London Biggin Hill Airport RNAV (GNSS) Runway 21 Airspace Change Proposal

ACP-2019-86

Stage 2 Gateway Clarifications

LONDON BIGGIN HILL AIRPORT

Stage 2 Gateway Clarifications

Background

The Civil Aviation Authority (CAA) have requested clarification on some points within the Stage 2 submission documents, submitted as part of the London Biggin Hill Airport (LBHA) Runway 21 RNAV (GNSS) Airspace change Proposal (ACP). This document aims to address the clarifications requested and provides an additional level of detail to assist in further understanding the second iteration of the Stage 2 documentation. Please note that this document is for clarification only and as such references applicable paragraphs within the previously submitted documents.

To confirm, any reference within the latest iteration of the Stage 2 documentation should refer to the replication of the existing ILS/DME/VOR (Instrument Landing System/Distance Measuring Equipment/VHF Omni-directional Ranging) procedure as published on the UK Aeronautical Information Publication (UK AIP - AD 2-EGKB-8-1), in accordance with the requirements set out in the Statement of Need (SoN). The VOR/DME is a separate approach procedure which will become unavailable when the Biggin Hill (BIG) VOR beacon is removed from service in the near future. It is worth emphasising that, the VOR/DME approach procedure is a rarely used as aircraft are normally provided with radar vectors from NATS Thames Radar onto the ILS.

Throughout this document, the method of navigation employed by aircraft is known as Performance Based Navigation (PBN). As defined in Civil Aviation Publication (CAP) 1616, Appendix J, PBN is an internationally recognised concept that aims to move away from the traditional use of aircraft navigating by ground-based beacons and utilises airborne technologies, utilising Area Navigation (RNAV) and GNSS.

Process

Shortlisting of Options

Through the process defined in CAP 1616, a change sponsor will 'filter down' design options from the Comprehensive List to a Shortlist (including the preferred option[s]). This process is carried out by applying various criteria, constraints, and assessment metrics throughout Stage 2 of the CAP 1616 process.

At the very start of Stage 2, LBHA identified all possible options. However, between the first and second iteration of the ACP documentation, an initial assessment into the possibility of offering a PBN to ILS element within the procedure was conducted. This was precipitated by the BREXIT changes as explained in paragraph 1.6.3 of the Design Options Development Document (DOD). While this is a Radical Option, as it is not currently operational anywhere in the UK, LBHA believes this could be developed to provide resilience that was effectively removed by the unavailability of European Geostationary Navigation Overlay Service (EGNOS) agreement.

The PBN to ILS element would enable aircraft at LBHA to utilise the PBN element of the procedure until they are established on the ILS at the Final Approach Fix (FAF). The advantage of this is that using the ILS provides additional resilience, enabling aircraft to operate into LBHA in lower visibility

than the full PBN approach. Therefore, the Radical Option of a PBN to ILS element was considered to be feasible.

The work undertaken as described in Paragraph 1.8 within the DOD, showed that the lateral track for the PBN to ILS element would remain the same as a full PBN element. For this reason, the change sponsor elected to group these elements together for the purposes of assessment in the DPE and IOA, because the tracks over the ground are the same.

It must be stressed that each option that was not discounted within the DOD can be flown in one of two ways. Either a full PBN approach or a PBN to ILS approach. This aims to answer the SoN by providing the required modernised procedures and incorporating a degree of resilience. Both these procedures can be flown in the absence of the VHF Omni-directional Range (VOR) beacon and/or radar vectors. In addition, the full PBN element can be flown if the ILS is unavailable, meanwhile the PBN to ILS element can be utilised if a lower procedure minima is required.

Neither of the proposed procedural elements are likely to increase usage, which is expected to remain consistent with the current uptake of the conventional VOR approach, of approximately 2 aircraft a month. Whilst it is accepted that, theoretically, the implementation of this ACP could result in NATS Thames Radar utilising the procedure instead of providing radar vectors, the sole reliance on the procedure rather than radar vectors is only likely to happen when the airspace configuration, complexity and interactions allow, and the inbound aircraft has specifically elected to utilise this rarely used approach procedure instead of the normal radar vectors.

