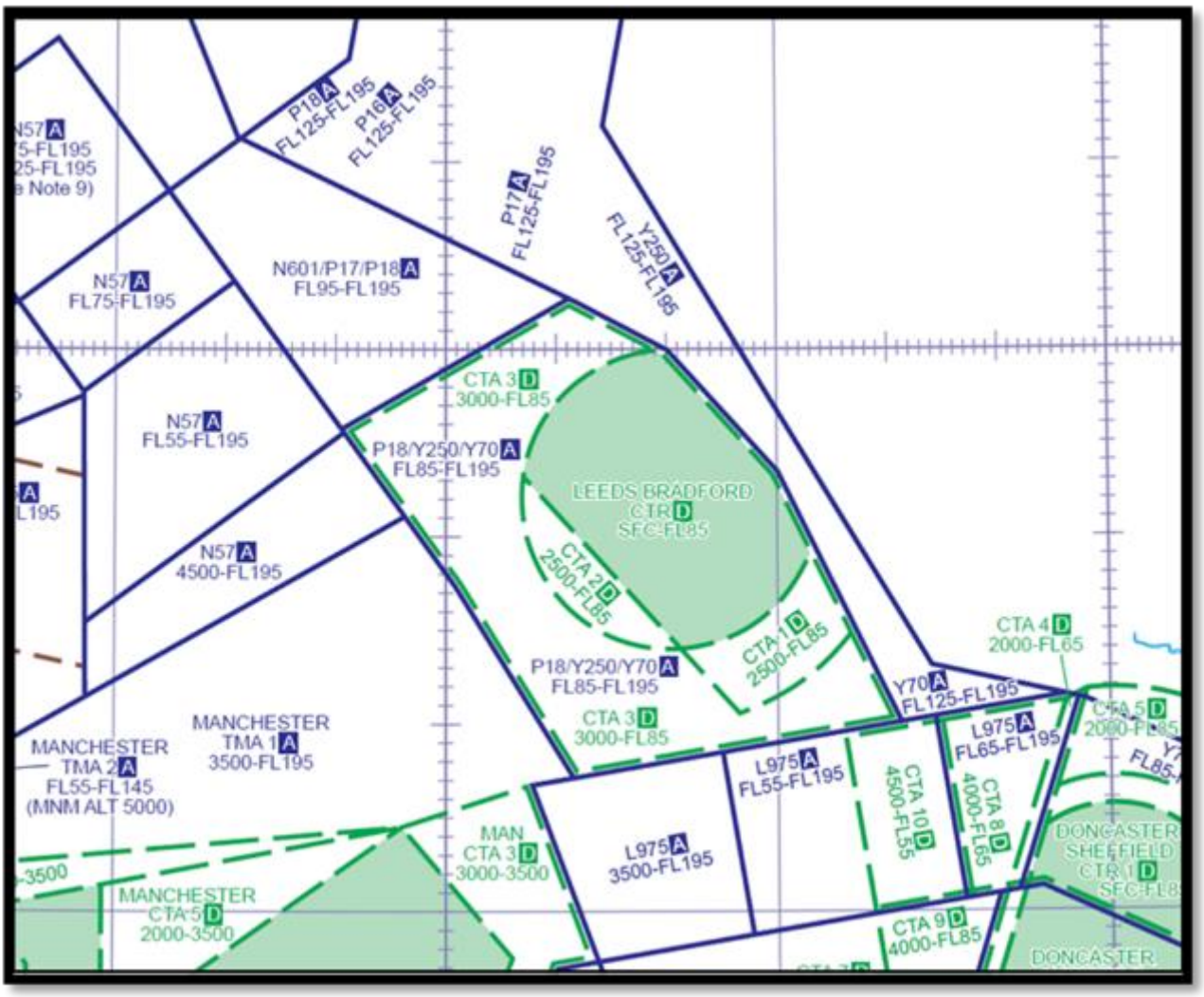

Figure 1 – Current Airspace

2.2.2 Current Departure Procedures

All Standard Instrument Departures (SIDs) from Runway 32 follow the same track to 3.5 DME to the west before splitting to transit west or south-south east of the airfield. All departures from Runway 14 maintain runway track initially, before splitting to the west or south east of the airfield. Currently, all jet aircraft departing from the Airport are required to fly within Noise Preferential Routes (NPRs).

2.2.3 Current Arrival Procedures

At present, LBA does not use Standard Arrival Routes (STARs); instead each aircraft is handled individually as it exits the en-route airspace structure. The exact arrival route for each aircraft is currently dependent on:

- how the aircraft has been presented by the en-route Air Traffic Control (ATC) agency, NATS, based at the Prestwick Air Traffic Control Centre (ATCC); and
- the positions of other air traffic that the Airport is already handling.

When operating on Runway 32, traffic inbound from the north must travel to west abeam the airport before setting course to the NDB (LBA). When Runway 14 is in use, the majority of traffic from the south east must also route to the west of the airport to remain inside CAS. Most of the inbound traffic is funnelled into an area to the west of the airfield.

2.2.4 Current Instrument Flight Procedures

The current approach procedures take aircraft on approximately the last 10 nm of their journey inbound to the Airport and provide a stable, straight track to fly and a steady descent rate for a safe landing. The current approach procedures utilise ground-based navigation beacons to provide both precision (lateral and vertical guidance) and non-precision (lateral guidance only) approaches. For each approach, the pilot must interpret the information from the instruments and will alter course in order to route towards the runway threshold.

2.2.5 Safety Issues under Current Operational Procedures

The extant airspace format causes conflictions to the west of the airfield which impacts on the flow rate under busy traffic conditions and makes it difficult for controllers to manage tactically whilst maintaining a safe level of service. Procedures were re-assessed in 2013 to optimise the routes and airspace currently available, but the steady increase in air traffic movements is stretching the safe application of an efficient service within the extant airspace.

Ensuring the safety of the proposed changes is a priority for LBA. Details of the Safety Methodology is at Section 10 and the Safety Case Reports Parts 1, 2, 3 and 4 are enclosed [Enclosure 7].

2.3 Justification for Revised Airspace

For many years Leeds Bradford Airport (LBA) has not benefitted from STARs. Arriving aircraft are routed individually by ATC according to the local air picture at the time. The LBA CAS was delegated in the early 1980s in order to protect aircraft operating from and near the Airport. The number of aircraft movements within, and around, this delegated airspace has steadily increased, and the current airspace is insufficient in size and volume to allow arriving and departing aircraft to be de-conflicted without short-notice intervention from (Air Traffic Controllers (ATC). This intervention is reaching the limit, impacting controller capacity for the traffic volume that can be safely managed.

Changes to the procedures and protective, delegated airspace are required in order to maintain the current safe levels of service for greater numbers of aircraft, to meet modern demands for aircraft operations and to future-proof functions at the Airport.

CAA regulations require that unless an aircraft has planned to leave CAS, it is not to be vectored outside the horizontal or vertical limits except when an emergency situation occurs, or weather requires it, or if the pilot specifically makes a request[2].

[2] Civil Aviation Publication (CAP) 493 *Manual of Air Traffic Services Part 1* Section 1, Chapter 6 paragraph 13A.3.

In order to contain aircraft when they are flying the new approach and arrival procedures, the dimensions of the LBA CAS will need adjusting.

LBA is proposing to establish new arrival and final approach procedures, new departure procedures and Controlled Airspace (CAS) to contain the new procedures in the immediate area surrounding the Airport.

The overall aim is to update flight procedures and airspace that will align with proposed changes by NATS under the Future Airspace Initiative (FASI) North project. This will be achieved through:

- new arrival procedures (including changes implemented by FASI North associated with LBA);
- Global Navigation Satellite System (GNSS) (RNAV) approach procedures that replicate current approach procedures;
- Performance Based Navigation (PBN) departure procedures that replicate current departure procedures; and
- new airspace structure to contain the new procedures.

The proposed approaches have been designed by a UK CAA approved Procedure Designer in accordance with International Civil Aviation Organisation (ICAO) PANS-OPS Document 8168 [Reference 3] and CAA policy guidance and regulations and are in line with best practices and standards across the UK. The implementation of the GNSS (RNAV) procedures will mean the LBA complies with the EU Commission Implementing Rule that states that airports with an instrument runway must have a PBN approach by 2024, and one SID and one STAR by 2024, with all SIDS and STARs utilising PBN by 2030[3].

2.4 Justification for Revised Instrument Flight Procedures (IFPs)

There are several factors that have required LBA to propose changes to their IFPs, including changes to wider airspace initiatives and changes to regulations. These have imposed additional constraints on the project that have needed to be factored in to the overall program.

2.4.1 National Changes to Air Traffic Handling

Changes are being proposed separately to this project by NATS under a project known as Future Airspace Initiative (FASI) North. The new designs for LBA are intended to complement these changes. Any changes proposed by LBA need to be designed in cooperation with NATS to ensure that the interface with the National network today and in the future can be handled by NATS controllers at Prestwick.

2.4.2 Withdrawal of Infrastructure Supporting Current Procedures

NATS is undertaking a programme to withdraw, due to their age, 27 of the 46 Doppler Very High Frequency (VHF) Omni-directional-Range (D-VOR) beacons it has historically operated across the UK. Many airports use the data from the D-

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1048&from=EN

VOR in the construction of their departure and/or arrival procedures. LBA makes use of the D-VOR at Gamston for some of its departure procedures. The Gamston D-VOR was due to be withdrawn from operation in early 2018, requiring LBA to take action to provide procedures for aircraft departing the Airport to the south and south-east. This has been delayed but is now expected to be withdrawn from service by December 2022[4].

2.4.3 Arrival Procedures

It is highly beneficial for ATC and aircraft operators alike to have a degree of predictability of the route to be flown and how the aircraft will be required to descend on its approach to the Airport. Most of the aircraft operating from LBA now use Performance Based Navigation (PBN), which provides accurate three-dimensional information based on satellite data; utilising the Global Navigation Satellite System (GNSS). This change proposes to introduce satellite-based STAR procedures for LBA; these routes will automatically introduce separation from departing traffic, reducing controller interventions and will build in methods to sequence multiple simultaneous arrivals to improve efficiency and effectiveness.

2.4.4 Approach Procedures

The current approach procedures utilise ground-based navigation beacons, which are on the verge of obsolescence. To cater for aircraft operators needs and to future-proof operations at the Airport, LBA intend to introduce satellite-based GNSS approach procedures. Although the method of flying approach procedures will be different, the approach tracks will not differ from those currently flown by aircraft during the final section of flight.

2.4.5 Departure Procedures

PBN routes allow aircraft to accurately navigate along a three-dimensional flight path designed to make best use of the modern performance characteristics of aircraft. As well as improving the efficiency of aircraft along flight paths, PBN also has the effect of concentrating aircraft along defined flight paths.

Currently, departures from the Airport are required to fly within Noise Preferential Routes (NPRs), which have been in place for many years under a clause in the Section 106 Agreement between Leeds City Council and the Airport. In order to minimise the impacts of change on our neighbours, LBA has decided not to change the location of NPRs and the proposed routes are designed to remain within the existing NPRs whilst adopting modern flying techniques, particularly PBN.

2.5 Defining the Options

Prior to the Consultation, several options were considered by LBA. The Airport took into consideration the requirement for change whilst balancing those requirements against the needs of other airspace users and by minimising the impact to residents.

[4] http://publicapps.caa.co.uk/docs/33/DVOR-NATMAC-1Jun2018-REDACTED.pdf

The following options were considered and included within the Consultation Document, where comment was invited from stakeholders:

- Option 0 – Do Nothing;
- Option 1 – Do Minimal;
- Option 2 – Other Airspace Constructs;
- Option 3 – Initial Concepts;
- Option 4 – Simplified and Consolidated Arrival and Departure Procedures;
- Option 5 – Replication of Current Departures and Rationalisation of Airspace Requirements; and
- The Preferred Option.

2.6 Option 0 – Do Nothing

At the outset of the project, in challenging the need for any change at all, LBA considered the effects of doing nothing. The principle factor in assessing the need for change is the preservation of safe operations. The need for controller intervention in sequencing and separating aircraft is already presenting significant challenges, with a resulting increase to pilot workload at critical stages of flight and route changes at short notice. Such lack of predictability introduces planning difficulties and inefficiency for aircraft operators and ATC, and results in an environmental impact that could be reduced.

The changes to airspace and ground equipment structure being driven by external agencies, over which LBA has very little influence, mean that current procedures will become unusable within 2 years, leaving the Airport with no departure options to the south and south east.

For these reasons, the "Do Nothing" option was not considered viable.

2.7 Option 1 – Do Minimal

LBA fully understands that changing the routes that aircraft fly and the airspace required to contain those new routes will affect those outside the Airport. In order to minimise any impact, LBA considered how to make smaller adjustments to the way they operate to achieve the aims of the project. During 2014, LBA worked extensively with Prestwick ATCC to develop new ways of working to improve efficiency and reduce the workload for controllers at both units and for aircraft operators. These new ways of working realised several improvements without having an adverse impact on outside agencies. However, they were unable to resolve all of the issues faced by LBA and, once again, the capacity of these new methods is now being tested as the traffic levels at the Airport increase.

The benefits gained from revised practices are now exhausted and there are no further improvements that can be realised within the current airspace infrastructure limitations. The "Do Minimal" option is, therefore considered not viable.

2.8 Option 2 – Other Airspace Constructs

LBA established that new procedures are required which will result in a corresponding change to the airspace structure; Option 2 considered the classification of airspace that might be most appropriate. The classifications of airspace considered potentially appropriate to meet the needs of LBA were Class D and Class E.

Within Class E airspace, pilots operating under Visual Flight Rules (VFR) have no obligation to speak to ATC and are permitted to fly within the airspace, taking their own visual separation from aircraft that are operating under Instrument Flight Rules (IFR). Commercial Air Transport (CAT) aircraft operate to and from LBA under IFR and would not be provided with standard vertical or horizontal separation from VFR aircraft; they would be reliant on the pilots of the VFR traffic seeing and avoiding them. One of the main issues that LBA is trying to resolve by making a change to the operating practices for air traffic is the preservation of the safety of operations by the prevention of safety-related incidents, which occur due to the congestion and complexity of air traffic operations. LBA has assessed that it is necessary to provide greater protection to their carriers that that afforded by Class E airspace, particularly in the busiest periods.

Class D airspace requires pilots to request entry clearance, regardless of the flight rules under which they are operating. This allows ATC to maintain much greater situational awareness of the traffic within the airspace immediately surrounding the Airport and to provide safe separation between all aircraft operating within their airspace.

Class E was considered unsuitable to meet the needs of the Airport; a Class D airspace design was taken forward.

2.9 Option 3 – Initial Concepts

The initial concept for the new procedures and the airspace to contain them was extremely ambitious. It was proposed to have departures routing to each of the 4 compass cardinal points and separate routes for jet aircraft and turbo-prop aircraft in order to increase the rate at which aircraft can depart. Arrivals would also be able to use procedures routing from multiple directions, with a new hold proposed to the east of the Airport. Charts showing the initial concept are provided at Annex A2.

LBA considered these initial designs to be too complex and the airspace demands for their containment would produce a disproportionate adverse impact on other airspace users. The initial concepts considered under Option 3 were discounted.

2.10 Option 4 – Simplified and Consolidated Arrival and Departure Procedures

LBA re-tested their initial assumptions to try to reduce the volume of airspace required to contain the new procedures. It was determined that the increased rate of departures afforded by having separate turbo-prop and jet departures, (described in Option 3) was unlikely to be met due to the existing ground infrastructure, which requires aircraft to backtrack on the runway. This led to the

separate turbo-prop procedures being discounted and the routes amalgamated with those for jet aircraft. Whilst the new departure routes would reduce the distance flown by aircraft, particularly those transiting to the east and south east, changing the routes would change the distribution of aircraft noise to those living beneath the routes and would be contrary to current Section 106 planning approvals from the Leeds City Council. LBA therefore decided to discount these draft departures but retain the arrival route. The introduction of arrival routes would still meet the overall aims of the project but would minimise the volume of changes and disruption. The proposed arrival routes developed at this stage are shown in charts at Annex A3.

Allied to the new arrivals routes was the positioning of the holding pattern. To improve efficiency further, LBA wanted to move the aircraft hold from overhead the Airport. However, the initial conceptual drafts showed that moving the hold to the east would require a far larger volume of airspace for its containment. A hold west or south of the Airport was unviable due to procedures operated by Manchester Airport and Doncaster Sheffield Airport respectively, and a hold to the north was considered inappropriate due to presence of the Yorkshire Dales National Park. The location of the hold required further consideration.

2.11 Option 5 – Replication of Current Departures and Rationalisation of Airspace Requirements

To comply with planning agreements and minimise disruption to the local community Option 5 sought to replicate the initial portion of the current departure procedures, shown at Figure 2 and Figure 3 below, which remains within the current Noise Preferential Routes. This would allow aircraft to fly the same tracks as they do now but will utilise modern satellite-based navigational data and techniques to fly them.

