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LEEDS BRADFORD AIRPORT FUTURE AIRSPACE – CAP1616 ACP – STAGE 2 – 3rd ROUND ENGAGEMENT

Introduction

As a part of Leeds Bradford Airport's (LBA) Airspace Change Proposal (ACP), we would appreciate if you, as a representative key stakeholder, would participate in a further round of stakeholder engagement.

The LBA ACP has not yet passed through the Stage 2 gateway as it was determined that the Design Principle Evaluation (DPE) conducted previously needed to be reviewed, as did the Initial Options Appraisal (IOA), to ensure a consistent application of criteria across the Design Options (DOs). Additionally, based upon meetings between the Airport and the En-Route Air Traffic Service (ATS) provider (NERL), it was deemed necessary to develop some additional Arrival Options. Given the additional time, we have also taken the opportunity to develop some new Departure Options largely focused on providing communities with respite or night-time noise relief. The resulting suite of DOs are provided in the two presentations attached:

- Part 1 'Departures'
- Part 2 'Arrivals'

Whilst we appreciate that we have taken up a great deal of your time already in Stages 1 and 2, it is critical that we get it right and proceed into Stage 3 of the process with an array of options that best meet the needs of our stakeholders. We are therefore seeking your views on all the DOs, including some new ones, and to what extent they meet the agreed Design Principles (DPs). In order for you to provide views on the DOs and DPs, we would be grateful if you could use the survey available at the following link.

Based on the stakeholder feedback, the DPE will again be finalised and an IOA will be conducted and documented. The intention is to have all Stage 2 materials submitted by **26 January 2024** in time for the **23 February 2024** CAA Gateway Assessment Meeting. In order for us to meet that deadline, we would be grateful of your feedback **by 1700hrs on 20 December 2023.**

An online briefing will be delivered on **Tuesday 5 December between 1200 and 1400hrs** for anyone who wishes to gain a fuller understanding of what is being requested. This session will be held on Microsoft Teams and an invite will be sent to the same email address from which you received this information.

Should the Gateway be successfully passed, the project will move into Stage 3 of the CAP1616 process and will ultimately culminate in a public consultation.

All associated documentation will be published on the CAA's ACP Portal[1].

The remaining sections of this document contain information about the development of the DOs and provide context for the content found in the presentations.

[1] https://airspacechange.caa.co.uk/

Design Options Development

According to CAP1616 Step 2A[2], Airspace Change sponsors are required to develop a full list of DOs that address the Statement of Need (SoN) for evaluation against the DPs that were developed, with the help of stakeholders, during Stage 1 of the ACP Process.

We developed DOs for departures by first assessing and describing the baseline, or 'Do Nothing' option. The output from our Noise and Track Monitoring System (NTMS) showed that there are very few areas of the region that are not currently overflown by departures albeit there were some baseline 'swathes'[3] that could be identified. Using this as a starting point, conceptual options were derived using 'swathes' aimed at the general directions required, i.e. where the En-Route ATS provider (NERL) wished to receive the traffic into the Route Network. This produced a number of directional options for both runways. Initially, it was believed that Standard Instrument Departure (SIDs) would be required to take aircraft to the North-West, North-East, South & West and South-East. Upon reflection, there is insufficient traffic to warrant the design of formalized SIDs to the North-West and the North-East. Accordingly, the swathes developed for those directions have been rejected. Aircraft departing in these directions will follow the Westerly SID until such time as noise abatement procedures have been adhered to and their desired routing can be tactically accommodated. Equally, some swathes were considered to be not worth further consideration, and these have been dropped from evaluation (as detailed in the 'Departures' presentation).

As with the departures, we assessed the baseline, or 'Do Nothing' option for Arrivals. The existing arrivals are all handled 'tactically', that is to say that controllers vector aircraft onto final approach in a manner that best suits the situation that presents itself at the time. This naturally results in a great deal of variation, or dispersion, of arrival tracks as the NTMS data shows[4]. The DOs developed for arrivals were aimed at trying to achieve systemization of the operation such that arrivals would be naturally deconflicted from the departures with minimal controller intervention thereby increasing the predictability and repeatability of the arrival routings. Not only does this help airlines with fuel planning but well-designed routings can result in noise and emissions related benefits. This systemized 'utopia' may not be entirely possible, but it is a goal worth striving towards in keeping with the UK's Airspace Modernisation Strategy (AMS)[5]. Having received feedback from NERL, a greater number of arrival DOs has recently been developed to ensure that at Stage 3 we have the flexibility to change tack based upon changes to the manner in which NERL present arriving traffic to LBA from the Route Network. Some of these DOs do not result in delivering the systemized 'utopia' however, we will continue to strive for the best solution for all our stakeholders.

