Birmingham International Airport Standard Instrument Departures from Runway 15: CAA decision

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Executive summary

Objective of the proposal

1. In accordance with the terms of a planning application decision made on 2 November 2009 the physical length of the runway at Birmingham International Airport (BHX) was extended. This enabled Birmingham Airport Ltd (BAL) to declare (that is make available to aircraft traffic) an extended runway length, in both directions. The runways at BHX are known as Runway 15 and 33 and are used for all arriving and departing aircraft regardless of destination/origin depending on the strength and direction of prevailing wind.

2. Departures and arrival procedures are designed specifically in relation to the declared start and end points of the runway. To declare a revised runway length it was necessary for BAL to publish new departure and arrival procedures for both runways. Departure procedures are known as SIDs (Standard Instrument Departures).

3. This proposal concerns the SIDs departing on runway 15 to the southeast. The arrival procedure on the reciprocal runway (runway 33) was the subject of separate airspace change proposals and is not part of this decision.

4. BAL as the sponsor developed an airspace change proposal for these amendments in accordance with the CAA's Airspace Change Process. BAL stated in that proposal that its overriding objective was to design safe procedures that comply with the relevant international design criteria. Subject to that, their objective was to minimise so far as possible the impact on local communities of making the changes necessary as a consequence of the longer runway.

5. There are 6 SIDs departing from runway 15. 4 used by aircraft on routes to the south and south-east of the airport and 2 used by aircraft on routes to the north.

6. As set out below, BAL has suspended its request that the CAA approve its proposals in respect of the SIDs departing for routes to the north. This decision is therefore only part of the decision in respect of BAL's airspace change proposal referred to in this decision as it only deals with the 4 SIDs that route aircraft to the south and south-east. The initial phase of all 4 south and southeast departures SIDs is the same.

7. The proposal has been considered and our decision is set out in this document.

Summary of the decision made

8. BAL identified 6 options, as set out in its public consultation, in respect of the SIDs routing aircraft south and south-east, including the 'do nothing' option. Two options, known as Option 5 and 6 were technically possible once relevant design criteria had been taken into account. BAL sought the CAA's approval for Option 6.

9. The CAA has decided to approve Option 6 (for the reasons set out in this decision) :

Southbound Option 6 – this proposal requires aircraft departing aircraft from runway 15 to turn right at the first allowable position using RNAV-1 design criteria to a common waypoint (coded as BBS06) from where the SIDs split to each of the four waypoints Daventry (DTY), Westcott (WCO), Compton (CPT) and COWLY; these SIDS were designated '2Yankee (2Y)'.

The CAA's decision to approve Option 6 is conditional upon BAL conducting some further trials and research in respect of Option 5 and to report the conclusions back to the CAA within agreed time frames. This condition is set out in full in Annexe A. The purpose of the further trial is to establish whether the SID designs broadly contained in Southbound Option 5 could alleviate the impact of the new routes on communities close to BHX. Depending on the results of any trial consideration will be

given to whether BAL will formally propose and seek the CAA's approval of the implementation of such alternative routes and on what terms.

Southbound Option 5 – this option (which was not in the end proposed to the CAA by BAL and has not been approved by the CAA) required aircraft departing from runway 15 to fly straight ahead to a particular waypoint (coded as BBS05) from where the SIDs split to each of four waypoints (DTY, WCO, CPT & COWLY): these SIDs were designated as '1 Lima (1L)'.

10. When making its decision the CAA has also taken into account a number of further steps which BAL has notified us it will be taking, which are also set out in Annex A.

Next steps

11. Uniquely, the southbound SIDs which are the subject of this decision are already published in the UK AIP, which is the means of implementing changes to the UK airspace structure, including SIDs. This is because once planning permission was agreed for the extended runway a programme of works commenced which included building the runway and installing all the accompanying technical apparatus (lights, beacons etc), in the correct locations associated with the longer runway. The programme of works was designed to ensure that all the necessary airspace structure changes would be complete and implemented in a co-ordinated manner such that the runway could be operational in all directions simultaneously. For the reasons set out in more detail below there was a delay to the finalising the design of the SIDs from runway 15 that best met the objective of the proposal, i.e. to implement safe procedures that otherwise minimised so far as possible the impact on the local community.

12. The CAA therefore made the decision that the southbound SIDs known as Options 5 and 6 could be placed in the UK AIP[1] as a temporary airspace change.