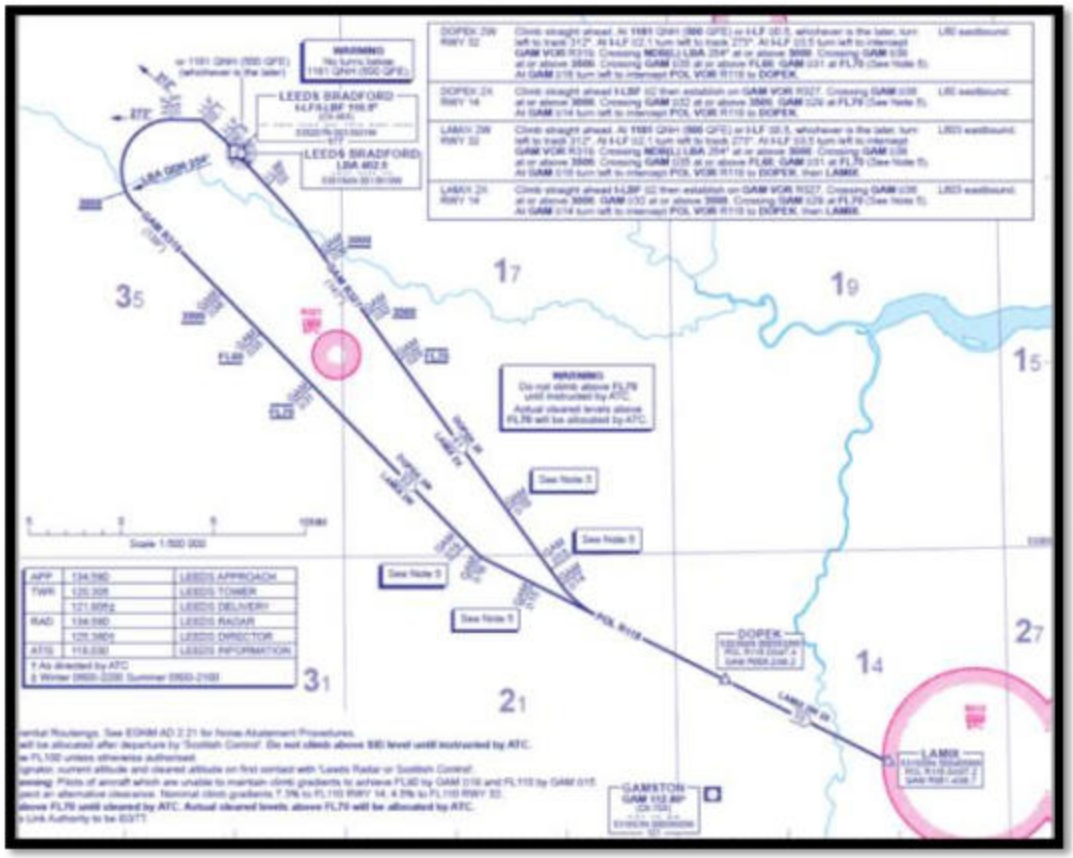

Figure 2 – Current DOPEK/LAMIX SID

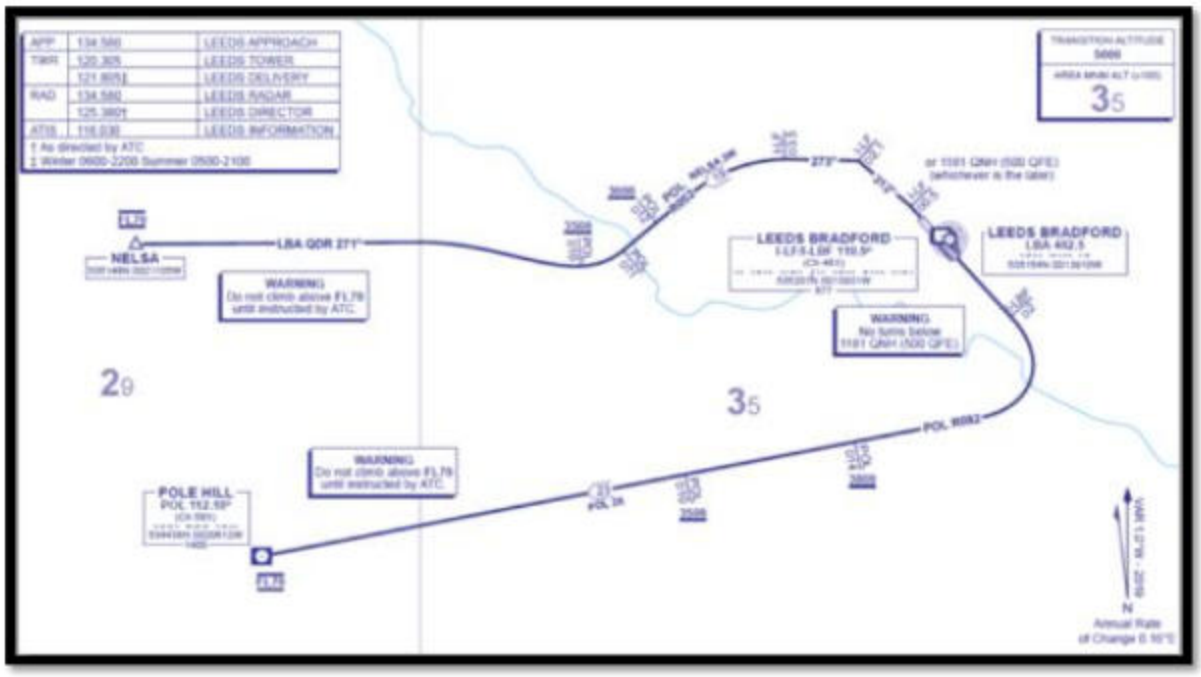

Figure 3 – Current NELSA/Pole Hill SID

However, this option would have demanded significant volumes of additional airspace to the north of the Airport to accommodate arrivals through the reporting point GASKO, see Figure 4 below. Therefore, although from an operational perspective this was the original preferred option, the procedure was adjusted to keep aircraft higher for longer, within the existing en-route structure, before descending as part of another arrival route, thus reducing the amount of additional CAS being requested. Furthermore, there was potential for aircraft to descend below the en-route structure on this procedure; rather than re-design the existing airspace, LBA assessed the likely usage of this route and determined that descent through controller instruction was both supportable and preferable to lowering the base of CAS over a wider area.

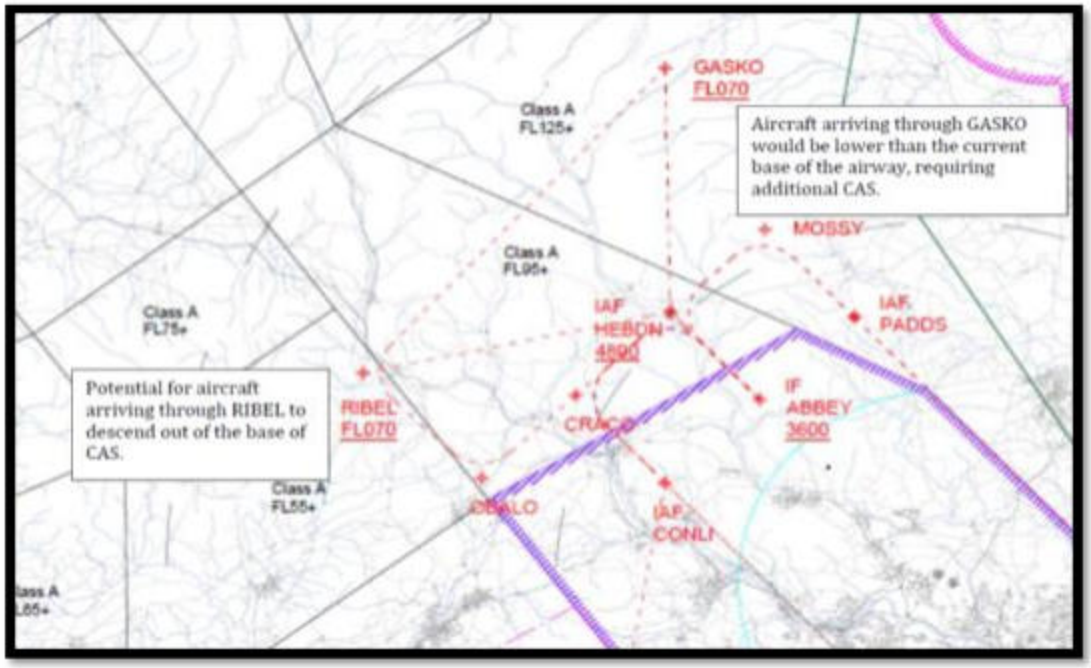

Figure 4 – Design Iteration for Arrivals Direct from GASKO Inbound to Runway 14

The options shown in Figures 2-4 were assessed to be unacceptable in terms of the demand for expansion of CAS, and due to the number of additional routes they would create. Therefore, the final option that was presented at Consultation as 'the Preferred Option' was a compromise on the Options above. This is explained in further detail at Section 3.

3 The Preferred Option Airspace - Description at Consultation

3.1 Overview

The procedure and airspace designs have taken almost six years to develop. The initial concepts were too complex and ambitious and would have had a significant and disproportionate adverse impact on other airspace users, as well as affecting a much wider area of residents local to the Airport. This section presents the solution that was presented at Consultation that was deemed to meet the needs of the Airport and provides the rationale behind the proposed designs.

3.2 The Preferred Option at Consultation

The initial options (Options 0 to Option 5) were ultimately discounted as not being viable solutions. The current flight procedures at LBA are not fully contained by CAS, so any change to the airspace was always likely to increase its lateral and/or vertical dimensions. Several iterations of design were produced and considered to try to minimise the additional airspace that will be required to accommodate the new procedures, and thereby minimise the impact on other airspace users. The Preferred Option proposes new arrival and final approach procedures, new departure procedures (albeit closely following the extant departure tracks) and a slight increase to the volume of Class D CAS to contain them.

3.3 Justification for the Preferred Option

The primary aim of the proposal is to enhance safety and improve efficiency. In meeting those aims, one of the key influences was the interaction with the en-route airways structure. Initial concepts were judged to be unmanageable by NATS Prestwick Centre and extensive work was undertaken to develop, through modelling and simulation, procedures that interact safely with the en-route architecture. This work was further complicated by the ongoing projects to review and modernise UK airspace, in particular, the FASI North project. The proposed procedure designs for LBA have been developed in full cooperation with NATS Prestwick Centre and are compatible with new procedures at surrounding airports.

The second key influence on the procedure designs was the volume and dimensions of the airspace that would be required to contain them. Several adjustments were made to the procedure designs to minimise the additional airspace that would be required in order to reduce the adverse impact on other airspace users who use the current Class G uncontrolled airspace. Class E CAS was deemed unsuitable to meet the operational needs of the Airport and that Class D CAS was the most appropriate airspace to provide greater protection for operations within LBA airspace.

The third key influence was to minimise any impact to local residents. In addition to altering the location of aircraft flight paths, an airspace change may also alter the vertical profiles of aircraft, resulting in aircraft being lower or higher over the ground. A primary reason for the LBA Airspace Change is to allow aircraft to make best use of modern performance characteristics, one of which is to allow aircraft almost unrestricted climb rates to maximum performance. This will therefore result in aircraft being at a similar or higher height than they are currently.

3.4 Consulted Airspace Option

The airspace design that was presented in the Consultation Document was predicated around using the minimum volume of airspace possible to contain the proposed IFPs in accordance with PANS Ops criteria. This meant that proposed SIDs and the STAR procedures, and the IAPs were considered. The existing airspace contains the SIDs but does not provide any flexibility to delay or sequence multiple arrivals. This means that the flow of aircraft during peak times is constrained by either keeping aircraft in the holding pattern or holding them on the ground to deconflict against arrivals. The proposed airspace provides containment of the IFPs and provides an area to tactically route aircraft if required.

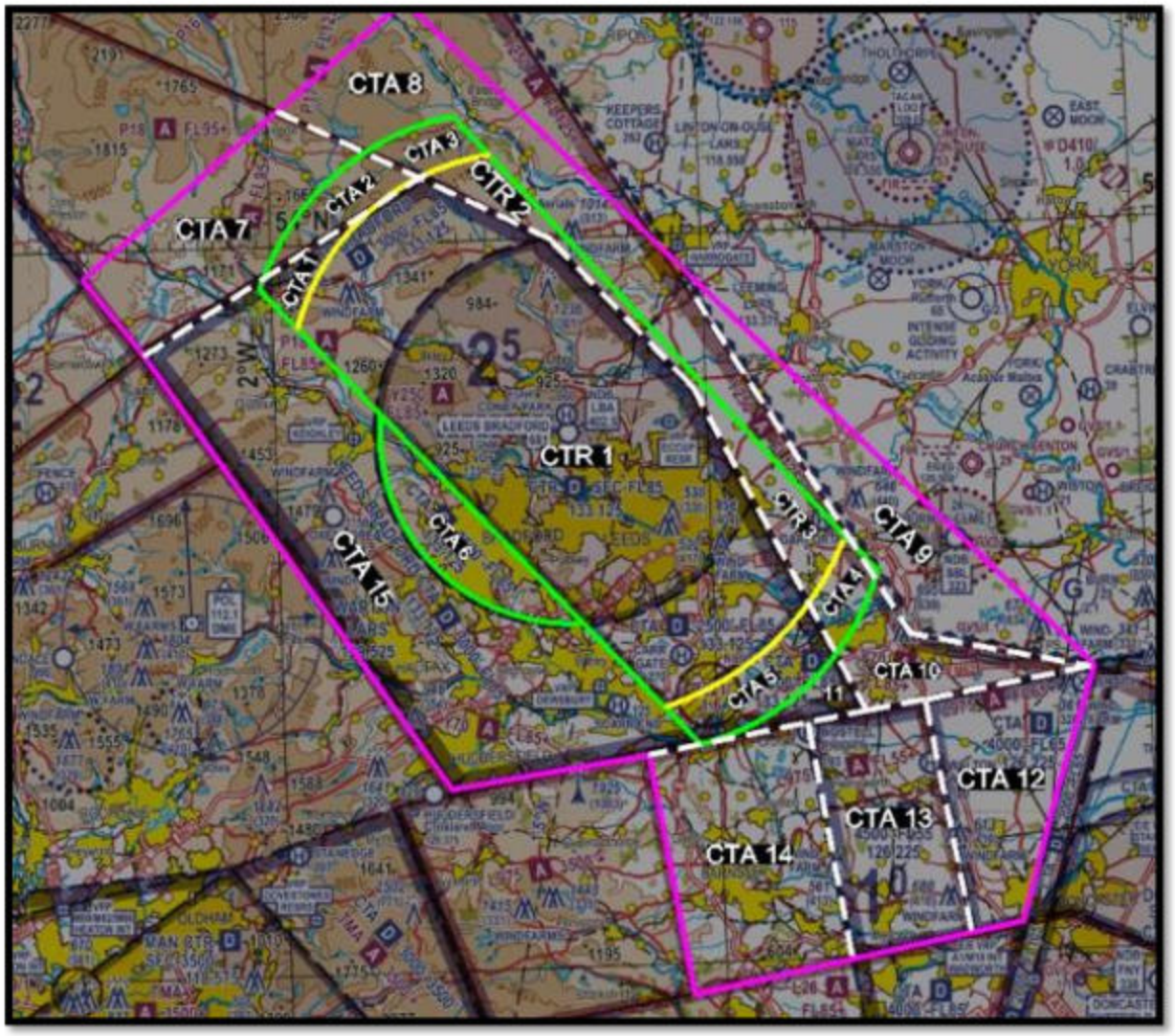

Figure 5 – Consulted Airspace Design

The airspace within the vicinity of the proposed CTAs 9, 10, 12, 13 and 14 is liberally utilised by the General Aviation (GA) community and local gliding clubs, as well as for military flights of aircraft operating from RAF Linton-on-Ouse.

LBA currently experiences high intensity operations first thing in the morning and in the evening, with another, slightly less-busy period just after lunch. These busy periods demand options for ATC to separate and sequence multiple aircraft arriving simultaneously, as described previously.

The Consultation Document originally contained details about a proposal to release some of the base levels of the southern CTAs for use by the General Aviation (GA) community during specific time periods. This was intended to be a compromise between requesting more regulated airspace, whilst allowing more users to access this airspace during specified periods.

Airspace	Upper Limit	Lower Limit 0900 – 1800 (L)	Lower Limit 1800 – 0900 (L)
CTR 1	FL85	Surface	Surface
CTR 2	FL125	Surface	Surface
CTR 3	FL125	Surface	Surface
CTA 1	FL85	3,000 ft	3,000 ft
CTA 2	FL95	3,000 ft	3,000 ft
CTA 3	FL125	3,000 ft	3,000 ft
CTA 4	FL125	3,000 ft	3,000 ft
CTA 5	FL85	3,000 ft	3,000 ft
CTA 6	3,000 ft	2,500 ft	2,500 ft
CTA 7	FL95	3,500 ft	3,500 ft
CTA 8	FL125	3,500 ft	3,500 ft
CTA 9	FL125	FL055	3,500 ft
CTA 10	FL125	4,000 ft	3,500 ft
CTA 11	FL85	3,500 ft	3,500 ft
CTA12	4,000 ft	Not required	3,500 ft
CTA 13	4,500 ft	4,000 ft	3,500 ft
CTA 14	FL55	4,000 ft	3,500 ft
CTA15	FL85	3,000 ft	3,000ft

Table 1 – Consulted Upper and Lower Limits of Proposed Airspace at LBA

However, during the analysis of the consultation responses, it became clear that LBA ATC did not have a high degree of confidence that any airspace released to the GA community was no longer in use if activation and de-activation was purely based on timings. Furthermore, the Ministry of Defence (MOD) announced that RAF Linton on Ouse will no longer be a flying station by the end of 2019, and consequently there will be less of requirement to provide access to military aircraft. For the above reasons, LBA is now seeking to facilitate access to the airspace with a more formal arrangement articulated within a mutually acceptable Letter of Agreement (LoA).

This would mean that the airspace would be released under **mutually agreed specific conditions**. Under the previous temporal arrangement, the airspace

would be unavailable to LBA during specified periods even if there was no GA flying, for example during inclement weather. Utilising a formal LoA means that everyone can be certain when the airspace is for the sole use of LBA, and when it is available to the GA community.

This equitable access arrangement does require a level of participation by the GA community; for example, one stipulation will be that each user of the airspace must be in receipt of the latest ATIS information from LBA or Doncaster Sheffield Airport (DSA). Activation of the area (which will be an enhancement of the existing Upton Corridor currently managed by DSA) will be broadcast on both the LBA and the DSA ATIS messages.

Access to the southern CTAs will be facilitated via an extended and updated version of the Upton Corridor. The area intended to be covered by the LoA is shown in Figure 6 below with full details of the LoA presented in Enclosure 10. The draft LoA has been issued to members of the RSAG, and the BGA, although agreement in principle has not yet been obtained.

