Airspace Change Proposal: Step 2a

Options Development and Design Principle Evaluation

Leeds Bradford Airport FASI(N)

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Executive Summary

This report forms part of the CAP 1616 Stage 2 submission and details the Comprehensive List of Design Options that have been developed and the Design Principle Evaluation that has been carried out for this Airspace Change Proposal.

In March 2022, Leeds Bradford Airport passed the Civil Aviation Authority CAP 1616 Stage 1 Gateway and commenced Stage 2 activities. In accordance with the CAP 1616 process, a comprehensive list of Options was developed through internal workshops and targeted stakeholder engagement. These options were assessed against the Design Principles which had been developed during Stage 1 of this Airspace Change Proposal process.

Workshops were held on the 05 July 2022 which introduced the list of Design Options to the stakeholders and our assessment of the Design Options against the Design Principles they helped us develop. Following these workshops, stakeholders were invited to take part in an online survey which ran from the 13 July 2022 to the 26 August 2022. This survey asked whether the stakeholders felt we had applied the Design Principles correctly and consistently to each of our Design Options. Importantly, it provided respondents an opportunity to comment on areas where they felt this may not have been the case.

An update was sent to stakeholders on 28 July 2022 to provide additional context to the Design Options and address some of the questions raised.

Following a period of reflection, and in response to some stakeholder feedback, a series of additional departure Design Options were conceived along with a revised array of arrival system Design Options. These Design Options were shared with the same set of stakeholders over the period 31 March 2023 to 28 April 2023 through a presentation sent out via email. The presentation was accompanied by an online survey and again sought feedback on whether stakeholders felt we had applied the Design Principles correctly and consistently to each of our Design Options.

Subsequently, a submission of Stage 2 documents was made to the Civil Aviation Authority, and this was assessed at the June 2023 Develop and Assess Gateway Meeting. The Civil Aviation Authority found various weaknesses within the submission, and it was established that the Design Principle Evaluation conducted previously needed to be reviewed, as did the Initial Options Appraisal, to ensure a consistent application of criteria across the Design Options. Additionally, based upon meetings between the Airport and the En-Route Air Traffic Service provider, it was deemed necessary to develop additional Arrival Options. Given the consequent availability of additional time, the opportunity was taken to develop new Departure Options largely focused on providing communities with respite or night-time noise relief.

These new Design Options, and most of the previously shared Design Options, were circulated to the same set of stakeholders over the period 22 November 2023 to 20 December 2023 through a presentation sent out via email. A briefing was held online on 05 December 2023 allowing stakeholders the opportunity to have concepts explained or have their questions answered. As with the second round, the presentation associated with the Third round engagement was accompanied by an online survey seeking feedback on whether stakeholders felt we had applied the Design Principles correctly and consistently to each of our Design Options.

Ultimately, the feedback from all the surveys has shaped the final Design Principle Evaluation that is summarised in this report.

In total, thirty-one departure swathes were considered of which twenty-three will progress to Step 2b for Initial Options Appraisal. In terms of the arrivals, following a period of reflection post-initial Stage 2 engagement, it was determined that the original array of arrival Design Options was not sufficiently detailed to evaluate, and they did not meet the needs of the Airport or the en-route ATS provider. These systems were therefore re-developed for further consideration by stakeholders and the original eight Design Options were removed from consideration in favour of five new arrival systems. In between the Second and Third rounds of engagement, a further five Arrival Design Options were conceived resulting in ten Arrival Design Options being shared with stakeholders at the Third round of engagement. All ten arrival Design Options will progress to Step 2b for the Initial Options Appraisal.

Abbreviations

ACOG	Airspace Change Organising Group
ACP	Airspace Change Proposal
AMS	Airspace Modernisation Strategy
ANSP	Air Navigation Service Provider
AONB	Area of Outstanding Natural Beauty
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
BGA	British Gliding Association
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAT	Commercial Air Transport
CCO	Continuous Climb Operations
CDC	City of Doncaster Council
CDO	Continuous Descent Operations
CTA	Control Areas
CTR	Control Zones
DFT	Department for Transport
DHPC	Dales Hang gliding and Paragliding Club
DME	Distance Measuring Equipment
DO	Design Option
DP	Design Principle
DPE	Design Principle Evaluation
DSA	Doncaster Sheffield Airport
FAS	Future Airspace Strategy
FASI-S	Future Airspace Implementation South
FASI-N	Future Airspace Implementation North
GA	General Aviation
GNSS	Global Navigation Satellite Systems
hPA	Hectopascals
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
IFP	Instrument Flight Procedure

ICAO	International Civil Aviation Organisation
IOA	Initial Options Appraisal
LCR	Leeds City Region
NAP	Noise Action Plan
NERL	NATS En-Route Limited
nm	Nautical Miles
NP	National Park
NPR	Noise Preferential Route
NTMS	Noise and Track Monitoring System
NWLTA	North West Leeds Transport Association
PBN	Performance-Based Navigation
RNAV	Area Navigation
RNP AR	Required Navigation Performance (Authorisation Required)
RSAG	Regional Soaring Airspace Group
RW	Runway (when followed by runway designator numbers e.g. RW32)
RVR	Runway Visual Range
SID	Standard Instrument Departures
STAR	Standard Arrival
TDZ	Touchdown Zone
UK	United Kingdom

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1. Introduction

1.1.1. Many air routes and Air Traffic Management (ATM) practices are not utilising the modern technologies available, and aircraft continue to use flightpaths that are outdated. Those flightpaths often constrain aircraft climb performance such that more time is taken for them to reach their optimum cruising altitude. This creates inefficiencies and results in greater fuel burn and more emissions. Flightpaths may not presently be optimised to reduce noise impacts or designed to offer relief from noise. This inefficient use of airspace causes unnecessary delays for passengers and significant air traffic control workload to manage bad weather or other forms of disruption. It also has excessive impacts on the environment and those living near our airports. The outdated design is also, crucially, constraining the number of flights that the airspace can safely accommodate.

1.1.2. Airspace is a crucial part of the UK's infrastructure. It must be maintained and enhanced to provide more choice and value for consumers, through the capacity for airlines to add new flights, reduced flight delays and enhanced global connections that can help boost the UK economy, while continuing to improve safety standards. Unlocking the benefits of modernisation will make journeys faster and more environmentally friendly. Better airspace design can help with the management of noise impacts and improve access for other airspace users, including the Ministry of Defence and General Aviation (GA), for whom airspace is a key resource.

1.1.3. Demand for air travel has grown strongly in recent decades, and the Government expects that demand will continue to rise significantly between now and 2050. Growth in demand for air travel means increasing pressure on our airspace. The strategic case for airspace modernisation and the resultant benefits were set out by the Department for Transport (DfT) in 2017. Unlocking the benefits of modernisation will make journeys faster and more environmentally friendly. Better airspace design can manage noise impacts and improve access for other airspace users.

1.1.4. UK airspace is some of the most complex in the world, yet its design dates to the 1950s and 1960s. The Government has set out its support and objectives for the modernisation of UK airspace.

1.1.5. Modernisation of relevant airspace structures, systems and processes can also further improve the flexible use of airspace, whereby airspace is considered as a shared resource and is allocated for specific periods of time to users, such as the military and GA.

1.1.6. Implementing new airspace design will affect overflown communities in different ways, for example in terms of facilitating an increased number of flights at some airports or changing the flightpaths that are used. Reducing noise impacts could itself be a driver for a new design. Those who are affected by airspace change must therefore be involved in the decision-making process, and fully informed of the pros and cons of such a transformation.

1.2. Overview

1.2.1. One of the aims of the Airspace Modernisation Strategy (AMS) is to make airspace more efficient – saving time and fuel and reducing emissions. Key to achieving this is improving the accuracy of where aircraft fly by using the Performance Based Navigation (PBN)

capability of aircraft which places much greater reliance on satellite navigation (SatNav); some ground-based navigation aids will be retained for resilience and contingency purposes.

1.2.2. The UK Airspace ATM structures require modernisation to accommodate increasing demand for commercial air travel whilst safely accommodating increasing demands for airspace access from other users. The AMS sets out a shared objective between the Civil Aviation Authority (CAA) and the DfT for modernising airspace which is to deliver quicker, quieter, and cleaner journeys and more capacity for the benefit of those who use and are affected by UK airspace.

1.3. Where are Leeds Bradford Airport in the process?

1.3.1. CAA regulations contained within CAP 1616 define the ACP process. The ACP is designed to be transparent, comprehensible, and proportionate. It is aligned to the Government's Policy on managing airspace.

1.3.2. The 7-stage process contains 14 'Steps' and 4 'Gateways'. At each Gateway, the Change Sponsor must satisfy the CAA that it has followed the process fully. Failure to do so results in the need to conduct further work until such time as the CAA are satisfied.

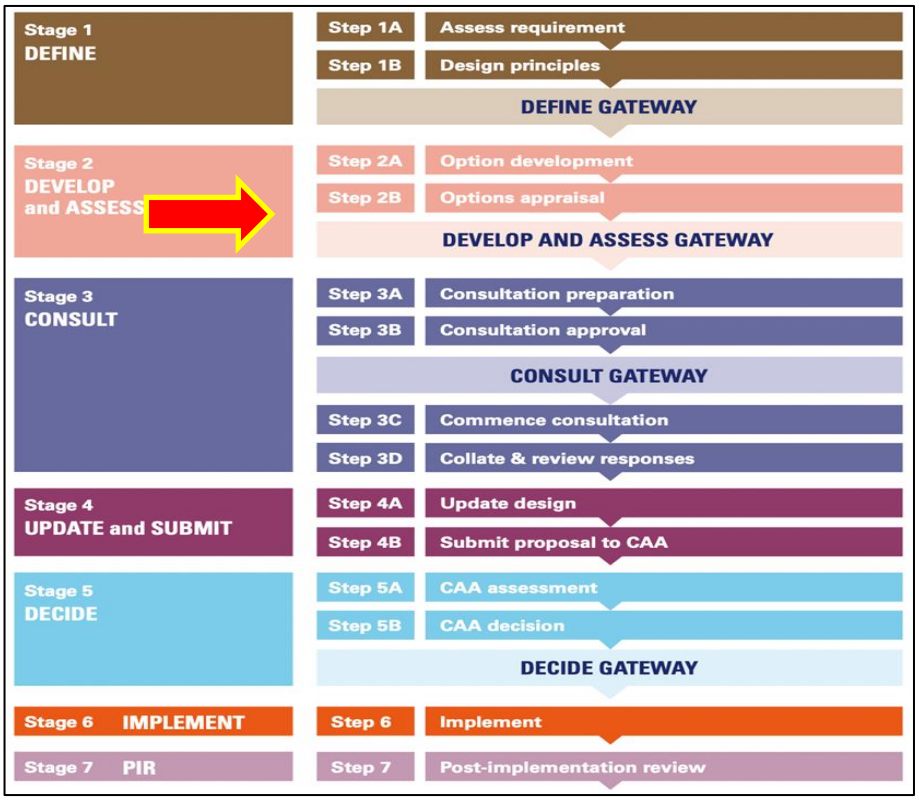


Figure 1: CAP 1616 Process

1.3.3. Leeds Bradford Airport (LBA) passed the CAA CAP 1616 Stage 1 Gateway in March 2022 and commenced Stage 2 activities. A Comprehensive List of Design Options (DOs) were developed through internal workshops and stakeholder engagement. These DOs were assessed against the Design Principles (DPs) developed during Stage 1 of this ACP process.

1.3.4. Workshops were held on the 05 July 2022 which introduced the list of DOs to the stakeholders and explained our assessment of the DOs against the design principles they

helped us develop. Following these workshops stakeholders were invited to take part in an online survey which ran from the 13 July 2022 to the 26 August 2022. This survey asked whether the stakeholders felt we had applied the DPs correctly and consistently to each of our DOs. It provided an opportunity to comment on areas they felt this may not have been the case.

1.3.5. An update was sent to stakeholders on 28 July 2022 to provide additional context to the DOs and address some of the questions raised.

1.3.6. Following a period of reflection and in response to some stakeholder feedback, a series of additional departure DOs were conceived along with a revised array of arrival system DOs. These were shared with the same set of stakeholders over the period 31 March 2023 to 28 April 2023 through a presentation which was sent out via email. The presentation was accompanied by an online survey and sought feedback on whether stakeholders felt we had applied the DPs correctly and consistently to each of our DOs.

1.3.7. A submission was made to the CAA, and this was assessed at the June 2023 Develop and Assess Gateway Meeting. The CAA found various failings and it was determined that the DPE conducted previously needed to be reviewed, as did the IOA, to ensure a consistent application of criteria across the 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, the opportunity was seized to develop some new Departure Options, largely focused on providing communities with respite or night-time noise relief.

1.3.8. These new DOs, and most of the previously aired Design Options, were shared with the same set of stakeholders over the period 22 November 2023 to 20 December 2023 through a presentation sent out via email. A briefing was held online on 05 December 2023 allowing stakeholders the opportunity to have concepts explained or have their questions answered. As with the Second round, the presentation associated with the Third round engagement was accompanied by an online survey seeking feedback on whether stakeholders felt we had applied the Design Principles correctly and consistently to each of our Design Options.

1.3.9. This report forms part of the Stage 2 submission (Step 2A) and details the Comprehensive List of DOs that we have developed for this ACP and the Design Principle Evaluation (DPE).

1.3.10. The feedback from the Stakeholders will be made available via the ACP Portal[1]. The Initial Options Appraisal (IOA) is intended to fulfil the requirements of Step 2B and completes the steps within Stage 2 of the process.

[1] The CAA's Airspace Change Proposal Portal enables interested parties to find details of proposed changes to UK airspace that could affect them. Allowing stakeholders to monitor the progress of an airspace change proposal, make their views known as it is developing and sign up for email notifications relating to the proposal.

1.4. Leeds Bradford Airport Design Principles

1.4.1. LBA's DPs, as agreed in Stage 1 of the process, are shown below. The documentation that supports these was associated to Stage 1 of the process and can be found on the ACP Portal.

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 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.

Table 1: Leeds Bradford Airport Design Principles

1.5. Altitude-Based Priorities for Environmental Impacts

1.5.1. The Government's priorities for consideration of the environmental impacts arising from Airspace Change Proposals (ACPs) are set out in its Air Navigation Guidance. For the purposes of assessing environmental impacts of ACPs the CAA should apply the following altitude-based priorities:

- In the Airspace from the ground to below 4000 ft, the Government's environmental priority is to limit and, where possible, reduce the total adverse effects on people;
- Where options for route design from the ground to below 4000 ft are similar in terms of the number of people affected by total adverse noise effects, preference should be given to that option which is most consistent with existing published airspace arrangements;
- In the Airspace at or above 4000 ft to below 7000 ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the Government's overall policy on aviation noise, unless the CAA is satisfied that the evidence presented by the sponsor demonstrates this would disproportionately increase CO2 emissions;
- In the Airspace at or above 7000 ft, the CAA should prioritise the reduction of aircraft CO2 emissions and the minimising of noise is no longer the priority;
- Where practicable, it is desirable that airspace routes below 7000 ft should seek to avoid flying over AONB and National Parks (NPs); and,
- All changes below 7000 ft should take into account local circumstances in the development of the airspace design, including the actual height of the ground level being overflown, and should not be agreed to by the CAA before appropriate community engagement has been conducted by the sponsor.

1.5.2. This ACP concerns changes being made from the surface to 7000 ft and accordingly, five of the above bullets apply.

1.6. UK Airspace Change Masterplan Iteration 2

1.7. The DfT and the CAA are co-sponsors of UK airspace modernisation. In 2018, they commissioned NATS (En Route) plc (NERL) to create an Airspace Change Masterplan. NERL was required to set up a separate and impartial unit, the Airspace Change Organising Group (ACOG), to develop the Masterplan.

1.8. The purpose of the Masterplan is to set out a single coordinated implementation plan to deliver the objectives of airspace modernisation. It is intended to identify which UK airspace design changes need to be developed in coordination to achieve the range of benefits that modernisation can deliver, and when.

1.9. Before the Masterplan can be implemented, the CAA must decide whether to formally accept the Masterplan into its AMS[2], having consulted the Secretary of State.

[2] See https://www.caa.co.uk/commercial-industry/airspace/airspace-modernisation/airspace-modernisation-strategy/

1.10. ACOG proposed an iterative approach to the development of the Masterplan, which recognises that different information and levels of detail will be available at different points as the Plan develops. Each iteration must be accepted separately, except Iteration 1, which has already been assessed and published. Once the Masterplan is accepted into the AMS, together with the CAA's general duties in Section 70 of the Transport Act 2000, the Masterplan forms the basis against which individual airspace change decisions are made by the CAA.

1.11. Iteration 2 of the UK Masterplan has now been accepted into the AMS[3]. CAA Airspace Regulation has a requirement to assure that the Stage 2 Develop & Assess Gateway submissions for airspace changes under the Masterplan programme are in accordance with this iteration of the Masterplan.

1.12. To enable Airspace Regulation to undertake this activity, seven indicators have been defined as per the following table and submissions will be reviewed by Airspace Regulation against these. The documentation associated to Stage 2 of the LBA ACP is intended to meet these criteria.

Civil Aviation Authority Indicator	Leeds Bradford Airport Response
Has the Change sponsor identified, or otherwise can Airspace Regulation identify, the regional cluster within which the ACP sits?	**Yes, this ACP is part of the Manchester Terminal Manoeuvring Area (MTMA) Regional Cluster.**
Has the Change sponsor identified all adjacent ACPs as identified under the Masterplan programme for the regional cluster in which the ACP sits and has highlighted the potential for conflicts in the Design Options?	**Yes, MTMA (NERL), Manchester, East Midlands and Liverpool.**
Has the Change sponsor evidenced that the comprehensive list has identified all viable options, noting that the Masterplan is a high-level coordinated implementation plan of a series of individual airspace design changes that need to be developed in coordination to achieve the range of benefits that modernisation can deliver?	**Yes, this document identifies all viable options that have been the subject of various coordination meetings with ACOG, NERL and the MTMA Team.**

[3] See CAP 2132A
https://publicapps.caa.co.uk/docs/33/CAP2312A%20Masterplan%20assessment%20and%20acceptance.pdf

Civil Aviation Authority Indicator	Leeds Bradford Airport Response
Evidence that the Change sponsor's Design Options developed at Stage 2 are the product of co-ordination with other change sponsors of interdependent ACPs carried out under the Masterplan programme. A key indicator will be that the Change sponsor has engaged with ACOG and the Change sponsors of interdependent ACPs, as part of the Masterplan programme, in developing its comprehensive list of options and undertaking its DPE and subsequent IOA.	**The Design Options have been developed in coordination with other change sponsors through various coordination meetings with ACOG, NERL and the MTMA Team.**
Evidence that the Change sponsor's DPE includes an assessment of how the different Design Options respond to the relevant AMS Design Principle (i.e. achieve network optimisation). This can only be based on available evidence and assumptions about the outcome of integrating different ACPs, as there are various risks and unknowns until, at least, the Change sponsor has carried out the Full Options Appraisal (i.e. the quantitative work) during Stage 3. Additionally, evidence that the change DPE and IOA include a qualitative (high-level) assessment of how the Design Options perform against the vision and parameters/strategic objectives of the AMS.	**Bilateral meetings with the NERL MTMA Team have been held at various points through the development process to ensure network optimisation has been considered.**
Evidence that the Change sponsor has justified, based on available evidence, why certain Design Options have been discounted, noting that the Design Option may need to be re-introduced after "integration" occurs in Stage 3 for masterplan reasons.	**This report details the reasons why certain Design Options have been discounted**
Are the Change sponsor's proposed next steps/timelines consistent with those set out by ACOG in Iteration 2 for the regional cluster within which the ACP sits?	**The timeline has been coordinated with ACOG.**

Table 2: Seven Masterplan Indicators

2. Methodology

2.1. The following section describes the methodology adopted to develop the Comprehensive List of Design Options and to carry out the DPE for this ACP.

2.2. Options Development Approach

2.2.1. Having considered the Operational Requirement, the ACP team conceived unconstrained options i.e. a 'blank sheet of paper' approach was adopted. Whilst it was accepted that this may have resulted in unrealistic options, it was considered important to think as broadly as possible, at this stage, to identify a comprehensive range of options.

2.2.2. Later in the CAP 1616 process, the list of Design Options (DOs) will be reduced based upon the extent to which each DO meets the agreed Design Principles (DPs) and how each performs in the IOA. The long list of options described hereafter will be refined to a short list through a process of:

- DPE;
- Stakeholder Engagement; and
- Options Appraisal (Step 2b).

2.2.3. It is important to note that the Options developed are purely swathes at this stage (i.e. areas within which a final departure or arrival nominal track might ultimately be designed). It is intended that the fine tuning from swathes to definitive options (actual tracks) will take place during Stage 3 of the CAP 1616 process ahead of the Formal Consultation. The Section that follows provides an overview of the baseline swathes development.

2.2.4. The Options for departures were developed using broad areas, or 'swathes,' to create Design Options and these options were coded by runway, design envelope/direction of flight and individual letter to identify each option within each design envelope. For example, in section 4.6, this describes options A and B which are from Runway 32 heading to the North and West.

2.2.5. Following the Second stakeholder engagement round, new departure options were developed as it was decided to introduce some more modern approach options. These options seek to break away from the standard requirement to fly in a straight line for the final 10nm towards the runway. This brings the potential for improving the noise outcome for stakeholders living under the traditional approach lane. These procedures use modern and emerging navigational techniques and are known as Required Navigation Performance (Authorisation Required) (RNP AR) Approaches. These options have been labelled 'Combination Options' and can be found in section 4.14.

2.3. Development of Baseline Swathes

2.3.1. Departures

2.3.1.1. Using track data from LBA's Noise and Track Monitoring System (NTMS), trends in track density can be identified that can be traced to form 'baseline swathes' (see sections 3.8 and 3.10) These baseline swathes have been used to facilitate qualitative assessments through the DPE and IOA phases of Stage 2 of the process.

2.3.1.2. Initially, the data from the 92-day summer 2022 (defined as 16 June to 15 September inclusive) was plotted. The resulting image was complex and, to enable greater meaning to be derived from the data, a set of smaller samples of traffic was used such that trends could be identified. The samples were still contained within the 92-day summer period (considered to be the busiest time of year) and chosen to best reflect the pattern of movements from each runway. The specific time windows chosen were:

Movement	Runway	Time period (2022)
Arrivals	14	23-29 June
Arrivals	32	14-20 July
Departures	14	18-24 August
Departures	32	11-17 August

Table 3 – Time Windows

2.3.1.3. These samples were used to identify baseline arrival swathes, starting from the edge of the LBA delegated airspace, by drawing swathes around where there was an obvious track density. This exercise was carried out for each runway to see how traffic entered the LBA airspace on arrival to each runway.

2.3.1.4. For RW32, trends or greater track density could be clearly seen from the South, West and East. These were translated into swathes to establish a baseline by simply drawing a polygon, extending from the edge of LBA airspace to the beginning of the approach, that encompassed the majority of the tracks. Arrivals from the North-West were not evident and there were very few from the North-East making it difficult to identify swathes from those directions. The hold was not visible on the sample as it was in use during the time period.

2.3.1.5. To establish the baseline, Noise Preferential Routings (NPRs) and Standard Instrument Departures (SIDs) were also considered. Swathes (polygons) were drawn around the tracks where they appeared most densely concentrated, and these were extended out to 20nm from the Airport.

2.3.1.6. When engaging stakeholders a variety of methods were used to explain where aircraft are likely to reach 4000ft and 7000ft. In the first round of engagement, two range rings were presented from the centre point of each runway, blue circle representing RW14 and Red for RW32, to indicate where aircraft are likely to be 7000ft on a 6% climb gradient, see Figure 2. In the second round of engagement a yellow line for each option was used to indicate where in the swathe the aircraft would reach 7000ft on a 6% climb gradient, see Figure 3. In the third round of engagement, range rings were used giving indications of where aircraft would be at 4000ft and 7000ft on an 8% climb gradient, see Figure 4 . The climb gradient was changed to 8% as an airline capability survey had been completed indicating that this gradient had been achieved and exceeded. The range of methods used was an attempt to give stakeholders the best possible indication of where aircraft are likely to be at any given point.

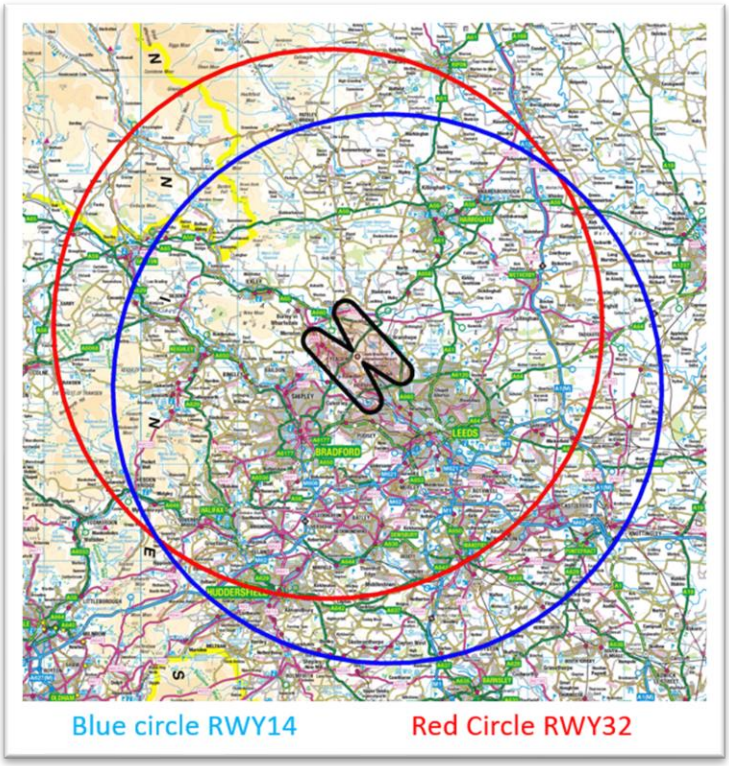


Figure 2: Indicative heights of aircraft used in first engagement round.

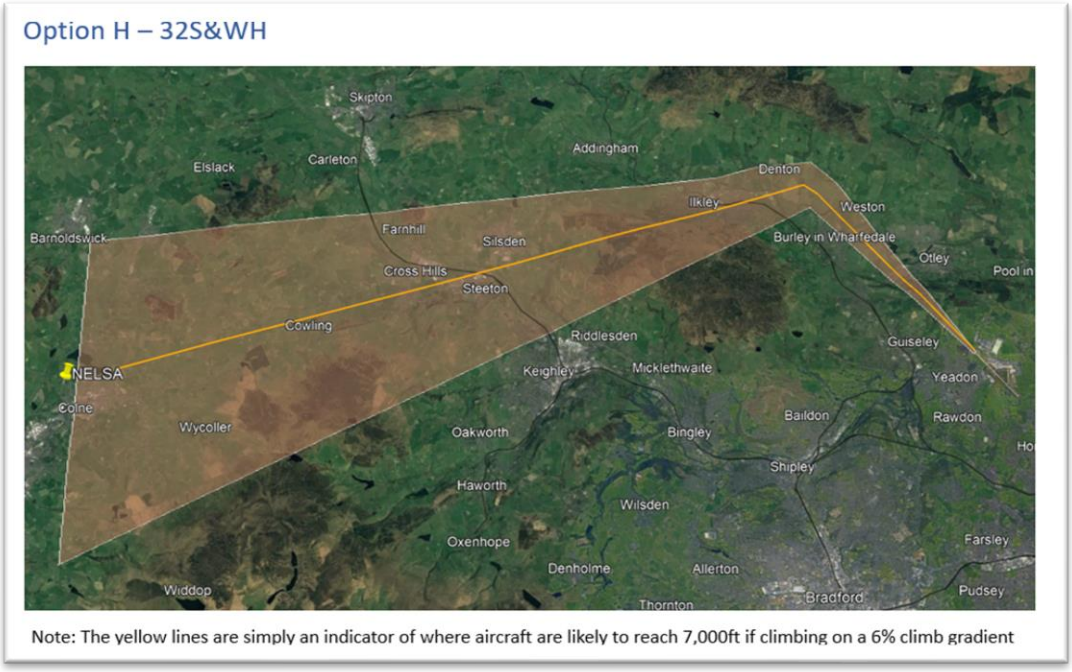


Figure 3: Indicative heights of aircraft used in the second round of engagement, an example.

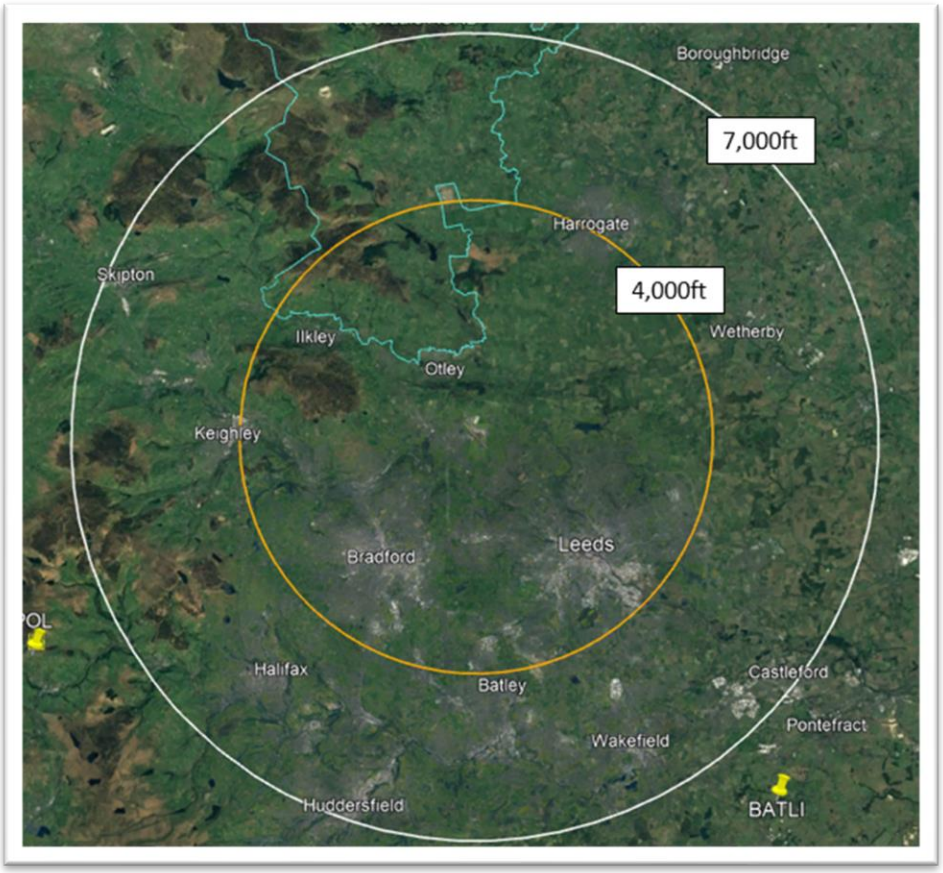


Figure 4: Indicative heights of aircraft used in the third round of engagement.

2.3.1.7. Following the third round of engagement, it was decided to present some departures as combination options, for example Runway 32 Combination Options A, B, C etc. LBA sought to change the standard requirement to fly in a straight line for the final 10nm towards the runway and this brings the potential for improving the noise outcome for stakeholders living under the traditional approach lane. These procedures use modern and emerging navigational techniques and are known as Required Navigation Performance (Authorisation Required) Approaches (RNP AR).

2.3.1.8. The combination options were presented to stakeholders, in the third round of engagement, as potential respite routes, potential night routes and potential night and/or respite routes.

2.3.1.9. In this document, for the purposes of the DPE, options are presented as range rings as depicted in Figure 4 as it was considered appropriate for capturing the stakeholder feedback when assessing the Design Principles against the options. In the IOA (2b) document these range rings are converted to Nautical Miles (nm)[4] as it was appropriate for assessing impact factors such as air quality and noise in terms of distance from the airport in order to identify environmentally sensitive areas and population density.

2.3.2. Arrivals

[4] 4000ft is at 9nm and 7000ft is at 15nm and calculated using an 8% climb gradient, plus 0.5nm buffer, in Initial Options Appraisal 2b.

2.3.2.1. The same exercise was followed for RW14 arrivals using NTMS samples as shown in the table above. From these data samples, arrivals swathes could be identified as a baseline, and the hold was just visible as it was used a little during the specified timeframe. As before, there were very few arrivals from the North-East or North-West making it difficult to identify a pattern.

2.4. Stakeholder Engagement

2.4.1. A range of stakeholders made up the target audience for engagement:

- Local councils;
- LBA Airport Consultative Committee;
- Environmental bodies;
- Technical stakeholders;
- Local aviation representatives;
- NATMAC (National ATM Advisory Committee) members;
- Other interested parties.

2.4.2. Engagement took the form of workshops, online surveys, presentations, and email communication.

2.4.3. Workshops were held on the 05 July 2022 which introduced the list of Design Options to the targeted audience of stakeholders, along with an assessment of the Design Options against the Design Principles which they had helped develop in Stage 1 of the process.

2.4.4. Following these workshops, stakeholders were invited to take part in an online survey which ran from the 13 July 2022 to the 26 August 2022. This survey asked whether the stakeholders felt the Design Principles had been applied correctly and consistently to each of the Design Options. The Survey also provided an opportunity to comment on areas where respondents felt this may not have been the case. An update was sent to stakeholders on 28 July 2022 to provide additional context to the Design Options and address some of the questions raised by respondents.

2.4.5. Following a period of reflection, and in response to stakeholder feedback, a series of additional departure Design Options were conceived along with a revised array of arrival system Design Options.

2.4.6. These Design Options were shared with the same set of stakeholders over the period 31 March 2023 to 28 April 2023 through a presentation sent out via email. The presentation was accompanied by an online survey and again sought feedback on whether stakeholders felt we had applied the Design Principles correctly and consistently to each of the Design Options.

2.4.7. Subsequently, a submission of the DPE and Initial Options Appraisal was made to the CAA, and this was assessed at the June 2023 Develop and Assess Gateway meeting. The CAA found various shortcomings in the contents of the reports, and it was determined that the DPE conducted previously needed to be reviewed, as did the Initial Options Appraisal, to ensure a consistent application of criteria across the Design Options.

2.4.8. Additionally, based upon meetings between the Airport and the En-Route Air Traffic Service provider (NERL)[5] , it was deemed necessary to develop some additional Arrival Options. Given the additional time, the opportunity was taken to develop some new Departure Options largely focused on providing communities with respite or night-time noise relief. The new Departure Options were presented to the Manchester Terminal Manoeuvring Area (MTMA) members on 16 May 2023.

2.4.9. These new Design Options, and most of the previously revealed Design Options[6], were also shared with the same set of stakeholders over the period 22 November 2023 to 20 December 2023 through a presentation sent out via email. A briefing was held online on 05 December 2023 allowing stakeholders the opportunity to have concepts explained or their questions answered. As with the Second round, the presentation associated with the Third round engagement was accompanied by an online survey seeking feedback on whether stakeholders felt we had applied the Design Principles correctly and consistently to each of our Design Options. Ultimately, the feedback from all the surveys has shaped the final DPE.

2.4.10. In total, thirty-nine departure swathes were considered (including the baseline and do-minimum options) of which twenty-seven will progress to Step 2b for Initial Options Appraisal. In terms of the arrivals, following a period of reflection post-initial Stage 2 engagement, it was determined that the original array of arrival Design Options was not sufficiently detailed enough to evaluate, nor did they meet the needs of the Airport or the en-route ATS provider. These systems were therefore re-developed for further consideration by stakeholders and the original eight Design Options were removed from consideration in favour of five new arrival systems. In between the Second and Third rounds of engagement, a further five Arrival Design Options were conceived resulting in ten Arrival Design Options being shared with stakeholders at the Third round of engagement. All ten arrival Design Options progressed to Step 2b for the Initial Options Appraisal.

2.4.11. Some Design Options were rejected ahead of the Third round of engagement as they were either not achieving what was required (such as departures procedures in directions that had no demand) or they were broadly considered unfavourable/unworkable. No comments were received by stakeholders wishing to see these rejected options re-introduced.

2.4.12. The Initial Options Appraisal methodology is described in a later section. The following section outlines the approach adopted for the DPE.

2.5. Design Principle Evaluation Approach

2.5.1. The DPE took each of the options and qualitatively assessed them against the Design Principles developed in Stage 1 (detailed in 1.4 Design Principles). The Team at Cyrrus and LBA conducted an internal DPE on all of the Options. This was a basic assessment of the Options, where each swathe was assessed against each Design Principle and assigned a colour depending on whether it was deemed to meet the Design Principle:

- Green – Based upon current circumstances/environment, the DO is most likely to meet the given DP;

[5] Meetings with NERL were held on 01 June 2022, 15 February 2023, 27 March 2023 and 17 April 2023.
[6] Some Design Options were rejected ahead of the Third round of engagement as they were either not achieving what was required (such as departures procedures in directions that had no demand) or they were broadly considered unfavourable/unworkable.

- Amber – Based upon current circumstances/environment, the DO may not entirely meet the given DP;
- Red – Based upon current circumstances/environment, the DO is most unlikely to meet the given DP.

2.5.2. This initial assessment Red, Amber, Green (RAG) can be seen in the DPE document in a column titled 'June DPE 2023'.

2.5.3. The initial assessment was presented to the Stakeholders though the survey and their feedback was requested.

2.5.4. Stakeholders were invited to take part in an online survey from the 23 December 2022 to the 03 February 2023. This survey asked whether the stakeholders felt we had applied the Design Principles correctly and consistently to each of our options. It provided an opportunity to comment on areas they felt this may not have been the case.

2.5.5. The feedback from the stakeholders was incorporated into the DPE.

2.6. Noise

2.6.1. The CAA has published its Policy on Minimum Standards of Noise Modelling (CAP 2091). This document defines categories of noise modelling sophistication and describes the different situations where the CAA require noise calculations to be provided. Moreover, it sets out requirements for the minimum category which different stakeholder or sponsor groups should use when providing noise calculations to the CAA for them to carry out their regulatory duties.

2.6.2. The current situation with regards to noise is described in section 3.11 and draws on data from the Noise Preferential Routes (NPRs) published in the Aeronautical Information Publication (AIP), the airport's Noise Action Plan (NAP)[7], and the Section 106 agreement with the local authority.

2.6.3. The LBA NAP brings together all noise management activities into one living document. This includes specific actions that will be implemented by LBA to manage the effects of noise arising from airport activities, in order to minimise, as far as reasonably practicable, any adverse impact on the local communities surrounding the airport.

2.6.4. The NAP is a legal requirement under the Environmental Noise Directive (END) (2002/49/EC), relating to the assessment and management of environmental noise. The END was transposed into English law by the Environmental Noise (England) Regulations 2006 (as amended).

2.6.5. Noise contours have been produced, and presented in this ACP, based on the actual aircraft movements for 16 June to 15 September using the Aviation Environmental Design Tool (AEDT) software (version 3d), developed by the Federal Aviation Administration (FAA). A report was produced by Bickerdike Allen Partners LLP (BAP) on behalf of LBA.

[7] The Noise Action Plan can be found here: Noise Action Plan | Leeds Bradford Airport

2.7. CO2 Emissions

2.7.1. LBA will undertake environmental assessments (quantitative and/or qualitative, according to the scale of the change options and the nature of the potential environmental impacts) as part of the next stage of this ACP (see IOA document). Additionally, a longer term (10-year) forecast scenario will also be provided.

2.7.2. One of the desired environmental outcomes for this ACP is reflected in LBA's design principles. DP4 states that the proposed design should minimise CO2 emissions per flight (see Section 1.4).

2.7.3. In preparation for the assessments at the next stage, LBA has assessed the existing situation with regards to fuel and CO_2 emissions. Further information can be found in the 2030 Net Zero Carbon Roadmap report, this provides LBAs progress to date and the efforts made to reduce aircraft CO_2 emissions.

2.7.4. Existing conventional procedures that require a significant degree of controller intervention through vectoring and through the stepping of climbs and descents are not the most environmentally efficient. These factors may result in more track miles being flown at potentially inefficient altitudes and may also require higher engine power settings. Procedures that do not support the optimum performance of aircraft are going to involve greater fuel-burn and by extension, greater emissions.

2.8. Local air quality (if any options include changes below 1,000 feet)

2.8.1. CAP 1616 states that 'due to the effects of mixing and dispersion, emissions from aircraft above 1,000ft are unlikely to have a significant impact on local air quality'. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport. However, sponsors must still show explicit consideration of whether local air quality could be impacted when developing ACPs.

2.8.2. The CAA have also stated that they will continue to consider the impact of airspace changes to local air quality, in addition to biodiversity and tranquillity, as part of their regulatory role. The UK Airspace Change Masterplan will also consider non- CO2 warming effects as part of their work in other areas, such as in relation to sustainable aviation fuels and novel technologies, whilst considering the latest scientific research.

2.8.3. Air Quality Management Area (AQMA) boundaries are identified using DEFRA's UK Air Information Resource interactive map. These are detailed in section 3.12. An AQMA is a designated area where air quality does not meet the standards set by the government for specific air pollutants, such as Nitrogen Dioxide (NO2), particulate matter (PM10) or Sulphur dioxide (SO2). AQMAs are designated by local authorities to address air pollution and implement plans to improve air quality. Bournemouth Airport conducted a desktop survey using DEFRA's UK Air Information Resource to identify any AQMAs in the vicinity.

2.8.4. LBA undertakes monthly air quality monitoring. The Airport has been conducting this both inside and outside of the Airport's boundary since 1994.

2.9. Tranquillity

2.9.1. Tranquillity refers to the remoteness and sense of isolation, or lack of it, within the landscape. This can be affected and often determined by noise levels and visual amenity resulting from the absence of built development and intrusion from traffic.

2.9.2. Impacts upon tranquillity must be considered with specific reference to Areas of Outstanding Natural Beauty (AONB) and NPs in addition to other areas for consideration identified through community engagement.

2.9.3. In line with TAG Unit A3 (section 5) Step 1: Scoping and identification of study area is detailed in this document. This provides baseline information regarding tranquillity and satisfies the initial step in the determination of any changes to the tranquillity of the environment for all options taken forward.

2.9.4. Tranquillity is specified in LBA's DPs, see section 1.4, DP 3.

2.9.5. Qualitative assessment of tranquillity impacts will be undertaken as part of the Options Appraisal (step 2b). A more detailed assessment will be conducted via WebTAG under 'Landscape' (TAG Unit A3 – Section 6) in stage 3 of this ACP.

2.9.6. Scoping and identification of AONBs, NPs and other local areas for consideration was completed using the DEFRA MAGIC Map application; MAGIC website provides authoritative geographic information about the natural environment from across government. The information covers a variety of environments and is presented in an interactive map which can be explored using various mapping tools.

2.9.7. A Tranquillity Map was produced with LBA at the centre and areas for consideration were identified within a 25nm radius. See Annex A. Options are further assessed in the Initial Options Appraisal (2b) document for all options over Areas of Outstanding Natural Beauty (AONB), NPs and environmentally sensitive areas such as Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI).

2.10. Biodiversity

2.10.1. Consideration was given to relevant legislation regarding biodiversity, such as Wildlife and Countryside Act 198175 and the Conservation of Habitats and Species Regulations 2010.

2.10.2. CAP 1616 states that all changes below 7000 ft should consider local circumstances in the development of airspace structures, the change sponsor should include in its consultations and engagement, potential biodiversity implications associated with design options under consideration and should be mindful of such potential impacts as are identified by stakeholders.

2.10.3. Whilst ACPs are unlikely to have an impact upon biodiversity because they do not involve ground-based infrastructure, biodiversity was considered during the development of the design principles (stage 1b).

2.10.4. Stakeholders did not identify biodiversity concerns during the engagement or in feedback in Stage 1b of this ACP process.

2.10.5. Given the above statements and considerations, no further quantitative assessment is considered necessary for this stage of the ACP. There is therefore no baseline description of biodiversity in this document, other than identification of sites for consideration in the initial options appraisal (step 2b). This will be given further consideration at stage 3 of this ACP.

2.10.6. DEFRA's MAGIC maps were used to identify any environmentally sensitive areas and areas of conservation, these are Ramsar sites, Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) and Special Areas of Conservation (SAC). These can be used to further assess any potential changes in biodiversity once options have been refined at a later stage of the ACP process[8].

[8] Proposed sites were also considered in the scoping exercise.

3. The Baseline – Leeds Bradford Airports Existing Airspace Arrangements

3.1. Overview

3.1.1. This section describes the existing situation at LBA. It begins with the CAP1616 requirements for providing a baseline for ACPs and a brief introduction to the airport, including a description of how the runways are used, the 'do nothing' and 'do-minimum' scenarios, the latter in acknowledgement that for LBA, to do nothing is not a viable option. The Airspace is fully described, including airspace classifications, neighbouring ANSPs, adjacent aerodromes and reporting points for aircraft when departing LBA. Additionally, a brief description of Common Transition Altitude (TA) is provided with an explanation of why this may be important in a later stage of the ACP process. An explanation of CAP 1781 is provided with further clarification of the relevance and importance to LBA, i.e. the requirement for an interim measure due to the decommissioning of an existing navigation facility before the completion of this ACP.

3.1.2. A description of the current situation with regards to arrivals and departures along with data from representative weeks for each runway. The full data for the period required by the CAA, 16 June to 15 September 2022, is provided in Annex B. The holding system for Arrivals is also described. The current noise environment is presented in section 3.11. A forecast for future noise forecasts is given in the other document for this ACP 'Initial Options Appraisal 2b' section 4.4. A brief description of the current performance of aircraft with regards to continuous climb and continuous decent, as these factors are important objectives for the AMS, it is useful to describe this as part of the baseline in order to measure and anticipate improvements for departure and arrival options.

3.1.3. Finally, this section outlines the Strategic Development Plan to 2030 for LBA. This highlights key objectives and forecasts for the airport. A detailed traffic forecast can be found in section 3.12 Table 6.

3.1.4. CAP 1616 requires airspace change sponsors to identify a baseline to facilitate environmental evaluation of the DOs. It explains that this will be a 'Do Nothing' scenario and will largely reflect the current-day scenario, although taking due consideration of known or anticipated factors that might affect that baseline, for example any significant planned housing developments close to an airport, forecast growth in air traffic, or expected changes in airlines' fleet mix. Therefore, all environmental assessments must illustrate the difference between a pre-implementation ('Do Nothing') scenario and a post-implementation scenario, ensuring that the periods are comparable.

3.1.5. LBA is in Yeadon, 7 miles (11 km) northwest of Leeds City Centre, and about 9 miles (14 km) northeast of Bradford City Centre. It serves Leeds, Bradford and the wider Yorkshire region which include York, Harrogate, and Wakefield, and is the largest airport in Yorkshire. LBA is situated in an elevated position, 208 metres above mean sea level, making it the highest in England.

3.1.6. Operators using LBA include EasyJet, Ryanair, TUI Airways, KLM and Jet2 where it is headquartered. The Airport operates flights to domestic and European destinations catering for approximately 4 million passengers per annum.

3.2. Runways and Modal Split

3.2.1. LBA has a single runway with two ends known as '14' and '32'; these are given their names as their true bearing is rounded to two figures, e.g., runway 14 has a true bearing of 137.74 degrees.

3.2.2. Aircraft normally land and take off heading into the wind, thus the wind direction at the time of an aircraft approach or departure usually determines which runway is chosen. The prevailing wind direction at LBA is from the South-West, therefore crosswinds are routinely a factor, and neither runway is often favoured by the wind. There is a 'Selective runway Procedure' in place as part of the Section 106 Agreement with the Local Planning Authority. This Procedure is intended to mitigate the noise impact on the more densely populated area to the South-East of the Airport. *'Aircraft will use runway 14 for landing and runway 32 for take-off, whenever this is possible, having regard to wind, cloud base, approach aid limitations and aircraft performance and requirements.'* The S106 agreement is outside of the scope of the CAP 1616 process. There are no plans to request changes to it as part of this process, except that it may be necessary to modify the description of the NPRs which are also a matter for the Local Planning Authority, in the event that they cannot adequately contain the preferred routes following the next stage of the process.

3.2.3. The runway usage at LBA from 2008 to the 2023 with data taken from the Airport's Noise and Track Monitoring System (NTMS) was measured; RW32 was used the most for both arrivals and departures, with arrivals 69% of the time and departures 71%. RW14 was used 31% of the time for arrivals and 29% for departures.

3.3. The Do-Nothing and Do Minimum Scenarios

3.3.1. CAP 1616 acknowledges that in certain cases, doing nothing is not a feasible option[9]. In such cases, in addition to the 'Do Nothing' baseline, Change Sponsors are required to set out an informed view of the future and the minimum changes required to address the identified issues, i.e. the 'Do Minimum' option.

3.3.2. 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). Nevertheless, LBA set out what the 'Do Nothing' baseline looks like in the Step 2a document 'Options Development and DPE', and it is re-iterated here.

3.3.3. Four of LBA's departure procedures (SIDs) are predicated on radials and ranges from the GAM DVOR but aircraft will soon be left without this navigational aid from which to obtain these radials and ranges.

[9] CAP 1616 Appendix E paragraph E21.

3.3.4. As this ACP will not be complete before these DVORs are decommissioned, a temporary solution has been applied for through a CAA process detailed in CAP 1781[10]. This is a 'Do Minimum' solution and LBA has submitted an Impact Assessment for a CAP 1781 application to substitute the affected SIDs with Area Navigation (RNAV) overlays. RNAV Substitution is not an alternative to either deleting procedures or replacing conventional procedures with RNAV procedures when a dependent navigation aid is removed but, subject to certain conditions, it can provide an interim step which gives procedure owners additional time to plan and implement their RNAV strategy, including any consultation required by the ACP, without preventing the navigation aid rationalisation programme from continuing. The conclusion of this ACP may not be until as late as 2027 but the Airport needs to continue to function. Note: There is no CAP 1781 solution for the arrivals or the approaches.

3.3.5. As CAP 1781 is not intended as a long-term solution, an 'airspace modernisation' ACP (this project) is required to develop options for the future operations at the Airport. It may not be possible to entirely replicate the departure procedures that exist today, nor is that necessarily desirable either operationally or environmentally. It is important to take a fresh look at the airspace and its operation in the spirit of modernisation.

3.3.6. On leaving the European Union, the UK Government did not retain all elements of the Performance-Based Navigation Implementing Regulation (PBN IR). Industry awaits what form of legislation for PBN is developed in the UK however, the goals of the AMS will most likely be aligned with the European Regulations and it is entirely realistic to expect an exclusive use of PBN in UK airspace in the 2030 timeframe.

3.3.7. The implementation of PBN approach and departure procedures as part of this ACP, which is unlikely to conclude until 2027 at the earliest, is appropriate and therefore it is not feasible to 'Do Nothing'. There is however scope to 'Do Minimum' for departures through the implementation of the CAP 1781 RNAV Substitution as a temporary measure.

3.3.8. Do Minimum (CAP1781 – Temporary Solution)

3.3.8.1. As described above, there is a temporary solution to the withdrawal of the conventional navigation aids allowing LBA to continue 'business as usual' until the conclusion of this CAP1616 process. The RNAV substitution of the existing SIDs would result in more accurately and consistently flown departures certainly in the initial phase of flight. Were aircraft to maintain the nominal track of these procedures to their conclusion, the swathes would look something akin to that depicted in Figure 5.

[10] CAP1781 DVOR/DME/NDB Rationalisation: Guidance for the use of RNAV Substitution Version 2 dated 4th Aug 22.

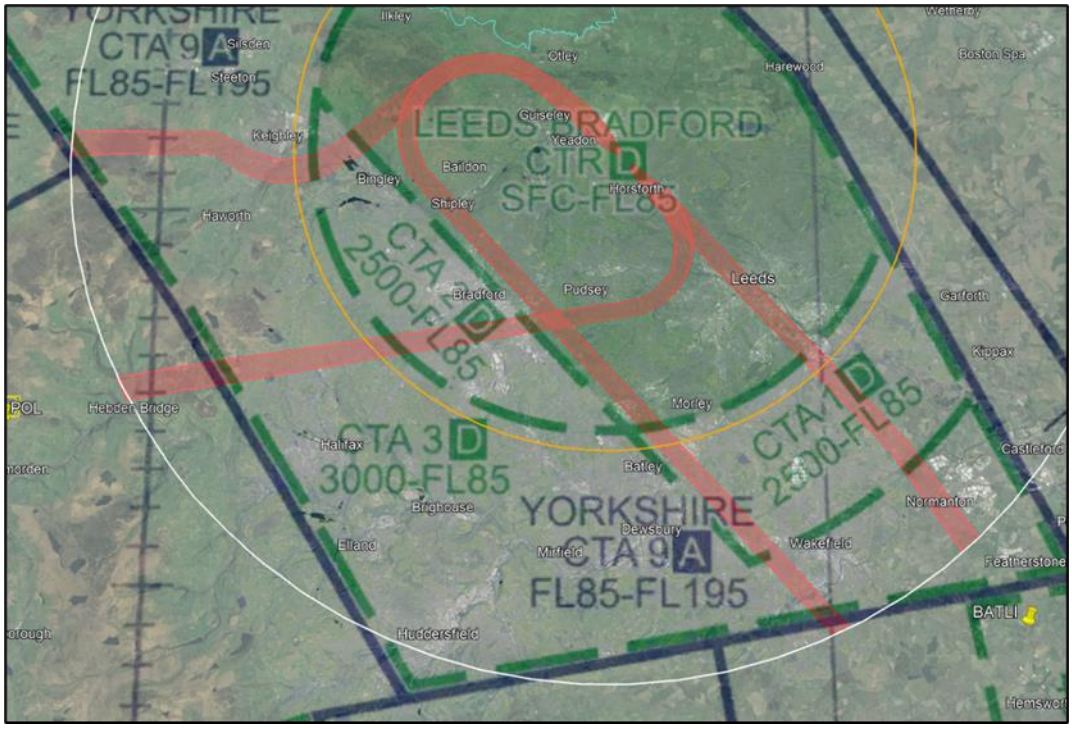


Figure 5: Do Minimum (CAP1781) swathes following the nominal track of published procedures.

3.3.8.2. However, once the aircraft leave the LBA Air Traffic Control (ATC) frequency and are climbing through 5-7000ft, the aircraft will be turned onto as direct a track as possible by the NERL controllers at Scottish Control. Accordingly, the Do Minimum swathes would look more like that depicted in Figure 6. The greater accuracy and concentration of tracks in the initial phase of flight would be evident before the variance becomes apparent on being released onto own navigation or on being given vectors.

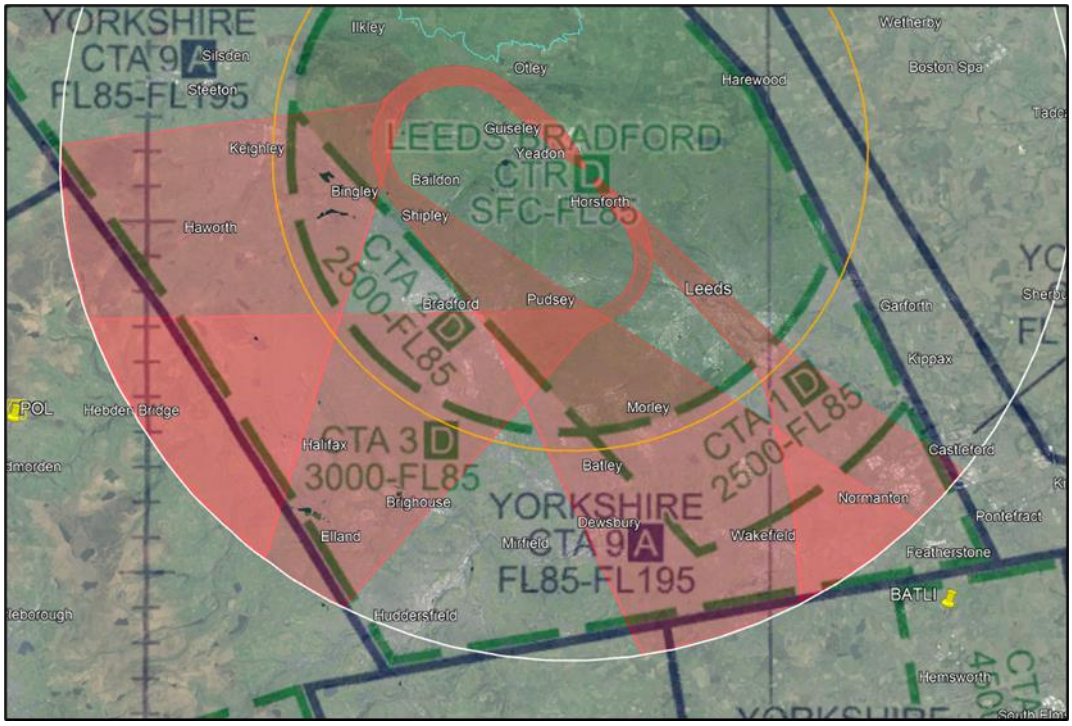


Figure 6: Do Minimum (CAP1781) swathes assuming NERL release aircraft on direct track.

3.3.8.3. It is feasible that the 'Do Minimum' options (that closely resemble the 'Do Nothing') could become the chosen options at the end of this CAP1616 process and accordingly these swathes should be considered as DOs in their own right.

3.4. Controlled Airspace Configuration

3.4.1. LBA has a Control Zone (CTR) that extends from the surface to Flight Level (FL) 85 (8,500ft). It has three associated Control Areas (CTAs), and all are classified as Class D airspace (controlled airspace or CAS)[11].

- CTA 1 extends from 2,500ft to FL85 (south of the Airport);
- CTA 2 (due west of the Airport) has the same vertical extent as CTA 1; and
- CTA 3 which surrounds the Airport from the South, through West to the North, extends from 3,000ft to FL85.

3.4.2. Another form of CAS, the Yorkshire CTA, sits above and extends to FL195; this is classified as Class A airspace.

3.4.3. The LBA and Yorkshire CTAs is adjacent to the Manchester Terminal Manoeuvring Area (MTMA) which is the subject of another ACP (ACP-2019-77)[12], an ACP which encompasses the LBA region and is inextricably linked. It is part of a regional cluster of ACPs[13] all associated with the Future Airspace Implementation - North (FASI-N) initiative.

3.4.4. Aircraft typically pass through the MTMA on the way in and the way out of LBA and it is critical that this interface (the locations and altitudes at which aircraft are transferred from one agency to the other) is designed in a coordinated fashion.

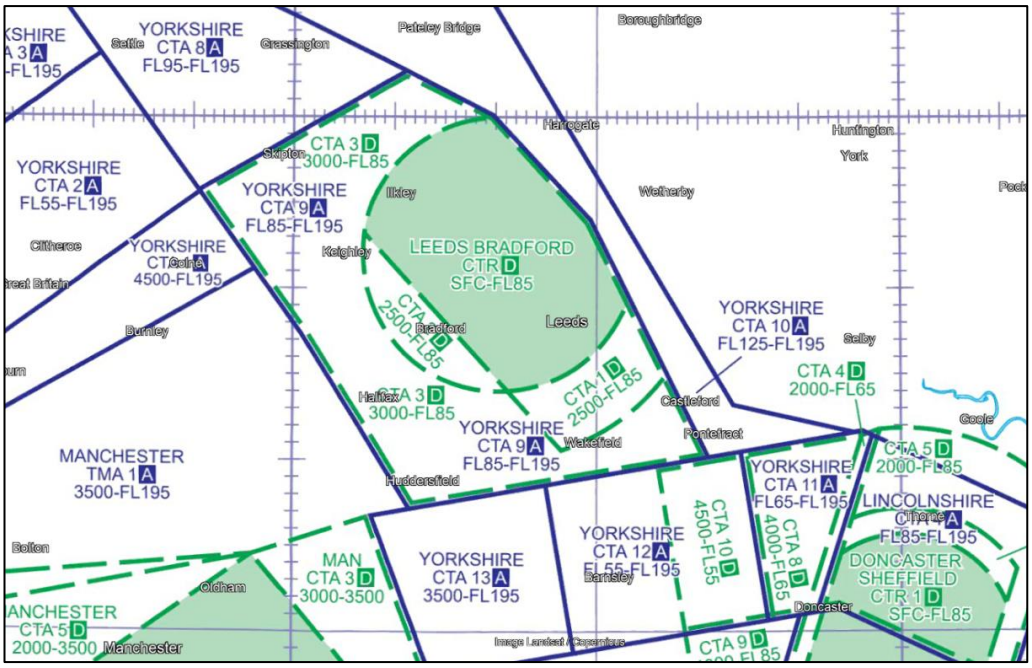


Figure 7: Airspace Configuration

[11] More details on Airspace Classifications here
[12] More detail on the FASI(N) MTMA ACP, sponsored by NATS, can be found on the Airspace Change Portal.
[13] Includes Liverpool, Manchester, Leeds Bradford, East Midlands and the MTMA ACPs.

3.4.5. The Airspace immediately east of the CTR consists of uncontrolled airspace (Class G) from the surface up to FL125 (12,500ft). The Yorkshire CTA (Class A airspace) then extends from FL125 to FL195.

3.4.6. This absence of CAS due east of LBA at the lower levels is problematic as it gives the Air Traffic Controllers (ATCOs) very little room for manoeuvre in order to keep aircraft from straying into uncontrolled airspace.

3.4.7. Accordingly, the departure procedures are all designed to keep aircraft in CAS and as such these are not able to turn right off RW32 or left off RW14. This constraint is equally pertinent in relation to arrivals as there is very little room to vector inbound aircraft to the east of the Airport or to hold them in that area.

3.4.8. The Class G airspace over the Vale of York is relatively busy and contains the activities of multiple GA airfields, RAF Leeming and Teesside International Airport along with military fast jets and helicopters from Lincolnshire and further south.

3.4.9. When the DOs were first being developed for this ACP, Doncaster Sheffield Airport (DSA) was still a going concern and accordingly the DOs that were developed assumed LBA would need to deconflict their activities with those of DSA. By the time the second round of DO conception was underway, DSA had closed and as such consideration was given to some options that might utilise some airspace adjacent to airspace previously used by DSA. Whilst the airspace surrounding DSA has been suspended, it is unclear whether this is the final outcome.

3.4.10. It should be noted that LBA utilised some of DSA's delegated airspace for some arrivals into LBA as part of a local agreement between the two airports. The suspension of this airspace has resulted in changes to how LBA manages the descent of the inbounds from the East, but it has had no significant impact on the operation.

3.4.11. The existing departure procedures utilise a number of reporting points and conventional navigation aids. These are depicted at Figure 8 and listed below:

- GASKO is utilised by aircraft routing to the NE;
- NELSA, POL and MCT are utilised by aircraft routing S or W; and
- DOPEK, LAMIX and GAM are utilised by aircraft routing to the SE.

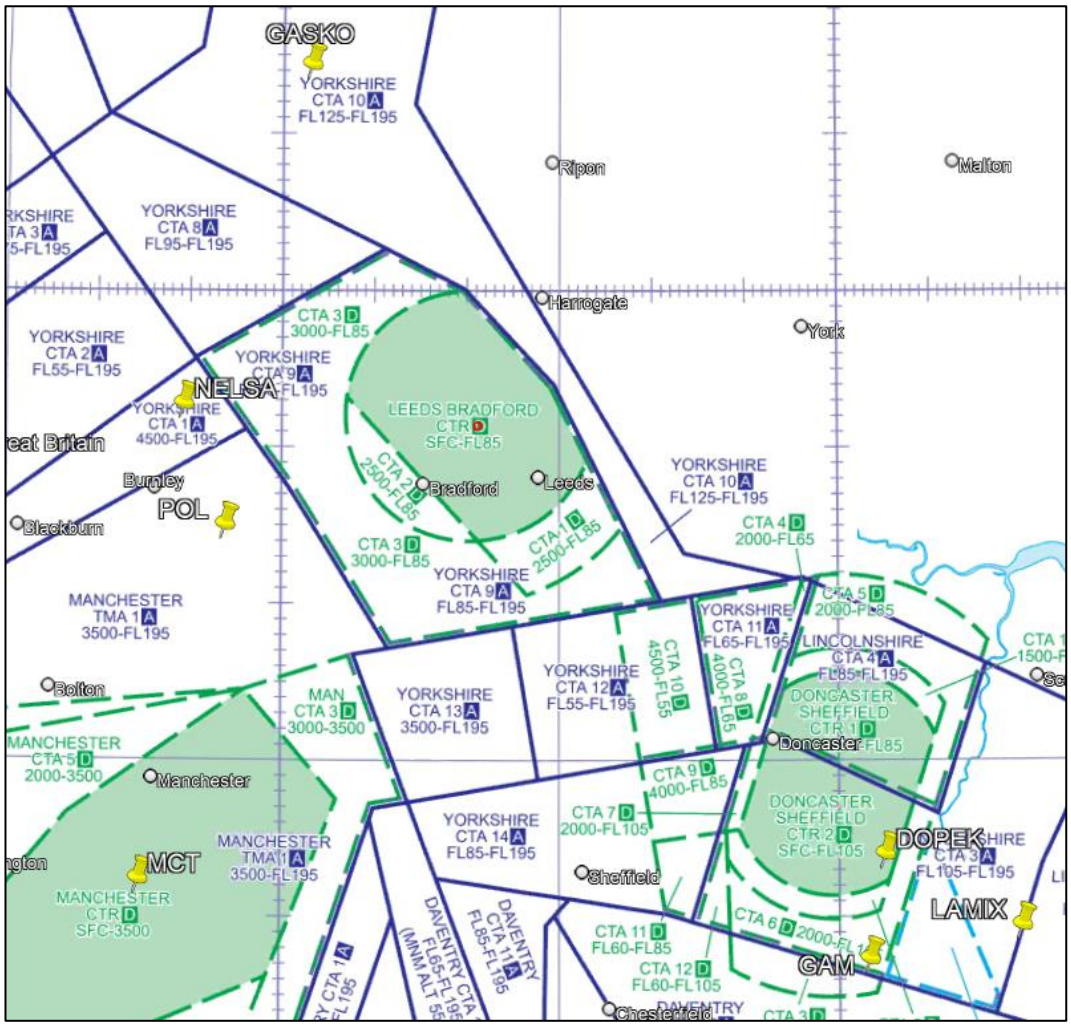


Figure 8: Relevant Reporting Points

3.5. CAP 1781 Area Navigation Substitution

3.5.1. As highlighted above (3.3.2) LBA currently relies upon a conventional navigation facility, known as a Doppler Very High Frequency Omni-Directional Range (DVOR). This DVOR, situated at Gamston (GAM), is being withdrawn by its owner (NATS Holdings Ltd) as it is an ageing and expensive asset to maintain. With RNAV, the reliance on satellite-based navigation positioning and a reduced dependency on conventional ground-based navigation aids has an impact on the numbers of such facilities that NATS requires to retain, for its future navigation infrastructure. Accordingly various ground-based navigation aids are being rationalised. This rationalisation is one of the primary drivers for this ACP, but the GAM will be withdrawn before the CAP 1616 ACP reaches conclusion.

3.5.2. CAP 1781 is a CAA publication that offers a method of mitigation for continued use of conventional Instrument Flight Procedures (IFPs) in lieu of radiating conventional navigation facilities ahead of the introduction of permanent airspace changes utilising PBN

3.5.3. LBA has a CAP 1781 application in process for RNAV Substitution to be used on the existing SIDs. Detail on this can be found on the ACP Portal. This is intended as an interim measure to enable the Airport to continue 'business as usual' until such time as the CAP 1616 ACP reaches conclusion.

3.5.4. It should be noted that this is the 'Do Minimum' Option for this ACP, but it is only valid for the departures. There is no such CAP 1781 RNAV Substitution option available for arrivals or approaches. As the 'Do Minimum' is viable in the short-term, it is reasonable to expect it to be viable in the longer-term and as such the CAP 1781 'Do Minimum' DOs are DOs in their own right for assessment and consultation through the CAP 1616 process. Should these ultimately be the preferred solutions by the Airport and its stakeholders, then something akin to the 'Status Quo' may endure.

3.6. Common Transition Altitude

3.6.1. One of the proposals associated with the MTMA ACP is the consolidation of the Transition Altitude (TA) in the MTMA from 5,000ft to 6,000ft for consistency.

3.6.2. Aircraft can use different vertical references when flying. 'Altitude' means the distance an aircraft is above mean sea level using a local or regional pressure setting; 'height' means the distance above the ground; a 'Flight Level' (FL) is the vertical distance of an aircraft above the assumed mean sea level pressure of 1013.25 hPa (hectopascals), and is the standard reference for aircraft at higher levels, in hundreds of ft, i.e., with 1013.25 hPa set, an aircraft flying at 9,000ft is referred to being at 'FL90'.

3.6.3. In order to maintain separation, ATCOs need to use common vertical references for the aircraft under their control, and those in the local vicinity; to do this they use altitudes and flight levels. The Transition Altitude (TA) is the altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes. Above the TA, aircraft fly with reference to FLs.

3.6.4. Currently the TA differs depending on the volume of airspace an aircraft is flying in thereby increasing complexity. One of the proposals of the MTMA ACP is to consolidate these differing TAs by establishing a common TA of 6,000ft across the entire MTMA region.

3.6.5. NATS has stated in its ACP documentation that the consolidation of the TA will have the following benefits:

- Progresses CAA policy to consolidate the TA within UK CAS;
- Consolidates the TA within the MTMA and surrounding airspace;
- Reduces the possibility of (vertical) infringement into CAS in this region due to a common TA;
- Simplifies the airspace picture:
  - reduces operational confusion; and
  - reduces pilot and controller workload.
- Enables higher Standard Instrument Departure (SID) endpoints to be considered within the airport ACPs enabling the associated benefits, such as:
  - improved continuous climb operations (CCO); and
  - reduction in fuel burn leading to a reduction in greenhouse gas emissions.

3.6.6. Consolidation of the TA will not constrain the DOs being considered or alter the patterns of flights (IFR, VFR or SVFR) using the airspace. It is likely to result in the SIDs needing to extend to FL80 (vice FL70) and the Standard Arrivals (STARs) being limited to FL90 (vice FL80) in the descent.

3.7. Adjacent Aerodromes

3.7.1. LBA's neighbours include the following:

- **DSA** – At the time of writing, this Airport has ceased operations and the CAS delegated to it has been suspended. The CAA are conducting an ACP to permanently disestablish the CAS previously delegated to DSA. City of Doncaster Council (CDC) are however seeking to re-open the Airport and have requested the Secretary of State call-in for the CAA sponsored ACP to stop the permanent suspension of the airspace;
- **Leeds East Airport (formerly RAF Church Fenton)** – Due east of LBA and situated within Class G airspace. LBA ATC occasionally handle inbounds to this airport, but this causes minimal extra workload;
- **Sherburn-in-Elmet** – Due east of LBA and situated in Class G airspace, a relatively busy GA hub;
- **RAF Leeming** – Situated in Class G airspace to the NE of LBA. Minimal interaction between the two aerodromes and their associated traffic;
- **Teesside International Airport** – Situated within Class D airspace to the North-East of RAF Leeming;
- **Manchester Airport** – Situated to the SW of LBA requiring the most coordination with LBA traffic than any of its other neighbours.

3.8. Arrivals to Leeds Bradford Airport

3.8.1. Inbound aircraft to LBA largely follow the routings depicted in the UK Aeronautical Information Publication (AIP). LBA does not have designed and published STARs or Arrival Transitions. Aircraft that are inbound from the Route Network are typically issued tactical headings prior to transfer from Scottish Control to LBA radar descending to an agreed level through a 'gate'.

3.8.2. Figure 9, taken from the UK AIP, details the routings off the various routes on the Network. The AIP also states: *'Aircraft likely to be issued tactical headings prior to transfer from Scottish Control to EGNM RAD'*[14].

Approach from	Via	Route
NW	L612 N57	CALDA - POL - LBA POL - LBA
N	P18	GASKO - LBA
E	Y70	GOLES - BATLI - LBA
S	N57/T420 N601	TNT - DENBY - LBA EMBOR - TNT - DENBY - LBA
SW	N864	REXAM - BARTN - POL - LBA
W	L10/L975	WAL - BARTN - POL - LBA

Figure 9: Standard Inbound Routes into LBA - UK AIP

[14] EGNM is the ICAO code for LBA.

3.8.3. Figure 10 illustrates the gate system for arrivals at LBA [15]. The orange arrows show traffic leaving the Route Network and heading towards a gate (pink lines) in the descent to FL80 (8,000ft). Aircraft are then either vectored by Leeds Radar to 10nm finals on the extended centreline of the runway in use or they are sent to the LBA hold (overhead the Airport and shown as the pink lozenge shape in Figure 10) until such time as it is possible to accommodate their approach. Arrivals to LBA are predominantly from the South, east and west with only a few arrivals from the North and north-west.

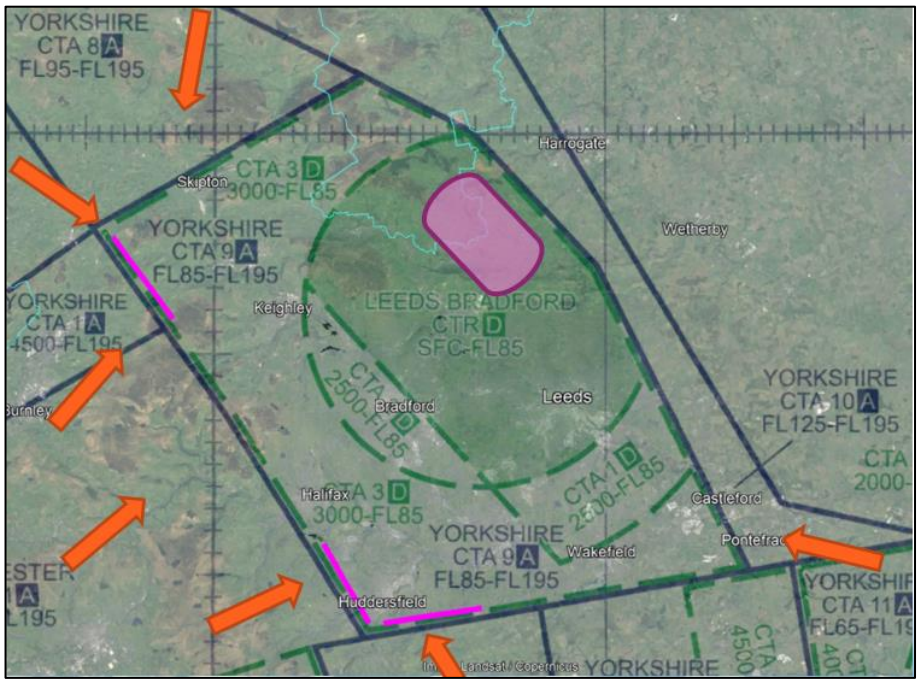


Figure 10: Baseline Gate and Single Hold System

[15] The gate system is the transition from the en-route system to the terminal airspace within the airport vicinity.

3.8.4. Figure 11 depicts all arrivals to runway 32 during the period of 16 June to 15 September 2022. In Annex B these arrivals are broken down by week to illustrate arrival patterns. These represent the points at which aircraft are expected to be over 4000ft and 7000ft respectively[16]

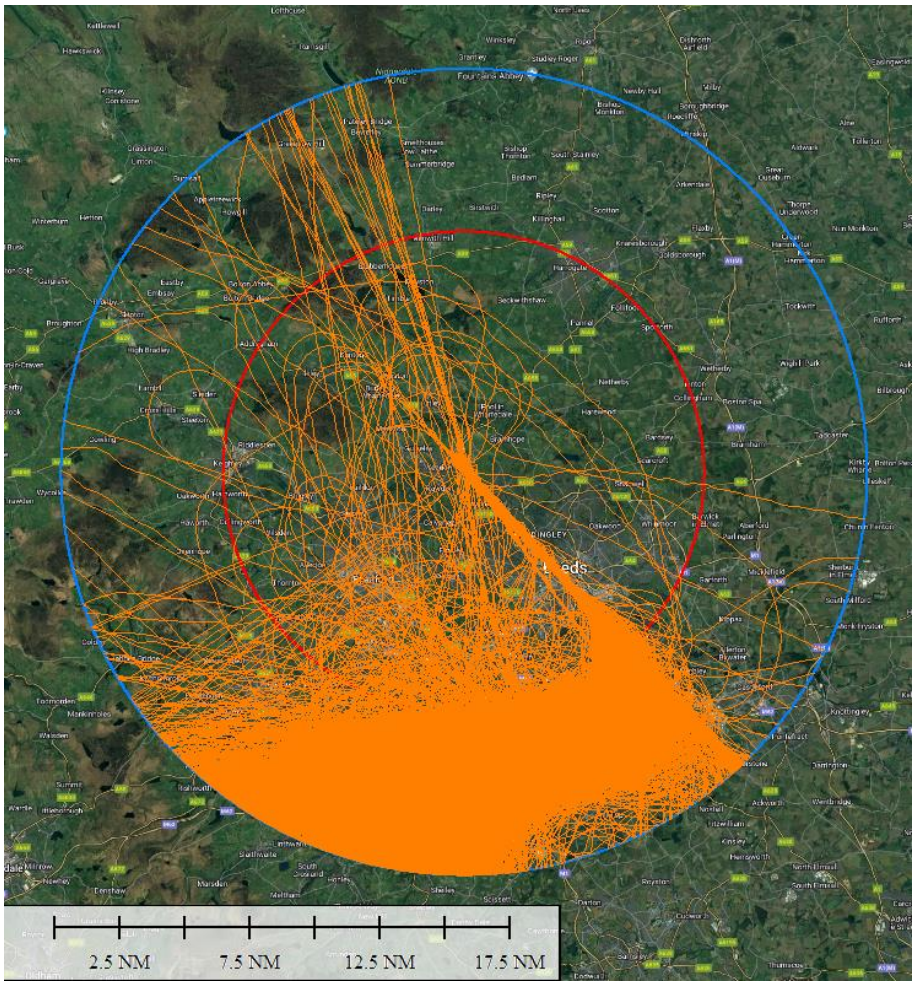


Figure 11: Arrivals to RW 32 16th June to 15th September 2022

3.8.5. Figure 12 depicts all arrivals to runway 32 during the period of 16 June to 15 September 2022. In Annex B these arrivals are broken down by week to illustrate arrival patterns. Arrival patterns can be seen from the South, west and east. As described in section 2, these were used to create swathes to represent the baselines by drawing a polygon extending from the edge of LBA airspace to the beginning of the approach. Arrivals from the North-West are not evident and there are very few from the North-East and therefore no baseline is identified.

[16] Distances are calculated using an 8% climb gradient.

3.8.6. The same exercise was followed for RW14 arrivals using a NTMS sample from the same time period. Similarly to RW32, there are very few arrivals from the North-East or the North-West and therefore no baseline is identified. See Figure 12 below.