13. The CAA made this decision to enable the new runway and its associated features to become operational in accordance with the timetable set out in the planning application approval taking into account that other than the SIDs from runway 15, the new airspace structures had gone through the airspace change process and had been approved and were ready for implementation. The CAA also made this decision to enable further time and research to ensure that the new SIDs achieved their objective of minimising so far as possible the impact on the local communities. (The further work and analysis which was done is set out in more detail below.)

14. The SIDs known as Option 5 are in the permanent section of the AIP (albeit as temporary airspace changes) and the SIDs known as Option 6 are in the supplemental section of the AIP (also as temporary airspace changes). This reflects the chronology set out below that initially BAL considered Option 5 best met the objectives of its proposal, whereas subsequent information and research lead it to conclude that Option 6 best met those objectives. The fact that both sets of SIDs have been published as temporary airspace structures and process in the AIP has enabled and facilitated the extended period of research into the impact of the changes on the local communities that is referred to below.

15. As the CAA has decided to approve the Option 6 southbound SIDs as a permanent airspace change, these will be moved from the supplementary to the permanent part of the UK AIP on 23 June 2016. This will be achieved by continuing the procedure promulgated in AIP Supplement 007/2015 that came into effect 17 February 2015. The procedure will transfer to the UK AIP and be promulgated in the Aerodrome Section of

[1] The Aeronautical Information Publication (AIP) “A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation” (ICAO Annex 2). Essentially it is a definitive description of a State’s airspace including its boundaries, dimensions, classification as well as those of all airspace structures within it.

Birmingham Airport effective 23rd June 2016 (AIRAC7/2016).The SIDs known as Option 5 will remain in the UK AIP at this time to facilitate the further trials and research, completion of which is a condition of the CAA's decision, as set out above. At the conclusion of any trial the Option 5 SIDs will either be removed from the UK AIP, or remain in place pending a decision from CAA on the process to be followed by BAL to make Option 5 permanent part of the airspace structure in response to the concerns raised by the residents of Barston.

16. In respect of the SIDs that have been approved by the CAA in this decision, the CAA's Post Implementation Review (PIR) will commence at least one year after implementation of the changes approved. It is a condition of the CAA's approval that the sponsor provides data required by the CAA throughout the year following implementation to carry out that PIR. In due course, the sponsor will be advised of the specific data sets and analysis required, and the dates by when this information must be provided. The PIR is the seventh stage of the CAA's airspace change proposal process (set out in CAP 725, the Guidance on the Application of the Airspace Change Process[2]) and will consider whether *"the anticipated impacts and benefits, set out in the Airspace Change Proposal, have actually been delivered"*. The policy states that if those impacts and benefits have not been delivered then the review should *"ascertain why and … determine the most appropriate course of action"*.[3] (See Annexe B paragraph 22 for more information.)

Northbound SIDs from Runway 15

17. The consultation carried out as part of this airspace change process and the subsequent airspace change proposal submitted to the CAA included proposals relating to the two northbound SIDs that depart runway 15.

2 www.caa.co.uk/CAP725

3 There are therefore a wide range of possibilities for the conclusions of a PIR; they include a rejection of the proposal, the imposition of further requirements on the proposal, and the making of wider recommendations, albeit that the success of the proposal is not dependent upon them.

18. BAL has suspended its request for approval of the two northbound SIDs. BAL has advised that these will be re-designed and those new designs submitted to the CAA in a supplement to the airspace change proposal that is the subject of this decision. Accordingly, the CAA will in due course make a decision in respect of that part of BAL's proposal that has been suspended. The CAA will decide once the supplement has been received whether or not we will require BAL to carry out a further consultation on those designs.

19. The northbound SIDs therefore do not form part of this decision.

20. The northbound SIDs have been published as a temporary airspace change in the AIP since 6th February 2014 This was done for the same reason as the southbound SIDs were published as temporary airspace changes. These temporary airspace changes will also remain published in the UK AIP for the time being pending the matters set out in paragraph 18 above taking place. The CAA will keep the decision to continue to publish the existing temporary northbound SIDs under review, whilst monitoring BAL progress with regard to revised northbound SIDs being submitted to the CAA.