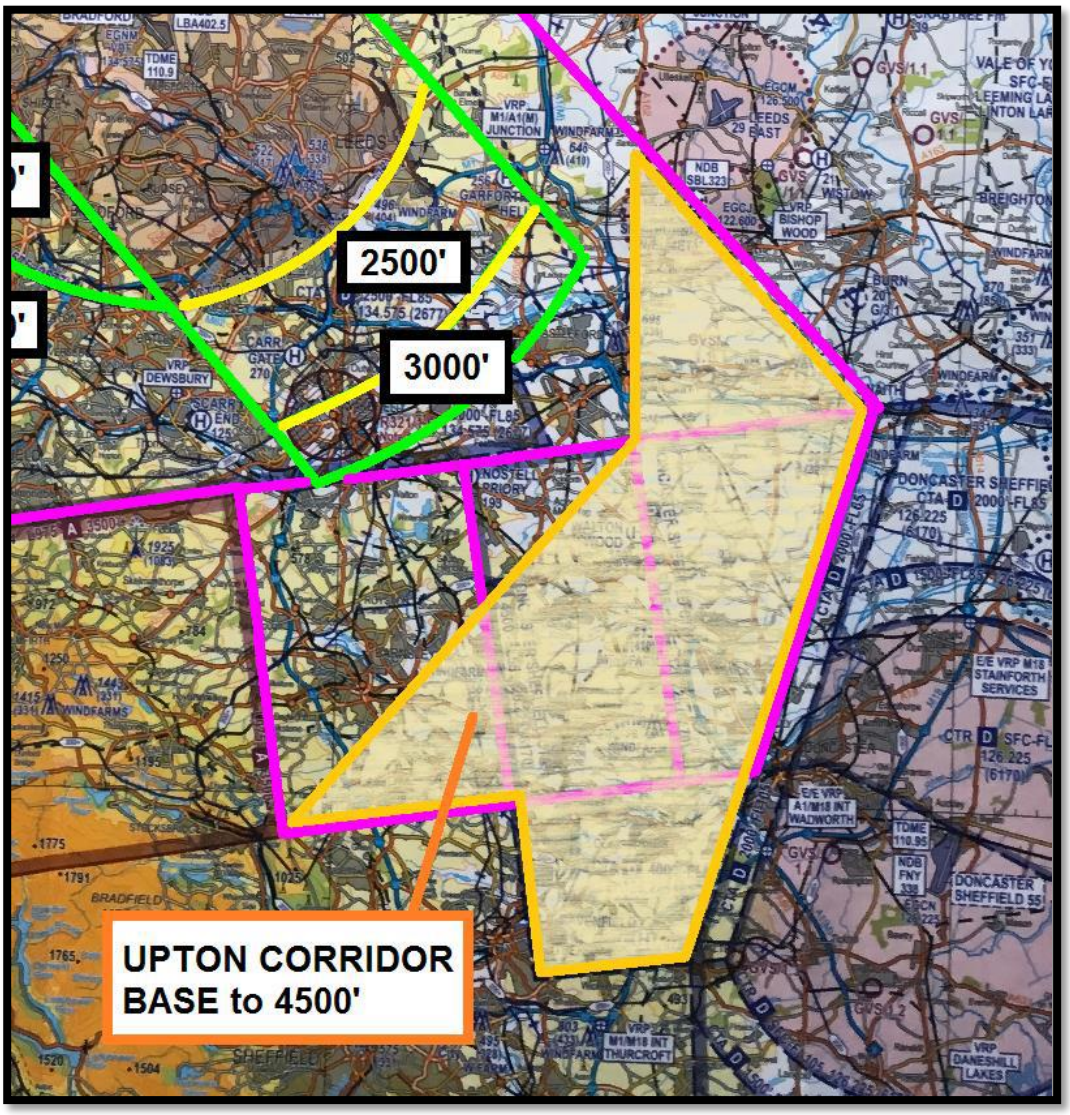

Figure 6 – Proposed Upton Corridor Extension

4 Consultation Analysis Summary

4.1 Overview

As part of the Civil Aviation Authority's (CAA) Guidance on the Application of the Airspace Change Process (Civil Aviation Publication (CAP) 725) [Reference 1], LBA is required to submit a case to the CAA to justify its proposed airspace change and to undertake consultation with aviation and non-aviation stakeholders. This ensures that stakeholders who may be directly, or indirectly, affected by the proposed changes have an opportunity to provide comment on the proposal. The purpose of the consultation was to gather and analyse the views of the various aviation stakeholders and local authorities concerned regarding the effects of the proposed airspace change. The Consulted LBA procedures and CAS design was the Preferred Option design as detailed in Section 3 above. Whilst a summary of the findings is included here, the full Consultation Feedback Document is included as Enclosure 5.

4.2 Consultation Summary

The LBA ACP consultation was conducted in accordance with the principles set out in the Cabinet Office Code of Practice on Consultation [Reference 5], as required by the CAA. A comprehensive Consultation Document [Enclosure 1] was prepared by LBA, presenting the proposal, rationale for the change, the perceived effects and mitigation measures considered by LBA. Prior to the preparation of the Consultation Document, meetings were conducted with major stakeholders to engage them early in the design process. A link to the Consultation Document was made available on the LBA website. LBA notified consultees by email alerting them about the consultation and explaining how to access the Consultation Document.

Full consultation commenced with wide circulation of the electronic Consultation Document and conceptual airspace designs to all identified stakeholders on 23rd June 2017. The required minimum period for formal consultation is twelve weeks; the consultation was due to close on 11th September 2017. However, following the release of amendments to the Consultation Document [Enclosures 2, 3 and 4] and the discovery that some district councils had been missed from the original consultation emails, the consultation was extended until the 29th December 2017.

This section summarises the aim of the consultation exercise, describes the aviation stakeholder consultee organisations and individuals that were consulted and provides a breakdown of the responses received. It also provides an analysis of the responses received and outlines the approach undertaken by LBA to review the airspace design in the light of the significant points of objection raised by consultees. Section 5 describes the continuing dialogue with key stakeholders to develop mechanisms to collaboratively manage the airspace to address the concerns raised during the consultation.

4.3 Aviation Stakeholder Consultee Organisations

A full list of consultees was developed with the advice of the CAA. However, following a change of management since the conclusion of the consultation process, LBA has been unable to locate the complete stakeholder list. There is a complete record of the email addresses that the consultation was sent to and from this list a composite stakeholder list has been derived. It is acknowledged that it is possible that the consultation material was sent to more consultees.

At the start of the consultation, LBA sent out notification to 408 consultees, comprising:

- 34 Aviation "National Organisations" (CAA National Air Traffic Advisory Committee (NATMAC list);
- 30 Members of Parliament;
- 278 Local Councillors;
- 10 Airport Operators;
- 28 Members of the Regional Airspace Users Working Group (RAUWG);
- 19 Local Aerodromes, Flying Schools and Flying Clubs; and
- 9 Ministry of Defence (MOD) operators.

4.4 Consultation Responses

A total of 16 responses (3.9 %) to this consultation were received from the direct consultees. In addition to the 16 responses received from direct consultees, a further 429 submissions were received from other individuals or organisations making the total number of responses equal to 445. The majority of the responses received from stakeholders were from glider pilots and individuals associated with general aviation groups and organisations.

Whilst the consultation documentation was sent to a number of local MOD operators, the MOD provided a consolidated response, through Defence Airspace and Air Traffic Management (DAATM), on behalf of all military consultees. This is standard MOD practice.

Of the 445 responses received during the consultation period:

- 13 consultees (2.9 %) supported the proposal;
- 370 consultees (83.2 %) objected to the proposal;
- 21 consultees (4.7 %) provided a neutral response or provided no comments on the proposal; and
- 41 consultees (9.2 %) provided questions for clarification purposes but did not formally provide a response.

4.5 Key Issues

The response analysis process identified a number of key themes in those responses that objected to the proposal. The themes could be subdivided into the issues of local residents and the issues of the GA community.

The main emphasis of the concerns raised by the local community focused on the impact of noise on local residents and a perceived increase in air pollution as a result of the changes proposed.

The main emphasis of the concerns raised by the GA community can be summarised as follows:

- The dimensions of the suggested CAS construct are considered disproportionate to the requirements of LBA, and the forecast growth predictions veracity have been questioned;
- The base of the proposed CAS is too low to facilitate soaring and cross-country flights;
- The new CAS design produces a funnelling effect as aircraft avoid and go around CAS rather than transit through, which has safety implications including an increased risk of mid-air collision (MAC);
- The new CAS design is too complicated and will lead to more airspace infringements; and
- The impact on the sustainability of local gliding clubs generally, and specifically the impact on Burn Gliding Club's ability to continue to operate.

It was noted that some consultees who objected to the proposal, considered that some form of Class D CAS of a smaller scale was appropriate in support of LBA operations.

The Consultation raised concerns from the MOD relating to the reduction in available airspace for flying training exercises, and the need for careful consideration with regard to the delegation of CAS to military units.

NATS supports the proposal. In particular, the introduction of Performance Based Navigation (PBN) is supported as it will enable improvements in the safety and efficiency of UK airspace; however, a number of concerns were raised surrounding the implementation of the new procedures and how they will be managed by LBA and NATS Prestwick.

5 Post Consultation Engagement

5.1 Overview

Any ACP is complex and can be concerning to a wide variety of stakeholders and the LBA ACP is no exception. It is for these reasons that some time was taken by LBA to fully analyse the consultation responses to be certain that all concerns were examined to see if they could be further mitigated. This also coincided with a change of management within Air Traffic Control at LBA, and therefore a further engagement strategy commenced. LBA remains committed to mitigate, as far as is practicable, the principal concerns of those consultees who objected to this proposal.

5.2 Stakeholders

The key stakeholders that objected to the ACP in its entirety were mainly GA, particularly the gliding community, and also local residents who were concerned about changes to flight path and the proliferation of noise pollution. Several additional meetings were held to allow respondents to learn more about the changes, and where possible, to mitigate for any of their concerns. The approach taken by LBA was to review the airspace design in the light of the significant points of objection raised by consultees and to continue a dialogue with key stakeholders to develop mechanisms to collaboratively manage the airspace to address the concerns raised.

5.3 Other Airports

5.3.1 Durham Tees Valley Airport

The LBA Head of Air Traffic Services (HoATS) met with Karen Maidment, ATC Unit Manager at Durham Tees Valley Airport (DTVA) on 16th August 2018 to discuss how the ACP might affect interactions between the two airports. The outcome of the meeting established that a LoA could be agreed in principle to manage the DTVA arrivals.

5.3.2 Sherburn in Elmet and Leeds East Airport

The HoATS from LBA visited both Sherburn in Elmet and Leeds East Airport on 28th August 2018. Both airports are running their own ACPs to establish IFR arrivals, and therefore LoAs are required with each airport and LBA respectively. The post design modification to reduce the size of the proposed CTR and raise the base level to create new CTAs was specifically to accommodate the requirements of Leeds East and Sherburn in Elmet. A framework was agreed in principle about how to accommodate each airport and LBA undertook an action to draft new LoAs for their review. The draft LoAs for Leeds East and for Sherburn in Elmet have both been agreed in principle.

5.4 General Aviation Community

5.4.1 Gliding Community

The local Gliding Clubs, under the direction of the BGA, have established the Regional Soaring Airspace Group (RSAG) to liaise with ACP sponsors regarding matters of airspace. LBA visited Sutton Bank Gliding Club on 24th July 2018 and met with members of the RSAG. They discussed the ACP process and restated the case for the proposed increase in volume of airspace. The outcome of the meeting was agreement for RSAG members to visit LBA to take part in a Gliding Workshop.

LBA hosted a workshop with members of the Gliding Community on 23rd August 2018. The purpose of the workshop was not only to explain some of the requirements of the ACP but to investigate how some of the gliding community's concerns could be addressed. The outcome was that the members of RSAG requested that LBA send a letter to the attendees of the workshop to clarify that LBA did not propose to alter the lateral limits or the classification of the proposed airspace, but that some discussions were ongoing concerning the base levels of some of the CTAs. LBA agreed to draft a LoA to articulate how the airspace would be managed and to include a framework arrangement to facilitate access to the airspace.

5.4.2 Presentation to RAUWG

LBA has been a regular member of the Regional Airspace Users Working Group (RAUWG) and has presented to the group providing regular updates on the project periodically.

5.4.3 Letter of Agreement Discussions

LBA has engaged with local airspace users to facilitate access should the ACP be successful. Agreement in principle has been obtained with the following organisations and draft LoAs are submitted with this submission:

- Leeds East Airport;
- Durham Tees Valley Airport;
- Doncaster Sheffield Airport (DSA); and
- Sherburn in Elmet Flying Club.

Further discussions have been held with the Regional Soaring Airspace Group.

5.5 Local Residents

5.5.1 Meetings with Local Councillors

LBA has had extensive meetings with local councillors and the residents that they represent, both during the consultation period and ongoing since then. The issues discussed have revolved around explanations concerning the proposed changes and the potential impact on the individual communities. Whilst the departure profiles have been designed to broadly replicate the existing procedures, and they have been designed to be compliant with the existing NPRs, there may some slight changes to the tracks that aircraft overfly. The latest

meeting took place on 13th November 2018 with councillors from Burley in Wharfedale Parish Council.

5.5.2 Residents Meeting

The LBA Head of Air Traffic Services (HoATS) met with local councillors and residents of Burley in Wharfedale on the 9th October 2018 (two sessions) to discuss the Airport's plans and to explain how residents might be affected. A further meeting has been planned for Menston in early 2019.

6 Preferred Option Airspace - Modifications Post Consultation

6.1 Overview

Following the Public Consultation, it became clear that LBA needed to look again at the proposed airspace design to make it easier for other aviators to either avoid the CAS, or agreements needed to be established to ensure safe access to the airspace could be facilitated. This section explains the areas that LBA considered specifically following receipt of the consultation responses. Full details of the analysis undertaken is detailed within the Consultation Feedback Document [Enclosure 5].

6.2 Description of Modifications

One area that LBA was able to release airspace was in the proposed extension to the CTR. This effectively would have created a much larger volume of airspace that extends from the surface up to either FL 85 or FL 125. This would also create some issue for Leeds East Airport who would not be able to operate autonomously in and out of their Airport in the way that they currently are able to. Therefore, LBA commissioned an analysis of the containment areas required by the new IFPs, in order to investigate whether the CTR could be reduced in size, by replacing the extensions with a CTA. This would allow aircraft to operate below the base of the CTA without calling LBA.

The analysis concluded that the change could be made without compromising the containment; essentially the provision under the modified design is similar to the current airspace arrangements. The revised, modified airspace design is shown in Figure 7 below:

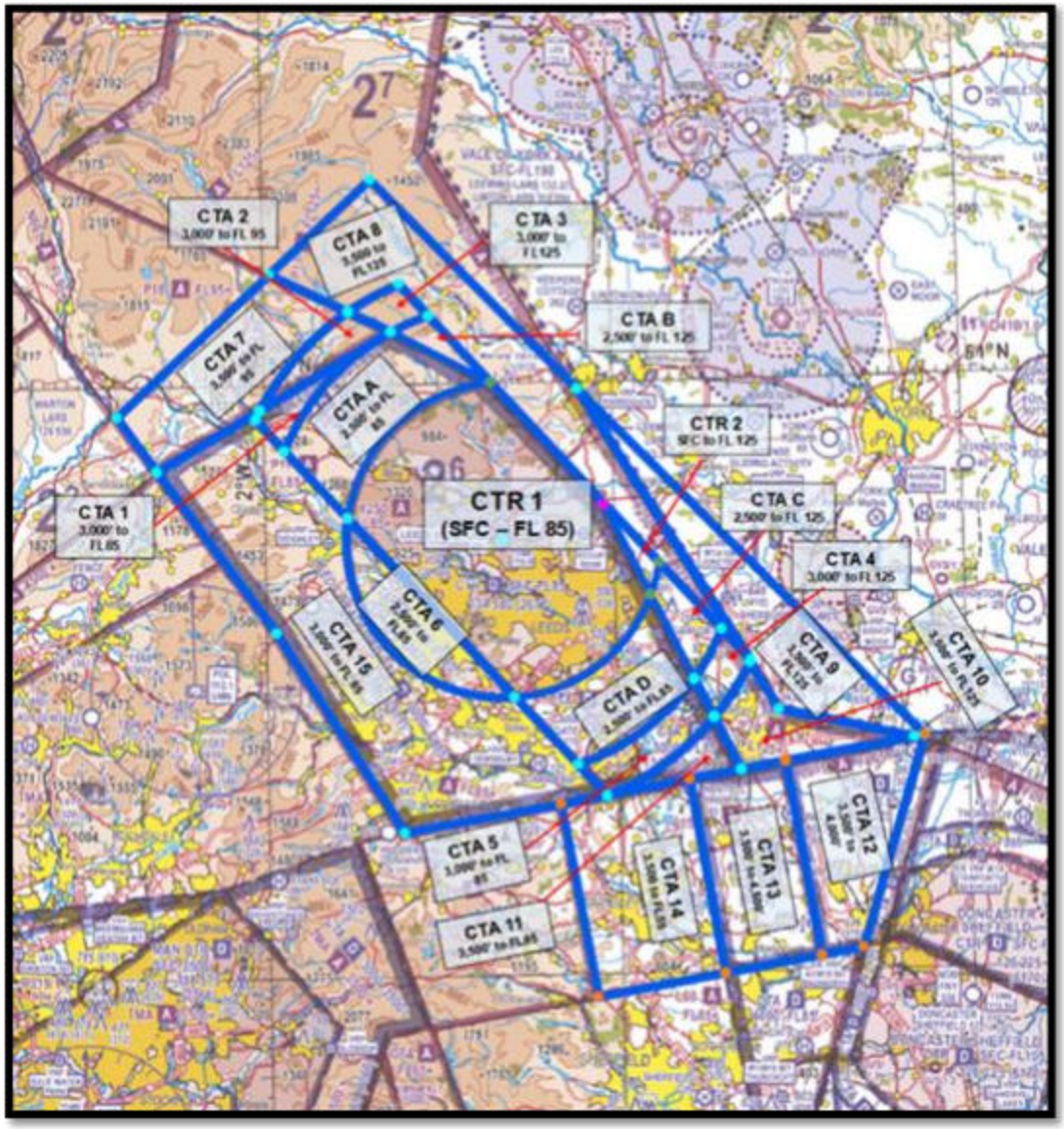

Figure 7 – Post Consultation Airspace Design

NB: In order to avoid confusion over the labelling of proposed CTAs, the modified CTR areas have been renamed as CTAs A, B C and D.