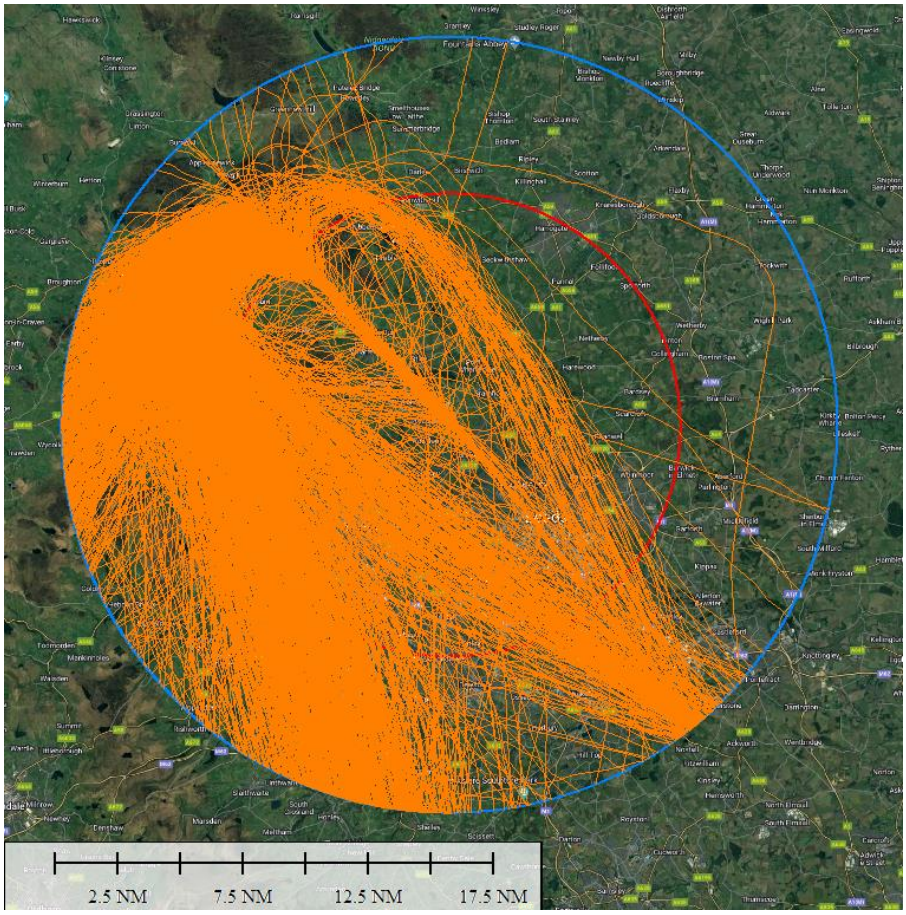


Figure 12: Arrivals to RW14 16th June to 15th September 2022

3.8.7. As the traffic for the specified period is busy for both runways, the traffic movements were broken down by week, and can be seen in Annex B (92-Day 2022 weekly track data), a representative sample was chosen for each runway for clarity. For runway 32, the week of 14 to 20 July 2022 was chosen, Figure 13 . For runway 14, the week of 23 to 29 June 2022 was chosen, Figure 14. These tracks are shown over an En-route chart (left) and Google Maps Satellite imagery (right), the inner red circle is 9nm from the runway, and the blue circle is 15nm. These represent the points at which aircraft are expected to be over 4000ft and 7000ft respectively.

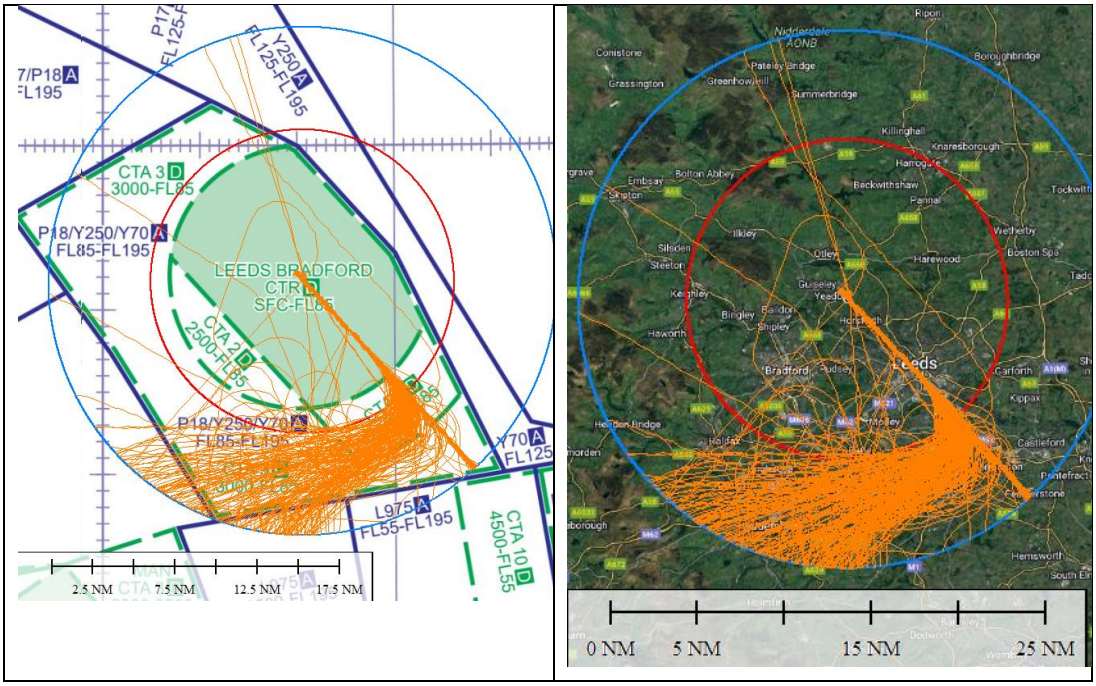


Figure 13: RW32 14 – 20 July 2022 Track Data.

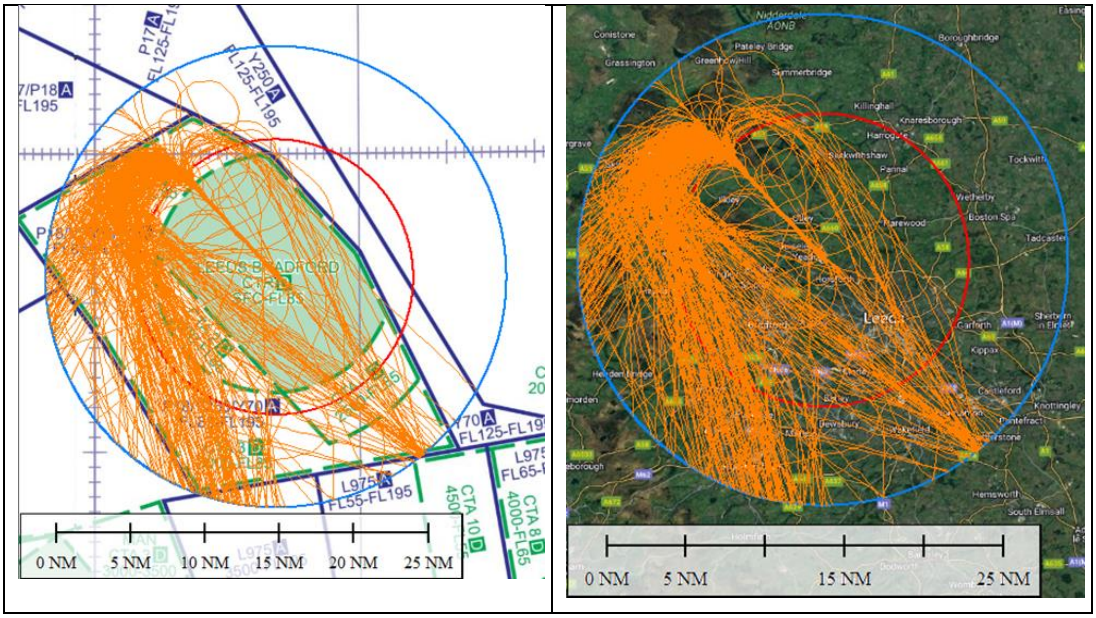


Figure 14: RW14 23 – 29 June 2022 Track Data.

3.8.8. In summary, arrivals to LBA are predominantly from the South, East and West with only a small number arriving from the North and North-West. Using actual track data from LBA's NTMS, the existing baseline of arrival swathes can be determined.

3.9. Holding

3.9.1. LBA has a single arrival hold (also used as the Missed Approach Hold) associated with the Non-Directional Beacon (NDB) known as the LBA. It is roughly situated in the overhead of the Airport (to the North-East of the runway).

3.9.2. The LBA hold is used very infrequently as an arrival hold and even less frequently as a Missed Approach Hold. Holding for weather would only realistically happen for extremely strong crosswinds or if the visibility were below the minimum allowable for aircraft to make an approach. The runway Visual Range (RVR)[17] within the Touchdown Zone (TDZ)[18] would need to drop below 200m for this to be the case for the majority of the fleet mix operating at the Airport. Meteorological Actual Reports (METARs) taken over a 12-month period at the Airport show that an average RVR below 200m only happens 0.21% of the time. This is shown by hour of the day in the chart at Figure 15.

3.9.3. Holding due to traffic congestion is equally highly unlikely under current traffic levels and therefore, unless the runway has been blocked or damaged by another aircraft or vehicle, the LBA is rarely in use.

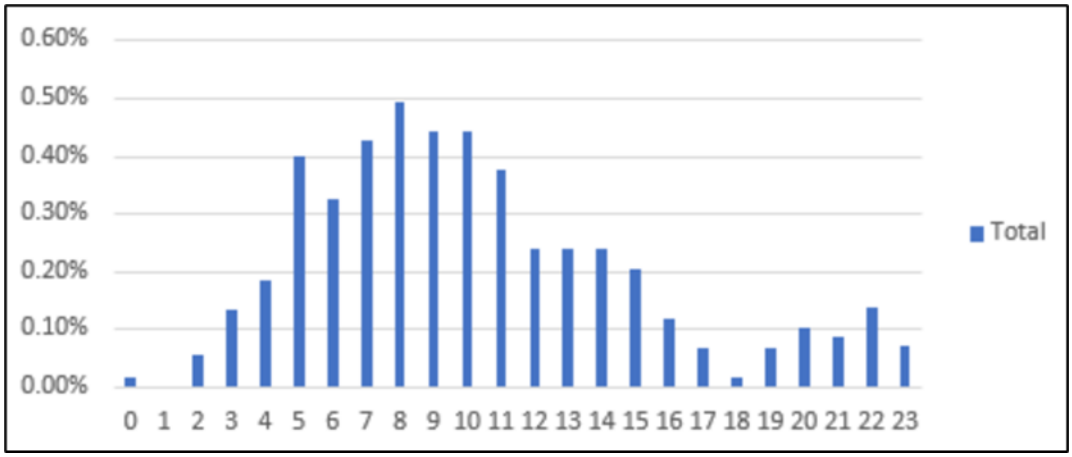


Figure 15: Percentage of METARs that contain TDZ RVR below 200m over a 12-month period.

3.10. Departures from Leeds Bradford Airport

3.10.1. LBA has Noise Preferential Routings (NPRs) to supplement the 'Selective runway Procedure'. NPRs are for departures only, there is no such equivalent for arrivals/approaches. These NPRs are defined in the UK AIP as follows:

a) *Runway 14 – After take-off maintain runway heading to 'I LBF' Distance Measuring Equipment (DME) 2 before setting course (or 'I LF' DME 2 when runway 32 is being used for landing traffic);*

b) *Runway 32 – Climb straight ahead. At 1181 FT QNH (500 FT QFE) or I-LF D0.5, whichever is the later, turn left to track 311° MAG. At 'I LF' DME 2.1 *535340N 0014258W reduce to minimum safe power settings and turn left to make good a track of 272° MAG. Maintain this track until 'I LF' DME 3.5 *535405N 0014521W before setting course;*

[17] The runway visual range (RVR) is the distance over which a pilot of an aircraft on the centreline of the runway can see the runway surface markings delineating the runway or the lights delineating the runway or identifying its centre line.
[18] The touchdown zone (TDZ) refers to the area of a runway where an aircraft makes contact with the ground during landing.

c) Turbo-prop: After take-off make good a track of 311° MAG and at DME 2.1 turn onto course.

Note: The above routeings are compatible with normal ATC practice. In individual cases they may be varied owing to operational circumstances. The use of the Noise Preferential Routeings specified above is supplementary to the noise abatement take-off techniques as used by piston engined, turbo-prop and turbo-jet aircraft.

3.10.2. The NPRs can be visualised in Figure 16 and Figure 17. It should be noted that these were designed at a time when aircraft used conventional navigation (vice satellite navigation). Modern aircraft have satellite navigation overlays (RNAV overlays) of the departure procedures loaded into their Flight Management Systems (FMS) and each FMS uses coding from different coding houses. This coding is unregulated at present, and this can result in different interpretations of the procedures. This is beyond the control of both the Airport and the CAA. Once the formal replication of the existing routes is implemented through the CAP 1781 process, the coding will be published in the AIP and will become regulated. There will no longer be different interpretations of the procedures.

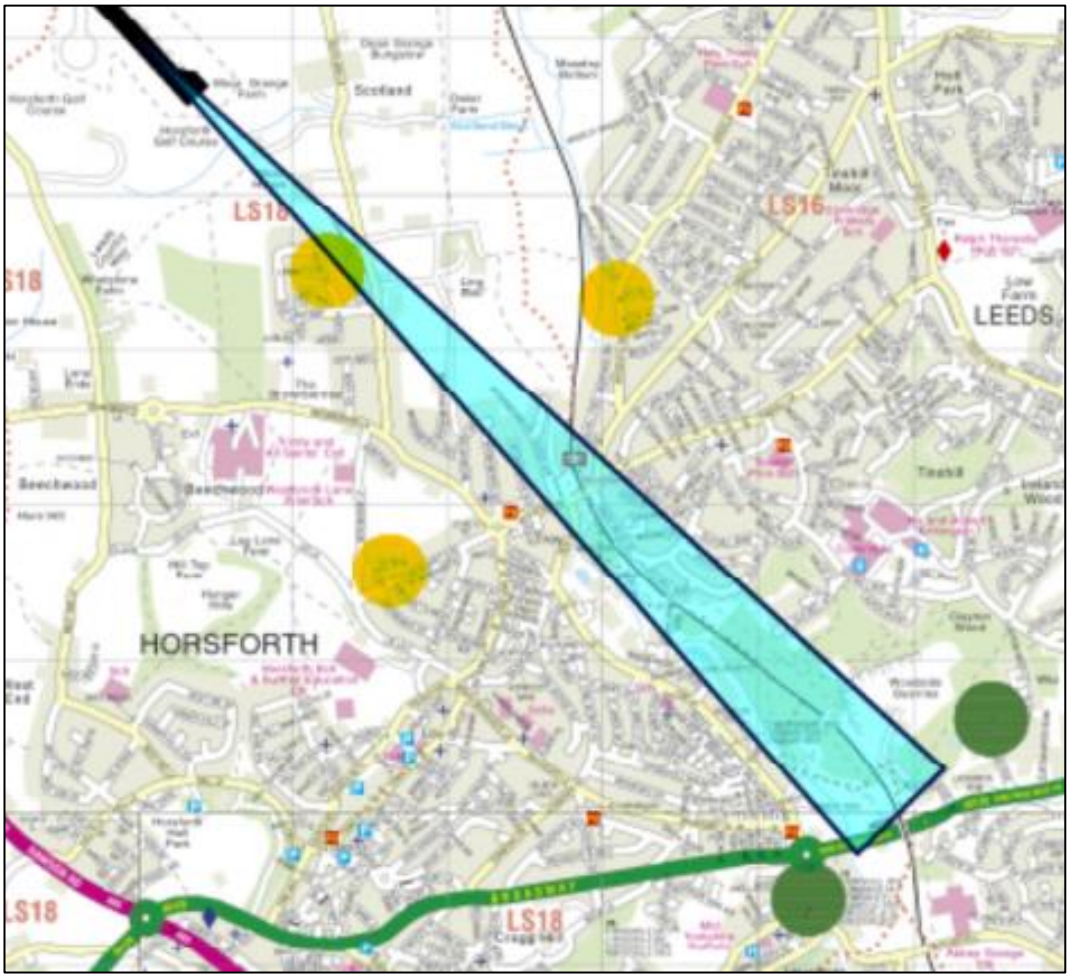


Figure 16: NPR RW14 as shown on LBA website.

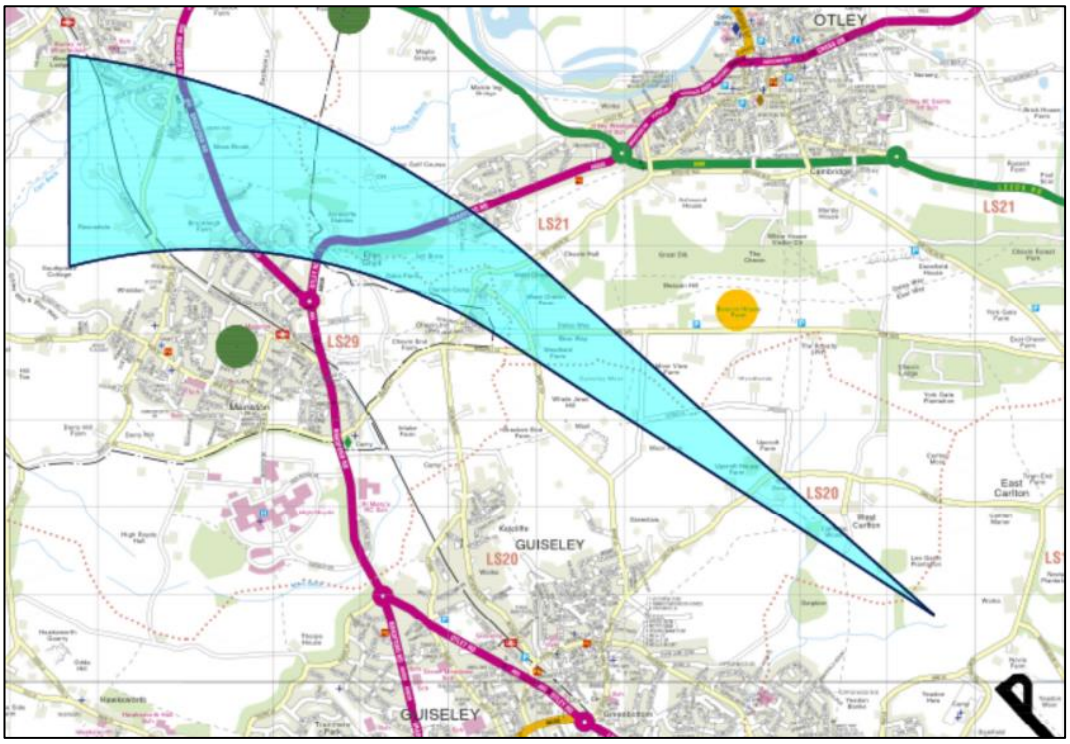


Figure 17: NPR RW32 as shown on LBA website.

3.10.3. It may be necessary to modify the description of the NPRs if they cannot adequately contain the preferred DOs following the next stage of the stakeholder engagement process. It is necessary within the CAP 1616 process to confirm with the relevant LPA whether the NPRs may be varied because, if not the extant NPRs effectively become hard design criteria that greatly limit the options that can be considered. Leeds City Council are not averse to the idea of the NPRs changing if it can be proven that there will be a net environmental benefit. However, it is far from a foredrawn conclusion that changes to the NPRs will be made; the DOs that have been conceived have been done so with a blank sheet of paper in mind to encourage freedom of thought and not to stifle creativity.

3.10.4. LBA has two SIDs off each runway. These are depicted in Figure 18 and Figure 19 and consist of the NELSA/POLEHILL (for West and South-Westbound traffic depending on runway in use) and the DOPEK/LAMIX (for South-East and Eastbound traffic).

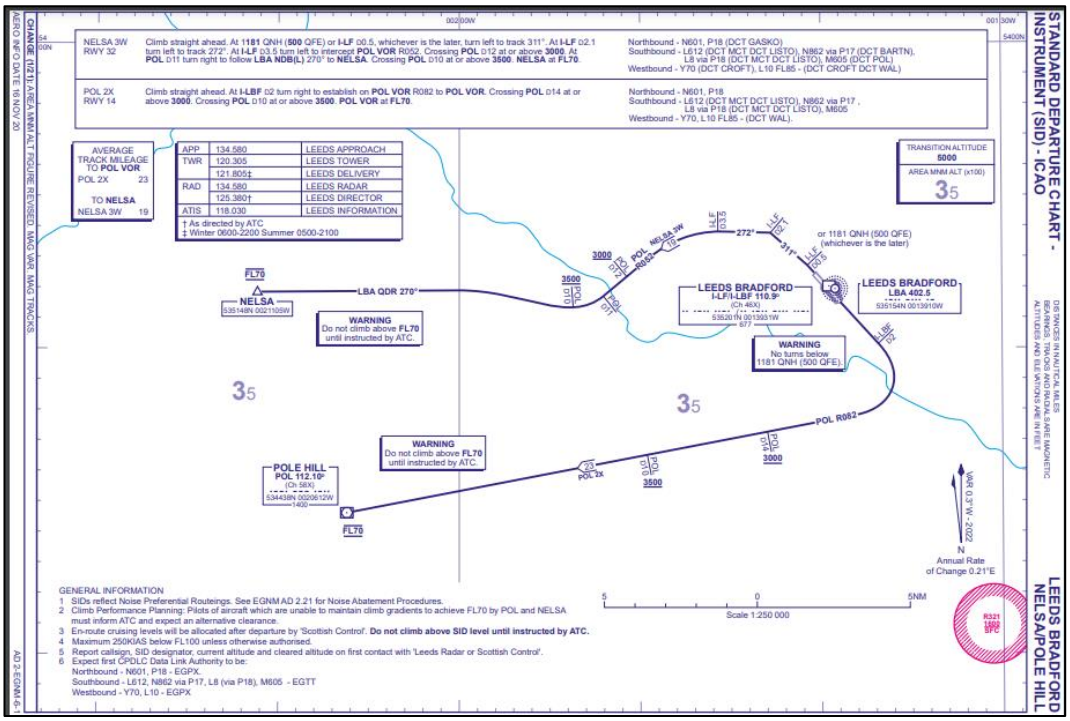


Figure 18: NELSA/POLEHILL SID

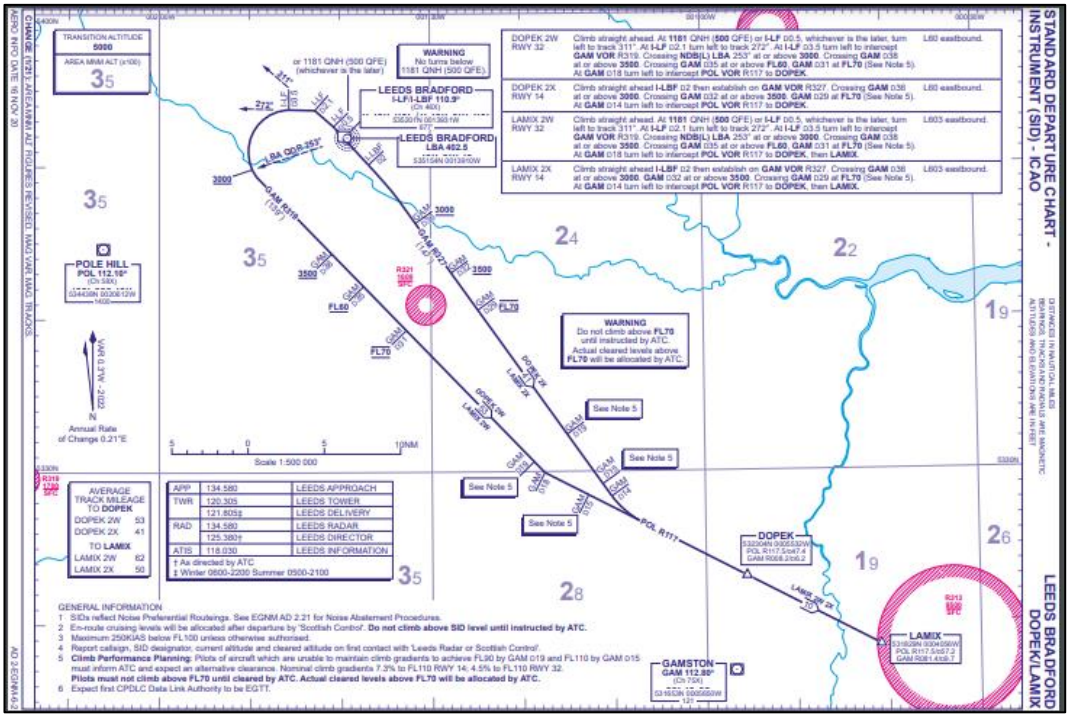


Figure 19: DOPEK/LAMIX SID

3.10.5. These SIDs do not cater for every departure direction and, as conventional navigational means is the basis for these departures, the actual flight path varies from flight to flight particularly once best efforts have been made to adhere to the NPRs. Satellite navigation could be expected to be far more consistent and repeatable.

3.10.6. Using track data from LBA's NTMS, the existing baseline of departure swathes can be determined. Data from a 92-day period in summer 2022 (defined as 16 June to 15 September inclusive) was plotted, but as can be seen Figure 20 for runway 32 and Figure 21 for runway 14. The Inner red circle is 9nm from the runway, and the Blue circle is 15nm. These represent the points at which aircraft are expected to be over 4000ft and 7000ft respectively [19].

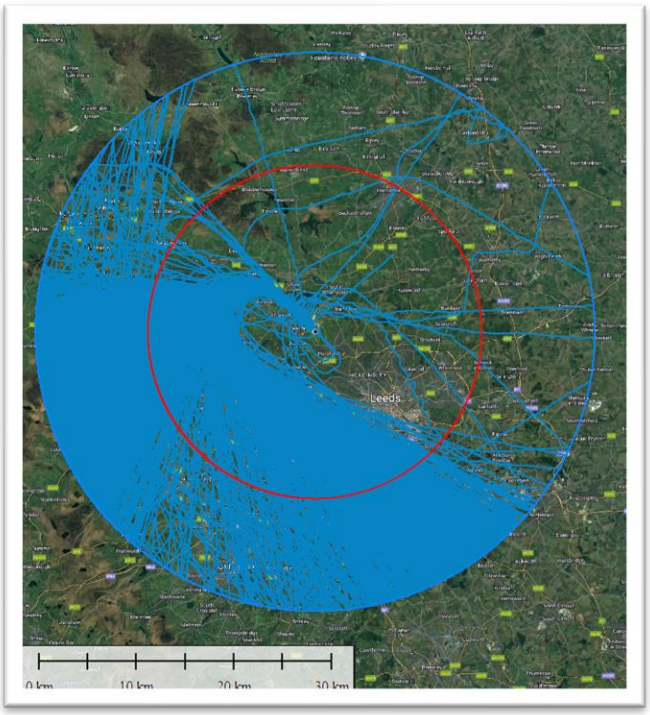


Figure 20: Departures from RW 32

[19] Distances are calculated using an 8% climb gradient.

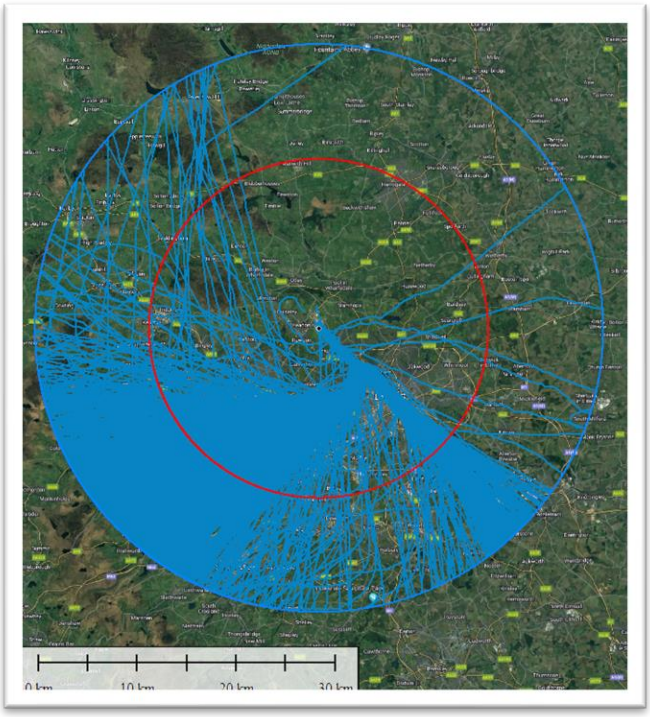


Figure 21: Departures RW 14

3.10.7. As the traffic for the specified period is busy for both runways, the traffic movements were broken down by week, and can be seen in Annex B (92-Day 2022 weekly track data), a representative sample was chosen for each runway for clarity.

3.10.8. For runway 32, the week of 11 to 17 August 2022 was chosen, Figure 22.

3.10.9. For runway 14, the week of 18 to 24 August was chosen, Figure 23. These tracks are shown over an En-route chart (left) and Google Maps Satellite imagery (right).

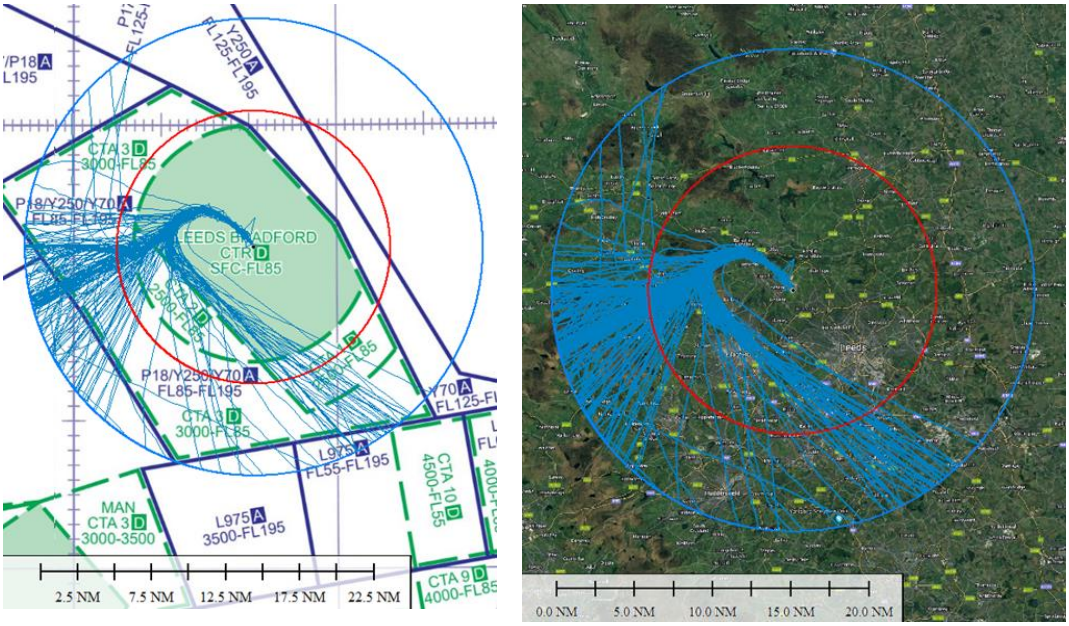


Figure 22: RW32 11 - 17 August 2022 track data.

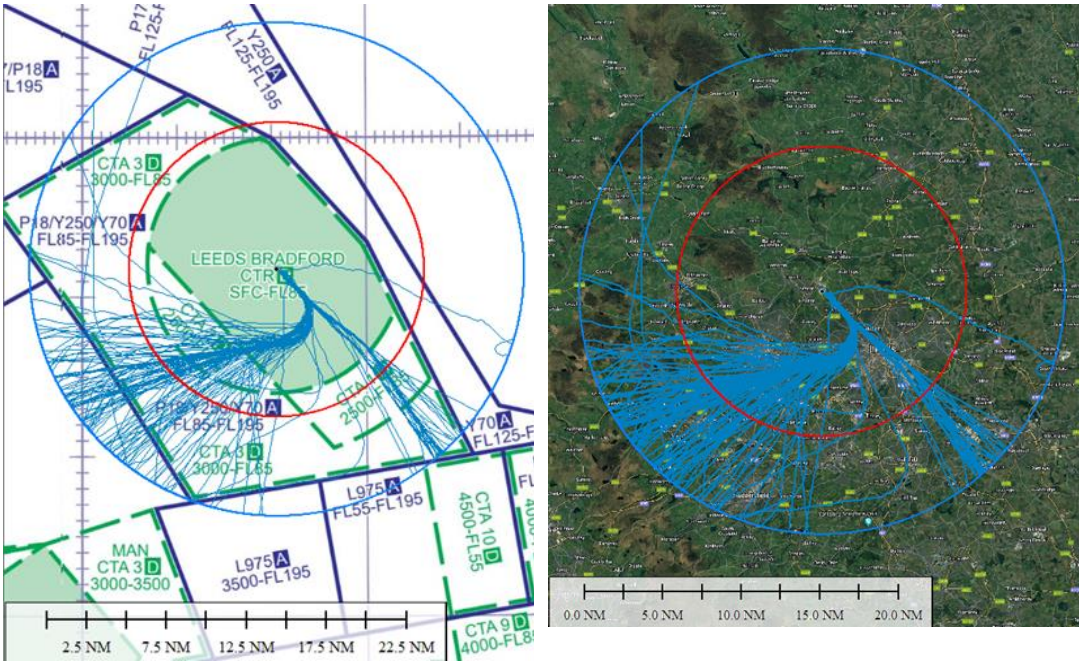


Figure 23: RW 14 18 - 24 August 2022 track data.

3.10.10. The representative sample tracks in the images above clearly indicate very few flights departing to the North-West or North-East from either runway, therefore there is no baselines for these directions.

3.10.11. The following images depict the baseline swathes and tracks over Google Maps Satellite imagery. As indicated in the methodology Section 2.

3.10.12. The inner circle represents 9 nautical miles (nm), a similar distance to the circle indicated to stakeholders at the third engagement round of 4000ft.

3.10.13. The outer circle has been measured at 15nm, a similar distance to the 7000ft circle indicated to stakeholders at the third engagement round.

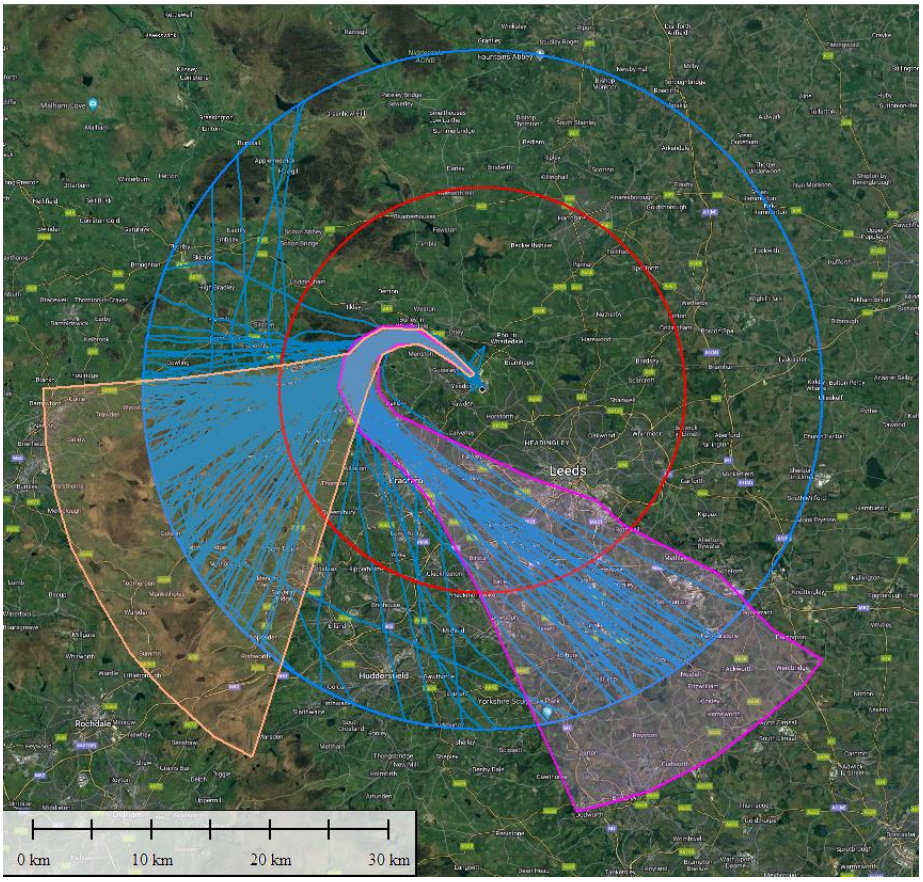


Figure 24: Runway 32 Baseline Swathes with NTMS Track Data (11-17 August 2022)

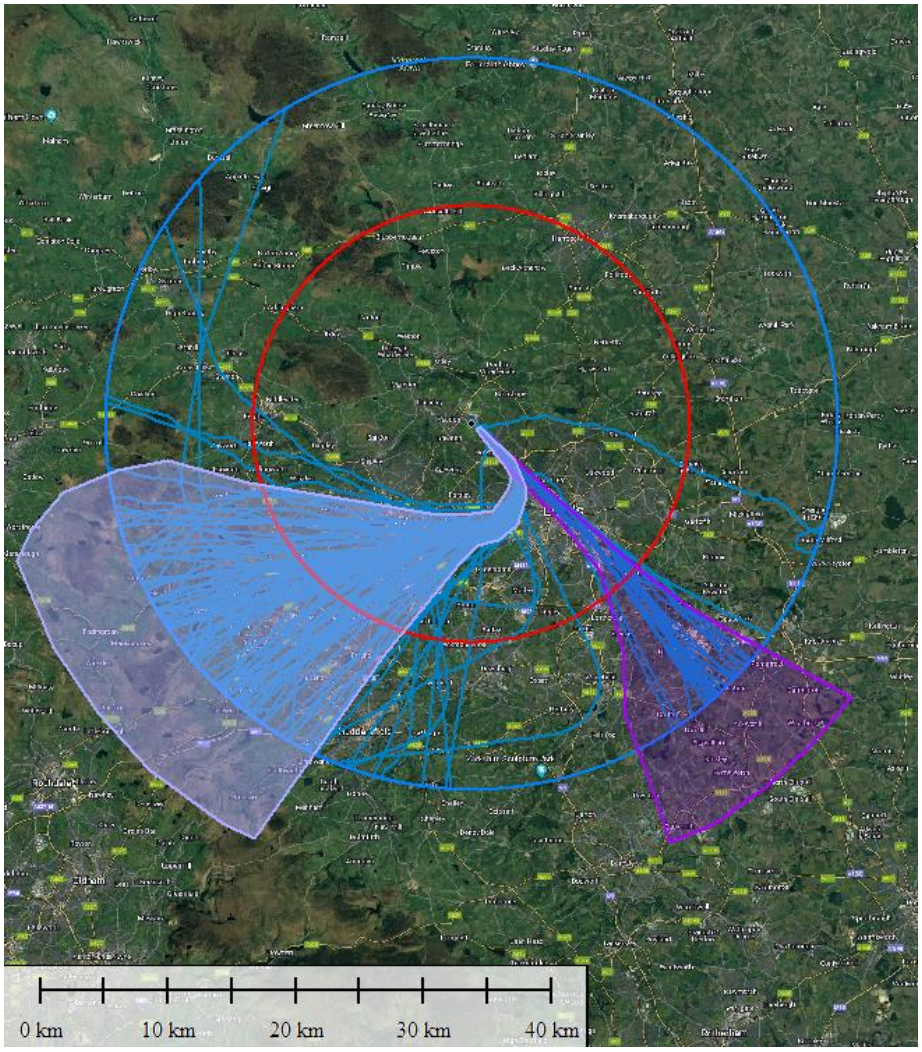


Figure 25: Runway 14 Baseline Swathes with NTMS Track Data (18 -24 August 2022)

3.11. Existing Noise Environment

3.11.1. Airport Operators in the UK are obliged to review and revise (if necessary) their NAP every 5 years, or sooner where a major development occurs. The last Action Plan, with meaningful data and contours contained within it, was produced based upon data collected in 2016. Subsequent data collection in 2021 was affected by COVID-19 and its significant impact on the number of aircraft movements. Accordingly, the 2022 NAP and the noise contours contained therein is not a helpful benchmark to use as a baseline[20]. As LBA also had some noise contours developed in 2018 in support of a planning application, this 2018 data was seen to be more representative of the baseline for movements and fleet mix. **The data and contours developed from 2018 data is therefore set as the baseline.**

[20] Note that 2022 data (vice 2018 data) has been used to depict the baseline in terms of 'where' traffic goes, i.e. to determine the baseline swathes. 2018 data was however more representative to show numbers and fleet mix.

3.11.2. The noise modelling that was undertaken for these contours (and those done for the 2030 model) has been made compliant with CAP 2091 Category A minimum requirements, although Category C is the level which was deemed to be relevant to this ACP. This Category was determined by the guidance on population thresholds provided in CAP 2091 (namely that between 25000 and 200000 people would be exposed to 51 dBLaeq16hr, average summer day, and 45 dBLaeq8hr, average night), given that the estimated populations exposed are 21300 and 45950 respectively (as shown in Tables 3 and 4).

3.11.3. The following table shows the estimated number of people and dwellings experiencing average noise levels above 51 decibels (dB) during the average summer day in 2018; this is the average noise level produced by aircraft over the 16-hour daytime period (07:00 to 23:00) for the 92-day "summer", defined as 16 June to 15 September inclusive.

Noise Level (dB)	Number of Dwellings	Number of People
≥ 51 LOAEL	52000	21300
≥ 54	16400	7450
≥ 57	2800	1100
≥ 60	900	350
≥ 63	200	100
≥ 66	0	0
≥ 69	0	0

Table 4: Estimated total number of people and dwellings above various noise levels, LAeq 16h in the vicinity of LBA, 2018

3.11.4. The following chart shows where these noise contours lie in relation to the Airport. The outer contour is the 51dB contour as referred to in Table 4.

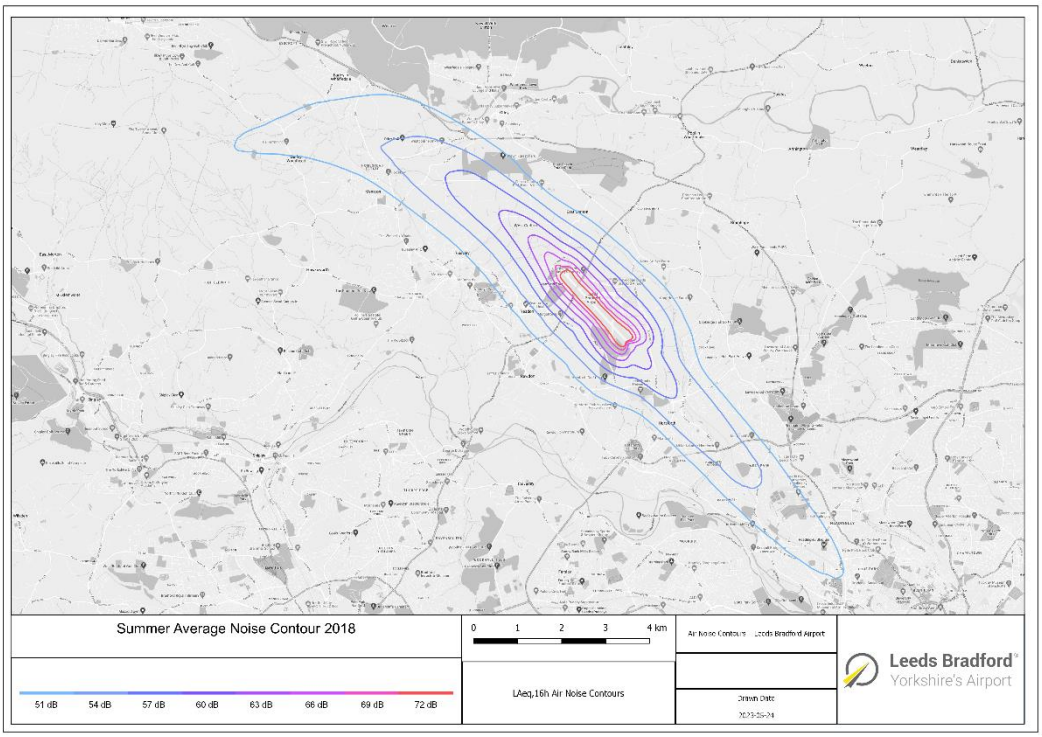


Figure 26: 2016 LBA Average Summer Day LAeq 16h

3.11.5. The next table shows the estimated number of people and dwellings experiencing average noise levels above 45 dB during the average summer night in 2018; this is the average noise level produced by aircraft over the 8-hour night-time period (23:00 to 07:00).

Noise Level (dB)	Number of Dwellings	Number of People
≥ 45 LOAEL	115200	45950
≥ 48	55900	21950
≥ 51	13400	6100
≥ 54	1500	600
≥ 55	1100	450
≥ 58	200	100
≥ 61	0	0

Table 5: Estimated total number of people and dwellings above various noise levels, LAeq 8h in the vicinity of LBA, 2018

3.11.6. The following chart shows where these noise contours lie in relation to the Airport. The outer contour is the 45dB contour as referred to in Table 5.

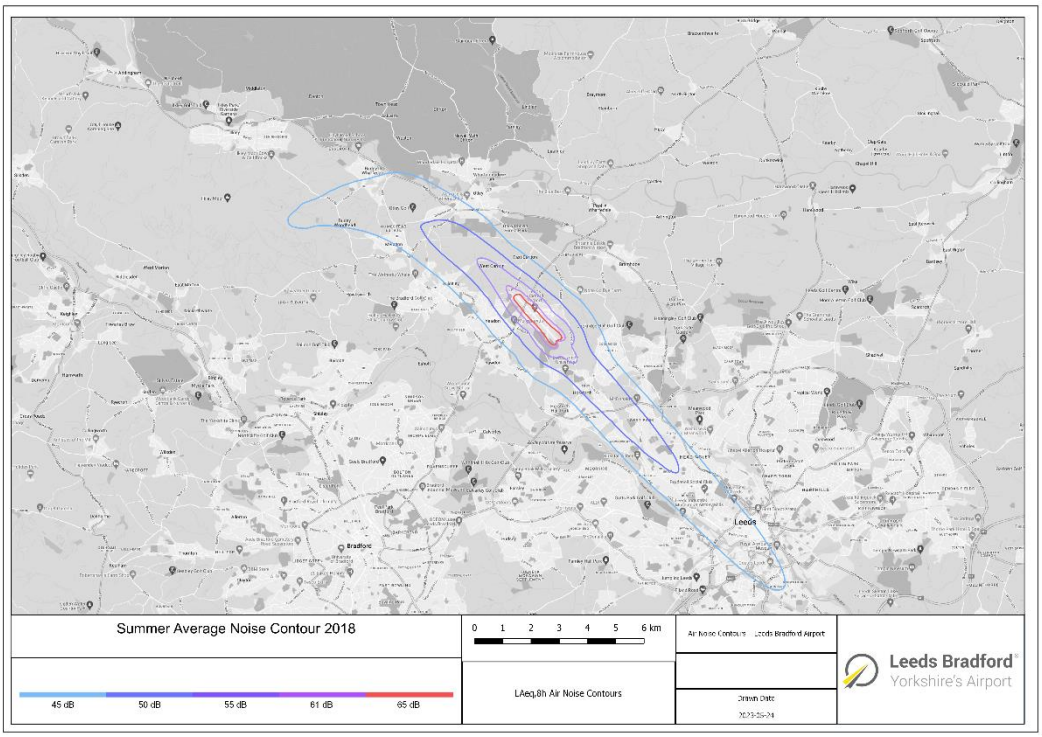


Figure 27: 2018 LBA Average Summer Night LAeq 8h

3.11.7. Future noise impact scenarios along with the Noise Modelling Category are detailed in the Initial Options Appraisal document (2b), section 4.4 and 4.5 respectively, to estimate the impact of noise on proposed options and the appropriate category for assessment for this ACP.

3.12. Total Annual Aircraft Movements and Traffic Forecasts

3.12.1. The Total annual aircraft movements in 2018 were used to develop the 2018 LAeq noise contours. For 2022, the aircraft movements for that year were used to describe the current day scenario (baseline). Estimated aircraft movements were provided by the sponsor's noise consultants to develop the 2030 contours. The following table illustrates these numbers, along with forecast aircraft movements (post-2022) for the years to 2030:

Year	2018	2022	2023	2024	2025	2026	2027	2028	2029	2030
Annual aircraft movements	38680	33912	35419	36926	38433	39940	41447	42954	44461	45970

Table 6 - Total Annual Aircraft Movements at LBA 2018 to 2030 forecast.

3.13. Continuous Climb and Continuous Descent Performance

3.13.1. Continuous Climb and Descent Operations (CCOs and CDOs) are aircraft operating techniques enabled by airspace design, instrument procedure design and facilitated by ATC. CCO and CDO allow aircraft to follow a flexible, optimum flight path that delivers major environmental and economic benefits - reduced fuel burn, emissions, noise and fuel costs - without any adverse effect on safety.

3.13.2. CCO and CDO operations allow arriving or departing aircraft to descend or climb continuously, to the greatest extent possible. Aircraft conducting CCO employ optimum climb engine thrust and climb speeds until reaching their cruising levels. With CDO, aircraft employ the minimum engine thrust necessary, ideally from top of descent and in a low drag configuration, prior to the final approach. Employment of these techniques reduces the need for intermediate level-offs and results in time being spent at more fuel-efficient higher cruising levels, resulting in significantly reducing fuel burn and lowering emissions and fuel costs. CDOs also reduce the noise impact as there is less requirement to increase power to maintain an altitude.

3.13.3. LBA's current ability to achieve continuous climb rests firmly on the traffic levels within the MTMA. RW32 departures fare better as they route further to the North however RW14 departures can frequently be held underneath or in the vicinity of arrivals into Manchester.

3.13.4. Continuous descent is also frequently impacted by Manchester traffic. For example, LBA arrivals may be rendered 'stuck' above aircraft on the ROSUN arrival, or departures carrying out a 'turn and burn'[21] after departure. This can mean that arriving aircraft may then be high on the approach profile.

3.13.5. When DSA was operating, this used to affect LBA SE inbounds resulting in a stepped descent from FL90, through FL70, FL60 then 3000ft. Not only is it challenging from an energy management perspective, if it was not executed exactly right by ATCOs, aircraft were levelling off before being given the next descent clearance, increasing noise and fuel burn.

3.14. Leeds Bradford Airport Strategic Development Plan – "Route to 2030"

3.14.1. The 'Route to 2030' is the Strategic Development Plan (SDP) for LBA, produced by the airport in line with the requirements set out in the Aviation Policy Framework. The Framework reiterated the need for UK airports to produce 'masterplans'; documents which enable airports to communicate their development strategies to key stakeholders and the public.

[21] To 'turn and burn' is a saying that comes from military flying in which aircraft turn and put in the afterburners on the jet engines to achieve a rapid rate of climb.

3.14.2. The SDP provides an update on investment and growth at LBA since 2005 and sets out a high-level strategy for the development of the airport through to 2030. Underpinning the SDP is a clear understanding of the role of the airport in the Leeds City Region (LCR), which has been developed carefully with key stakeholders. This process has ensured that the SDP is aligned with and supports the development and growth of the LCR economy and in turn has fostered a much wider understanding of the importance of a successful airport to the region. LBA contributes £336m to the local economy every year and delivers over 2,350 direct jobs, with considerably more relying indirectly on the success of the Airport. LBA has in recent years, outstripped the percentage growth of many other UK airports. It exceeded 3.6 million passengers per annum (mppa) in 2016/17 representing a 27% increase in numbers since 2005. The SDP stated:

> 'We estimate that LBA had a total net economic footprint in the LCR of around £107 million of GVA … a total net tourism impact in the LCR 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.'
>
> 'In total, we estimate that LBA currently supports around £336 million in GVA in the LCR and around 5,200 jobs. By 2030, if the airport grows in line with the Master Plan forecasts, these impacts are projected to grow to around £724 million at 2015 prices and around 10,100 jobs.'

3.14.3. The Government believes that aviation needs to grow, delivering the benefits essential to our economic well-being, whilst respecting the environment and protecting quality of life.

3.14.4. LCR Economic Plan 2016-2036, LCR LEP, 2016 stated:

> 'Leeds Bradford International Airport connects the City Region internationally. A better-connected airport will help to promote business growth in our key sectors and other industries, and to attract more investment'.

4. Options Development

4.1. Development Process

4.1.1. The DOs presented in this document were conceived with no pre-conceptions; they were intended to establish the art of the possible without trying to find a solution. Ultimately this long list of DOs will be trimmed down based upon the extent each DO meets the agreed DPs and how each fare in the Initial Options Appraisal (IOA).

4.1.2. All the DOs are presented against Google Earth and En-Route Chart backgrounds for context. Some are also presented over Google Maps for clarity.

4.2. Additional Approach Options

4.2.1. Ahead of the final stakeholder engagement, LBA determined that it ought to include the option to introduce some more modern approach options. These options seek to break away from the standard requirement to fly in a straight line for the final 10nm towards the runway and this brings the potential for improving the noise outcome for stakeholders living under the traditional approach lane. These procedures use modern and emerging navigational techniques and are known as (RNP AR) Approaches. More detail on these can be found in paragraph 4.37.

4.3. Departures

4.3.1. In the case of the departures, the DOs are depicted as swathes i.e. areas within which a final departure nominal track might ultimately be designed. A climb gradient of 8% has been assumed as it is a realistic and reasonable gradient. Each graphic shows two ranges from LBA where aircraft can realistically expect to achieve 4000ft and 7000ft based on an 8% climb gradient. This gradient has been routinely achieved and exceeded, even on the hottest days of the summer months.

4.3.2. The following graphics show the point at which 4000ft was reached by aircraft departing off RW14 (on 10 August 2023) and RW32 (on 19 June 2023). Each show that the vast majority of aircraft climb through 4000ft well before the 4000ft range ring we have set for the option swathes. This demonstrates that an 8% climb gradient is achievable and could be outperformed. The codes next to the pins on the map are callsigns of aircraft (for example EXS213 is the callsign of a Jet2 aircraft).

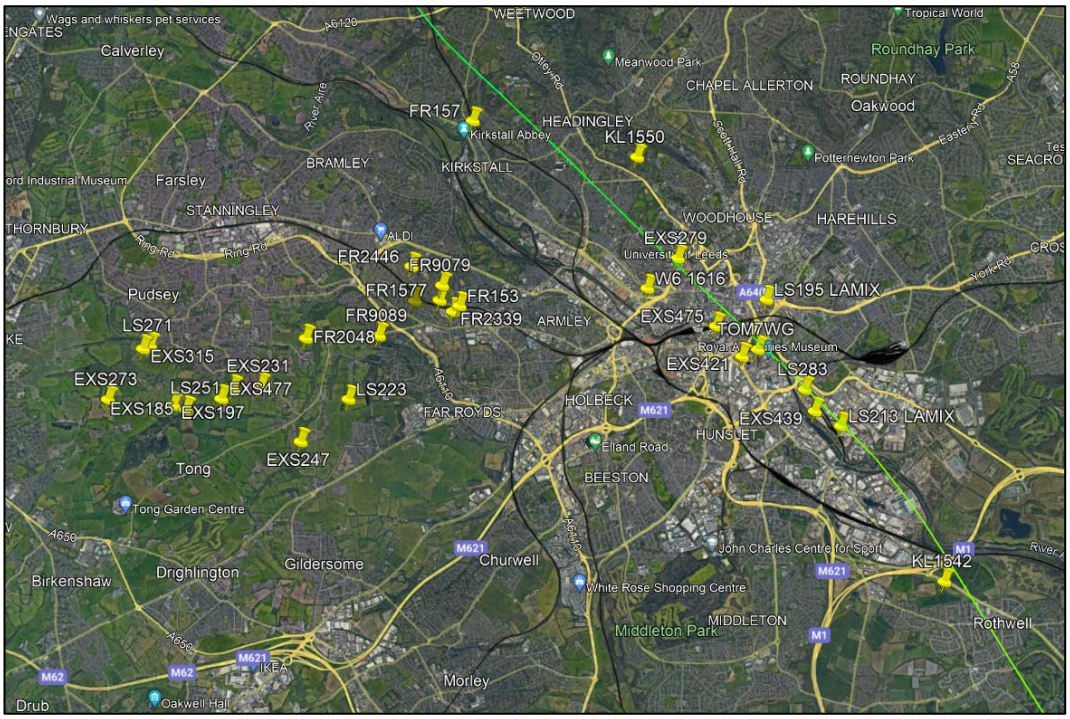


Figure 28: Point at which 4000ft was passed on climb out from RW14 on 10 August 2023

Figure 29: Point at which 4000ft was passed on climb out from RW32 on 19 June 2023

4.3.3. The same aircraft passed through 7000ft in the climb at the points shown on the next two graphics. Again, the results show that the 8% climb gradient is easily achievable even on a hot summer day.

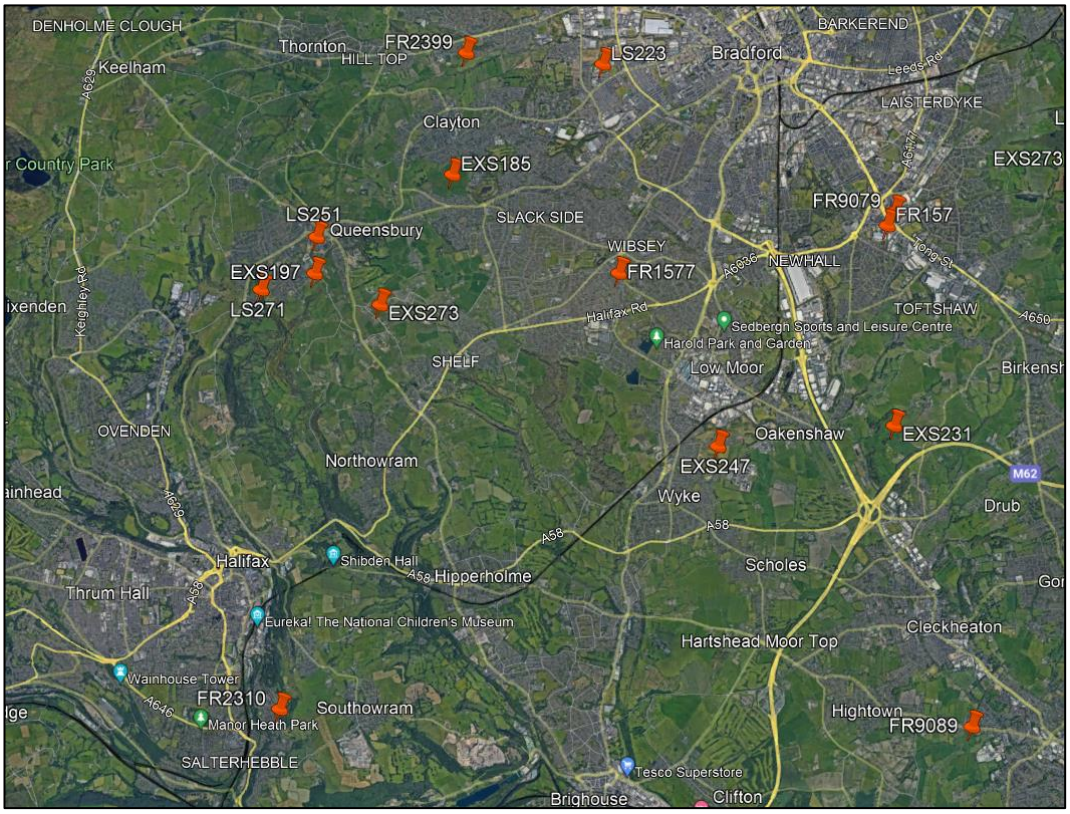


Figure 30: Point at which 7000ft was passed on climb out from RW14 on 10 August 2023

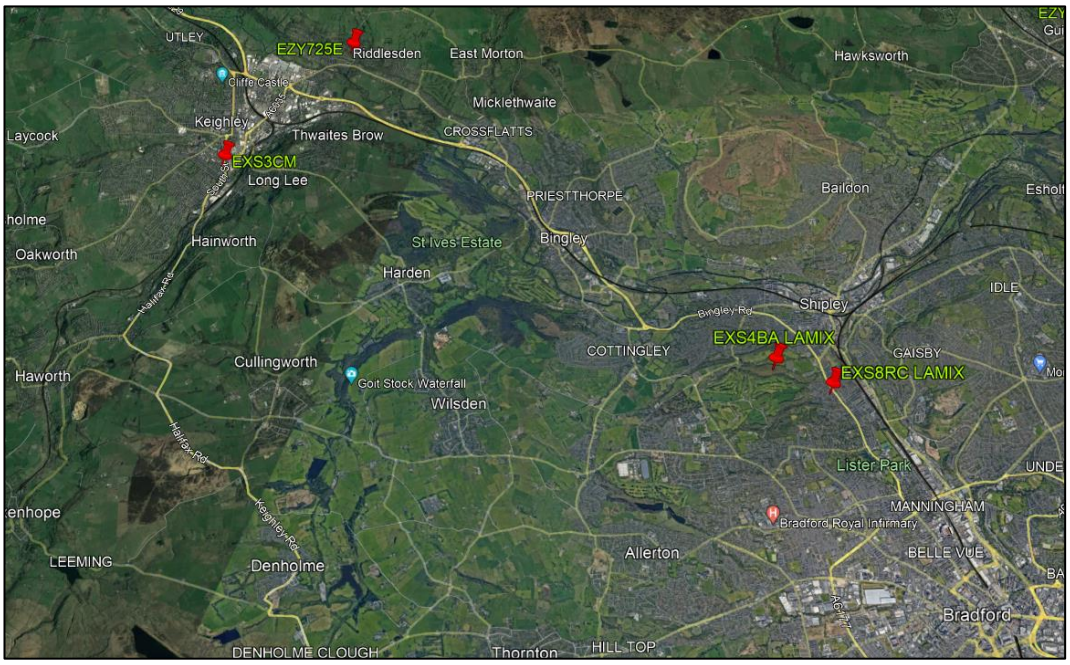


Figure 31: Point at which 7000ft was passed on climb out from RW32 on 19 June 2023

4.4. Removal of Options

4.4.1. Originally it was perceived that there was a requirement to depart in a variety of directions off each runway, namely North-West, North-East, South-East, West and South. Accordingly, each direction of departure was considered in turn with the conception of a variety of options. It subsequently became clear that there is insufficient demand for SIDs to the North-West and North-East. The small number of aircraft requiring departure to these directions can follow a westerly SID turning on track to the North-West or North-East upon passing at least 7000ft. These DOs were removed from consideration after the second round of engagement but are included in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback' of this document for completeness. There is no business or operator requirement for SIDs to the North-West and North-East and while DOs in these directions were initially explored the impact to new communities, and communities already impacted by the airport was deemed unnecessary with the lack of requirement.

4.4.2. **The 'Do Nothing' Option from each runway to a given direction is the 'Baseline' as depicted and described in the previous section. The 'Do Minimal' Option is the CAP 1781 RNAV Substitution outcome as the SIDs require an RNAV alternative to facilitate continued use of the procedures following the rationalisation of the GAM DVOR.**

4.4.3. NERL have expressed a preference to see departures from LBA to route via three gateways into the Route Network (as can be seen in Figure 32):

- W, NW and NE via NELSA;
- S and SW via POL; and
- ESE via MAMUL.

4.4.4. **Important:** Note that the arrows on Figure 32 do not show flight paths, they show direction of travel from LBA. Flight paths off the two runways would look very different.

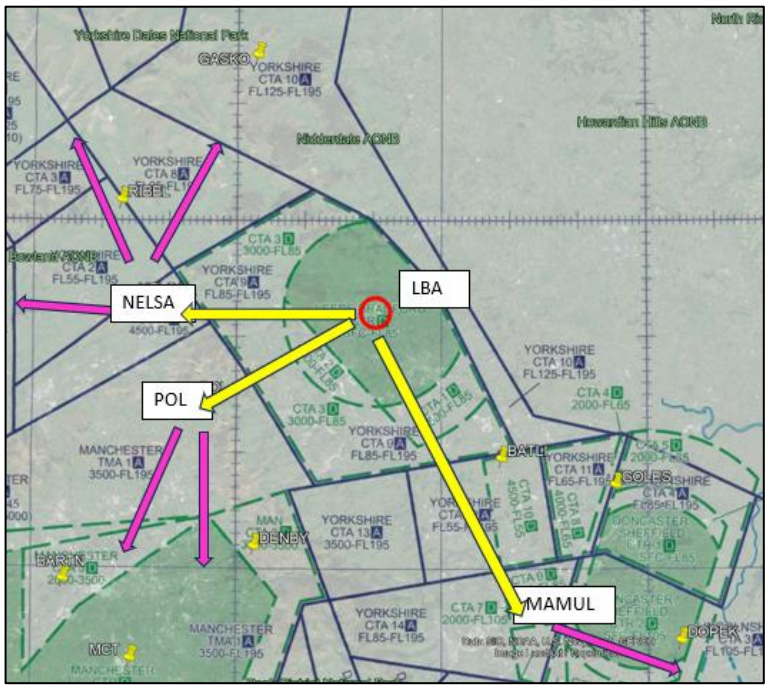


Figure 32: Departure Flow Direction

4.5. Comprehensive List of Design Options

4.5.1. The following table lists the Design Options that underwent DPE.

Type of Procedure	Title	Brief Description
Departure	32SE-BASELINE	Baseline
Departure	32SE-DO MINIMUM	RNAV Substitution
Departure	32SEB	RH turn north of Otley and over East Leeds towards BATLI/MAMUL
Departure	32SEC	RH turn north of Otley and over West Leeds and west of BATLI/MAMUL
Departure	32SED	LH turn between Menston and Burley in Wharfedale and then towards MAMUL
Departure	32SEE	LH turn between Menston and Burley in Wharfedale but then turning more easterly towards BATLI/GOLES
Departure	32SEF	Straight ahead to 4.5nm before RH turn over Leeds towards BATLI/MAMUL
Departure	32SEG	Straight ahead to 4.5nm before LH turn over Bradford towards MAMUL
Departure	32S&W-BASELINE	Baseline
Departure	32S&W-DO MINIMUM	RNAV Substitution
Departure	32S&WA	RH wrap-around turn north of Otley then over Bradford towards POL
Departure	32S&WC	LH turn between Menston and Burley in Wharfedale then direct POL
Departure	32S&WD	LH turn between Menston and Burley in Wharfedale then direct NELSA
Departure	32S&WE	LH turn between Menston and Burley in Wharfedale then a RH turn towards Skipton and the Northwest
Departure	32S&WF	Straight ahead to 4.5nm before RH wrap-around turn north of Otley then over Shipley towards NELSA
Departure	32S&WG	Straight ahead to 4.5nm before RH turn over Ilkley towards POL
Departure	32S&WH	Straight ahead to 4.5nm before RH turn over Ilkley towards NELSA
Departure	14SE-BASELINE	Baseline
Departure	14SE-DO Minimum	RNAV Substitution

Type of Procedure	Title	Brief Description
Departure	14SEA	RH turnover Central Leeds to position west of BATLI/MAMUL
Departure	14SEB	Straight ahead towards BATLI/DOPEK
Departure	14S&W-BASELINE	Baseline
Departure	14S&W-DO MINIMUM	RNAV Substitution
Departure	14S&WC	RH turn over Bradford towards POL & NELSA
Departure	14S&WD	LH wrap-around turn over Otley then towards POL
Departure	14S&WE	LH wrap-around turn over Otley then towards NELSA
Departure	RW32 Combination Option A	Tight LH turn between North Guiseley and South Menston then splitting POL/NELSA/LAMIX
Departure	RW32 Combination Option B	Early RH turn to avoid Otley then LH turn, and another LH turn over Askwith Moor before splitting POL/NELSA
Departure	RW32 Combination Option C	Early RH turn south of Otley then a wrap-around before splitting in the Calverley area for POL/NELSA/LAMIX
Departure	RW32 Combination Option D	Straight ahead then RH turn well north of Otley then a wrap-around before splitting in the Greengates area for POL/NELSA/LAMIX
Departure	RW32 Combination Option E	Early LH deviation before a RH turn west of Otley and a LH turn over Askwith Moor then splitting POL/NELSA/LAMIX
Departure	RW14 Combination Option A	Early RH turn towards Pudsey then splitting in the Birkenshaw area for POL/NELSA/LAMIX
Departure	RW14 Combination Option B	Early LH turn over Adel and Eccup before wrap-around north of Otley before splitting POL/NELSA
Arrival	Baseline	Baseline
Arrival	System 1 – Do Minimum	1 Hold – LBA
Arrival	System 2	2 Holds - NELSA/GOLES
Arrival	System 3	2 Holds – 'AIREY' & 'WORTH'
Arrival	System 4	3 Holds – LBA with 'AIREY' & 'WORTH'
Arrival	System 5	3 Holds – NELSA/'UDDER'/GOLES
Arrival	System 6	2 Holds - LBA/GOLES
Arrival	System 7	3 Holds – NW Hold/LBA/GOLES
Arrival	System 8	2 Arrival Holds – NW Hold/GOLES
Arrival	System 9	2 Holds – 'UDDER'/GOLES

Type of Procedure	Title	Brief Description
Arrival	System 10	1 Arrival Hold – GOLES & Direct Arrivals
Approach	RNP AR RW14	Downwind left with early turn to intercept the centreline about 3.5nm final
Approach	RNP AR RW32	Offset approach intended to avoid central Leeds residential districts, Headingly and Hyde Park Districts

Table 7: Comprehensive List of Design Options for DPE

4.6. Runway 32 – North-West – Discontinued

4.6.1. Two DOs were conceived to facilitate a departure to the North-West off RW32. Option A (32NWA) follows the NPR to the South of Ilkley before turning right to track towards the Skipton area. Option B (32NWB) was not presented at the initial Stakeholder Focus Group for discussion but was conceived due to a request from stakeholders. Option B is simply a straight ahead climb on runway track to 4.5nm prior to a left-turn towards RIBEL. Option A (32NWA) has greater similarity to the baseline although it is still very different as the existing track goes further West before turning North-West. *Note: The original DPE for these options and associated stakeholder feedback is also available in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'.*

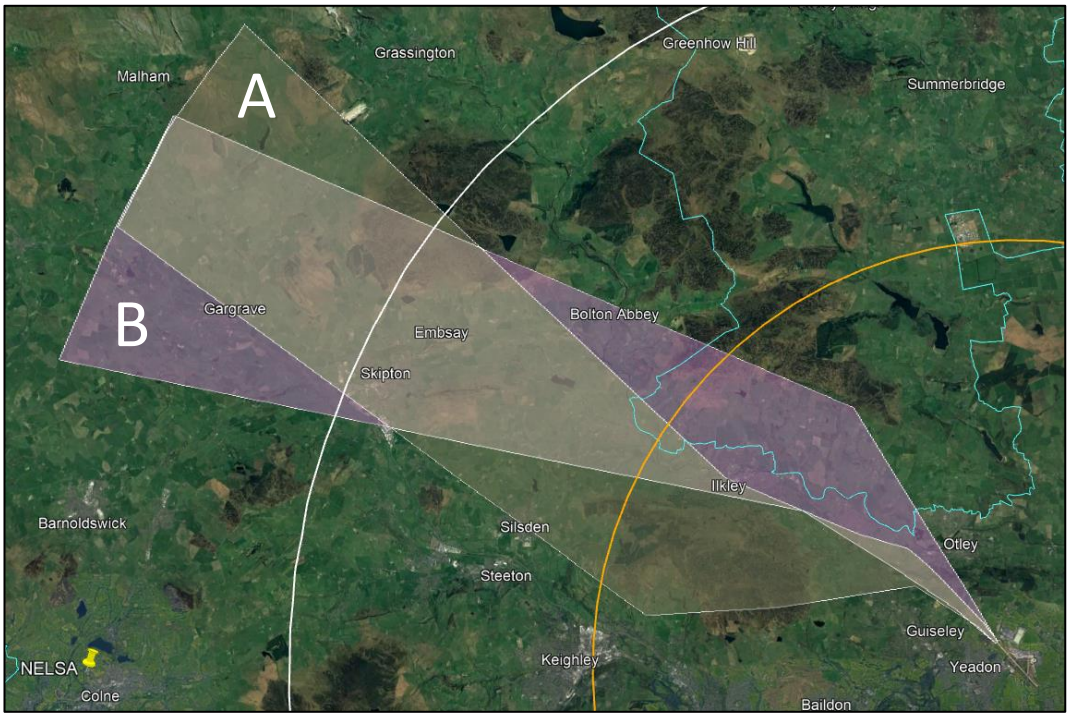


Figure 33: RW32 North-West Options (Google Earth)

4.7. Runway 32 – North-East – Discontinued

4.7.1. Departures to the North-East turn after adherence to the NPR towards the reporting point called GASKO (as depicted in Figure 34) on P18 (name of a Route on the Route Network).

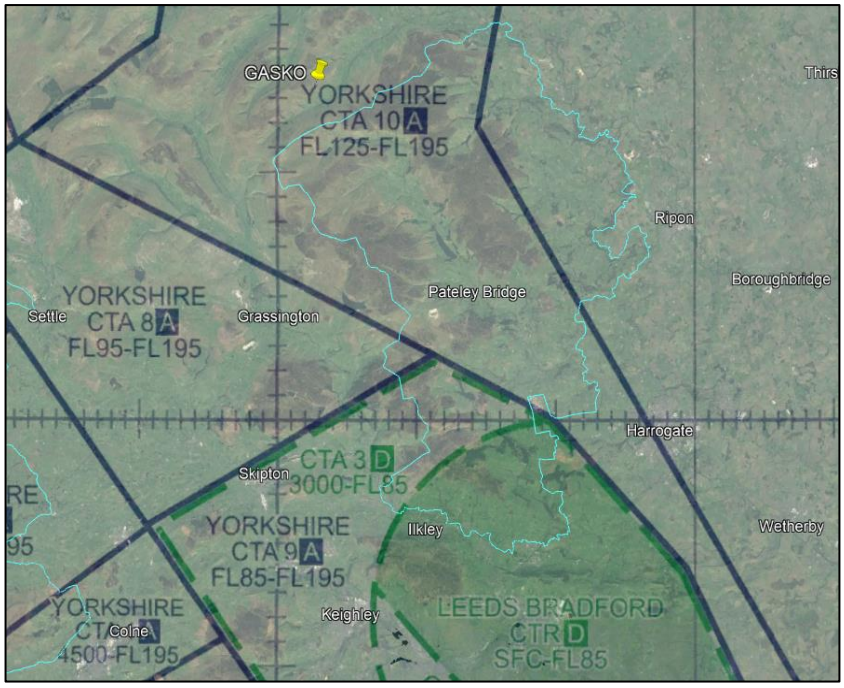


Figure 34: Position of Reporting Point GASKO in relation to LBA.

4.7.2. Five DOs were conceived for North-Easterly departures off RW32. These DOs are presented as a fan of options in the figures below with Option D (32NED) being the most challenging due to the lack of CAS containment to the North-East of LBA. All the other DOs are contained within the existing airspace configuration laterally although it is likely that DOs B (32NEB) and C (32NEC) would fall vertically outside the existing CAS as the base of the airspace in Yorkshire CTA 10 is FL125 (12,500ft). Option A (32NEA) seeks to follow the NPR whilst Option B (32NEB) is essentially a straight-ahead routing initially with a right-turn abeam Ilkley. Option E (32NEE) is most like the baseline. *Note: The original DPE for these options and associated stakeholder feedback is also available in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'.*

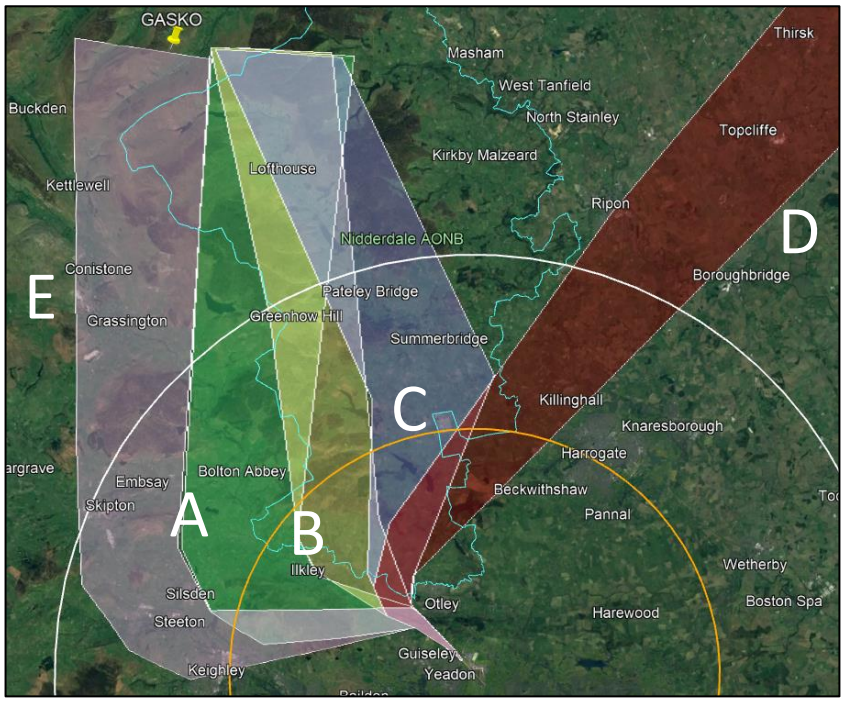


Figure 35: RW32 North-East Options (Google Earth)

4.8. Runway 32 – South-East

4.8.1. Existing departures to the South-East off RW32 turn left once they have adhered to the NPRs and route towards DOPEK and LAMIX.

4.8.2. Seven DOs were conceived to facilitate a South-Easterly departure off RW32. Three with a left turn adhering to the NPR (32SED, 32SEE and 32SEG[22]) and four with a right turn (32SEA, 32SEB, 32SEC and 32SEF). The departures with the right turn route around the North of Otley and would almost certainly require additional CAS to contain the procedures. These then proceed to fly over Central Leeds in the case of Options B, C and F. The left turns result in flight over Shipley, Bingley and Bradford (and Ilkley in the case of Option G). Option E (32SEE) is initially most similar to the baseline but diverges further to the East than the baseline. Options F and G remain on runway track until circa 4.5nm.

[22] Note each option was given a name based upon the runway (14 or 32), then the direction of travel (e.g. SE), then the Option letter (i.e. A). The options are sometimes referred to simply by their option letter, i.e. Option A. as described in the methodology section 2.4.4.