Conventional (non-RNAV) SIDs from Runway 15

21. BAL's proposal is to re-design an existing conventional SID to enable non RNAV equipped aircraft to depart BHX to the south. The airspace change proposal submission that is the subject of this decision contained a request to approve a re-designed conventional SID (DTY 4E SID) which was amended to as closely follow the originally preferred Option 5 DTY 1L (RNAV) SID. BAL has withdrawn that part of this proposal and is not seeking approval of the revised conventional SID at this time.

22. BAL has advised the CAA that it will do further re-design work and submit a proposal for approval in due course. In the meantime the existing conventional SID remains published in the AIP and will not be removed.

23. BAL has advised the CAA that currently 2.3% of aircraft departing from runway 15 to the south/south-east are unable to fly a RNAV-1 SID. BAL is currently redesigning the conventional DTY 4E SID to follow the track of the DTY 2Y (RNAV) SID (i.e. Option 6 as referred to in this decision).

Chapter 1

CAA decision – full reasons

The CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations

24. It is necessary to understand the CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations in order to understand the decisions the CAA has taken.

25. This information is set out in Annex B.

The overriding aims and objectives of the revised SIDs from runway 15 at Birmingham International Airport and the CAA's decision with regard to those aims and objectives

26. On 6th February 2014, the main runway at BHX was extended to the south-east by 391 meters. This not only altered the Threshold for aircraft landing on runway 33 but also the Departure End of Runway (DER) for runway 15. The CAA had already approved revised arrival procedures for aircraft landing on runway 33 as a separate ACP.

27. On 14 August 2013, BAL submitted an ACP entitled "Birmingham Airport Airspace Change: Introduction of new Standard Instrument Departure Procedures from Runway 15" to the CAA, that would result in revised RNAV-1 SIDs from runway 15 taking account of the displaced DER.

28. The justification presented by BAL for the new RNAV-1 SIDs was that all SIDs are required to commence from the DER; as the DER had changed as a result of the runway extension, then the SIDs must also change. BAL also contended that the proposal accorded with the aspirations of the CAA's Future Airspace Strategy (FAS) and the UK's international obligations in moving to Performance-based Navigation (PBN)[4]

[4] Performance-based Navigation (of which RNAV-1 is a type) is satellite aviation guidance; in comparison to ground-based navigation aids (such as those used by conventional SIDs) PBN technology will allow aircraft to fly much more accurate and flexible tracks.

environment.[5] BAL said its objective was to introduce safe procedures that complied with internationally agreed design criteria that minimised so far as possible the impact of the extended runway on local communities.

29. In this part of the record of the CAA's decision, the CAA formally records that the aims and objectives of the 2Y (Option 6) SIDs are objectives which it endorses and, subject to the terms of the regulatory and policy framework set out in Annex B, the CAA will seek to approve changes to the UK airspace structure that meet the aims and objectives of this proposal.

Chronology

30. Initial discussions with the CAA regarding the extension of runway 15/33 at BHX took place in summer 2008 when the CAA was advised that the procedures for both arriving and departing traffic would need to be amended to reflect the proposed extended runway at Birmingham.[6]

31. On 2nd November 2009, BAL was granted planning approval for the extension to runway 15/33 and on 12th July 2012 the CAA received a Framework Briefing from BAL on its proposals for new arrival and departure procedures for the extended runway which was due to become operational in spring 2014. (See Annex B paragraph 22 for a more

5 The Future Airspace Strategy (FAS) is an initiative started by the CAA to create a joined-up UK airspace and air traffic management (ATM) modernisation programme across the many different stakeholder groups involved. The goal of FAS is to modernise the UK airspace and ATM infrastructure through significant technological improvements by 2030, to make a more efficient use of airspace (thereby providing airspace capacity benefits), as well as environmental (noise and emissions) and safety benefits. In particular, the introduction of satellite guidance, also known as performance-based navigation of which RNAV-1 is a type, instead of ground-based navigation aids (such as those used by conventional SIDs) will allow aircraft to fly more accurate flight paths, not constrained by the location of ground-based conventional navigational aids. Satellite guidance will also allow the UK's complicated and busy airspace to be redesigned, increasing capacity and efficiency while maintaining or enhancing safety performance. A route structure optimised for satellite guidance with aircraft flying a pre-programmed trajectory will also reduce the need for tactical intervention by air traffic controllers to instruct pilots to change direction, bringing down the cost of air traffic control, and optimise the climb and departure profiles of aircraft.