6.2.1 CTR

The proposed CTR dimensions included within the Consultation Document have been reduced in size and replaced by two additional CTA stubs. Due to the difference in the top height of these areas, there are 4 new separate CTAs established; for consistency in labelling at this stage, they are annotated above as CTAs A, B, C and D. This means that the proposed CTR is very similar to the current CTR, centred on a radius of 8 nm from the Airport but with the eastern and western boundaries 5 nm laterally from the ARP, parallel to the runway centreline. The 'kink' in the current CTR boundary to the east has been straightened and extends to the 8 nm arc. The proposed CTR extends from ground level to FL 85.

6.2.2 CTAs

The proposed CTA design appears quite complex as each area has a separate vertical upper limit which is consistent with the existing airspace structure above. Amalgamating CTAs to reduce the complexity of the design would result in an increase in the volume of airspace requested. The proposal to vary the base levels of the CTAs using time activation was considered unviable as it did not provide ATCOs with the required level of confidence that the airspace would be handed back to LBA, and therefore could be safely used for IFR aircraft. However, as described in Section 3.4, an alternative arrangement has been developed that meets the requirements of the Airport and the GA community alike. **Further details can be found within the draft LoAs [Enclosure 10]**.

The additional stubs that replace the CTRs in the consulted design option would be within the current 10 nm width and start at arcs 8 nm from the ARP and extend out to arc at 12 nm from the ARP. The base levels are 2,500 ft and upper levels remain the same as the existing airspace. They are annotated as CTAs A, B, C and D.

6.2.3 Area Descriptions

Airspace	Lower Limit	Upper Limit
CTR	Surface	FL 85
CTA A	2,500 ft	FL 85
CTA B	2,500 ft	FL 125
CTA C	2,500 ft	FL 125
CTA D	2,500 ft	FL 85
CTA 1	3,000 ft	FL 85
CTA 2	3,000 ft	FL 95
CTA 3	3,000 ft	FL 125
CTA 4	3,000 ft	FL 125
CTA 5	3,000 ft	FL 85
CTA 6	2,500 ft	FL 85
CTA 7	3,500 ft	FL95
CTA 8	3,500 ft	FL125
CTA 9	3,500 ft	FL125
CTA 10	3,500 ft	FL125

Airspace	Lower Limit	Upper Limit
CTA 11	3,500 ft	FL85
CTA 12	3,500 ft	4,000 ft
CTA 13	3,500 ft	4,500 ft
CTA 14	3,500 ft	FL55
CTA 15	3,000 ft	FL85

Table 2 – Vertical Limits of the Proposed Airspace at LBA

6.2.4 Containment of IFPs

The impact on aircraft containment while on the IFPs was examined to ensure that the modifications did not affect compliance with the containment policies[5]. The proposed CTR has been reduced in size with additional CTA stubs replacing parts of the CTR. Only the portions of the IFPs through the proposed airspace that have changed were considered; the containment of the procedures within the airspace design that was consulted on that has not changed has been assessed previously.

Each of the procedures has been assessed by a UK CAA approved procedure designer to determine the extent of the containment within the revised airspace, and the analysis is included at Enclosure 11. It has been assessed that the revisions to the proposed airspace have no impact on most of the IFPs. The protection for the short CAT AB aircraft base turn procedures is slightly reduced, and in the case of Runway 32, there is no greater protection than that already provided with the extant airspace arrangements.

6.2.5 Proposed Airspace Coordinates

The CAA issued a new policy statement on 19th November 2018 articulating new requirements to meet Aeronautical Data Quality[6] criteria for airspace design projects. Whilst this project is a legacy CAP 725 project and is therefore not formally required to submit the coordinates with this level of accuracy, it is considered best practice to do so. Therefore, the coordinates will be updated in accordance with the policy statement and will be submitted separately to the CAA.

6.3 Interaction with Existing En-Route Structures and ANSPs

6.3.1 NATS Link Routes

Once aircraft leave the airspace that immediately surrounds LBA, they enter the en-route airspace structure and ATC services are provided by NATS at the

[5] https://publicapps.caa.co.uk/docs/33/20140117ContainmentPolicyFinal.pdf
[6] See http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=6200&filter=2

Prestwick ATCC. The primary aim of this proposal is to enhance safety and improve efficiency. In meeting those aims, the key influence has been the interaction with the en-route airways structure. Initial concepts were judged to be unmanageable by NATS Prestwick Centre and extensive work has been undertaken to develop, through modelling and simulation, procedures that interact safely with the en-route architecture. This work has been further complicated by the ongoing projects to review and modernise UK airspace, in particular the FASI (N) project. This programme seeks to significantly enhance efficiency using PBN routes, and departure and arrival procedures that allow continuous climb or descents.

Achieving procedure designs for LBA that are compatible with new procedures at surrounding airports has been a long and intensive process, but this proposal has been developed in full cooperation with NATS Prestwick Centre. This ACP includes a requirement to include Standard Arrival (STAR) procedures and Standard Instrument Departures (SIDs) which need to link up with the en-route network. Traditionally SIDs and STARs terminate and commence at reporting points within the en-route CAS structure. Working closely with the FASI (N) Team at NATS Prestwick Centre, LBA has explored a more efficient option to truncate the SIDs and introduce STARs. Until the FASI (N) project delivers the full scope of airspace revisions under development, link routes to connect the LBA departures and arrivals to airways will be required. Whilst the en-route service provider would usually conduct the consultation for new link routes, it was considered most effective to include the routes within the LBA ACP consultation in order to present the proposed solution as a full package. Although details are included within this submission to provide context for the remaining elements of the ACP, the STARs will be the subject of a separate application post 2019.

6.4 Hours of Operation

There is no change planned to the hours of operation of LBA following this ACP. LBA operates 24 hours a day and this is not likely to change for the future.

6.5 Interaction with Domestic and International Route Structures

This ACP is part of a wider change to the airways network structure being undertaken by NATS En-Route Ltd (NERL) under a program called Future Airspace Strategy Implementation (North) or FASI(N). FASI(N) is a combination of airspace redesign modules that comply with the UK's Future Airspace Strategy through the provision of Performance Based Navigation routes, Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs) which facilitate continuous climb and continuous descent operations, user preferred routes, Flexible Use of Airspace and simplified boundaries between controlled and uncontrolled airspace. The redesign and modification will include the Manchester Terminal Control Area, Scottish Terminal Control Area, Belfast Terminal Control Area and Irish Sea sector operations.

Essentially, any changes proposed by LBA as part of an ACP must be compatible with the FASI (N) program. LBA has liaised continually throughout the project with the project managers at NERL to ensure that any changes do not affect any other aspect of the program.

6.5.1 Arrival Procedures

Figure 8 below provides details of the existing routes that will be utilised under the proposal (green), and the new routes that will be required (red). The dotted red line indicates a route that will be adopted once the wider Manchester Control Area revision is complete.

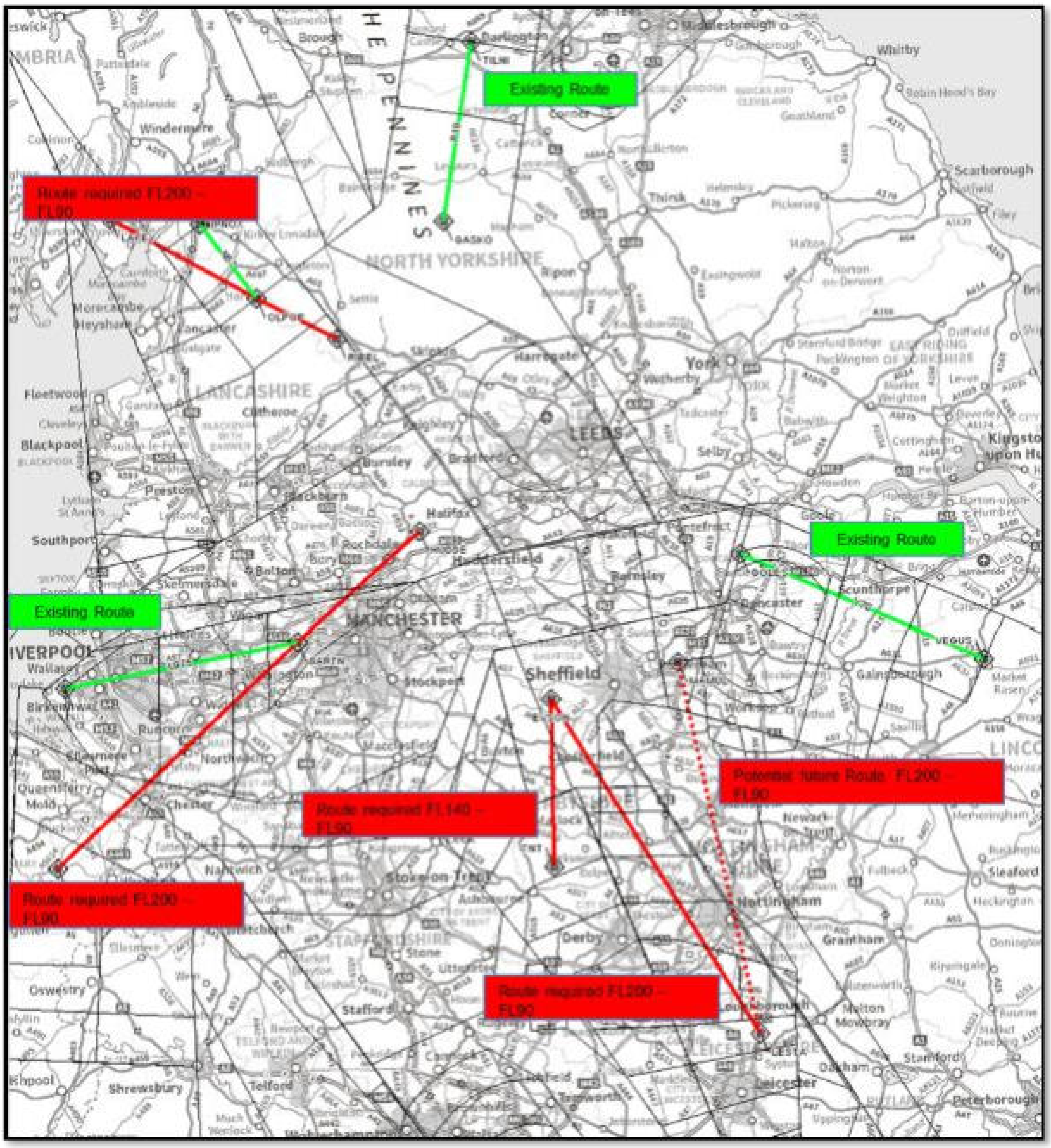

Figure 8 – FASI North Additions to LBA ACP – New Arrival Routes (STARs)

6.5.2 Departure Procedures

Figure 9 below shows the proposed link routes and anticipated levels to join the new LBA SIDs with the airways structure at reporting points DOPEK, POL, CROFT and NOKIN; magenta lines show the tracks of the SIDs, the light blue lines provide the link routes.

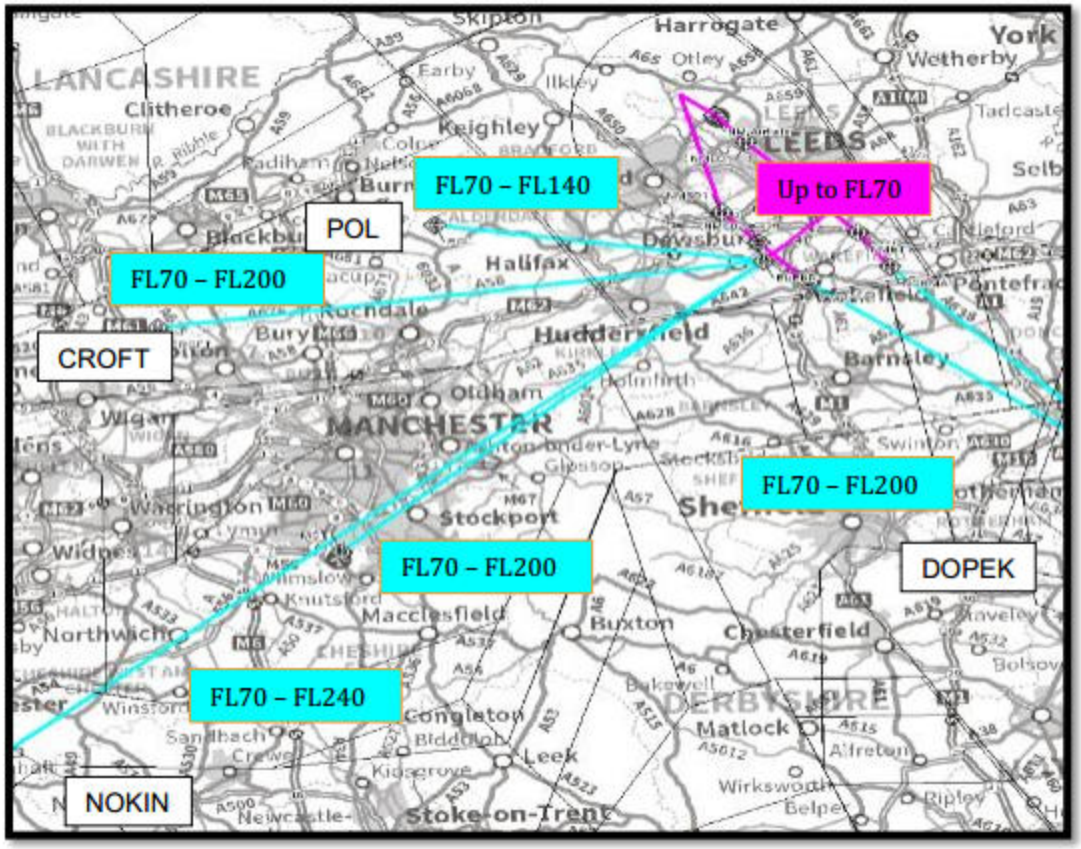

Figure 9 – FASI North Additions to LBA ACP – New SIDs, Departure Link Routes and Anticipated Levels

7 Proposed IFPs

7.1 Overview

The primary aim of the ACP proposal is to enhance safety and improve efficiency. In meeting those aims, one of the key influences has been the interaction with the en-route airways structure. The initial design concepts were judged to be unmanageable by NATS Prestwick Centre and extensive work has been undertaken to develop procedures, through modelling and simulation, which interact safely with the en-route architecture. This work has been further complicated by the ongoing projects to review and modernise UK airspace; FASI (N) is part of that process and is being managed by Prestwick Centre. Achieving procedure designs for LBA that are compatible with new procedures at surrounding airports has been a long and intensive process, but LBA is pleased that this proposal has been developed in full cooperation with NATS PC.

The second key influence on the procedure designs was the volume and dimensions of the airspace that would be required to contain them. As outlined within Section 2.5 onwards, prior to consultation several adjustments were made to the procedure designs to minimise the additional airspace that would be required in order to reduce the adverse impact on other airspace users who use the current Class G uncontrolled airspace. Full draft IFP design plates can be found at Annex A5.

7.1.1 Standard Instrument Departure (SIDs) Procedures

The proposed SIDs are designed to broadly replicate, as far as practicable, the existing departure profiles, and are compliant with the Noise Preferential Routes (NPRs). All departing jet aircraft are expected to fly within the NPRs up to 4,000 ft as defined in the IAIP AD 2-EGNM-1 Section 2.21 [Reference 4], and the proposed PBN procedures have been designed to remain within these NPRs. Departing turbo-prop aircraft are not required to follow the NPR in accordance with the Airport's planning approval. Full details of the IFPs are included within Enclosure 8; draft plates for SIDs can be found at Annex A5.3

7.1.2 Standard Arrival Routes (STARs)

In order to provide a degree of de-confliction with the departure routes, which predominantly route to the west of the Airport, LBA initially developed procedures that allow the option of routing arriving aircraft to the east of the Airport. These procedures show that from each key arrival reporting point, ATC has the option during intensive periods to route aircraft to either the east or west of the Airport. It is intended that the most direct route shall be used whenever available, but if this should conflict with departing traffic, the alternate arrival route will be adopted.

It was hoped that this ACP submission would include STARs, transitions to the IAPs within this submission; whilst they have been included to demonstrate the context for the airspace and the IAPs, they will be subject to a separate application post 2019. This is due to the complexity of introducing a new system of arrivals ahead of the FASI (N) project delivery.

Full details on the STARs can be found at Annex A4.

7.1.3 Instrument Approach Procedures

Approach Applications that are classified as RNP Approach (APCH) in accordance with International Civil Aviation Organisation (ICAO) Doc 9613 Performance Based Navigation (PBN) Manual (and ICAO state Letter SP 65/4-10/53) give access to minima (on an Instrument Approach Procedure) for all suitably equipped aircraft. The instrument approach procedures associated with RNP APCH are entitled RNAV (GNSS) to reflect that GNSS is the primary navigation system. The proposed IFPs for Runways 14 and 32 respectively are shown at Annex A5.

The arrival procedures for each runway consist of three Initial Approach Fixes (IAFs), an Intermediate Fix (IF) and two reporting points that form a rectangle. This layout allows controllers to adopt the shortest route for an aircraft, or to delay an aircraft to achieve greater distances between it and the aircraft in front, in order to achieve the required spacing between aircraft on final approach.