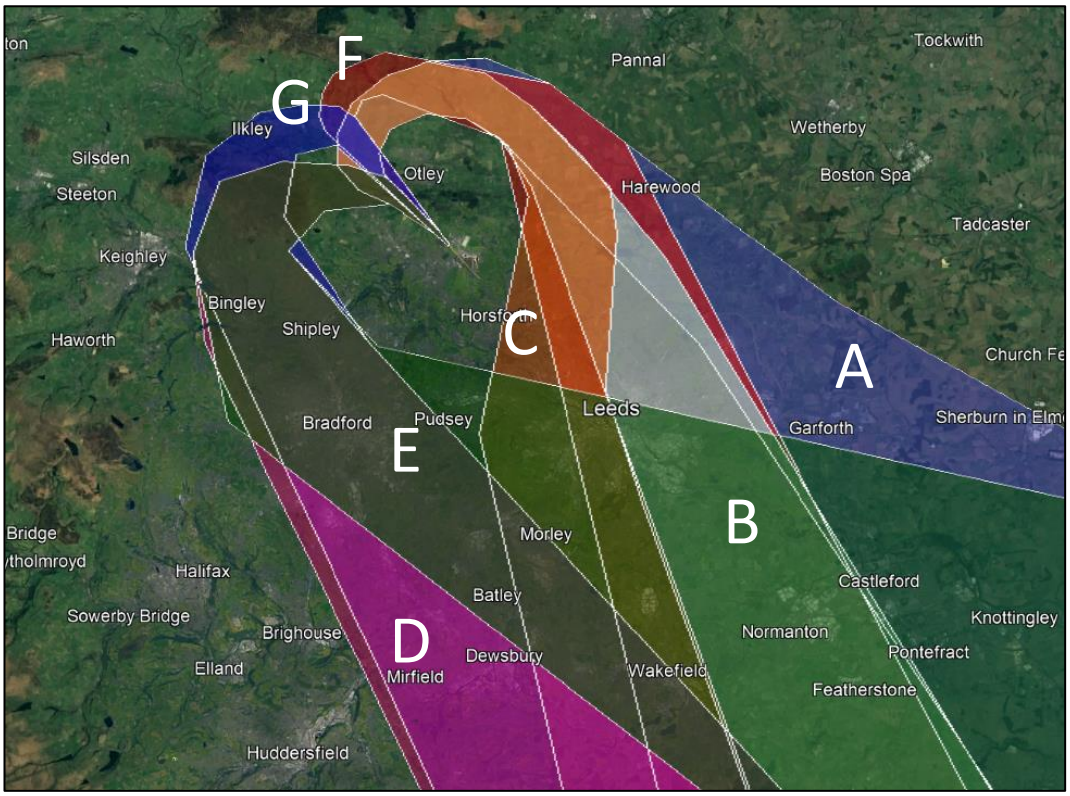


Figure 36: RW32 South-East Options (Google Earth)

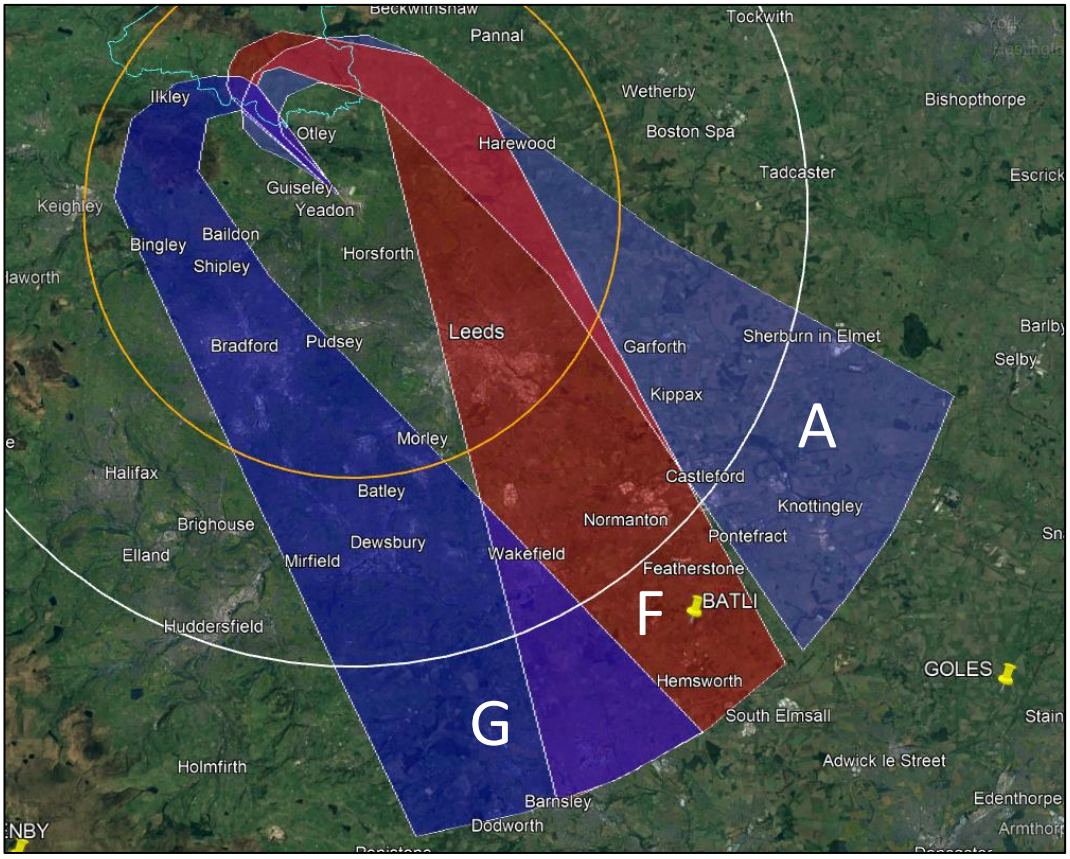


Figure 37: RW32 South-East Options A, F and G (Google Earth)

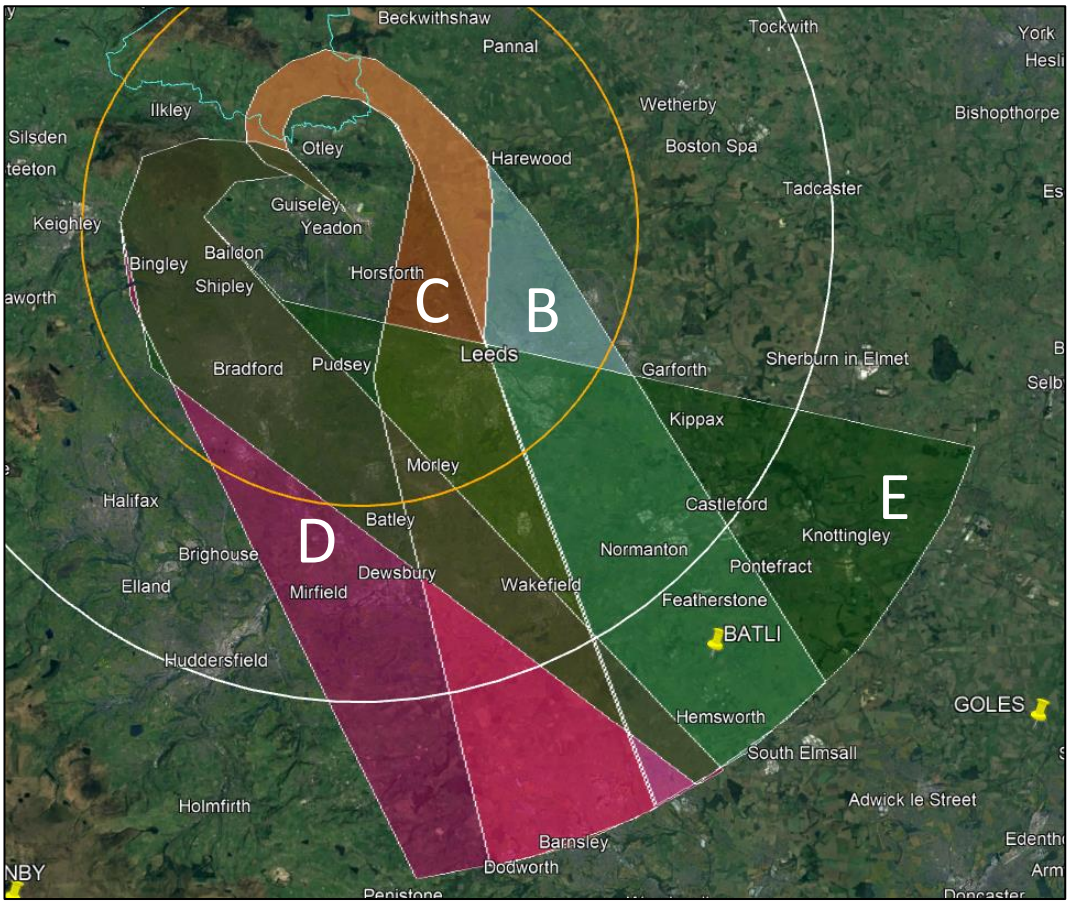


Figure 38: RW32 South-East Options B, C, D and E (Google Earth)

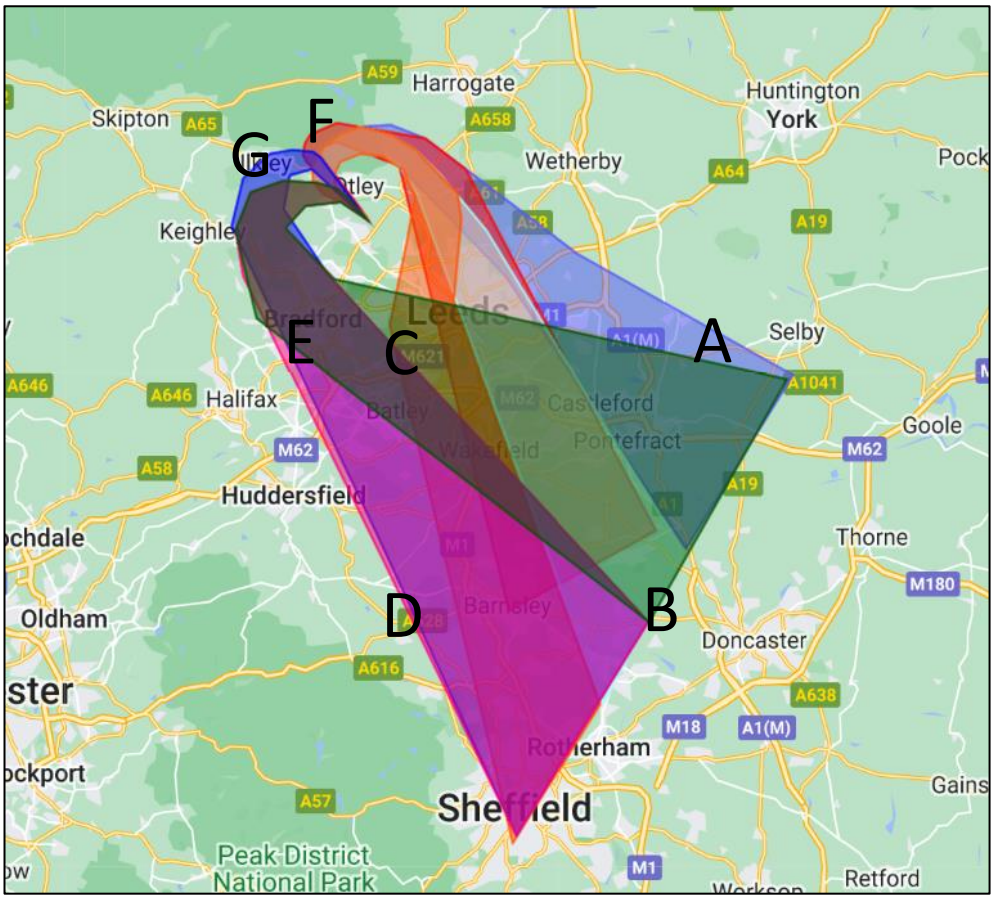


Figure 39: RW32 South-East Options (Google Maps)

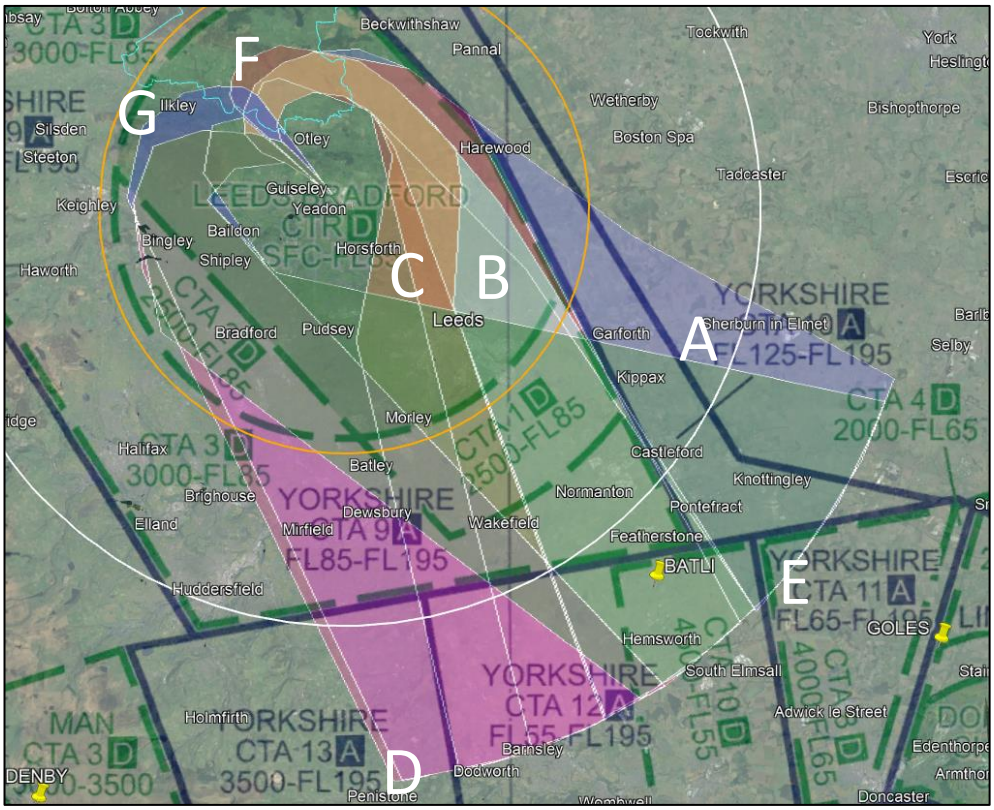


Figure 40: Runway 32 South-East Options (En-Route Chart)

4.9. Runway 32 – South & West

4.9.1. Eight DOs were developed to facilitate a departure to the South and West off RW32. Option A (32S&WA) and Option F (32S&WF) involve a right turn and a wraparound to the South of the Airport whilst the other six DOs involve left turns. Option B (32S&WB) is most like the baseline. Options F, G and H (32S&WF, 32S&WG and 32S&WH) all remain on runway track to circa 4.5 nm.

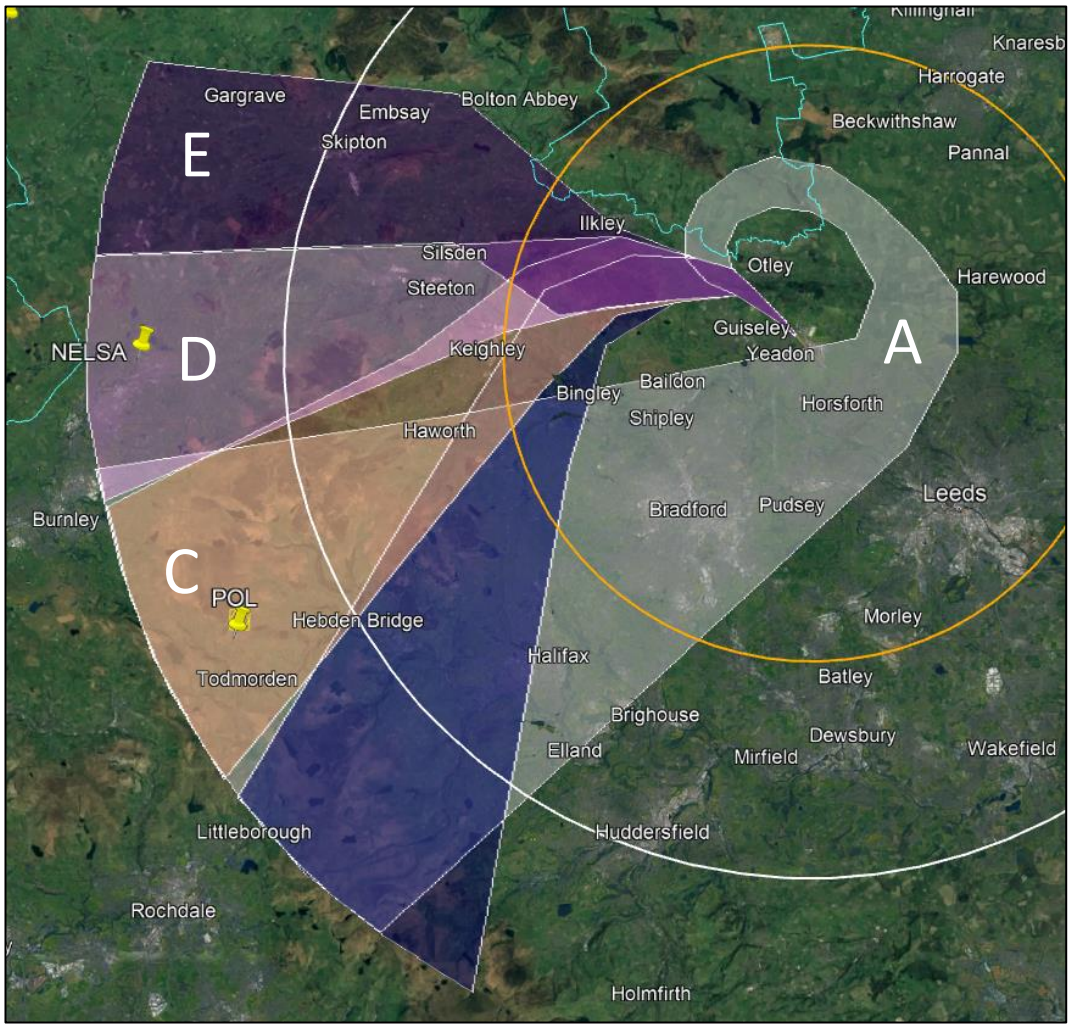


Figure 41: RW32 South & West Options A-E (Google Earth)

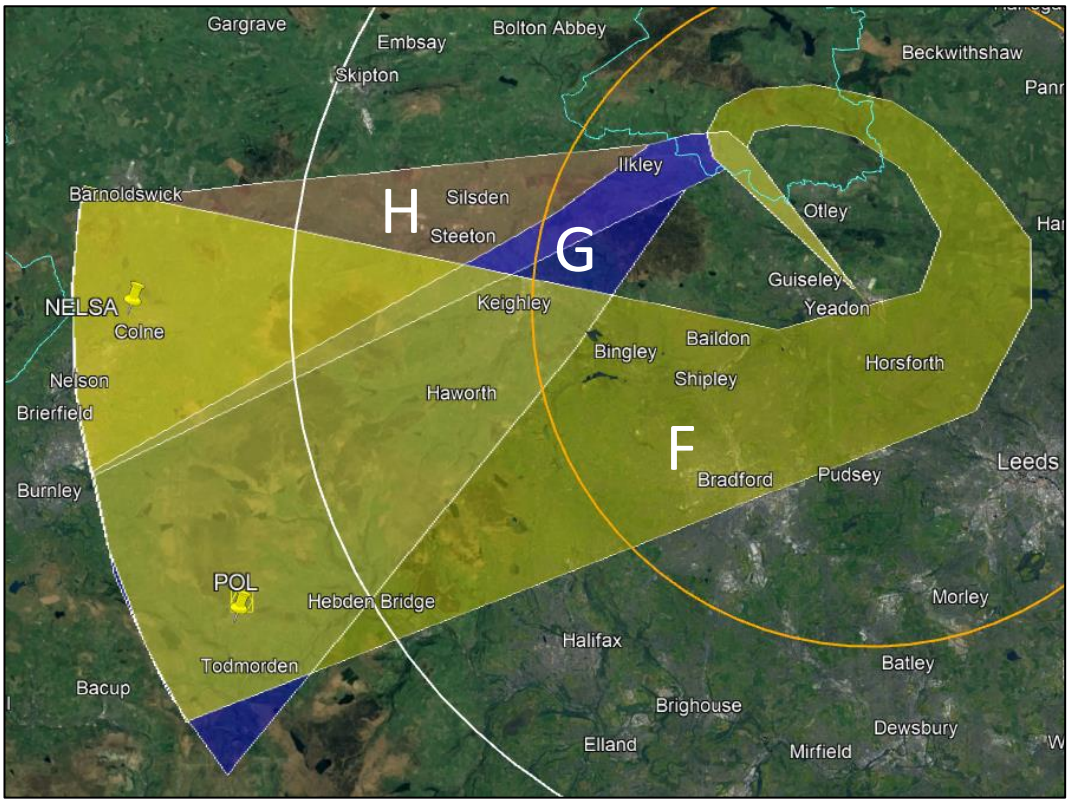


Figure 42: RW32 South & West Options F-H (Google Earth)

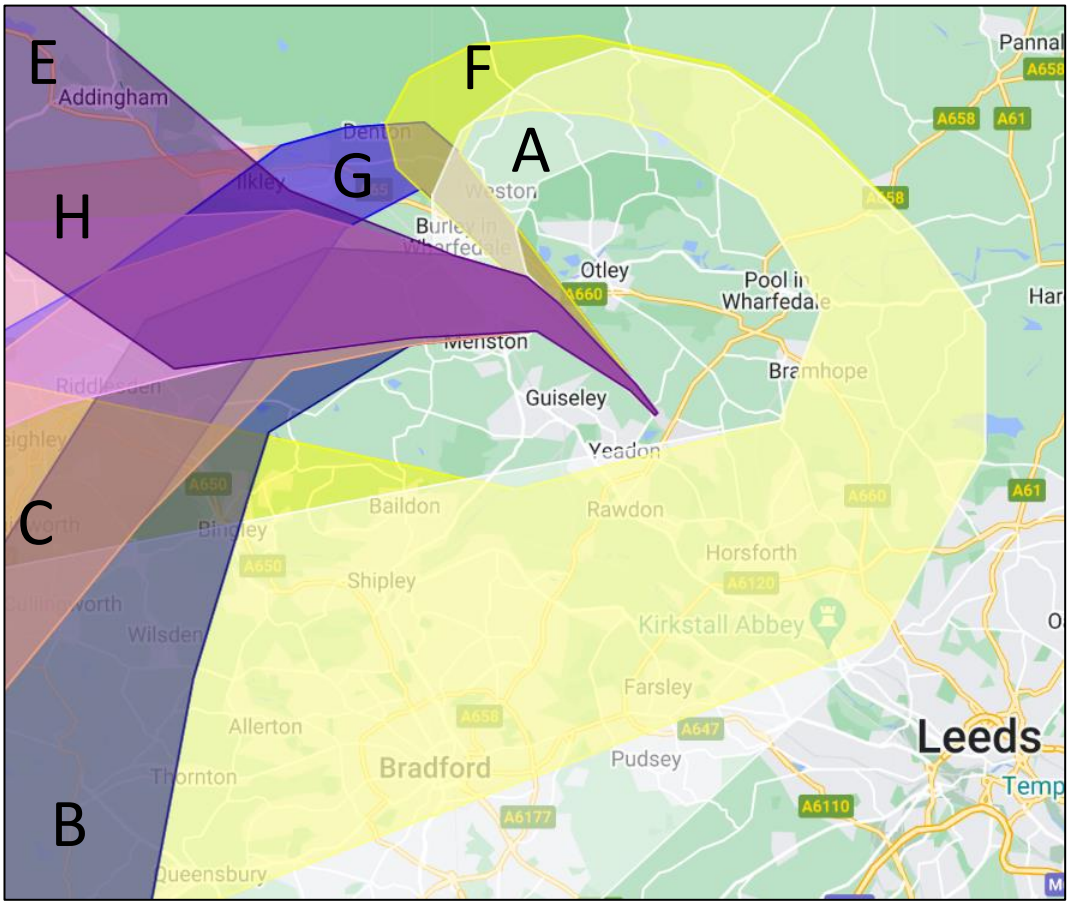


Figure 43: RW32 South & West Options (Google Maps)

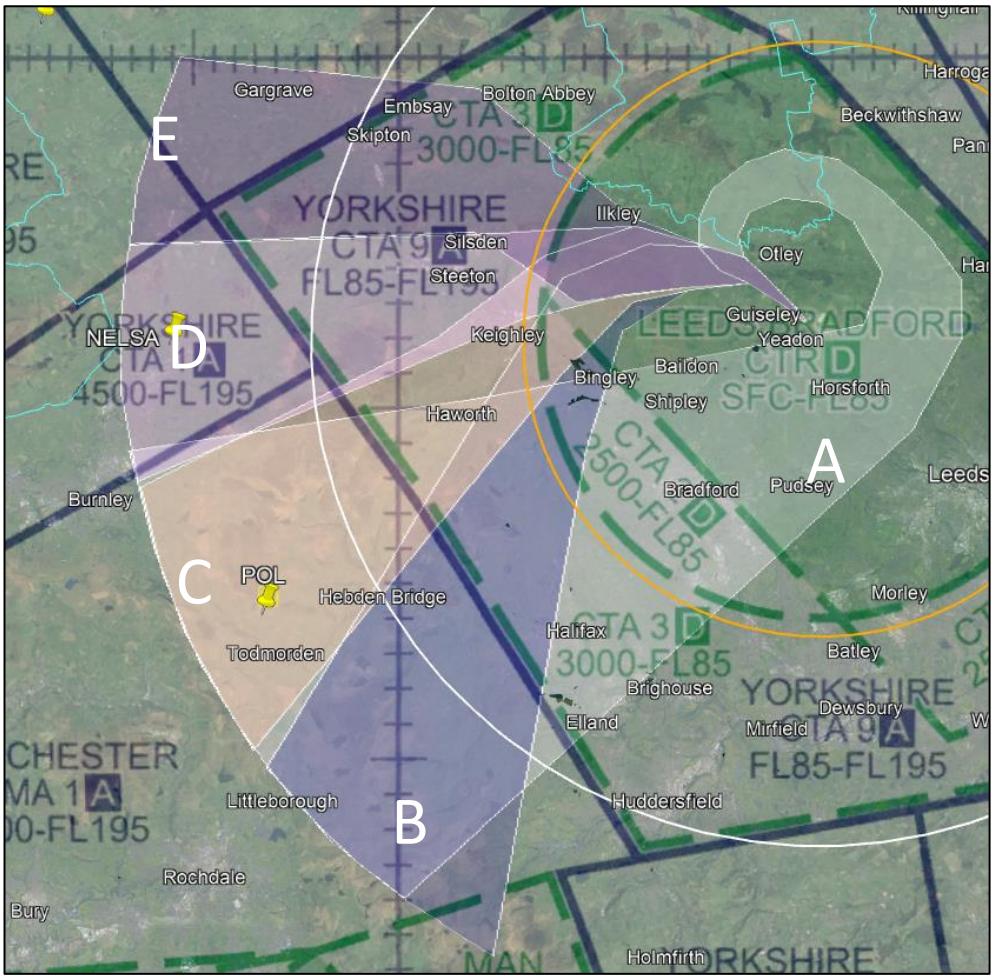


Figure 44: RW32 South & West Options A-E (En-Route Chart)

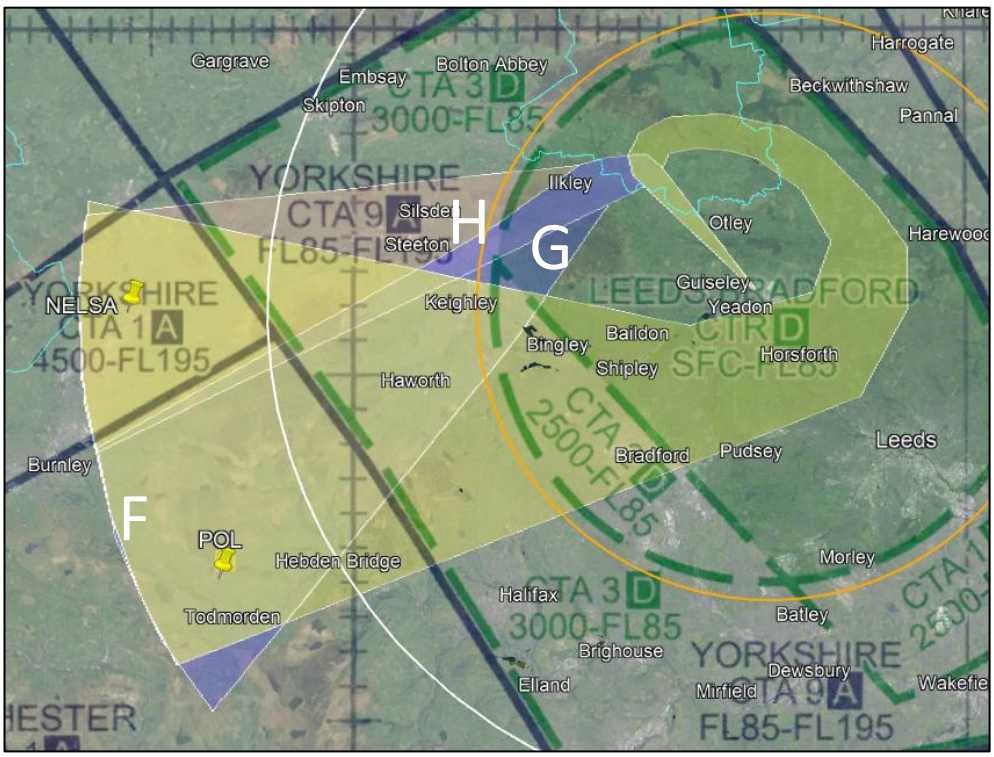


Figure 45: RW32 South & West Options F-H (En-Route Chart)

4.10. Runway 14 – North-West – Discontinued

4.10.1. Four DOs were conceived to facilitate departures to the North-West off RW14, two right-hand turnouts (14NWB and 14NWD) and two left-hand turnouts that may require additional CAS (14NWA and 14NWC). Option D (14NWD) is most like the baseline. *Note: The original DPE for these options and associated stakeholder feedback is also available in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'.*

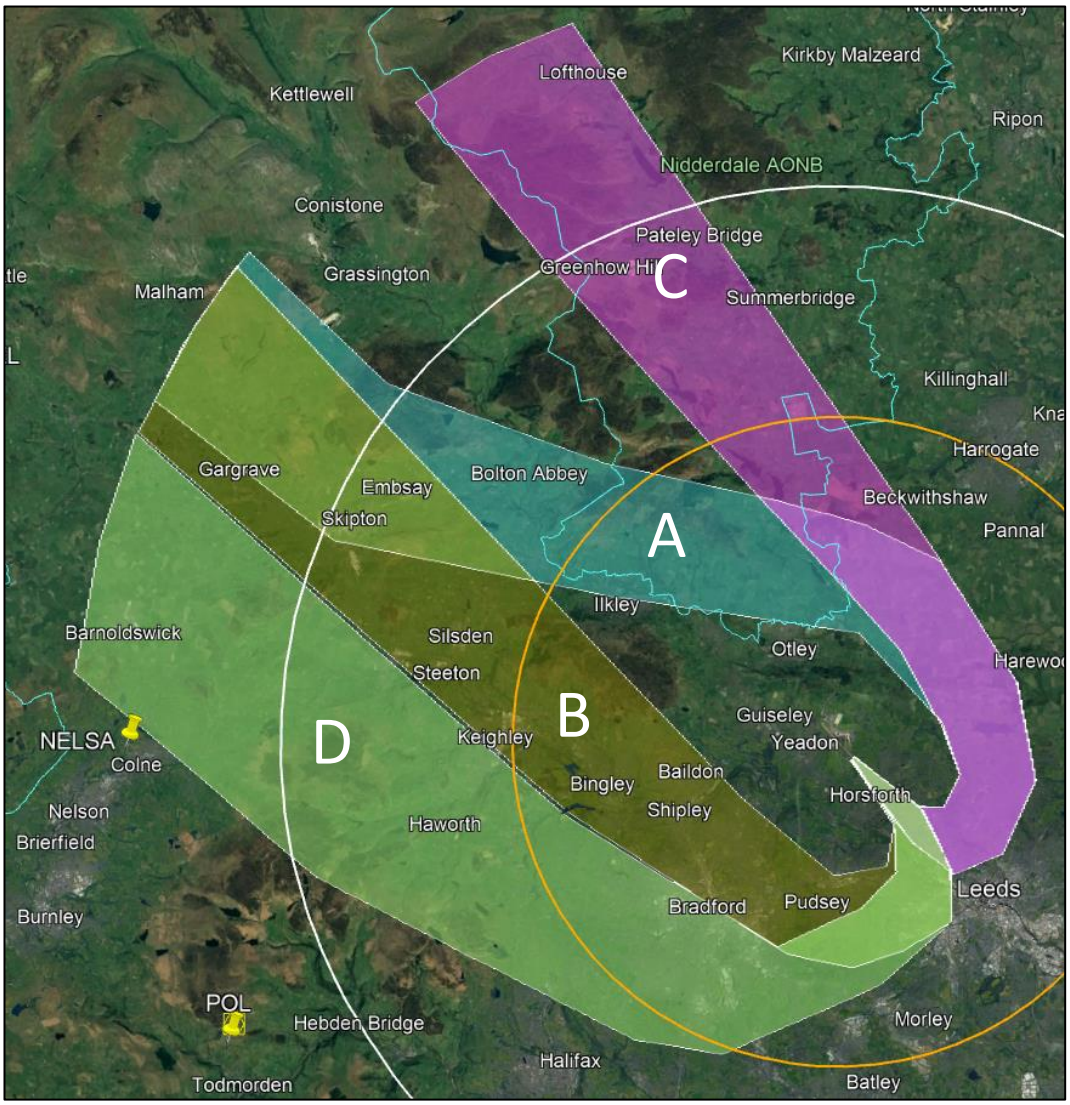


Figure 46: RW14 North-West Options (Google Earth)

4.11. Runway 14 – North-East – Discontinued

4.11.1. Five DOs were developed to meet the needs of a departure to the North-East off RW14. Three involving a left-hand turn out and possibly a requirement for additional CAS (14NEA, 14NEB and 14NEC) and two with a right-hand turnout (14NED and 14NEE). Notably, Option A is significantly different and cuts across the Class G uncontrolled airspace area known as the Vale of York Area of Intense Aerial Activity (AIAA). Option E (14NEE) is most like the baseline. *Note: The original DPE for these options and associated stakeholder feedback is also available in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'.*

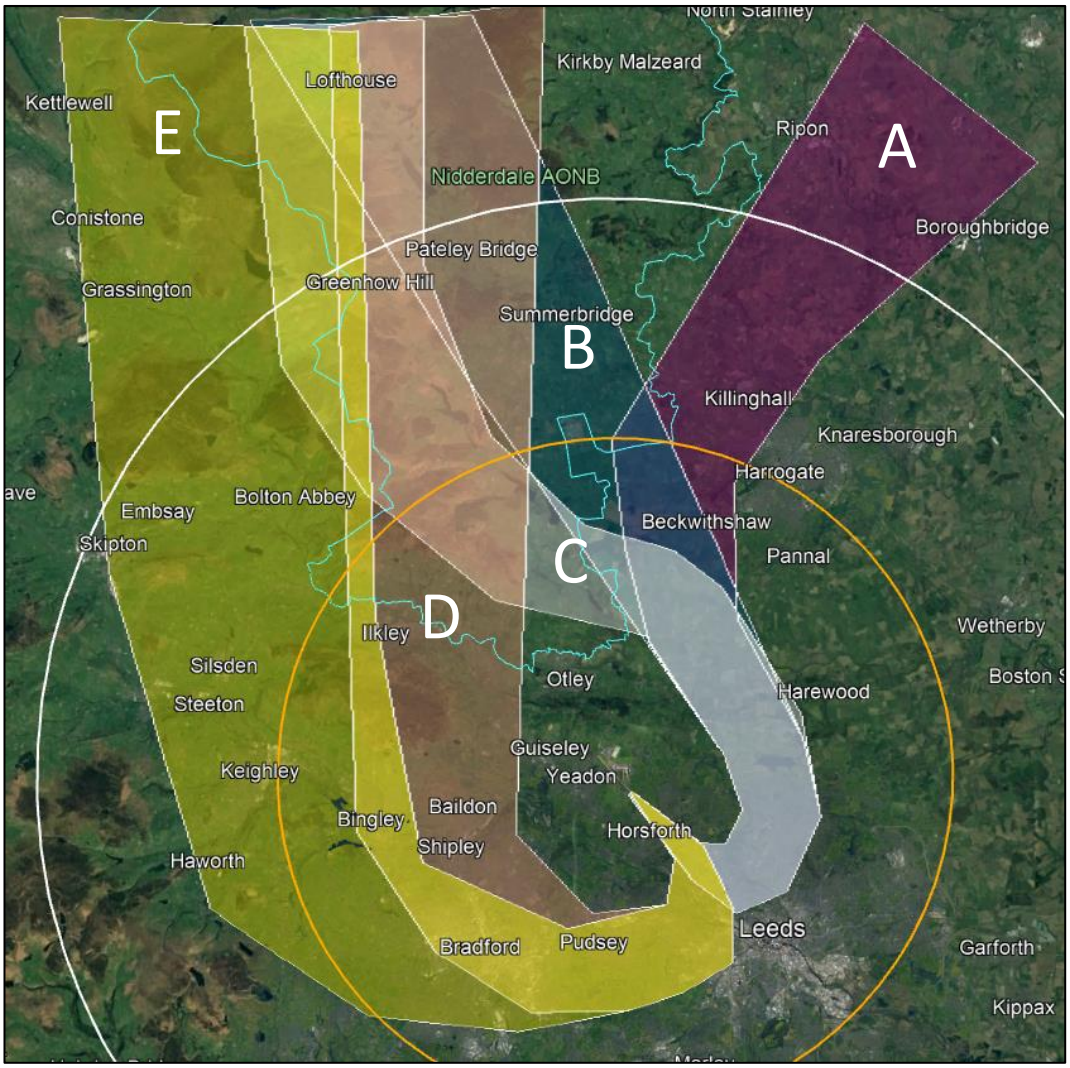


Figure 47: RW14 North-East Options (Google Earth)

4.12. Runway 14 – South-East

4.12.1. Four DOs (a fan of options) were conceived to enable aircraft to depart to the South-East off RW14. Option B (14SEB) being most like the baseline.

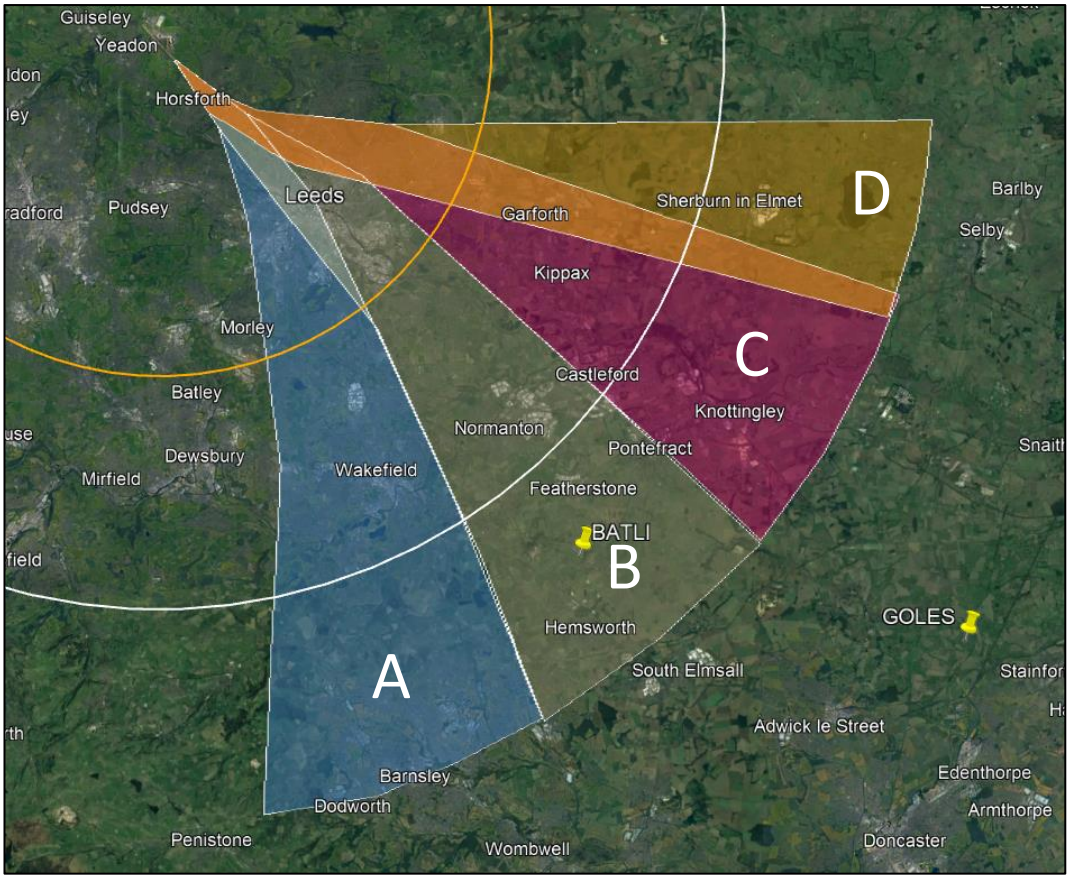


Figure 48: RW14 South-East Options (Google Earth)

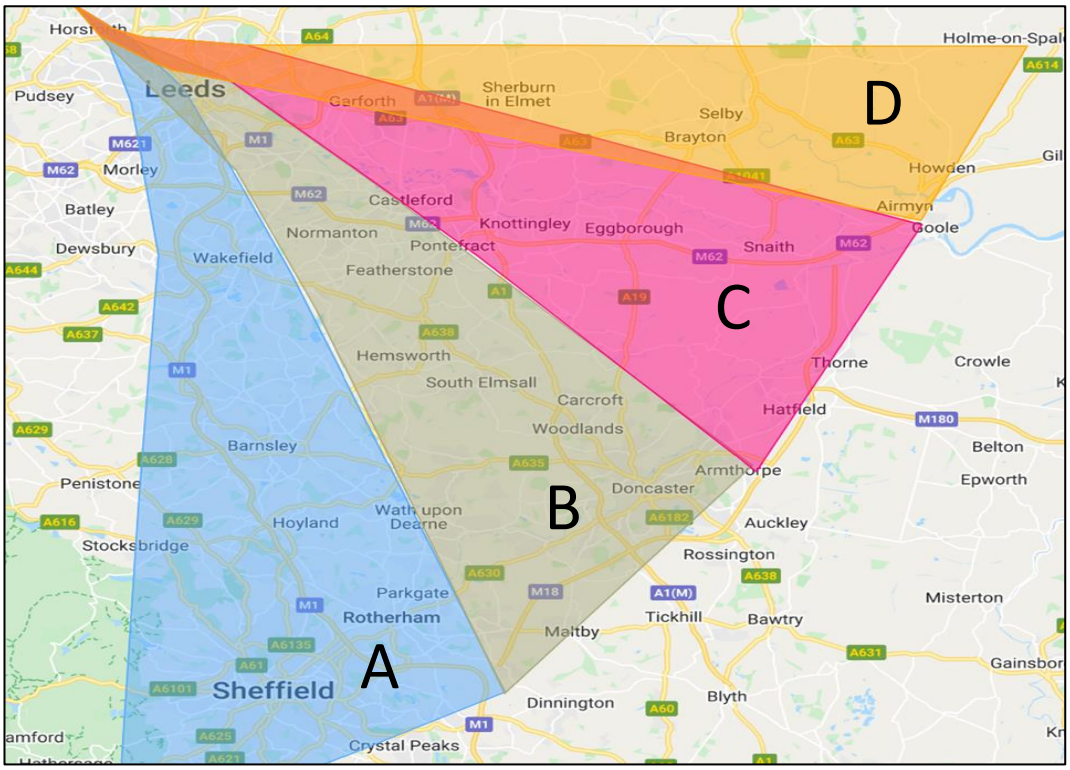


Figure 49: RW14 South-East Options (Google Maps)

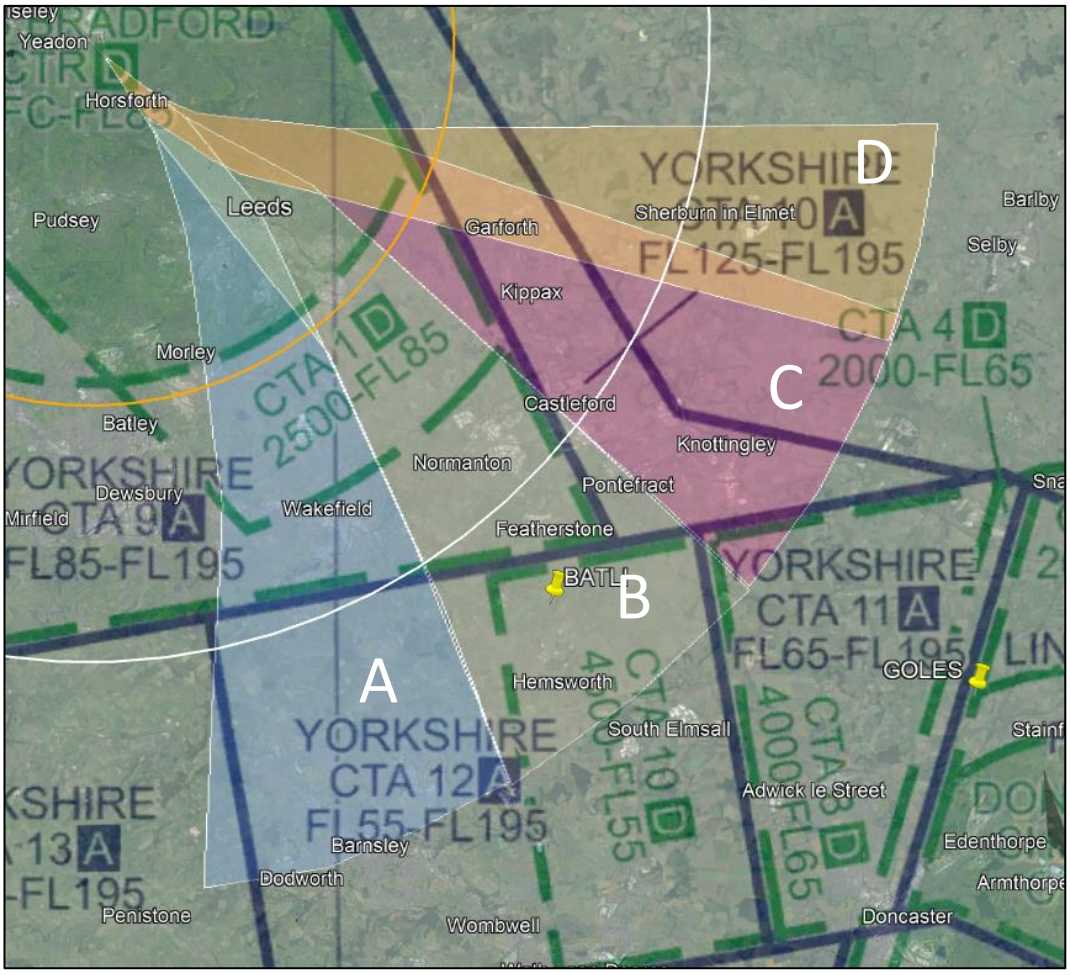


Figure 50: RW14 South-East Options (En-Route Chart)

4.13. Runway 14 – South & West

4.13.1. Five DOs have been developed for departures to the South and West from RW14. Two with a left-hand turn out and possibly needing additional CAS (14S&WD and 14S&WE) and three with a right-hand turnout (14S&WA, 14S&WB and 14S&WC). Option B (14S&WB) bears the greatest resemblance to the baseline.

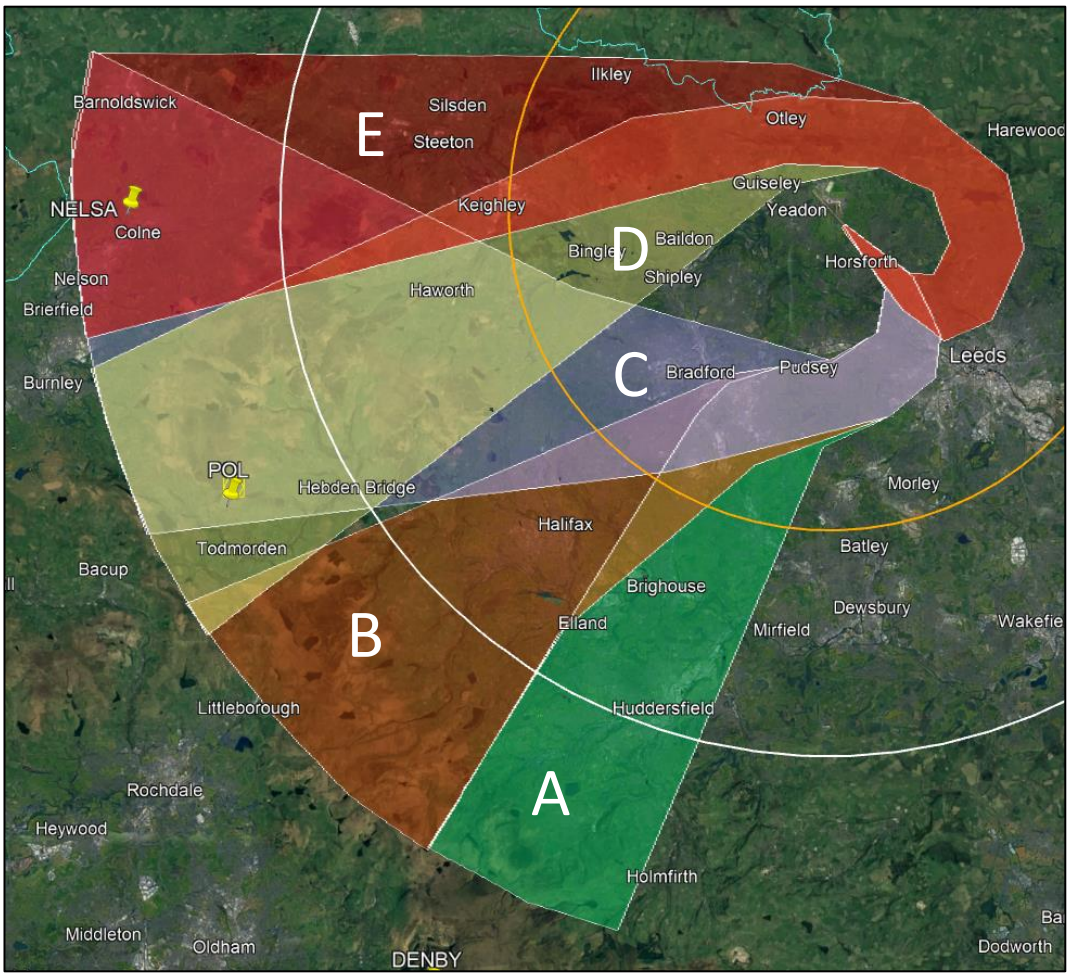


Figure 51: RW14 South & West Options (Google Earth)

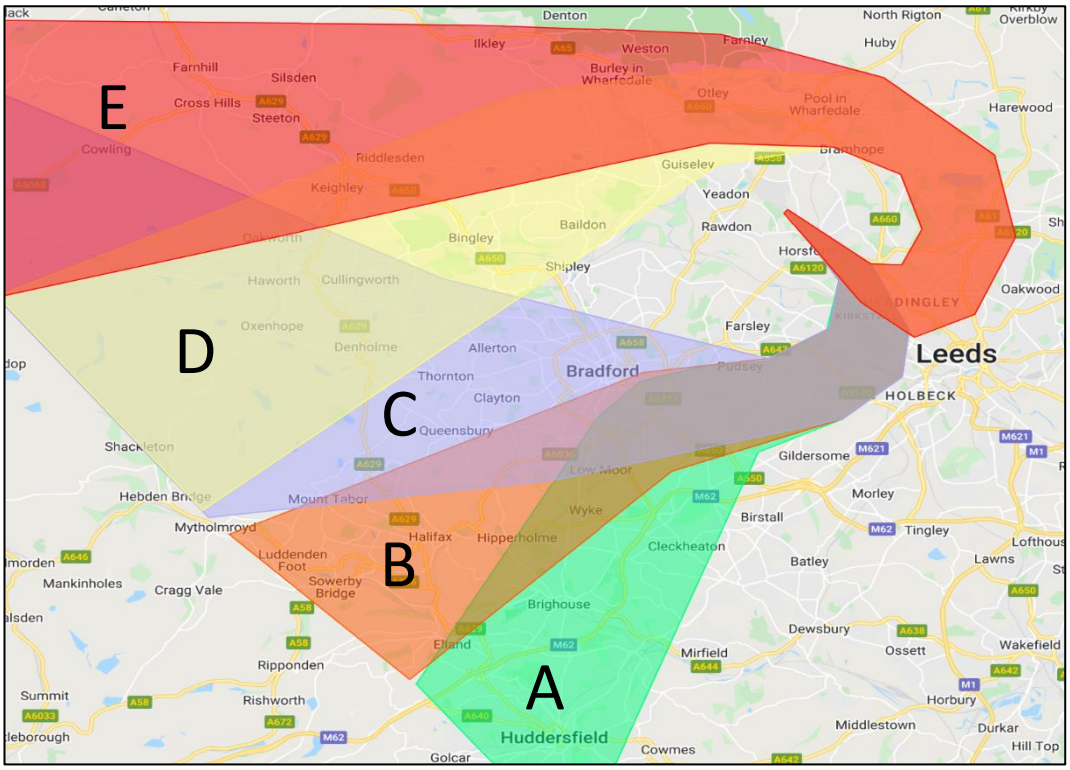


Figure 52: RW14 South & West Options (Google Maps)

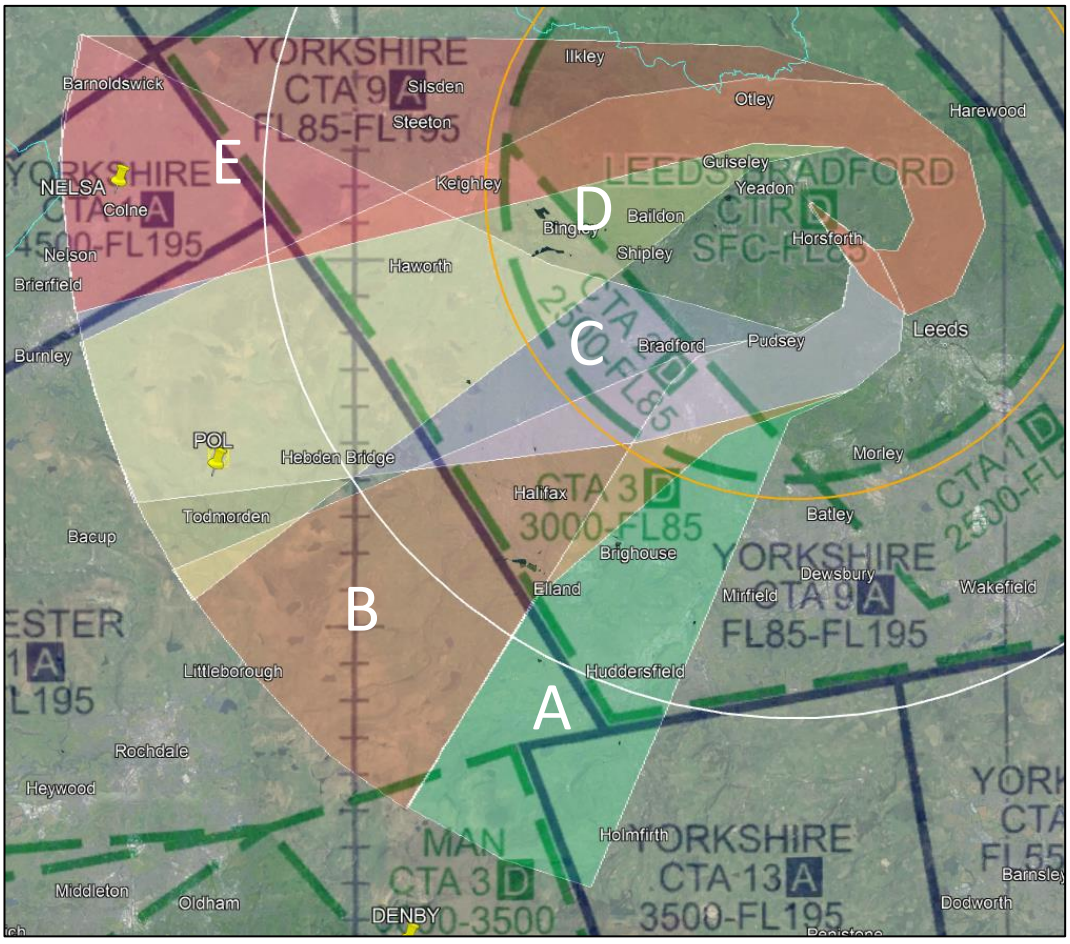


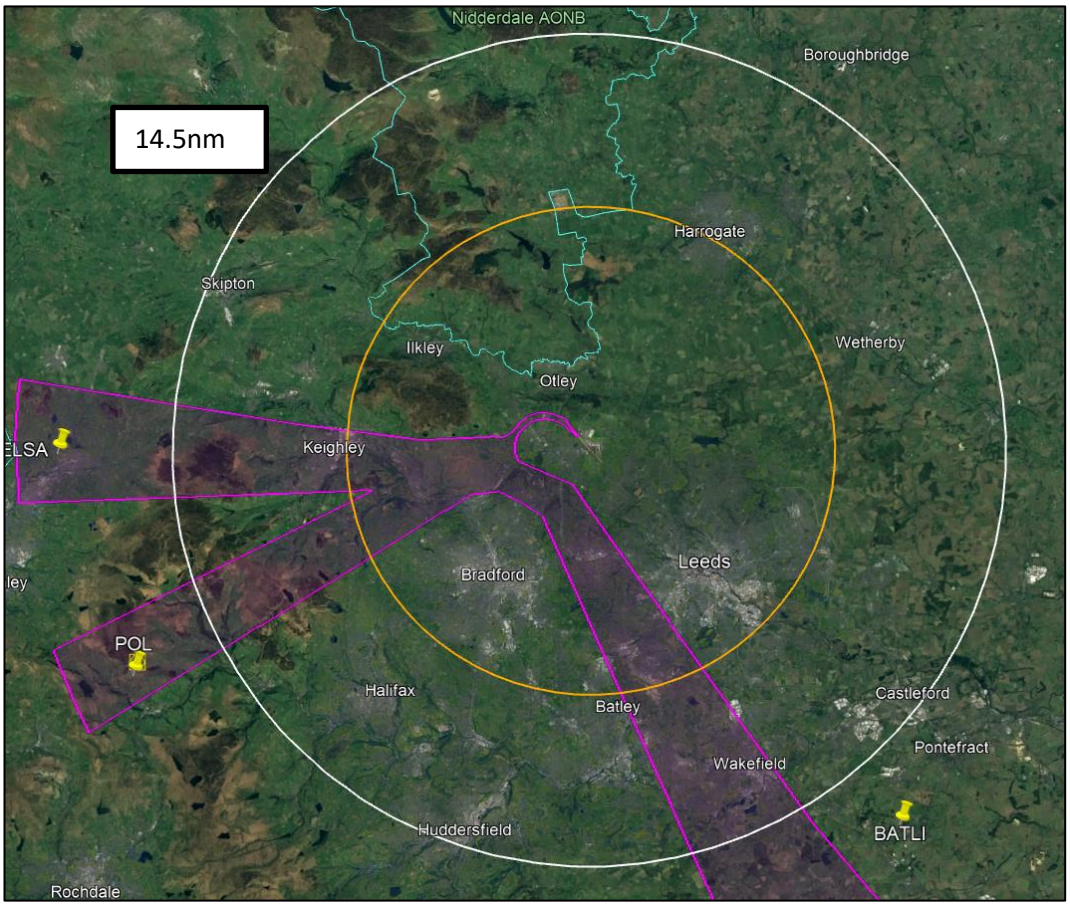
Figure 53: RW14 South & West Options (En-Route Chart)

4.14. New Combination Departure Options (Third Engagement)

4.14.1. The additional time afforded to the Project Team after the first submission to the CAA, enabled recently improved procedure design and navigation techniques to be considered in an attempt to avoid overflying some of the communities closer to the Airport. Accordingly, seven new Departure DOs were developed, five for RW32 and two for RW14. These DOs share the same initial climb-out but then split in the required departure directions and were developed with respite and night-noise relief specifically in mind.

4.15. Runway 32 Combination Option A – Potential Respite Route

4.15.1. This option uses modern navigational techniques (Radius-to-Fix turns[23]) to navigate over the fields between North Guiseley (Wetherby Whaler Restaurant area) and South Menston. The objective is to reduce the noise nuisance from the existing route over North Menston/South Burley by sharing the load between the two routes. Flight paths could be altered on a daily basis to share the noise between the two areas. As satellite navigational techniques are used, the flight tracks over the ground will have greater accuracy.



[23] A Radius to Fix (RF) leg is defined as a constant radius circular path around a defined turn centre that terminates at a fix. Like putting a pin in a board with a piece of string and drawing a circle using a pen attached to that piece of string. These turns, encoded into the navigation database, allow aircraft to avoid critical areas of terrain or conflicting airspace while maintaining positional accuracy by maintaining precise, positive course guidance along the curved track.

Figure 54: RW32 Option A Overview

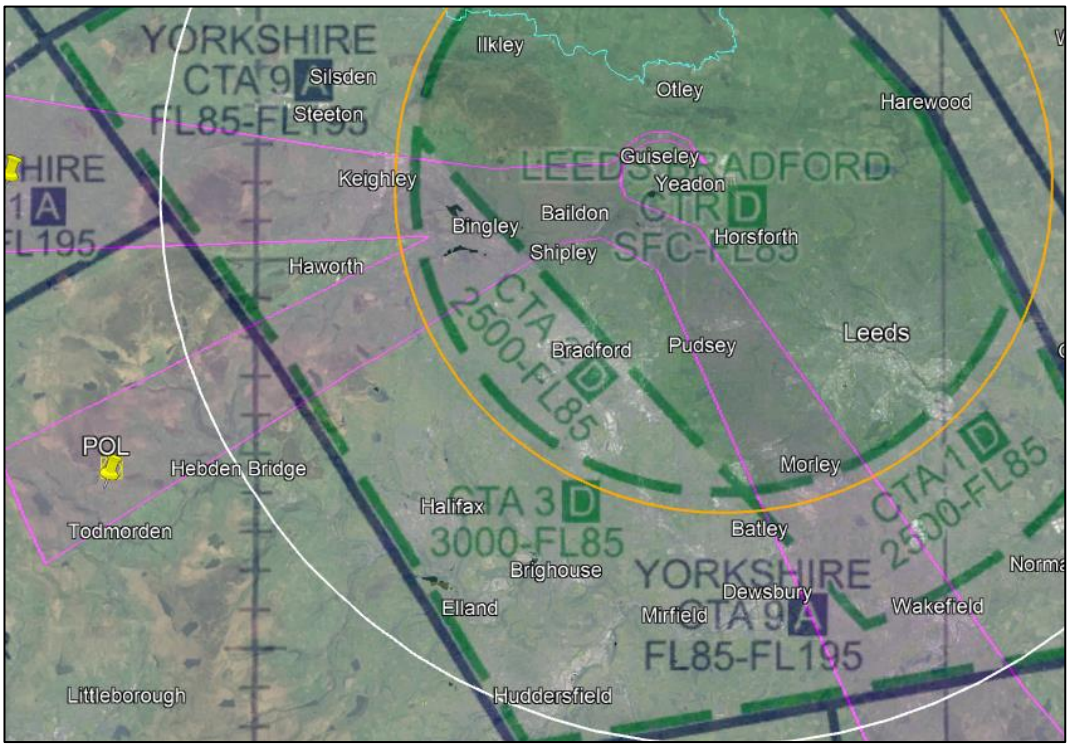


Figure 55: RW32 Option A – Airspace

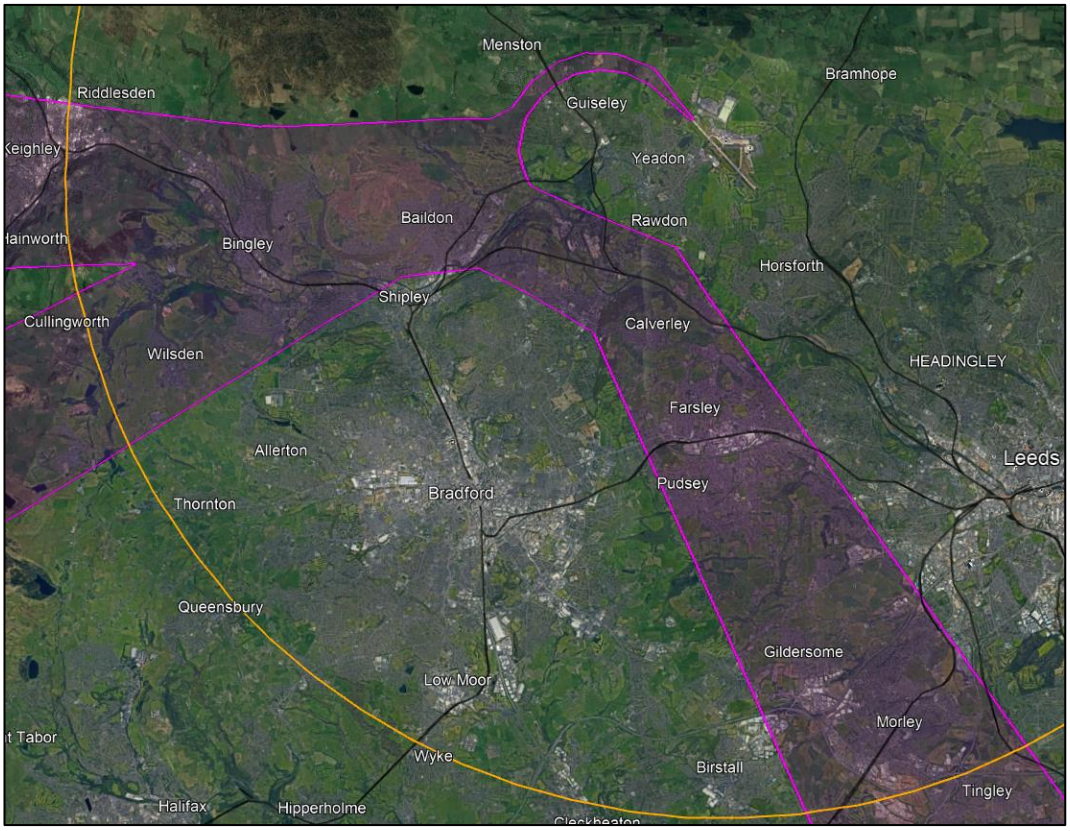


Figure 56: RW32 Option A to 4000ft.

Figure 57: RW32 Option A - Initial Climb-out.

4.16. Runway 32 Combination Option B – Potential Night Route

4.16.1. This option involves an early right turn over the Chevin followed by a left turn intended to route around the back of Otley and in so doing, reduce the populated areas overflown. The initial climb-out is then split in the three most in demand departure directions. The extra track distance makes less likely for regular use but instead as a night-time noise abatement route.

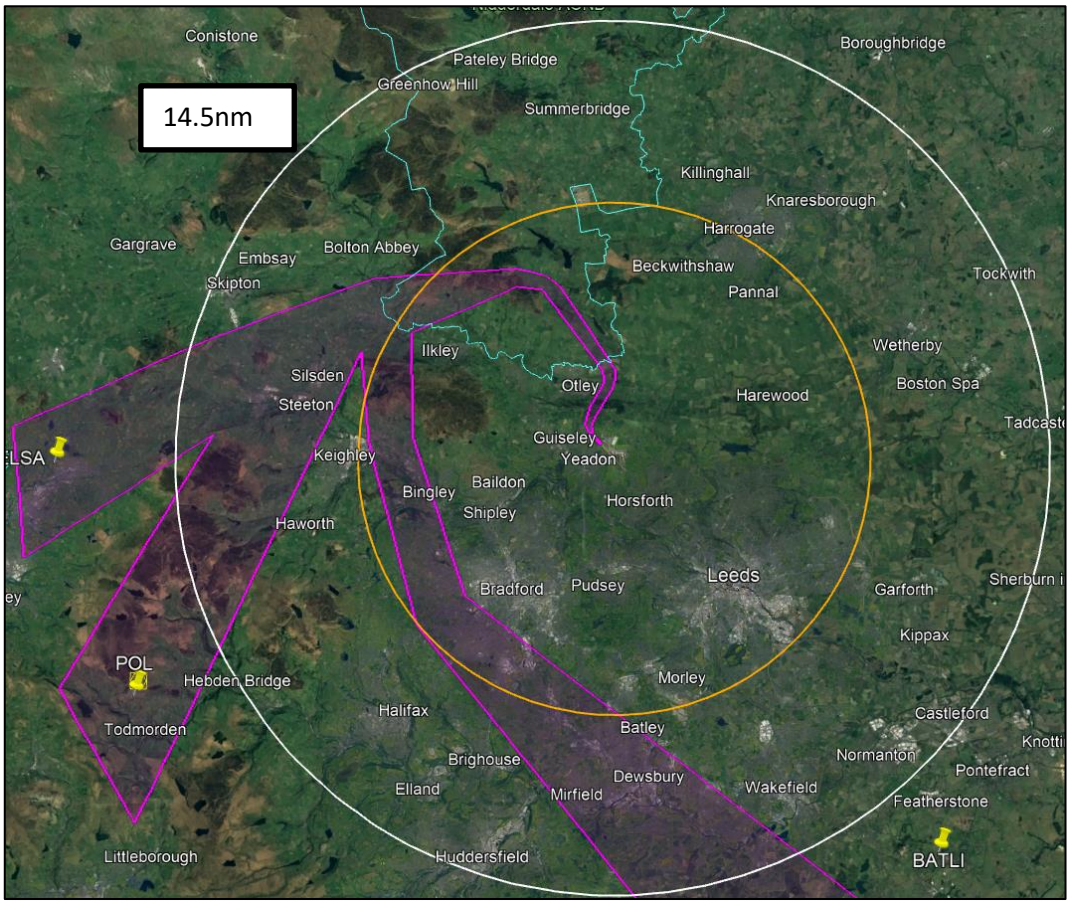


Figure 58: RW32 Option B Overview

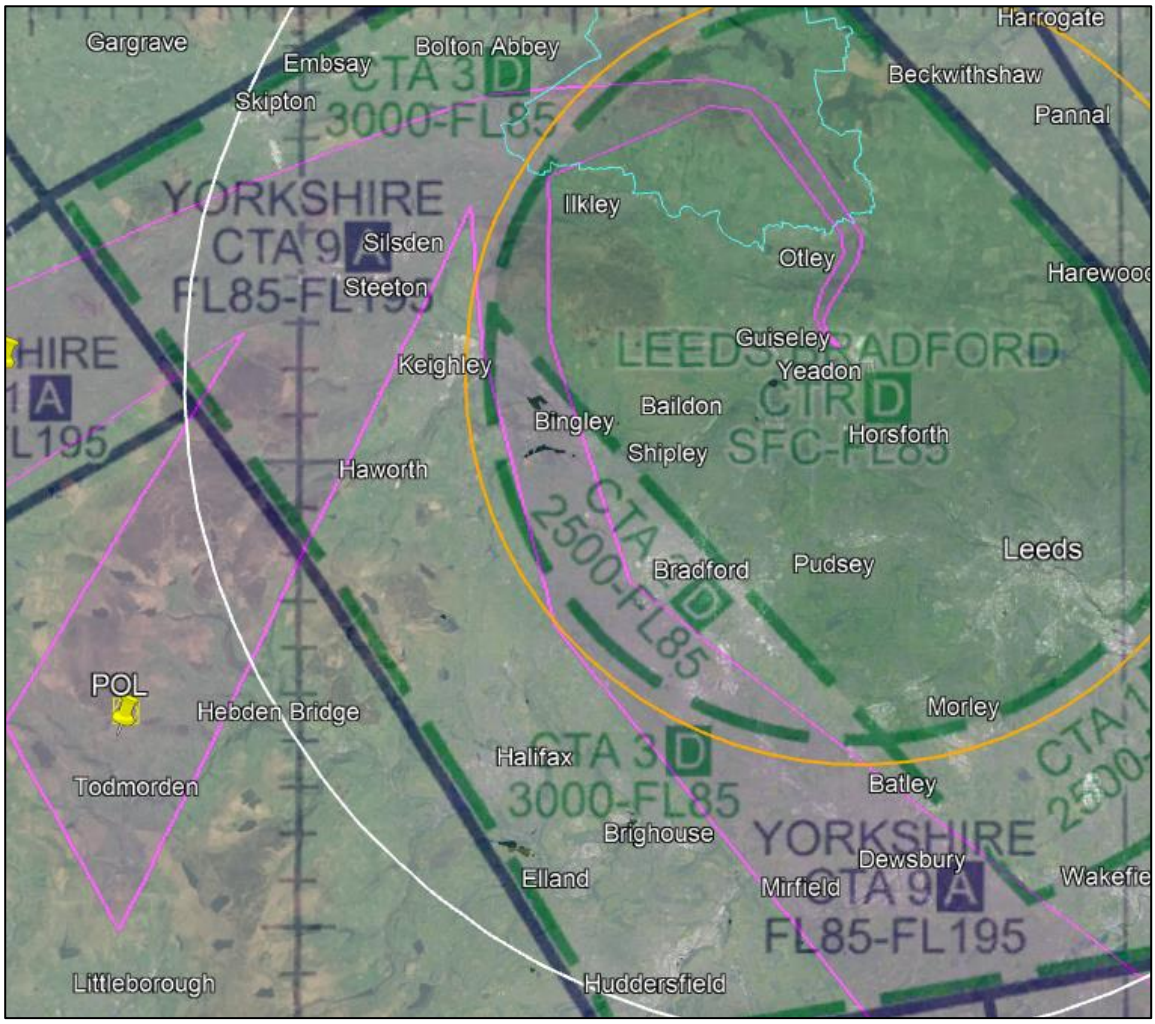


Figure 59: RW32 Option B Airspace

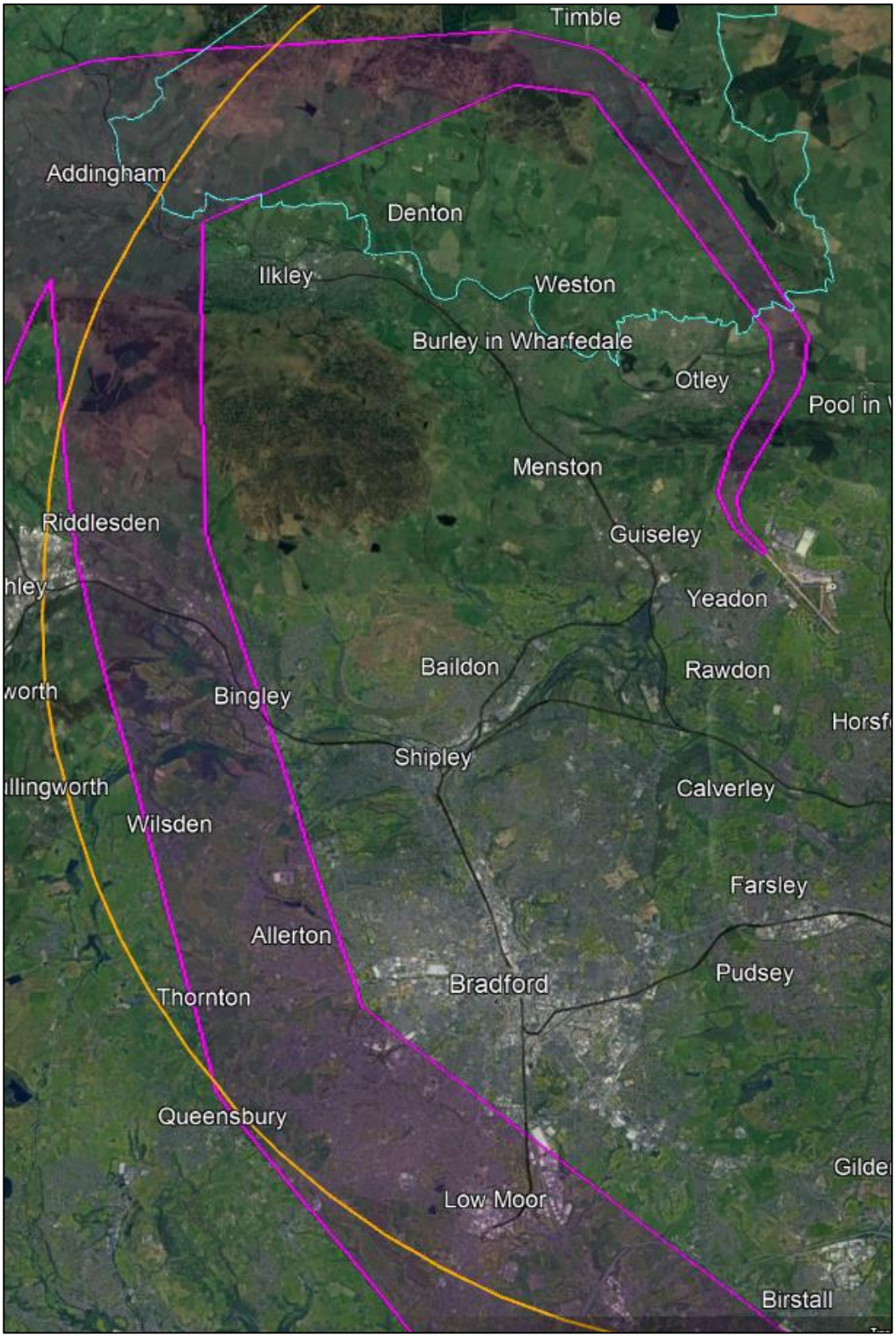


Figure 60: RW32 Option B Closer

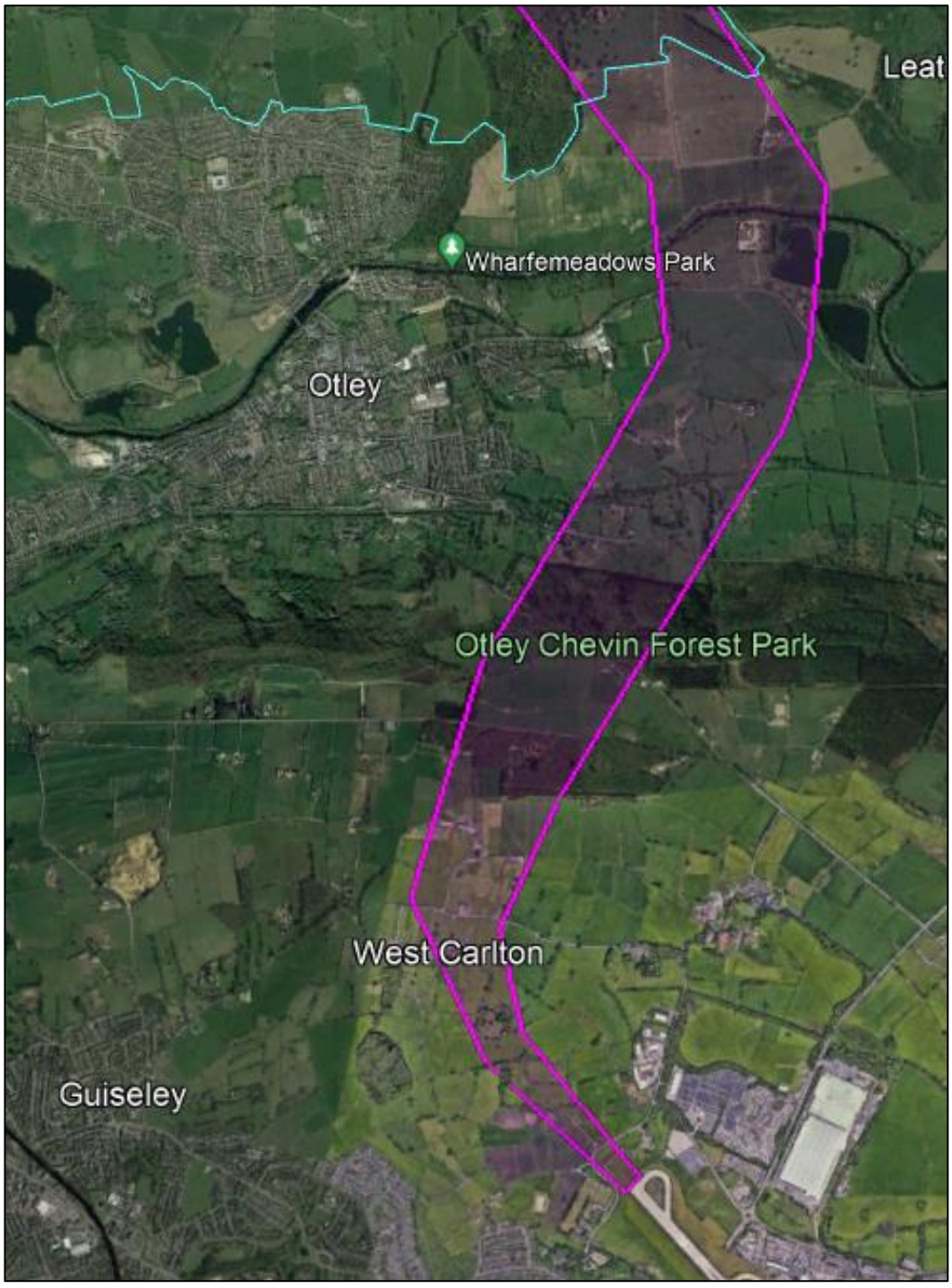


Figure 61: RW32 Option B Initial Climb-out.