The next step in the process was to ensure that the DOs met the SoN and then to evaluate the DOs against the DPs; this process is called the Design Principle Evaluation (DPE). Stakeholders once again are invited to provide feedback on how effectively (or not) the DPs have been applied to the DOs. Our DPE will be amended to reflect this feedback.

Stakeholder input is vital at this stage as you are likely to have expert knowledge relating to one or more of the DPs, for example, an environmental organisation will have more detailed knowledge regarding the

[2] The CAA's guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic. Available here.
[3] These can be viewed in the 'Departures' presentation.
[4] These can be viewed in the 'Arrivals' presentation.
[5] https://www.caa.co.uk/commercial-industry/airspace/airspace-modernisation/airspace-modernisation-strategy/about-the-strategy/

environmental sensitivity of areas potentially overflown, or a pilot may have more experience of technical constraints of a proposed option.

Once this is complete, we will redo the Initial Options Appraisal (IOA). The purpose of this is to produce a viable list of options, including where possible, the 'do nothing' option[6], which the options will now be assessed against, in addition to the following:

- An indicator of the likely noise impacts; and
- High level assessment of the costs and benefits involved.

Additionally, we are required to provide the following:

- A description of the change proposal;
- Criteria for assessing the list of options, including how these criteria were used to develop a shortlist;
- Shortlist options, including indication of preferred option; and
- Evidence of the above or strategy for filling in the gaps before a full appraisal at Stage 3.

ACP Progress

We have twice sought feedback from key stakeholders on the DPE of options. However, post-CAA review, we have again revised the DPE for all the Departure DOs. It was considered that the DPs had not been applied consistently to each DO and therefore a revised DPE is presented for comment.

In addition, this revision process has allowed us to consider recently improved procedure design and navigation techniques to try and avoid overflying some of the communities closer to the Airport. Accordingly, seven new Departure DOs have been developed, five for RW32 and two for RW14. These DOs share the same initial climb-out but then split in the required departure directions. These also require a DPE.

As with Departures, the DPE for Arrivals needed to be revised following CAA review. Subsequent bilateral meetings with NERL resulted in the apparent need for several different arrival options. The DPE for all the Arrival DOs has been revised following CAA review. A revised DPE is presented for comment.

To assist in ensuring consistency in the application of our DPE a table containing the criteria for how a given DO should been evaluated against the DPs has been developed. This can be found at the end of this document along with the agreed list of DPs. It is also contained within the presentations for ease of access.

Abbreviations and Explanation of Terms

ACP	Airspace Change Proposal
AMS	Airspace Modernisation Strategy. Replaced the Future Airspace Strategy. A Government sponsored strategy that sets out the initiatives required to modernize the existing Airspace System by upgrading the airspace design, technology and operations.

[6] LBA has not got the option to 'Do Nothing' owing to the Airport's reliance on ground-based navigational aids known as Doppler VHF (Very High Frequency) Omni-Directional Range (DVOR) beacons that are being decommissioned as part of the wider plans to modernise UK airspace as set out in the AMS. The DVOR beacons at Pole Hill (POL) and Gamston (GAM) are fundamental to LBA's departure procedures, and the GAM (amongst many others) is being withdrawn by NERL in favour of a more efficient satellite-based navigational system, known as Global Navigation Satellite System (GNSS).