The proposed approaches have been designed by a UK CAA approved Procedure Designer in accordance with International Civil Aviation Organisation (ICAO) PANS-OPS Document 8168 and CAA policy guidance and regulations and are in line with best practices and standards across the UK.

8 Operational Impact

8.1 Overview

CAP 725 requires that ACP sponsors provide information concerning the operational impact of the proposed change. This section articulates the anticipated impact if the ACP is successful.

8.2 Perceived Impact – Noted by Consultation Responses

Following closure of the Consultation, and in the light of the responses received, LBA has undertaken a detailed review of the alternative suggestions proposed by stakeholders. LBA has considered the suggestions in general terms but has also considered specific alternative solutions for each element of the proposed airspace and provided reasons, where applicable, why alternative solutions could not be instigated. Full details of the consultation analysis can be found within the Consultation Feedback Report at Enclosure 5. The key operational impact themes raised from the objections were:

- Size and complexity of the CAS construct; and
- Safety of GA aircraft and access to Class D CAS.

These themes are addressed in the Sections below.

8.3 Size and Complexity of the Proposed CAS

LBA recognises that the GA community perceives the proposed increase in airspace to be excessive and overly complicated. In designing the airspace proposed, LBA considered both size and complexity and recognised the CAA's requirement to balance both when deciding the outcome of the ACP. Following a review of the proposed airspace and the nature of the new RNAV routes proposed, LBA considers that the airspace requested strikes the appropriate balance between size and complexity. LBA recognises that it would be possible to design less complicated airspace but that would result in a necessary increase in volume of airspace proposed.

LBA also considers that the critical factor for a majority of GA pilots is the base level of the proposed airspace. When considering the base of the proposed airspace only, the airspace is less complex as a number of the base levels are aligned, and the proposed airspace has only been further subdivided to be coincidental with the airspace already in place above it.

8.4 Safety of GA Aircraft and Access to Class D CAS

A large number of objections stated that the proposed airspace reduces level of safety by forcing more aircraft into a smaller amount of airspace. It is not the intent of LBA to reduce safety levels for any airspace user and the Airport would

like to stress that they have a proactive nature towards use of the proposed airspace by GA aircraft. LBA ATC intends to facilitate as much access as possible to GA aircraft whenever safety considerations allow; the Airport would like to foster relationships with local GA organisations to develop better communication so that both parties can benefit from a shared understanding of all airspace users' requirements.

8.5 Impact on other ANSPs

LBA has always taken care to ensure that it remains a 'good neighbour' to other ANSPs, other aviation users and members of the local community that it serves. The designs for the IFPs and airspace have aimed to ensure minimal impact on other ANSPs, but it is inevitable that there will be some changes to operational relationships because of the ACP. LBA has sought throughout the project to collaboratively work with other neighbouring ANSPs in order to ensure continuity of existing service or to ensure new mutually acceptable ways of working can be developed.

8.5.1 NATS En Route Ltd (NERL)

The proposed airspace change will need to complement new routes to allow aircraft to join the en-route airspace structure as expeditiously as possible. LBA has been working closely with NATS to create link routes to facilitate the proposed departure and arrival procedures that interact safely with the en-route architecture.

8.5.2 Doncaster Sheffield Airport (DSA)

Doncaster Sheffield Airport is approximately 40 miles to the south east of LBA.

The airport and air traffic controlling staff are satisfied that the proposal is compatible with their existing airspace arrangements, and do not foresee any reasons why the proposal would impede the safe and expeditious operation of either airport. DSA welcomes the good working relationship between both Air Traffic Control (ATC) units and believe that the proposal will allow this to continue. Some of the lower airspace immediately south of LBA's current airspace is controlled by DSA. Although DSA is the controlling authority, currently LBA traffic routinely transits through the airspace, with DSA approval. The combined number of aircraft movements for both airports through this airspace is significant. LBA has discussed plans with DSA to ensure that their ATC would continue to support LBA aircraft transiting through its airspace. The plans were positively received, and some relatively minor amendments were made to the approach tracks to ensure de-confliction with DSA procedures within the vicinity of UPTON.

8.5.3 Durham Tees Valley Airport (DTVA)

DTVA expressed some concern about the potential impact of the northern extension to the LBA CTAs on their arrivals to Runway 05. However, following discussion with DTVA, any concerns can be resolved with a LoA between the two airports to articulate how any conflicts might be managed.

8.6 Impact on IFR GAT

The implementation of RNAV SIDs and IAPs, and the additional volume of airspace to contain those procedures will enhance the expediency of flow of traffic at LBA. The additional volume of airspace will facilitate sequencing of multiple arrivals and will help to reduce aircraft having to take up holding patterns. This will assist in ensuring most aircraft can achieve a CDA, and all departures should be able to receive a continuous climb instruction. The design of the SIDs and IAPs (including the STARs that will be the subject of a separate application) were completed in collaboration with NATS Prestwick centre to ensure that they can be handled by the en-route system. Any Commercial Air Transport (CAT) that are RNAV equipped will be able to make use of the new RNAV SIDs, IAPs and new volume of airspace, providing the ACP is successful. This will allow them greater certainty about being able to achieve a CDA or a Continuous Climb on departure. Further, due to additional volume of airspace available to the east of the Airport, ATCOs will be able to sequence arrivals and departures more efficiently resulting in fewer aircraft having to hold prior to making their approach. Even aircraft not yet RNAV equipped will benefit from this additional airspace.

8.7 Impact on VFR GA – Powered Aircraft

The GA community view additional CAS as an area from which they are prohibited to fly. This is not the case and LBA has made a concerted effort to visit local GA establishments to provide information about the best way to request access to the airspace.

8.7.1 Sherburn-in-Elmet and Leeds East Airports

Sherburn-in-Elmet Aerodrome is the home of the Sherburn Aero Club, a large flying club and flying training school. Leeds East Airport occupies the site of the former RAF Church Fenton; at present it provides services to privately-owned aircraft, with aspirations to develop a passenger service. Both aerodromes lie to the east of LBA are developing GNSS procedures. Discussions between LBA and Leeds East and Sherburn-in-Elmet have taken place to establish how LBA might support these aerodromes through the provision of radar services and to ensure that our procedures de-conflict. A framework working arrangement has been agreed and LoAs are being developed between LBA and both Sherburn in Elmet and Leeds East Airport.

8.8 Impact on GA – Non-Powered Aircraft

A number of gliding clubs operate in the airspace surrounding LBA. The nature of glider flight means that glider pilots are unable to comply with instructions to maintain a set course or altitude, making adherence to a CAS crossing clearance problematic. Additionally, the majority of gliders are not fitted with radios, or the glider pilots do not possess a licence to operate a radio. This results in the boundaries of CAS being viewed as “barriers in the sky” by glider pilots and an extension of CAS restrictive to their operations.

8.8.1 Gliding Operations

A comprehensive response to the ACP consultation was received from Burn Gliding Club (BGC). Their concerns relate to gliding within the area.

They had particular concerns about CTAs 10, 12, 13 and 14 as it was considered that these areas with a base of 4,000 ft, would prevent cross country flights to the south for all except the most experienced of pilots.

Concerns were also raised about the implementation of CTAs 3, 4, 8 and 9. CTA 9 was cited as a particular concern to BGC due to its proximity to their location and the proposed base altitude of 3,500 ft. BGC stated that CTA 9 would hinder evening flying and late returns from cross country flights.

LBA analysed the responses and undertook to examine where the airspace could be modified or how to facilitate access to other airspace users when LBA was not using the airspace. As a result, two separate LoAs have been drafted to facilitate access to some of the CTAs. The first is an extension of the Upton Corridor, described in Section 3.4 and Figure 6 above. The second relates to the northern CTAs which would facilitate access when LBA was using Runway 32 under specific conditions. The LoA would provide access to the areas currently labelled as CTAs 2, 3, 7 and 8. The area intended to be covered by the Grassington Box is shown in Figure 10 below. Full details of the LoA is contained within Enclosure 10.

Figure 10 – Grassington Box – Subject to a LoA with the BGA and BHPA.

8.9 Impact on Military Users

The DAATM response stated that they acknowledge that through open and constructive dialogue with affected military units, a number of adjustments have been made to the proposal to alleviate some of the impact on operations and they welcome the opportunity to develop a LoA in order to agree and capture operational procedures.

DAATM stated that despite the adjustments made, the proposal would create some issues for the MOD. These are:

- The increase in CAS to the east of LBA will reduce the airspace available for Class G flying training sorties from RAF Linton-On-Ouse. The reduction of airspace will compress activities of all aviation types into a smaller area which will increase the Risk to Life from Mid-Air Collision.
- The increase in CAS has the potential to limit or re-route aircraft transiting from the west. The MOD would like to seek assurance from LBA that the increase in CAS will not be used to segregate aircraft activity, and appropriate air traffic services (ATS) will be provided to enable the safe integration of military aircraft in transit.
- The increase in CAS is likely to introduce delayed descent profiles for high-level aircraft inbound to airfields in Yorkshire. In some cases, this may include the adjustment of Instrument Flight Rules (IFR) patterns.

8.9.1 RAF Linton-On-Ouse and RAF Leeming

RAF Linton-on-Ouse is located within the Vale of York, north east of LBA, and provides pilot training. The extension of airspace to the east of LBA has the potential to limit the vertical space available for RAF Linton-on-Ouse controllers to use for the safe separation and sequencing of their aircraft. Earlier this year, the Ministry of Defence announced that RAF Linton is to close. Therefore, there is likely to be minimal impact to RAF Linton if the ACP is successful.

RAF Leeming is also located within the Vale of York, north of LBA, and operates Hawk T1 and Tutor aircraft. The extension of airspace to the north east of LBA will partially subsume one of the flight procedures that RAF Leeming uses to hold aircraft prior to recovery to the airfield. A LoA is being developed to allow RAF Leeming controllers to provide services to aircraft within LBA CAS, although the MOD has stated that they will not fully engage until the airspace has been approved.

8.10 Impact on Aerodromes and other Specific Activities

8.10.1 Warton Aerodrome

Warton Aerodrome is located on the west coast of the UK near Preston. It is run by BAE Systems and is used extensively for Research, Test and Development of several military aircraft types. Air Traffic Controllers at Warton have special permission to control aircraft through CAS for extended distances, and frequently control aircraft in the vicinity of LBA. LBA and Warton have discussed Warton's requirements and initially it was suggested that Warton's requirements could be addressed by the development of a Letter of Agreement (LoA) which would articulate how Warton controllers could operate autonomously within LBA CAS, under specified conditions. However, as the discussion matured, it was agreed that it would more flexible to accommodate Warton's requirements by agreeing coordination and facilitating access on a tactical basis. This was accepted by both Airports.

8.10.2 Other Aerodromes

See Section 5.3 above.

8.11 Any Flight Planning or Route Restrictions

Since the STARs do not form part of this ACP submission, all arrivals will be handled tactically as they currently are until the FASI (N) project delivery outcomes are realised.

8.12 Impact on Existing Procedures and Capacity

8.12.1 VFR Flights and Visual Reference Points (VRPs)

LBA wishes to make as little impact as is practicable on the extant operation of VFR flights at and near LBA, including the flight operations to and from nearby aerodromes. LBA ATC does not envisage any capacity problems in integrating VFR flights, including transit flights, into the proposed CTR/CTA traffic flow.

The remaining VRPs will remain in place:

- Harrogate (HGT) 036M 8.8nm
- Eccup (ECP) 090M 4.0nm
- Keighley (KLY) 276M 9.0nm
- Dewsbury (DBY) 182M 10.6nm

8.12.2 Special VFR Flights

Special VFR (SVFR) clearances are applicable only within control zones and under conditions which would usually require aircraft to comply with IFR (i.e. in Instrument Meteorological Conditions (IMC)). Within the proposed airspace, this would be in the LBA CTR, airspace below 2,000 ft. They are normally available to those types of light aircraft operations which are conducted with visual reference to the ground. SVFR clearances require standard IFR separation both between two SVFR flights, and between SVFR and IFR flights. LBA proposes to establish visually referenced Clearance Limits for inbound SVFR flights, which will provide adequate geographical separation, in accordance with CAP 493 MATS Part 1, for the purposes of IFR separation in time or space, from Final Approach and Departure tracks. The routing within the CTR to the SVFR clearance limits will normally be with reference to the current VRPs.

The pilot shall determine the flight meteorological conditions under which s/he intends to operate. Currently for flights in ATZ the pilot is required to take the reported meteorological visibility for the aerodrome (as passed by ATC) as being the flight visibility and conduct her/his flight accordingly[7].

[7]When the reported meteorological conditions at aerodromes in Class D airspace reduce below a ground visibility of 1500 m and/or a cloud ceiling of 600 ft, both by day or night, ATC shall advise pilots of aircraft intending to operate under Special VFR to or from such aerodromes and request the pilot to specify the type of clearance required. Except for helicopters using Police; Helimed; Rescue; Electricity; Grid; Powerline, or Pipeline callsigns,or a SAR training flight operating in accordance with MATS Part 2, controllers shall not issue a SVFR clearance to aircraft wishing to operate under SVFR to or from an aerodrome within a control zone, or enter the aerodrome traffic zone or aerodrome traffic circuit, when the official meteorological report at that aerodrome indicates: (1) By day or night: (a) Aircraft other than helicopters: ground visibility less than 1500 m and/or cloud ceiling less than 600 feet (SERA.5010(c)); (b) Helicopters: ground visibility less than 800 m and/or cloud ceiling less than 600 feet (SERA.5010(c)).

8.12.3 Secondary Surveillance Radar (SSR) and Frequency Monitoring Code (FMC)

LBA operates a frequency monitoring code: Mode 3A 2677 on frequency 134.580MHz. Operation of this will not change as a result of the ACP.

9 Economic Impact

9.1 Short Economic Impact Assessment

In November 2014, LBA commissioned York Aviation Ltd to conduct an economic impact assessment of the airport, looking at the contribution of the airport to the economy, which is measured in Gross Value Added (GVA). GVA is the economic output of the airport measured in salaries, services, job opportunities and profit. The report identified the following:

> *"We estimate that LBA had a total net economic footprint in the Leeds City Region of around £107 million of GVA … a total net tourism impact in the Leeds City Region of around £29 million of GVA … and in terms of other wider business benefits, supports around £200 million in GVA through increased productivity associated with business connectivity."*

The economic competitiveness of city regions is underpinned by the provision of connections to international markets – for business and leisure travellers – both outbound and inbound. Providing businesses in the Leeds City Region with better access to global business destinations, through direct short-haul flights and via major hub airports, is vital to supporting their growth and access to markets. LBA believes there is strong potential for further sustainable growth due to its location within the largest catchment of any other UK airport outside London, with a regional population growing faster than the UK average. This potential is reflected in forecasts provided by the DfT in 2013, in the document, 'Aviation Forecasts' which concluded that passenger numbers could increase from 3.3 million passengers per annum (mppa) per year to 7.1 mppa per year by 2030[8]. This level of growth would depend on a large number of variables, but if realised would make LBA the largest airport in the UK to the east of the Pennines, from and including Newcastle Airport in the north and East Midlands Airport in the south.

9.2 Traffic Forecasts

9.2.1 Current Levels of Traffic

This ACP is required to support existing levels of traffic and to ensure that the Airport can continue to grow in line with its current forecast. LBA currently handles 4 mmpa and aspires to increase this to 7 mmpa by 2030. As at the end of October 2018, the figure for 2018 had already reached 3.6 million passengers.

9.2.2 5 Year Traffic Forecast

The LBA Strategic Route to 2030 Masterplan[9] published in 2017 states that the Airport plans to meet the demand for air transport regionally by increasing the passenger throughput from 3.6 mppa to 7mppa by 2030. Assuming uniformed

[8] UK Aviation Forecasts, Department of Transport 2013
[9] https://www.leedsbradfordairport.co.uk/media/2522/masterplan-2017-update.pdf

growth, this would imply a throughput of around 4.5 mppa by 2020 and 5.7 mppa by 2023. This growth was anticipated without taking into consideration a successful ACP outcome.

Date	Number of Aircraft Movements	% Change	Number of Passengers	% Change
2014	29,873	-	3,274,474	-
2015	31,149	+4%	3,455,445	+5.52
2016	31,704	+1.78	3,612,117	+4.53
2017	34,549	+8.97	4,076,616	+12.86

Table 3 – Numbers of Aircraft and Passenger Movements at LBA (taken from the CAA website)

9.3 Impact of Noise

Included in Environmental Report [Enclosure 6].

9.4 Anticipated level of fuel burn/CO_2 Emissions

Included in Environmental Report [Enclosure 6].

9.5 Anticipated Effect on Local Air Quality

Included in Environmental Report [Enclosure 6].

10 Safety Management

10.1 Safety Methodology

This ACP is supported by a four-part suite of Safety Case Reports. These reports have been completed throughout the process and updated when design modifications have been made. The Safety Documentation has been prepared in accordance with the Leeds Bradford Airport Safety Management System.

10.2 Safety Case Part 1

See Enclosure 7.

10.3 Safety Case Part 2

See Enclosure 7.

10.4 Safety Case Part 3

See Enclosure 7.

10.5 Safety Case Part 4.

See Enclosure 7.

11 Airspace and Infrastructure Requirements

11.1 Introduction

A key element of an ACP is the requirement to demonstrate that the proposed airspace change complies with the Airspace and Infrastructure Requirements stipulated in CAP 725. This section will review the requirements and the evidence that Leeds Bradford Airport is able to comply with them, or if not already compliant, the necessary mitigations to become compliant.

11.2 Primary Surveillance Radar (PSR) Coverage

The existing (PSR) coverage that supports LBA operations is sufficient to meet the requirements of the new airspace and procedures. This ACP does not require a change to the existing PSR coverage.

11.3 Radio Coverage

This ACP does not introduce additional radio coverage requirements than that currently provided to support the existing LBA operation.