4.17. Runway 32 Combination Option C – Potential Respite or Night Route

4.17.1. This option uses advanced navigational techniques to fly an early right turn after departure to avoid Otley. It is intended as a respite option to share the noise loading with the traditional route over Menston and Burley-In-Wharfedale. The aircraft would climb out looping mainly over countryside to then cross Cookridge (approximately ¾ of a mile East South East of the Airport) at realistically 5000 ft or above.

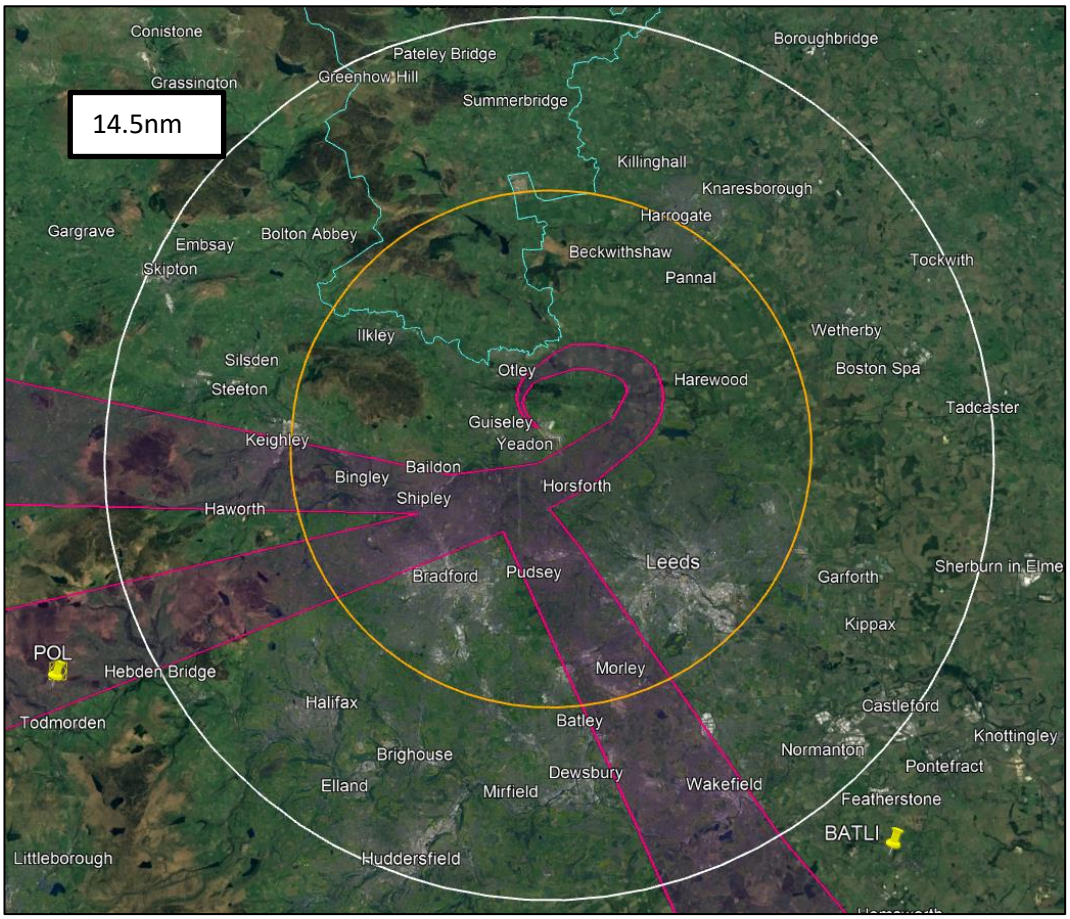


Figure 62: RW32 Option C Overview

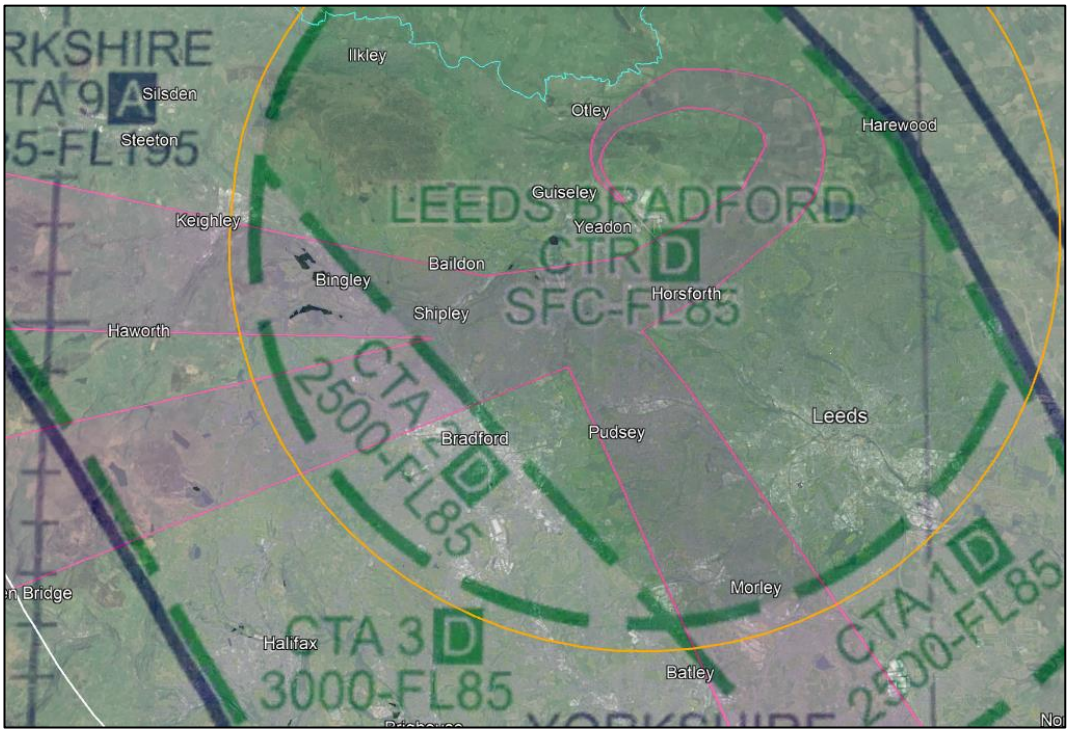


Figure 63: RW32 Option C Airspace

Figure 64: RW32 Option C Closer

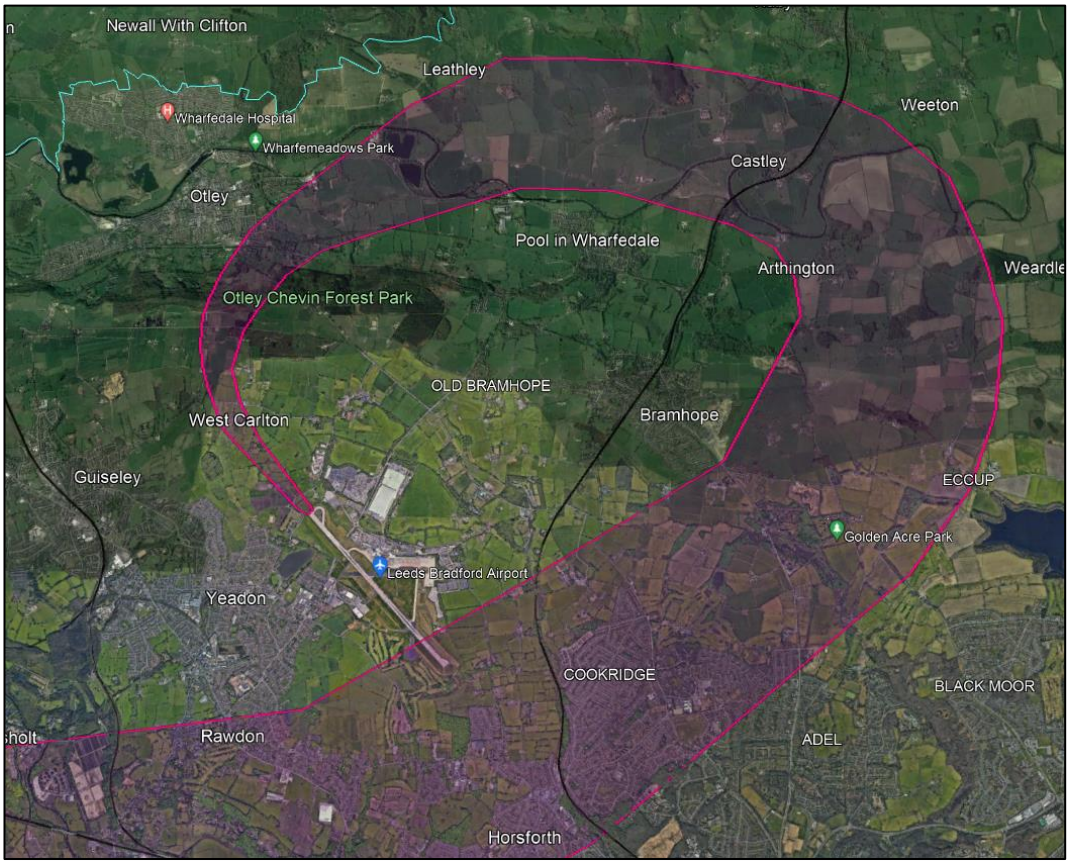


Figure 65: RW32 Option C Initial Climb-out.

4.18. Runway 32 Combination Option D – Potential Night Route

4.18.1. This route generally follows the initial track of the existing flightpath for 2 miles to deviate West of Otley. Rather than turning west over Menston, the flightpath makes a wide right turn to the north of Otley to gain height over open countryside prior to turning back westbound. The route is designed to minimise noise to local communities during the night. Due to the excessive miles flown and excess CO_2 produced, this route is not considered viable for continuous operations and is more suited for use at night for purposes of noise nuisance reduction.

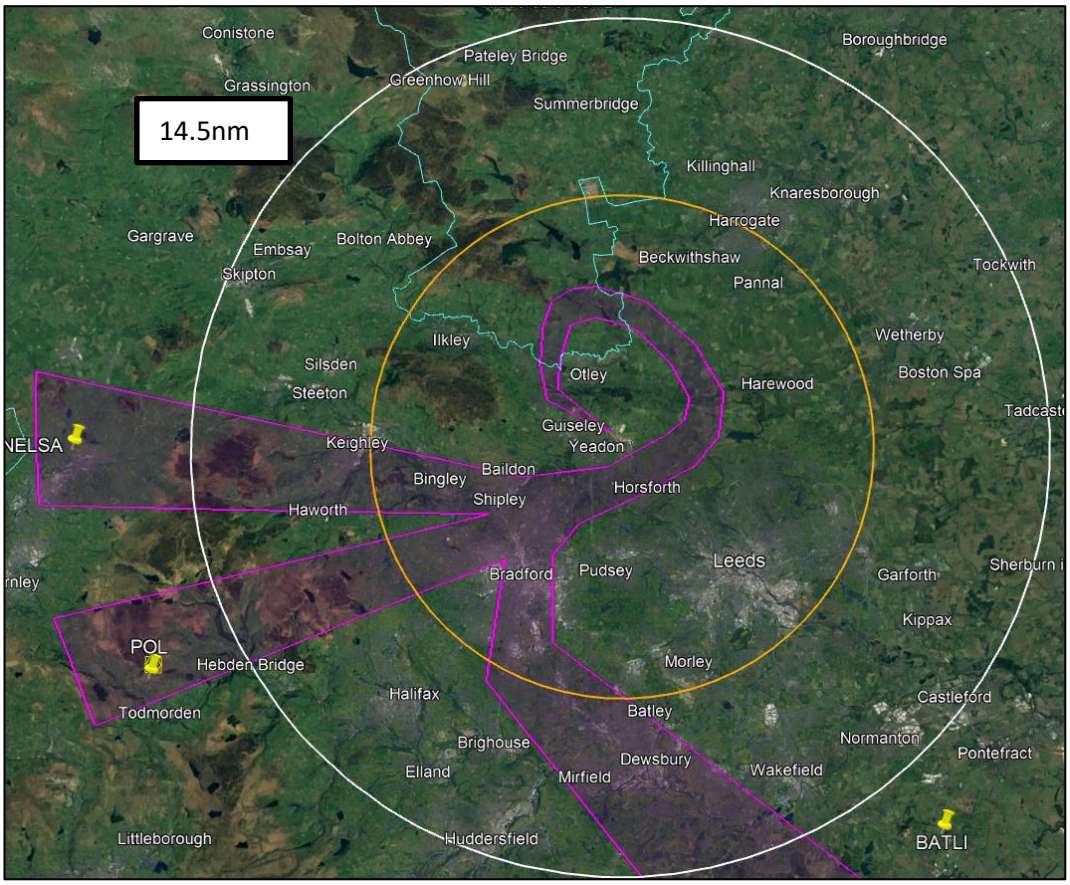


Figure 66: RW32 Option D Overview

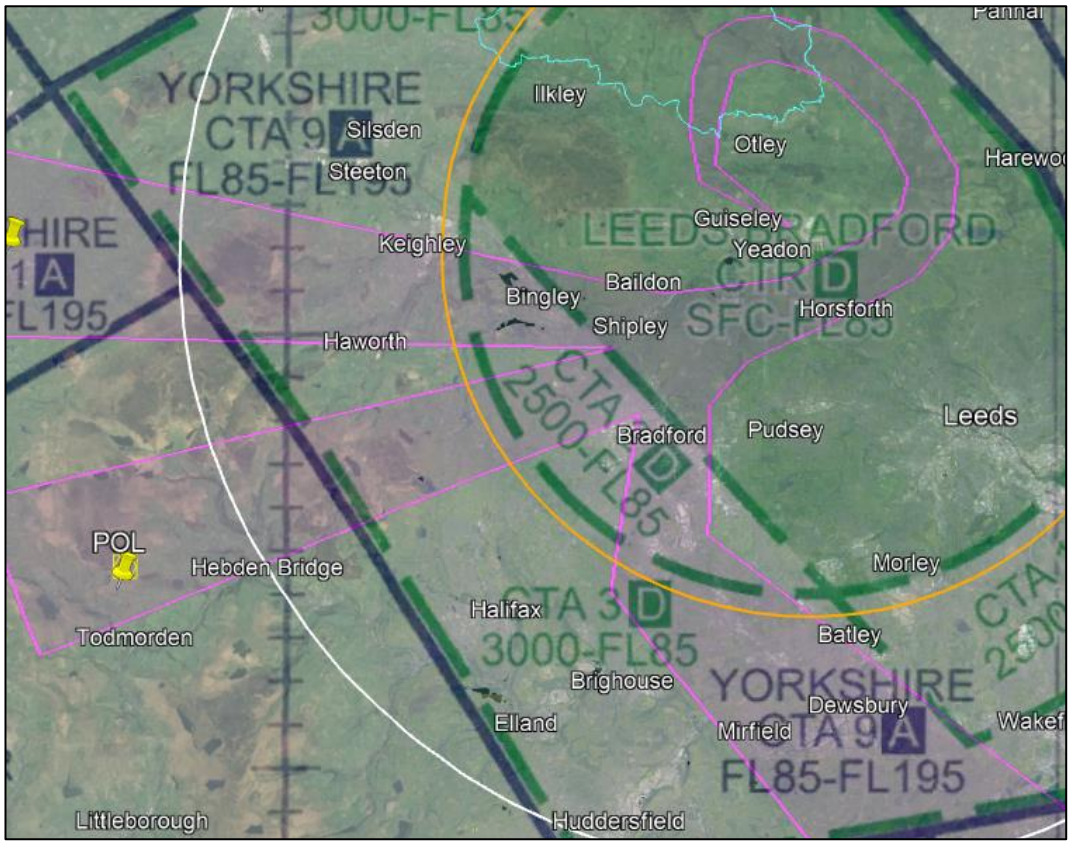


Figure 67: RW32 Option D Airspace

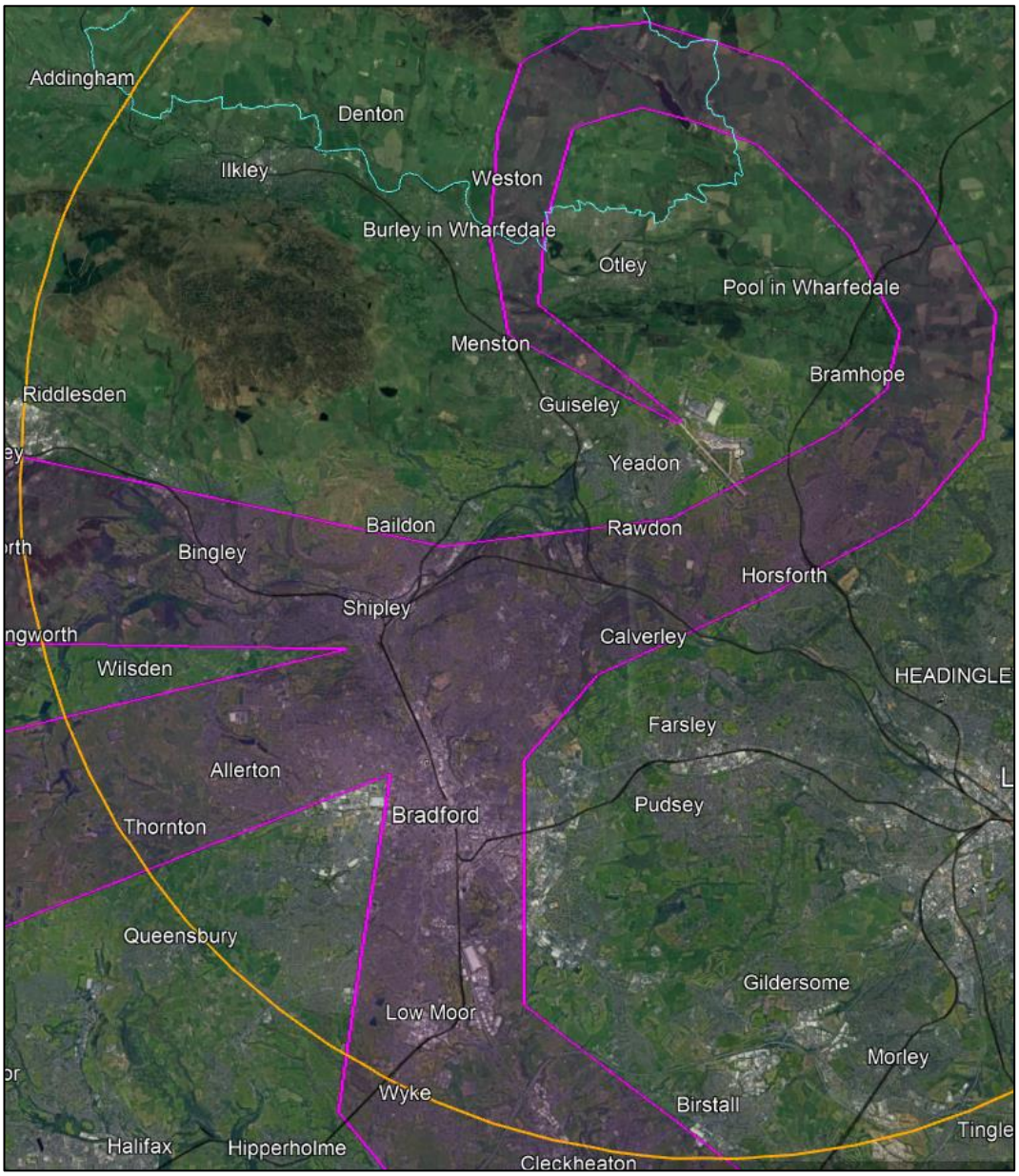


Figure 68: RW32 Option D Closer

Figure 69: RW32 Option D Initial Climb-out.

4.19. Runway 32 Combination Option E – Potential Night Route

4.19.1. This route generally follows the initial track of the existing flightpath for circa 2 nm to deviate West of Otley. After this point, the route flies north and then westbound to avoid all major settlements whilst gaining height over open countryside. The route is designed to minimise noise to local communities during the night. Due to the excessive number of additional miles flown and excess CO_2 produced, this route is not considered viable for continuous operations and is more suited for use at night for purposes of noise nuisance reduction.

Figure 70: RW32 Option E Overview

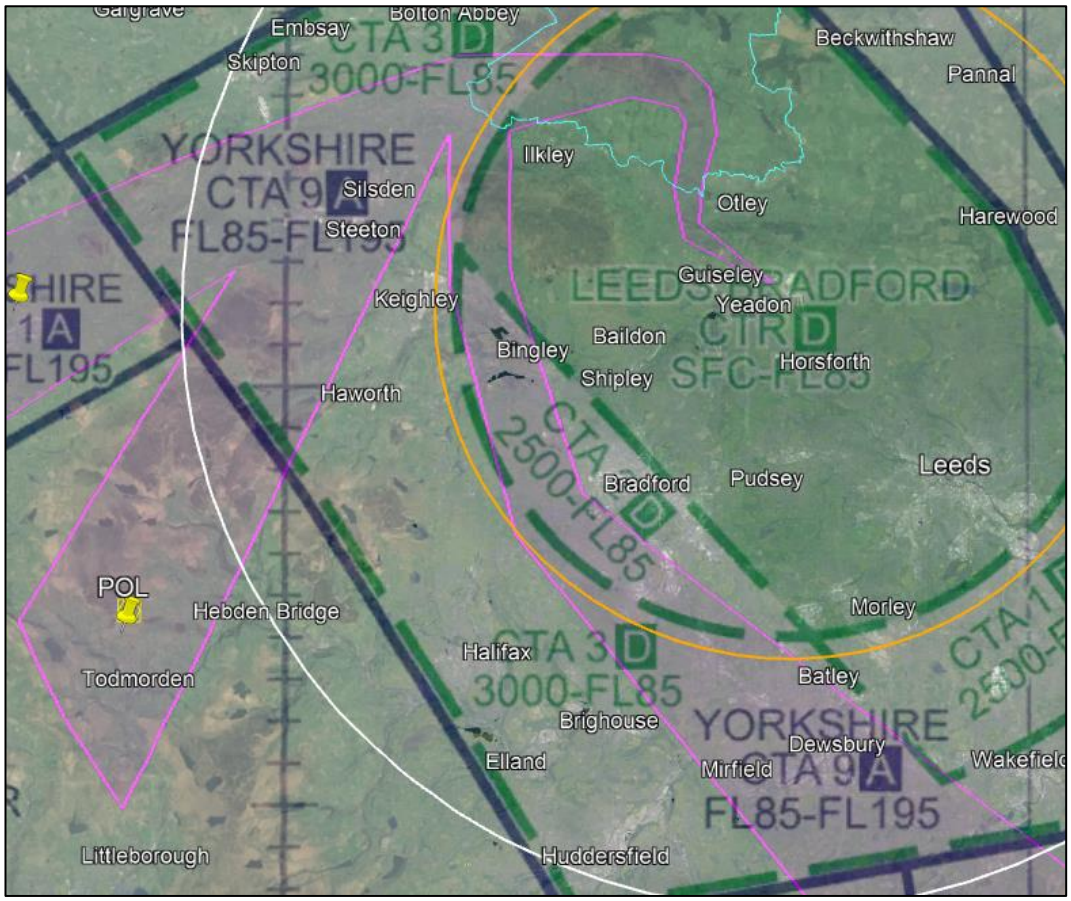


Figure 71: RW32 Option E Airspace

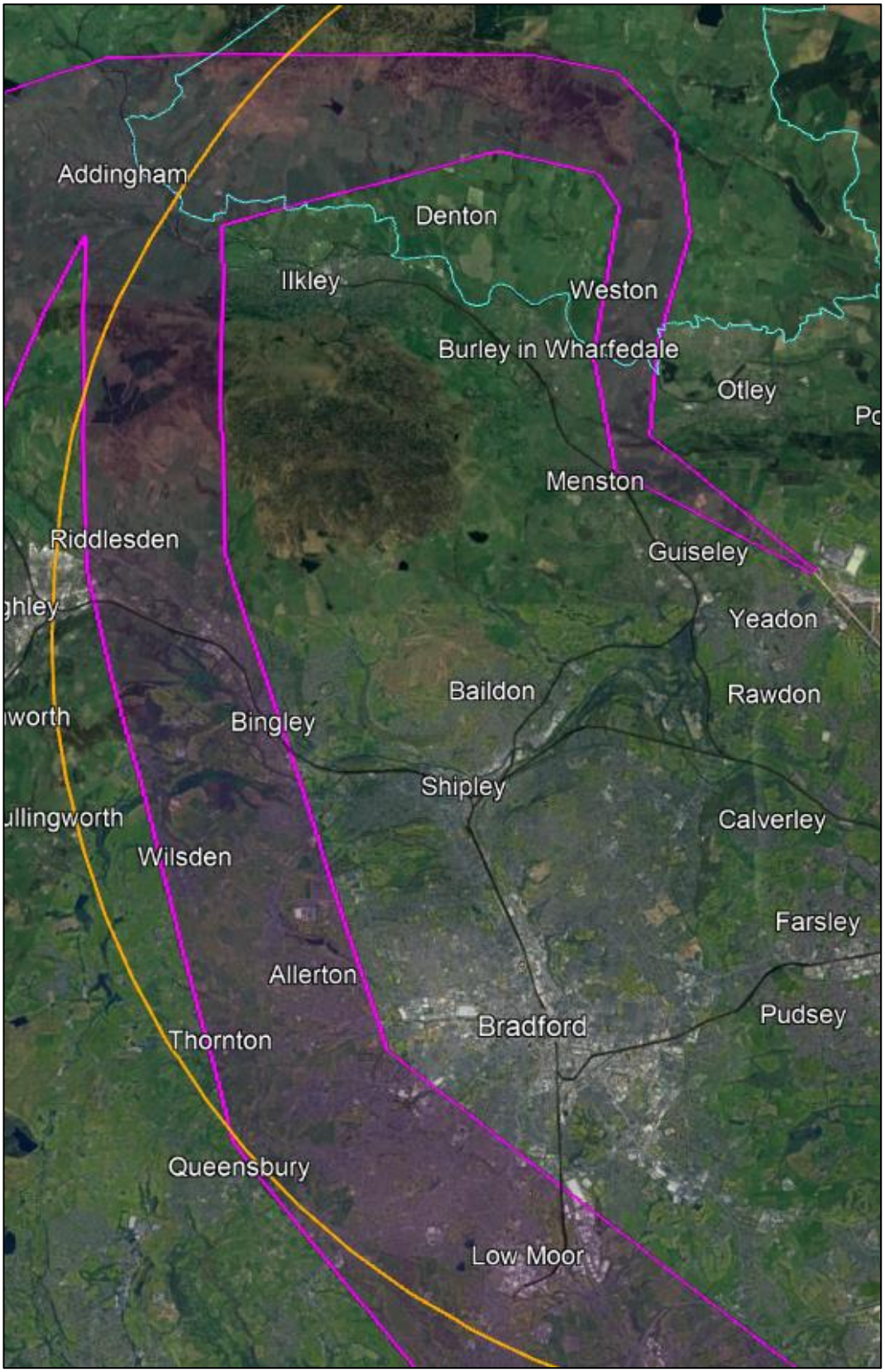


Figure 72: RW32 Option E Closer

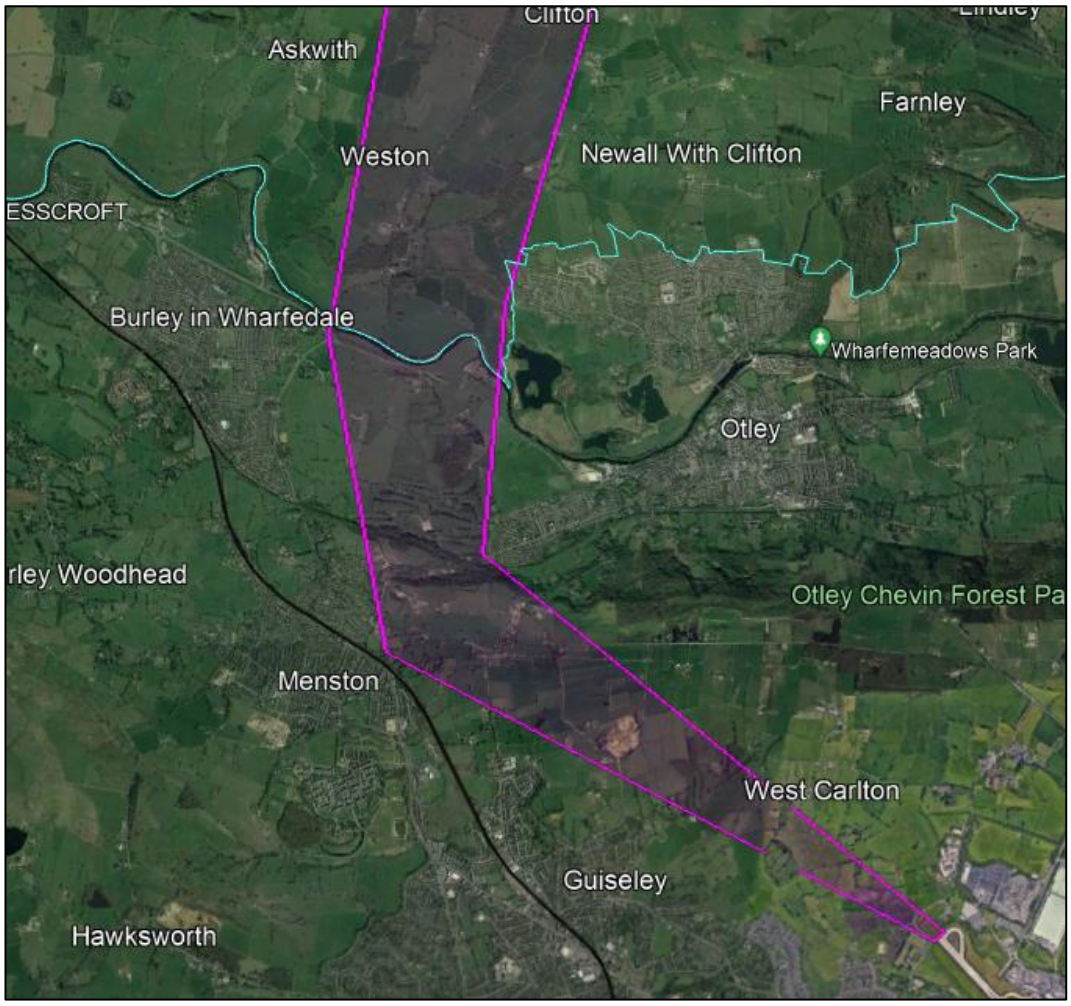


Figure 73: RW32 Option E Initial Climb-out.

4.20. Runway 14 Combination Option A – Potential Respite or Permanent Route

4.20.1. This option turns right on passing 500 ft to avoid overflying the suburbs North-West of Leeds. The route seeks to weave through an area of countryside dividing Leeds and Bradford prior to turning on a direct track. It intends to offer some respite to the North-West Leeds area whilst accepting that new areas such as Eastern Calverley and Farsley may be overflown. This route also offers an element of dispersion; as aircraft climbs rates differ, the point at which the turn is made (500 ft) will vary on each departure, resulting in varied tracks. Currently, due to its proximity to the Airport, the area of North-Western Leeds is regularly directly overflown regardless of the runway in use; departures over this area when on RW14 and arrivals when on RW32. This option may provide an opportunity to remove some noise nuisance from this area when RW14 is in use.

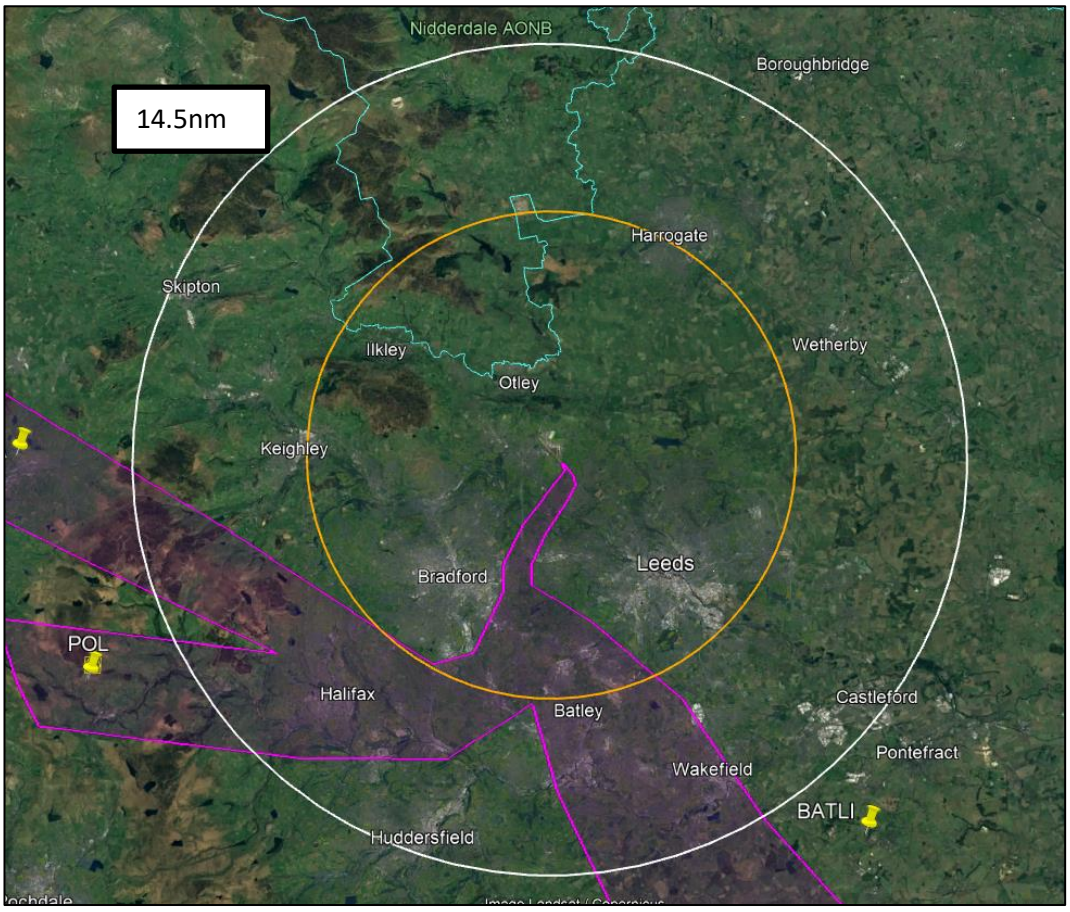


Figure 74: RW14 Option A Overview

Figure 75: RW14 Option A Airspace

Figure 76: RW14 Option A Closer

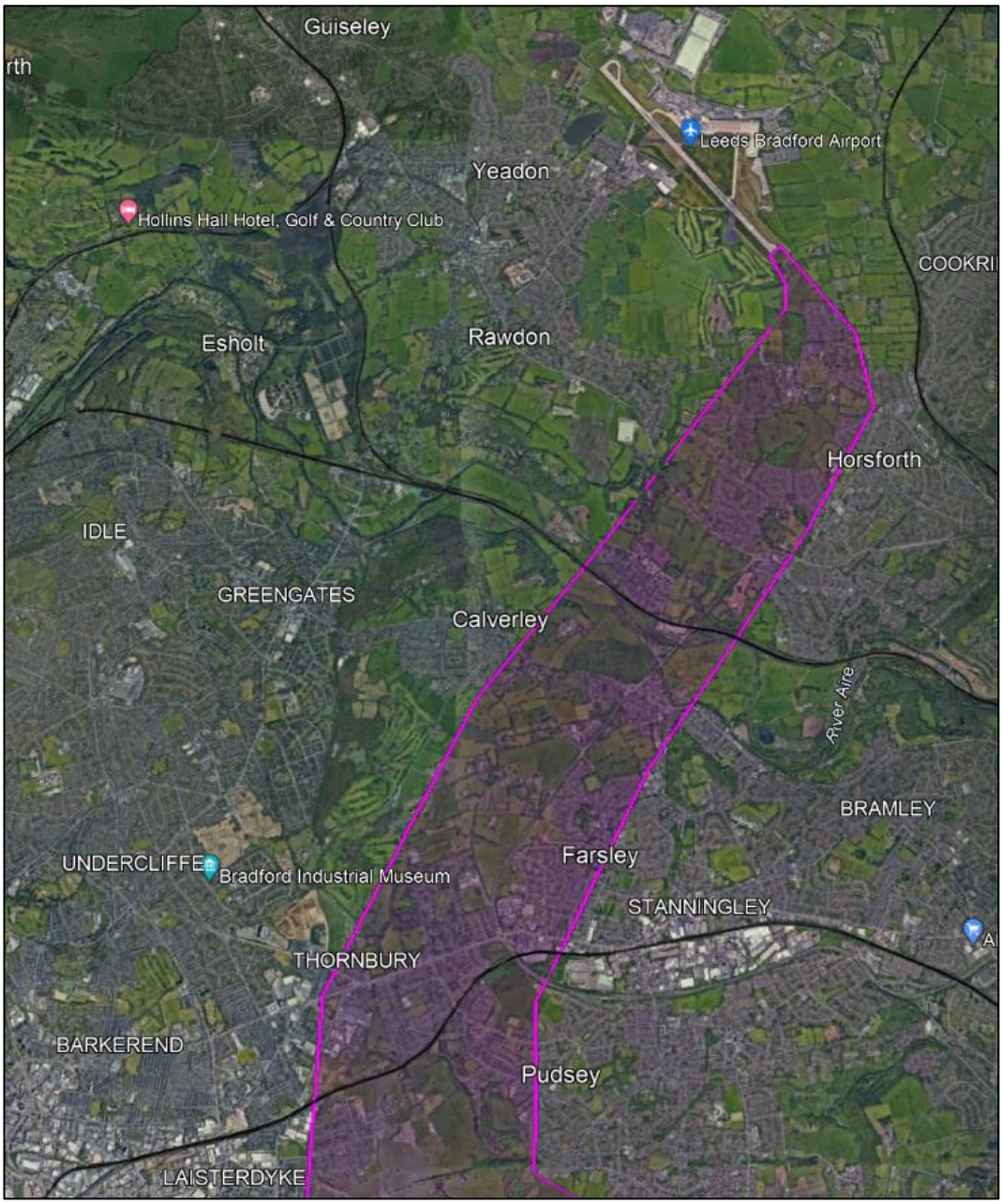


Figure 77: RW14 Option A Initial Climb-out.

4.21. Runway 14 Combination Option B – Potential Night Route

4.21.1. This option utilises an early left turn off RW14 to offer respite to both the suburbs of North-Eastern Leeds and the towns of Pudsey and Bramley. It does however overfly new communities in North-East Leeds such as Weetwood and Adel before continuing to climb out over the countryside. Due to the length of route flown, this route would only be viable as a night noise mitigation route in a combined respite rotation with other noise routes. It would not be viable for departures routing out towards LAMIX (to the South-East).

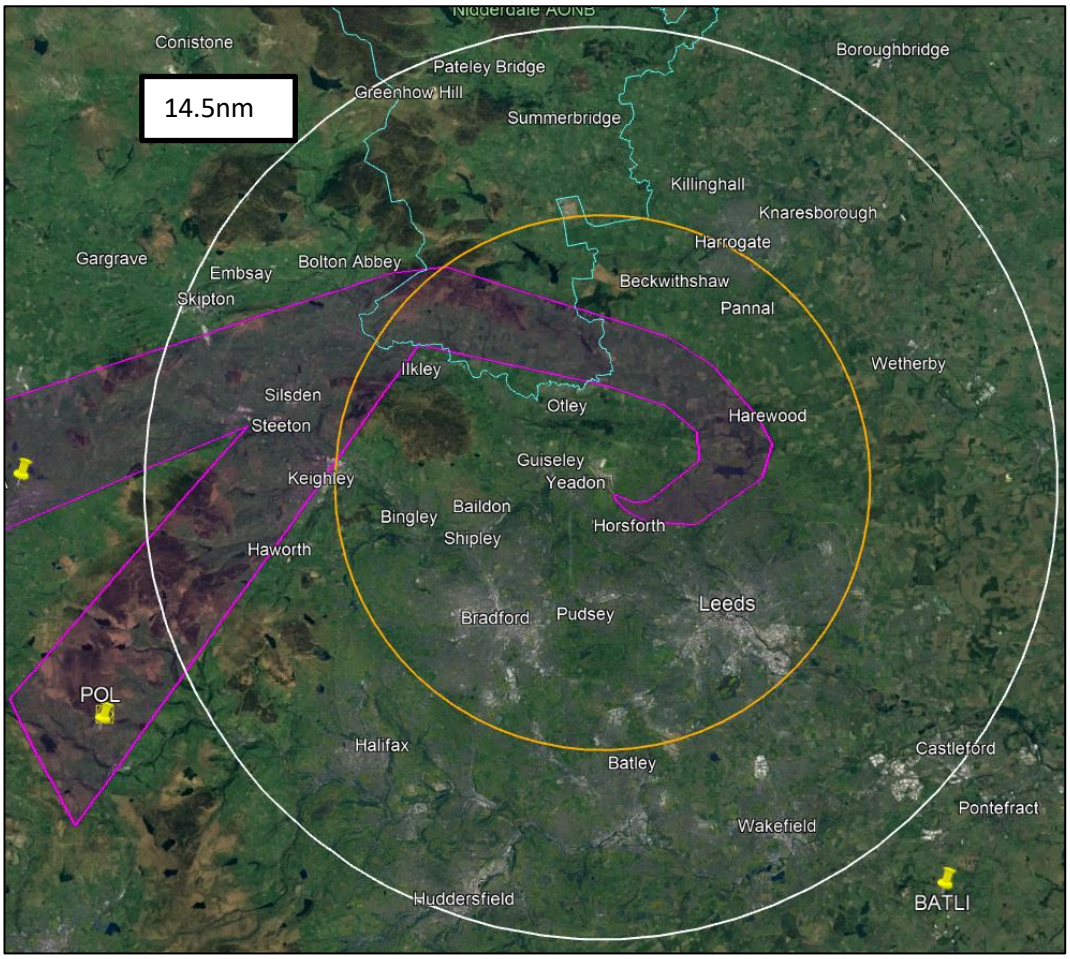


Figure 78: RW14 Option B Overview

Figure 79: RW14 Option B Airspace

Figure 80: RW14 Option B Closer

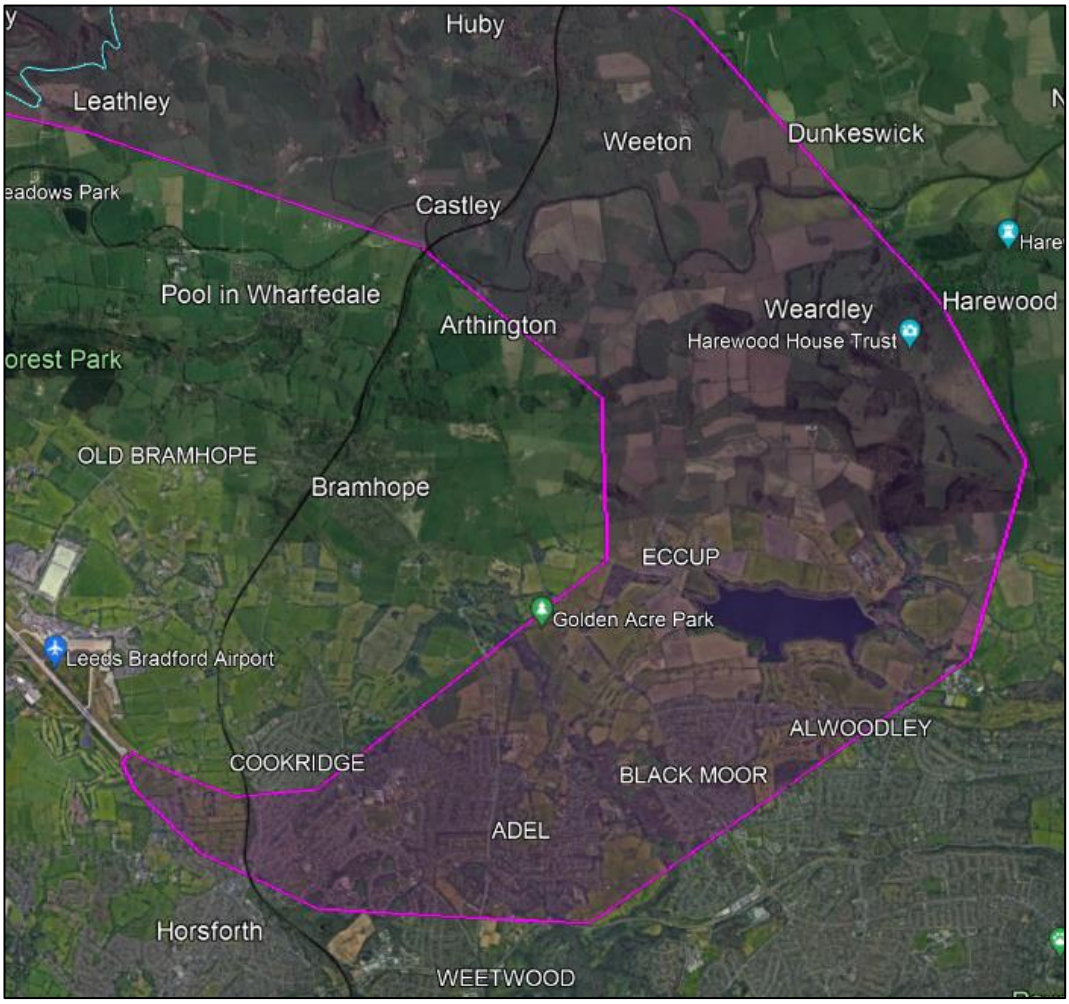


Figure 81: RW14 Option B Initial Climb-out.

4.22. Arrivals

4.22.1. In the case of the arrivals, the DOs are depicted as general directions of travel based on a variety of different hold and transition options. The lines depicting the Arrival Transitions and the Missed Approach Procedures are not intended to show definitive tracks over the ground. These are purely intended to provide an indication of how such a system would work. The final procedures would be refined through the consultation process should a given DO progress beyond Stage 2 of the process.

4.22.2. The arrival hold depictions are intended to give stakeholders an idea of how the system might work. These are drawn within blue circles/lozenges surrounding them as the number of holds and their final locations have not been determined. It is the responsibility of the en-route ANSP to determine the location of these holds. LBA is a stakeholder in the NERL MTMA ACP and accordingly will have some input into this decision-making process.

4.22.3. The LBA hold already exists and this is depicted as it exists today. The LBA hold is also a Missed Approach hold and any future system will also require a Missed Approach hold. This may be the LBA hold, or it may be coincident with any one of the hold options presented as arrival holds.

4.23. Standard Required Navigation Performance T-Bars

4.23.1. States are required by the International Civil Aviation Organisation (ICAO) to develop implementation plans setting out the adoption of PBN within their airspace structure, including routes and, of relevance to this Section of the document, Instrument Approach Procedures (IAPs). IAPs that utilise PBN typically have a centreline that extends from 10nm out to touchdown from an Intermediate Fix (IF). The centreline is typically extended with 5nm legs that end with an Initial Approach Fix (IAF). This is referred to as a T-Bar. Figure 82 shows how a standard T-Bar would look if it were to be implemented at LBA. The leg extensions would, in some cases, either fall outside the existing CAS or potentially result in aircraft routing outside CAS to get to them. Accordingly, there would need to be a change to the existing airspace configuration to accommodate a standard T-Bar.

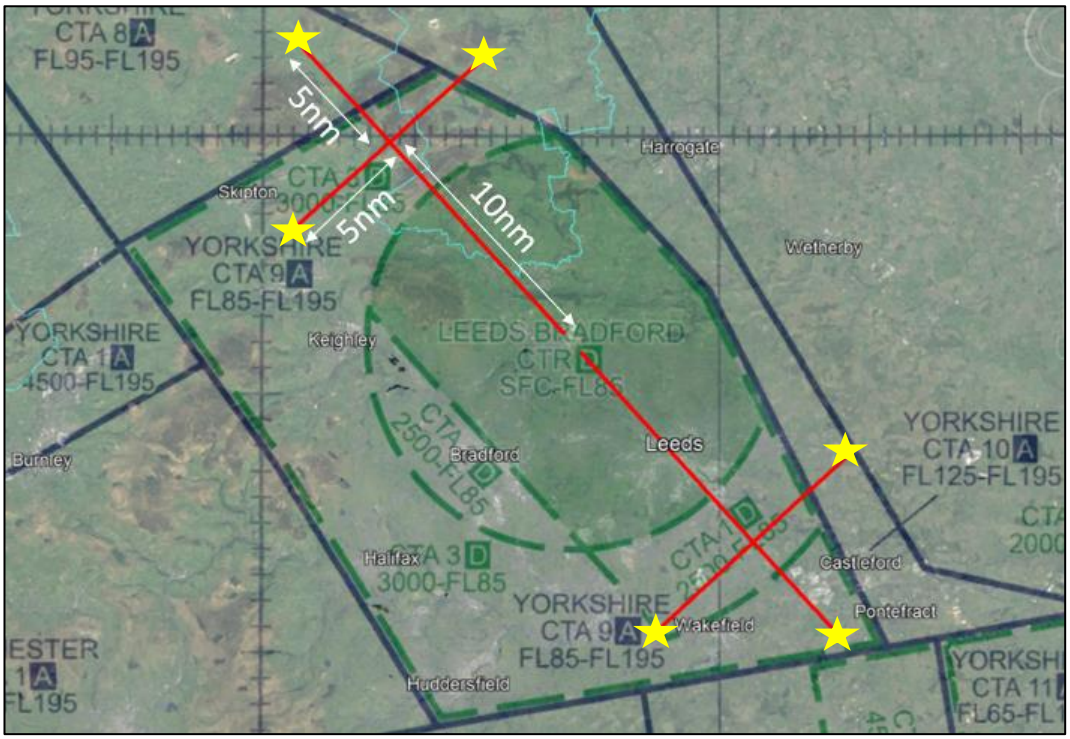


Figure 82: Standard T-Bar Configuration

4.23.2. These IAFs (depicted using yellow stars in Figure 82) enable an aircraft's Flight Management System (FMS) to navigate to that point in space. These points in space, known as 'waypoints' can be coded in different ways including, amongst others, Flyover and Fly-By waypoints, the latter not requiring the aircraft to fly directly over the point. By way of an example, Figure 83 shows the track of an aircraft flying over the IAF (yellow star), flying by (rather than over) the IF (orange star) before establishing on final approach and flying over the Final Approach Fix (FAF) (pink star) to the runway.

Figure 83: PBN Approach

4.23.3. T-Bars can be amended by removing legs or changing the angle of the legs to create what is known as a Y-Bar. Y-Bars can be used when the 90-degree arrangement is not practicable. The angle cannot exceed 90-degrees as otherwise the turn onto the final approach track would be too severe, but it can be reduced. Creating a Y-Bar configuration at LBA would be counterproductive as the extensions would fall further outside of the existing CAS.

4.24. Amended Required Navigation Performance T-Bars

4.24.1. Another option for LBA, given the current airspace configuration, would be an amended T-Bar with only the western 90-degree legs added to the final approach track as depicted in Figure 84. This configuration would not be suitable for some, but not all, the DOs presented later in this Section.

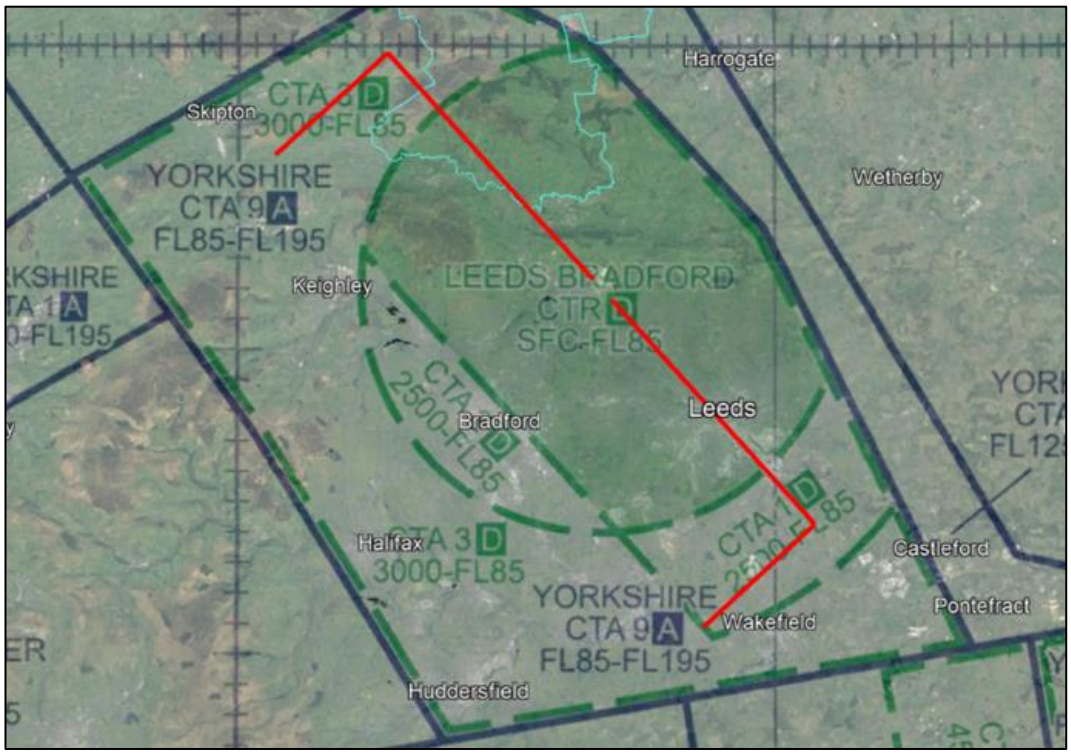


Figure 84: Amended T-Bar Configuration (no Eastern, Northern, or Southern legs)

4.25. Use of Arrival Transitions

4.25.1. Another consideration is the use of Arrival Transitions. A Transition essentially provides a systematic means to link from one route segment to another (i.e. link the STAR to the IAP). Arrival Transitions may be applied if the STAR does not terminate at the start of approach i.e. the IAF.

4.25.2. In the UK, all STARs terminate at the Holding Fix and the Airspace design then requires a mechanism to provide connectivity to an IAP, either through use of a tactical vectoring or some form of Transition. Transitions are an extension of the arrival procedure, providing aircraft with route connectivity to either the IF or Final Approach Segment. The Navigation database on board the aircraft cannot accommodate a STAR followed by another STAR, hence the requirement for an Arrival Transition. These Arrival Transitions provide a repeatable route of waypoints that aircraft will flyover to ultimately reach the T-Bar/Y-Bar configuration. Arrival Transitions provide a systemisation of the approach element reducing the need for controller input and making it more predictable and repeatable. The Options below all include Arrival Transitions as they are in keeping with Design Principles 8 and 11.

4.25.3. Whilst Arrival Transitions are proposed, it is essential that the flexibility to vector aircraft off these is maintained for weather, fuel efficiency (more expeditious routing) and sequencing of traffic.

4.26. Arrival Option Evolution

4.26.1. The initial set of DOs (Options A-F) for the arrivals provided insufficient detail and were considered inadequate to be able to conduct a meaningful DPE and IOA against. Therefore, a second set of DOs (Options 1-5) were conceived and shared with stakeholders in the Second engagement period in March 2023. Both sets of DOs were presented for reasons of transparency in V1.0 of this document (available on the ACP portal) and Options A-F can still be viewed in that document on the ACP portal. For reasons of clarity and brevity, Options A-F have been removed from this version of the document. Note: There were no objections to the removal of Options A-F from representative stakeholders accordingly it is determined that stakeholders were content with the decision to evaluate the new DOs instead.

4.26.2. Since June 2023, an additional five DOs were developed following conversations with NERL, namely Options 6-10. The following paragraphs detail Options 1-10 that all underwent the Third round of stakeholder engagement in November/December 2023. Each DO has been considered for both runway operation modes and accordingly there are graphics showing the operation for RW32 and RW14.

4.26.3. NERL have expressed a preference to see Standard Terminal Arrival Routes (STARs) to LBA route via three particular exits from the Route Network:

- Traffic from W, NW and NE via RIBEL area;
- Traffic from S and ESE via MAMUL/GOLES; and
- Traffic from SW and W towards the LBA via existing arrival gates.

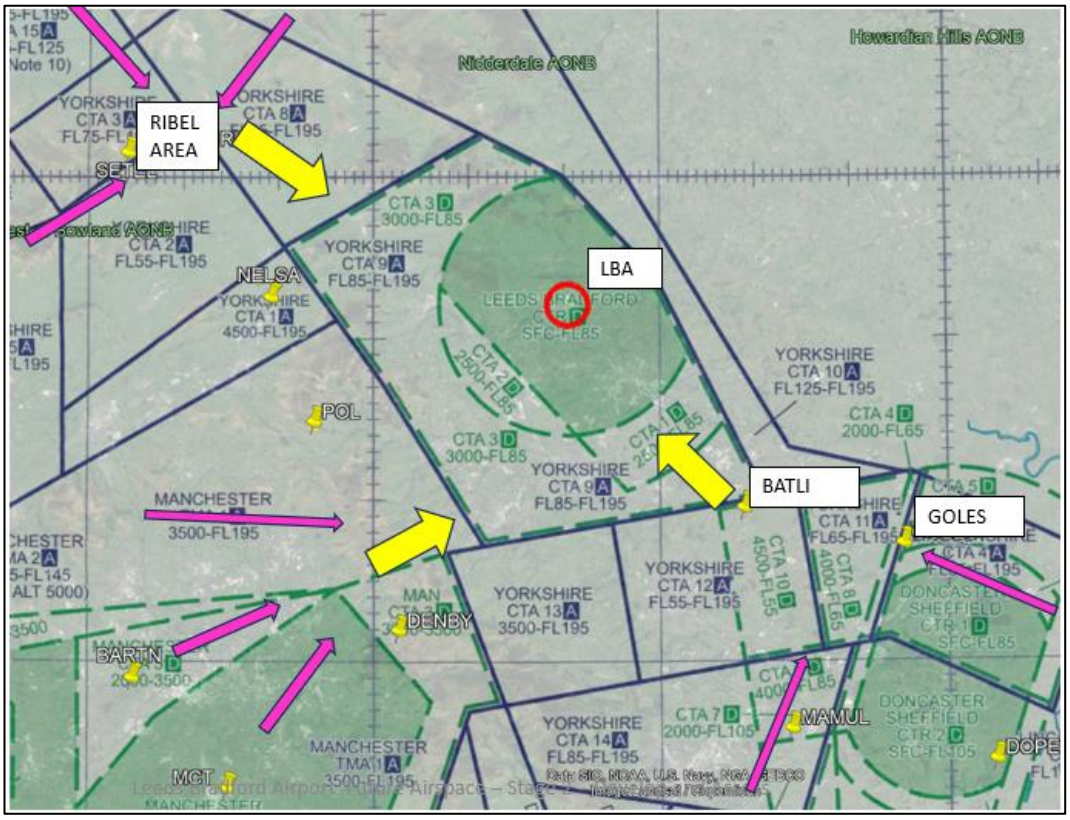


Figure 85: Arrival Flow Patterns

4.26.4. These points are chosen as they best fit the overall flow of the MTMA within which aircraft are climbing in and out of various airports. Important: *Note that the arrows on Figure 85 do not show flight paths, they show direction of travel to LBA runway.*

4.26.5. Typically, the holds at the end of STARs have a lowest holding level of FL90 (roughly 9,000ft) whilst any holds that are also used as Missed Approach Holds have a lower base altitude, typically circa 5,000ft.

4.26.6. **Note: The lines associated to the Arrival Transitions (yellow), Missed Approach Procedures (pink) and the holds (red racetrack pattern) on the following graphics do not show definitive flight paths, they are purely an indication of the systems being proposed in these DOs. The final procedures would be refined through the consultation process should a given option progress beyond CAP1616 Stage 2 of the process.**

4.27. Arrival System 1- Do Minimum – One Hold – Leeds Bradford Airport

4.27.1. Arrival System 1 (as shown in Figure 86 and Figure 87) is essentially a modernisation of the current construct with the addition of PBN. Instead of conventional approaches, the PBN approaches with their T/Y-Bar construct are fed into from the LBA with Arrival Transitions. Aircraft would still enter the LBA CTAs via the existing routes/gates towards the LBA and, tactically, would either be permitted to route directly for their approach (vectors or own navigation) or route via the LBA and the associated arrival transition.

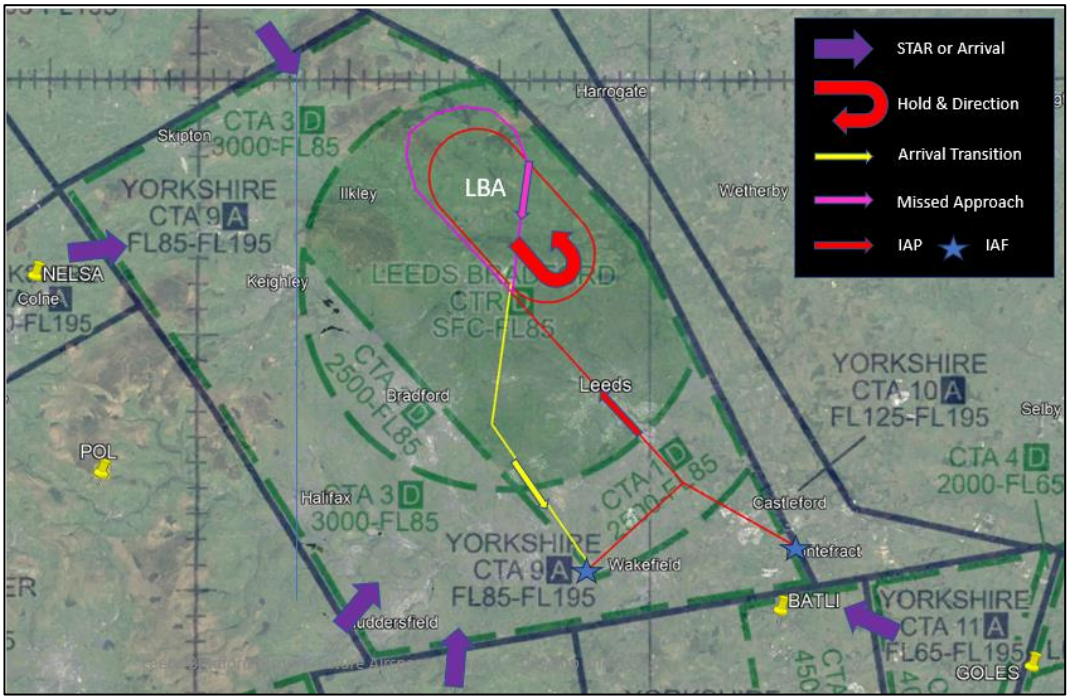


Figure 86: Arrival System 1 RW 32- Do Minimum – One Hold – LBA

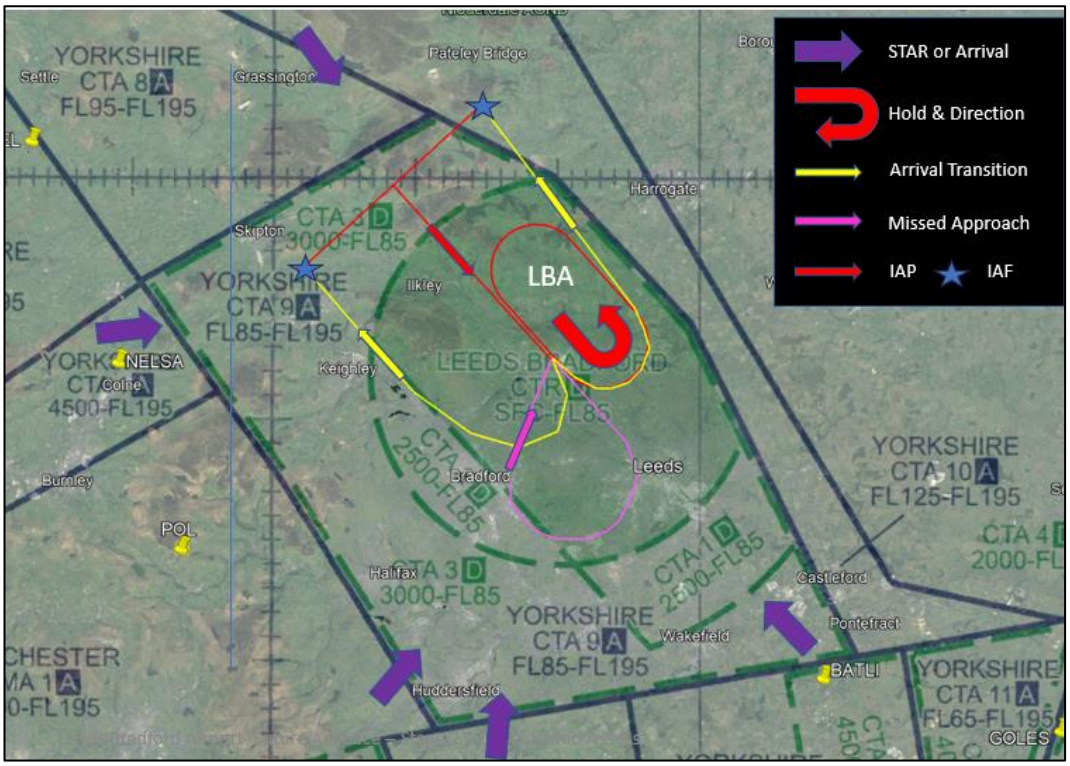


Figure 87: Arrival System 1 RW 14- Do Minimum – One Hold – LBA

4.28. Arrival System 2 – Two Holds – NELSA/GOLES

4.28.1. Arrival Option 2 (as shown in Figure 88 & Figure 89) sees the creation of two new holds, one to the NW and one to the SE. The SE hold would be associated with the routing from the ESE, i.e. the reporting point known as GOLES. The NW hold would be associated with the routing from the WSW, i.e. the reporting point known as NELSA and is most likely intended as the Missed Approach Hold in this configuration.

Note: The holds may be sited somewhere within the blue circles/lozenges.

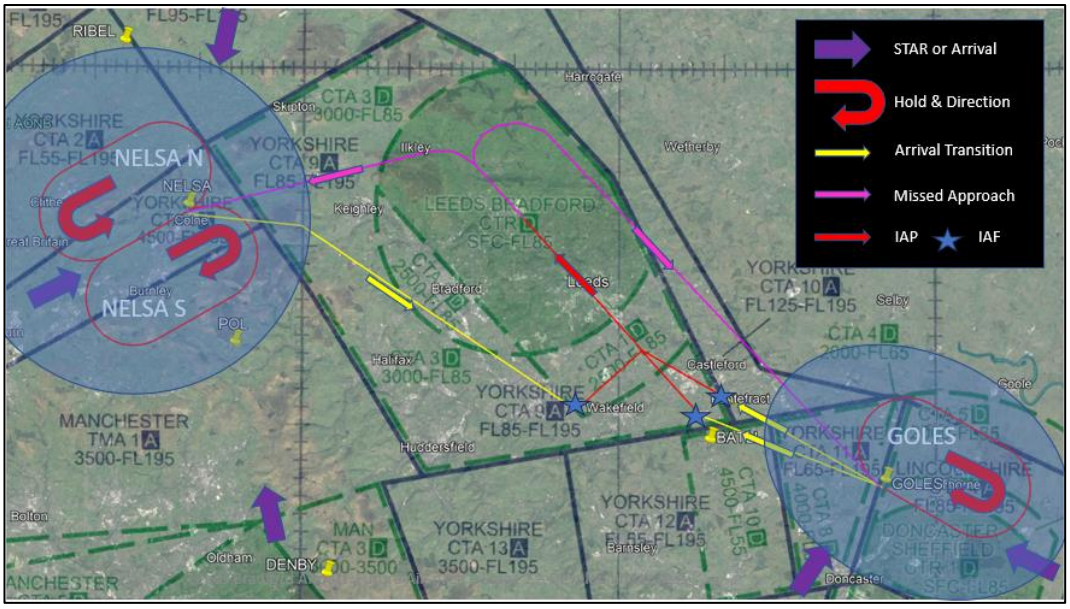


Figure 88: Arrival System 2 RW 32 – Two Holds – NELSA/GOLES

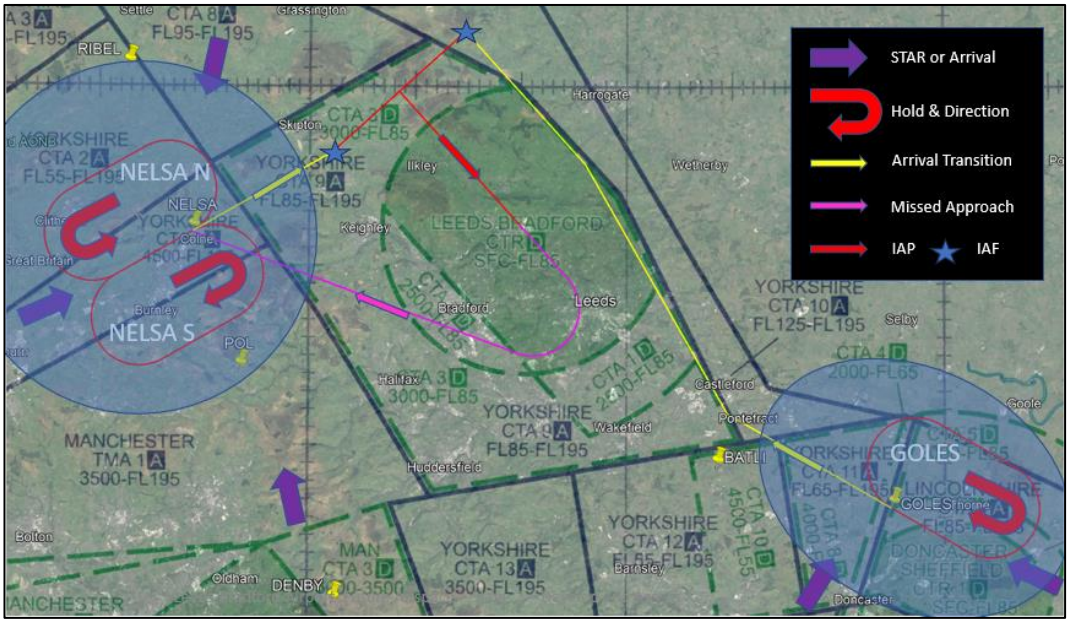


Figure 89: Arrival System 2 RW 14 – Two Holds – NELSA/GOLES

4.29. Arrival System 3 – Two Holds – 'AIREY' & 'WORTH'

4.29.1. Arrival Option 3 (as shown in Figure 90 & Figure 91) sees the creation of two new holds, one to the NW and one to the SE. The SE hold would be associated with the routing from the ESE, although unlike Option 2, the end of the STAR and the holding fix would be closer to the approach. The hold has been given the name 'AIREY' for ease of reference due to its proximity to the River Aire. The NW hold would be associated with the routing from the WSW and the RW14 T-Bar. It is closer to the Airport than NELSA and is referred to as 'WORTH' for ease of reference and its proximity to Haworth. The Missed Approach Hold in this configuration is dependent on runway in use as can be seen in the graphics.

Note: The holds may be sited somewhere within the blue circles/lozenges.

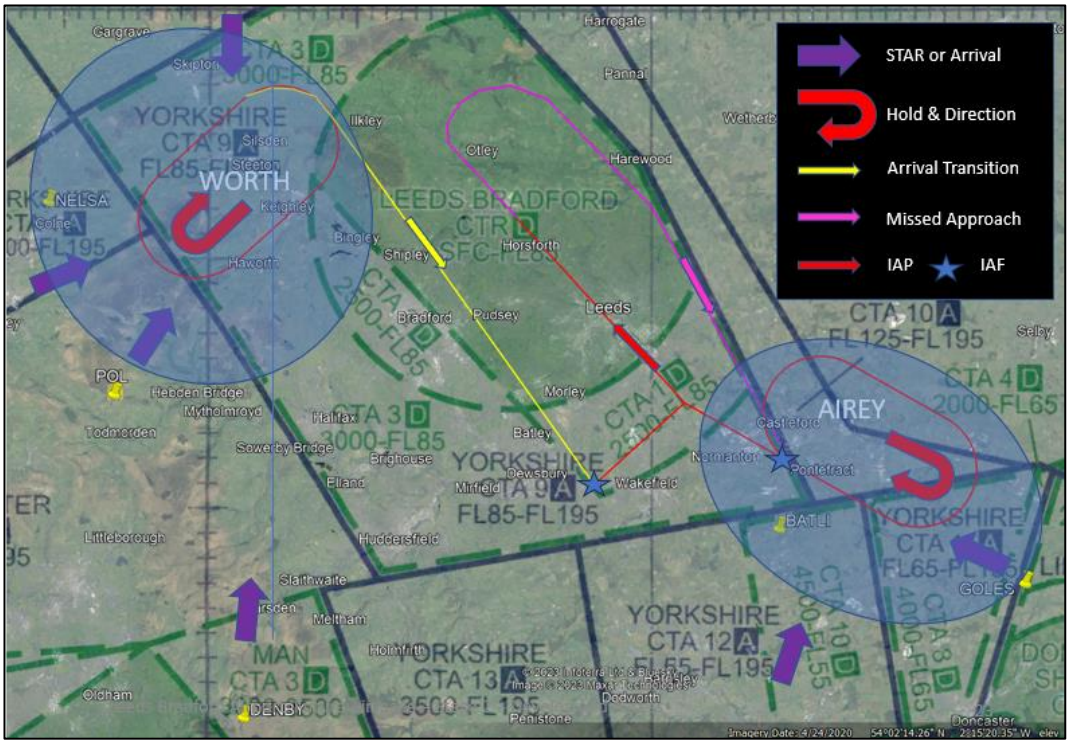


Figure 90: Arrival System 3 RW 32 – Two Holds – 'AIREY' & 'WORTH'

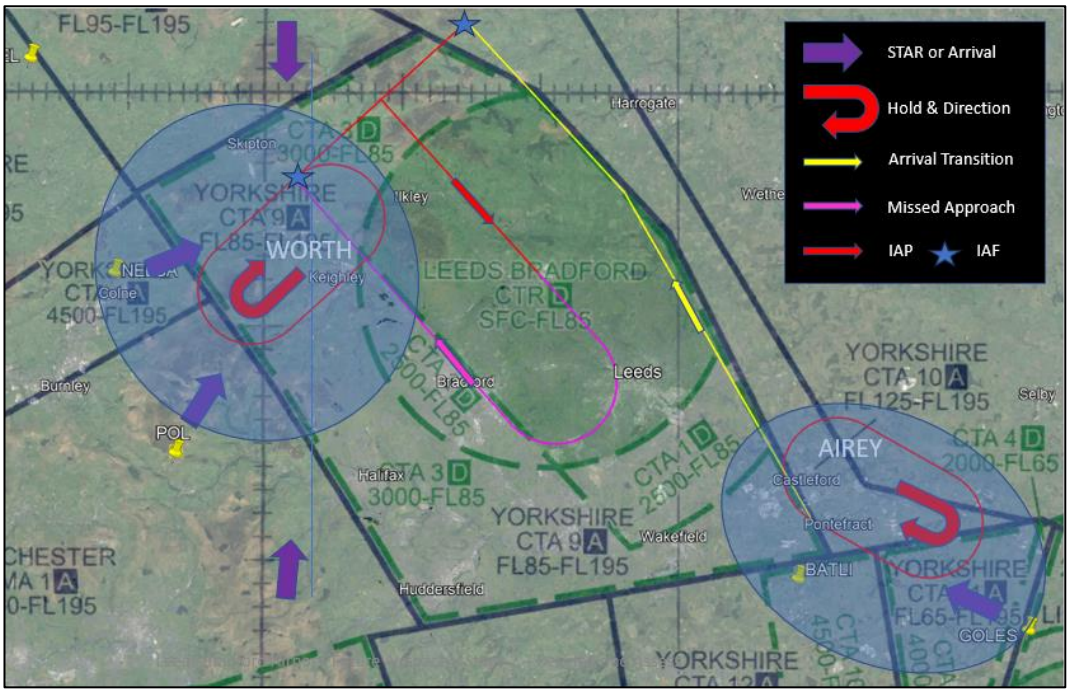


Figure 91: Arrival System 3 RW 14– Two Holds – 'AIREY' & 'WORTH'

4.30. Arrival System 4 – Three Holds – 'AIREY', 'WORTH' and the Leeds Bradford Airport

Arrival Option 3 (as shown in Figure 92 & Figure 93) is a hybrid of Option 3 in that the 'AIREY' and 'WORTH' holds remain but are complemented with the LBA Hold. Note: The 'AIREY' and 'WORTH' holds may be sited somewhere within the blue circles/lozenges. It is most likely that the LBA Hold would be the Missed Approach Hold in this configuration. Note: The holds may be sited somewhere within the blue circles/lozenges.