AONB	Area of Outstanding Natural Beauty
Arrival Transition	The flight procedure that links the Standard Arrival Route (STAR) to the runway final approach segment i.e. links the en-route phase of flight to the approach phase of flight.
ATC	Air Traffic Control
CAA	Civil Aviation Authority
CAS	Controlled Airspace is airspace of defined dimensions within which air traffic control services are provided to Instrument Flight Rules (IFR) and to Visual Flight Rules (VFR) flights in accordance with the airspace classification as opposed to uncontrolled airspace (airspace in which an air traffic control service is not deemed necessary or cannot be provided for practical reasons).
CTA/CTR	Control Area/Control Zone
Dispersion	The latest satellite-based navigation enables aircraft to fly an extremely accurate path. Aircraft flying using older navigational equipment tended to stray off track slightly (i.e. they were less accurate and naturally dispersed). This resulted in a number of flights paths which differed slightly, meaning the exact location wasn't overflown continuously. Using the latest technology, track keeping is accurate and the same area could be overflown continuously resulting in a concentration of noise effect over the same places. Various techniques can be used to add an element of unpredictability to routes where an exact track is not necessary for noise avoidance. These methods result in noise dispersion over a greater area.
DO, DP, DPE	Design Option, Design Principle, Design Principle Evaluation
FASI(N)	Future Airspace Strategy Implementation (North). An AMS initiative encompassing the requirement to fundamentally redesign the National Airspace System at lower altitudes and in the terminal airspace that serves commercial air transport across the busiest regions of the UK, making the most of the capabilities of modern aircraft and satellite-based navigation technology. FASI is split into two regions: North and South.
IAF	Initial Approach Fix. The fixes depicted on instrument approach procedure charts that identify the beginning of the initial approach segment(s).
IAP	Initial Approach Procedure. A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix to a point from which a landing can be completed.
IOA	Initial Options Appraisal
MAP	Missed Approach Procedure. Provides an initial heading or track to follow, and altitude to climb to, typically following holding instructions at a nearby navigation fix required in the event that an approach cannot be completed to its logical conclusion.
NATS	National Air Traffic Services
NERL	NATS En-Route Limited
Night Route	A route flown under agreed hours (usually night-time) where as many communities as possible are avoided to minimise noise disturbance. These routes are generally much longer than standard daytime routes, creating greater fuel burn and emissions as the aircraft deviates around built up areas.
NP	National Park
PANS-OPS	Procedures for Air Navigation Services
PBN	Performance-Based Navigation
Radius-to-fix	A radius about a fixed point to better enable track keeping accuracy around a turn.
Respite Route	An alternate route designed with the objective of sharing the noise between communities. Rather than one route flying over the same population 24/7, respite routes ensure that different tracks are flown at alternating times to ensure that as many communities as possible receive days of minimal or no aircraft noise. For example, one community may receive aircraft noise for one day, whilst another community receive none.
RNAV	Area Navigation
RW	Runway

SID	Standard Instrument Departure. Instrument departure procedure by which aircraft should proceed from take-off to the en-route phase of flight.
STAR	Standard Arrival Route. A designated arrival route linking a significant point, normally on an Air Traffic Service route, with a point from which a published IAP can be commenced. In the United Kingdom, a STAR terminates at the aerodrome holding fix (which may not be coincident with an IAP). Aircraft are vectored from the holding procedure to the IAP or an Arrival Transition is published to provide a promulgated route from the holding procedure to the IAP.
Trombone	A means by which aircraft can be extended on the arrival phase of flight to provide adequate and sufficient spacing between aircraft on the approach phase of flight.
Vectoring	The provision of navigational guidance to aircraft in the form of specific headings.

Agreed Design Principles

DP #	Design Principle
1	**Importance of Safety** – The airspace design and its operation must maintain or where possible, enhance current levels of safety.
2	**Noise** - The design should limit, and where practicable reduce, the number of people overflown, the impact of noise to stakeholders on the ground and where possible periods of built-in respite should be considered.
3	**Tranquillity** - Where practical, route designs should limit effects upon noise sensitive areas. These may include cultural or historic assets, tranquil or rural areas, sites of care or education and AONB's.
4	**Emissions and Air Quality** – The proposed design should minimise CO^2 emissions per flight.
5	**Airspace Dimensions** – The volume and classification of controlled airspace required for LBA should be the minimum necessary to deliver an efficient airspace design, considering the needs of all airspace users.
6	**Airspace Complexity** – The airspace design should seek to reduce complexity and bottlenecks in controlled and uncontrolled airspace and contribute to a reduction in airspace infringements.
7	**Technical Requirements** – The design shall be fully compliant with PANS-OPS and UK CAA criteria to meet the technical capability requirements of aircraft using the airport.
8	**Systemisation** – The new procedures will integrate with the en-route network, as per the FASI(N) programme. If required, the arrival transitions shall integrate with the Instrument Approach Procedures (IAPs), deconflict with the departure procedures, reducing the requirement for tactical coordination.
9	**Operational Cost** – Provided it does not have an adverse impact of community disturbance, procedures should be designed to optimise fuel efficiency.
10	**AMS Realisation** – This ACP must serve to further, and not conflict with, the realisation of the AMS.
11	**PBN** – The new procedures should capitalise on as many of the potential benefits of PBN implementation as are practicable.