11.4 LBA Communications Contingency Plan

The changes proposed within this ACP do not affect the existing Communications Contingency arrangements already in place at LBA. The plans are reviewed periodically and in accordance with the Aerodrome Licence.

11.5 Staffing Availability and Qualifications

11.5.1 Sponsor Unit Training Requirements

The Sponsor Unit Training Requirements are captured within the Safety Case Part 3 and within a Transition Plan that is being developed for LBA ATCOs.

11.5.2 Contingency Operations

The existing business continuity and contingent arrangements remain extant. However, they will be reviewed and updated in light of this ACP.

11.6 Evidence of Compliance or Mitigation

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
The airspace structure must be of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to fully contain horizontal and vertical flight activity in both radar and non-radar environments.	Compliant	The airspace has been designed by a UK CAA Approved Procedure Designer and provides containment of the IFPS iaw ICAO PANS-OPS Document 8168.
Where an additional airspace structure is required for radar control purposes, the dimensions shall be such that radar control manoeuvres can be contained within the structure, allowing a safety buffer. This safety buffer shall be in accordance with agreed parameters as set down in SARG Policy Statement 'Safety Buffer Policy for Airspace Design Purposes Segregated Airspace'.	Compliant	The proposed airspace complies with the SARG Policy Statement 'Safety Buffer Policy for Airspace Design Purposes Segregated Airspace'.
The Air Traffic Management (ATM) system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structures.	Compliant	
Air Traffic Control (ATC) procedures are to ensure required separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures.	Compliant	

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
Within the constraints of safety and efficiency, the airspace classification should permit access to as many classes of user as practicable.	Compliant	Access to airspace will be facilitated tactically, or by use of LoAs.
There must be assurance, as far as practicable, against unauthorised incursions. This is usually done through the classification and promulgation.	Compliant	LBA will conduct visits to local airspace users to provide advice about the airspace and how to avoid incursions.
Pilots shall be notified of any failure of navigational facilities and of any suitable alternative facilities available and the method of identifying failure and notification should be specified.	Compliant	Existing procedures will remain extant
The notification of the implementation of new airspace structures or withdrawal of redundant airspace structures shall be adequate to allow interested parties sufficient time to comply with user requirements. This is normally done through the AIRAC cycle.	Compliant	It is proposed that a two-phased implementation will be applied. If the ACP is successful, SIDs will be implemented first (AIRAC 10/2019, and the airspace and the IAPs will be implemented at a later AIRAC. The STARs (transitions to the IAPs will be subject to a separate application post 2019).
There must be sufficient R/T coverage to support the ATM system within the totality of proposed controlled airspace.	Compliant	The existing Declared Operational Capability of the transmitters and receivers will be sufficient to manage the new airspace dimensions.
If the new structure lies close to another airspace structure or overlaps an associated airspace structure, the need for operating agreements shall be considered.	Compliant	LoA and MoUs are agreed in principle with NATS PC and DSA.

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
Should there be any other aviation activity (low flying, gliding, parachuting, microlight site, etc.) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, the Change Sponsor shall act to resolve any conflicting interests.	Compliant	LBA has offered several LoAs to facilitate glider flying within some areas of the newly proposed airspace under specified conditions. Gliding Competitions can be accommodated provided that Glider Clubs engage in advance.

Table 4 – Airspace and Infrastructure Requirements and Evidence of Compliance or Mitigation

Airspace changes in respect of ATS routes and Terminal Airspace (CTR/CTA) structures are subject to additional requirements as specified in Table 5 below.

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
There must be sufficient accurate navigational guidance based on inline VOR/DME or NDB or by approved RNAV derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/Eurocontrol Standards.	Compliant	

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
Where ATS routes adjoin Terminal Airspace there shall be suitable link routes as necessary for the ATM task.	Compliant	The existing LBA airspace already connects to the ATS routes and no changes are proposed to existing arrangements under this ACP.
All new routes should be designed to accommodate P-RNAV navigational requirements.	Compliant	
The airspace structure shall be of sufficient dimensions to contain appropriate procedures, holding patterns and their associated protected areas.	Compliant	See above
There shall be effective integration of departure and arrival routes associated with the airspace structure and linking to designated runways and published IAPs.	Compliant	The proposed airspace and new procedures have been designed improve the efficiency of aircraft operating in and out of LBA. The additional airspace to the east of the airport means arrivals can be de-conflicted from departures more effectively and reducing the requirement for arrivals to hold off.
Where possible, there shall be suitable linking routes between the proposed terminal airspace and existing en-route airspace structure.	Compliant	Existing routes exist for aircraft accessing and egressing from the en-route airspace.

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
The airspace structure shall be designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace.	Compliant	
Suitable arrangements for the control of all classes of aircraft (including transits) operating within or adjacent to the airspace in question, in all meteorological conditions and under all flight rules, shall be in place or will be put into effect by Change Sponsors upon implementation of the change in question (if these do not already exist).	Compliant	LBA currently has Class D CAS and this ACP represents a larger volume of airspace. Procedures for providing VFR and IFR control service remain extant.
Change Sponsors shall ensure that sufficient VRPs are established within or adjacent to the subject airspace to facilitate the effective integration of VFR arrivals, departures and transits of the airspace with IFR traffic.	Compliant	The existing VRPs remain extant. LBA will review the surrounding area and examine whether any new VRPs are required.
There shall be suitable availability of radar control facilities.	Compliant	LBA has PSR and SSR (provided via an ORRD feed from NATS) equipment that is being used for the provision of radar control services currently.

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
Change Sponsors shall, upon implementation of any airspace change, devise the means of gathering (if these do not already exist) and of maintaining statistics on the number of aircraft transiting the airspace in question. Similarly, Change Sponsors shall maintain records on the numbers of aircraft refused permission to transit the airspace in question, and the reasons why. Change Sponsors should note that such records would enable ATS Managers to plan staffing requirements necessary to effectively manage the airspace under their control.	Compliant	LBA already keeps details of aircraft who are refused permission to transit their existing CAS; the same procedure will be used in the future.
All new procedures should, wherever possible, incorporate Continuous Descent Approach (CDA) profiles after aircraft leave the holding facility associated with that procedure.	Compliant	Although the STARs and transitions will not be included within this ACP, the additional airspace associated with the ACP will facilitate the ability for arrivals to conduct CDAs.

Table 5 – Additional Airspace and Infrastructure Requirements and Evidence of Compliance or Mitigation

12 IAIP Amendment

12.1 Overview

The following sections of the LBA entry to CAP 032 The UK Aeronautical Information Publication will be updated following CAA review and decision and details of required changes will be submitted to NATS AIS. The following sections have already been identified as requiring amendment.

12.2 EN 1.1

Para 1.1.3

12.3 EN 1.4

Section 2.4.1. Notifications

No change.

12.4 ENR 2.1

No change.

12.5 ENR 3.1, 3.3

ENR 3.1-12 – check arrangements for L975 Crossing Area to see if still extant. [

ENR 3.1-36 – Check details of Camphill Box.

ENR 3.1-50 – Check details of IPSIR (under P17) to see if details still extant.

ENR 3.1-51 – Check details of IKDOL (under POLE HILL VOR/DME) to see if still extant.

ENR 3.1-68 – Check details of Camphill Box and L975 Crossing Area.

ENR 3.3-22 – Check details of Camphill Box and L975 Crossing Area.

ENR 3.3-41 - Check details of Camphill Box and L975 Crossing Area.

ENR 3.3-83 – Check details of Camphill Box.

ENR 3.3-155 – Check details of L975 Crossing Area.

12.6 ENR 4.4

New Name code designators – *if applicable*

12.7 ENR 6 Charts

ENR 6.1.4.1 – Depiction of LBA CTR/CTA

12.8 VFR Charts

1:250,000 Northern England

12.9 AD 2-EGNM-1 Leeds Bradford Aerodrome – Textual Data

12.10 AD 2-EGNM-5-1 ATC Surveillance Minimum Altitude Chart

12.11 AD 2-EGNM-6-1 SID Charts

12.12 AD 2-EGNM-7-1 STAR Charts

12.13 AD 2-EGNM-8-X Approach Charts Related to the Airport

13 Phased Implementation Plan

13.1 Overview

As explained within this document, LBA initially planned to submit an ACP that included SIDs, STARs and additional CAS to contain the new procedures. These were developed in close cooperation with NATS PC as the ACP forms part of a wider program (FASI North). However, due to constraints beyond the control of LBA, it is now clear that a phased implementation will be sought, that fits in with planned network upgrades at PC, and takes account of the CAA approval process. This section articulates how a phased implementation for the LBA ACP is proposed if the ACP submission is successful.

13.2 STARs

NATS Prestwick Centre is planning a major upgrade to its system that means that any changes to the airspace network are embargoed between May 2019 and 2021. The implementation of the STARs would require additional interaction and supplementary agreements between LBA and NATS PC. Many of these will be affected or potentially superseded by the FASI North program, so the decision has been taken to delay submission of an application to implement the STARs for LBA until the project deliveries of FASI North are clearer. The STARs will now be the subject of a separate application under CAP 1616 that will be developed post 2019.

13.3 SIDs

The new RNAV SIDs for LBA have been designed to broadly replicate the existing SIDs as far as practicable. The interaction between LBA and NATS PC will not alter when compared to how transfer of control and transfer of communication currently takes place between the two agencies. Although the submission of the ACP will not be in time to allow CAA to make a decision that allows implementation by AIRAC 06 (2019), which is when the embargo is due to start, NATS PC has agreed that they can accommodate the minimal changes to the system to support the new SIDs if the application is successful, for implementation by AIRAC 10 2019. The existing Class D CTR and CTAs contain the new SIDs, so no additional airspace is required for their implementation.

13.4 IAPs and Additional Airspace

Although the STARs are not included within this submission, LBA wishes to implement the new GNSS (RNAV) approaches from the Initial Approach Fix (IAF). This means that aircraft presented to LBA from PC will be tactically handled and radar vectored to either an ILS approach or a GNSS (RNAV) approach from the IAF. The IAPs each have 3 IAFs configured in a T-Bar design. In order to provide appropriate containment of the IAPs, additional airspace is required, particularly to

the east of the airport. This ensures that the IAPs are contained in accordance with ICAO PANS Ops criteria and complies with the UK CAA Policy Statement on containment of procedures. Since the additional airspace and the implementation of the IAPs does not affect the interactions between LBA and NATS PC, these proposed changes would not affect the network systems upgrade work. However, due to constraints within the CAA, it is unlikely that a decision on these procedures and airspace is achievable in time to meet the AIRAC 10 deadline that is required for the SIDs implementation. Therefore, it is likely that if the ACP is approved, implementation of the IAPs and additional airspace will take place on AIRAC 11, 12 or 13 (2019).

14 References

Reference	Name	Origin
1	CAP 725 CAA Guidance on the Application of the Airspace Change Process Fourth Edition March 2016	CAA
2	CAP 785 Approval Requirements for Instrument Flight Procedures for Use in UK Airspace March 2010	CAA
3	ICAO PANS-OPS Document 8168 Vol II Construction of Visual and Instrument Flight Procedures Sixth Edition 2014	ICAO
4	IAIP AD 2-EGNM-1 Leeds Bradford Aerodrome Textual Data Dec 2017	NATS
5	Code of Practice on Consultation July 2008	Cabinet Office URN 08/1097

Table 6 – Table of References

A1 Glossary

Acronym	Meaning
ACP	Airspace Change Proposal
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
ANSP	Air Navigation Service Provider
AR	Airspace Regulation
ARP	Aerodrome Reference Point
amsl	above mean sea level
APCH	Approach
ATC	Air Traffic Control
ATM	Air Traffic Management
ATSM	Air Traffic Services Manager
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
ATZ	Aerodrome Traffic Zone
BGA	British Gliding Association
BHPA	British Hand Gliding and Paragliding Association
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAS	Controlled Airspace
CAT	Commercial Air Transport
CO_2	Carbon Dioxide
CTA	Control Area (Class D UK Airspace)
DAATM	Defence Airspace and Air Traffic Management

DAP	Directorate of Airspace Policy (part of the CAA – now SARG)
DfT	Department for Transport
DME	Distance Measuring Equipment
DSA	Doncaster Sheffield Airport
DTVA	Durham Tees Valley Airport
EASA	European Aviation Safety Agency
FAS	Future Airspace Strategy
ft	feet
GA	General Aviation
GAT	General Air Traffic
GNSS	Global Navigation Satellite System
HoATS	Head of Air Traffic Services
IAF	Instrument Approach Fix
IAIP	Integrated Aeronautical Information Package
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
km	kilometre
kts	knots
LBA	Leeds Bradford Airport
LoA	Letter of Agreement
m	metre
MAA	Military Aviation Authority
MAP	Missed Approach Point
MoD	Ministry of Defence
MoU	Memorandum of Understanding

NATMAC	National Air Traffic Management Advisory Committee
NATS	National Air Traffic Service *Provider of en-route air traffic services in the Scottish and London Flight Information Regions and at some civil airports.*
NDB	Non-Directional Beacon
NERL	NATS En Route Ltd
nm	nautical mile
NOTAM	Notice to Airmen
NO_2	Nitrogen Dioxide
PC	Prestwick Centre
PBN	Performance Based Navigation
PSR	Primary Surveillance Radar
RAF	Royal Air Force
RNAV	aRea NAVigation
RNP	Required Navigation Performance
RSAG	Regional Soaring Airspace Group
SARG	CAA Safety and Airspace Regulation Group
SMM	Safety Management Manual
SSR	Secondary Surveillance Radar
VFR	Visual Flight Rules
VOR	VHF Omni Directional Radio Range; a type of short-range radio navigation system for aircraft

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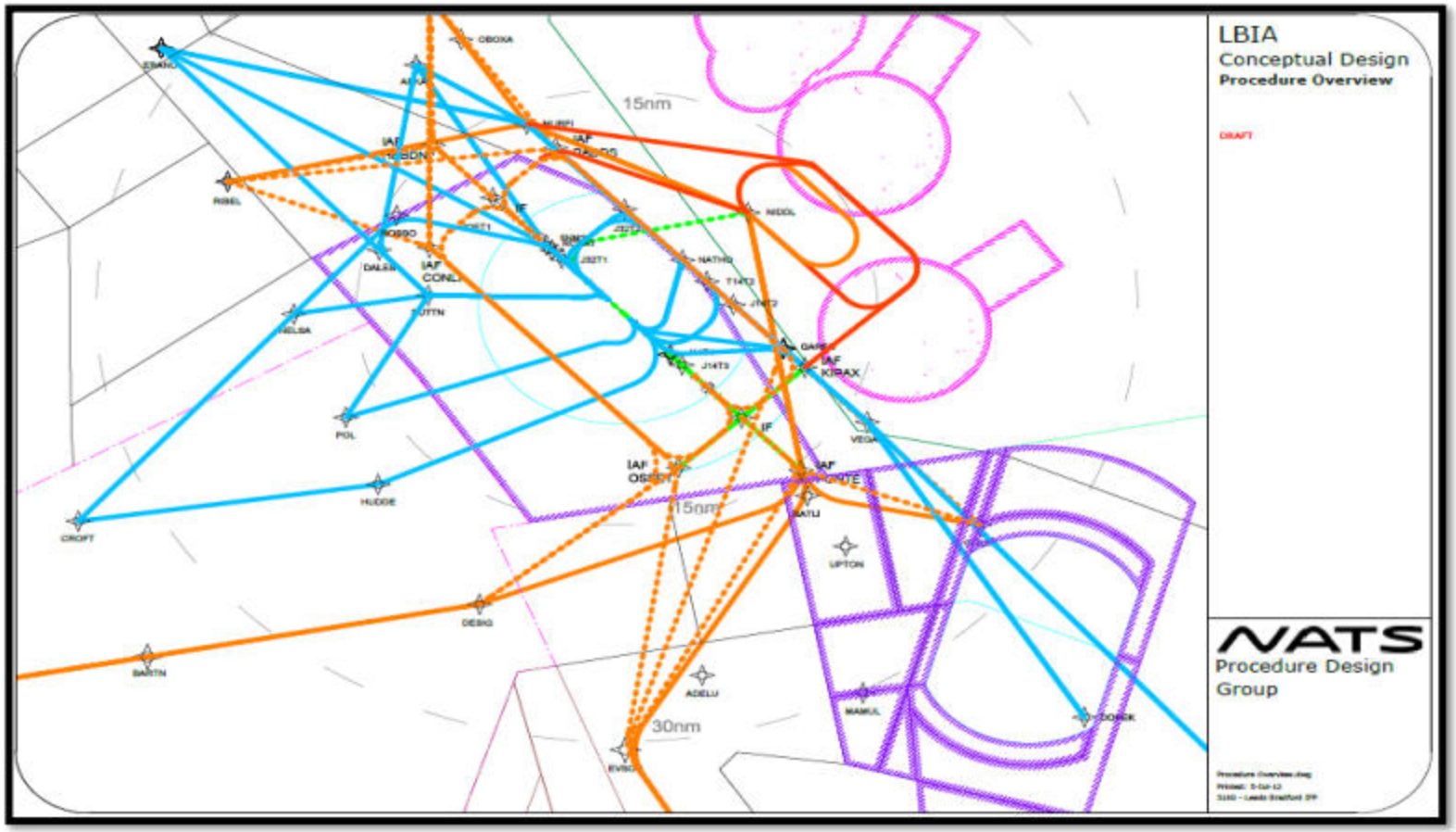
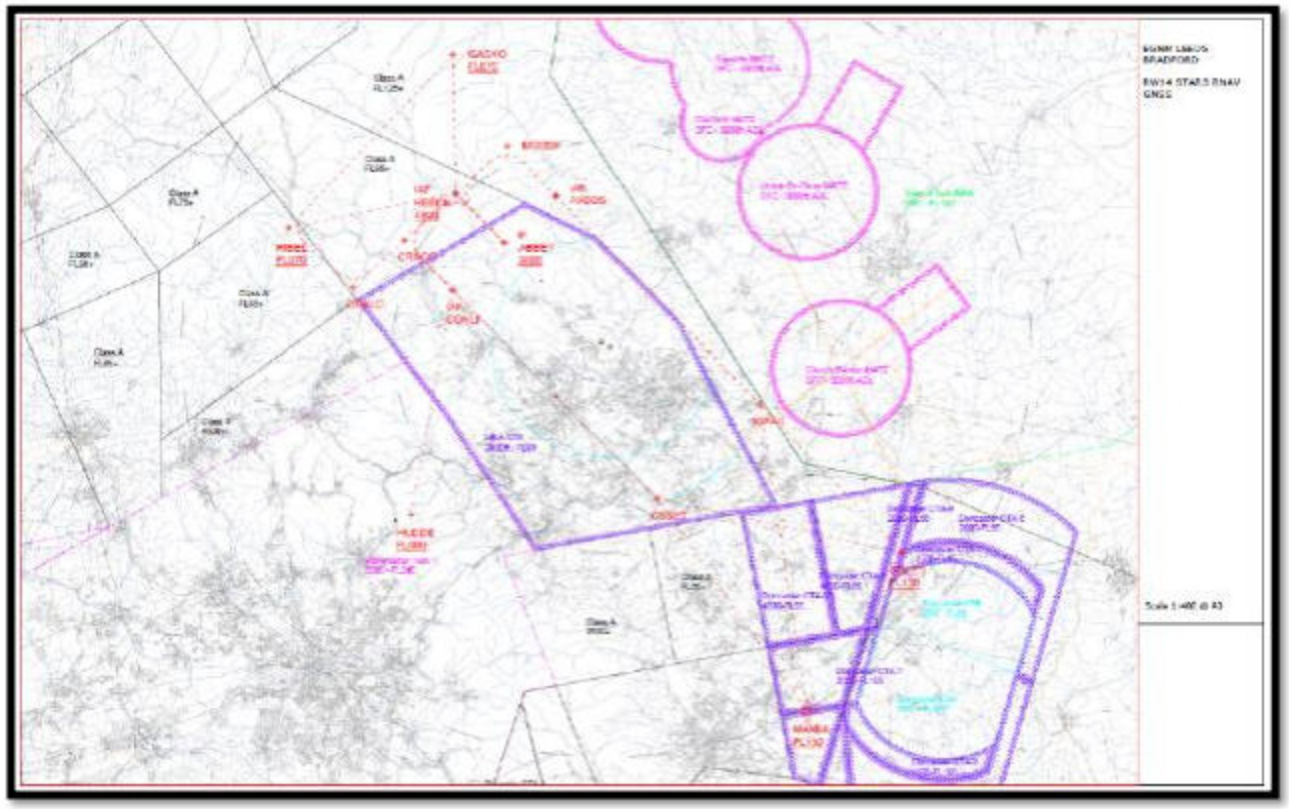
A2 Initial Conceptual Designs