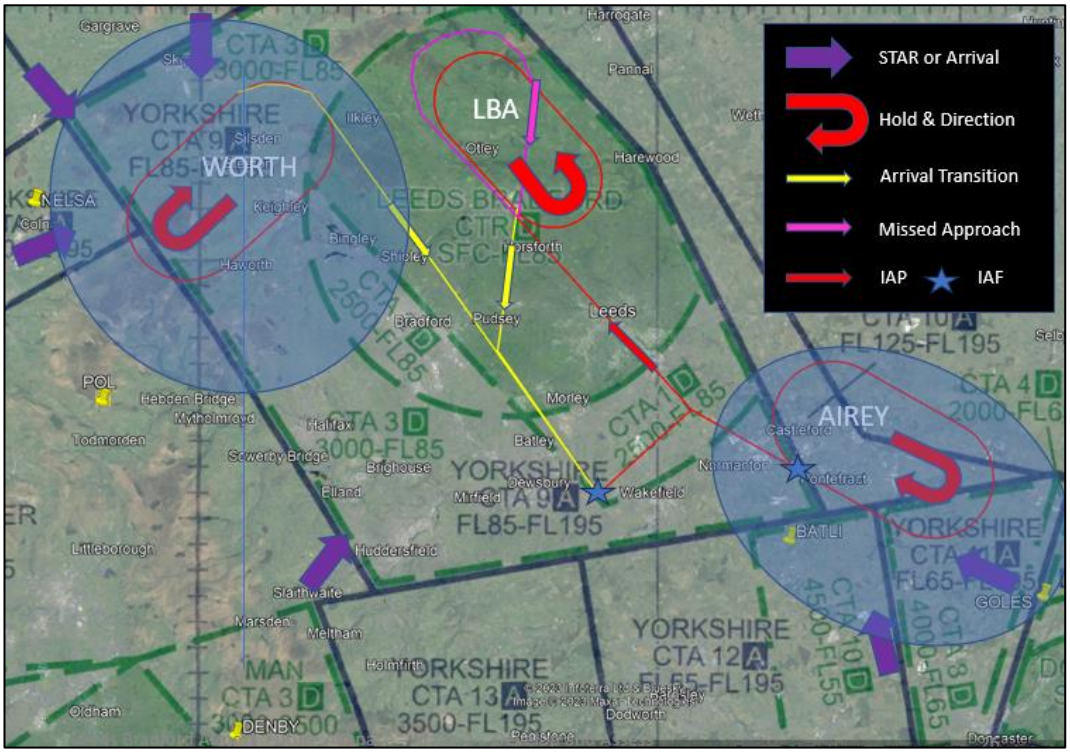


Figure 92:Arrival System 4 RW 32 – Three Holds – 'AIREY', 'WORTH' and the LBA

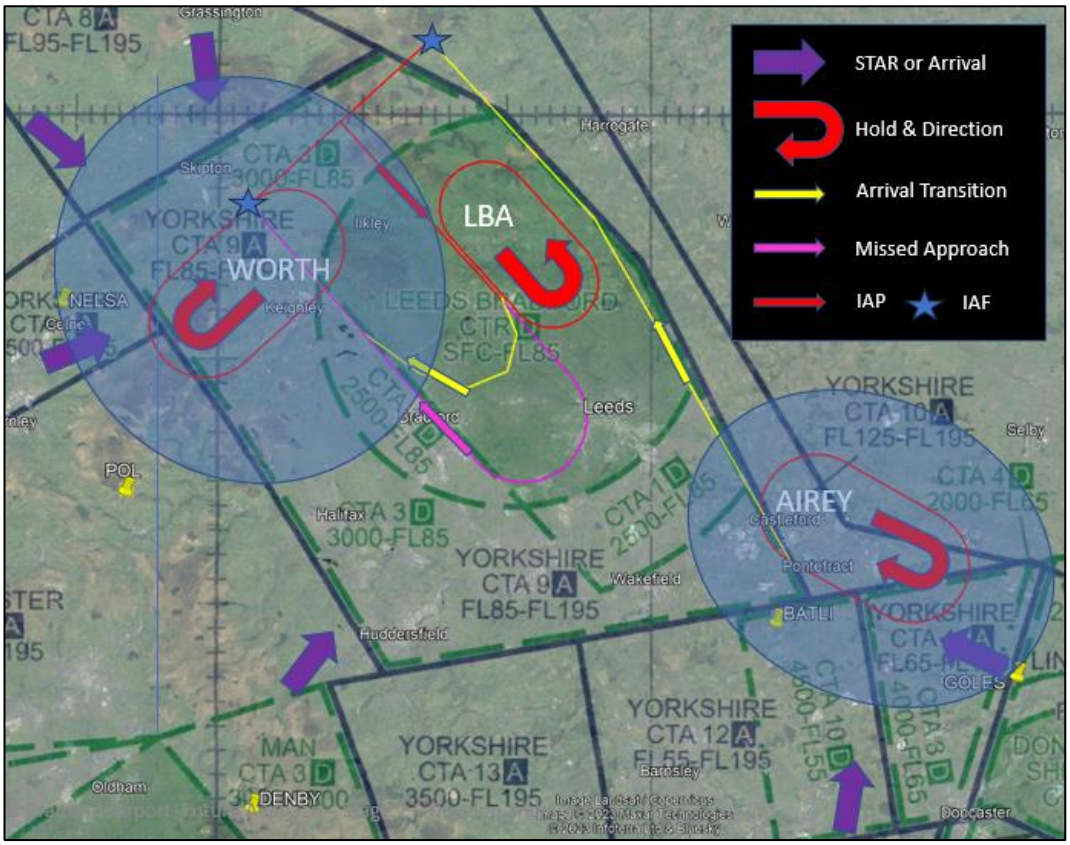


Figure 93: Arrival System 4 RW 14– Three Holds – 'AIREY', 'WORTH' and the LBA

4.31. Arrival System 5 – Three Holds – NELSA, 'UDDER' & GOLES

4.31.1. Arrival Option 5 (as shown in Figure 94 & Figure 95) is a hybrid of Arrival Option 2 in that it sees the inclusion of the holds at NELSA and GOLES but with the addition of another hold to the SW of the Airport given the name 'UDDER' due to its proximity to Huddersfield. The hold at NELSA is the most likely hold to be associated with the Missed Approach in this configuration.

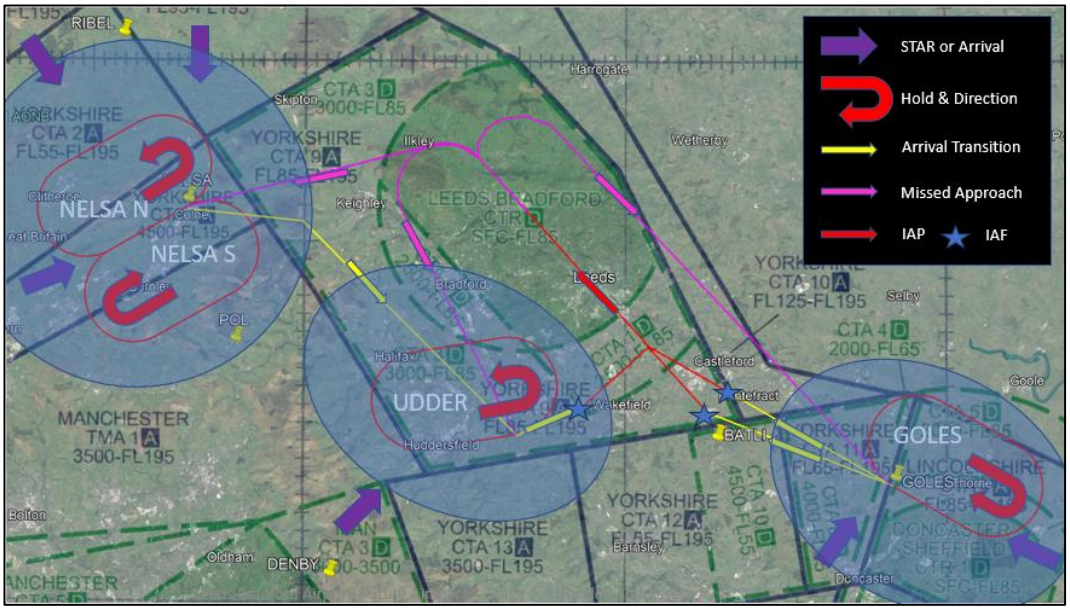


Figure 94: Arrival System 5 RW 32– Three Holds – NELSA, 'UDDER' & GOLES

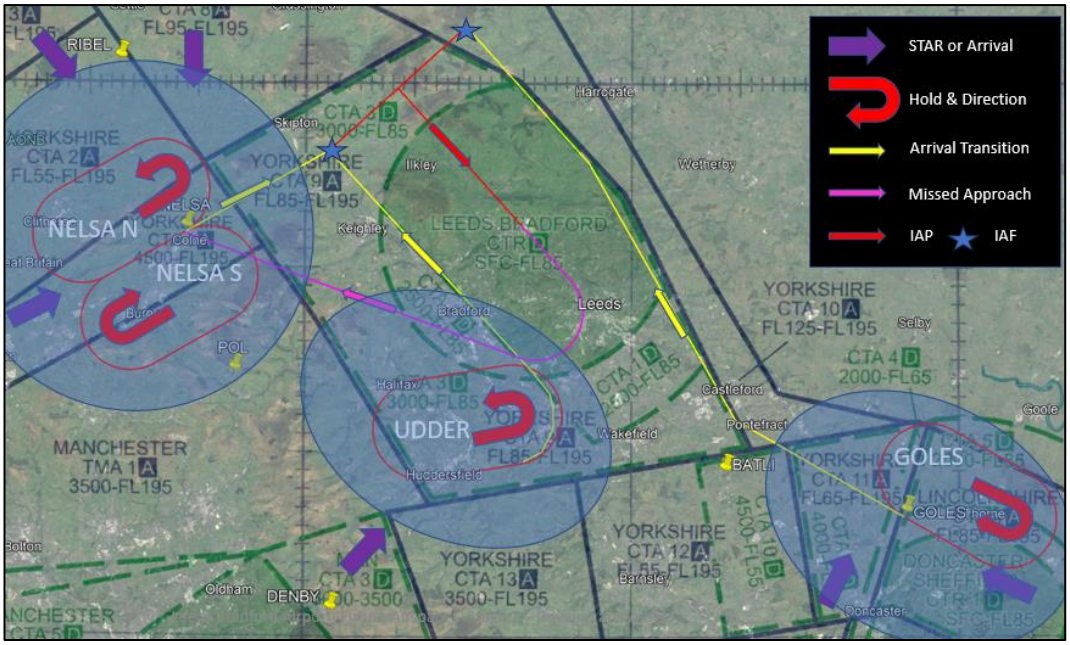


Figure 95: Arrival System 5 RW 14 – Three Holds – NELSA, 'UDDER' & GOLES

4.32. Arrival System 6 - 2 Holds – Leeds Bradford Airport/GOLES

4.32.1. Arrival Option 6, as seen in Figure 96 and Figure 97, is a two arrival hold system in which aircraft arriving from all directions other than the East have a STAR that ends with a holding fix at the LBA (or route directly through the existing arrival gates). Arrival Transitions then take aircraft from the LBA to a downwind left IAF for RW32 and to a downwind right IAF for RW14 unless aircraft are released on own navigation prior to reaching the LBA. Each runway has the potential to add a 'Trombone' for sequencing of traffic by extension of the downwind leg albeit this would result in the need to extend the LBA CAS. Traffic from the East would route via a STAR to a holding fix at GOLES and for RW14, an Arrival Transition would route initially to the East of the climb-out lane before turning through the overhead to a downwind right IAF (possibly utilising the Trombone for sequencing). For RW32, traffic would use an Arrival Transition to at 15nm final on the extended centreline, or via an extension (for sequencing) to the western IAF. The LBA hold would also serve as the MAP Hold in this configuration.

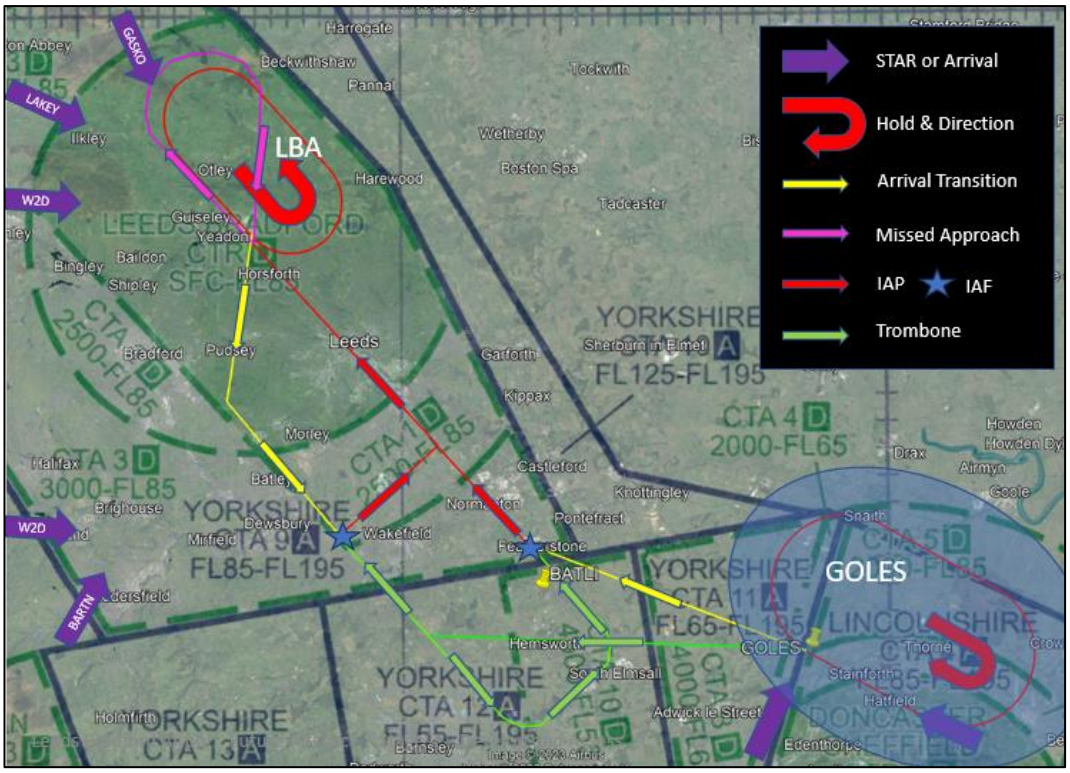


Figure 96: Arrival System 6 RW 32 - 2 Holds – Leeds Bradford Airport/GOLES

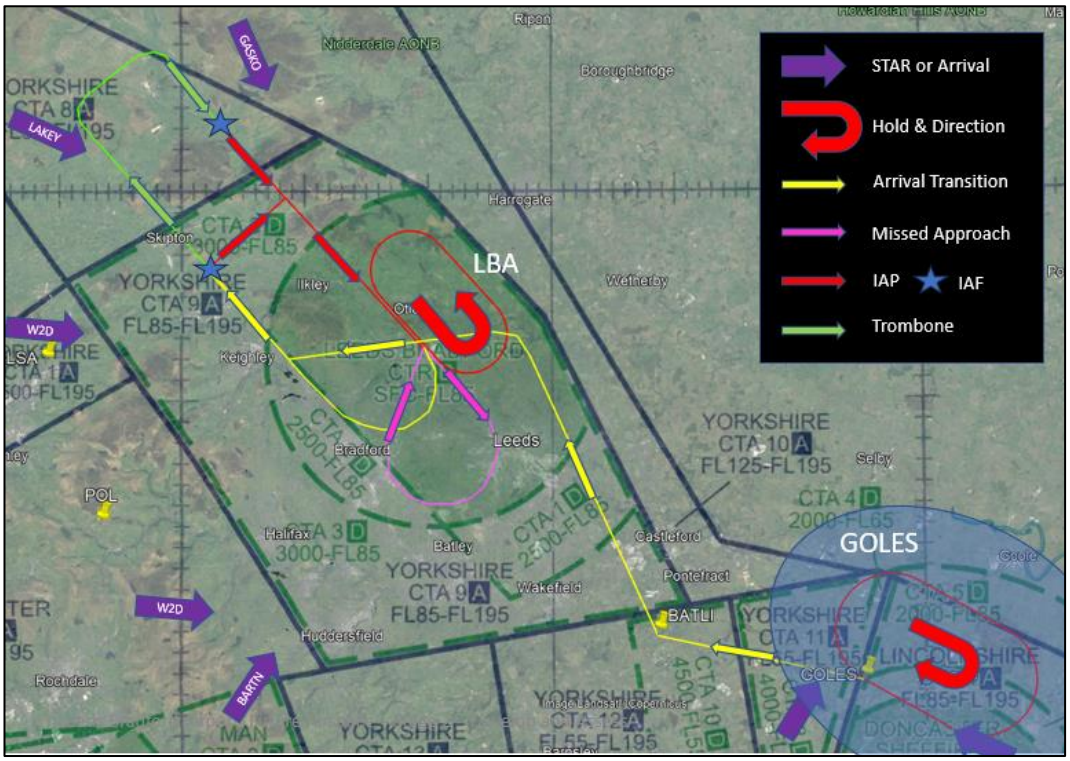


Figure 97: Arrival System 6 RW 14 - 2 Holds – Leeds Bradford Airport/GOLES

4.33. Arrival System 7 - 3 Holds – NW Hold/Leeds Bradford Airport/GOLES

4.33.1. Arrival Option 7, as seen in Figure 98 and Figure 99, is a three arrival hold system with the LBA additionally serving as the MAP Hold. Aircraft from the South-West and South-East would route through the existing arrival gates or via a STAR terminating at the LBA. Arrival Transitions then take aircraft from the LBA to a downwind left IAF for RW32 and to a downwind right IAF for RW14 unless aircraft are released on own navigation prior to reaching the LBA. Traffic from the East would route via a STAR to a holding fix at GOLES and for RW14, an Arrival Transition would route initially to the East of the climb-out lane before turning through the overhead to a downwind right IAF (possibly utilising the Trombone for sequencing). For RW32, traffic would use an Arrival Transition to at 15nm final on the extended centreline, or via an extension (for sequencing) to the western IAF. Traffic from the North-West or north-east would route via a STAR to a NW Hold before transitioning via the overhead for downwind left for RW32 or a 15nm final for RW14.

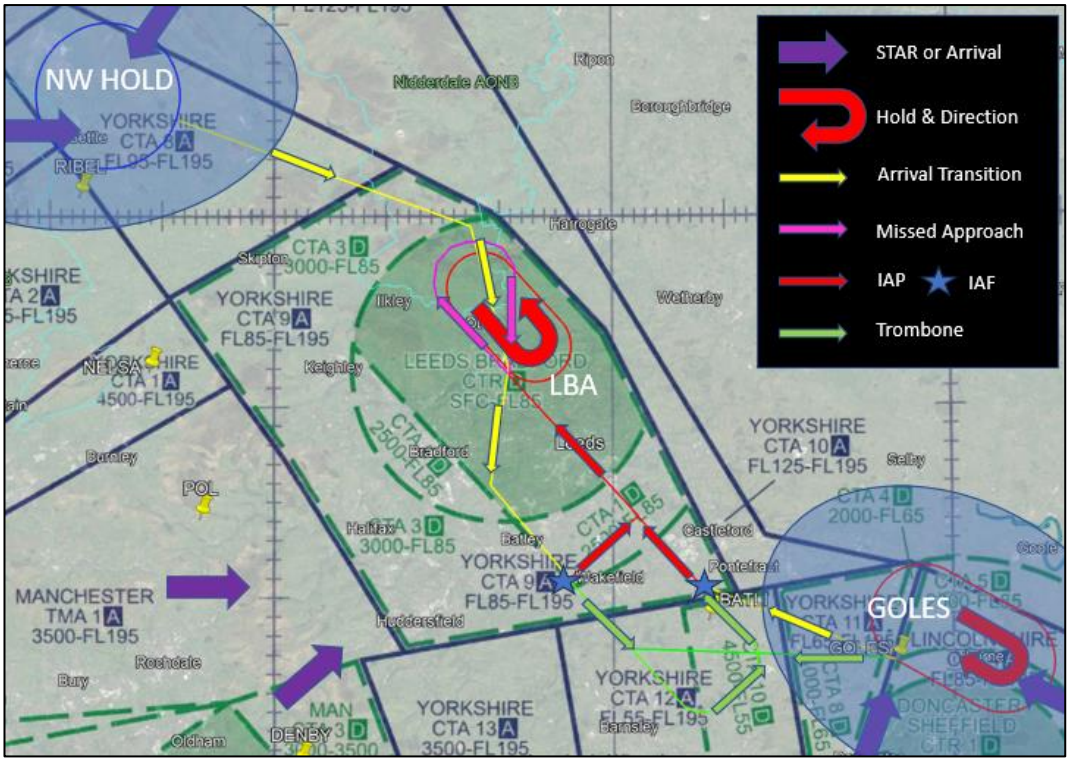


Figure 98:Arrival System 7 RW 32 - 3 Holds – NW Hold/Leeds Bradford Airport/GOLES

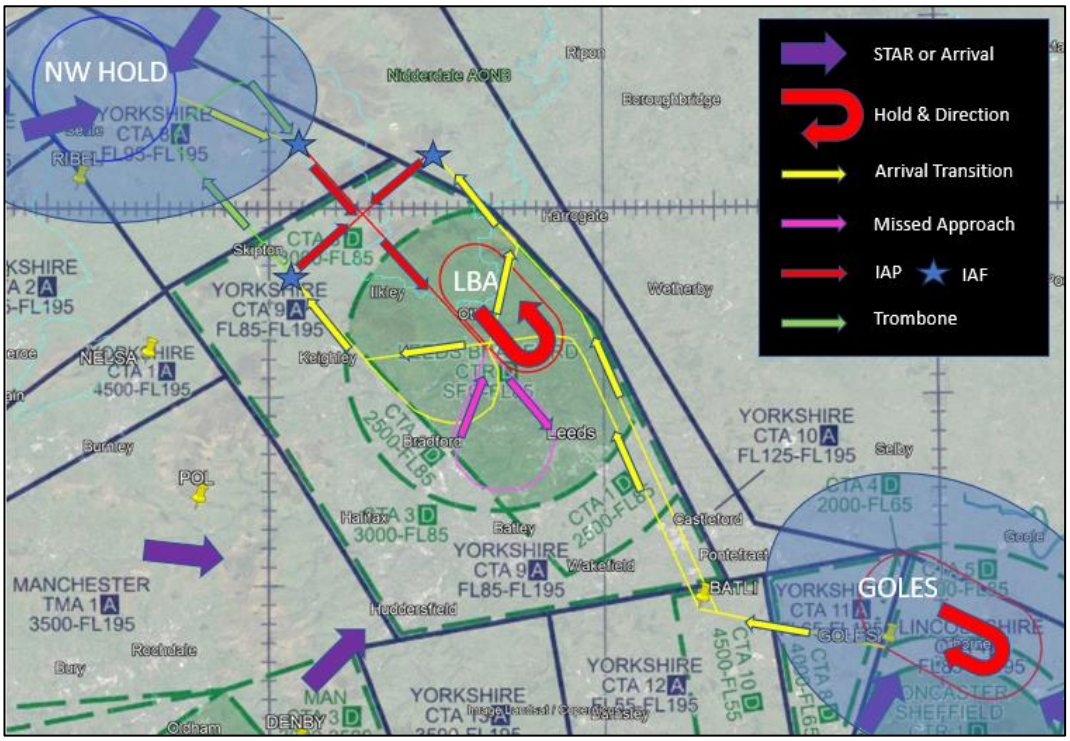


Figure 99: Arrival System 7 RW 14- 3 Holds – NW Hold/Leeds Bradford Airport/GOLES

4.34. Arrival System 8 - 2 Arrival Holds – NW Hold/GOLES

4.34.1. Arrival Option 8 is a two arrival hold system with the LBA purely serving as a MAP hold. All traffic would be sent via a STAR to either a holding fix to the North-West or via the holding fix at GOLES (depending on the direction the traffic had come from). There would be no arrival gates. Aircraft would then transition to the IAFs as depicted in Figure 100 and Figure 101.

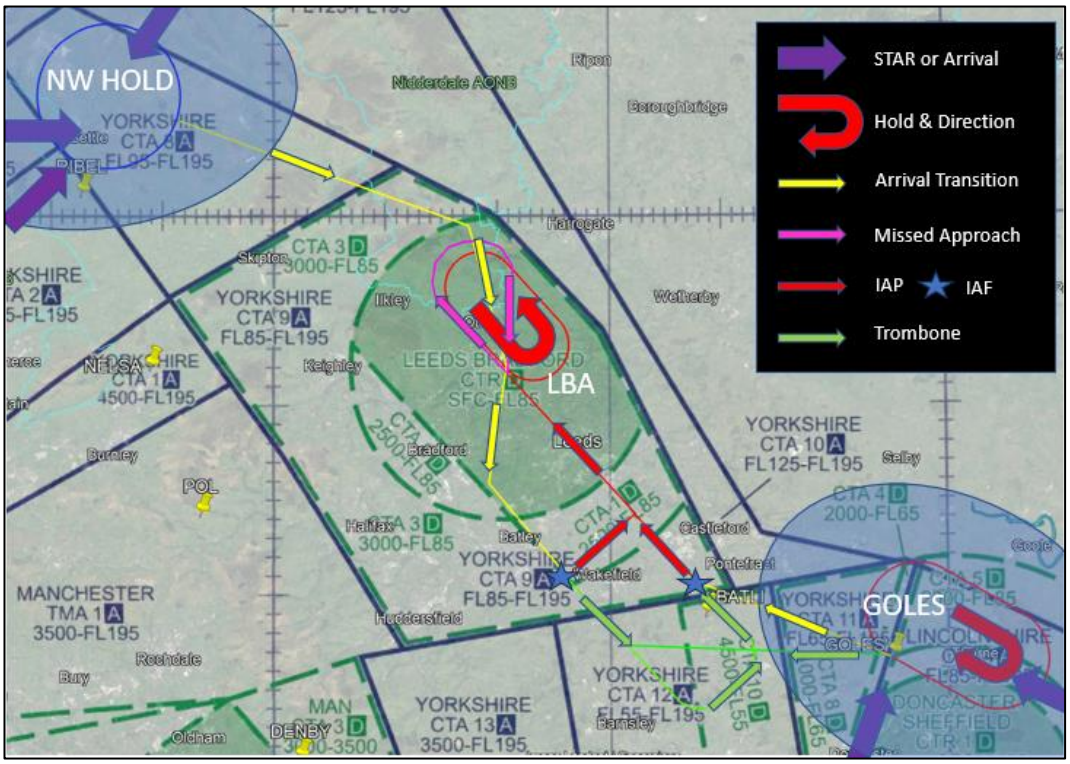


Figure 100: Arrival System 8 RW 32- 2 Arrival Holds – NW Hold/GOLES

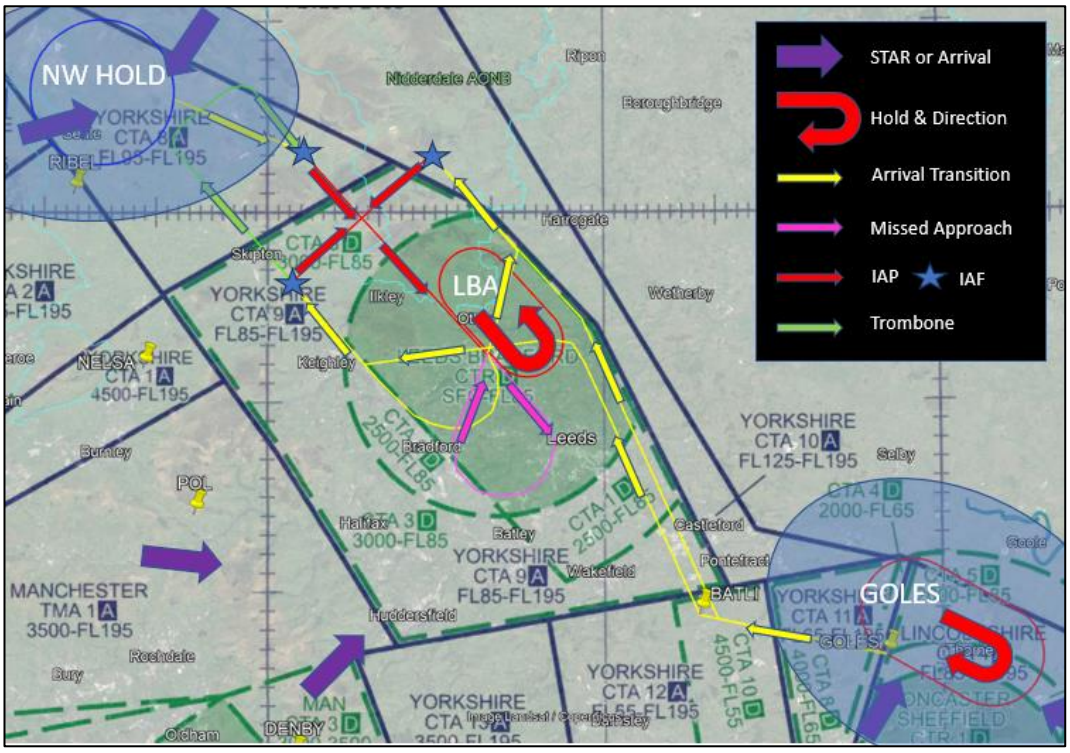


Figure 101: Arrival System 8 RW 14- 2 Arrival Holds – NW Hold/GOLES

4.35. Arrival System 9 - 2 Holds – 'UDDER'/GOLES

4.35.1. Arrival Option 9 is a two arrival hold system and again the LBA is purely used for the MAP hold. Traffic from the North-West and north-east would be tactically managed largely due to the small volumes associated with these arrival directions. Traffic from the South-West and west would be routed via a STAR terminating at UDDER and the traffic from the South-East and east would utilise a STAR ending at GOLES. Traffic would then transition as depicted in Figure 102 and Figure 103.

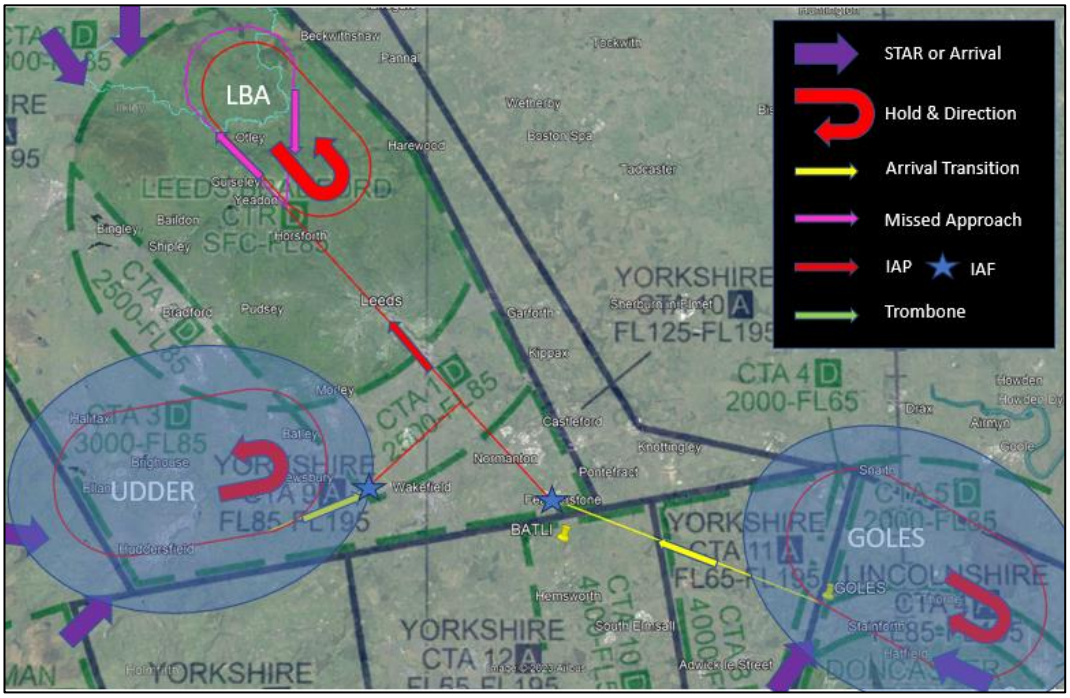


Figure 102: Arrival System 9 RW 32- 2 Holds – 'UDDER'/GOLES

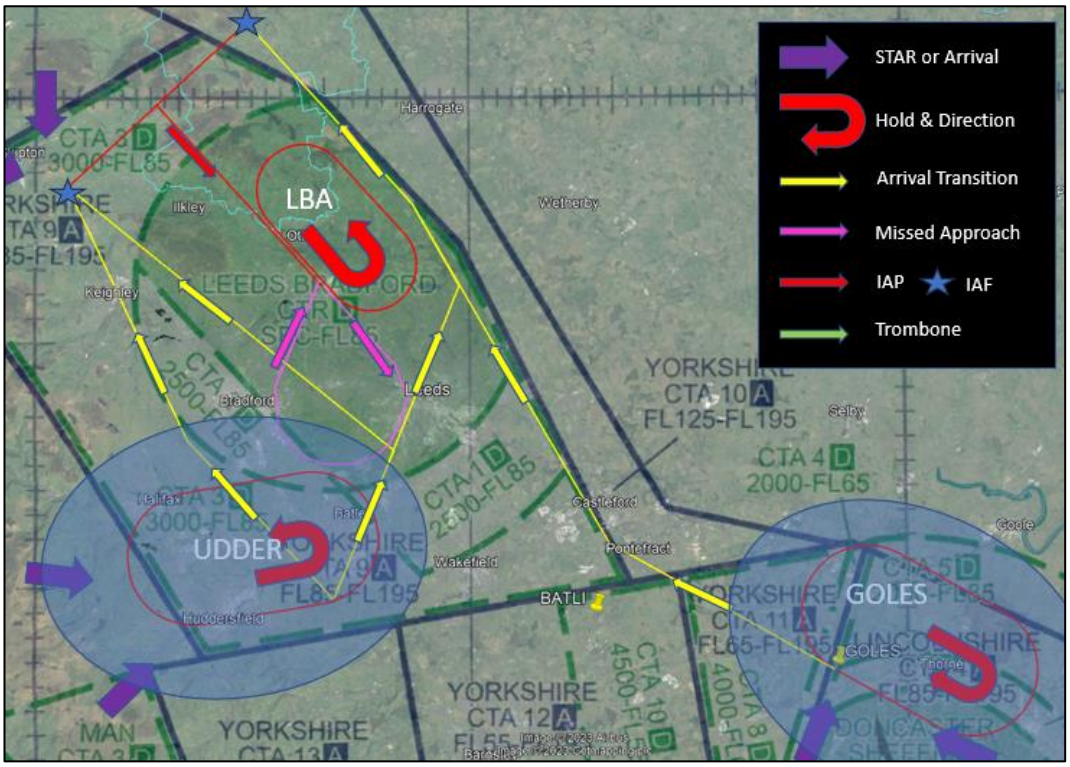


Figure 103: Arrival System 9 RW 14- 2 Holds – 'UDDER'/GOLES

4.36. Arrival System 10 - 1 Arrival Hold – GOLES & Direct Arrivals

4.36.1. UK policy [24] requires that STARs conclude at a holding fix with an associated arrival hold. From this holding fix, arrival transitions can be designed to take aircraft directly to the various IAFs from which to commence their final approach.

4.36.2. The problem with this is that holds take up significant volumes of airspace and the protection required around them exacerbates this still further. Therefore, finding suitable volumes of airspace within which to contain the holds required for the required STARs into LBA has become a challenge.

4.36.3. One of the objectives of the AMS is to systemise airspace to an optimal extent, providing repeatable, predictable and efficient procedures that are all linked. Adherence to UK policy on STARs whilst seeking to meet the demands of the AMS is proving challenging at LBA due to the limitations on where holds can go.

4.36.4. CAP 785B is a Civil Aviation Publication (CAP) written by the CAA that gives sponsors the option to develop STARs that do not have holding fixes or holds but instead route directly to the IAFs. These 'Direct Arrivals' require the Sponsor to provide the CAA's IFP Regulator sufficient justification for why they do not wish to adhere to normal policy.

4.36.5. Option 10 is an attempt to systemise the LBA operation without having STARs (that have holding fixes and holds) for every arrival direction. Instead, only traffic from the South and East would have a STAR ending at a holding fix (GOLES). Traffic from all other arrival directions would have direct arrivals to the respective IAFs contained within the swathes depicted in Figure 104 and Figure 105. In this configuration, the LBA is intended as a MAP and weather hold with GOLES intended as an arrival and weather hold (with transitions to the approach).

4.36.6. The coloured swathes depict containment for other arrival transitions with purple arrows depicting the likely origin of that traffic into the LBA CTA. Airspace to the West of GOLES intended to contain potential 'trombone' procedure to facilitate the sequencing of arrivals.

[24] https://publicapps.caa.co.uk/docs/33/PolicyConventionalSIDSSTARSHOLDSusingPBN2018.pdf

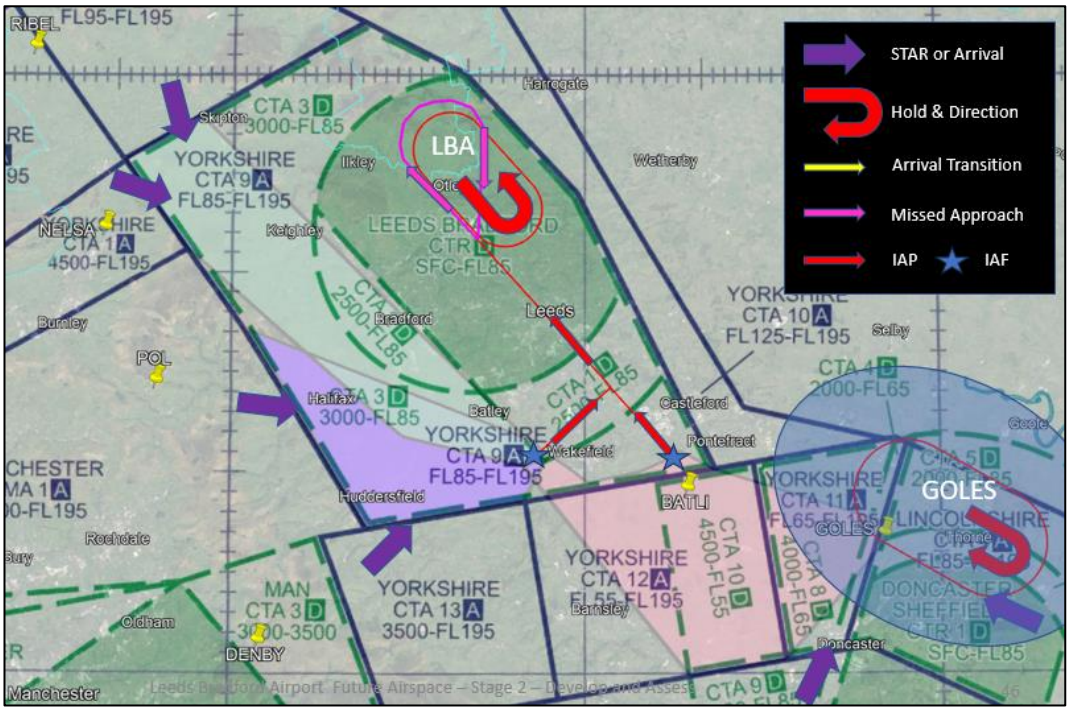


Figure 104: Arrival System 10 RW 32 - 1 Arrival Hold – GOLES & Direct Arrivals

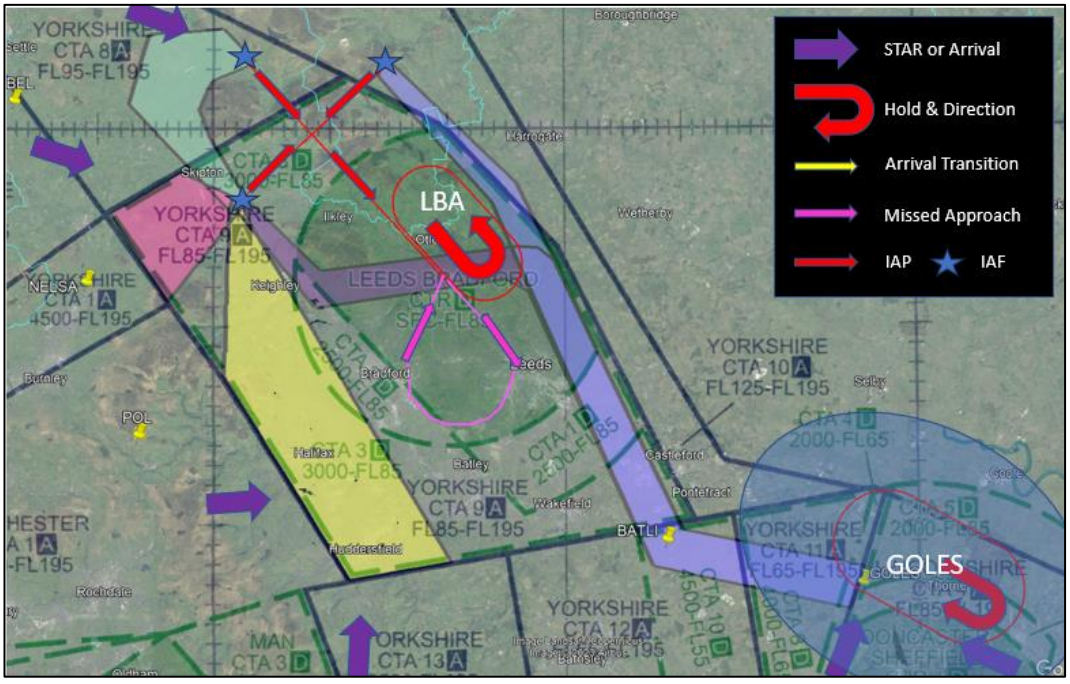


Figure 105: Arrival System 10 RW 14 - 1 Arrival Hold – GOLES & Direct Arrivals

4.37. Additional Option – Required Navigation Performance (Authorisation Required) Approaches

4.37.1. (RNP AR) Approaches use cutting-edge satellite-based technology flown by the most up to date aircraft fleets. Highly accurate track monitoring enables shorter final approaches and manoeuvres around built-up areas. LBA would be the first UK airport to propose such ambitious eco-friendly approaches, but these have been safely proven around the world for over a decade.

4.37.2. Limited aircraft are certified to fly such approaches in Instrument Meteorological Conditions in the UK at this time, however this capability is forecast to increase rapidly in the next 2-5 years and therefore could potentially be flown under Visual Meteorological Conditions by non-certified operators.

4.38. Required Navigation Performance (Authorisation Required) RW14

4.38.1. This option affords a more environmentally friendly approach providing a shorter route to RW14 from the SE. Significantly shorter than the STAR and, as a result, significant fuel and CO_2 saved on each arrival. Eastern suburbs of Leeds overflown not below 5,000 ft at continuous descent on idle power, further descent over open countryside until final approach.

4.38.2. **It is important to note** that this option is only an indication of what might be possible. It would be optimised for noise, fuel and emissions reduction before final proposals are developed for consultation.

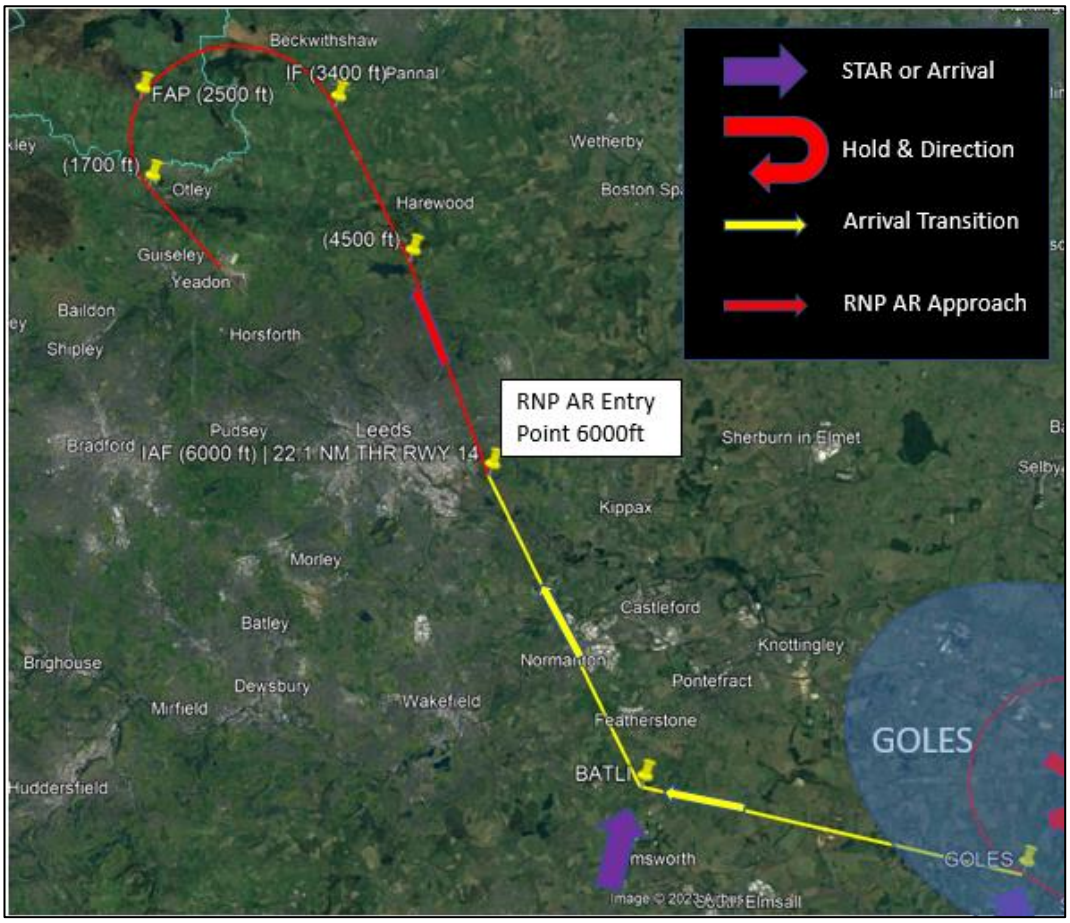


Figure 106: RNP AR RW14 Overview

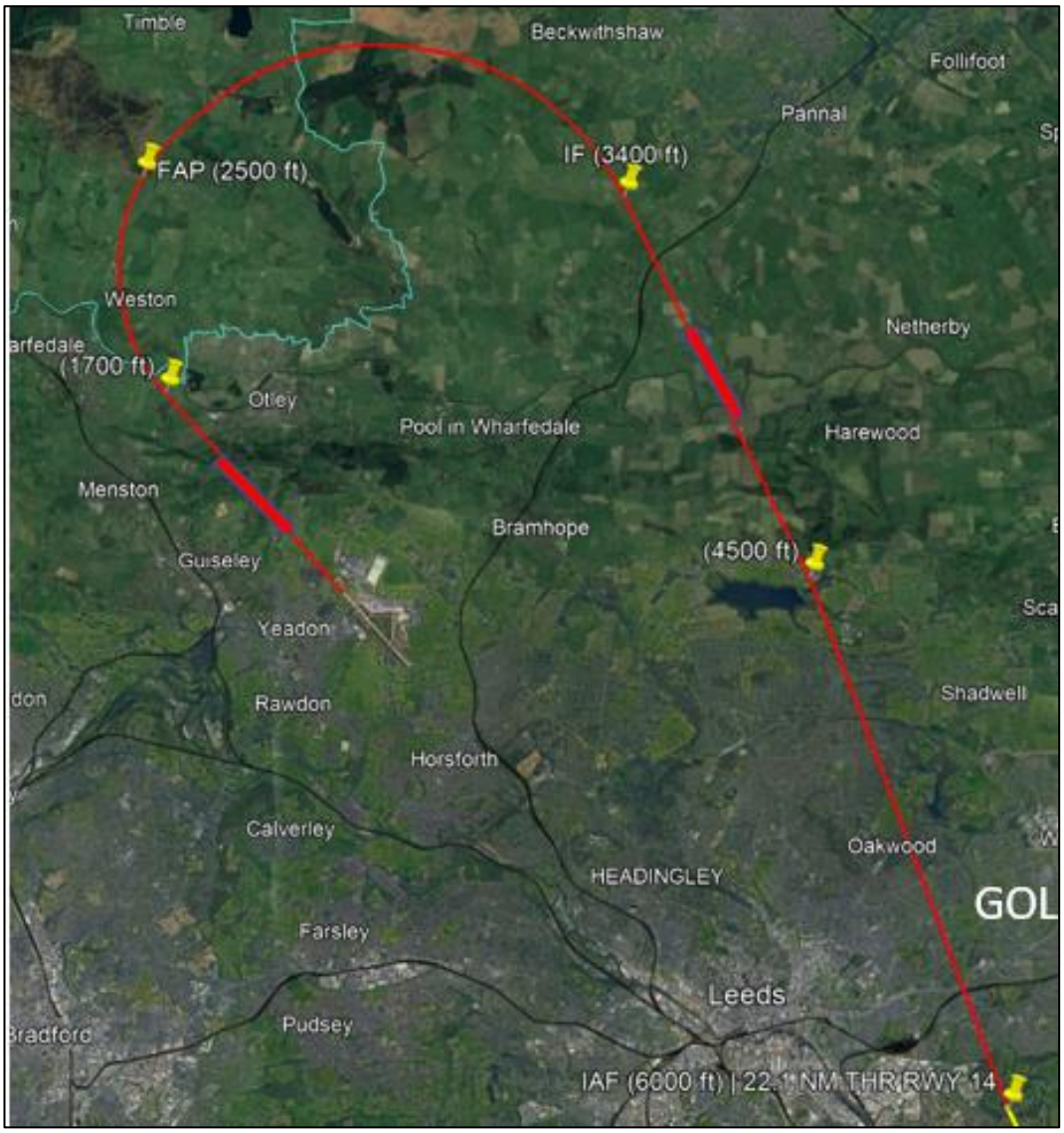


Figure 107: RNP AR RW14 Closer

4.39. Required Navigation Performance (Authorisation Required) Approaches RW32

4.39.1. This option is an approach offset intended to avoid overflying central Leeds Residential district, Headingley and Hyde Park Districts. This is a potential respite option that could be alternated with standard approach on rotation. It has the potential for arrival transitions to the IAF from other arrival directions, not just GOLES.

4.39.2. **It is important to note that this option is concept only.** This option only an indication of what might be possible. It would be optimised for noise, fuel and emissions reduction before final proposals are developed for consultation in Stage 3 of this ACP.

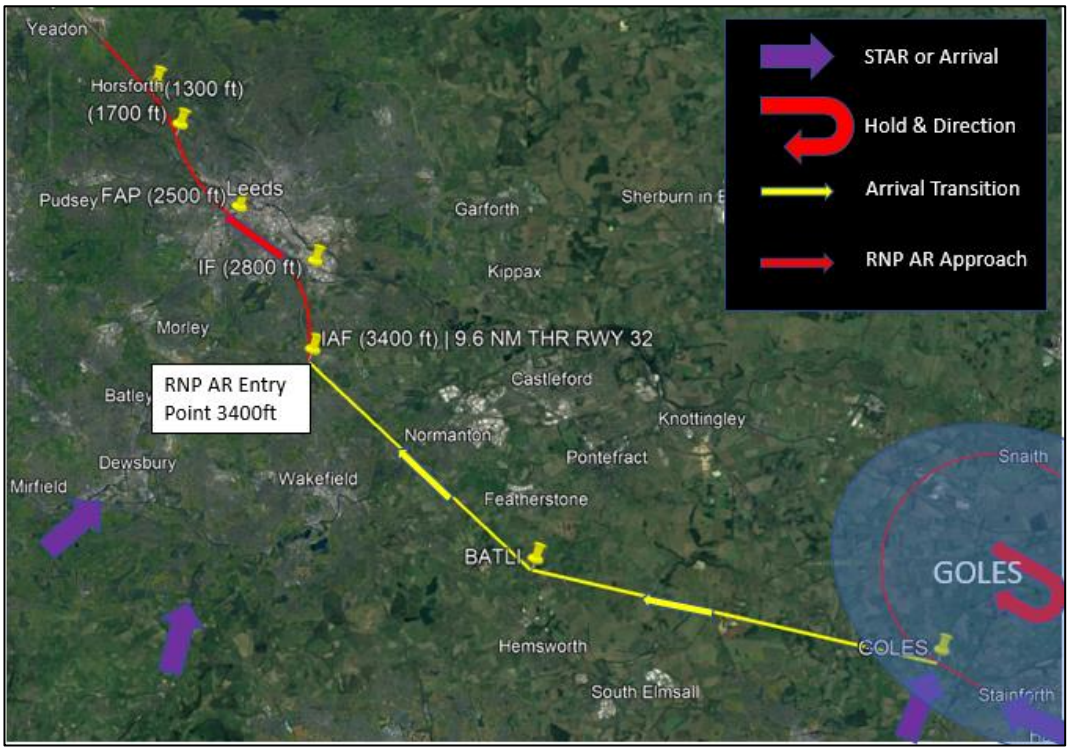


Figure 108: RNP AR RW32 Overview

Figure 109: RNP AR RW32 Closer

5. Targeted Stakeholder Engagement

5.1. Stakeholder List

5.1.1. The CAA sets out the engagement expected in CAP 1616 at Stages 1 and 2 as being targeted at the following:

- Directly affected local aviation stakeholders, including airspace users, Air Navigation Service Providers (ANSPs) and airports;
- Relevant members of the National ATM Advisory Committee (NATMAC);
- Relevant aviation/non-aviation national organisations, including those which represent areas/interests likely to be affected by potential impacts; and
- Elected representatives and/or environmental interest groups representing communities likely to be affected by potential impacts (such as noise or economic growth) associated with the change.

5.1.2. The Stakeholder List (See below) was developed based upon the guidance in CAP 1616 for targeted stakeholder at the representative level. The List evolved from that which was used in Stage 1 to invite stakeholders previously not included to participate.

5.1.3. The Engagement process resulted in some responses from local residents who had discovered this process was underway. Whilst their interest in the process, and their feedback has been noted, these community stakeholders will get their opportunity to feed into the process at the appropriate time, i.e. during Stage 3. Some of the feedback indicated that the Airport was not following consultation 'best practice' and there was a feeling that the Airport was covertly bringing about change without due process. This is not the case; the CAP 1616 process is being followed and community stakeholders can be assured that they will be consulted extensively during Stage 3.

5.1.4. Local Councils

Barnsley Council	Kirklees Council
Bradford Council	Leeds City Council
Calderdale Council	Mayor of West Yorkshire
Craven District Council	Pendle Borough Council
Doncaster Council	Selby District Council
Harrogate Borough Council	Wakefield Council

5.1.5. Airport Consultative Committee

Chairman	Pool In Wharfedale Parish Council	Horsforth Town Council
Transdev	Bramhope & Carlton Parish Council	City Of Bradford MDC
Harrogate District Chamber of Commerce	Wakefield Council	LBA Support Group
Burley in Wharfedale Parish Council	Inner North-West Community Committee	Yorkshire Local Councils Association - Leeds Branch 1 of 2
Calderdale Council	Leeds City Council (CON)	Vale of York Gliding Clubs
North Yorkshire County Council	Rawdon Parish Council	Aireborough Neighbourhood Forum
Local Resident Rep - Yeadon	Leeds City Council (LAB)	Yorkshire Local Councils Association - Leeds Branch 2 of 2
Baildon Town Council	Otley Town Council	Menston Parish Council
Local Resident Rep - Horsforth End of runway	Trades Union Congress - Yorkshire & The Humber	

5.1.6. Environmental Bodies

National Trust
Natural England
Peak District NP Authority
Yorkshire Dales NP Authority

5.1.7. Technical Stakeholders

Aurigny	KLM
British Airways (BA Cityflyer)	Manchester ATC
Doncaster Sheffield ATC (ATCSL)	Multiflight

Eastern Airways	NATS En-Route Ltd (NERL)
EasyJet	RAF Leeming ATC
Helijet	Ryanair
Jet2	Teesside ATC

5.1.8. Local Aviation Stakeholders

(Doncaster Sheffield Flight Training)	Dales Hang gliding and Paragliding Club (DHPC)	Humber Flying Club
Bagby	Derbyshire Soaring Club	Humberside Airport Flying School
Breighton Aerodrome	DSA	Humberside POM Flying Club
Burn Gliding Club	DSA (Yorkshire Aero Club)	LAC Flight School
Camphill	Flight Academy Manchester	Leeds East Airport
City Airport and Heliport	Full Sutton Airfield	Netherthorpe (Sheffield Aero Club)
Cleveland Flying School	Heli-Jet Aviation	North-West Leeds Transport Forum
Crosland Moor Airfield	Hields Aviation	NPAS
Pennine Soaring Club	Sandtoft Airfield	Sutton Bank (Yorkshire Gliding Club)
Pocklington (Wolds Gliding Club)	Sheffield Aero Club	Teesside International Airport (Eden Flight Training)
Retford Gamston	Sherburn Aero Club	Sutton Bank (Yorkshire Gliding Club)
Warton Aerodrome	West Yorkshire Police	York Rufforth (York Gliding Centre)
Yorkshire Air Ambulance		

5.1.9. National Air Traffic Management Advisory Committee

ACOG	British Airways (BA)	Helicopter Club of Great Britain (HCGB)
Aircraft Owners and Pilots Association (AOPA)	British Balloon and Airship Club	Honourable Company of Air Pilots (HCAP)
Airfield Operators Group (AOG)	British Hang gliding and Paragliding Association (BHPA)	Light Aircraft Association (LAA)
Airlines UK	British Gliding Association (BGA)	Low Fare Airlines
Airspace4All	British Helicopter Association (BHA)	Military Aviation Authority (MAA)
Aviation Environment Federation (AEF)	British Microlight Aircraft Association (BMAA) / GA Safety Council (GASCo)	Ministry of Defence - Defence Airspace and ATM (MoD DAATM)
BAe Systems	British Parachute Association (BPA)	NATS / NERL
British Airline Pilots Association (BALPA)	GA Alliance	PPL/IR (Europe)
UK Airprox Board (UKAB)	UK Flight Safety Committee (UKFSC)	

5.1.10. Others

Independent submission: former ACC member	ARARA (Ash Road Area Residents Association)	Climate Action Menston
Liverpool John Lennon Airport	Crosland Moor Airfield (Huddersfield)	Ledsham Parish Council
MAG Manchester Airport	Bramhope & Carlton Parish Council	Cardigan Triangle Association
Regional Soaring Airspace Group (RSAG)	The four Gliding Clubs in the Vale of York	Skyhigh skydiving

Harrogate District Chamber of Commerce	LCC Planning	Leeds City Council Inner North-West Community Committee
Pennine Soaring Club	City Airport Ltd (Manchester Barton)	Several individuals

5.2. Workshops

5.2.1. Two workshops were held on the 05 July 2022 (one for Technical stakeholders and another for Non-Technical stakeholders). These workshops introduced the list of DOs to the stakeholders and our assessment of the DOs against the DPs they helped us develop during Stage 1.

5.2.2. An update was sent to stakeholders on 28 July 2022 to provide additional context to the DOs and address some of the questions raised. This document can be viewed on the ACP Portal (CPJ-5692-PRE-017-LBA Future Airspace Stage 2A – Update).

5.3. July 2022 Update and Survey 1

5.3.1. Following these workshops, stakeholders were invited to take part in an online survey which ran from the 13 July 2022 to the 26 August 2022. This survey asked whether the Stakeholders felt we had applied the DPs correctly and consistently to each of our DOs. It provided an opportunity to comment on areas they felt this may not have been the case. The Survey[25] and feedback, which shaped the evolution of our DPE, can be found in full within the 'Stakeholder Engagement Record' on the ACP Portal.

5.4. Meetings with Manchester Terminal Manoeuvring Area Team

5.4.1. Following a period of reflection, and in response to some stakeholder feedback, a series of additional departure DOs were conceived along with a revised array of arrival system DOs. These were discussed in detail with the NERL MTMA ACP Project Team over a series of bilateral meetings. These meetings were deemed to be essential, given that the interface with the Route Network is fundamental to the operational viability of any future systems and procedures. The LBA Team also attended two Visualisation Simulations[26] developed to understand how the whole MTMA might work with the new procedures.

[25] The surveys can be found on the ACP portal entitled 'Survey round 1, 2 and 3' respectively.

[26] Visualisation simulation imitates the operation of real-world processes or systems with the use of models. The model represents the key behaviours and characteristics of the selected process or system while the simulation represents how the model evolves under different conditions over time.

5.5. March 2023 Update Brief and Survey 2

5.5.1. The revised array of DOs was shared with the same set of stakeholders over the period 31 March 2023 to 28 April 2023 through a presentation sent out via email. The presentation was accompanied by an online survey and again sought feedback on whether stakeholders felt we had applied the DPs correctly and consistently to each of our DOs.

5.5.2. The feedback, which shaped the final version of the DPE, can be found in full within the 'Stakeholder Engagement Record' on the CAA ACP Portal.

5.6. November/December 2023 Update Brief and Survey 3

5.6.1. Following the unsuccessful Stage 2 Gateway in Summer 2023, various new DOs were conceived and evaluated internally. These new DOs, developed through discussion with the MTMA ACP Project Team, were shared (along with most of the previously aired DOs) with the same set of stakeholders over the period 22 November 2023 to 20 December 2023. This was done through a presentation sent out via email. A briefing was held online on 05 December 2023 allowing stakeholders the opportunity to have concepts explained or have their questions answered. In addition, Otley Town Council requested that a delegation be sent to their monthly meeting to explain the presentation and what was required of them. This meeting was attended on 11 December 2023 by two members of the Team. As with the Second round, the presentation associated with the Third-round engagement was accompanied by an online survey seeking feedback on whether stakeholders felt we had applied the Design Principles correctly and consistently to each of our Design Options.

5.6.2. A reminder was sent out to stakeholders listed within the Stakeholder List on 04 December 2023 in relation to the 05 December 2023 briefing. Twenty-two representatives attended the briefing. A hastener for survey responses was sent out on 15 December 2023. A minor glitch with Q5 of the survey was rectified on 18 December 2023 (at this time, four responses had been received and those respondents had managed to overcome this glitch still providing meaningful answers). Ultimately, the survey received 15 responses. The responses came from the following organisations[27]:

- Peak District NP;
- York Gliding Centre;
- North West Leeds Transport Association (NWLTA);
- Ministry of Defence (DAATM);
- DHPC;
- Yorkshire, Derbyshire and Nottinghamshire RSAG
- Leeds City Council;
- Otley Town Council;
- BGA;
- Bramhope & Carlton Parish Council;
- NATS NERL (MTMA ACP);
- Menston Parish Council;
- Ryanair;
- Moor Lane Residents Association;
- Burn Gliding Club Ltd.

[27] Full responses can be found in Annex C, extracts are detailed in the relevant options in section 6.

5.7. General Feedback to Third Stakeholder Engagement

5.7.1. There were a couple of comments made in relation to the presentation of the engagement material. Some felt there was insufficient detail provided on the pre-existing DOs in order to conduct their own DPE. Whilst greater detail was provided on the newer DOs that were being presented for the first time, the Sponsor believes there *was* sufficient detail included on the 'legacy' DOs in the previous publications and engagement material on the ACP Portal. The pre-existing DOs had not changed ahead of the Third engagement, and this point was clearly made. The engagement material was already extensive, indeed some commented on there being too much to digest. Ultimately a balance needed to be struck between bombarding stakeholders with too much information to digest, and not enough. A decision was taken to provide less detail on the legacy DOs as this detail had previously been provided and commented upon by the same stakeholders in the Second engagement.

5.7.2. Burley in Wharfedale and Menston Parish Council organised a petition to determine the most favourable options. The results of which were favourable to option 32SEF with no objections, or support for, other options. This petition can be found in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'.

5.8. Manchester Airport Group Feedback

5.8.1. Manchester Airport Group (MAG) did not complete the survey but had the following comments to make:

5.8.2. Departures

5.8.3. Existing Options: Routes via MAMUL and NELSA do not appear to interact with any MAN departure or arrivals options below 7000ft. However, LBA routes via POL do have the potential to interact with MAN departures to the north, depending on the Runway direction and route options chosen for the MAN Stage 3 systems.

5.8.4. LBA Runway 32 Options A to E: There is the possibility for MAN departures to the north to interact with these LBA departures via POL depending on the route options chosen for the MAN Stage 3 systems.

5.8.5. Whilst the probability of interaction below 7000ft is low on either existing or new options, these will be worth examining within future bilateral workshops under CAF.

5.8.6. Arrivals

5.8.7. Existing Options: Option 2 - The position of either NELSA holds (N or S) creates a possible interaction with MAN departures to the north depending on the Runway direction and route options chosen for the MAN Stage 3 systems. Option 5 - There remains some uncertainty on the separation needed between RNAV holds and systemised dep/arrivals routes. Although vertical separation is likely to provide a safe resolution of any conflict, the separation/containment required between the UDDER hold and MAN arrivals to runway 23L/R is worth examining within future bilateral / trilateral workshops with NERL.

5.8.8. New Options: Of the new Options presented, Options 6, 7 and 8 are well separated for MAN inbound and outbound routes. Option 9 is a modification to the UDDER routings, but the interactions/separation in our comments on Option 5 above remain. Option 10 appears to

resolve many of the interaction issues commented on above. MAN fully support this option in its ability to provide greater separation between our operations.

5.8.9. Sponsor response to feedback: MAGs comments are duly noted, and these will be worked through within future bilateral workshops under the Cumulative Assessment Framework (CAF). The POL departure routing has been favoured by NERL in the bilateral meetings to date, so it is assumed that any potential conflict with MAN departures is being considered. Any concerns relating to the location of the holds may well be ameliorated as the options are refined moving into Stage 3 of the process. MAN support for Arrival Option 10 is understood as is the dislike for Options 2, 5, and 9.

5.9. City of Doncaster Council Feedback

5.9.1. The City of Doncaster Council (CDC) did not respond directly to the survey but sent a letter instead. The comments received from CDC on the departure and arrivals options related to DP5 (Airspace Dimensions), DP6 (Airspace Complexity), DP7 (Technical) and DP8 (Systemisation). A paraphrased response from CDC is below with Sponsor response to feedback::

5.9.2. **Departures**

5.9.3. CDC comment on the 'new options' of the LBA departure route network was limited to those procedures that would interact with the revived DSA departure and arrival profiles. Consequently, only those procedures that are described to route through an area in the vicinity of BATLI, GOLES and MAMUL were reviewed.

5.9.4. From the data provided, it appears that about 15-20% of LBA departure traffic route to the South-east (deduced from the data presented on pages 13-15 of the presentation). Currently, there appears to be a wide dispersal of tracks east and west of the mean line BATLI-MAMUL; but we are pleased to note that the 'new options' route to the west of BATLI and would be more concise. CDC would prefer to see these departure profiles adopted. Sponsor response to feedback: Noted.

5.9.5. *The tabulated evaluation of the DP applied to the current RW32 SE MAMUL presents several issues: DP5 (additional CAS) and DP6 and DP8 (potential complexity in GOLES area versus LBIA inbounds). We consider it appropriate for the following text to be added to the DP6 and DP8 comments: DSA SIDs routing through the area adjacent to GOLES and the STARs through UPTON and MAMUL.*

5.9.6. Sponsor response to feedback: This is acknowledged however LBA needed to work on the premise that DSA was no longer operational. Owing to the flow of traffic managed by NERL in and out of the MTMA to/from the East, it is unlikely that a MAMUL/LAMIX SID would end up in the GOLES area but more likely west of BATLI/MAMUL. 32SEA has already been rejected and the other swathes that route into that area have been rated Red for DP6 and DP8 owing to complexity in the GOLES area. These comments will be borne in mind during the conduct of the IOA.

5.9.7. *We would favour Option 14SEA as the planned route sits west of the BATLI/MAMUL area. The analysis of the 14SEB Option identifies only a confliction with arrivals via GOLES. To this, we believe the following should be added to reflect the interaction with DSA procedures: DSA SIDs routing through GOLES and the STARs through UPTON and MAMUL.*

5.9.8. Sponsor response to feedback: Owing to the flow of traffic managed by NERL in and out of the MTMA to/from the East, it is unlikely that a MAMUL/LAMIX SID would end up in the GOLES area but more likely west of BATLI/MAMUL. These comments will be borne in mind during the conduct of the IOA.

5.9.9. **Arrivals**

5.9.9.1. A key concern is the proposal to establish a hold at GOLES. This location is adjacent to the end point (UPTON) for the published DSA SIDS routing north and west from both runway ends at DSA. If the proposed LBA hold was established, it would have the following impact on DSA SIDs:

- *Deny access to the enroute network for DSA traffic at an optimum level;*
- *Probably require DSA aircraft to be levelled off under the hold until clear to the west*
- *Restricting the climb (bullet 2) would have:*
  - *An environmental impact and introduce inefficiency in the route design;*
  - *Potentially impact optimum descent profiles for aircraft arriving from the east into the Manchester TMA;*
  - *Create high complexity in effecting safe integration (include LBIA inbounds to the mix makes it worse;*
- *Require DSA to establish different SIDs avoiding the GOLES/UPTON area which could be problematic to the route network and necessitate a DSA ACP.*

5.9.10. Conclusion

5.9.10.1. CDC (and by association DSA) supports the proposed design of the south-east and east departures from LBA that would route west of MAMUL. We could not support the proposal to establish a hold in the vicinity of GOLES and suggest that this design proposal needs further consideration.

5.9.10.2. Sponsor response to feedback: It is not possible at this stage to understand the exact implications of having a hold at GOLES. The existence of DSA has not been ignored in the options development stage, but it was believed that a hold at GOLES would still be workable. NERL has indicated that it is favourable for the MTMA to have traffic from the East and the South East routed via GOLES into LBA. Given the wholesale review of MTMA operations taking place as a consequence of the FASI-N programme, it is likely that DSA might have to adapt their procedures to fit into the overall flow of the MTMA.

5.10. Burley-in-Wharfedale Parish Council Feedback

5.10.1. Burley-in-Wharfedale Parish Council did not respond directly to the survey but sent a letter instead. Their comments were specifically related to the DPE, and these have been incorporated as if they were completed within the survey itself.

5.11. Dales Hang-gliding and Paragliding Club

5.11.1. The Dales Hang-gliding and Paragliding Club (DHPC) made some general comments as follows:

5.11.2. *It is unfortunate that the additional swathes and options were not identified initially, and that this stage of consultation is having to be repeated, with another 120 pages of documentation to review.*

5.11.3. Sponsor response to feedback: Options development is an iterative process and work done in the wider MTMA has resulted in some of the evolution of the options. Furthermore, many stakeholders sought an airspace change process in which sponsors would be held accountable for failure to adhere to process. LBA has had to repeat this stage as a consequence of failing to satisfy the CAA that the process has been followed but a consequence of this is hopefully that the best solutions will be found and implemented.

5.11.4. *None of the DPs relate to limitations placed upon other air users – for example the loss (or limitation) of a paragliding site. Where I consider this to be an issue, I have marked it against DP6 – RED for the loss or reduced ceiling of an existing site; AMBER (minor challenges to other aviators) where a review of the LoA would be required but without significant additional limitations.*

5.11.5. Sponsor response to feedback: DP5 (Airspace Dimensions) is intended to address this issue. The DPs were agreed through stakeholder engagement at Stage 1 of the process.

5.11.6. *Although we only operate during the daytime, we have commented upon night routes on the assumption that CAS dimensions are likely to be consistent 24/7.*

5.11.7. Sponsor response to feedback: This assumption is not necessarily correct. Airspace is a commodity, a limited resource, that should be manged and shared appropriately. It might be that some CAS is reverted to Class G in the daytime, but this is finer detail not yet determined.

5.11.8. *I found the format of the review thoroughly confusing and hard to follow. The diagrams of rejected swathes were still included, and I couldn't find any charts depicting hold MAMUL.*

5.11.9. Sponsor response to feedback: There is not a hold intended for MAMUL. The rejected swathes were included as we wanted to know if stakeholders felt they should have been rejected or not. The nature of this project is extremely complex, and we have done our utmost to simplify it without losing the detail that many stakeholders desire.

5.11.10. *The revised DPE Criteria were, in some cases, too specific and difficult for the layman to understand. For example, the AMBER definition of DP1 (Safety) is, 'Issues identified that would require significantly more robust safety argument than today's operation to overcome'. Gobble-de-gook! How about, 'Requires additional safety measures? Frankly I preferred the DPE Criteria published on 01 Jun 23.*

5.11.11. Sponsor response to feedback: The CAA did not approve of our DPE criteria used in the first submission. Accordingly, more specific criteria were crafted and utilised in an attempt to ensure consistency in the evaluation process.

5.11.12. *The only way to comment on each individual swathe/option in the survey was to disagree with your assessment. This wasn't always the case!*

5.11.13. Sponsor response to feedback: There was a free text field at the end of the survey for this purpose.

5.11.14. *The links to the survey (& CAA portal) in the notification email dated 22 Nov 23 did not work on 3 devices tried (mimecast error?). It was only on 15 Dec 23 (5 days before the survey ended – and just before Christmas) that I was able to access the survey thanks to the link in the reminder email. Once accessed I discovered that the survey didn't work (it was impossible to proceed beyond Q17 if you disagreed with Q5 and wanted to comment). This was resolved 48 hours before the deadline for submissions.*

5.11.15. Sponsor response to feedback: The mimecast error you encountered is not a technical issue caused by our survey but rather more likely a security or firewall issue at the user end. The issue with Q5 was resolved as soon as the problem was raised with us (18 December 2023) and at this time only four responses had been received.

6. Design Principle Evaluation

6.1. This section begins by explaining the methodology used to evaluate the options against the Design Principles and provides an overview which highlights the evolution of the process so far and gives an explanation of the DOs discounted before the final DPE evaluation. Furthermore, the overview provides an explanation of how the DPEs were conducted.

6.2. Evaluation Methodology

6.2.1. Initially, when conducting the DPE, a Red, Amber, Green (RAG) status for the various DPs (an entirely subjective assessment) was determined using the following definitions:

- Green – Based upon current circumstances/environment, the DO is most likely to meet the given DP;
- Amber – Based upon current circumstances/environment, the DO may not entirely meet the given DP;
- Red – Based upon current circumstances/environment, the DO is most unlikely to meet the given DP.

6.2.2. The initial DPE was conducted by our airspace consultants and then workshopped with stakeholders for verification resulting in amendments to the DPE in some areas. Following the conception of the additional DOs, our airspace consultants carried out a fresh DPE, based upon that done previously to ensure consistency and to ensure all the stakeholder feedback had been factored in. Following this, the DPE was sent out to stakeholders in March 2023 with the new DOs for feedback.

6.2.3. Post-review by the CAA in Summer 2023, it was determined that more specific definitions of the criteria required to meet each DP was required. These newly written definitions were sent out to stakeholders in November 2023 with a revised DPE for feedback.

6.2.4. The assessment criteria for the DPE was subsequently refined following feedback from the CAA. Additionally, LBA decided to rationalise the RAG metrics in order to make them relative to the individual DPEs rather than today operation[28]. These new criteria did not change the outcome of the assessment of any of the options or DPs. The revised RAG score criteria now enables options to be categorised in relation to the individual DP and graded as the same, better or worse. Previously there was only room to show varying degrees of impact. The decision was made not to reengage with stakeholders about the refinement as the assessment of each of the options and DPs has not changed, only the final assessment, this has enabled a clearer picture of where options may provide benefits and not just costs.

6.2.5. The DPs where the criteria was changed are summarised below with explanation.

6.2.6. DP4 criteria previously assessed the options in relation to each other, this has been removed as this is not a factor in the DP wording. For example, the criteria **'meets'** has been changed from '*As compared to other DOs, has potential to burn less fuel and, as a result, minimise CO2 emissions.*' to '*Has potential to minimise CO2 emissions*'.

[28] Unless today's operation was indicated in the wording of the individual DP.

6.2.7. DP9 **Partially Meets** criteria changed from '*Fuel efficiency is marginally sub-optimal due to consideration to the impact on local communities'* to *'Fuel efficiency is optimal however there is some impact on local communities*' and **Does Not Meet** criteria changed from *'Fuel efficiency is clearly not optimised, or it has been optimised at the expense of local communities*' to '*Fuel efficiency not optimised*' Both of these amendments were made to make the assessments clearer, more defined and in line with the wording of the DP.

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.	**Partially Meets:** Issues identified to overcome that would require a significantly more robust safety argument than today's operation.	**Does Not Meet:** Issues identified that would be unlikely to be overcome without prohibitively restrictive safety mitigations.
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 albeit 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 AONB's.		

DP #	Design Principle		
Criteria	**Meets:** Limits effects on Noise Sensitive Areas and does not result in any overflight of a AONB or a NP below 7000ft.	**Partially Meets:** May result in overflight of a portion of an AONB or a NP, also may result in overflight of tranquil areas important to local communities such as reservoirs or parks.	**Does Not Meet:** Results in direct and significant overflight of AONBs or NPs and/or various tranquil areas important to local communities.
4	**Emissions and Air Quality** – The proposed design should minimise CO_2 emissions per flight.		
Criteria	**Meets:** Has potential to minimise CO_2 emissions.	**Partially Meets:** CO_2 emissions likely to be the same or similar to today's operation.	**Does Not Meet:** Has the potential to increase 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 option without the potential to revert 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.		

DP #	Design Principle		
Criteria	**Meets:** Does not result in a complex CTA/CTR configuration with numerous different base levels likely to lead to inadvertent CAS penetrations.	**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.
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 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 not decrease 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 optimal however there is some impact on local communities.	**Does Not Meet:** Fuel efficiency not optimised.
10	**AMS Realisation** – This ACP must serve to further, and not conflict with, the realisation of the AMS.		

DP #	Design Principle		
Criteria	**Meets:** Aligned with the AMS.	**Partially Meets:** Partially aligned with the AMS.	**Does Not Meet:** Not aligned with the AMS.
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.

Table 8: Design Principle Criteria

6.3. Overview of Evaluation

6.3.1. The following paragraphs look at each DO in isolation. Stakeholders were reminded that the flightpath of the resulting procedures could be contained anywhere within the option swathes.

6.3.2. The following departure DOs were discounted ahead of the final DPE:

- There is insufficient demand for a North-Easterly SID from the Airport.
  - There is currently no North-Easterly SID from the Airport; all aircraft requiring a departure in this direction follow a westerly SID until such time as it is safe (and environmentally appropriate) to turn to the North-East.

- There is insufficient demand for a North-Westerly SID from LBA.
  - There is currently no North-Westerly SID and all aircraft requiring a departure in this direction can follow a Westerly SID until such time as it is safe (and environmentally appropriate) to turn to the North-West.

- 32SEA
  - Fundamentally this will not work with the Route Network as use of this would result in aircraft climbing towards other aircraft, head-to-head, descending into the MTMA along the Northern side of L975.

- 32S&WB & D
  - These DOs are inefficient as they do not point aircraft in the direction they wish to depart, neither do they fit with the Route Network as they do not point towards POL or NELSA.

- 14SEC and 14SED
  - Fundamentally these will not work with the Route Network as use of these would result in aircraft climbing towards other aircraft, head-to-head, descending into the MTMA along the Northern side of L975.

- 14S&WA & B
  - These DOs are inefficient as they do not point aircraft in the direction they wish to depart, neither do they fit with the Route Network as they do not point towards POL.