Following the completion of the Design Principles Evaluation (DPE) a Comprehensive List of Viable Options was generated. This list then fed into the Initial Options Appraisal (IOA) conducted at Step 2B. As part of the IOA, the design options were assessed against the defined baseline (Do Nothing) and then shortlisted based on the benefits they could provide.

The list below contains a full list of the proposed arrival options and sub-elements (which make up the whole option) within the Comprehensive List of Viable Options:

- Option 2A – ILS/DME/VOR Replication from ALKIN (3 Deg)
    - Element 2A – Full PBN procedure
    - Element 2Ai – PBN to ILS procedure
- Option 2AD – ILS/DME/VOR Replication direct from OSVEV (3 Deg)
    - Element 2AD – Full PBN procedure
    - Element 2ADi – PBN to ILS procedure

Error! Reference source not found. below summarises the IOA outcome, broken down by sub-element rather than high-level option.

Shortlist Option	IOA Status	Sub-Element Initial Appraisal Outcome
Option 2A	Carry Forward	Full PBN Element – Based on its performance in the IOA, this element has been taken forward. This option provides a clear alternative to the preferred option but does not include a direct link from OSVEV to ALKIN.

Shortlist Option	IOA Status	Sub-Element Initial Appraisal Outcome
		PBN to ILS Element – Based on its performance in the IOA, this element has been taken forward. This option provides a clear alternative to the preferred option but does not include a direct link from OSVEV to ALKIN. Having said that, this option performs better than the Full PBN element as it provides additional resilience due to the RNAV to ILS element.
Option 2AD	Preferred Option	Full PBN Element – Based on its performance in the IOA, this element has been selected as part of the Preferred option. This is because it is more beneficial in terms of network connectivity when compared to Option 2A as it includes a link between OSVEV and ALKIN.
		PBN to ILS Element – Based on its performance in the IOA, this element has been selected as part of the Preferred option. This is because it is more beneficial in terms of network connectivity when compared to Option 2A as it includes a link between OSVEV and ALKIN and provides additional resilience due to the PBN to ILS element.

Table 1 IOA Outcome by Sub-Element

Environmental

Noise Modelling Categorisation

In accordance with CAP 2091, Paragraph 5.8, ACP change sponsors are required to provide 10 years' worth of traffic forecasts (each year) from the expected date of implementation. This information along with local population data is used to inform the appropriate level of noise modelling required as part of the ACP environmental assessments. At Stage 2 of the CAP 1616 process, a change sponsor is required to indicate which level of noise modelling they are likely to undertake in Stage 3.

This is specified in Paragraph 1.9.3 of our Design Options Document; around 2,100 people are affected within the 51dB, $_{LAeq,16\ hours}$ daytime contour. This approximation is based on noise monitoring data from Summer 2019. At night there were around 20 people within the 45 dB $L_{Aeq,\ 8\ hours}$ contour (based on Summer 2019 noise monitoring data) which is well below the recommended minimum threshold of 1,600 for Category D. LBHA therefore deems that Category D modelling is applicable as the estimated population sits between 2,000 and 25,000 as specified in Table 4.1 within CAP 2091.

LBHA have recently invested in an environmental noise monitoring system, and, at this point, it is expected that all of the required noise-related outputs listed in CAP 1616a can be realised through this system and collaboration with specialist environmental consultants. The requirements for noise modelling in terms of data collection are set out in CAP 1616a and will be complied with during environmental assessment work conducted during Stage 3.

Additionally, the LBHA Noise Abatement Policy (NAP) is currently under review in consultation with the applicable local borough council, the new NAP will also be considered at Stage 3.

Traffic demand in 2021 was impacted by COVID 19 with a total of 36,763 movements, of which 13,763 were IFR and 13,000 VFR. The table below shows forecast growth with the figures for 2022-2025 from the airport Masterplan and the remaining years from business development for the subsequent Masterplan. LBHA believes that the forecast traffic growth relevant to this ACP, and engagement with local planning authorities (no evidence of relevant housing growth), allows LBHA to be secure in the thinking that the noise modelling Category D identified Paragraph 1.9.3 of our Design Options Document is correct