LBIA
Conceptual Design
Airspace Overview
Primary protection area of procedures that may require additional or adjusted controlled airspace.
Primary protection area of procedures that cross Airway L975 and Doncaster Sheffield CTA.
NATS
Procedure Design Group

A3 Interim Airspace Design Proposed Arrival Routes

A3.1 Runway 14



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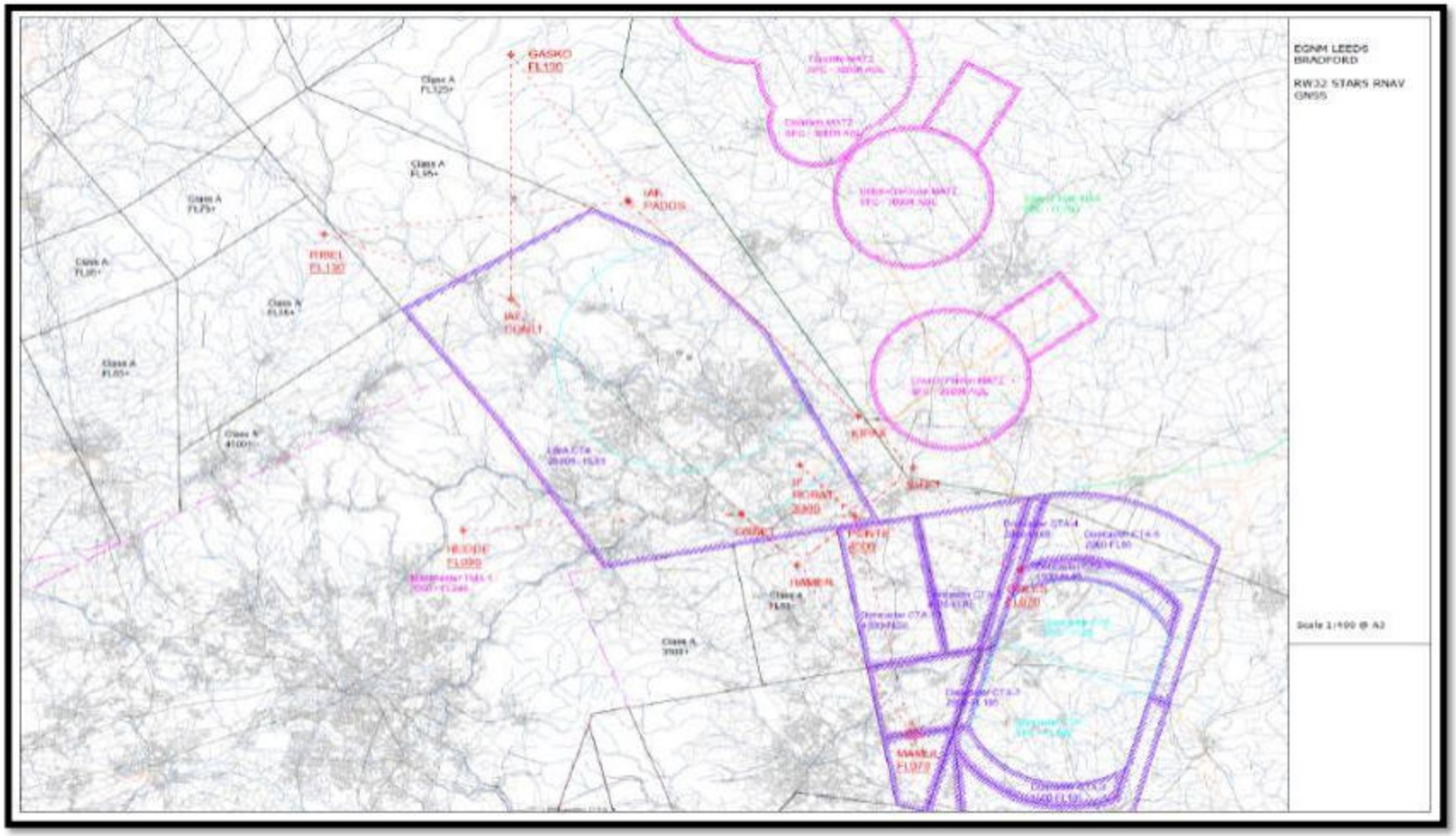
A3.2 Runway 32



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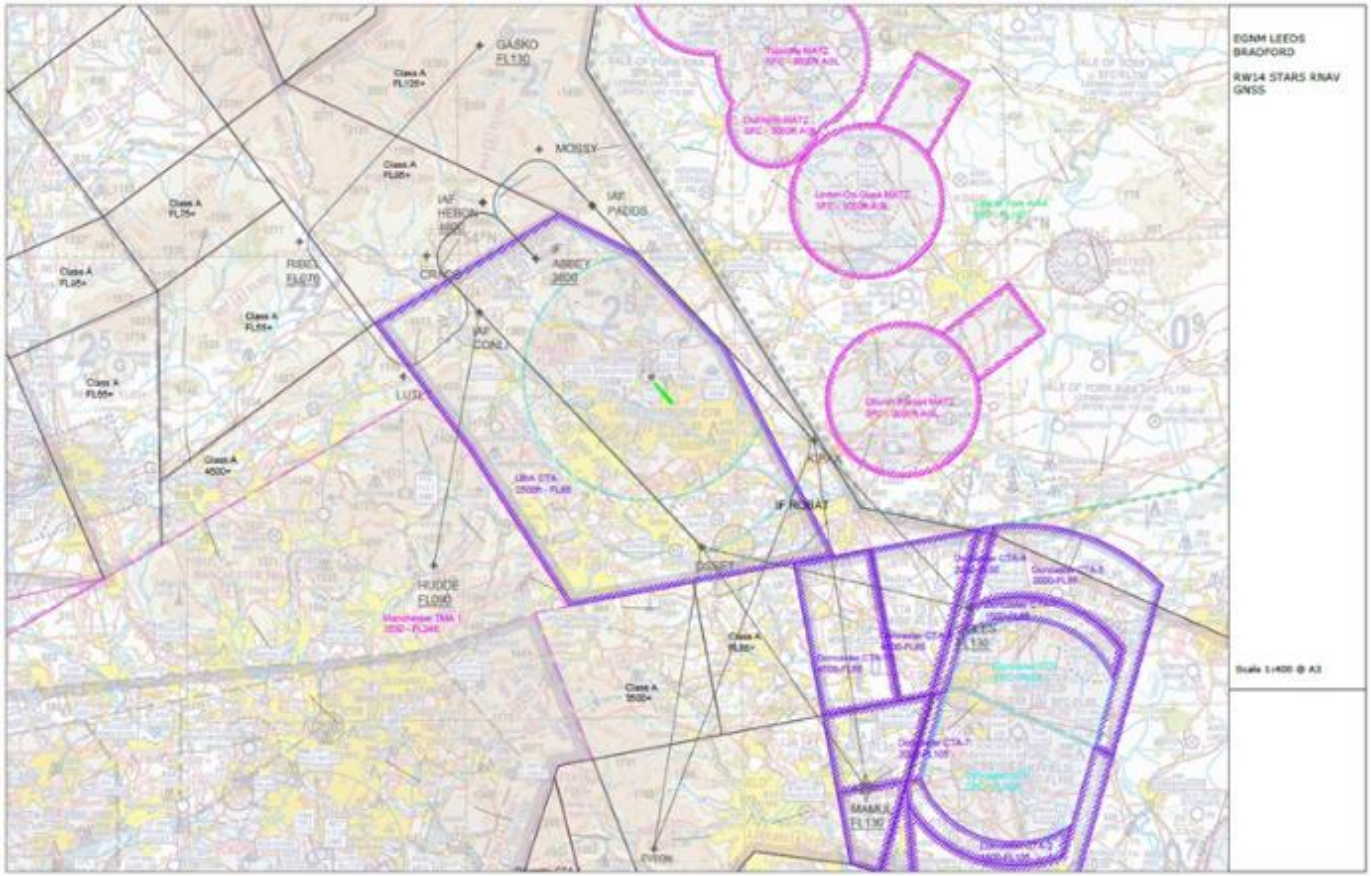
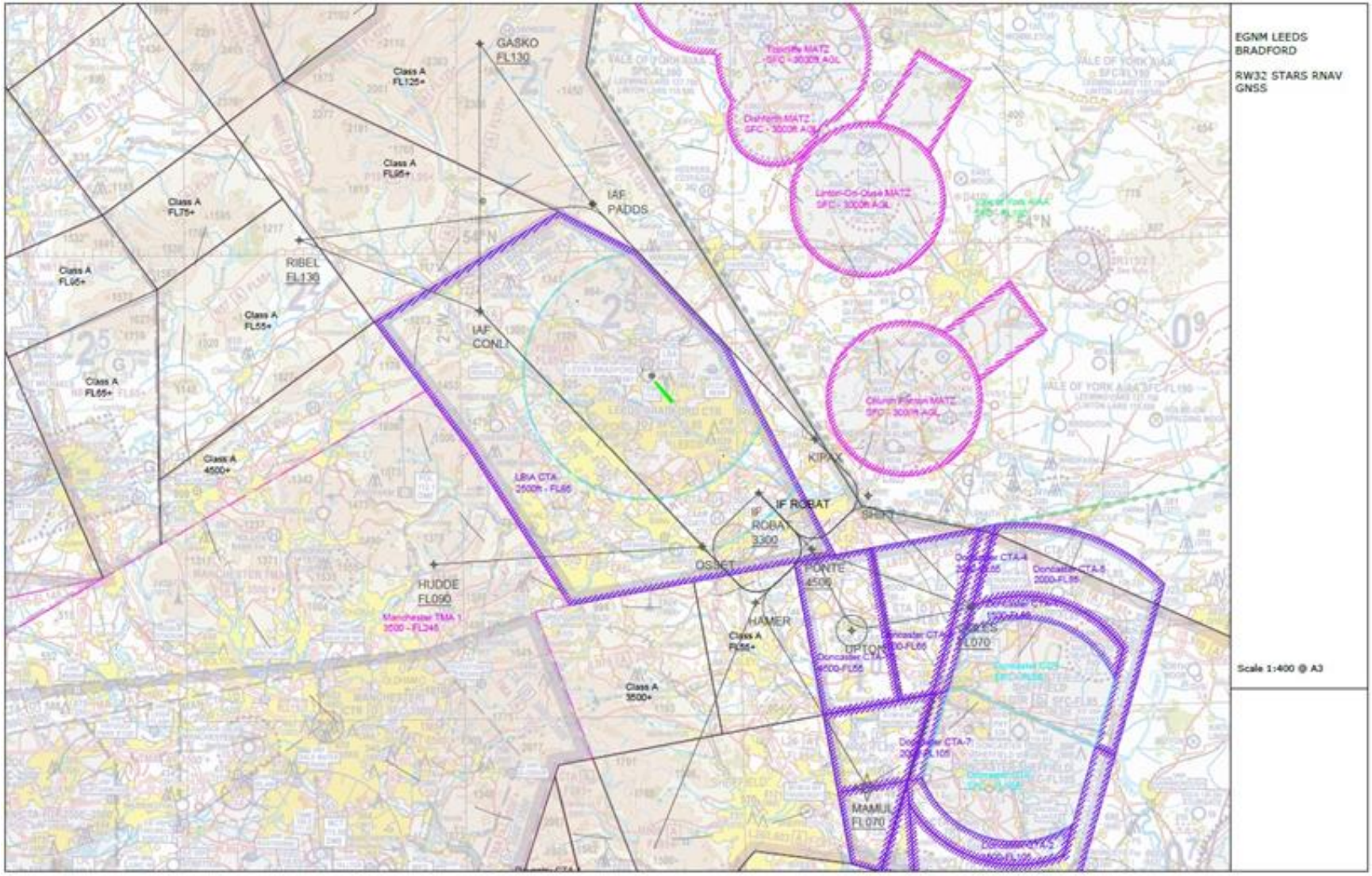
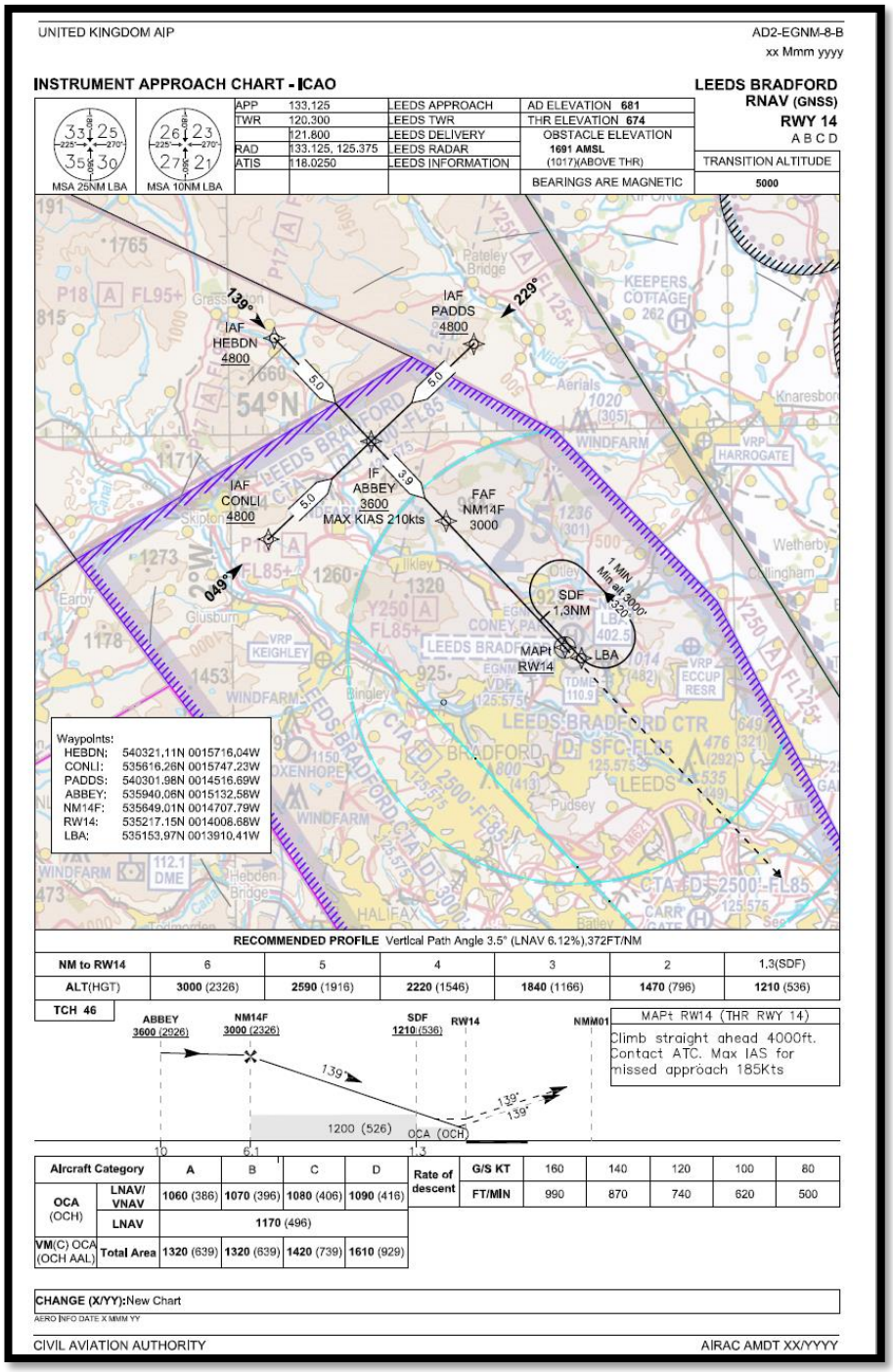
A4 Proposed Arrival Routes (STARs)