6.3.3. Below each graphic is a table showing how each DO 'scored' when compared to each of the DPs using the Red, Amber, Green criteria detailed above.

6.3.4. There are one to three rows, the first row shows how they were scored when submitted to the CAA i.e. June 2023 (only where relevant, as there are some new DOs), the row below this shows the evaluation prior to the Third round of engagement i.e. November 2023 and the third row shows the final evaluation following a Third period of engagement and refinement of the assessment criteria. For the Baseline and Do-Minimum options, only one DPE was conducted and therefore the DPE had one row.

6.3.5. The first row is there purely for reference to what was previously submitted to the CAA. It is important to understand that the latter rows use new criteria and as such, comparison to the first row is not entirely valid.

6.3.6. If any of the DPEs score an Amber or Red, then the reason for this is listed below the tables.

6.3.7. A summary of the Stakeholder feedback for each round of engagement is contained below the tables. Not all options we're engaged upon in every round.

6.3.8. Upon initial assessment of the feedback there were several responses repeated for every question posed. Others were repeated for every question posed within a design envelope. Whilst all feedback is considered relevant and valued, in the interests of brevity only the feedback relevant to each option or deign envelope is detailed in the DPE against the relevant option/design envelope. The general comments for each stakeholder engagement round are recorded below in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'.

6.4. Runway 32 Departures

6.4.1. This section contacts the DPE for all options departing from runway 32. Each section contains a design envelope with the DPE for each option as a sub section.

6.4.2. Runway 32 South-East Design Envelope

6.4.2.1. This section contains the DPE for nine options in the South-East Design Envelope, including the baseline and do-minimum options.

6.4.2.2. Runway 32 South-East Baseline

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 9 – Runway 32 South-East Baseline DPE

6.4.2.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being today's current baseline operation;
- DP10 – Red as this is the baseline option and if it were to be retained it does not satisfy the objectives of the AMS;
- DP11 – Red as this is the baseline option and if it were to be retained the latest navigational standards would not be utilised.

6.4.2.3. Runway 32 South-East Do Minimum (Area Navigation Substitution)

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 10 – Runway 32 South-East Do Minimum DPE

6.4.2.3.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being geographically the same as today's current baseline operation.

6.4.2.4. Runway 32 South-East Option A (32SEA)

Figure 110: 32SEA Swathe.

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	*32SEA was considered no longer a viable option and was discounted from assessment ahead of the third DPE. The swathe routes outside CAS and did not point in the direction of the Route Network joining points of MAMUL/LAMIX. This decision was reinforced by comments made by the General Aviation community.*										

Table 11 – Runway 32 South-East Option A DPE

6.4.2.4.1. Feedback from stakeholders include that they felt they had insufficient time/information to assess if this should have been retained or not. Others commented that there is insufficient recognition of the Temporary Reserved Areas for Gliders, the Non-Secondary Surveillance Radar Gliding Areas, or of the likelihood of encountering gliders in thermal up to cloud base and in mountain wave above FL100 in swathe 32SE-A

6.4.2.4.2. LBA believes that sufficient detail on these options had been provided in the Second round of engagement to the same set of stakeholders and as a result of the safety and airspace dimension issues, this option was no longer considered viable.

6.4.2.4.3. In conclusion, this option was discounted on safety and airspace dimensions grounds. This decision was supported by stakeholders from the GA community concerned about additional CAS requirements.

6.4.2.5. Runway 32 South-East Option B (32SEB)

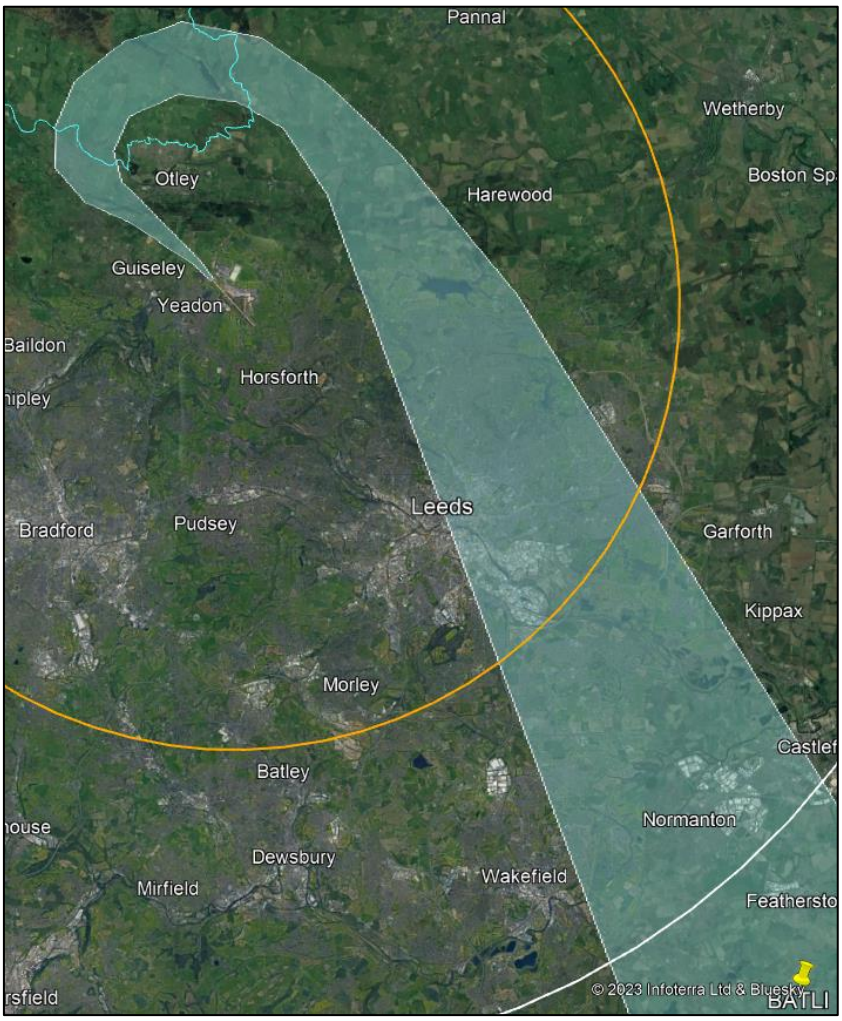


Figure 111: 32SEB Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 12 – Runway 32 South-East Option B DPE

6.4.2.5.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber - Potential conflict with inbounds via GOLES/BATLI;
- DP2 – Red - Burley-in-Wharfedale more greatly affected;
- DP3 – Red - AONB and Lindley Reservoir;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP5 – Amber - Potential for additional CAS requirement;
- DP6 – Red - Potential complexity in GOLES area vs inbounds;
- DP8 – Red - Potential complexity in GOLES area vs inbounds;
- DP10 –Amber - due to Amber in DP1 and DP5 which indicates this option is only partially aligned with the AMS.

Stakeholder feedback

6.4.2.5.2. In the first round, Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Red. They were concerned with potential impacts on soaring north of Otley and any amendment to the existing Upton Corridor arrangements associated to CTAs 8 and 9 in place between the BGA and DSA. As DP6 is already assessed as Red due to possible complexity in the GOLES area. The soaring concerns north of Otley, whilst noted, are not relevant at this time as such a procedure would not need additional CAS to the north of Otley. Any additional CAS would be to the East of LBA in this instance. Given the uncertainty surrounding DSA and the airspace associated to it, it is not possible to comment further on the Upton Corridor arrangements. DP1 remains Amber as the criteria definition fits this scenario.

6.4.2.5.3. Other stakeholders commented that it was difficult to make an informed decision until the airspace had been promulgated DHPC, airspace specified in terms of dimensions (Wolds Gliding Club), or designs published (BGA). These sentiments were repeated in round 2 from the DHPC and the RSAG.

6.4.2.5.4. Additional comments in round 2 from North West Leeds Transport Forum noted that noise would be a concern with this option and "wholly contrary to the spirit of the local planning condition" and as a result they stated that DP2 and DP4 should be Red and DP6 should be Amber "due to the potential conflict with arriving aircraft". How has this influenced the DPE They added that DP1 and DP9 should be Amber, reiterating the assertion for DP1 in Round 3.

6.4.2.5.5. In Round 2, there was a suggestion that DPs 1, 5, and 6 should be Amber for all DOs DHPC. In Round 3, this stakeholder agreed with this DO.

6.4.2.5.6. Also, in Round 2, comments were made by RSAG suggesting that DPs 1, 5 and 6 should be Red until any further details of airspace changes are communicated to RSAG. This view was reiterated in Round 3.

6.4.2.5.7. In the first round, Yorkshire, Derbyshire, and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Red. They were concerned with potential impacts on soaring north of Otley and any amendment to the existing Upton Corridor arrangements associated to CTAs 8 and 9 in place between the BGA and DSA. As DP6 is already assessed as Red due to possible complexity in the GOLES area, the soaring concerns north of Otley, whilst noted, are not relevant at this time as such a procedure would not need additional CAS to the north of Otley. Any additional CAS would be to the East of LBA in this instance. Given the uncertainty surrounding DSA and the airspace associated to it, it is not possible to comment further on the Upton Corridor arrangements. DP1 remains Amber as the criteria definition fits this scenario.

6.4.2.5.8. Other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable assessment, although Otley Town Council indicated that this option could have noise and tranquillity impacts near to the West of Otley.

6.4.2.5.9. The National Trust identified that this option flies over Nostell Priory, a Registered Parks and Gardens (RPG) which are considered particularly sensitive to any noise impacts by virtue of their heritage significance. DP is assessed as red accordingly and because it flies over an Area of Outstanding Natural Beauty (AONB).

6.4.2.5.10. In summary, safety was assessed as Amber because of potential conflict with arrivals and this decision supported by stakeholders for all three rounds of engagement. Some stakeholders felt safety should be assessed as red due to the potential conflicts with the GA community, however the assessment criteria states that *Issues identified .. would be unlikely to be overcome without prohibitively restrictive safety mitigations,* and LBA believes that any mitigations would not be prohibitively restrictive. Stakeholders feedback for other DPs were noted and used to influence the final assessment which is largely in line with the feedback.

6.4.2.6. Runway 32 South-East Option C (32SEC)

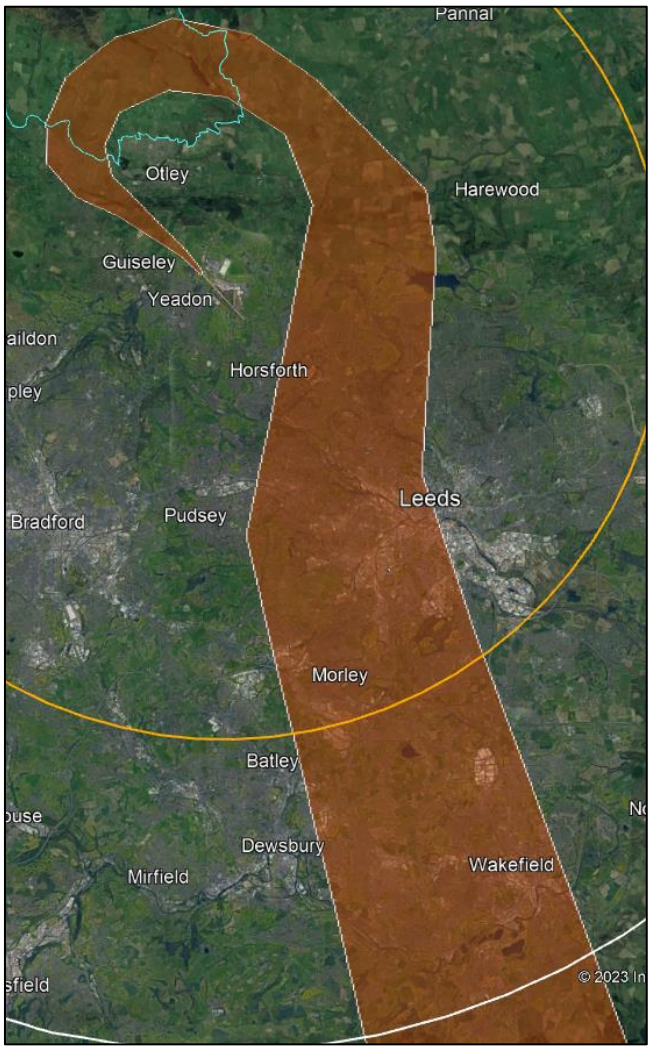


Figure 112: 32SEC Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 13 - Runway 32 South-East Option C DPE

6.4.2.6.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber - Potential conflict with inbounds via GOLES/BATLI;
- DP2 – Red - Burley-in-Wharfedale more greatly affected;
- DP3 – Red - AONB and Lindley Reservoir;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation.
- DP5 – Amber - Potential for additional CAS requirement;
- DP9– Amber - Burley-in-Wharfedale more greatly affected;
- DP10 – Amber - due to Amber in DP1 and DP5 which indicates this option is only partially aligned with the AMS.

6.4.2.6.2. In addition, post-engagement, the DPE changed for DP1 (Safety) which moved from Green to Amber. The following comments are from representative stakeholders:

6.4.2.6.3. The NWLTA felt that DP1 (Safety) should be rated Amber due to the potential conflict with arrivals as otherwise the assessment would be inconsistent with the assessment of 32SEB, 32SEE and 32SEF. They also raised concern with the overflight of North West Leeds. DP1 has been amended to Amber in light of this comment. Aircraft would be through 4000ft and climbing by the time they flew over North West Leeds.

6.4.2.6.4. Additional comments in Round 2 from North West Leeds Transport Forum noted that noise would be a concern with this option and "wholly contrary to the spirit of the local planning condition" and as a result they stated that DP2 and DP4 should be Red and DP6 should be Amber "due to the potential conflict with arriving aircraft". They added that DP1 and DP9 should be Amber, reiterating the assertion for DP1 in Round 3.

6.4.2.6.5. In Rounds 1 and 2, there was a suggestion that DPs 1, 5, and 6 should be Amber for all DOs (DHPC). In Round 3, this stakeholder agreed with this DO.

6.4.2.6.6. Some stakeholders commented that it was difficult to make an informed decision until the airspace had been promulgated (DHPC), airspace specified in terms of dimensions (Wolds Gliding Club), or designs published BGA. These sentiments were repeated in Round 2 from the DHPC and the RSAG.

6.4.2.6.7. Other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable assessment, although Otley Town Council indicated that this option could have noise and tranquillity impacts near to the West of Otley.

6.4.2.6.8. In the first round, Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Red. They were concerned with potential impacts on soaring north of Otley and any amendment to the existing Upton Corridor arrangements associated to CTAs 8 and 9 in place between the BGA and DSA. As DP6 is already assessed as Red due to possible complexity in the GOLES area, the soaring concerns north of Otley, whilst noted, are not relevant at this time as such a procedure would not need additional CAS to the north of Otley. Any additional CAS would be to the East of LBA in this instance. Given the uncertainty surrounding DSA and the airspace associated to it, it is not possible to comment further on the Upton Corridor arrangements. DP1 remains Amber as the criteria definition fits this scenario. In addition, in Round 3, this stakeholder indicated that DP 1, DP 5 and DP 6 should be designated as Amber.

In summary, safety was assessed as Amber because of potential conflict with arrivals and this decision largely supported by stakeholders for all three rounds of engagement. Some stakeholders felt safety should be assessed as Red due to the potential conflicts with the GA community, however the assessment criteria states that Issues identified .. would be unlikely to be overcome without prohibitively restrictive safety mitigations, and LBA believes that any mitigations would not be prohibitively restrictive. Stakeholders feedback for other DPs were noted and used to influence the final assessment which is largely in line with the feedback. Additionally, the assessment for noise was amended to Red as LBA acknowledges the feedback regarding additional noise over Leeds.

6.4.2.7. Runway 32 South-East Option D (32SED)

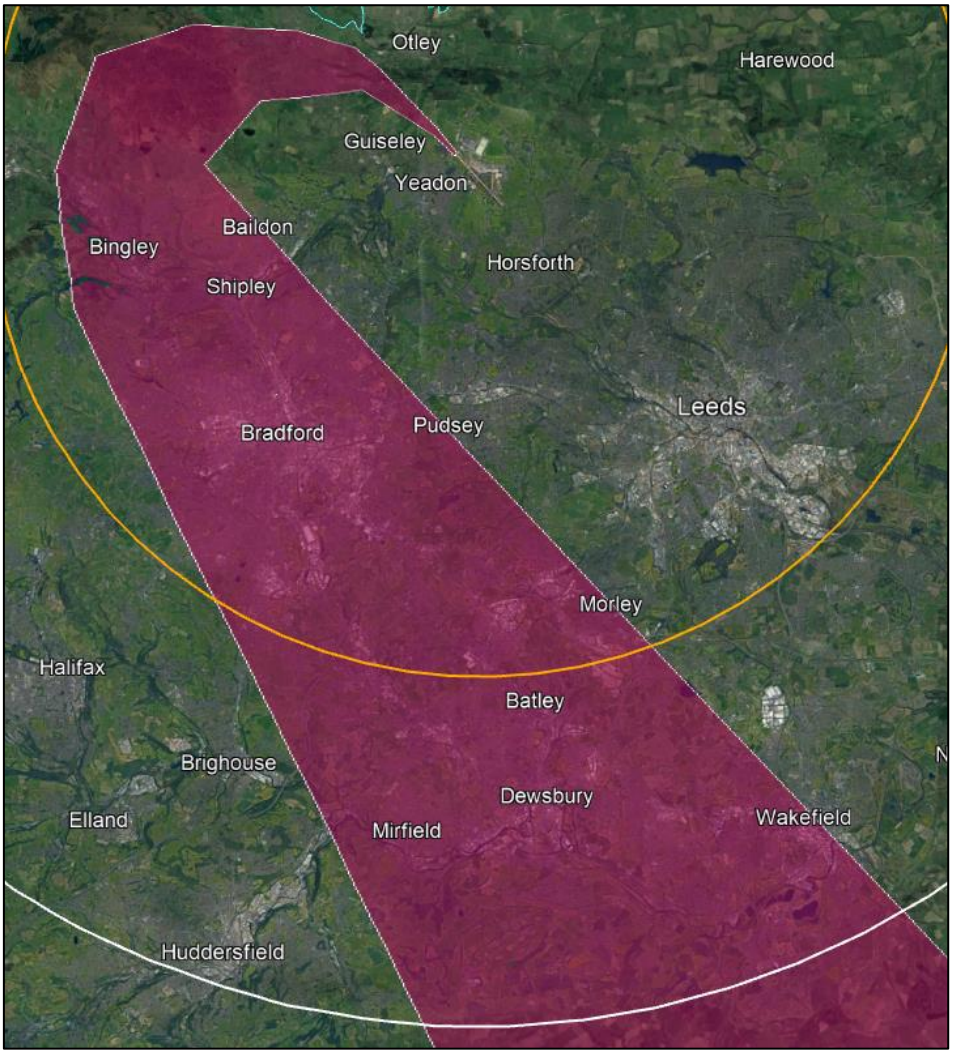


Figure 113: 32SED Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 14 - Runway 32 South-East Option D DPE

6.4.2.7.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber - Broadens area of affected communities;
- DP3 – Amber – Ilkley Moor, part of the Nidderdale AONB;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation.

6.4.2.7.2. In Rounds 1, 2 and 3, there was a suggestion that DPs 1, 5, and 6 should be Amber for all DOs (DHPC).

6.4.2.7.3. In addition, in Round 1, NERL indicated that they did not agree with the assessment of DP2 as the DO overflies Baildon, Bingley, Shipley and Bradford. Similarly, City of Bradford Metropolitan Borough Council expressed disagreement with the assessment of DP3 as the DO overflies Ilkley Moor and Bradford.

6.4.2.7.4. In the first round, Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Red. They were concerned with potential impacts on cross-country gliders transiting North/South (and vice versa), gliders flying in wave in Nidderdale and any amendment to the existing Upton Corridor arrangements associated to CTAs 8 and 9 in place between the BGA and DSA. In Round 3, this stakeholder indicated that the three DPs (1, 5 and 6) should be evaluated as Amber. Given the uncertainty surrounding DSA and the airspace associated to it, it is not possible to comment further on the Upton Corridor arrangements.

6.4.2.7.5. Other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable assessment, although Otley Town Council indicated that this option looks similar to the existing northbound NPR swathe but also goes close to or near to Otley and will therefore have a noise and tranquillity impact.

6.4.2.7.6. In summary, three DPs were assessed as Amber due to the potential impact on communities and tranquil areas. One DP (3) was changed to Amber for the third round, this was due to a reinterpretation of the assessment criteria rather than as a result of feedback; the criteria *states CO_2 emissions likely to be the same or similar to today's operation* and this is assessed as being the case for option D. Whilst some stakeholders have assessed this option as Red for safety, this was largely the response to all options in this design envelope from this stakeholder. LBA does not assess safety, airspace dimensions or complexity as being an issue for this option.

6.4.2.8. Runway 32 South-East Option E (32SEE)

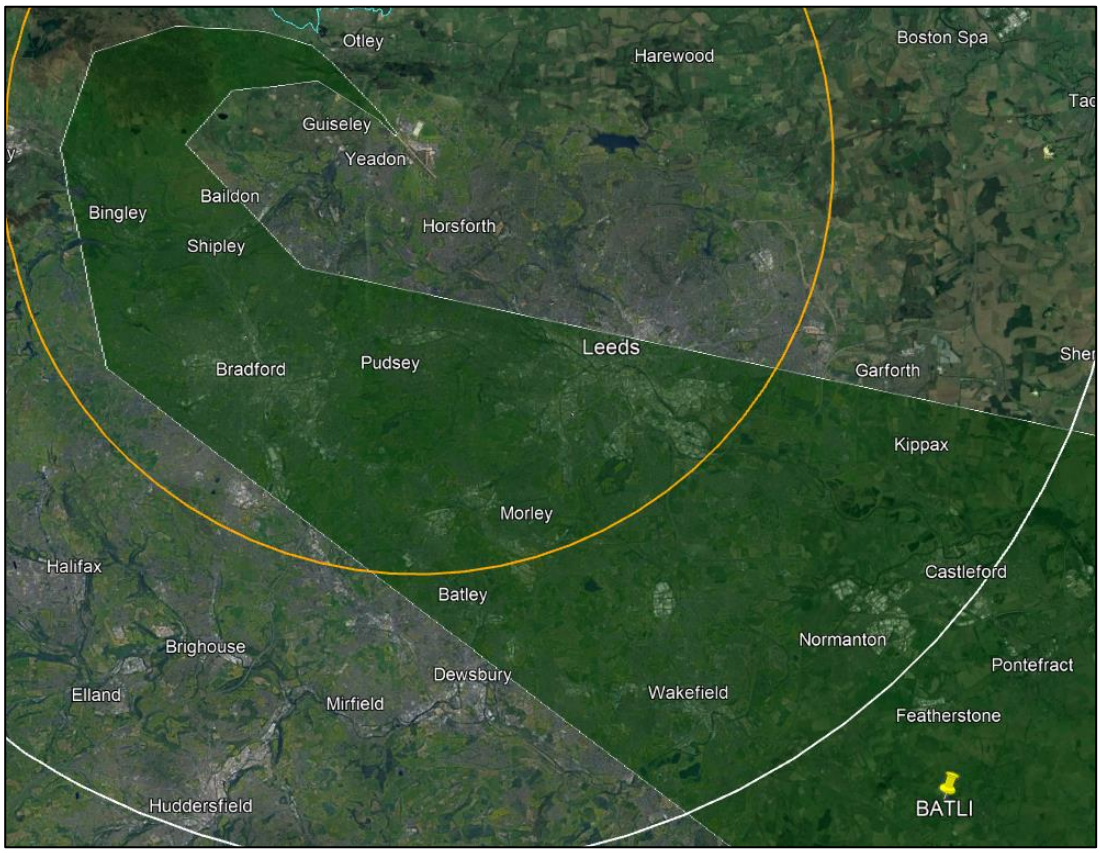


Figure 114: 32SEE Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 15 - Runway 32 South-East Option E DPE

6.4.2.8.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – Potential conflict with inbounds via GOLES/BATLI;
- DP2 – Amber - Broadens area of affected communities;
- DP3 – Amber – Ilkley Moor, part of the Nidderdale AONB;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP5 – Amber - Potential for additional CAS requirement;
- DP6 – Red - Potential complexity in GOLES area with additional CAS requirement;
- DP8 – Red - GOLES area conflictions and L975 flow issues;
- DP10 – Red - Unlikely to be systemised, more CAS required which indicates this options only partially aligns with the AMS.

6.4.2.8.2. With regards to feedback from stakeholders, there were no meaningful comments specifically aimed at this option.

6.4.2.8.3. LBA amended the safety assessment from Red to Amber for this option as issues with arrivals was no longer considered as prohibitively restrictive, rather that it would require a more robust safety argument than today's operation. DP3 was changed to Amber for the third round, this was due to a reinterpretation of the assessment criteria rather than as a result of feedback; the criteria states CO2 emissions likely to be the same or similar to today's operation and this is assessed as being the case for option E.

6.4.2.8.4. In summary, the assessment for this option was carried out by LBA as there were no meaningful comments from stakeholders with regards to this option.

6.4.2.9. Runway 32 South-East Option F (32SEF)

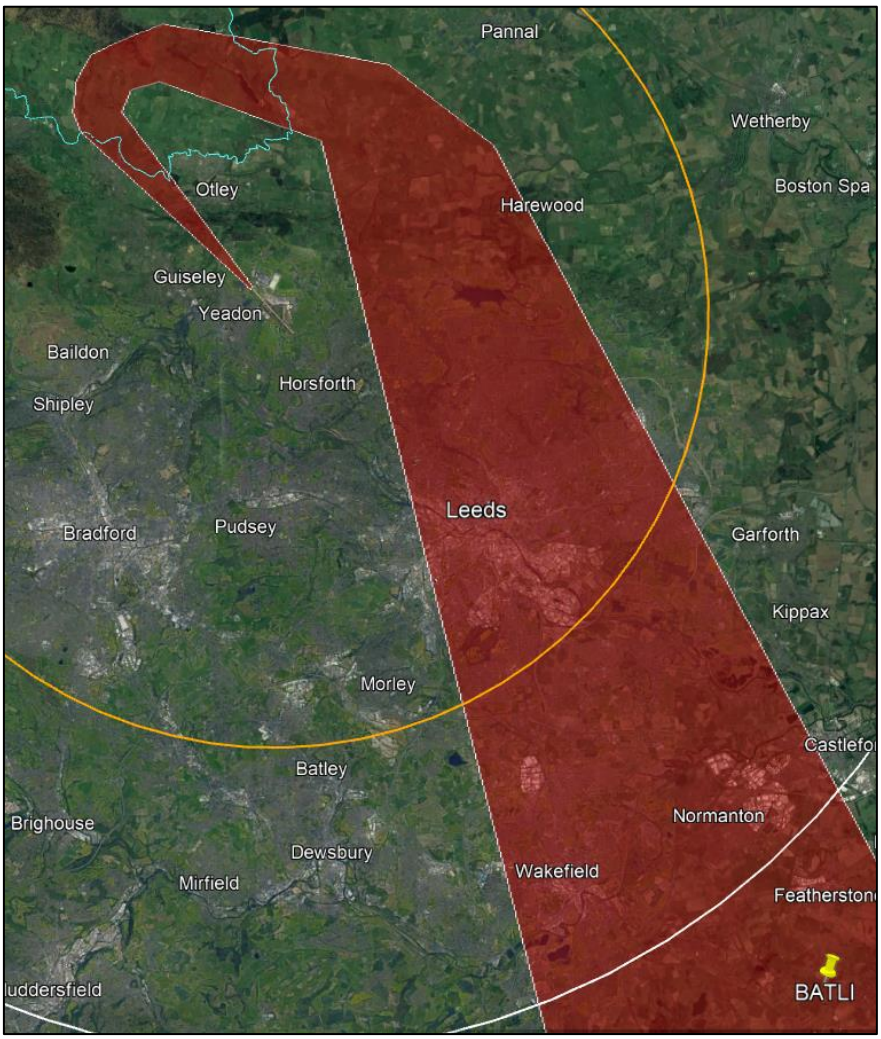


Figure 115: 32SEF Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 16 - Runway 32 South-East Option F DPE

6.4.2.9.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – Potential conflict with inbounds via GOLES/BATLI;
- DP2 – Amber - Otley affected instead of Burley-in-Wharfedale;
- DP3 – Red – AONB and Lindley Reservoir;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP5 – Amber - Potential for additional CAS requirement;
- DP6 – Red - Potential complexity in GOLES area vs inbounds;
- DP8 – Red - Potential complexity in GOLES area vs inbounds;
- DP9 – Amber - 'Fuel efficiency is optimal however there is some impact on local communities.' - Otley affected instead of Burley-in-Wharfedale;
- DP10 –Amber - due to Amber in DP1 and DP5 which indicates this option is only partially aligned with the AMS.

6.4.2.9.2. The NWLTA raised concern with the overflight of North West Leeds. Sponsor response to feedback Aircraft would be through 4000ft and climbing by the time they flew over North West Leeds.

6.4.2.9.3. Otley Town Council felt that 32SEF would have the biggest impact on Otley but did not recommend the evaluation be changed. Sponsor response to feedback: A straight-ahead option was requested by stakeholders in the First engagement and as a result, 32SEF and 32SEG were conceived. The impact currently experienced by Burley in Wharfedale would be shifted towards Otley but the evaluation remains Amber for DP2 (Noise).

6.4.2.9.4. This swathe (32SEF) was not consulted upon in Round 1.

6.4.2.9.5. In Round 2, North West Leeds Transport Forum stated that DP2 should be Red (because residents of North West Leeds would be subject to the noise of departing aircraft). They also indicated that DP4 should be Red, DP9 should be Amber (as a result of the extra track miles) and that DP1 and DP6 should both be orange (due to the potential conflict with arriving aircraft).

6.4.2.9.6. In Round 2, there were suggestions that DPs 1, 5, and 6 should be Amber for all DOs (DHPC and RSAG). In Round 3, DHPC stated that they agreed with this option.

6.4.2.9.7. Also in Round 3, RSAG expressed concern about potential impact to soaring north of Otley and Ilkley areas. They sought to understand the detailed dimensions and location of the GOLES Hold area (and any related CAS) which aligns with this swathe, the relationship with NERL/MTMA proposals and any impact on the Upton Corridor Agreement existing between the BGA and DSA which allowed the bases of DSA CTA 8 & 9) to be raised to facilitate transiting North/South (and vice versa) cross country gliders. In this Round, they evaluated DPs 1, 5 & 6 as Red.

6.4.2.9.8. In Round 3, other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable evaluation, although Otley Town Council indicated that this option looks as though it will have the biggest impact as it is likely to impact on west, east and north of Otley in terms of noise and tranquillity.

6.4.3. Burley in Wharfedale and Menston parish council organised a petition to determine the most favourable options. The results of which were favourable to option 32SEF with no objections, or support for, other options. This petition can be found in the supporting documents entitled 'LBA Stage 2 Collated Stakeholder feedback'. Signatories indicated overwhelming support for design option 32SEF and it stated that they would like this to be taken through to the next stage alongside new proposals.

6.4.3.1.1. In summary, this option was conceived following the first round of engagement as the result of feedback from stakeholders in the first round. Whilst stakeholders requested this be assessed as Red, the criteria for Amber '*Impacts of aircraft noise likely to be broadly similar in terms of the number of people affected albeit some communities (possibly previously unaffected ones) may be affected more than others'* was considered more appropriate as although different communities would be overflown, it was assessed that the same number of people would be flown over. Similarly, the same reason DP9 was assessed as Amber; Otley would be affected rather than Burley-in-Wharfedale.

6.4.3.2. Runway 32 South-East Option G (32SEG)

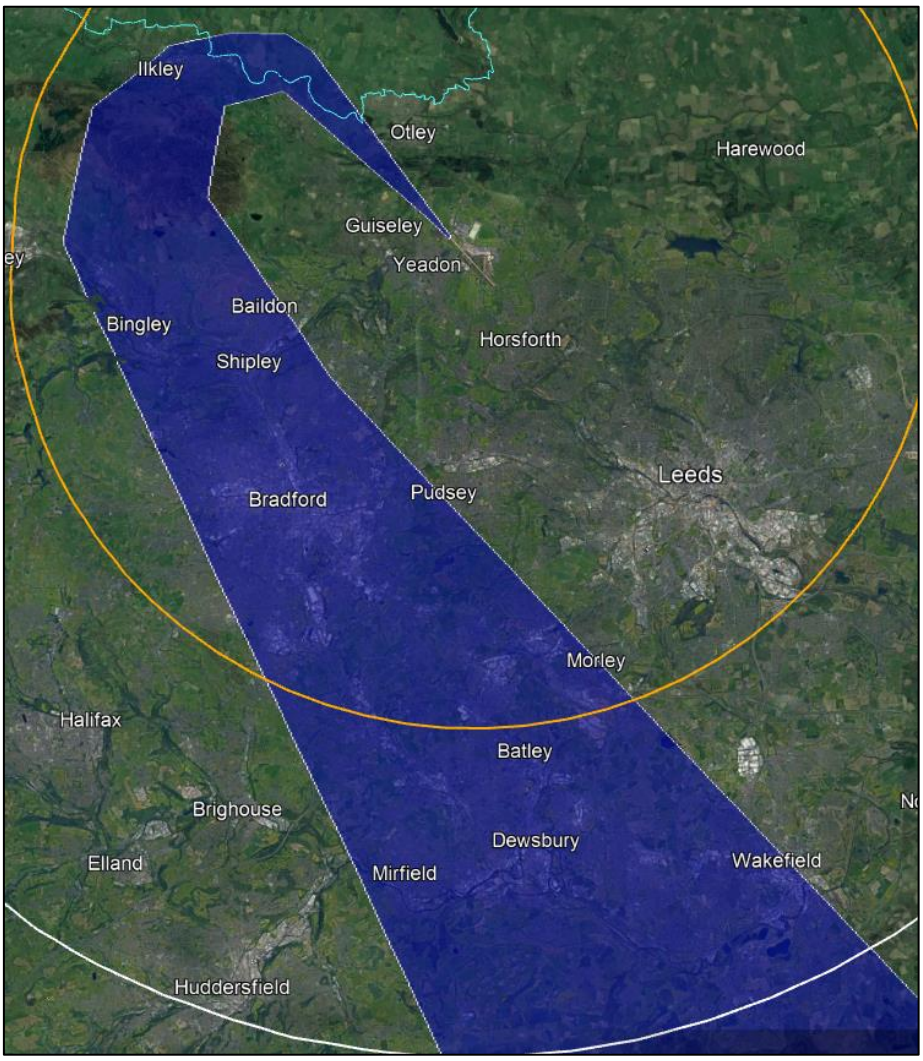


Figure 116: 32SEG Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 17 - Runway 32 South-East Option G DPE

6.4.3.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red – Ilkley;
- DP3 – Red – AONB and Ilkley Moor, part of the Nidderdale AONB;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP9 – Amber - 'Fuel efficiency is optimal however there is some impact on local communities.' – Ilkley.

6.4.3.2.2. Post-engagement the DPE remained the same as there were no meaningful comments specifically aimed at this option.

6.4.3.2.3. In summary, DP2 Noise was assessed as Red as this option has the potential to increase the noise impact on more communities and Red for DP2 as this option would directly impact the Nidderdale AONB and other tranquil areas. DP4 was changed to Amber for the third round, this was due to a reinterpretation of the assessment criteria rather than as a result of feedback; the criteria states *CO2 emissions likely to be the same or similar to today's operation* and this is assessed as being the case for option G.

6.4.4. Runway 32 South and West Design Envelope

6.4.4.1. This section contains the DPE for ten options in the South-West Design Envelope, including the baseline and do-minimum options.

6.4.4.2. Runway 32 South and West Baseline

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 18 - Runway 32 South and West Baseline DPE

6.4.4.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being today's current baseline operation;
- DP10 – Red as this is the baseline option and if it were to be retained it does not satisfy the objectives of the AMS.;
- DP11 – Red as this is the baseline option and if it were to be retained the latest navigational standards would not be utilised.

6.4.4.3. Runway 32 South and West Do Minimum (Area Navigation Substitution)

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 19 - Runway 32 South and West Do Minimum DPE

6.4.4.3.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being geographically the same as today's current baseline operation.

6.4.4.4. Runway 32 South and West Option A (32S&WA)

Figure 117: 32S&WA Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 20 - Runway 32 South and West Option A DPE

6.4.4.4.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red – Burley-in-Wharfedale;
- DP3 – Red – AONB;
- DP4 – Red - 'Has the potential to increase CO_2 emissions';
- DP5 – Amber - Potential for additional CAS requirement;
- DP9 – Red - 'Fuel efficiency not optimised';
- DP10 – Amber - due to Amber in DP5 which indicates this option is only partially aligned with the AMS.

6.4.4.4.2. The NWLTA felt DP1 (Safety) and DP2 (Noise) should be Amber. Sponsor response to feedback: DP1 is not considered worse than Green as the suggested conflict with inbound traffic would not materialise. The outbound traffic would pass well above the approach lane. DP2 is already rated as Red due to the potential impact to communities closer to the Airport.

6.4.4.4.3. In Round 2, the North West Leeds Transport Forum indicated that DP1, DP2, DP4, DP6 and DP9 should be Red. Sponsor response to feedback: DP1 and DP 6 are not considered worse than Green as suggested conflict with inbound traffic would not materialise. LBA agree that DPs 2, 4 and 9 are Red.

6.4.4.4.4. The DHPC, RSAG and BGA all felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Amber. RSAG and BGA also felt DP1 (Safety) should be Amber and DP5 (Airspace Dimensions) should be Red. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance the likelihood of additional CAS being required has

been noted with the Amber rating for DP5. It is not felt that this translates into changes for DPs 1 or 6.

6.4.4.4.5. In Round 2, DHPC and RSAG stated that DP1, DP5 and DP6 should all be Amber. They added that there was insufficient detail of the proposed controlled airspace for further comment to be made. In Round 3, DHPC indicated that DP6 should be Amber and RSAG stated that, given the lack of detail, DPs 1 & 6 should be Amber and DP5 Red.

6.4.4.4.6. Otley Town Council felt that 32S&WA & F posed the biggest Noise and Tranquillity threat to Otley. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Red.

6.4.4.4.7. Menston Parish Council felt that there was no mention as to the impact on their community with 32S&WA. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Red but not due to Menston. The swathe follows the baseline for the initial climb-out and would be no worse for Menston than that experienced today whereas Burley-in-Wharfedale would experience a disbenefit.

6.4.4.4.8. Burn Gliding Club sought clarification as to why DP4 (Emissions and Air Quality) and DP9 (Operational Cost) evaluations were not the same on 32S&WA and 32S&WF. Sponsor response to feedback: The reason for this is that 32S&WF has a track that goes much further north before turning, adding additional track miles unnecessarily.

6.4.4.4.9. In summary, DP2 (Noise) and DP3 (Tranquillity) have been assessed as Red as a result of stakeholder feedback. DP 4 (Emissions and Air Quality) has changed to Red from Amber as a result of reassessing the option against the criteria. Whist some stakeholders felt that DP1 (Safety) should be Red due to potential conflicts with inbound traffic, LBA can confirm this would not be the case as outbound traffic would pass above the approach lane, safety was thus assessed as Green.

6.4.4.5. Runway 32 South and West Option B (32S&WB)

Figure 118: 32S&WB Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	*32S&WB was considered no longer a viable option and was discounted from assessment ahead of the third DPE. It did not fit with the Route Network as it does not point towards POL or NELSA.*										

Table 21: Runway 32 South and West Option B DPE

6.4.4.5.1. Some stakeholders commented that they had insufficient time/information to assess if this should have been retained or not. Sponsor response to feedback: Sufficient detail on these options had been provided in the Second round of engagement to the same set of stakeholders.

6.4.4.5.2. In summary, this option has been discounted as it is not considered viable due to lack of network connectivity.

6.4.4.6. Runway 32 South and West Option C (32S&WC)

Figure 119: 32S&WC Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 22 - Runway 32 South and West Option C DPE

6.4.4.6.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber - Potentially affects different communities;
- DP3 – Amber – Ilkley Moor, part of the Nidderdale AONB.

6.4.4.6.2. The NWLTA felt DP2 (Noise) should be Green. Sponsor response to feedback: NWLTA was the only stakeholder to make this observation. Whilst it is possible the final design outcome may be 'Green', at this stage it is perceived to have an Amber grading.

6.4.4.6.3. The DHPC felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Red. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance there is very little likelihood of additional CAS being required.

6.4.4.6.4. In Round 2, DHPC indicated that DPs 1, 5 and 6 should be Amber across all DOs.

6.4.4.6.5. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed due to the increase in the size of the CAS. It is most unlikely that this DO would require more CAS to contain it and on that basis these DP evaluations remain unchanged.

6.4.4.6.6. Otley Town Council felt that 32S&WC, D, G and H posed a Noise and Tranquillity threat to West Otley. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Amber due to impact to new communities and Ilkley Moor.

6.4.4.6.7. Menston Parish Council felt that there was no mention as to the impact on their community with 32S&WC. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Amber but Menston was not specifically mentioned. It was insinuated as opposed to being explicitly mentioned by saying it had potential to affect new communities.

6.4.4.6.8. City of Bradford Metropolitan District Council pointed out in Round 1 that they did not agree with the evaluation of DP3 as the swathe overflies Ilkley Moor. Sponsor response to feedback: The DPE already had DP3 graded as Amber due to impact on Ilkley Moor, as well as new communities.

6.4.4.6.9. In Round 3, other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable evaluation, although Otley Town Council indicated that this option looks similar to the existing NPR swathe but also goes close to the west of Otley and would have a noise and tranquillity impact.

6.4.4.6.10. In Round 3, Moor Lane Residents Association stated that evaluation of DP2. DP3 and DP4 had not been carried out correctly.

6.4.4.6.11. The National Trust noted that land at Hardcastle Crags, to the north of Hebden Bridge, which is designated as a protected open space in the Replacement Calderdale Unitary Development Plan (2009), It is overflown by swathes D32-S&W-C, however aircraft are likely to be close to or over 7000ft at this point. DP3 is nevertheless assessed as Amber due to this option flying over an AONB.

6.4.4.6.12. In summary, the evaluation of this option has largely remained the same through the 3 rounds of engagement. DP2 (Noise) was assessed as Amber due to the fact that different communities may be impacted, not necessarily more people impacted. Whilst some stakeholders felt that DP1 (safety) and DP6 (Airspace Complexity) should be Amber due to the potential infringement on GA activities, LBA considered this to be unfounded as it is unlikely this option would require more airspace.

6.4.4.7. Runway 32 South and West Option D (32S&WD)

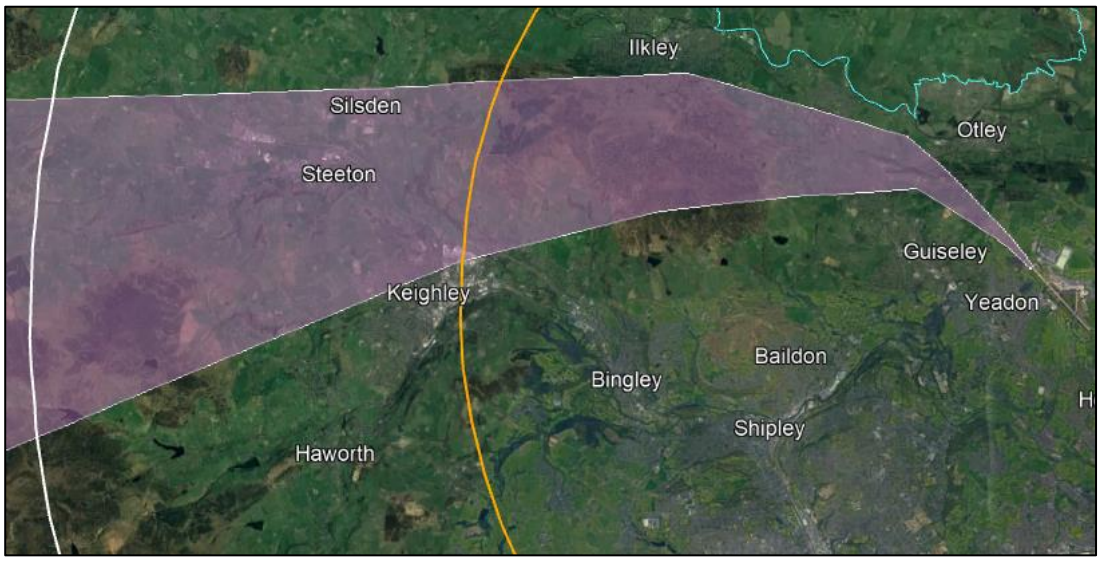


Figure 120: 32S&WD Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 23 - Runway 32 South and West Option D DPE

6.4.4.7.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – impact to new communities;
- DP3 – Amber – Ilkley Moor, part of the Nidderdale AONB.

6.4.4.7.2. The NWLTA felt DP2 (Noise) should be Green. Sponsor response to feedback: NWLTA was the only stakeholder to make this observation. Whilst it is possible the final design outcome may be 'Green', at this stage it is perceived to have an Amber grading.

6.4.4.7.3. The DHPC felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Red. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance there is very little likelihood of additional CAS being required.

6.4.4.7.4. In Round 2, DHPC indicated that DPs 1, 5 and 6 should be Amber across all DOs. In the following Round (3), they stated that DP6 should be Red due to a potential threat to the site at Ilkley Moor.

6.4.4.7.5. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed due to the increase in the size of the CAS. It is most unlikely that this DO would require more CAS to contain it and on that basis these DP evaluations remain unchanged.

6.4.4.7.6. Otley Town Council felt that 32S&WC, D, G and H posed a Noise and Tranquillity threat to West Otley. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Amber due to impact to new communities and Ilkley Moor.

6.4.4.7.7. Menston Parish Council felt that there was no mention as to the impact on their community with 32S&WD. Sponsor response to feedback: The DPE has been amended to Amber for consistency with 32S&WC.

6.4.4.7.8. City of Bradford Metropolitan District Council pointed out in Round 1 that they did not agree with the evaluation of DP3 as the swathe overflies Ilkley Moor. Sponsor response to feedback: The DPE already had DP3 graded as Amber due to impact on Ilkley Moor, as well as new communities.

6.4.4.7.9. In Round 3, other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable evaluation, although Otley Town Council indicated that this option looks similar to the existing NPR swathe but also goes close to the west of Otley and would have a noise and tranquillity impact.

6.4.4.7.10. In Round 3, Moor Lane Residents Association stated that evaluation of DP2. DP3 and DP4 had not been carried out correctly.

6.4.4.7.11. In summary, the evaluation of this option has largely remained the same through the 3 rounds of engagement. DP2 (Noise) was assessed as Amber due to the fact that different communities may be impacted, not necessarily more people impacted. Whilst some stakeholders felt that DP1 (safety) and DP6 (Airspace Complexity) should be Amber due to the potential infringement on GA activities, LBA considered this to be unfounded as it is unlikely this option would require more airspace.

6.4.4.8. Runway 32 South and West Option E (32S&WE)

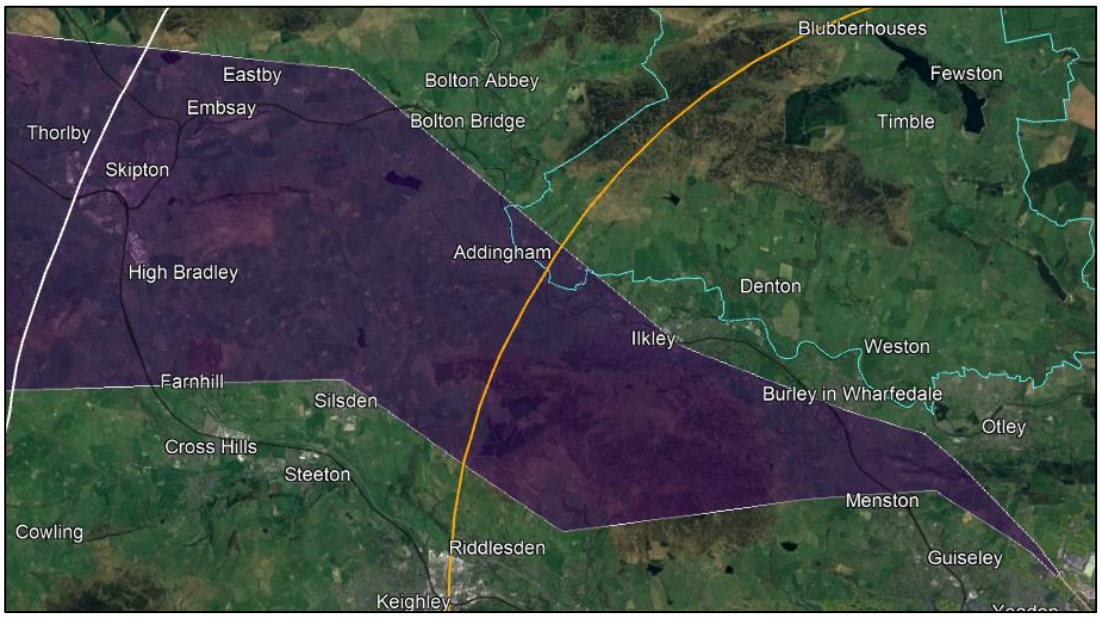


Figure 121: 32S&WE Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	*32S&WE was considered no longer a viable option and was discounted from assessment ahead of the third DPE. It did not fit with the Route Network as it does not point towards POL or NELSA.*										

Table 24 - Runway 32 South and West Option E DPE

6.4.4.8.1. Some stakeholders commented that they had insufficient time/information to assess if this should have been retained or not. Sponsor response to feedback: Sufficient detail on these options had been provided in the Second round of engagement to the same set of stakeholders.

6.4.4.8.2. In summary, although some stakeholders felt there was not enough information to assess if this option should be retained, LBA assessed that that it does not fit with the route network and therefore not a viable option.

6.4.4.9. Runway 32 South and West Option F (32S&WF)

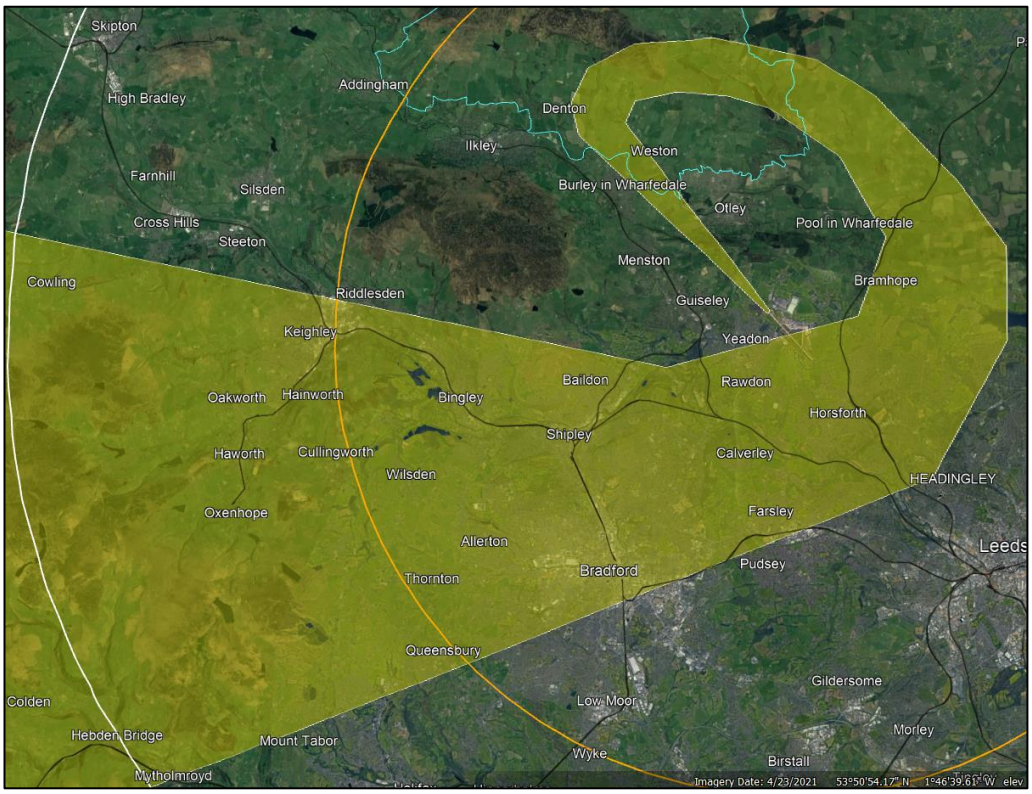


Figure 122: 32S&WF Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 25 - Runway 32 South and West Option F DPE

6.4.4.9.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red – Affects western Otley but takes some of the impact away from Burley-in-Wharfedale;
- DP3 – Red – AONB;
- DP4 – Red – Too many track miles in wrong direction;
- DP5 – Amber – Uncertainty about requirement for additional CAS;
- DP9 – Red - Too many track miles in wrong direction;
- DP10 – Amber - due to Amber in DP5 which indicates this option is only partially aligned with the AMS.

6.4.4.9.2. The DHPC, RSAG and BGA all felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Amber. RSAG and BGA also felt DP1 (Safety) should be Amber and DP5 (Airspace Dimensions) should be Red. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance the likelihood of additional CAS being required has been noted with the Amber rating for DP5. It is not felt that this translates into changes for DPs 1 or 6.

6.4.4.9.3. In Round 2, DHPC indicated that DPs 1, 5 and 6 should be Amber across all DOs. In the following Round (3), they stated that DP6 should be Amber.

6.4.4.9.4. The NWLTA felt DP2 (Noise) should be Red. *Sponsor response to feedback: DP2 has been amended to Red.*

6.4.4.9.5. In addition, in Round 2, the NWLTA stated that DP4 and DP9 should both be Red (as a result of the extra track) and that DP1 and DP6 should also both be Red. Sponsor response to feedback: LBA agree with regards to DP4 and 9, however when assessing DP1 and 6 against the criteria explained in section Table 8: Design Principle Criteria, these DPs were assessed as Green because no safety issues have been identified and this option does not result in a complex CTA/CTR configuration with numerous different base levels likely to lead to inadvertent CAS penetrations.

6.4.4.9.6. In Round 3, NWLTA stated that DP1 and DP2 should both be Amber. Sponsor response to feedback: DP2 had been assessed as red due to the increase in the numbers of people impacted. There were no safety issues identified and therefore DP1 remains Green.

6.4.4.9.7. Otley Town Council felt that 32S&WA & F posed the biggest Noise and Tranquillity threat to Otley. Sponsor response to feedback: The DPE already had DP3 graded as Red but on balance, with the impact to Western Otley and Northern Burley-in-Wharfedale, DP2 is amended to Red in this case.

6.4.4.9.8. Burn Gliding Club sought clarification as to why DP4 (Emissions and Air Quality) and DP9 (Operational Cost) evaluations were not the same on 32S&WA and 32S&WF. Sponsor response to feedback: The reason for this is that 32S&WF has a track that goes much further north before turning, adding additional track miles unnecessarily.

6.4.4.9.9. In Round 3, other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable evaluation, although Otley Town Council indicated that this option looks like it will have the biggest impact as it is likely to impact on west, east and north of Otley in terms of noise and tranquillity.

6.4.4.9.10. In Round 3, Moor Lane Residents Association stated that evaluation of DP2. DP3 and DP4 had not been carried out correctly.

6.4.4.9.11. In summary, the assessment for DP1 (Safety) changed from Red to Green after the second round of engagement, this is because LBA felt It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned, for this option the likelihood of additional CAS being required has been noted with the Amber rating for DP5 and It is not felt that this translates into changes for safety in relation to the current operation. DP4 (Emissions and Air Quality) have been reassessed as Red following the second round of engagement as it was noted that the additional track miles would be significant, adding to fuel consumption and therefore emissions.

6.4.4.10. Runway 32 South and West Option G (32S&WG)

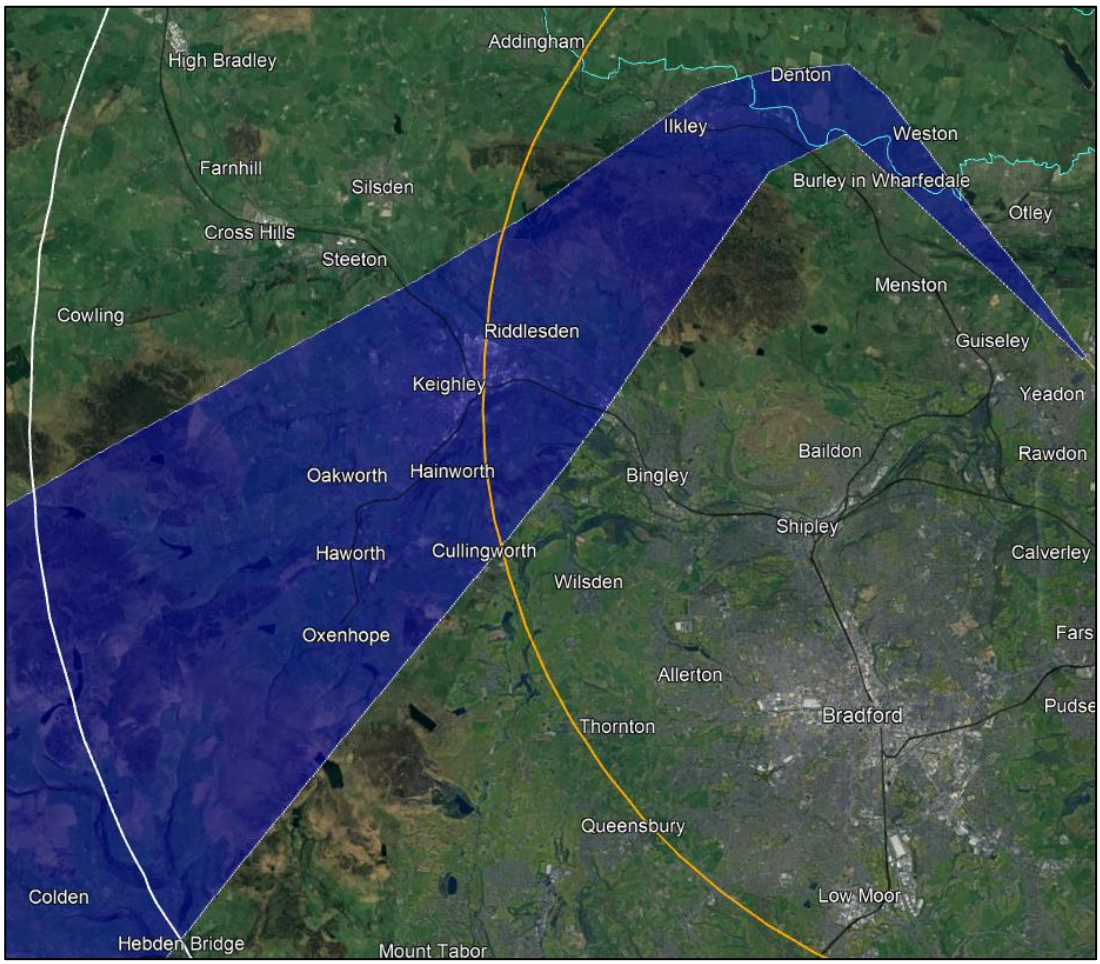


Figure 123: 32S&WG Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 26 - Runway 32 South and West Option G DPE

6.4.4.10.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red – Also brings Ilkley into the equation;
- DP3 – Red – AONB and Ilkley Moor, part of the Nidderdale AONB;
- DP9 – Amber - 'Fuel efficiency is optimal however there is some impact on local communities.' – Ilkley.

6.4.4.10.2. The NWLTA felt DP2 (Noise) should be Amber. Sponsor response to feedback: NWLTA was the only stakeholder to make this observation. Whilst it is possible the final design outcome may be 'Amber', at this stage it is perceived to have a Red grading as it has the potential to impact Western Otley, Burley-in-Wharfedale, Ben Rhydding and Ilkley.

6.4.4.10.3. The DHPC felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Amber. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance there is very little likelihood of additional CAS being required.

6.4.4.10.4. In Round 2, DHPC indicated that DPs 1, 5 and 6 should be Amber across all DOs. In the following Round (3), they stated that DP6 should be Amber.

6.4.4.10.5. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed due to the increase in the size of the CAS. It is most unlikely that this DO would require more CAS to contain it and on that basis these DP evaluations remain unchanged.

6.4.4.10.6. Otley Town Council felt that 32S&WC, D, G and H posed a Noise and Tranquillity threat to West Otley. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Red due to impact to new communities and Ilkley Moor.

6.4.4.10.7. In Round 3, other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable evaluation, although Otley Town Council indicated that this option looks similar to the existing NPR swathe but also goes close to the west of Otley and would have a noise and tranquillity impact.

6.4.4.10.8. In Round 3, Moor Lane Residents Association stated that evaluation of DP2. DP3 and DP4 had not been carried out correctly.

6.4.4.10.9. In summary, whilst some stakeholders felt that DP1 (safety) and DP6 (Airspace Complexity) should be Amber due to the potential infringement on GA activities, LBA considered this to be unfounded as it is unlikely this option would require more airspace. DP9 (Operational cost) was changed to Amber after the third round of engagement as LBA assessed that although fuel efficiency is optimal, there is some impact on local communities; the assessment criteria for DP9 states that '*provided it does not have an adverse impact of community disturbance, procedures should be designed to optimise fuel efficiency'*. The impact on local communities (DP2 Noise) has remained Red throughout the engagement process as a result.

6.4.4.11. Runway 32 South and West Option H (32S&WH)

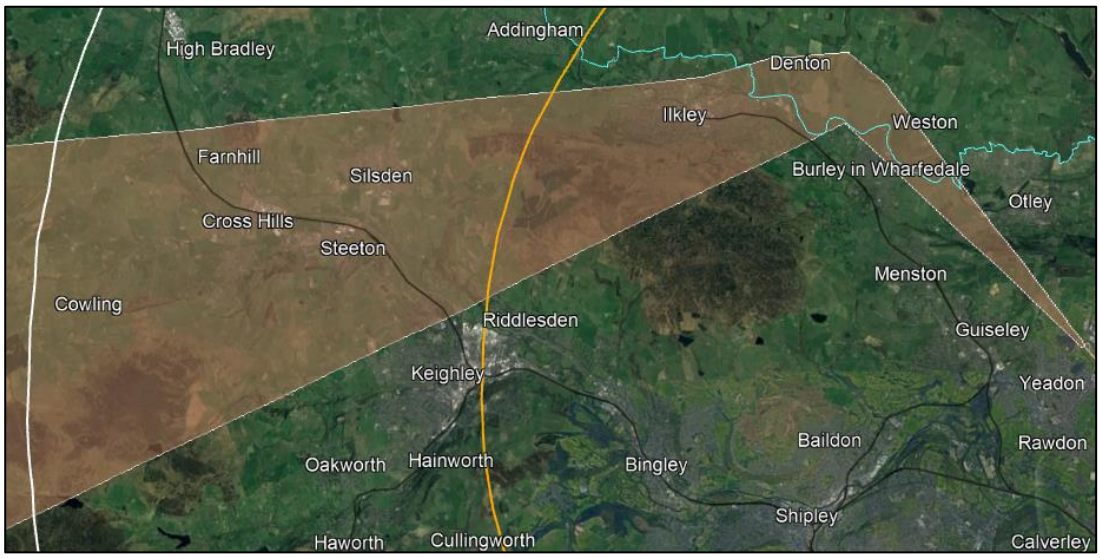


Figure 124: 32S&WH Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 27 - Runway 32 South and West Option H DPE

6.4.4.11.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red – Also brings Ilkley into the equation;
- DP3 – Red – AONB and Ilkley Moor, part of the Nidderdale AONB.;
- DP9 – Amber - 'Fuel efficiency is optimal however there is some impact on local communities.' – Ilkley.

6.4.4.11.2. The NWLTA felt DP2 (Noise) should be Amber. Sponsor response to feedback: NWLTA was the only stakeholder to make this observation. Whilst it is possible the final design outcome may be 'Amber', at this stage it is perceived to have a Red grading as it has the potential to impact Western Otley, Burley-in-Wharfedale, Ben Rhydding and Ilkley.

6.4.4.11.3. The DHPC felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Amber. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance there is very little likelihood of additional CAS being required.

6.4.4.11.4. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed due to the increase in the size of the CAS. It is most unlikely that this DO would require more CAS to contain it and on that basis these DP evaluations remain unchanged.

6.4.4.11.5. In subsequent engagement rounds, RSAG stated that DPs 1, 5 and 6 should be Red (Round 2) and Amber (Round 3).

6.4.4.11.6. Otley Town Council felt that 32S&WC, D, G and H posed a Noise and Tranquillity threat to West Otley. Sponsor response to feedback: The DPE already had DPs 2 and 3 graded as Red due to impact to new communities and Ilkley Moor.

6.4.4.11.7. In Round 3, other stakeholders (Leeds City Council and Otley Town Council) stated that there was not enough detail in the consultation material to enable evaluation, although Otley Town Council indicated that this option looks similar to the existing NPR swathe but also goes close to the west of Otley and would have a noise and tranquillity impact.

6.4.4.11.8. In Round 3, Moor Lane Residents Association stated that evaluation of DP2. DP3 and DP4 had not been carried out correctly.

6.4.4.11.9. In summary, whilst some stakeholders felt that DP1 (Safety) and DP6 (Airspace Complexity) should be Amber due to the potential infringement on GA activities, LBA considered this to be unfounded as it is unlikely this option would require more airspace. DP9 (Operational cost) was changed to Amber after the third round of engagement as LBA assessed that although fuel efficiency is optimal, there is some impact on local communities; the assessment criteria for DP9 states that '*provided it does not have an adverse impact of community disturbance, procedures should be designed to optimise fuel efficiency'*. The impact on local communities (DP2 Noise) has remained Red throughout the engagement process as a result.

6.4.5. Runway 32 South and West Combination Options

6.4.5.1. This section contains the DPE for the five options in the South-East Design Envelope, there is no baseline for the combination options as these are already evaluated in the preceding design envelopes.

6.4.5.2. Runway 32 Combination Option A

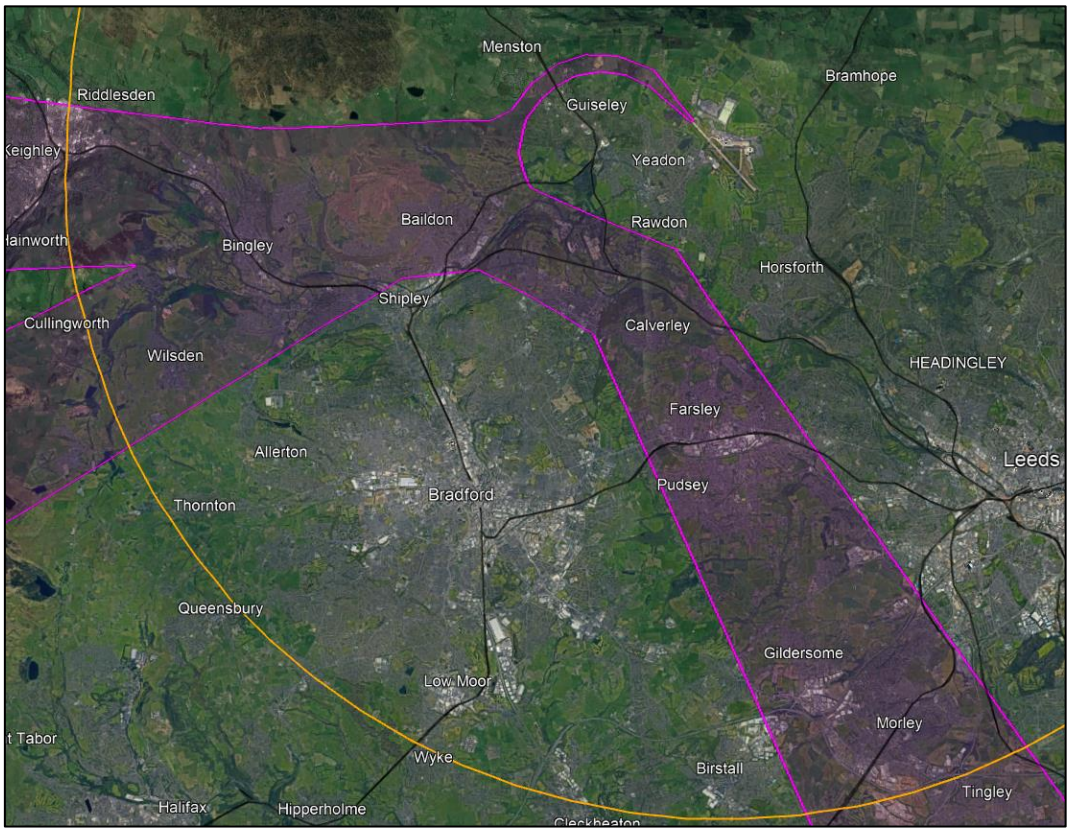


Figure 125: 32NEWA Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 28 - Runway 32 Combination Option A DPE

6.4.5.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – Potential to affect less people at lower level but newly affected North Guisley and Baildon;
- DP3 – Amber - Baildon Moor;
- DP7 – Amber - Early turn will need some justification;
- DP11 – Amber - May require fleet upgrades.

6.4.5.2.2. Peak District NP felt DP3 (Tranquillity) needed to reflect potential impact to Bolton Abbey, Embsay and Skipton in the Yorkshire Dales NP. Sponsor response to feedback: DP3 already rated Amber for Baildon Moor. Impact to these other places is duly noted although aircraft would be well above 5-6000ft by the time these places were reached. As per the criteria set for DP3, this swathe does not affect a significant portion of the NP.

6.4.5.2.3. North-West Leeds Transport Association (NWLTA) felt DP2 (Noise) needed to be rated Green as fewer people were perceived to be affected by noise. Sponsor response to feedback: It is possible that fewer people may ultimately be affected depending on where the final procedure is designed within the swathe however, on balance and with other stakeholders disagreeing, DP3 remains Amber.

6.4.5.2.4. DHPC felt DP6 (Airspace Complexity) should be rated Amber as it may pose issues for the Derbyshire Soaring Club and other British Gliding Association (BGA) clubs. This view was reiterated in Round 3. They also commented that the Baildon Moor Letter of Agreement would need reviewing. Sponsor response to feedback: A SID within this swathe would be contained in the existing CAS and as such should pose no more problem to these clubs than experienced today.

6.4.5.2.5. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber. They cited the lack of information on the future CAS construct as the reason for not being able to assess this any further and so settled on Amber. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.4.5.2.6. Otley Town Council felt they were unable to quantify the impact to western Otley with respect to DPs 2 (Noise) and 3 (Tranquillity). In Round 3, they stated that this option would appear to follow the existing northbound NPR swathe, but any flights on this route pass near or over the west side of Otley at below 4000ft and so would have a noise and tranquillity impact which they felt unable to quantify. Sponsor response to feedback: These have been rated as Amber based upon the criteria that has been set, i.e. it is not perceived that this option will increase the overall impact of aircraft noise, nor will it result in direct and significant overflight of AONBs or NPs. This is a qualitative assessment; quantitative assessment of more honed options will take place in Stage 3 giving stakeholders the opportunity to make quantifiable assessments.

6.4.5.2.7. Menston Parish Council were unhappy that, despite being billed as a potential respite route, there was insufficient detail on when and how often it would be used. They felt DPs 2, 3, 4 and 7 had not been evaluated correctly but offered no alternative evaluation. Sponsor response to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.2.8. Moor Lane Resident's Association also felt that DPs 2 (Noise), 3 (Tranquillity), 4 (Emissions and Air Quality) and 7 (Technical) had not been evaluated correctly but offered no alternative evaluation. They felt Option A would 'not enhance' DPs 2, 3 and 4 and that 'due to the tight radius of turn flyability will be challenging'. They also commented that despite being billed as a potential respite route, there was insufficient detail on when and how often it would be used. Sponsor response to feedback: DP2 and 3 are evaluated as Amber and as such have not been assessed as necessarily 'enhancing' the noise and tranquillity situation (albeit this may still be possible within this swathe). DP7 is already assessed as Amber as procedures utilising tight Radius-to-Fix turns are relatively new to the UK. However, were such a procedure to be implemented, it would only be used by those operators capable of flying them and flyability for these operators will not be 'challenging'.

6.4.5.2.9. Burley-in-Wharfedale Parish Council felt DPs 2 (Noise), 3 (Tranquillity), 4 (Emissions and Air Quality) and 7 (Technical) had not been evaluated correctly. Their rationale was that the route turns left much earlier than the current one and routes between Guiseley and Menston. They felt this would not enhance DP2, 3 or 4. In addition, due the tight radius of turn, flyability will be challenging (DP7) resulting in violation of future noise reduction methods. The lack of information on as to how often and under what circumstances this new route may be used left them unable to conduct an evaluation against the DPs. Sponsor response to feedback: DP2 and 3 are evaluated as Amber and as such have not been assessed as necessarily 'enhancing' the noise and tranquillity situation (albeit this may still be possible within this swathe) but more a case of 'sharing the burden' with Burley-in-Wharfedale receiving some benefit. The detail on how such a route might be utilised as a respite route is detail that will be included in the Stage 3 consultation should this DO progress. We feel the shorter mileage would only result in a positive result for DP4. DP7 is already assessed as Amber as procedures utilising tight Radius-to-Fix turns are relatively new

to the UK. However, were such a procedure to be implemented, it would only be used by those operators capable of flying them and flyability for these operators will not be 'challenging'.

6.4.5.2.10. Finally, Burn Gliding Club did not like how the material was presented in the engagement slide deck. Sponsor response to feedback: The challenge faced by the author is finding the balance between overloading a slide with too much information and not putting enough information there. It is felt that an appropriate balance was found in this instance.

6.4.5.2.11. In summary, although Baildon Moor is not a designated AONB, DP3 (Tranquillity) was assessed as Amber due to stakeholder feedback. DP7 assessed as Amber as procedures utilising tight Radius-to-Fix turns are relatively new to the UK and would be required for this option and would only be used by operators capable of flying them, it is assessed as Amber in recognition of technical challenges. DP2 evaluated as Amber and as this option does not enhance the situation regarding noise, rather it shares the burden of noise with the potential of improving it, this will be assessed further in the next stage. The assessments remained consistent throughout the two stages of consultation.

6.4.5.3. Runway 32 Combination Option B

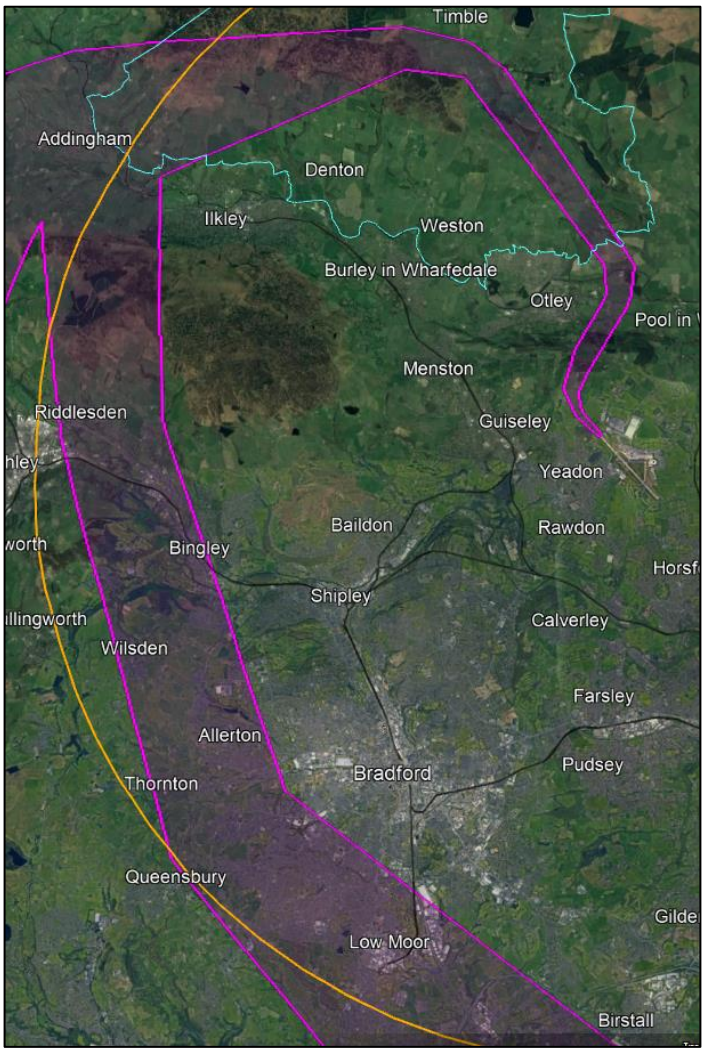


Figure 126: 32NEWB Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 29 - Runway 32 Combination Option B DPE

6.4.5.3.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP3 – Red - AONB and NP;
- DP4 – Red - More track miles but facilitates continuous climb;
- DP7 – Amber - Early turn will need some justification;
- DP9 – Red - Done to avoid communities.

6.4.5.3.2. Peak District NP felt DP3 (Tranquillity) needed to reflect potential impact to Bolton Abbey, Embsay and Skipton in the Yorkshire Dales NP. Sponsor response to feedback: DP3 already rated Red for the Nidderdale AONB and the Chevin. Impact to these other places is duly noted although aircraft would be well above 5-6000ft by the time these places were reached.

6.4.5.3.3. The DHPC felt DP6 (Airspace Complexity) should be rated Red as it may pose a threat to the Addingham Moorside Gliding Club. They also commented that the Ilkley Moor Letter of Agreement would need reviewing. Sponsor response to feedback: A SID contained within this swathe would be most likely be contained laterally and vertically in the existing CAS and as such should pose no more problem to these clubs than experienced today.

6.4.5.3.4. Leeds City Council felt that some members of the community would be affected more than they are today. Sponsor response to feedback: Whilst some members of the community may be more greatly affected, our assessment, in line with our criteria, is that this option has the potential to limit or potential to reduce the overall impact of aircraft noise.

6.4.5.3.5. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber. They cited the lack of information on the future CAS construct as the reason for not being able to assess this any further and so settled on Amber. Sponsor response to feedback: It would not be appropriate

to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.4.5.3.6. Otley Town Council felt they were unable to quantify the impact to eastern Otley with respect to DPs 2 (Noise) and 3 (Tranquillity). Sponsor response to feedback: DP2 has been rated as Green for the reasons stated above and DP3 has been rated as Red in recognition of the passage over the AONB and the Chevin. This is a qualitative assessment; quantitative assessment of more honed options will take place in Stage 3 giving stakeholders the opportunity to make quantifiable assessments.

6.4.5.3.7. Menston Parish Council were unhappy that, despite being billed as a potential night relief route, there was insufficient detail on when and how often it would be used. They felt DPs 2, 3, 4 and 7 had not been evaluated correctly but offered no alternative evaluation. Sponsor response to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.3.8. Moor Lane Residents Association felt DPs 2 (Noise), 3 (Tranquillity) and 7 (Technical) had not been evaluated correctly. They wished to know if there was a commitment to always using this at night, if so, would it to be used in the current published 'Night" hours of 2300-0700? Without this information evaluation against the DPs could not be made. This route has an early right turn after departure. This is likely to have aircraft performance issues in the event of a single engine failure and the adjacency to the rising ground of the Chevin (DP7). Sponsor response to feedback: DP2 has been rated Green as, whilst some members of the community may be more greatly affected, our assessment in line with our criteria, is that this option has the potential to limit, or potential to reduce, the overall impact of aircraft noise. DP3 has been rated Red in recognition of the passage over the AONB and the Chevin. The detail on how such a night relief route might be utilised is detail that will be included in the Stage 3 consultation should this DO progress. DP7 is already assessed as Amber as procedures utilising tight Radius-to-Fix turns are relatively new to the UK. However, were such a procedure to be implemented, it would only be used by those operators capable of flying them and flyability for these operators will not be 'challenging'.