Year	Total Forecasted Movements	IFR Forecasted Movements	VOR Forecasted Movements
2022	51500	25750	24
2023	52530	26265	25
2024 (Implementation)	53580	26790	25
2025	54652	27326	25
2026	55745	27873	25
2027	56860	28430	26
2028	57997	28999	26
2029	59157	29579	26
2030	60340	30170	27
2031	61547	30774	27
2032	62778	31389	27
2033	64034	32017	27
2034 (10 years post Implementation)	65314	32657	28

Table 2 Traffic forecast

Evidence Gaps

Consistent with the requirements of CAP1616, the IOA is primarily a qualitative analysis of each option against a defined baseline. This is expanded in the Full Options Appraisal (FOA) conducted at Stage 3, to include further quantitative analysis. The FOA, requires change sponsors to assess each of the design options against the baseline in relation to the criteria defined in CAP1616, Appendix E using primarily quantitative metrics. These metrics include the assessment of the environmental impacts of the proposed change.

As defined in CAP1616a, the FOA requires change sponsors to collect quantitative environmental metrics that describe the baseline scenario and conduct a series of modelling activities for each of the design options, to enable a fair comparison of the environmental impacts. The required metrics that LBHA intend to collect will include:

• 10-year traffic forecasts (baseline forecasts, at the time of implementation and implementation plus 10 years)

• Standard noise metrics:

  o L_{Aeq} noise contours

  o 100% noise mode contours

  o Nx contours

  o Difference contours

  o L_{max} spot point levels

• Operational diagrams

• Overflight (based on the CAA definition of overflight found in CAP1498)

The modelling is intended to provide a comparison between today's operation and operations at the point of implementation and 10 years post implementation. A comparison is made between the do-nothing baseline and the baseline at the point of implementation. Each option is then modelled against the baseline at the time of implementation and also 10 years post-implementation. More information regarding these metrics will be provided during the FOA at Stage 3.

AONB Justification

As specified in Paragraph 4.3.3 of our IOA submission, CAP 1616 Appendix B, Paragraph B76 requires change sponsors to consider the impact of the proposed change on Tranquillity with specific reference to Areas of Outstanding Natural Beauty (AONBs) and National Parks (NPs). However, as specified in CAP 1616, Appendix B, Paragraph B78 there is no legislative requirement to avoid the overflight of AONBs and NPs entirely as, on occasion, it may be impractical to do so. Paragraph B76 also requires the change sponsor to consider the impacts on any other areas identified through community engagement. In the case of LBHA, no additional areas were identified.

To fulfil the requirement of Paragraph B76 the change sponsor compared the lateral tracks of the proposed design options with a map of nearby AONBs and NPs. At Stage 2, there is no requirement to complete a quantitative overflight (as defined in CAP 1498) analysis, as such the sponsor elected to conduct a qualitative comparison. As a result, no formal overflight assessment was conducted. It would be disproportionate for LBHA to carry out a full overflight assessment at this stage.

Figure 1 LBHA and Kent Downs/Surrey Hills AONBs (Natural England)

Qualitative analysis showed that the lateral track of none of the design options (within the Comprehensive List of Viable Options) directly intersected with the boundary of the Kent Downs or Surrey Hills AONBs. Consequently, it was deemed that there would continue to be no or a very limited additional impact on these areas. It is acknowledged that this was a qualitative assessment, and that more analysis would be required during Stage 3 of the CAP 1616 process, as described above.

It should be recognised that not all aircraft arriving at LBHA arrive via the wider ATC enroute network. When aircraft arrive at LBHA from outside the network, these aircraft may overfly either of the AONBs due to their geographic location in relation to LBHA. This is what happens today, and this ACP will not change this. Additionally, aircraft arriving via the en-route network from the south, southwest or southeast, at this stage of flight are likely to be above 7,000ft and under the direct control of NATS (En-route and/or) Thames Radar, operations which are outside the control of LBHA. Again, this is what happens today, and this ACP will not change this.

As the remaining options within this ACP specifically focus on designs from ALKIN/OSVEV, which are both utilised in a similar way under the current operation, aircraft operating under the control of NATS above 7,000 ft are considered to be beyond the scope of this ACP as LBHA has no direct control over where these aircraft fly, as described in our IOA submission which includes the IOA Full Analysis Table.