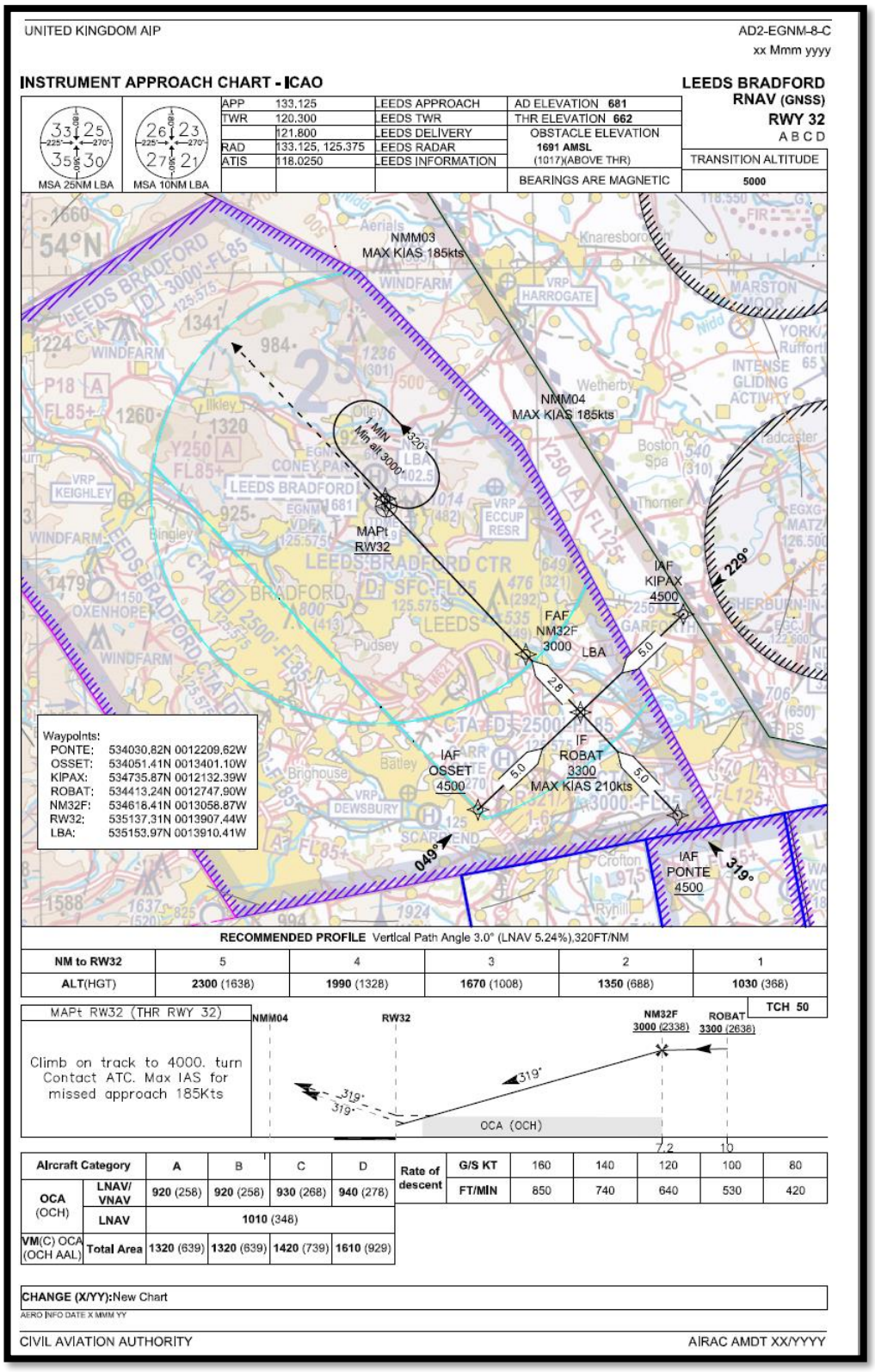

EGNM LEEDS BRADFORD
RW32 STARS RNAV GNSS
Scale 1:400 @ A3
GASKO FL130
IAF PADDS
IAF CONLI
RIBEL FL130
KIPAX
IF ROBAT 3300
OSNET
PONTE 4500
HUDDE FL090
HAMER
MAMUL FL070
UPTON
Class A FL125+
Class A FL95+
Class A FL75+
Class A FL55+
Class A 4500+
Class A 3500+
LBIA CTA 2500ft - FL66
Manchester TMA 1 3500 - FL245

A5 Draft Instrument Flight Procedures

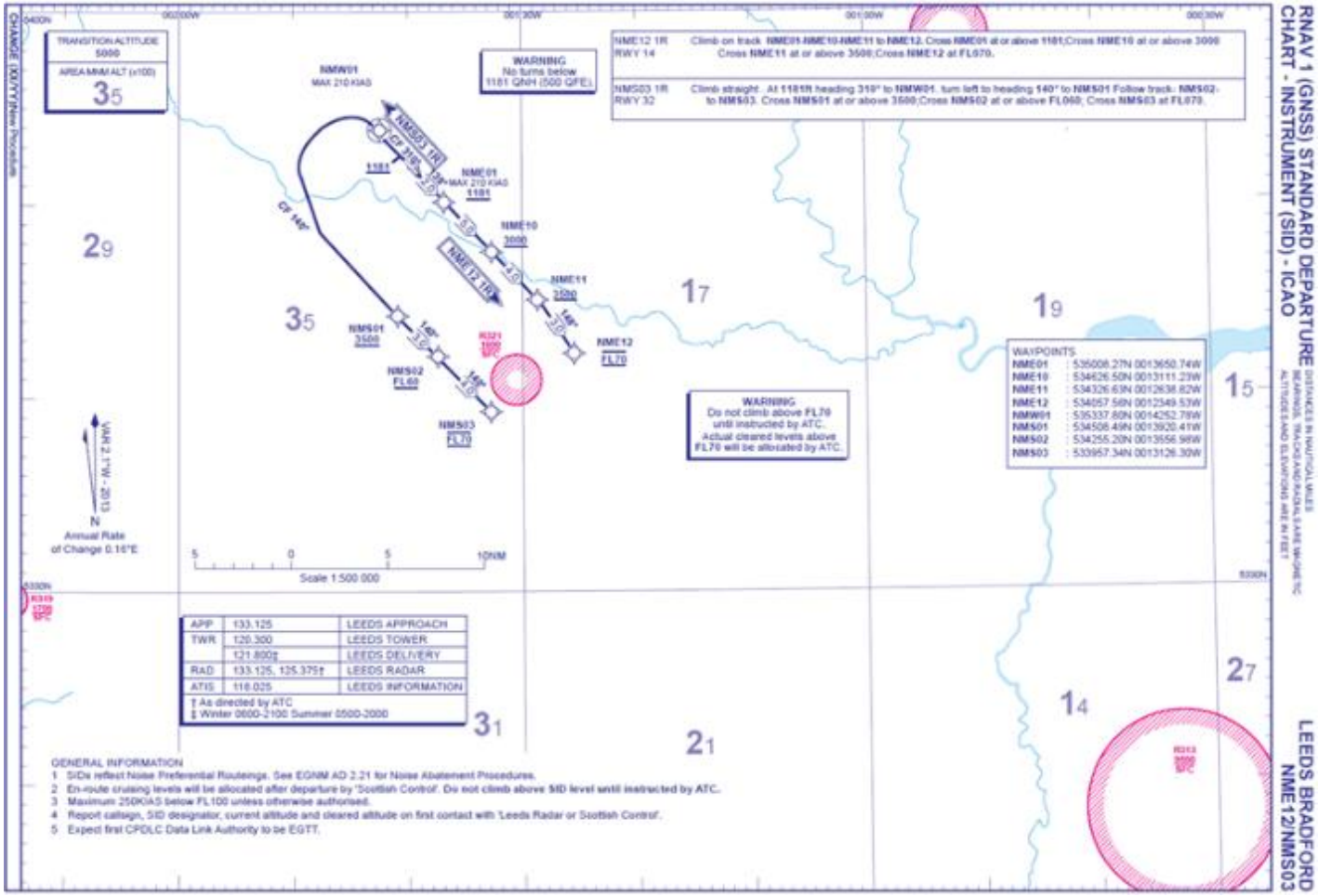
A5.1 Instrument Approach Chart Leeds Bradford RNAV (GNSS) Runway 14



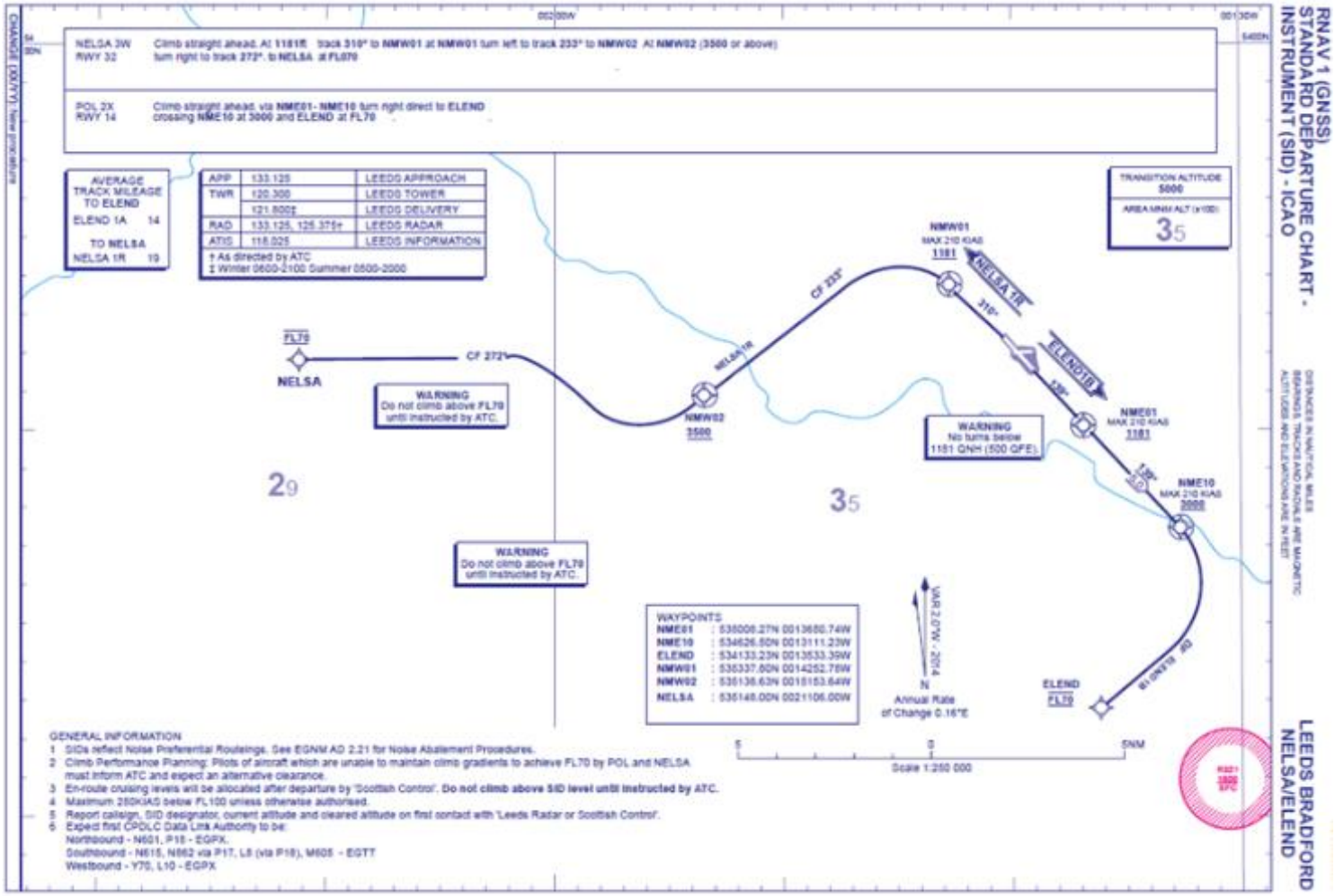
A5.2 Instrument Approach Chart Leeds Bradford RNAV (GNSS) Runway 32



A5.3 Draft GNSS SID – Truncated DOPEK/LAMIX



A5.4 Draft GNSS SID NELSA/ELEND



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A6 Leeds Bradford ATC Exemplar Staff Roster

		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21			
Date	Day	A WATCH				B WATCH				C WATCH				D WATCH				E WATCH				TRAINEES			
1	Mon	M	M	M	LV	O	O	O	O	O	O	O	O	LV	D	N	N	LV	A3	A1	A1	O			**1**
2	Tue	M	M	M	LV	O	O	O	O	O	O	O	O	LV	D	N	N	LV	A1	A3	A1	O			**2**
3	Wed	A1	A1	A3	LV	M	M	M	LV	O	O	O	O	O	O	O	O	LV	D	N	N	M			**3**
4	Thu	A1	A3	A1	LV	M	M	M	LV	O	O	O	O	O	O	O	O	LV	D	N	N	M			**4**
5	Fri	D	N	N	LV	A1	A1	A3	LV	M	M	M	LV	O	O	O	O	O	O	O	O	A1			**5**
6	Sat	D	N	N	LV	A1	A3	A1	LV	M	M	M	LV	O	O	O	O	O	O	O	O	A1			**6**
7	Sun	O	O	O	O	D	N	N	LV	A1	A1	A3	LV	M	M	M	LV	O	O	O	O	D			**7**
8	Mon	O	O	O	O	D	N	N	LV	A1	A3	A1	LV	M	M	M	LV	O	O	O	O	D			**8**
9	Tue	O	O	O	O	O	O	O	O	D	N	N	LV	A1	A1	A3	LV	M	M	M	LV	O			**9**
10	Wed	O	O	O	O	O	O	O	O	D	N	N	LV	A1	A3	A1	LV	M	M	M	LV	O			**10**
11	Thu	M	M	LV	M	O	O	O	O	O	O	O	O	D	N	N	LV	A1	A1	A3	LV	O			**11**
12	Fri	M	M	LV	M	O	O	O	O	O	O	O	O	D	N	N	LV	A1	A3	A1	LV	O			**12**
13	Sat	A1	A3	LV	A1	M	M	LV	M	O	O	O	O	O	O	O	O	D	N	N	LV	M			**13**
14	Sun	A1	A1	LV	A3	M	M	LV	M	O	O	O	O	O	O	O	O	D	N	N	LV	M			**14**
15	Mon	D	N	LV	N	A1	A3	LV	A1	M	M	LV	M	O	O	O	O	O	O	O	O	A1			**15**
16	Tue	D	N	LV	N	A1	A1	LV	A3	M	M	LV	M	O	O	O	O	O	O	O	O	A1			**16**
17	Wed	O	O	O	O	D	N	LV	N	A1	A3	LV	A1	M	M	LV	M	O	O	O	O	D			**17**
18	Thu	O	O	O	O	D	N	LV	N	A1	A1	LV	A3	M	M	LV	M	O	O	O	O	D			**18**
19	Fri	O	O	O	O	O	O	O	O	D	N	LV	N	A1	A3	LV	A1	M	M	LV	M	O			**19**
20	Sat	O	O	O	O	O	O	O	O	D	N	LV	N	A1	A1	LV	A3	M	M	LV	M	O			**20**
21	Sun	M	LV	M	M	O	O	O	O	O	O	O	O	D	N	LV	N	A1	A3	LV	A1	O			**21**
22	Mon	M	LV	M	M	O	O	O	O	O	O	O	O	D	N	LV	N	A1	A1	LV	A3	O			**22**
23	Tue	A1	LV	A3	A1	M	LV	M	M	O	O	O	O	O	O	O	O	D	N	LV	N	M			**23**

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		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21			
Date	Day	A WATCH				B WATCH				C WATCH				D WATCH				E WATCH				TRAINEES			
24	Wed	A1	LV	A1	A3	M	LV	M	M	O	O	O	O	O	O	O	O	D	N	LV	N	M			**24**
25	Thu	D	LV	N	N	A1	LV	A3	A1	M	LV	M	M	O	O	O	O	O	O	O	O	A1			**25**
26	Fri	D	LV	N	N	A1	LV	A1	A3	M	LV	M	M	O	O	O	O	O	O	O	O	A1			**26**
27	Sat	O	O	O	O	D	LV	N	N	A1	LV	A3	A1	M	LV	M	M	O	O	O	O	D			**27**
28	Sun	O	O	O	O	D	LV	N	N	A1	LV	A1	A3	M	LV	M	M	O	O	O	O	D			**28**
29	Mon	O	O	O	O	O	O	O	O	D	LV	N	N	A1	LV	A3	A1	M	LV	M	M	O			**29**
30	Tue	O	O	O	O	O	O	O	O	D	LV	N	N	A1	LV	A1	A3	M	LV	M	M	O			**30**
31	Wed	LV	M	M	M	O	O	O	O	O	O	O	O	D	LV	N	N	A1	LV	A3	A1	O			**31**

KEY			
M	0630 - 1400	O	Off
A1	1400 - 2130	LV	Leave
A3	1500 - 0130		
N	2130 - 0630		
D	1000 - 1800		

This example roster demonstrates how the roster can be managed with 20 Controllers, with additional trainees as required.
Assumes one controller per watch on annual leave at any given time.
Unit establishment is for 22 Controllers, with aspirations to increase this number over time as dictated by operational necessity.