6.4.5.3.9. Finally, Burn Gliding Club did not like how the material was presented in the engagement slide deck. Sponsor response to feedback: The challenge faced by the author is finding the balance between overloading a slide with too much information and not putting enough information there. It is felt that an appropriate balance was found in this instance.

6.4.5.3.10. In summary, this option was consistently assessed before and after the Third round of engagement. Stakeholders commented on tranquil areas; however, this DP was already assessed as Red due to the AONB. Some questioned DP6 (Airspace Complexity) due to perceived infringements on the GA community, however LBA assessed that this option would be contained within CAS. Similarly, DP2 noise was assessed as Green as this option has the potential to reduce noise impact. In order to reduce the noise impact an early turn was conceived but will need some justification and therefore assessed as Amber for DP7 (Technical). DP9 (Operational Costs) was assessed as Red due to this option being in favour of avoiding communities rather than operational efficiency.

6.4.5.4. Runway 32 Combination Option C

Figure 127: 32NEWC Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 30 - Runway 32 Combination Option C DPE

6.4.5.4.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – New communities affected;
- DP3 – Amber – AONB – Chevin;
- DP4 – Red - Has the potential to increase CO_2 emissions - Additional track miles;
- DP5 – Amber - Uncertain as to airspace containment in right turn;
- DP7 – Amber - Early turn will need some justification;
- DP9 – Amber - Fuel efficiency not optimised - Additional track miles;
- DP10 –Amber - due to Amber in DP5 which indicates this option is only partially aligned with the AMS;
- DP11 – Amber - May require fleet upgrades.

6.4.5.4.2. The NWLTA felt DP1 (Safety) should be Amber due to conflict with arriving traffic and that DP2 (Noise) should be Red due to the impact on the communities of East Otley, Bramhope, Adel, Cookridge and Horsforth being greater than the benefit to those no longer affected near Menston and Burley. Sponsor response to feedback: In the initial phase of flight, it is assessed that less people are affected at lower levels. Most of the communities mentioned by the NWLTA would be 'overflown' no lower than 4000ft but despite this, the DPE for DP2 has been amended to Amber.

6.4.5.4.3. The DHPC felt DP6 (Airspace Complexity) commented that the Baildon Moor Letter of Agreement would need reviewing. Sponsor response to feedback: A SID contained within this swathe would be most likely be contained laterally and vertically in the existing CAS and as such should pose no more problem to Baildon Moor than experienced today.

6.4.5.4.4. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety) and 5 (Airspace Dimensions) should be rated Amber and 6 (Airspace Complexity) should be rated Red. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. DP1 is not amended from Green to Amber as this 'wraparound' departure would take aircraft well above the inbounds as it crosses the inbound lane. This option is not considered to lead to a complex airspace construct and as such DP6 remains Green.

6.4.5.4.5. Otley Town Council felt they were unable to quantify the impact to eastern Otley with respect to DPs 2 (Noise) and 3 (Tranquillity). Sponsor response to feedback: DP2 has been rated as Green for the reasons stated above and DP3 has been rated as Amber in recognition of the passage over the Chevin. This is a qualitative assessment; quantitative assessment of more honed options will take place in Stage 3 giving stakeholders the opportunity to make quantifiable assessments.

6.4.5.4.6. Bramhope and Carlton Parish Council felt DP2 (Noise) should be rated Amber or Red due to the impact to the community they represent. Specific reference was made to the Spring Wood Park housing development (380 houses) that 'will need to be avoided'. Sponsor response to feedback: In the initial phase of flight it is assessed that less people are affected at lower levels. Bramhope would be 'overflown' no lower than 4000ft but despite this, the DPE for DP2 has been amended to Amber.

6.4.5.4.7. Menston Parish Council were unhappy that, despite being billed as a potential respite route, there was insufficient detail on when and how often it would be used. They felt DPs 2, 3 and 4 had not been evaluated correctly but offered no alternative evaluation. Sponsor response

to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.4.8. Moor Lane Residents Association felt DPs 2 (Noise), 3 (Tranquillity) and 4 (Emission and Air Quality) were incorrectly evaluated but offered no alternative evaluation. They commented as to the lack of detail on how this might be used as a respite route. Sponsor response to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.4.9. Burley-in-Wharfedale Parish Council felt DPs 2 (Noise), 3 (Tranquillity) and 4 (Emissions and Air Quality) had not been evaluated correctly. The lack of information on as to how often and under what circumstances this new route may be used for respite left them unable to conduct an evaluation against the DPs. Sponsor response to feedback: DP2 is assessed as Green as a qualitative assessment suggests it would affect less people at lower altitudes than today. DP3 is assessed as Amber in recognition of overflight of the Chevin. The detail on how such a route might be utilised as a respite route is detail that will be included in the Stage 3 consultation should this DO progress. DP4 is assessed as Amber in recognition of the additional mileage flown albeit this is not assessed as being as bad as Options B and D.

6.4.5.4.10. Finally, Burn Gliding Club commented on the potential for additional CAS being required. Sponsor response to feedback: Our assessment was Amber as per the criteria set as small amounts of additional CAS may be required for containment. The procedure would need to have a 2nm buffer from the nominal track to the edge of the CAS.

6.4.5.4.11. In summary, although some stakeholders questioned DP1 (Safety) due to perceived arrivals conflict, LBA assessed that there would be no conflict with arrivals. DP4 and 5 are assessed as Red due to increased emissions uncertainty regarding CAS confinement. As a result of stakeholder feedback DP2 (Noise) was changed to Amber to reflect impact on the communities of East Otley, Bramhope, Adel, Cookridge and Horsforth being greater than the benefit to those no longer affected near Menston and Burley.

6.4.5.5. Runway 32 Combination Option D

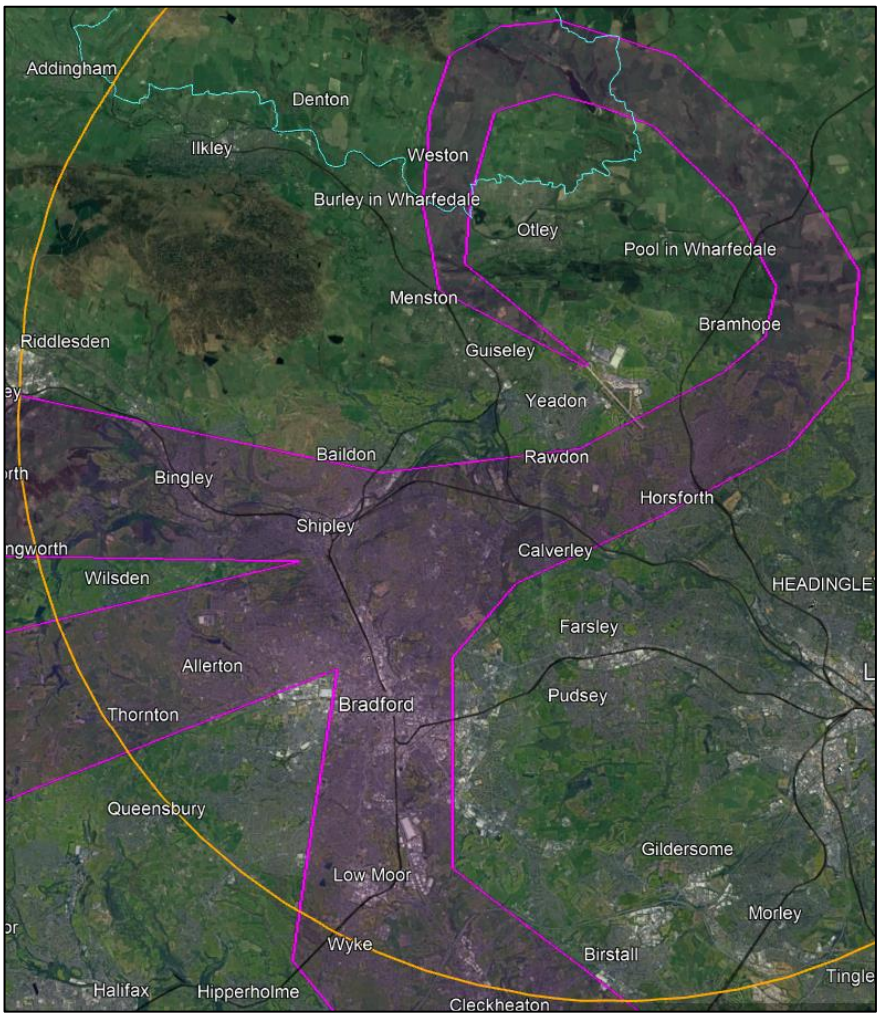


Figure 128: 32NEWD Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 31 - Runway 32 Combination Option D DPE

6.4.5.5.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – New communities affected;
- DP3 – Red – AONB;
- DP4 - Red - Has the potential to increase CO_2 emissions - More track miles but facilitates continuous climb;
- DP5 – Amber - Uncertain as to airspace containment in right turn;
- DP9 – Red - Fuel efficiency not optimised' - Done to avoid communities;
- DP10 – Amber - due to Amber in DP5 which indicates this option is only partially aligned with the AMS.

6.4.5.5.2. The NWLTA felt DP1 (Safety) should be Amber due to conflict with arriving traffic and that DP2 (Noise) should be Red due to the impact on the communities of East Otley, Bramhope, Adel, Cookridge and Horsforth being greater than the benefit to those no longer affected near Menston and Burley. Sponsor response to feedback: In the initial phase of flight, it is assessed that less people are affected at lower levels. Most of the communities mentioned by the NWLTA would be 'overflown' no lower than 4000ft but despite this, the DPE for DP2 has been amended to Amber.

6.4.5.5.3. The DHPC felt DP6 (Airspace Complexity) should be Amber and commented that the Baildon Moor Letter of Agreement would need reviewing. Sponsor response to feedback: A SID contained within this swathe would be most likely be contained laterally and vertically in the existing CAS and as such should pose no more problem to Baildon Moor than experienced today.

6.4.5.5.4. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) were incorrectly evaluated. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the

options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. DP1 is not amended from Green to Amber as this 'wraparound' departure would take aircraft well above the inbounds as it crosses the inbound lane. This option is not considered to lead to a complex airspace construct and as such DP6 remains Green.

6.4.5.5.5. In Round 3, RSAG stated that DPs 1 and 6 should be Amber and DP 5 should be Red.

6.4.5.5.6. Leeds City Council felt that some members of the community would be affected more than they are today. Sponsor response to feedback: Whilst some members of the community may be more greatly affected, our initial assessment, in line with our criteria, was that this option had the potential to limit or potential to reduce the overall impact of aircraft noise (in particular below 4000ft). Most of the communities 'overflown' would experience aircraft no lower than 4000ft but despite this, the DPE for DP2 has been amended to Amber.

6.4.5.5.7. In Round 3, Leeds City Council indicated that the route would pass near or over the west side of Otley at below 4000 ft meaning there would be a noise and tranquillity impact which they were unable to quantify at this stage.

6.4.5.5.8. Otley Town Council felt they were unable to quantify the impact to western Otley with respect to DPs 2 (Noise) and 3 (Tranquillity). Sponsor response to feedback: As stated above, DP2 has been amended to Amber. DP3 was already graded as Red due to the potential impact to the Nidderdale AONB. This is a qualitative assessment; quantitative assessment of more honed options will take place in Stage 3 giving stakeholders the opportunity to make quantifiable assessments.

6.4.5.5.9. Bramhope and Carlton Parish Council felt DP2 (Noise) should be rated Amber or Red due to the impact to the community they represent. Specific reference was made to the Spring Wood Park housing development (380 houses) that 'will need to be avoided'. Sponsor response to feedback: In the initial phase of flight it is assessed that less people are affected at lower levels. Bramhope would be 'overflown' no lower than 4000ft but despite this, the DPE for DP2 has been amended to Amber.

6.4.5.5.10. During a presentation for Round 3, Bramhope and Carlton Parish Council commented that navigational elements would be needed to be more precise in using this swathe. This would be required to avoid Spring Wood Park.

6.4.5.5.11. Menston Parish Council were unhappy that, despite being billed as a potential night relief route, there was insufficient detail on when and how often it would be used. They felt DPs 2, 3 and 4 had not been evaluated correctly but offered no alternative evaluation. Sponsor response to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.5.12. Moor Lane Residents Association felt DPs 2 (Noise), 3 (Tranquillity) and 4 (Emission and Air Quality) were incorrectly evaluated but offered no alternative evaluation. They commented as to the lack of detail on how this might be used as a respite route. Sponsor response to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.5.13. Burley-in-Wharfedale Parish Council felt DPs 2 (Noise), 3 (Tranquillity) and 4 (Emission and Air Quality) had not been evaluated correctly. They wished to know if there was a commitment to always using this at night, if so, would it to be used in the current published 'Night" hours of 2300-0700? Without this information evaluation against the DPs could not be made. Sponsor response to feedback: DP2 has been rated Green as, whilst some members of the community may be more greatly affected, our assessment in line with our criteria, is that this option has the potential to limit or potential to reduce the overall impact of aircraft noise. DP3 has been rated Red recognition of the passage over the AONB. The detail on how such a night relief route might be utilised is detail that will be included in the Stage 3 consultation should this DO progress. DP4 has been assessed as Red due to the significant additional mileage resulting in extra fuel burn.

6.4.5.5.14. Finally, Burn Gliding Club commented on the potential for additional CAS being required. Sponsor response to feedback: Our assessment was Amber as per the criteria set as small amounts of additional CAS may be required for containment. The procedure would need to have a 2nm buffer from the nominal track to the edge of the CAS.

6.4.5.5.15. In summary, although some stakeholders questioned DP1 (Safety) due to perceived arrivals conflict, LBA assessed that there would be no conflict with arrivals. DP4 (Emissions and Air Quality) is assessed as Red due to increased emissions and DP5 (Airspace dimensions) Amber due to uncertainty regarding CAS confinement. As a result of stakeholder feedback DP2 (Noise) was changed to Amber to reflect impact on the communities of East Otley, Bramhope, Adel, Cookridge and Horsforth being greater than the benefit to those no longer affected near Menston and Burley and Spring Wood Park housing development. Stakeholder comments about this option being respite and night relief route will be addressed in the next stage of the ACP process, should the option progress.

6.4.5.6. Runway 32 Combination Option E

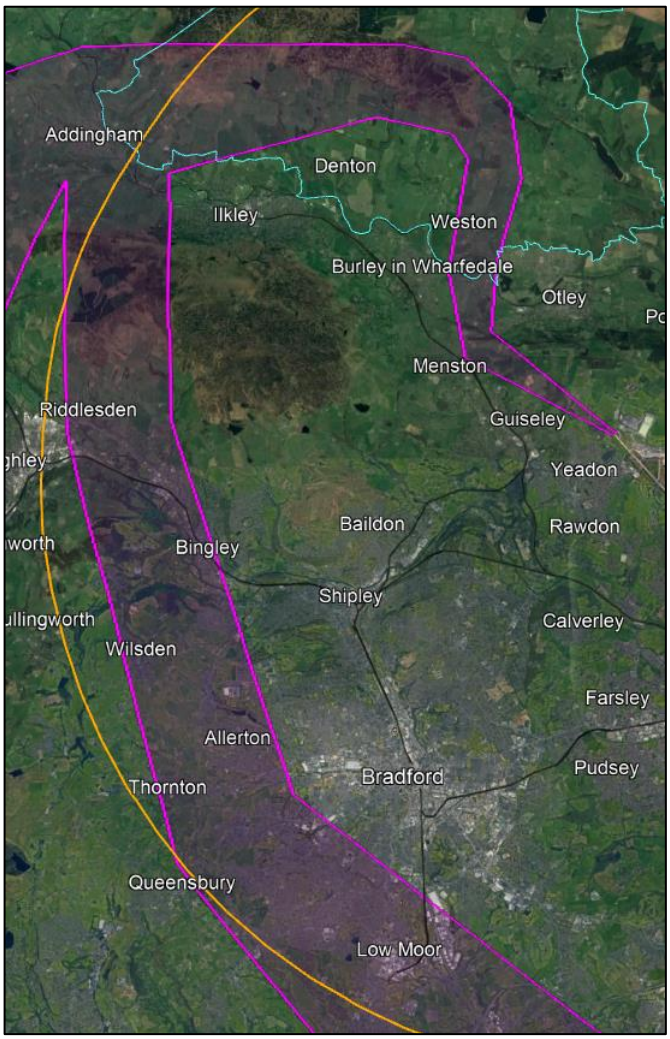


Figure 129: 32NEWE Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 32 - Runway 32 Combination Option E DPE

6.4.5.6.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP3 – Red – AONB;
- DP4 - Red - Has the potential to increase CO_2 emissions - More track miles but facilitates continuous climb;
- DP9 – Red - Fuel efficiency not optimised' - Done to avoid communities.

6.4.5.6.2. Peak District NP felt DP3 (Tranquillity) needed to reflect potential impact to Bolton Abbey, Embsay and Skipton in the Yorkshire Dales NP. Sponsor response to feedback: DP3 already rated Red for the Nidderdale AONB and the Chevin. Impact to these other places is duly noted although aircraft would be well above 5-6000ft by the time these places were reached.

6.4.5.6.3. The DHPC felt DP6 (Airspace Complexity) should be rated Red as it may pose a threat to the Addingham Moorside Gliding Club. They also commented that the Ilkley Moor Letter of Agreement would need reviewing. Sponsor response to feedback: A SID contained within this swathe would be most likely be contained laterally and vertically in the existing CAS and as such should pose no more problem to these clubs than experienced today.

6.4.5.6.4. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber. They cited the lack of information on the future CAS construct as the reason for not being able to assess this any further and so settled on Amber. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.4.5.6.5. Leeds City Council felt that some members of the community would be affected more than they are today. Sponsor response to feedback: Whilst some members of the community may

be more greatly affected, our assessment, in line with our criteria, is that this option has the potential to limit or potential to reduce the overall impact of aircraft noise.

6.4.5.6.6. Otley Town Council felt they were unable to quantify the impact to western Otley with respect to DPs 2 (Noise) and 3 (Tranquillity). Sponsor response to feedback: DP2 has remained Green as it remains our assessment that this option affords the potential to reduce the overall impacts of aircraft noise. DP3 was already graded as Red due to the potential impact to the Nidderdale AONB. This is a qualitative assessment; quantitative assessment of more honed options will take place in Stage 3 giving stakeholders the opportunity to make quantifiable assessments.

6.4.5.6.7. Menston Parish Council were unhappy that, despite being billed as a potential night relief route, there was insufficient detail on when and how often it would be used. They felt DPs 2, 3, 4 and 7 had not been evaluated correctly but offered no alternative evaluation. Sponsor response to feedback: The detail associated with the use of routes as night or respite routes will be included in the more mature option development in preparation for Stage 3 consultation.

6.4.5.6.8. In summary, the assessments remained the same re and post stakeholder engagement. Concerns regarding tranquillity had already been addressed by the assessment of DP3 (Tranquillity) as Red. DP2 (Noise) remained Green as it remains LBA's assessment that this option has the potential to reduce the overall impacts of aircraft noise, thus satisfying the assessment criteria. Some stakeholders suggested that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber as they felt the lack of information on the future CAS construct meant they were unable to assess these DPs for this option, LBA believe that it would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. DP4 (Emissions and Air Quality) and DP9 (Operational Cost) remained Red post engagement and was not challenged; this option would not optimise fuel efficiency and as a result potentially increase emissions.

6.5. Runway 14 Departures

6.5.1. This section contacts the DPE for all options departing from runway 14. Each section contains a design envelope with the DPE for each option as a sub section.

6.5.2. Runway 14 Southeast Design Envelope

6.5.2.1. This section contains the DPE for the six options in the South-East Design Envelope, including the baseline and do-minimum options.

6.5.2.2. Runway 14 South-East Baseline

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 33 - Runway 14 South-East Baseline DPE

6.5.3. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being today's current baseline operation;
- DP10 – Red as this is the baseline option and if it were to be retained it does not satisfy the objectives of the AMS;
- DP11 – Red as this is the baseline option and if it were to be retained the latest navigational standards would not be utilised.

6.5.3.1. Runway 14 South-East Do Minimum (Area Navigation Substitution)

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 34 - Runway 14 South-East Do Minimum DPE

6.5.3.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being geographically the same as today's current baseline operation.

6.5.3.2. Runway 14 South-East Option A (14SEA)

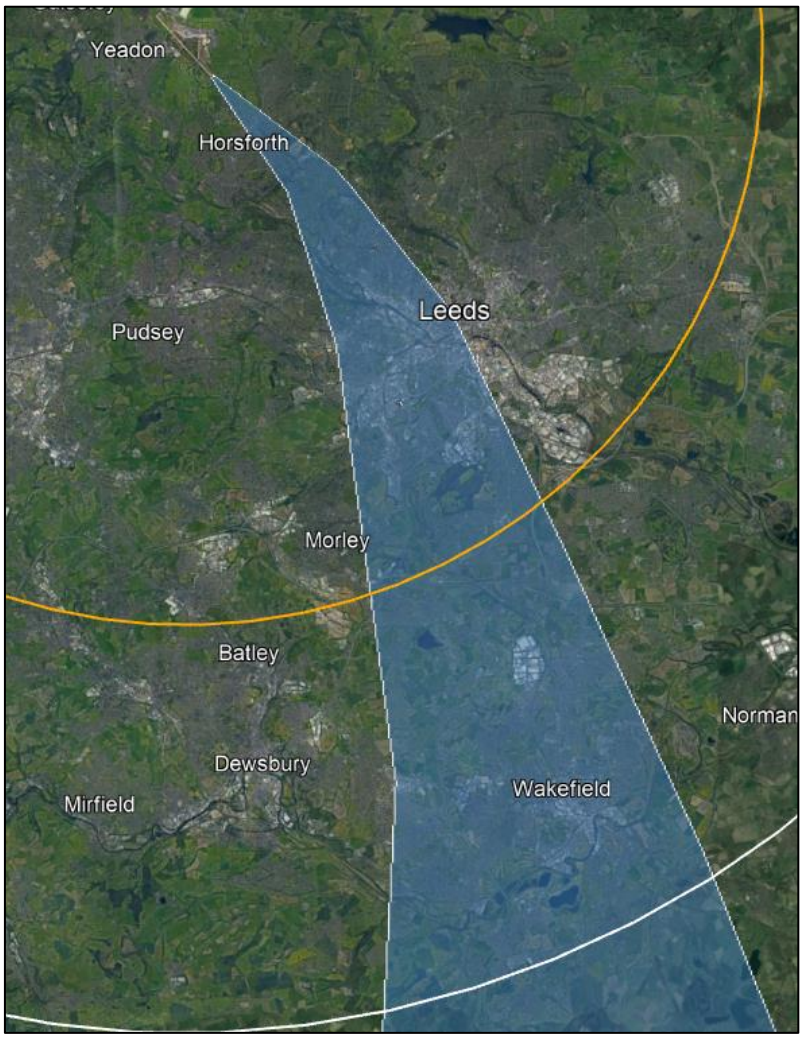


Figure 130: 14SEA Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 35 - Runway 14 South-East Option A DPE

6.5.3.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – Various different communities affected;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP9 – Amber - Fuel efficiency is optimal however there is some impact on local communities.

6.5.3.2.2. The NWLTA felt DP2 (Noise) should be Green. Sponsor response to feedback: Whilst the final outcome may allow for a design that would be 'Green' for Noise, it is very difficult to qualitatively assess this and, as such, with it still being a very built-up area that aircraft would pass over below 4000ft, it seems appropriate to retain the Amber rating.

6.5.3.2.3. In addition, in Round 1, NWLTA stated that they agreed with the DPE except in respect of the extra track miles. It suggested that this could have been avoided by placing the swathe slightly further north (centred on the southern boundary of swathe B) and the resulting swathe would have been better than all the others shown for departures on RW14 to the South East. Sponsor response to feedback: LBA have assessed this option and consider that the option would be the same or similar to today's operation and therefore assessed DP4 (Emissions and Air Quality) as Amber

6.5.3.2.4. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed specifically in the Camphill Wave Box area. Sponsor response to feedback: It is most unlikely that this DO would require more CAS to contain it and the Airport has no intention of not working with the glider community in relation to the Letters of Agreement already in place. The uncertainty with DSA remains but this is not in the hands of LBA. On that basis, these DP evaluations remain unchanged.

6.5.3.2.5. In Round 1, the Yorkshire Gliding Centre stated that it did not agree with DP6, indicating that it was unclear how the swathe would synchronise with DSA CTA and Yorkshire CTA as no flight level information was provided.

6.5.3.2.6. Other comments made in Round 1 related to there being no recognition under DP3 that there would be overflight of the Peak District NP (Peak District NP Authority). The Dales Hang Gliding and Paragliding Club stated that it did not agree with DP4 and recommended that it should be Amber due to extra track miles.

6.5.3.2.7. In summary, whilst it was suggested that DP2 (Noise) should be Green, LBA determined that as this option would initially fly over a very built-up area and that aircraft would pass over below 4000ft, it is appropriate to retain the Amber rating. DP4 (Emissions and Air Quality) was assessed as the same as today's operation and therefore not Red in response to concern regarding extra track miles. DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) remain unchanged despite concern regarding gliding operations being curtailed; LBA considers it unlikely that this option would require more CAS and the Airport has every intention of working with the glider community in relation to the Letters of Agreement already in place.

6.5.3.3. Runway 14 South-East Option B (14SEB)

Figure 131: 14SEB Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 36 - Runway 14 South-East Option B DPE

6.5.3.3.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – Confliction with arrivals via GOLES
- DP2 – Amber – Various different communities affected.;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP6 – Amber - Confliction with arrivals via GOLES;
- DP9 – Amber - 'Fuel efficiency is optimal however there is some impact on local communities.

6.5.3.3.2. The NWLTA felt DP2 (Noise) should be Red. They were keen to highlight the densely populated communities of North Woodhouse and Little London. Sponsor response to feedback: It is very difficult to qualitatively assess this and as such, with this option being most similar to the baseline and passing over a very built-up area, it seems appropriate to retain the Amber rating, i.e. that the experience would be broadly similar to today.

6.5.3.3.3. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed specifically in the Upton Corridor (CTA8 and 9) area. Sponsor response to feedback: It is most unlikely that this DO would require more CAS to contain it and the Airport has no intention of not working with the glider community in relation to the Letters of Agreement already in place. The uncertainty with DSA remains but this is not in the hands of LBA. On that basis these DP evaluations remain unchanged.

6.5.3.3.4. In Round 1, RSAG indicated that DPs 1, 5 & 6 should be Red. In the subsequent Round (2), they stated that DPs 1, 5 and 6 should be Amber and, in Round 3, given the uncertainties above, they suggested that DPs 1 & 6 should be Red and DP 5 Amber.

6.5.3.3.5. In Round 1, York Gliding Centre stated that it did not agree with DP1.

6.5.3.3.6. In Round 2, Dales Hang Gliding and Paragliding Club (DHPC) stated that DPs 1, 5 & 6 should be Amber for all DOs. They stated further that they were unable to make meaningful comment until details of the proposed controlled airspace has been promulgated.

6.5.3.3.7. In Round 2, the North West Leeds Transport Forum stated that, with regard to 32SEB, 32SEC and 32SED, DP2 should be Amber (because of increased noise disturbance to the heavily populated area of North and Central Leeds). In Round 3, they indicated that DP2 for this swathe (14SEB) should be Red because they felt that the affected population was likely to be greater due to the high population densities in areas such as North Woodhouse and Little London.

6.5.3.3.8. In summary, whilst it was suggested that DP2 (Noise) should be Red, LBA determined that as this option would initially fly over a very built-up area it is appropriate to retain the Amber rating. DP4 (Emissions and Air Quality) was assessed as the same as today's operation and therefore not Red in response to concern regarding extra track miles. DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) remain unchanged despite concern regarding gliding operations being curtailed; LBA considers it unlikely that this option would require more CAS and the Airport has every intention of working with the glider community in relation to the Letters of Agreement already in place.

6.5.3.4. Runway 14 South-East Option C (14SEC)

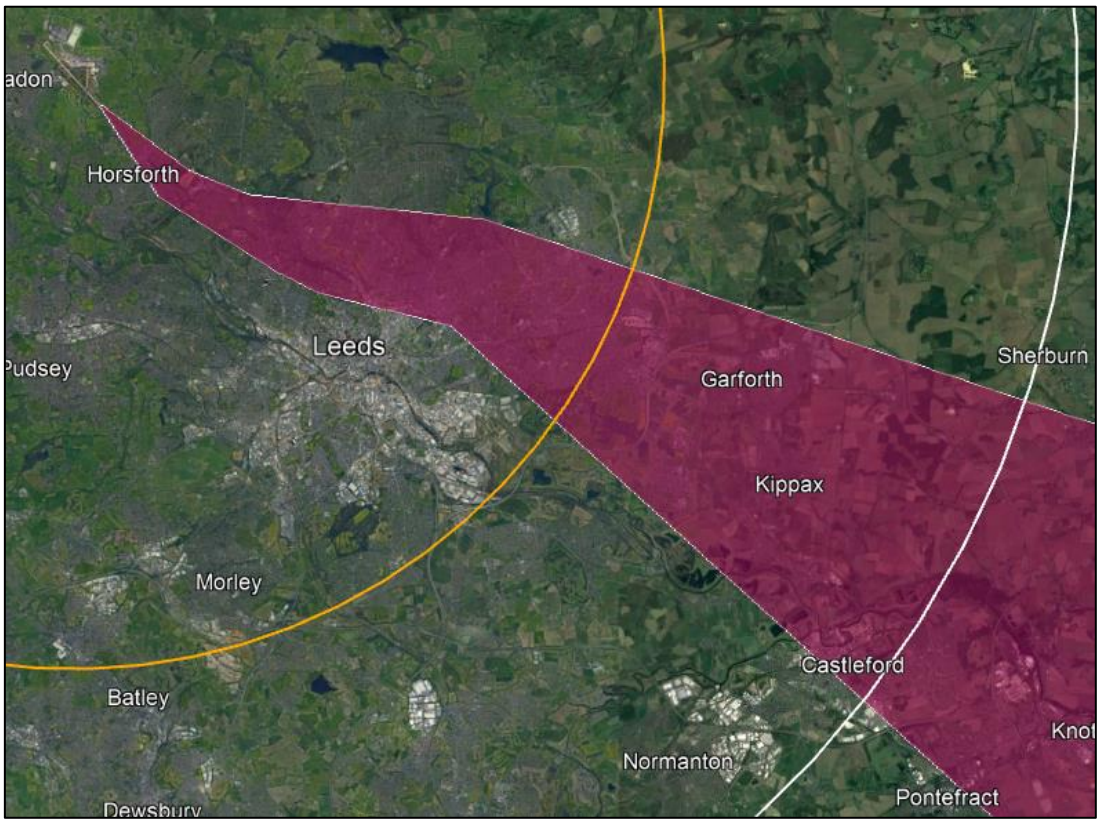


Figure 132: 14SEC Swathe.

	DP1 Safety	DP2 Noise	DP3 Tranquility	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	14SEC was considered no longer a viable option and was discounted from assessment ahead of the third DPE. It did not fit with the Route Network as it does not point to MAMUL or fit with Route Network and L975 flow.										

Table 37 - Runway 14 South-East Option C DPE

6.5.3.4.1. Some stakeholders commented that they had insufficient time/information to assess if this should have been retained or not. Sponsor response to feedback: Sufficient detail on these

options had been provided in the Second round of engagement to the same set of stakeholders.

6.5.3.5. Runway 14 South-East Option D (14SED)

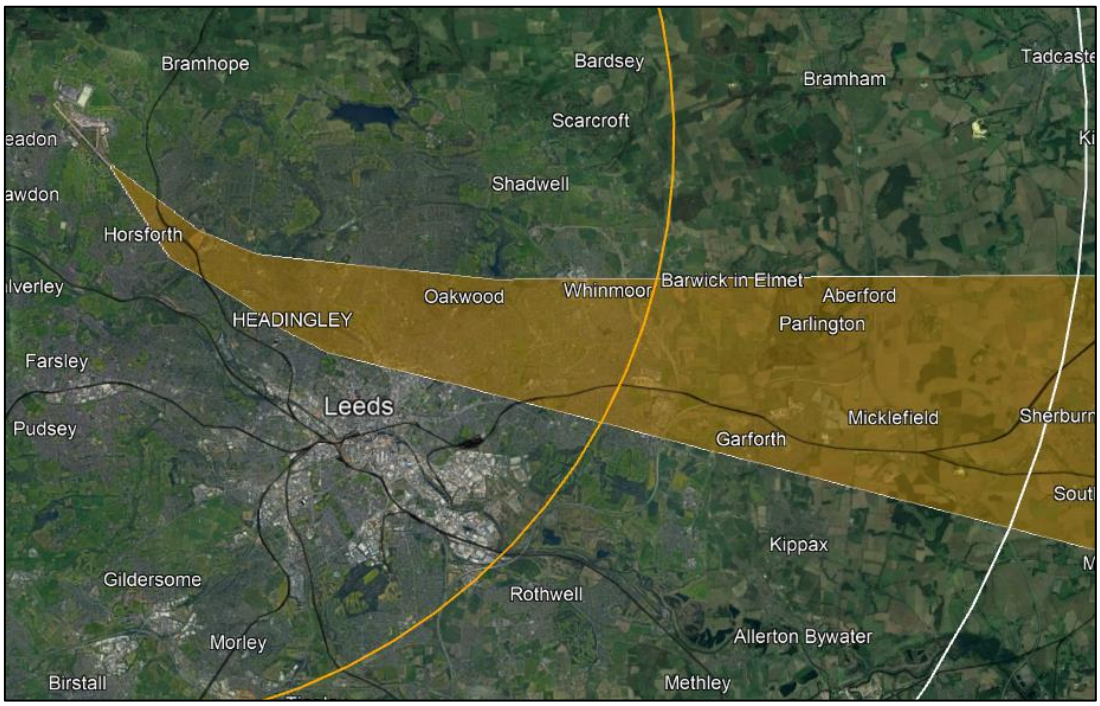


Figure 133: 14SED Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	14SED was considered no longer a viable option and was discounted from assessment ahead of the third DPE. It did not fit with the Route Network as it does not point to MAMUL or fit with Route Network and L975 flow.										

Table 38 - Runway 14 South-East Option D DPE

6.5.3.5.1. Some stakeholders commented that they had insufficient time/information to assess if this should have been retained or not. Sponsor response to feedback: Sufficient detail on these options had been provided in the Second round of engagement to the same set of stakeholders.

6.5.4. Runway 14 South and West Design Envelope

6.5.4.1. This section contains the DPE for the seven options in the South and west Design Envelope, including the baseline and do-minimum options.

6.5.4.2. Runway 14 South and West Baseline

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 39 - Runway 14 South and West Baseline DPE

6.5.4.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being today's current baseline operation;
- DP10 – Red as this is the baseline option and if it were to be retained it does not satisfy the objectives of the AMS;
- DP11 – Red as this is the baseline option and if it were to be retained the latest navigational standards would not be utilised.

6.5.4.3. Runway 14 South and West Do Minimum (Area Navigation Substitution)

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 40 Runway 14 South and West Do Minimum DPE

6.5.4.3.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being geographically the same as today's current baseline operation.

6.5.4.4. Runway 14 South and West Option A (14S&WA)

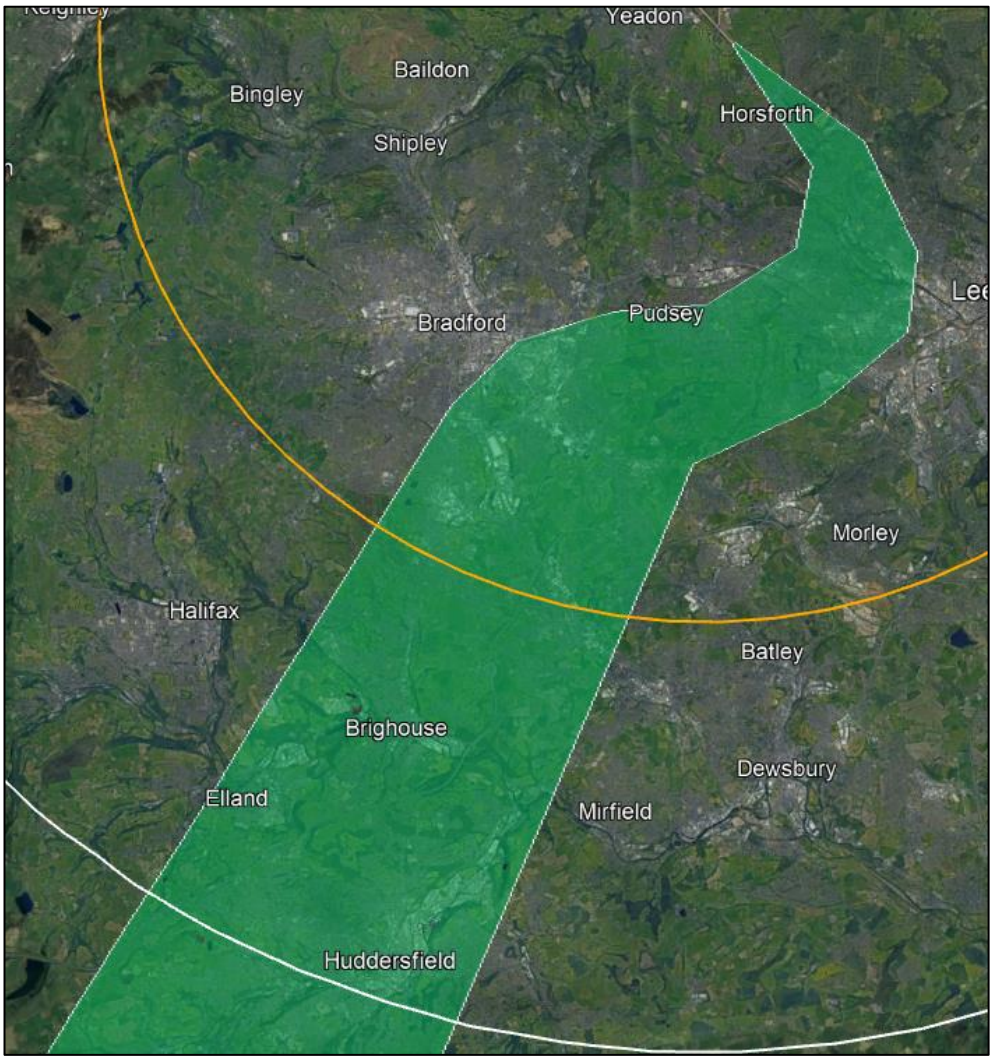


Figure 134: 14S&WA Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	14S&WA was considered no longer a viable option and was discounted from assessment ahead of the third DPE. It did not fit with the Route Network as it does route towards the joining point at POL.										

Table 41 - Runway 14 South and West Option A DPE

6.5.4.4.1. Some stakeholders commented that they had insufficient time/information to assess if this should have been retained or not. Sponsor response to feedback: Sufficient detail on these options had been provided in the Second round of engagement to the same set of stakeholders

6.5.4.5. Runway 14 South and West Option B (14S&WB)

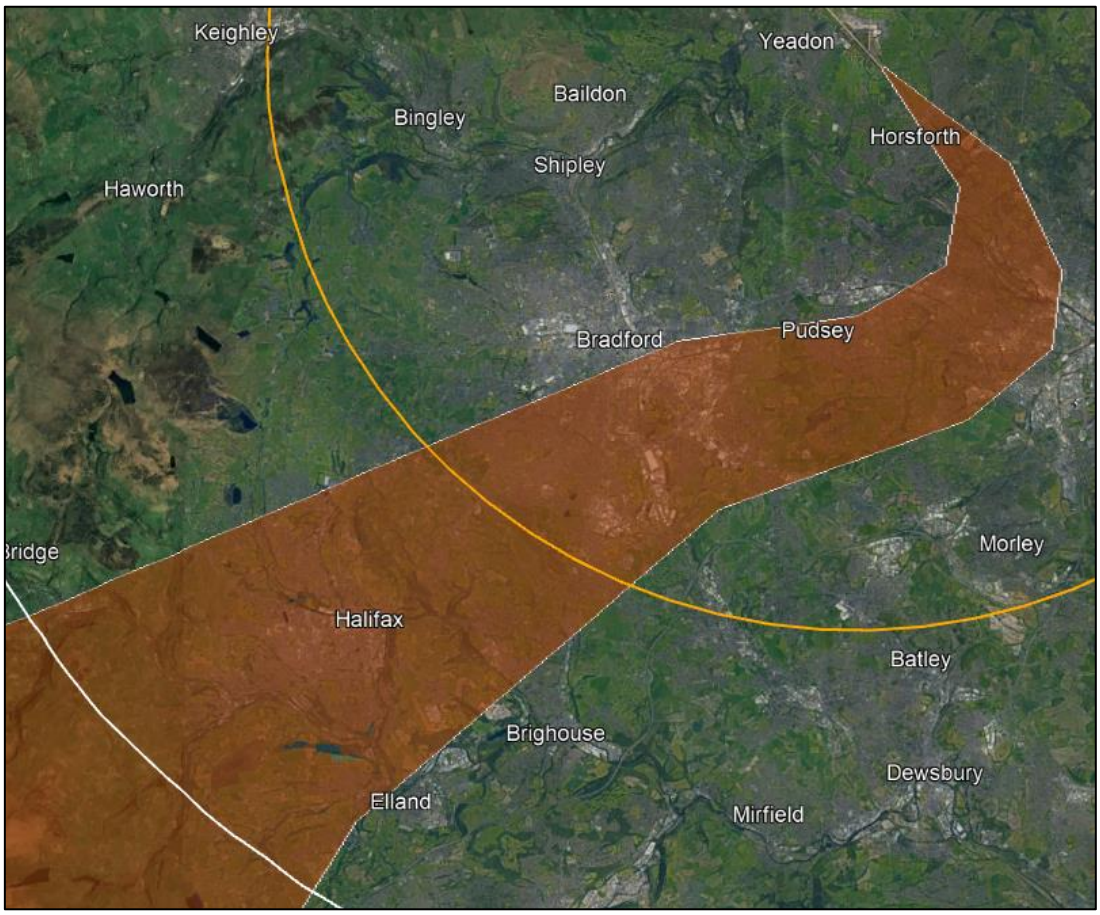


Figure 135: 14S&WB Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023	Discounted ahead of Third round										
Justification	14S&WB was considered no longer a viable option and was discounted from assessment ahead of the third DPE. It did not fit with the Route Network as it does route towards the joining point at POL.										

Table 42 - Runway 14 South and West Option B DPE

6.5.4.5.1. Some stakeholders commented that they had insufficient time/information to assess if this should have been retained or not. Sponsor response to feedback: Sufficient detail on these options had been provided in the Second round of engagement to the same set of stakeholders. No stakeholder disagreed with removal of this DO, although some did state that they had not had enough time to evaluate.

6.5.4.6. Runway 14 South and West Option C (14S&WC)

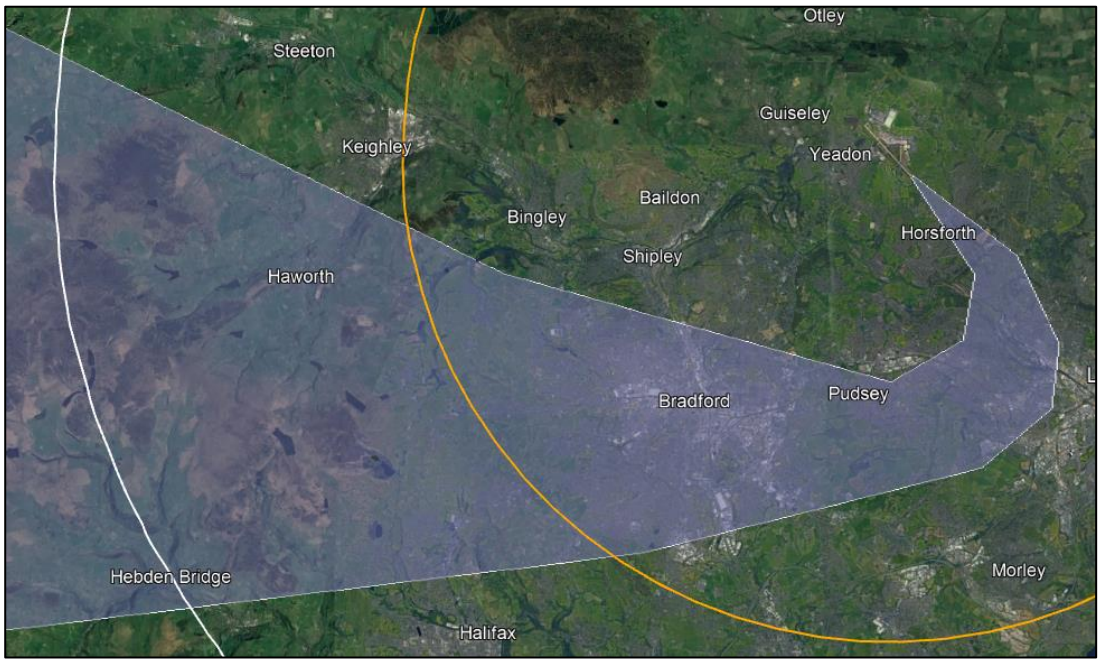


Figure 136: 14S&WC Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 43 - Runway 14 South and West Option C DPE

6.5.4.6.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber - Similar with potential for other communities affected.
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation.
- DP9 – Amber - 'Fuel efficiency is optimal however there is some impact on local communities.'

6.5.4.6.2. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed. It is most unlikely that this DO would require more CAS to contain it and on that basis these DP evaluations remain unchanged.

6.5.4.6.3. In Round 1, the North West Leeds Transport Forum stated that they agreed with the DPE except DP2 as it overflies Bramley and Pudsey.

6.5.4.6.4. In Round 2, the Dales Hang Gliding and Paragliding Club (DHPC) indicated that DPs 1, 5 & 6 should be Amber for all DOs. They stated that they were unable to make meaningful comment until details of the proposed controlled airspace have been promulgated.

6.5.4.6.5. In summary, DP2 (Noise) was assessed as Amber and supported by stakeholders as it flies over Bramley and Pudsey. DP4 (Emissions and Air Quality) was reassessed as Amber due to feedback and re assessment of the criteria; the CO2 emissions likely to be the same or similar to today's operation.

6.5.4.7. Runway 14 South and West Option D (14S&WD)

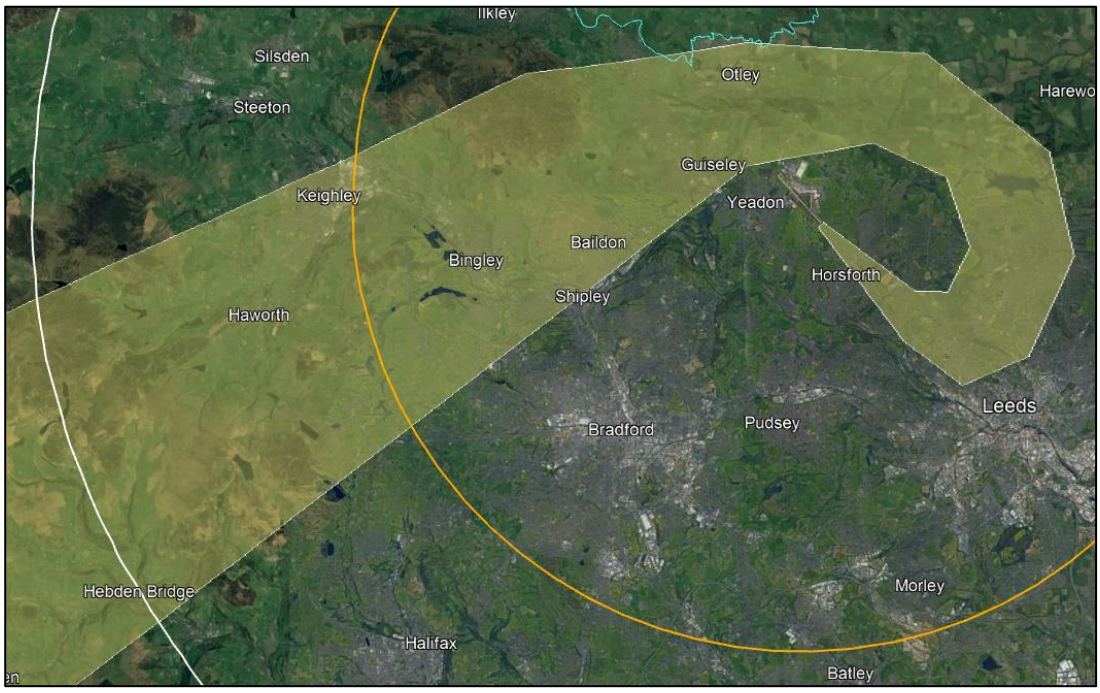


Figure 137: 14S&WD Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE as at June 2023											
DPE Nov 2023											
Final DPE											

Table 44 - Runway 14 South and West Option D DPE

6.5.4.7.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red - Brings in denser populations in the vicinity of Headingley;
- DP3 – Amber - Meanwood and Eccup;
- DP4 – Red - Has the potential to increase CO_2 emissions - Continuous Climb could offset additional miles;
- DP5 – Amber - Uncertainty on CAS containment;
- DP9 – Red - Fuel efficiency not optimised - Continuous Climb could offset additional miles;
- DP10 –Amber - due to Amber in DP5 which indicates this option is only partially aligned with the AMS.

6.5.4.7.2. The NWLTA felt that DP1 (Safety) should be Amber due to a potential conflict with inbound traffic. Sponsor response to feedback: The climbing traffic would be above the inbound traffic at the point of 'confliction' and as such this is not a safety concern.

6.5.4.7.3. In Round 1, the NWLTA indicated that it did not agree with the DPE, suggesting that the following reasons related to their view with regard to each of the respective DPs they commented on: DP1 -possible conflict, DP2- it overflies Headingley, Weetwood, Adel, Alwoodley, Chapel Allerton and Bramhope, DP4 – extra track miles, DP5 requires larger controlled airspace, DP6 - possible conflict with arrivals and DP9 - extra track miles.

6.5.4.7.4. In Round 2, the NWLTA stated that DP1 and DP6 should be Amber (due to the potential conflict with arrivals and the need for contingency arrangements for failure of the required vertical separation).

6.5.4.7.5. The DHPC felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Amber. They specifically raised a need to review the Baildon Moor and Ilkley Moor Letters of Agreement. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance there is a small likelihood of additional CAS being required and accordingly this has been rated Amber. The additional airspace would most likely be required due East of LBA and for this reason does not threaten the activities at Baildon Moor or Ilkley Moor.

6.5.4.7.6. In Rounds 1 and 2, DHPC stated that DPs 1, 5 & 6 should be Amber for all DOs. They stated that they were unable to make meaningful comment until details of the proposed controlled airspace have been promulgated.

6.5.4.7.7. Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed. Sponsor response to feedback: See comment above.

6.5.4.7.8. Otley Town Council identified that this swathe passes over the entire town of Otley and felt this posed a threat in terms of Noise and Tranquillity. They did not suggest a change in grading. Sponsor response to feedback: By the time aircraft are passing over Otley they would most likely be above 4000ft. Furthermore, there is scope within the swathe to avoid Otley by passing to the south of it.

6.5.4.7.9. Burn Gliding Club sought justification on the evaluation of DP9 (Operational Cost) and DP5 (Airspace Dimensions). They asked how we can be sure that a continuous climb on this profile would offset the additional miles flown. They also asked how we could justify the Amber rating for DP5 when the swathe appears to be contained within CAS. Sponsor response to feedback: These are qualitative assessments and lack the scientific data required to come to accurate conclusions. It is widely known that jets are more efficient if they can achieve a continuous climb and it is believed that in this instance, the additional track miles may be offset by the greater efficiency; it is Amber for that reason. The CAS containment is also not a certainty; whilst the swathe is indeed contained, if the final design was at the eastern extremity of the swathe as it turned to the west, it may be less than 1nm from the edge of CAS. For containment reasons, the nominal track would need to be at least 2nm from the edge. In this instance, the CAS would need to be expanded to the east of LBA to accommodate the procedure.

6.5.4.7.10. In summary, DP1 (Safety) is assessed as Green, whilst some stakeholders felt there may be a conflict with inbound traffic, LBA assessed this is not the case. DP2 (Noise) was assessed as Red due to stakeholder feedback as more densely populated communities would be flown over. DP5 (Airspace Dimension) was also assessed as Amber as result of stakeholder feedback as there is some uncertainty regarding CAS containment. LBA assessed DP10 (AMS realisation) as Amber due to DP5 being assessed as Amber and therefore only partially aligned with the AMS.

6.5.4.8. Runway 14 South and West Option E (14S&WE)

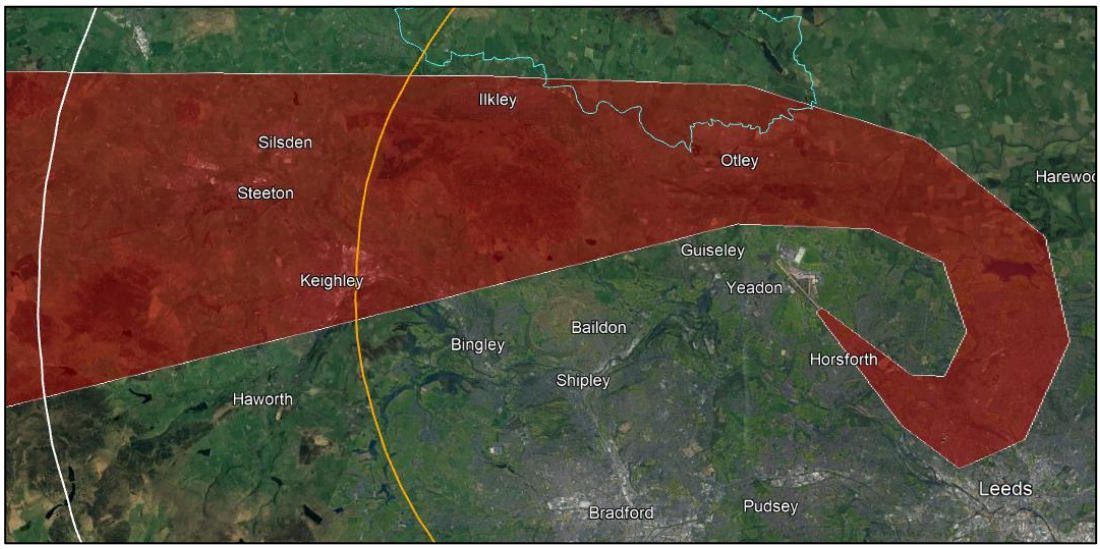


Figure 138: 14S&WE Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 45 - Runway 14 South and West Option E DPE

6.5.4.8.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Red - Brings in denser populations in the vicinity of Headingley;
- DP3 – Red - Meanwood, Eccup, East Riddleston Hall and AONB;
- DP4 – Red - Has the potential to increase CO_2 emissions - Continuous Climb may offset additional miles;
- DP5 – Amber - Uncertainty on CAS containment;
- DP9 – Red - Fuel efficiency not optimised - Continuous Climb may offset additional miles;
- DP10 –Amber - due to Amber in DP5 which indicates this option is only partially aligned with the AMS.

6.5.4.8.2. The NWLTA felt that DP1 (Safety) should be Amber due to a potential conflict with inbound traffic. Sponsor response to feedback: The climbing traffic would be above the inbound traffic at the point of 'confliction' and as such this is not a safety concern.

6.5.4.8.3. In Round 2, the NWLTA stated that DP1 and DP6 should be Amber (due to the potential conflict with arrivals and the need for contingency arrangements for failure of the required vertical separation).

6.5.4.8.4. The DHPC felt there was insufficient detail on CAS changes and that DP6 (Airspace Complexity) should be Amber. They specifically raised a need to review the Ilkley Moor Letter of Agreement. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. In this instance there is a small likelihood of additional CAS being required and accordingly this has been rated Amber. The additional airspace would most likely be required due East of LBA and for this reason does not threaten the activities Ilkley Moor.

6.5.4.8.5. In Rounds 1 and 2, DHPC stated that DPs 1, 5 & 6 should be Amber for all DOs. They stated that they were unable to make meaningful comment until details of the proposed controlled airspace have been promulgated.

6.5.4.8.6. In all three Rounds, Yorkshire, Derbyshire and Nottinghamshire RSAG felt that DPs 1 (Safety), 5 (Airspace Dimension) and 6 (Airspace Complexity) should be evaluated as Amber. Sponsor response to feedback: The concerns raised relate to fears of gliding operations being curtailed. Sponsor response to feedback: See comment above.

6.5.4.8.7. Otley Town Council identified that this swathe passes over the entire town of Otley and felt this posed a threat in terms of Noise and Tranquillity. They did not suggest a change in grading. Sponsor response to feedback: By the time aircraft are passing over Otley they would most likely be above 4000ft. Furthermore, there is scope within the swathe to avoid Otley by passing to the north or south of it.

6.5.4.8.8. Burn Gliding Club sought justification on the evaluation of DP9 (Operational Cost) and DP5 (Airspace Dimensions). They asked how we can be sure that a continuous climb on this profile would offset the additional miles flown. They also asked how we could justify the Amber rating for DP5 when the swathe appears to be contained within CAS. Sponsor response to feedback: These are qualitative assessments and lack the scientific data required to come to accurate conclusions. It is widely known that jets are more efficient if they can achieve a continuous climb and it is believed that in this instance, the additional track miles may be offset by the greater efficiency; it is Amber for that reason. The CAS containment is also not a certainty; whilst the swathe is indeed contained, if the final design was at the eastern extremity of the swathe as it turned to the west, it may be less than 1nm from the edge of CAS. For containment reasons, the nominal track would need to be at least 2nm from the edge. In this instance, the CAS would need to be expanded to the east of LBA to accommodate the procedure.

6.5.4.8.9. The National Trust commented that East Riddleston Hall, a 17th century manor house built above the River Aire, north east of Keighley is subject to an open space designation in the Bradford Core Strategy is overflown by swathes D14-S&W-E. DP3 Tranquillity) is assessed as Red accordingly and because it flies over an AONB.

6.5.4.8.10. In summary, DP1 (Safety) is assessed as Green, whilst some stakeholders felt there may be a conflict with inbound traffic, and others an infringement on GA activity, LBA assessed this is not the case. DP2 (Noise) was assessed as Red due to stakeholder feedback as more densely populated communities would be flown over. DP5 (Airspace Dimension) was also assessed as Amber as result of stakeholder feedback as there is some uncertainty regarding CAS containment. LBA assessed DP10 (AMS realisation) as Amber due to DP5 being assessed as Amber and therefore only partially aligned with the AMS.

6.5.5. Runway 14 South and West Combination Options

6.5.5.1. This section contains the DPE for the two options in the South and west Design Envelope, there is no baseline for the combination options as these are already evaluated in the preceding design envelopes.

6.5.5.2. Runway14 Option A

Figure 139: 14NEWA Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 46 - Runway 14 Combination Option A DPE

6.5.5.2.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber - New communities impacted including Calverley and Farsley.

6.5.5.2.2. The NWLTA felt that DP2 (Noise) should be evaluated as Green as they felt it would reduce the number of people affected by aircraft noise. Furthermore, they felt this 'respite' option should be considered for permanent use for this reason. Sponsor response to feedback: NWLTA were the only representative stakeholders to suggest we had this evaluation wrong, and it is very difficult to make a qualitative assessment in such a densely populated area. The assessment remains Amber, but the final outcome may indeed be a 'Green' one. Use of this Option as a permanent option was already considered and mentioned on the engagement material has having such potential.

6.5.5.2.3. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber. They cited the lack of information on the future CAS construct as the reason for not being able to assess this any further and so settled on Amber. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.5.5.2.4. The BGA stated that they were unable to evaluate impacts on DPs 1, 5 and 6 due to lack of detail on base heights and other information.

6.5.5.2.5. In summary, whilst some considered that DP2 (Noise) should be rated Green as it was felt a reduced number of people would be affected, this DP was rated Amber in line with the DP criteria for noise, i.e. that different communities, not necessarily more, would be affected. All other DPs are assessed as Green despite some concern regarding DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity). LBA concluded that it would not be appropriate at this stage to propose CAS configurations until such time as the options have been fine-tuned.

6.5.5.3. Runway 14 Option B

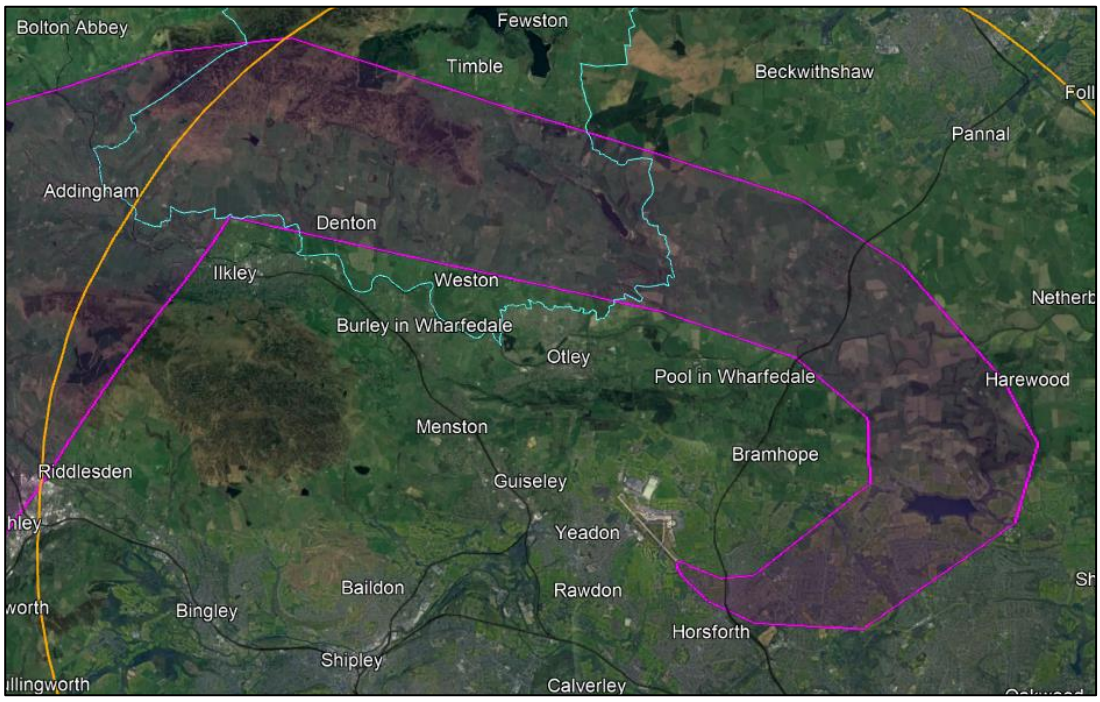


Figure 140: 14NEWB Swathe

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 47 - Runway 14 Combination Option B DPE

6.5.5.3.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – Potential conflict with inbounds;
- DP2 – Amber – New communities impacted including Adel and Blackmoor;
- DP3 – Red – NP and AONB;
- DP4 – Red - Has the potential to increase CO_2 emissions - Additional track miles largely for noise purposes;
- DP5 – Amber - Uncertain about airspace containment;
- DP6 – Amber - Potential conflict with inbounds
- DP8 – Amber - Potential conflict with inbounds.;
- DP9 – Red - Fuel efficiency not optimised - Additional track mileage largely for noise purposes;
- DP10 –Amber - due to Amber in DP1 and DP5 which indicates this option is only partially aligned with the AMS.

6.5.5.3.2. Peak District NP felt DP3 (Tranquillity) needed to reflect potential impact to Bolton Abbey, Embsay and Skipton in the Yorkshire Dales NP. Sponsor response to feedback: DP3 already rated Red. Impact to these other places is duly noted although aircraft would be well above 5-6000ft by the time these places were reached. As per the criteria set for DP3, this swathe does not affect a significant portion of the NP.

6.5.5.3.3. The NWLTA felt that DP2 (Noise) should be evaluated as Green as they felt it would reduce the number of people affected by aircraft noise. Sponsor response to feedback: NWLTA were the only representative stakeholders to suggest we had this evaluation wrong, and it is very difficult to make a qualitative assessment in such a densely populated area. The assessment remains Amber, but the final outcome may indeed be a 'Green' one.

6.5.5.3.4. The DHPC felt DP6 (Airspace Complexity) should be rated Red as it may pose a threat to the Addingham Moorside Gliding Club. They also commented that the Ilkley Moor Letter of Agreement would need reviewing. Sponsor response to feedback: A SID contained within this swathe would be most likely be contained laterally and vertically in the existing CAS and as such should pose no more problem to these clubs than experienced today.

6.5.5.3.5. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE. All these aspects have been rated Amber due to the uncertainty surrounding airspace containment to the East of LBA.

6.5.5.3.6. Otley Town Council felt there may be a noise and tranquillity impact on the north side of Otley but again were unable to quantify this. Sponsor response to feedback: DP2 and DP3 are rated Amber and Red respectively already based upon a qualitative assessment.

6.5.5.3.7. Bramhope and Carlton Parish Council felt DP3 (Tranquillity) should be rated Red and asked that the AONB and NPs be clearly shown on any Stage 3 Consultation material. Sponsor response to feedback: DP3 was already rated Red for the AONB and Eccup Reservoir. The AONB is plotted on the graphic, it has the light blue boundary. The author could not find a layer in Google Earth for the NPs, but this will be addressed ahead of any public consultation. Rest assured the presence of the NPs was not ignored where relevant.

6.5.5.3.8. Burn Gliding Club commented that this option 'fell down' on numerous issues, namely CAS containment concerns and the additional miles flown. Sponsor response to feedback: DP5 and 6 are rated Amber already and DP4 is rated Red due to the additional track miles.

6.5.5.3.9. In summary, whilst some considered that DP2 (Noise) should be rated Green as it was felt a reduced number of people would be affected, this DP was rated Amber in line with the DP criteria for noise, i.e. that different communities, not necessarily more, would be affected. Stakeholders agreed with red assessment of DP3 (Tranquillity). DPs 5, 6 and 8 assessed as Amber due to uncertainty and potential conflicts with arrivals.

6.6. Arrivals

6.6.1. This section contacts the DPE for all options arriving to both runways 32 and 14. Each section contains a design envelope with the DPE for each arrival system as a sub section.

6.6.2. Whilst there are general trends in the flight paths for arriving aircraft, many aircraft approaching LBA are routed direct by ATC. This results in large parts of the region being overflown by at least some aircraft. This general approach, where many aircraft are directed (vectored) by ATC rather than following strict established and repeatable routes, is expected to reduce in future due to the proposed introduction of Arrival Transitions but it will not be entirely eradicated as there will always be a requirement for tactical vectoring.

6.6.3. LBA therefore developed options as Arrival Systems rather than individual swathes and has proposed options for busy and off-peak periods (see Initial Options Appraisal (IOA), section 5.5.5 for more information). There are ten options for arrival systems including the baseline and do-minimum options.

6.6.4. Arrival System Baseline

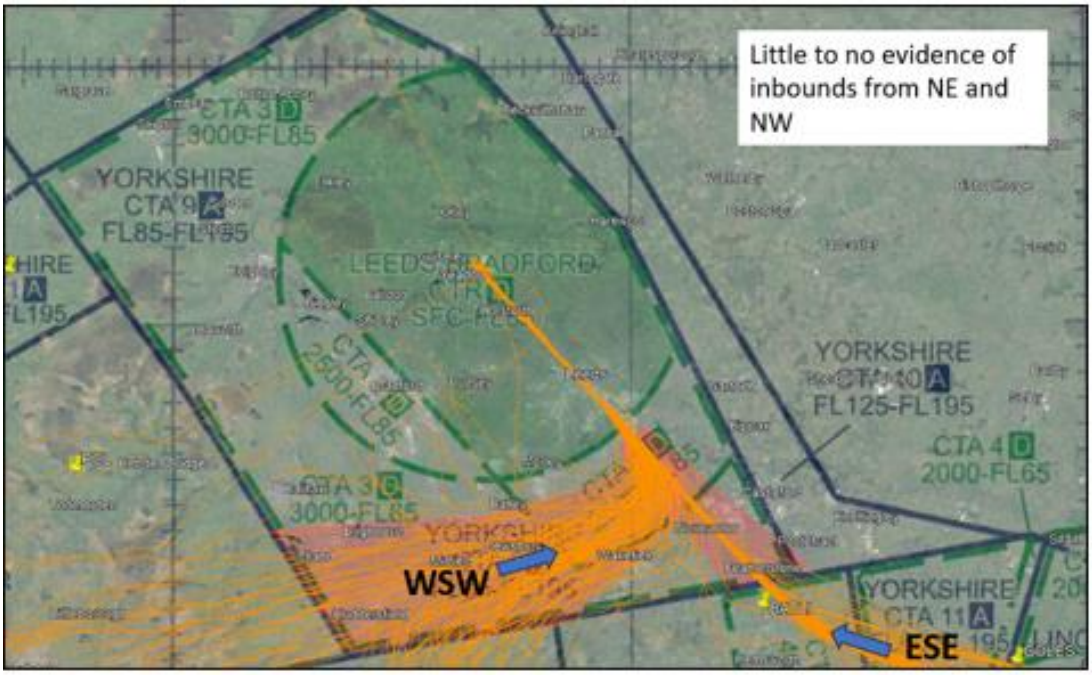


Figure 141 - Arrival System Baseline RW32

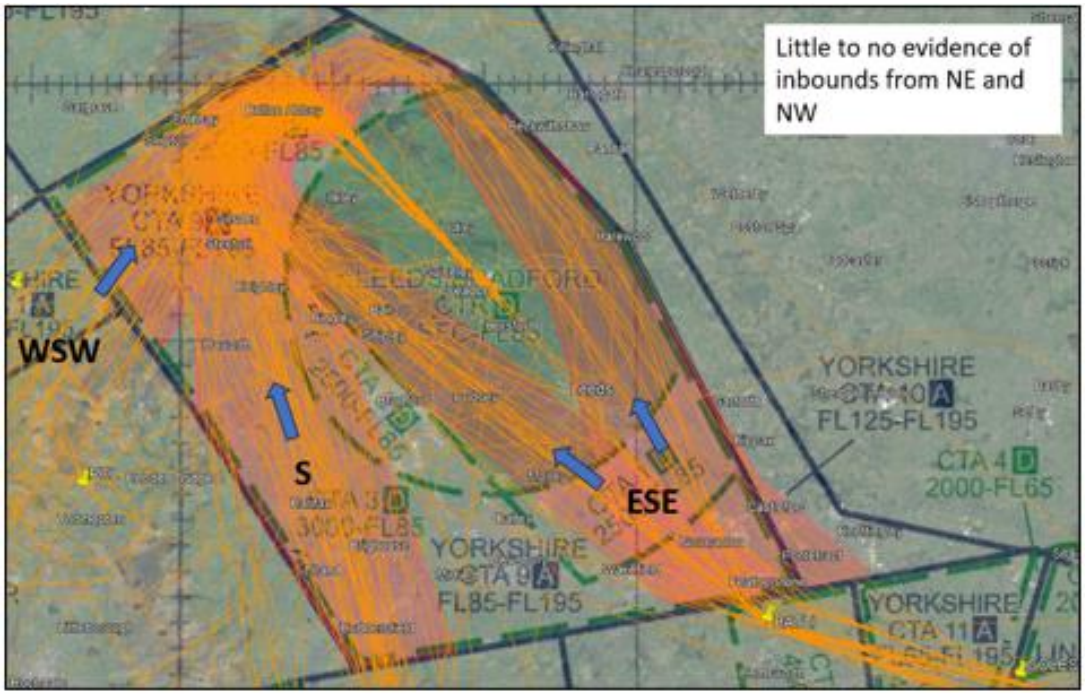


Figure 142 - Arrival System Baseline RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
Final DPE											

Table 48 - Arrival System Baseline DPE

6.6.4.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2, DP4, DP7, DP8 and DP9 – Amber due to criteria and being today's current baseline operation;
- DP3 – Red - overflight of Nidderdale AONB;
- DP10 – red as this is the baseline option and if it were to be retained it does not satisfy the objectives of the AMS;
- DP11 – Red as this is the baseline option and if it were to be retained the latest navigational standards would not be utilised.

6.6.4.1.2. Whilst stakeholders were presented the baselines during engagement activities, they were not asked to assess the DPs against the current operation. This assessment was carried out by LBA.

6.6.5. Arrival System 1 – Do Minimum

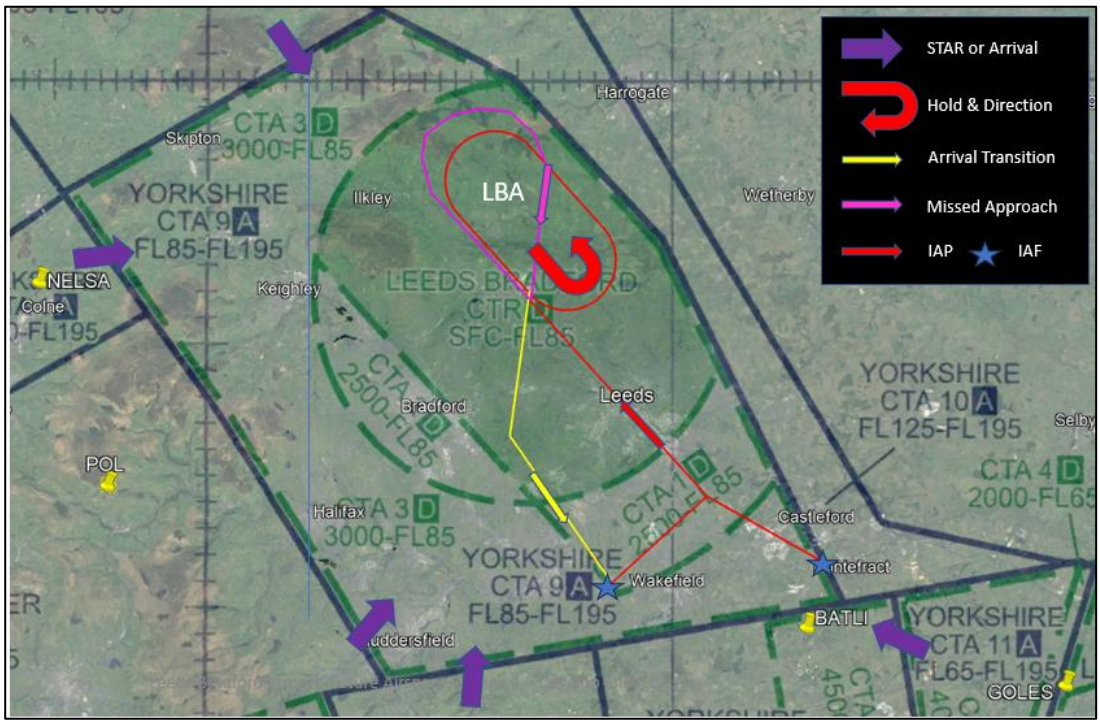


Figure 143: Arrival System 1 RW32

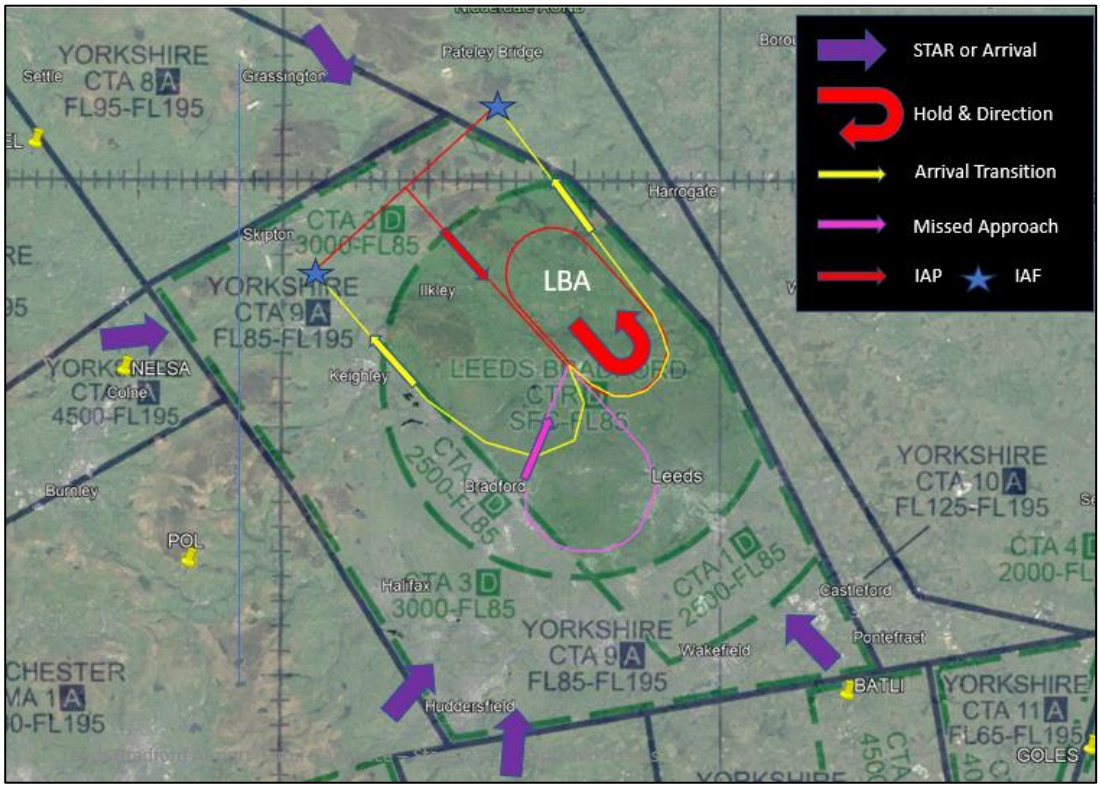


Figure 144: Arrival System 1 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 49 - Arrival System 1 Do Minimum DPE

6.6.5.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber - Eastern pattern for RW14 potentially affects new people;
- DP3 – Red - Eastern T-Bar for RW14 significant overflight of Nidderdale AONB;
- DP4 – Amber - Potentially less expeditious than other options;
- DP5 – Amber - Eastern T-Bar RW14 requires more CAS;
- DP8 – Amber – Hold in the overhead can limit CCO;
- DP9 – Amber - Every arrival must file and plan to route via the LBA;
- DP10 – Amber - Not really a modernisation of the LBA operation requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.5.1.2. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.5.1.3. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety) and 6 (Airspace Complexity) should be rated Amber and that DP5 (Airspace Dimensions) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 it would extend into Nidderdale and require more CAS. Sponsor response to feedback: Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences the vast majority of arrivals descending for base leg when RW14 is in use. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.5.1.4. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.5.1.5. Burn Gliding Club felt the Airport was being overly downbeat in assessing this option as it is similar to that in operation today and suggested the assessment was being used to justify unnecessary change. Sponsor response to feedback: The DPE has been done as fairly and consistently as possible using the criteria set at the outset without prejudice.