DPE Criteria

DP #	Design Principle		
DP1	**Importance of Safety** – The airspace design and its operation must maintain or where possible, enhance current levels of safety.		
Criteria	**Meets:** No safety issues identified that could not be overcome with similar levels of safety assurance to today's operation.	**Partially Meets:** Issues identified that would require a significantly more robust safety argument than today's operation to overcome.	**Does Not Meet:** Issues identified that could not be overcome without prohibitively restrictive safety mitigation.
DP2	**Noise** - The design should limit, and where practicable reduce, the number of people overflown, the impact of noise to stakeholders on the ground and where possible periods of built-in respite should be considered.		
Criteria	**Meets:** Limits or has the potential to reduce overall impacts of aircraft noise.	**Partially Meets:** Impacts of aircraft noise likely to be broadly similar in terms of the number of people affected. Some communities (possibly previously unaffected ones) may be affected more than others.	**Does Not Meet:** Has the potential to increase the overall impacts of aircraft noise on local communities.
DP3	**Tranquillity** - Where practical, route designs should limit effects upon noise sensitive areas. These may include cultural or historic assets, tranquil or rural areas, sites of care or education and AONBs.		
Criteria	**Meets:** Limits effects on Noise Sensitive Areas and does not result in any overflight of an AONB or a NP below 7000ft.	**Partially Meets:** Does not result in overflight of a significant portion of an AONB or a NP but may result in overflight of other sensitive areas.	**Does Not Meet:** Results in direct and significant overflight of AONBs, NPs and/or various tranquil areas important to local communities.

DP #	Design Principle		
4	**Emissions and Air Quality** – The proposed design should minimise CO_2 emissions per flight.		
Criteria	**Meets:** Has potential to burn less fuel and emit less CO_2 than other DOs.	**Partially Meets:** Is not the most fuel-efficient DO but is not significantly worse than other DOs.	**Does Not Meet:** Clearly an inefficient DO resulting in unnecessary and excessive fuel burn and therefore CO_2 emissions.
5	**Airspace Dimensions** – The volume and classification of controlled airspace required for LBA should be the minimum necessary to deliver an efficient airspace design, considering the needs of all airspace users.		
Criteria	**Meets:** Allows for either a reduction in the volume of CAS required or does not require any additional CAS.	**Partially Meets:** May result in a need for small amounts of additional CAS but there may be potential to revert some CAS to Class G.	**Does Not Meet:** Large additional volumes of CAS are required to contain the proposed DO without the potential to revert some to Class G.
6	**Airspace Complexity** – The airspace design should seek to reduce complexity and bottlenecks in controlled and uncontrolled airspace and contribute to a reduction in airspace infringements.		
Criteria	**Meets:** Does not result in a complex CTA/CTR configuration.	**Partially Meets:** Results in changes to the CAS configuration that may cause other aviators some minor challenges.	**Does Not Meet:** Results in a highly complex CAS configuration.

DP #	Design Principle		
7	**Technical Requirements** – The design shall be fully compliant with PANS-OPS and UK CAA criteria to meet the technical capability requirements of aircraft using the airport.		
Criteria	**Meets:** Is fully compliant and meets the technical capabilities of almost all airport operators.	**Partially Meets:** Is largely compliant but with reasonable justification for any non-compliance and meets the technical capabilities of most airport operators.	**Does Not Meet:** Has several non-compliances without reasonable justification and does not meet the technical capabilities of several airport operators.
8	**Systemisation** – The new procedures will integrate with the en-route network, as per the FASI(N) programme. If required, the arrival transitions shall integrate with the Instrument Approach Procedures (IAPs), deconflict with the departure procedures, reducing the requirement for tactical coordination.		
Criteria	**Meets:** Integrates seamlessly with the en-route network and is likely to reduce the need for tactical coordination and vectoring within the CTA/CTR.	**Partially Meets:** Integrates seamlessly with the en-route network but may not reduce the need for tactical coordination and vectoring within the CTA/CTR.	**Does Not Meet:** Does not integrate seamlessly with the en-route network and will increase the need for tactical coordination and vectoring within the CTA/CTR.
9	**Operational Cost** – Provided it does not have an adverse impact of community disturbance, procedures should be designed to optimise fuel efficiency.		
Criteria	**Meets:** Fuel efficiency is optimal without an adverse impact on local communities.	**Partially Meets:** Fuel efficiency is marginally sub-optimal due to consideration to the impact on local communities.	**Does Not Meet:** Fuel efficiency is clearly not optimised, or it has been optimised at the expense of local communities.
10	**AMS Realisation** – This ACP must serve to further, and not conflict with, the realisation of the AMS.		
Criteria	**Meets:** Generally aligned with the AMS.	**Partially Meets:** Partially aligned with the AMS.	**Does Not Meet:** Not aligned with the AMS.

DP #	Design Principle		
11	**PBN** – The new procedures should capitalise on as many of the potential benefits of PBN implementation as are practicable.		
Criteria	**Meets:** Designed to the latest navigation standards that do not require aircraft fleet upgrades.	**Partially Meets:** Designed to the latest navigation standards that may require aircraft fleet upgrades.	**Does Not Meet:** Fails to utilise the latest navigation standards.