6.6.5.1.6. In summary, DP3 (Tranquillity) is assessed as Red due to LBA assessment of significant overflight of the AONB. DPs 1 (Safety) and 6 (Airspace Complexity) continue to be assessed as Green despite requests for an Amber assessment; LBA have assessed that it would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned at a later stage and this is in line with the criteria. LBA have assessed this option as not fully aligned with AMS realisation objectives.

6.6.6. Arrival System 2

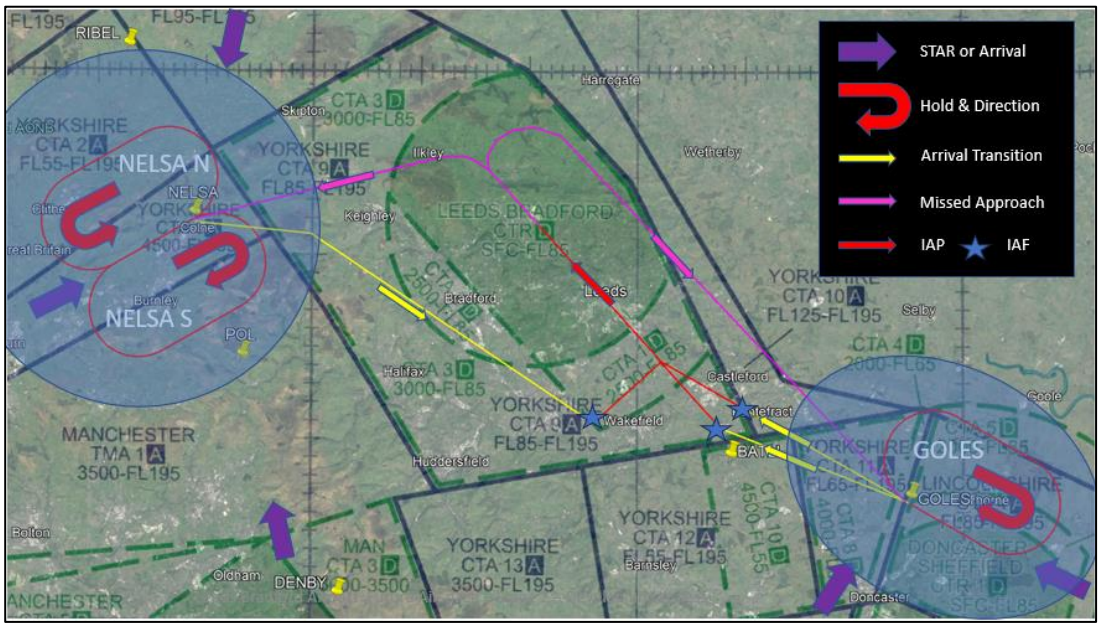


Figure 145: Arrival System 2 RW32

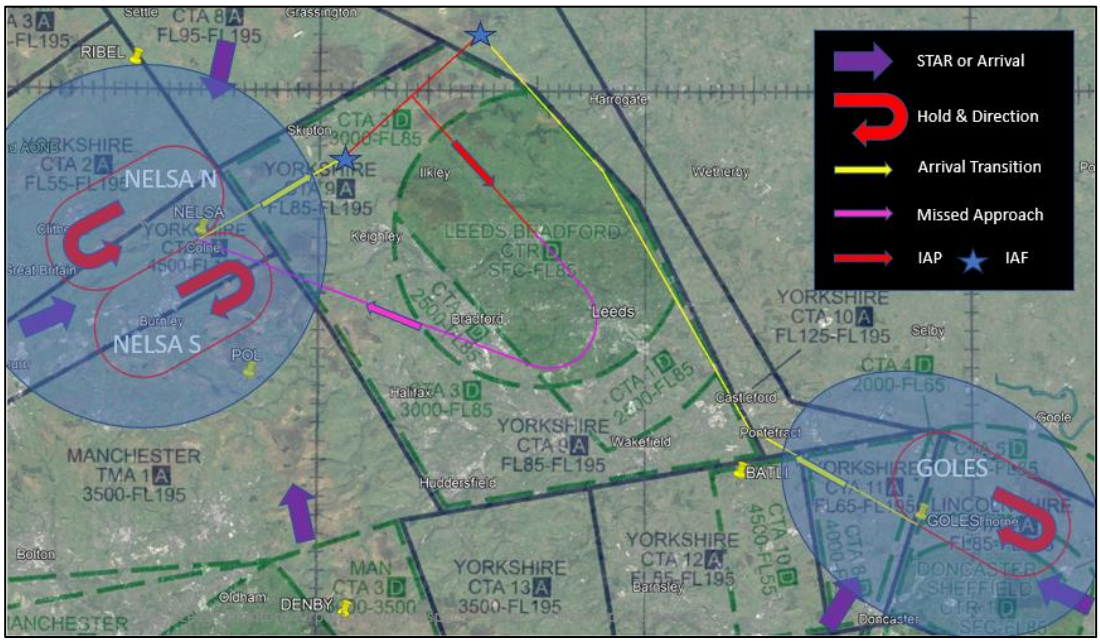


Figure 146: Arrival System 2 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 50 - Arrival System 2 DPE

6.6.6.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP3 – Red - Eastern T-Bar for RW14 affects Nidderdale AONB;
- DP5 – Amber - Potential requirement for additional CAS for Eastern T-Bar/GOLES/NELSA holds.;
- DP6 – Amber - Likely changes to CAS;
- DP8 – Amber - Arrival route BARTN-POL-NELSA may not work well for NERL;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.6.1.2. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.6.1.3. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 it would extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the NELSA and GOLES holds. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP and that being conducted for the wider MTMA is actively looking for airspace that can be down classified to Class G making more of it available for gliding. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.6.1.4. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.6.1.5. Burn Gliding Club commented that the CAS containment of the GOLES hold didn't make a lot of sense nor did having a hold there at all when it would impact on Manchester arrivals. Sponsor response to feedback: Whilst the GOLES hold itself is graphically depicted as being contained within CAS, there is a requirement for containment that goes beyond simply the nominal track of where aircraft are expected to go (i.e. a buffer area). NERL have expressed their support for a hold in the GOLES area as the mechanics of the whole MTMA is under review as part of their ACP. The GOLES hold would be laterally separated to the north of the Manchester descenders but the exact location or orientation of it is yet to be determined and accordingly it is not clear whether additional CAS is required or not.

6.6.6.1.6. In summary, DP3 (Tranquillity) is assessed as Red due to LBA assessment of significant overflight of the AONB. DPs 1 (Safety) and 6 (Airspace Complexity) continue to be assessed as Green despite requests for an Amber assessment; LBA have assessed that it would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned at a later stage and this is in line with the criteria. LBA have assessed this option as not fully aligned with AMS realisation objectives.

6.6.7. Arrival System 3

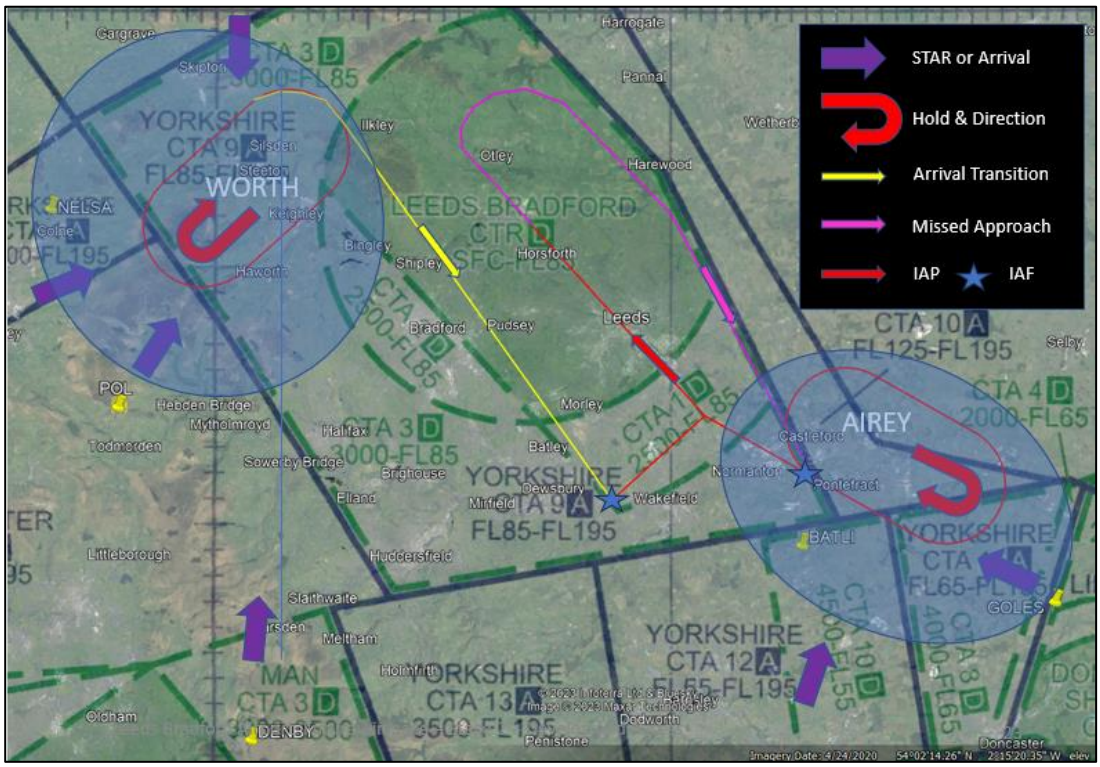


Figure 147: Arrival System 3 RW32

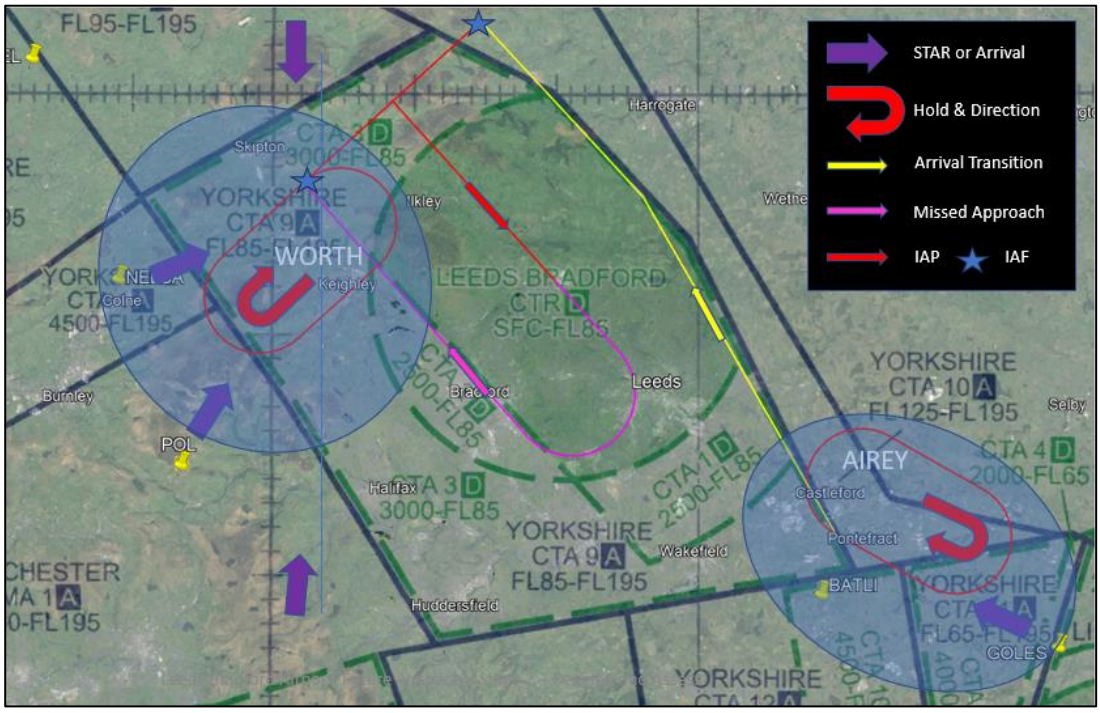


Figure 148: Arrival System 3 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 51 - Arrival System 3 DPE

6.6.7.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – Tactical coordination required to deconflict WORTH and RW32 departures. Proximity of AIREY hold to Sherburn and Leeds East and Burn Gliders is problematic;
- DP3 – Red - Eastern T-Bar for RW14 affects Nidderdale AONB;
- DP4 – Amber - Stepped climbs off RW reduces efficiency;
- DP5 – Red - Requirement for significantly more CAS to contain AIREY hold;
- DP6 – Amber - Likely changes to CAS;
- DP8 – Amber - WORTH may result in stepped climbs off RW32;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.7.1.2. In Round 2, the DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.7.1.3. In Round 3, the DHPC queried whether WORTH would require additional CAS.

6.6.7.1.4. In Round 2, RSAG stated that DPs 1, 5 and 6 should be Amber. In Round 3, Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 it would extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the holds but felt AIREY would require significantly more CAS. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being proposed here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP and that being conducted for the wider MTMA is actively looking for airspace that can be down classified to Class G making more of it available for gliding. It is accepted that the AIREY hold would require more CAS and that is why we evaluated DP5 as Red. We do not believe that this automatically translates into a Red grading for DP1 and DP6 and these have been graded Amber. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the early stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.7.1.5. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.7.1.6. In summary, DP3 (Tranquillity) is assessed as Red due to LBA assessment of overflight of the AONB. DP5 (Airspace Dimensions) has been assessed as Red as the requirement for significantly more CAS in necessary. DP6 (Airspace Complexity) remains Amber as there are only minor extensions to the LBA CAS anticipated and would not dramatically change the airspace available for gliding. DP5 is assessed as Red due to the requirement for significantly more CAS.

6.6.8. Arrival System 4

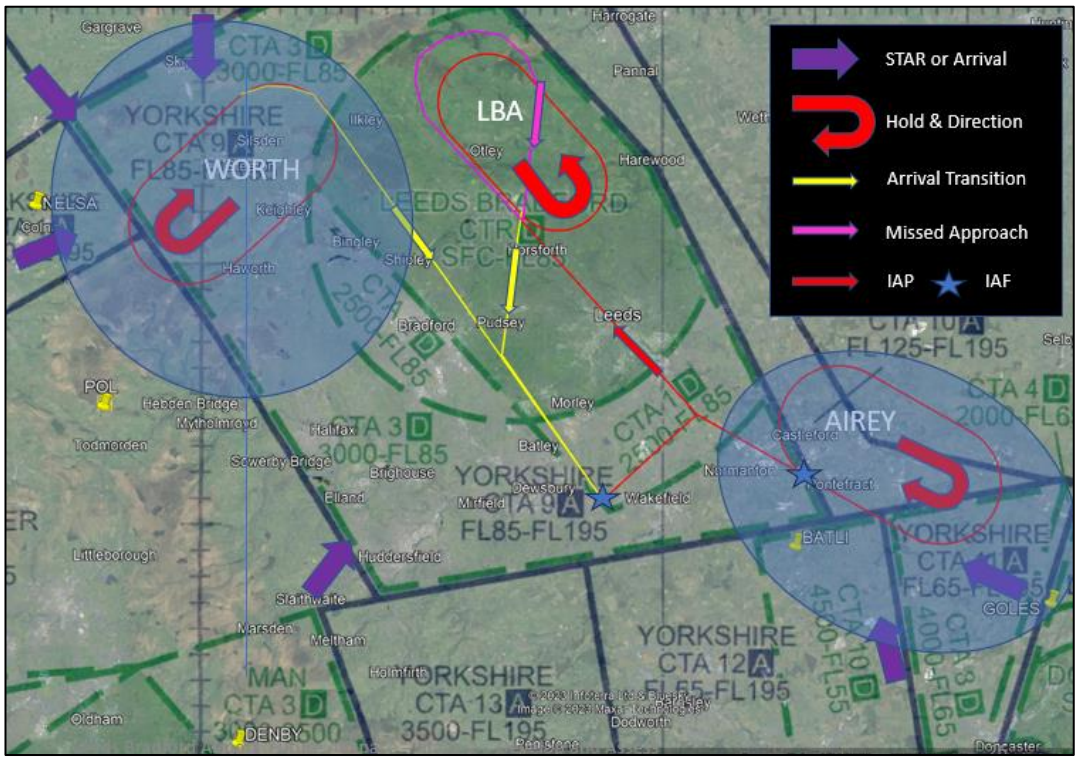


Figure 149: Arrival System 4 RW32

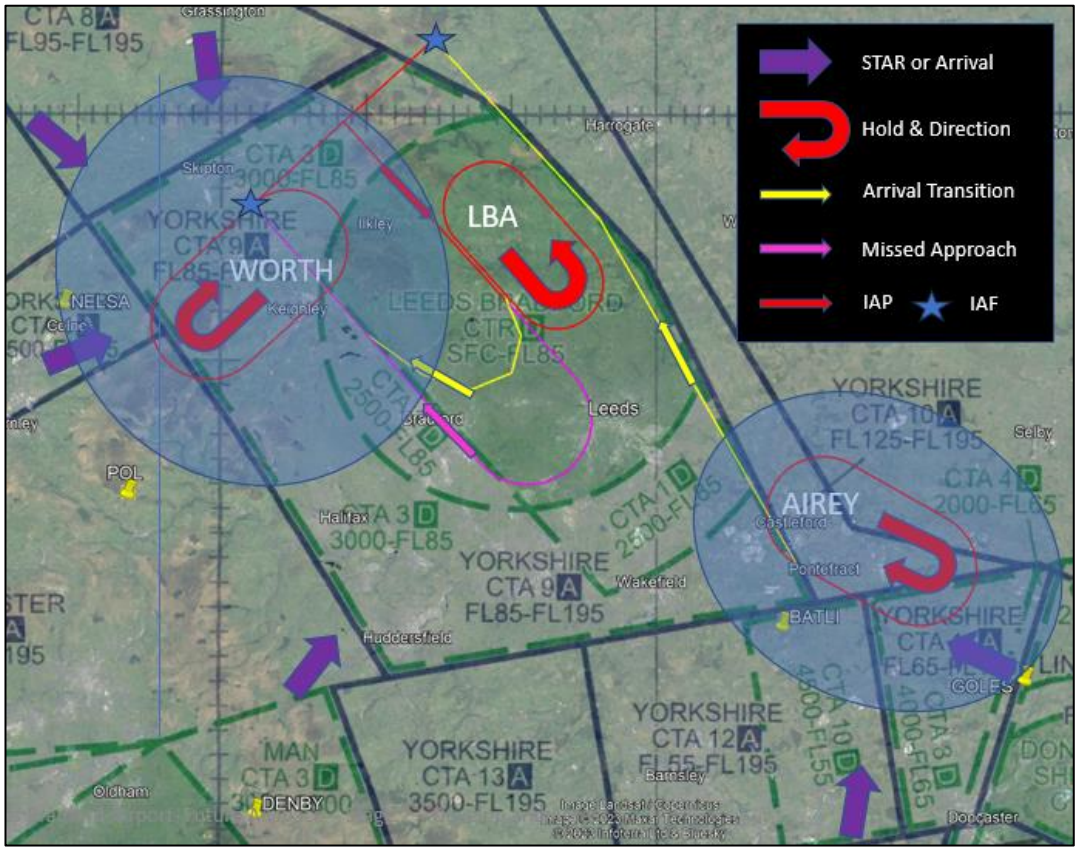


Figure 150: Arrival System 4 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 52 - Arrival System 4 DPE

6.6.8.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – Tactical coordination required to deconflict WORTH and RW32 departures. Proximity of AIREY hold to Sherburn and Leeds East and Burn Gliders is problematic;
- DP3 – Red - Eastern T-Bar for RW14 affects Nidderdale AONB;
- DP4 – Amber - WORTH and LBA hold likely to result In impact to Continuous Climbs off RW32;
- DP5 – Red - Requirement for significantly more CAS to contain AIREY hold;
- DP6 – Amber - Likely changes to CAS;
- DP8 – Amber - WORTH and LBA hold likely to result In impact to Continuous Climbs;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.8.1.2. In Round 2, the DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.8.1.3. In Round 3, the DHPC queried whether WORTH would require additional CAS.

6.6.8.1.4. In Round 2, RSAG indicated that DPs 1, 5 and 6 should be Amber. In Round 3, Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 it would extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the holds but felt AIREY would require significantly more CAS. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP, and that being conducted for the wider MTMA, is to actively look for airspace that can be down classified to Class G making more of it available for gliding. It is accepted that the AIREY hold would require more CAS and that is why we evaluated DP5 as Red. We do not believe that this automatically translates into a Red grading for DP1 and DP6, and these have been graded Amber. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region, which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.8.1.5. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.8.1.6. Burn Gliding Club commented as follows: 'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.' Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.8.1.7. In Round 3, North West Leeds Transport Forum stated that DP1 should be Red because, when RW32 is in use for arrivals, there is a potential conflict with arriving aircraft if, following a MAP, an aircraft departs LBA hold without having gained sufficient altitude (eg if it departs the hold without circling).

6.6.8.1.8. In summary, DP3 (Tranquillity) is assessed as Red due to LBA assessment of overflight of the AONB. DP5 (Airspace Dimensions) has been assessed as Red as the requirement for significantly more CAS in necessary. DP6 (Airspace Complexity) remains Amber as there are only minor extensions to the LBA CAS anticipated and would not dramatically change the airspace available for gliding. DP5 is assessed as Red due to the requirement for significantly more CAS. DP8 (Systemisation) is assessed as Amber as there may be an impact to continuous climb objectives, this and the CAS containment issue mean that this option does not fully align with AMS objectives. DP1 (Safety) is assessed as Amber as tactical coordination may be required to deconflict WORTH and RW32 departures. Additionally, the proximity of AIREY hold to Sherburn and Leeds East and Burn Gliders is problematic.

6.6.9. Arrival System 5

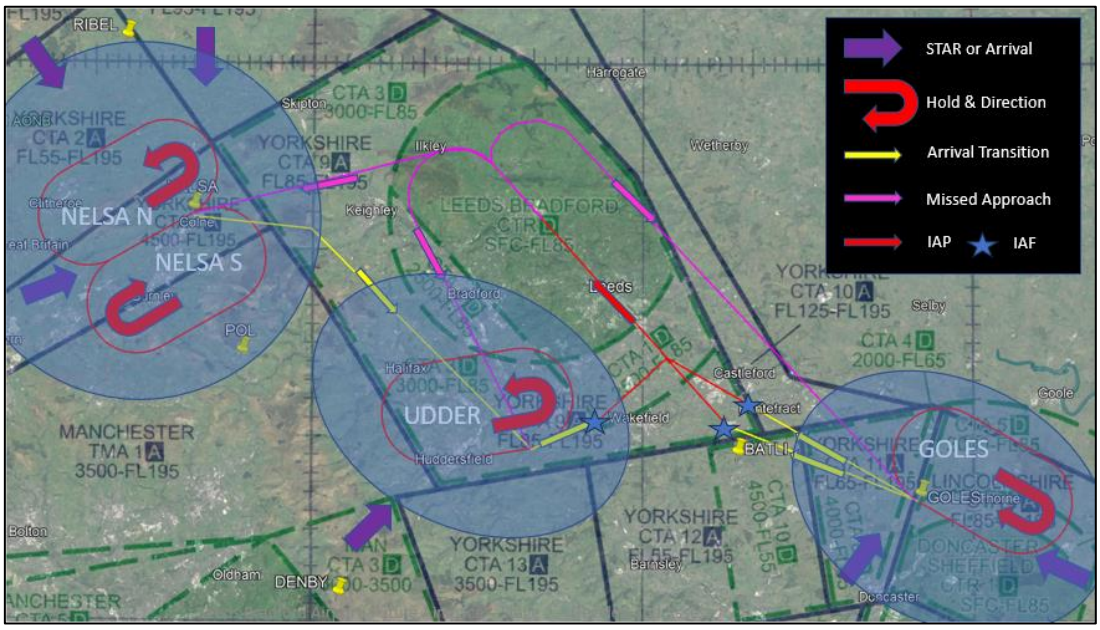


Figure 151: Arrival System 5 RW32

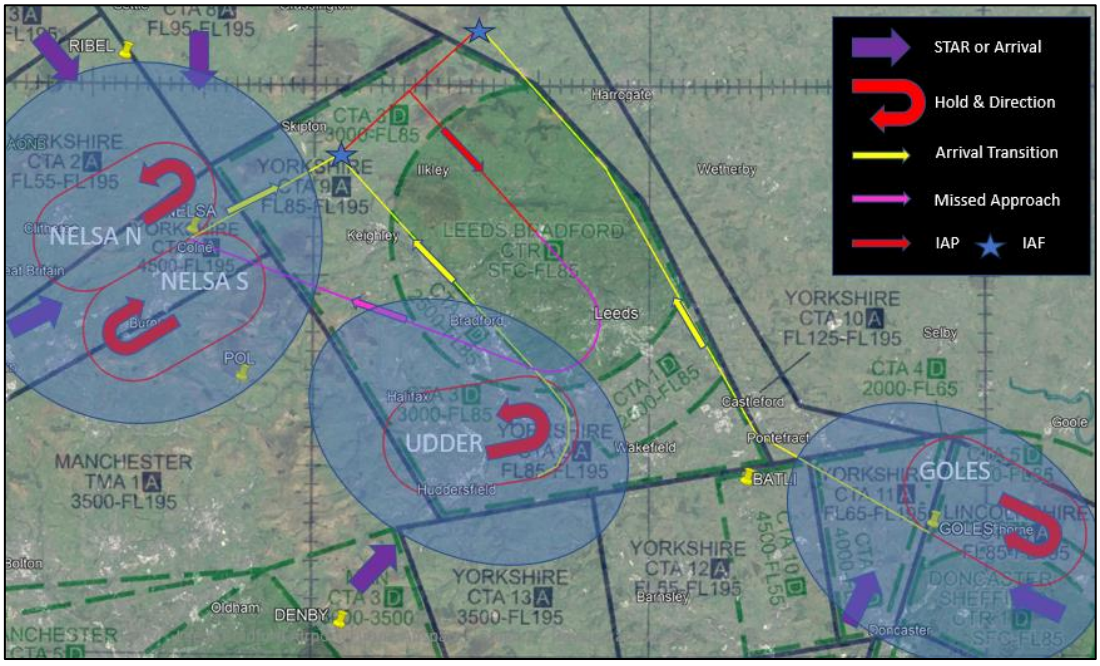


Figure 152: Arrival System 5 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023											
DPE Nov 2023											
Final DPE											

Table 53 - Arrival System 5 DPE

6.6.9.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP3 – Red - Eastern T-Bar for RW14 affects Nidderdale AONB;
- DP4 – Amber - UDDER hold may impact RW14 departures;
- DP5 – Amber - Potential requirement for additional CAS for GOLES/NELSA holds;
- DP6 – Amber - Likely changes to CAS
- DP8 – Amber - UDDER hold may impact RW14 departures.;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.9.1.2. The Peak District NP commented that the UDDER hold appeared to be over the North Eastern part of the NP. Sponsor response to feedback: The hold would rarely be utilised and, if it were to be utilised, it would be above 8000ft. DP3 is Red already but for the Nidderdale AONB where aircraft are descending for the approach.

6.6.9.1.3. The NWLTA felt that the three Missed Approach options resulted in an overly complex solution. Sponsor response to feedback: These three options were presented as 'options' as opposed to a suggestion that all three would be utilised. Only one would ultimately be established as the procedure.

6.6.9.1.4. In Rounds 2 and 3, the DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.9.1.5. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 it would extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the holds. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP and that being conducted for the wider MTMA is actively looking for airspace that can be down-classified to Class G making more of it available for gliding. It is accepted that both the holds might require more CAS and that is why we evaluated DP5 and DP6 as Amber. We do not believe that this automatically translates into an Amber grading for DP1. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.9.1.6. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.9.1.7. Burn Gliding Club commented as follows: 'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.' Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.9.1.8. In summary, DP3 (Tranquillity) is assessed as Red due to LBA assessment of overflight of the AONB. DP5 (Airspace Dimensions) has been assessed as Amber as there is a potential requirement for more CAS. DP6 (Airspace Complexity) and DP5 (Airspace Dimensions) remain Amber as there are likely changes to CAS. DP8 (Systemisation) is assessed as Amber as UDDER hold may impact RW14 departures, this and the CAS containment issue mean that this option does not fully align with AMS objectives. DP1 (Safety) remains Green despite

concerns regarding infringement on GA activities, however LBA believe that minor extensions to the LBA CAS would not dramatically change the airspace available for gliding.

6.6.10. Arrival System 6

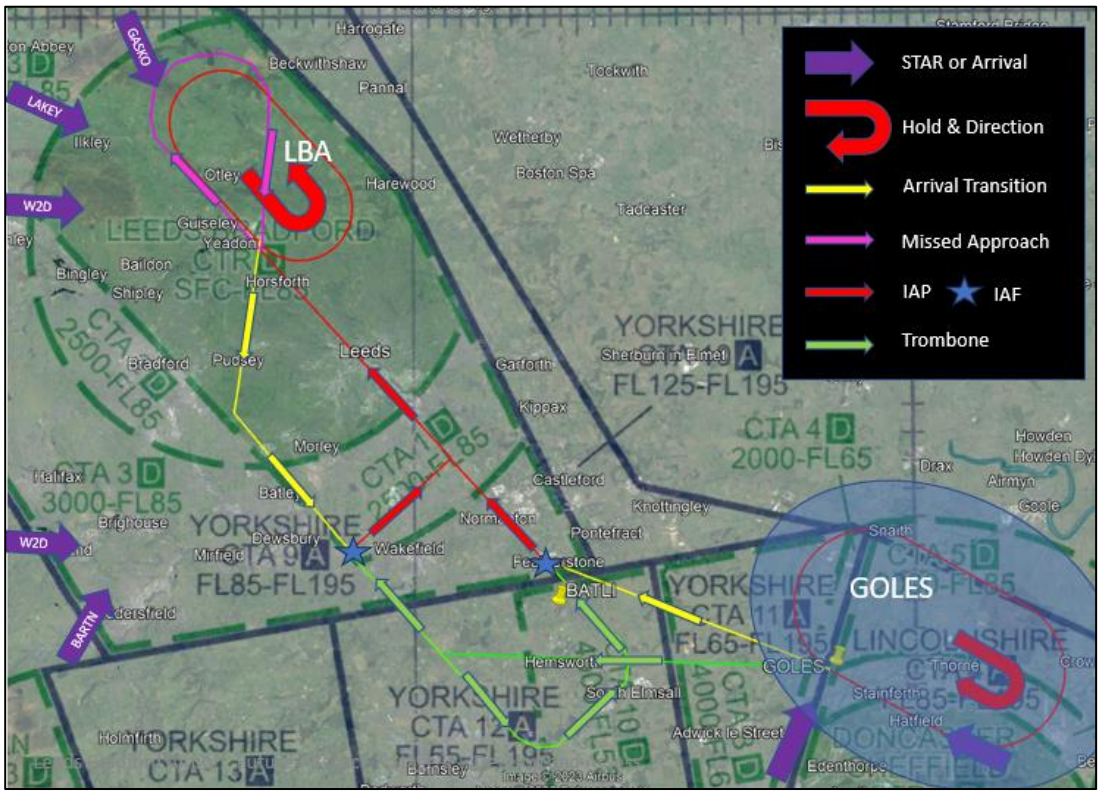


Figure 153: Arrival System 6 RW32

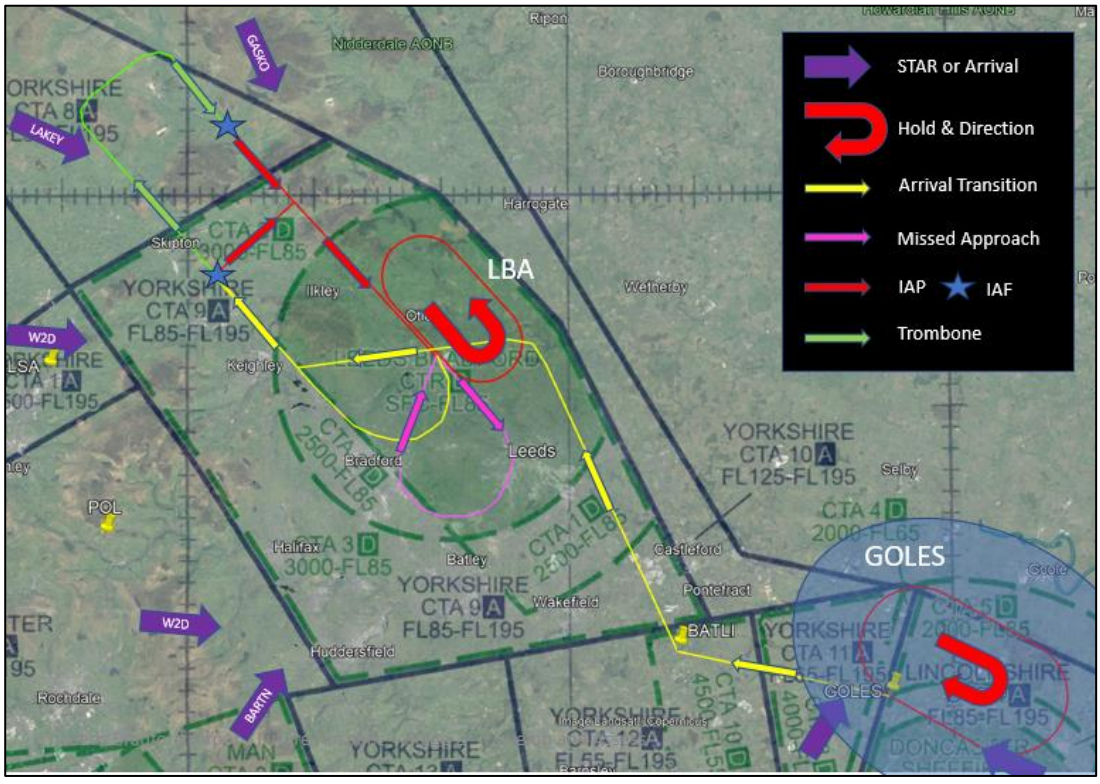


Figure 154: Arrival System 6 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 54 - Arrival System 6 DPE

6.6.10.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – Similar to today's operation;
- DP3 – Red – AONB and NP overflown.;
- DP4 – Amber – Unnecessary fuel carriage for always planning via LBA (NDB)[29];
- DP5 – Red – Needed for 15nm final and trombone[30];
- DP6 – Amber – GOLES element simplifies but the LBA (NDB) and trombone airspace has the opposite effect;
- DP8 – Red – Heavy requirement for tactical vectoring and level restrictions particularly on RW32;
- DP9 – Amber – Unnecessary fuel carriage for always planning via LBA (NDB) [24];
- DP10 – Amber – Not entirely systemised but modernising airspace with PBN, also requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.10.1.2. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

[29] LBA (NDB) is the identifier for the non-directional beacon located on the airfield.
[30] For more information on Trombone transition procedures visit SARG Policy 105: Policy For 'Point Merge' and 'Trombone' Transition Procedures | Civil Aviation Authority (caa.co.uk).

6.6.10.1.3. *Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 and a Trombone to 15nm final they would both extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the holds.* Sponsor response to feedback: The TRA(G) extends from FL195-FL245, No p[proposal in this ACP will extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP, and that being conducted for the wider MTMA, is actively looking for airspace that can be down classified to Class G making more of it available for gliding. We believe the concerns relating to the Trombone are reflected in our assessment of DP5 (Red) and DP6 (Amber). We do not believe that this automatically translates into an Amber grading for DP1. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned, during Stage 3 of the CAP1616 process. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.10.1.4. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: In terms of the impact of RW14 approaches, aircraft need to be on a stable final approach by the time they are at a certain range from touchdown. Because of this, the sponsor believes that there is little that can be done about the impact to Otley as it is positioned on the extended centreline for RW14.

6.6.10.1.5. Burn Gliding Club commented as follows: *'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.'* Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.10.1.6. In summary, stakeholder feedback similar to other arrival options. LBA assessed DPs 4, and 9 as Amber due to additional fuel carriage needed, DPs 5 and 8 Red as there would be a requirement for vectoring and changes to airspace dimensions for the 15nm approach and trombone procedures.

6.6.11. Arrival System 7

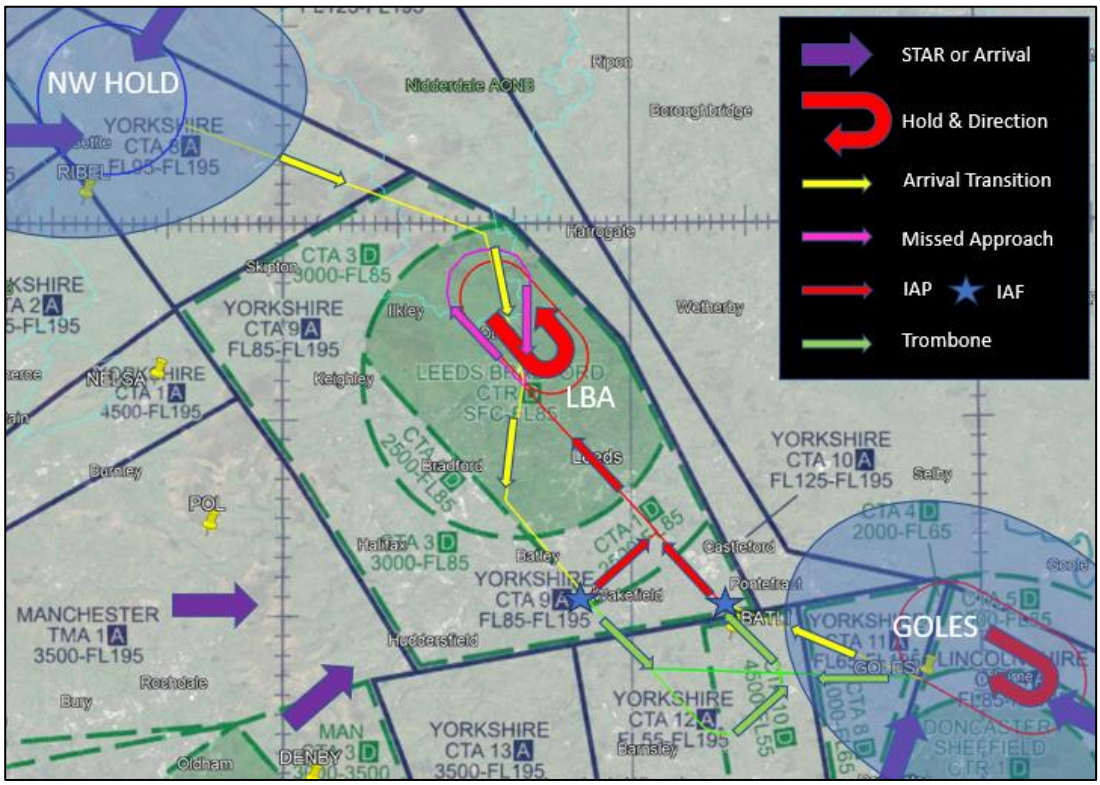


Figure 155: Arrival System 7 RW32

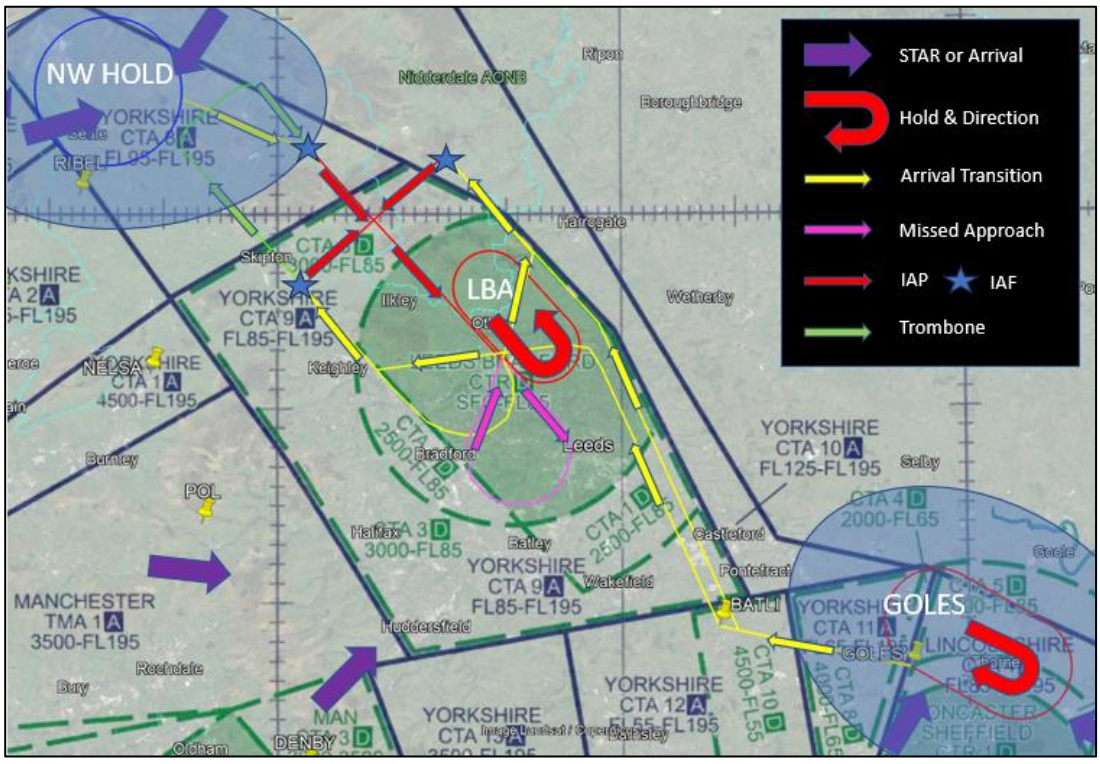


Figure 156: Arrival System 7 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 55 - Arrival System 7 DPE

6.6.11.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP1 – Amber – LBA STAR via SW Arrival Gate system is the problem as conflicts with outbounds off RW14;
- DP2 – Amber – No improvement;
- DP3 – Red - AONB and NP overflown ;
- DP4 – Amber - Regardless of Hold, if coming from the SW, aircraft planning for unexpeditious recovery;
- DP5 – Red - Needed for 15nm final, eastern T-bar on RW14 and trombone to the north;
- DP6 – Amber - GOLES element simplifies but the LBA and trombone airspace has the opposite effect;
- DP8 – Red - Heavy requirement for tactical vectoring and level restrictions particularly on RW32;
- DP9 – Amber – Regardless of Hold, if coming from the SW, aircraft planning for unexpeditious recovery;
- DP10 – Amber - Not entirely systemised but modernising airspace with PBN, also a requirement for more CAS which indicates this option is only partially aligned with the AMS.

6.6.11.1.2. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.11.1.3. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 and a Trombone to 15nm final they would both extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the holds and in particular the impact of having a North West Hold over the Nidderdale/Yorkshire Dales area. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP and that being conducted for the wider MTMA is actively looking for airspace that can be down-classified to Class G making more of it available for gliding. We believe the concerns relating to the Trombone are reflected in our assessment of DP5 (Red) and DP6 (Amber). Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.11.1.4. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.11.1.5. Burn Gliding Club commented as follows: 'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.' Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.11.1.6. In summary, stakeholder feedback similar to other arrival options. LBA assessed DPs 4, and 9 as Amber due to additional fuel carriage needed, DPs 5 and 8 Red as there would be a requirement for vectoring and changes to airspace dimensions for the 15nm approach and trombone procedures. Additionally, DP1(Safety) is assessed as Amber due to potential conflicts with departures, DP2 (Noise) as Amber due to no improvements on today's operation. As this option impacts both the AONB and NP, DP3 is assessed as Red. Accordingly, this option does not fully align with AMS realisation objectives.

6.6.12. Arrival System 8

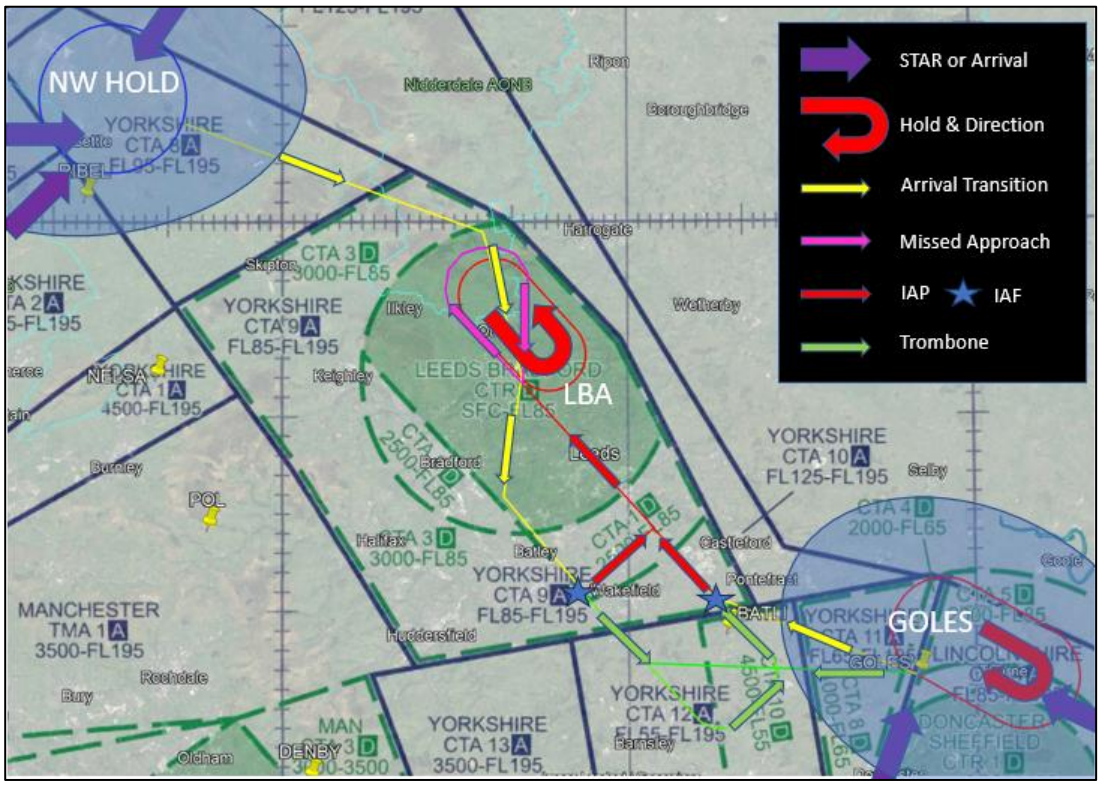


Figure 157: Arrival System 8 RW32

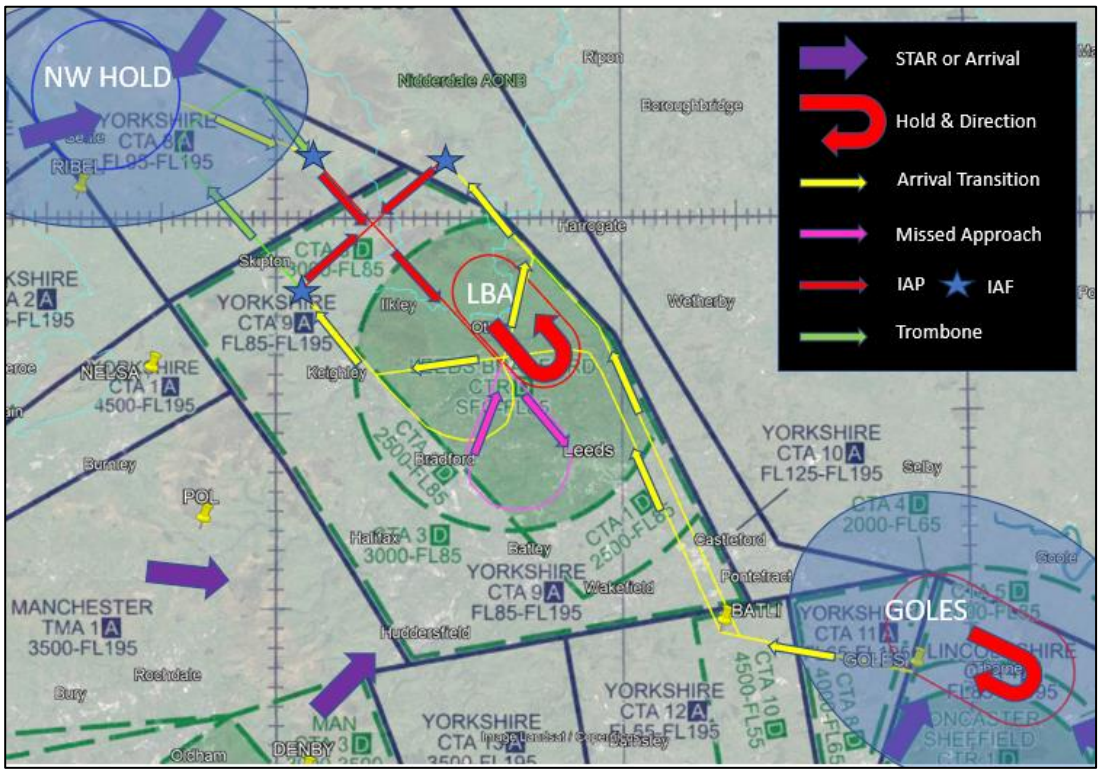


Figure 158: Arrival System 8 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 56 - Arrival System 8 DPE

6.6.12.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – No improvement;
- DP3 – Red - AONB and NP overflown;
- DP5 – Red - Needed for 15nm final, eastern T- bar on RW14 and trombone to the north;
- DP6 – Amber – Potential complexity with the introduction of trombone airspace;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.12.1.2. The MOD (DAATM) felt that DP6 (Complexity) should be amended to Amber due to the added complexity brought about through the inclusion of the Trombones[25]. Sponsor response to feedback: Whilst it is accepted that the graphics suggest a level of complexity, ultimately this would just be a volume of airspace being used for the sequencing of aircraft. However, for consistency, DP6 is changed to Amber.

6.6.12.1.3. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.12.1.4. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 and a Trombone to 15nm final they would both extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the holds and in particular the impact of having a North West Hold over the Nidderdale/Yorkshire Dales area. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP and that being conducted for the wider MTMA is actively looking for airspace that can be down-classified to Class G making more of it available for gliding. We believe the concerns relating to the Trombone are reflected in our assessment of DP5 (Red) and DP6 (Amber). Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.12.1.5. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.12.1.6. Burn Gliding Club commented as follows: 'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.' Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.12.1.7. In summary, whilst LBA accept that the graphics to illustrate this option suggest a level of complexity, this would just be a volume of airspace being used for the sequencing of aircraft. LBA have nevertheless assessed as Amber due to feedback. DPs 5 and 6 are assessed as Red and Amber respectively in recognition of increased complexity and dimensions for this option. Stakeholder feedback for this option is similar to other arrival options. DP2 continues to be Red due to impact on the NP and AONB.

6.6.13. Arrival System 9

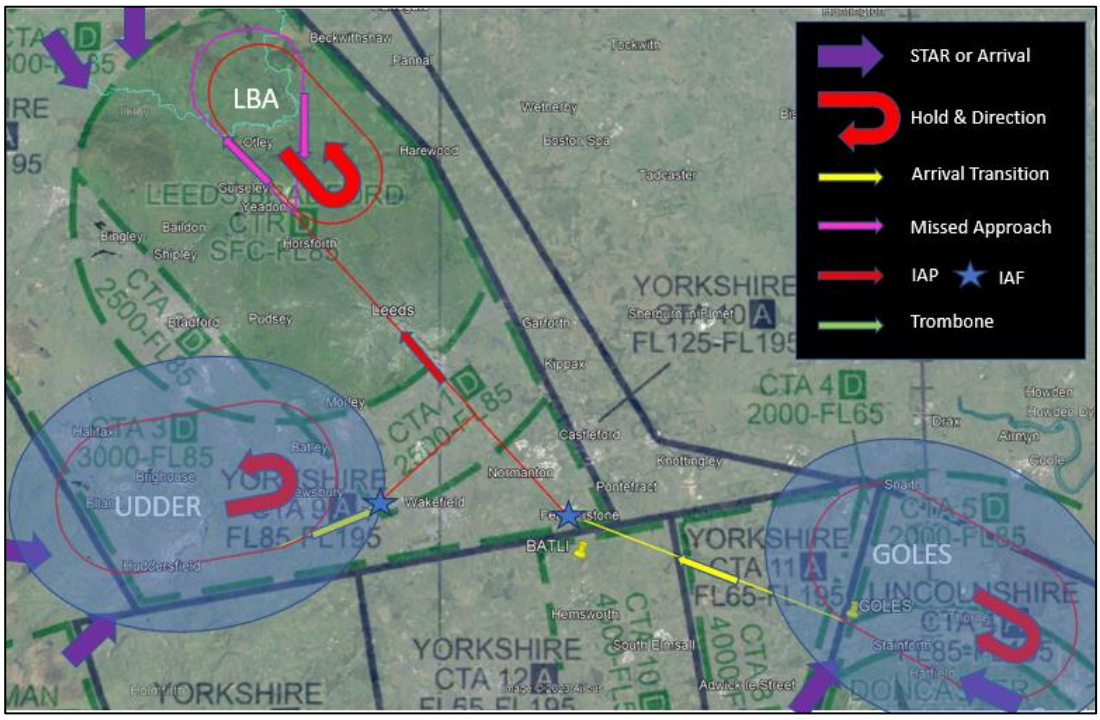


Figure 159: Arrival System 9 RW32

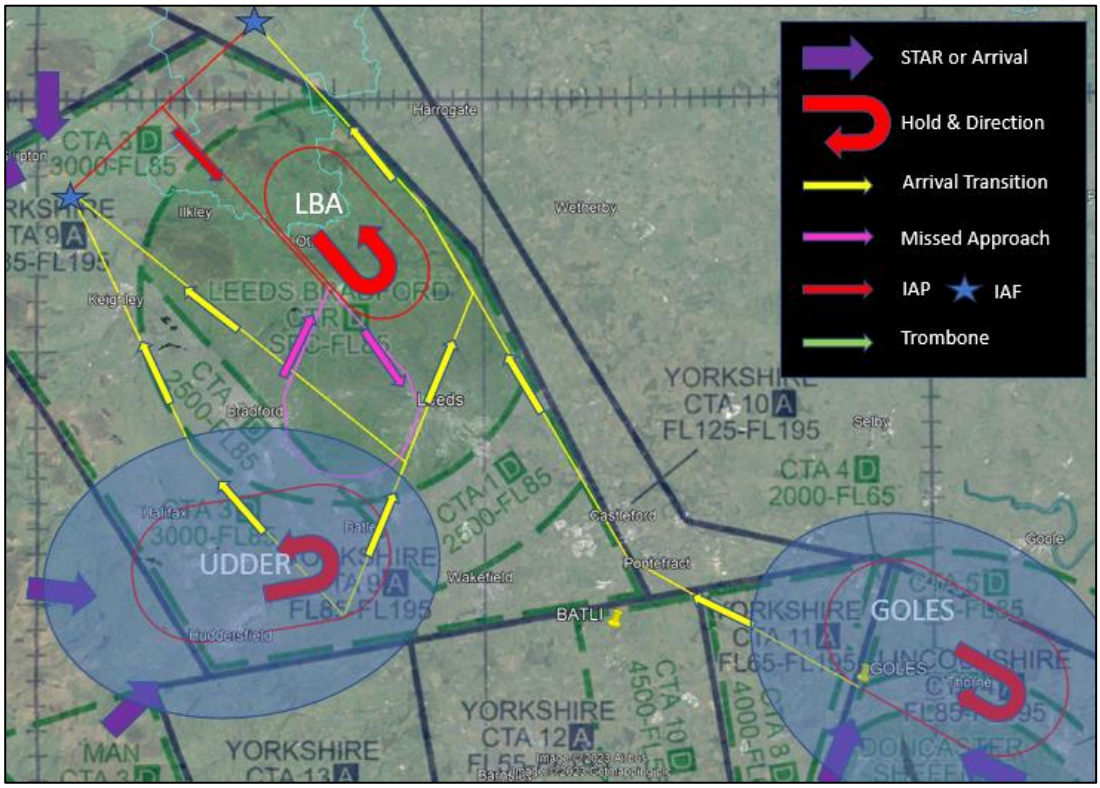


Figure 160: Arrival System 9 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 57 - Arrival System 9 DPE

6.6.13.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber – No improvement;
- DP3 – Red - AONB overflown by eastern T-Bar to RW14;
- DP4 – Amber – UDDER hold may impact RW14 departures;
- DP5 – Amber - Potential requirement for additional CAS for GOLES/UDDER holds.;
- DP6 – Amber – Likely changes to CAS;
- DP8 – Amber - UDDER hold may impact RW14 departures;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.13.1.2. The Peak District NP commented that the UDDER hold appeared to be over the North Eastern part of the NP. Sponsor response to feedback: The hold would rarely be utilised and if it were to be utilised, it would be above 8000ft. DP3 is Red already but for the Nidderdale AONB where aircraft are descending for the approach.

6.6.13.1.3. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.13.1.4. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 it would extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the GOLES hold. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP and that being conducted for the wider MTMA is actively looking for airspace that can be down classified to Class G making more of it available for gliding. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.13.1.5. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.13.1.6. Burn Gliding Club commented as follows: 'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.' Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.13.1.7. In summary, DP2 continues to be Red due to impact on the NP and AONB, this is supported by stakeholders. Other comments are similar to other arrival options. DP5 and 6 assessed as Amber due in recognition of changes to and additional CAS requirements. As the hold at UDDER may impact departures from RW14, DP8 is assessed as Amber by LBA. Accordingly, this option may not align with AMS realisation objectives (DP10).

6.6.14. Arrival System 10

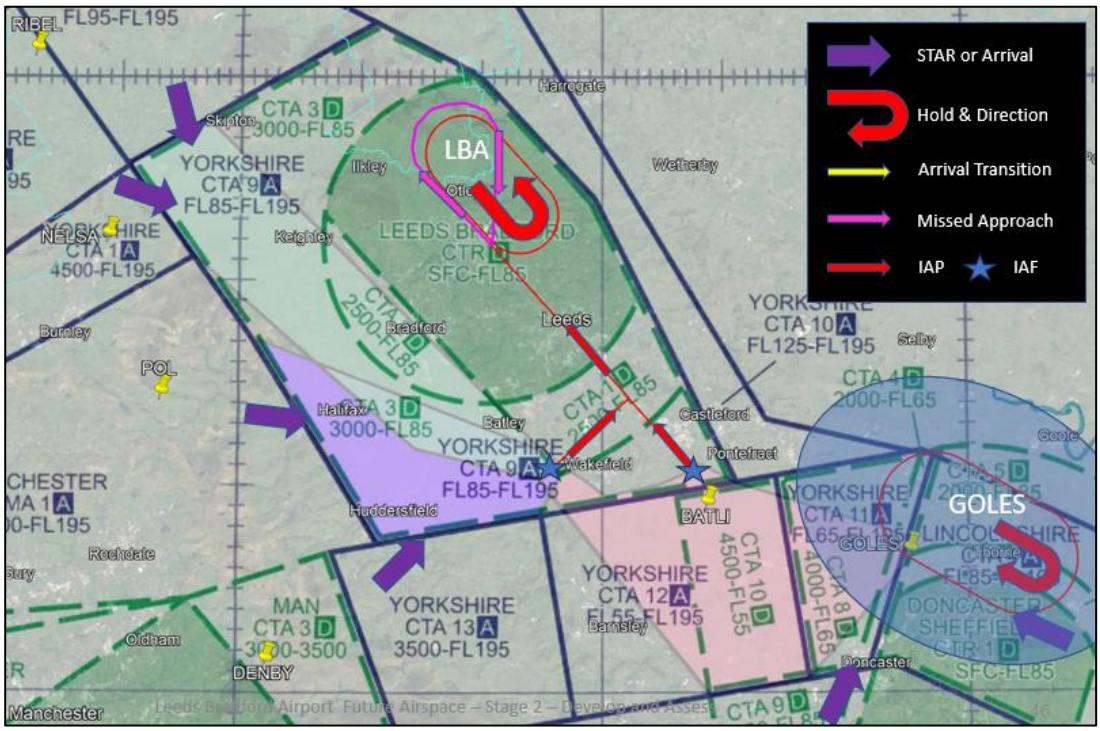


Figure 161: Arrival System 10 RW32

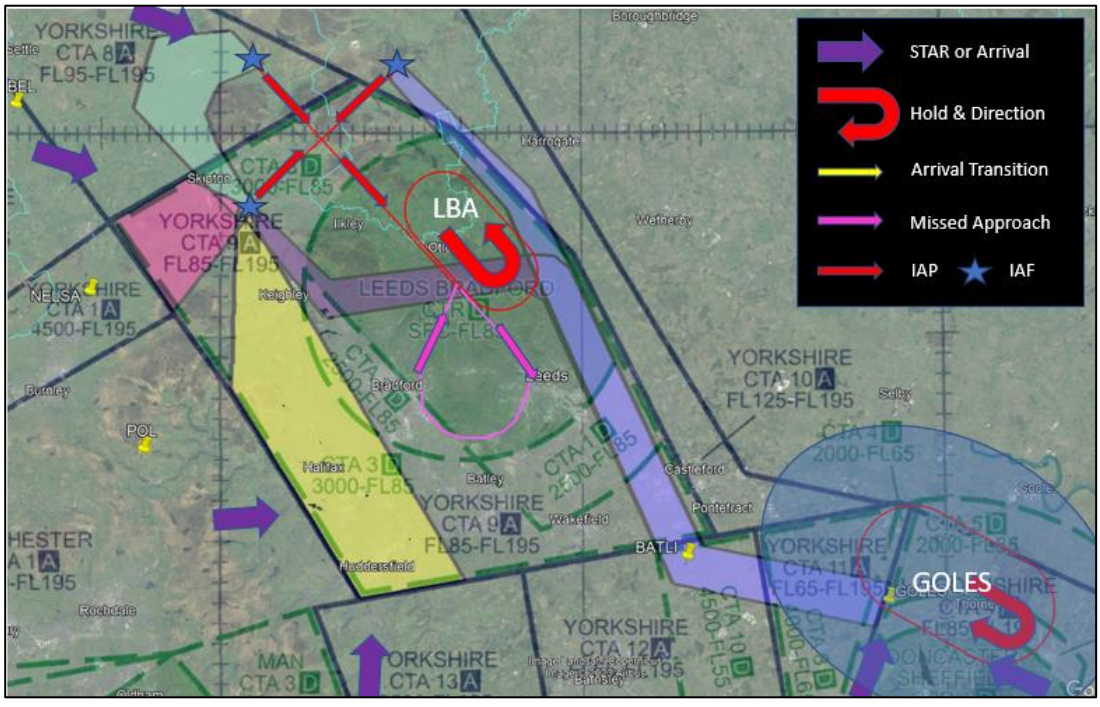


Figure 162: Arrival System 10 RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 58 - Arrival System 10 DPE

6.6.14.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP3 – Red - Yorkshire Dales NP and AONB impacted;
- DP4 – Amber - CO2 emissions likely to be the same or similar to today's operation;
- DP5 – Amber - Potential requirement for additional CAS for GOLES hold;
- DP6 – Amber - Likely changes to CAS;
- DP7 – Amber – Lack of holding fixes and holds for some arrivals needs justification;
- DP8 – Amber - Potential for inbounds from W and SW to still conflict with departures;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.6.14.1.2. The NWLTA felt that DP2 (Noise) should be Amber as when RW14 is in use for approaches, there might be an increase in traffic over eastern Leeds through the swathe marked in 'violet'. Sponsor response to feedback: DP2 was considered Green as traffic already passes through this area, albeit in a more dispersed fashion, when RW14 is in use for approaches. The use of RNAV arrival transitions present an opportunity to find a routing that affects the least people.

6.6.14.1.3. The DHPC felt that DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail made available on changes to the CAS configuration. Sponsor response to feedback: It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.14.1.4. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Red. The rationale for this was that should an Eastern T-Bar extension be installed on RW14 and a Trombone to 15nm final they would both extend into Nidderdale and require more CAS. They also felt that there had been no consideration to the Temporary Restricted Areas (Glider) (TRA(G)) and Non-Secondary Surveillance Radar Glider Areas (NSGA). Finally, they commented upon a lack of detail surrounding the GOLES hold. Sponsor response to feedback: The TRA(G) extends from FL195-FL245 and none of what is being 'proposed' here is going to extend up above FL195. The NSGA permits Non-SSR equipped gliders to operate above FL100 under Visual Flight Rules (VFR) but not in CAS. NSGA Area 2 is a large area but some of it is already taken by CAS. Minor extensions to the LBA CAS would not dramatically change the airspace available for gliding. Part of this ACP, and that being conducted for the wider MTMA, is actively looking for airspace that can be down-classified to Class G making more of it available for gliding. Having the Eastern T-Bar extension for RW14 could result in a dramatic improvement to the efficiency of the operation and could result in a significant reduction in noise disturbance for the Bradford region which currently experiences most arrivals descending for base leg when RW14 is in use. Detail on the holds is not currently available as this is still the embryonic stage of development. It would not be appropriate to propose CAS configurations until such time as the options have been fine-tuned. Where changes to the CAS construct are a likely consequence, this has been made clear in the DPE.

6.6.14.1.5. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.6.14.1.6. Burn Gliding Club commented as follows: 'Any new holds at "Airey" or "Goles" appear illogical whether they sit within the existing airway structure or not. If they do, they block up the airway, if they don't, they require extra airspace within the Vale of York AIAA.' Sponsor response to feedback: The operation within CAS is of more concern to NERL and the MTMA Team. The MTMA Team have voiced support for hold in the vicinity of GOLES and it is up to them to determine if that will 'block up the airway'. The hold at AIREY has not received such support and would require additional CAS. For this reason, DP5 has been graded Red.

6.6.14.1.7. In summary, DP2 continues to be Red due to impact on the NP and AONB, this is supported by stakeholders. Other comments are similar to other arrival options. DP5 and 6 assessed as Amber due in recognition of changes to and additional CAS requirements. DPs 7 and 8 also assessed as Amber due to justification required for holding fixes and potential conflicts with departures. Accordingly, this option may not align with AMS realisation objectives (DP10).

6.7. Approach

6.7.1. This section illustrates two concept approaches intended as respite routes, or noise reduction, and for optimisation of fuels and emissions.

6.7.2. Required Navigation Performance (Authorisation Required) Runway 32

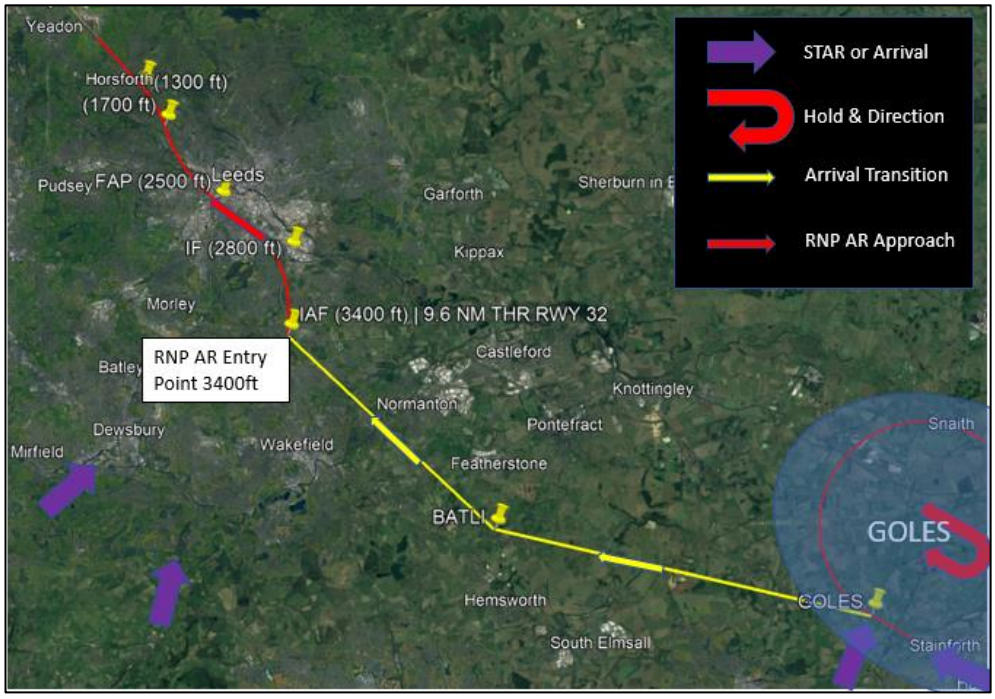


Figure 163: RNP AR RW32

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 59 - RNP AR RW32 DPE

6.7.2.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP7 – Amber – Crews not currently certified to fly such approaches;
- DP11 – Amber – Some operators would require a fleet upgrade.

6.7.2.1.2. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail provided on this conceptual option. Sponsor response to feedback: There is no logical reason why the introduction of such procedures would be overly complex or unsafe nor is there a likely requirement for additional CAS for such an approach.

6.7.2.1.3. When asked whether they agreed with the DPE, the Ministry of Defence stated, “Yes and No”, indicating that without greater fidelity of optimised routes rather than concept, it doesn't allow full evaluation against DPs.

6.7.2.1.4. The Dales Hang Gliding and Paragliding Club (DHPC) stated that it was unclear if approach for RW 14 is contained within existing CAS.

6.7.2.1.5. Otley Town Council stated that from an Otley perspective, any arrivals to the northern entrance to the runway pass over or near to the west of Otley at below 4000ft and so will have a noise and tranquillity impact.

6.7.3. Required Navigation Performance (Authorisation Required) Runway 14

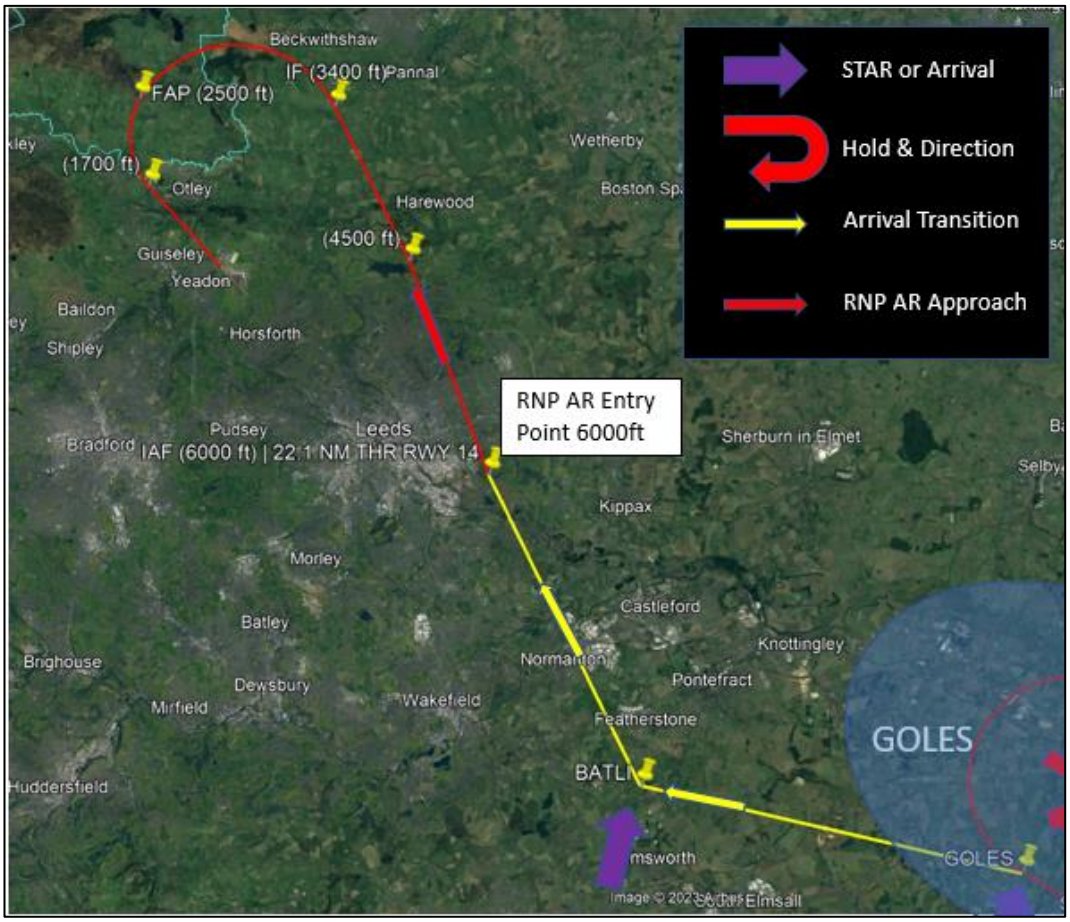


Figure 164: RNP AR RW14

	DP1 Safety	DP2 Noise	DP3 Tranquillity	DP4 Emissions & Air Quality	DP5 Airspace Dimensions	DP6 Complexity	DP7 Technical	DP8 Systemisation	DP9 Operational Cost	DP10 AMS Realisation	DP11 PBN
DPE June 2023	Not previously submitted – a new option										
DPE Nov 2023											
Final DPE											

Table 60 - RNP AR RW14 DPE

6.7.3.1.1. The following DPs are evaluated Red or Amber for the following reasons:

- DP2 – Amber - NE Leeds suburbs overflown in the descent to 5000ft;
- DP5 – Amber - Potential for additional CAS requirement;
- DP7 – Amber - Crews not currently certified to fly such approaches;
- DP11 – Amber - Some operators would require a fleet upgrade;
- DP10 – Amber – requires more CAS which indicates this option is only partially aligned with the AMS.

6.7.3.1.2. The DHPC commented that it wasn't clear if the procedure would be contained within the existing CAS. Sponsor response to feedback: On reflection, it is possible that this conceptual design might stray outside the existing CAS and accordingly DP5 has been amended to Amber.

6.7.3.1.3. Yorkshire, Derbyshire and Nottinghamshire RSAG and the BGA felt DPs 1 (Safety), 5 (Airspace Dimensions) and 6 (Airspace Complexity) should be rated Amber on account of the lack of detail provided on this conceptual option. Sponsor response to feedback: There is no logical reason why the introduction of such procedures would be overly complex or unsafe, but it is agreed that CAS demands might differ and DP5 has been amended to Amber accordingly.

6.7.3.1.4. Otley Town Council commented that use of RW14 for approaches results in a Noise and Tranquillity impact to their town. Sponsor response to feedback: There is little that can be done about the impact to Otley, given its location, in terms of the impact of RW14 approaches. Otley is on the extended centreline for RW14, and aircraft need to be on a stable final approach by the time they are at that range from touchdown.

6.8. Outcome of Evaluation

6.8.1. The DPE is a useful exercise in determining to what extent DOs meet the agreed set of DPs, although it is not necessarily the final arbiter. The DPE is a very subjective process and relies upon DPs that have been well worded such that they capture the real intent of all concerned. Whilst certain DOs may score 'Red' against certain DPs, this does not mean that they are definitively discounted from further consideration.

6.8.2. Ultimately, within reason, it is important to ensure that all viable DOs are considered in greater detail particularly if they show relative benefits in certain aspects. A clear example of this in this case is the departure options that turn right off RW32 and left off RW14. It is possible that the inclusion of these DOs may reduce the number of people overflown and having these DOs may result in the potential for alternate 'respite' operations.

6.9. Discounting Options

6.9.1. Following the DPE options have been discounted if they scored a Red in DP10 – AMS Realisation. This means that the option is not aligned with the AMS.

6.9.2. Airspace modernisation in line with the AMS is a fundamental objective of this ACP. As such, any option that does not align with these principles is discounted from further consideration in this process.

6.9.3. All of the baseline options have been discounted along with 32SEE for this reason.

6.9.4. It is worth noting that should any option have scored Red for DP1 – Safety it would have also been automatically discounted as any option that had 'Issues identified that would be unlikely to be overcome without prohibitively restrictive safety mitigations' would not be acceptable.

Option	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	Outcome
Runway 32 South-East												
32SE-Baseline												Rejected
32SE-Do Minimum												Kept for IOA
32SEA	Considered no longer a viable option and discounted from assessment.											
32SEB												Kept for IOA
32SEC												Kept for IOA
32SED												Kept for IOA
32SEE												Rejected
32SEF												Kept for IOA
32SEG												Kept for IOA
RW32 South & West												
32S&W-Baseline												Rejected
32S&W-Do Minimum												Kept for IOA
32S&WA												Kept for IOA
32S&WB	Considered no longer a viable option and discounted from assessment.											
32S&WC												Kept for IOA
32S&WD												Kept for IOA
32S&WE	Considered no longer a viable option and discounted from assessment.											
32S&WF												Kept for IOA
32S&WG												Kept for IOA
32S&WH												Kept for IOA
RW32 New Combination Options												
32NEWA												Kept for IOA

Option	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	Outcome
32NEWB												Kept for IOA
32NEWC												Kept for IOA
32NEWD												Kept for IOA
32NEWE												Kept for IOA
RW14 South-East												
14SE-Baseline												Rejected
14SE-Do Minimum												Kept for IOA
14SEA												Kept for IOA
14SEB												Kept for IOA
14SEC	Considered no longer a viable option and discounted from assessment.											
14SED	Considered no longer a viable option and discounted from assessment.											
RW14 South & West												
14S&W-Baseline												Rejected
14S&W-Do Minimum												Kept for IOA
14S&WA	Considered no longer a viable option and discounted from assessment.											
14S&WB	Considered no longer a viable option and discounted from assessment.											
14S&WC												Kept for IOA
14S&WD												Kept for IOA
14S&WE												Kept for IOA
RW14 New Combination Options												
14NEWA												Kept for IOA
14NEWB												Kept for IOA
Arrival Systems												

Option	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	Outcome
Baseline												Rejected
1 – LBA – DO MINIMUM												Kept for IOA
2 – NELSA/GOLES												Kept for IOA
3 – AIREY/WORTH												Kept for IOA
4 – AIREY/WORTH/LBA												Kept for IOA
5 – NELSA/GOLES/UDDER												Kept for IOA
6 – LBA/GOLES												Kept for IOA
7 – NW Hold/LBA/GOLES												Kept for IOA
8 – NW Hold/GOLES												Kept for IOA
9 – UDDER/GOLES												Kept for IOA
10 – GOLES/Direct Arrivals												Kept for IOA
RNP AR Approaches												
RNP AR RW32												Kept for IOA
RNP AR RW14												Kept for IOA

Table 61: Final DPE Matrix

7. Next Steps

7.1. The Stage 2 submission for the LBA FASI-N ACP is scheduled for 03 May 2024 and will include this document along with a document detailing the IOA. In addition, all supporting documentation such as the presentations used for stakeholder engagement and the Engagement Record will be posted on the ACP Portal.

7.2. The Manchester Airport, Liverpool, East Midlands and the MTMA (NERL) ACPs are all successfully through the Stage 2 Gateway. As Stage 3 commences, it is anticipated that several workshops will be held with the MTMA Team, ACOG and other key stakeholders over the coming months to begin the refinement process of turning swathes into procedures that allow for greater analysis.

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