6 In July 2013, the CAA approved revised arrival procedures for runway 33 that had been proposed under a different ACP; these were implemented and became effective on 6th February 2014.

detailed explanation of the CAA's seven stage airspace change process and Stage 1 – the Framework Briefing.)

32. The consultation for the revised SIDs from runway 15 began on 11th January 2013 with the 1L (Option 5) being the sponsor's preferred option for southbound departures. During that consultation, BAL commissioned further design work and developed an additional option – the 2Y (Option 6) SIDs.

33. Option 6 was put forward, and included in the consultation, on 12th April 2013 providing an opportunity for stakeholders to comment on both Option 5 and Option 6. BAL extended its consultation period by 5 weeks to allow stakeholders to consider both options. The consultation closed on 17th May 2013.

34. On the 14th August 2013 BAL submitted a proposal for the CAA to approve the implementation of the Option 5 SIDs.

35. During its initial environmental assessment[7] of BAL's proposal, the CAA's Environmental Research & Consultancy Department (ERCD) concluded that the noise impacts upon the community of Balsall Common/Balsall Road East from Option 6 were likely to be less than the noise impacts from Option 5, and that the noise impact upon the community of Barston was likely to be indiscernible between Options 5 and 6. The CAA could not, therefore, accept BAL's rationale for preferring Option 5 over Option 6 (namely that in all operational respects it was the same as Option 6 but that it would have a more beneficial noise impact upon Barston) and for proposing Option 5 in its airspace change proposal; it was agreed with BAL on 21 October 2013 that the CAA's decision-making phase of the Airspace Change Process should be stopped to allow additional analysis to be undertaken by BAL.

[7] See below the explanation of the environmental assessment carried out by the CAA of airspace change proposals put to it.

36. BAL, having included Option 6 as a possible option and following the additional consultation undertaken, requested an operational trial of both options 5 and 6 in order assess the benefit/impacts of each.

37. In discussions with BAL, it was agreed with the CAA that Options 5 and 6 would be trialled for 3 months each alternating on a monthly basis. The aim of the trial was to obtain actual noise and track data using radar plus noise monitors in selected locations that represented the principal communities affected by both Options. The data would be used to better understand the impacts on those communities and to determine if the trial results would be consistent with the impacts predicted through noise-modelling.

38. **Option 5** was effectively a 'straight ahead' route with the SID nominal track passing directly over the community of Balsall Common (specifically the area known as Balsall Street East) before splitting into the four en-route points of DTY, WCO,CPT and COWLY.

39. **Option 6** involved a small right turn at the earliest possible first point where a turn could be made using RNAV-1 design criteria and was, therefore, the design that was closest to following the nominal track of the previous conventional SID albeit that it was not possible to design a RNAV Replication to replicate the Hampton Turn.[8] The nominal track of Option 6 passes directly over the community of Barston which is about 1 mile closer to the runway than Balsall Common/Balsall Street East. As a consequence, aircraft were slightly lower as they flew over Barston under Option 6 than over Balsall Street East under Option 5. Option 6 then passes to the west of both Balsall Common and Balsall Street East before splitting to the four en-route points detailed above.

[8] Prior to the runway extension, the existing conventional SIDs from runway 15 had a small right then left turn to take aircraft further away from village of Hampton-in–Arden, known as the "Hampton Turn". RNAV-1 procedures have a different design criteria compared to Conventional SIDs. As a consequence, the Hampton Turn could not be replicated using RNAV-1 design criteria with the earliest possible turn for a RNAV-1 SID being at 2.2 nm from the DER. BAL's view, which the CAA accepts, is that it is not possible to design a SID from runway 15 using R-NAV design criteria to replicate the Hampton Turn that does not flyover the village of Hampton-in–Arden.

40. The plan was for each Option to be trialled for three 4-week AIRAC Cycles with Option 5 being used in May, July and September 2014 and Option 6 in June, August and October 2014. In agreement with the CAA, the trials began with Option 5 1st May 2014 alternating to Option 6 on 29th May 2014.

41. Early in June 2014, soon after the Option 6 trial had begun, it was noticed that the aircraft were not making the first right turn where it was envisaged and on closer examination it was established that the first turn had been incorrectly coded in the Flight Management Systems used by the airline operators that flew from BHX. That error meant that aircraft flew to the east of Barston and closer to Balsall Street East, although not as close as experienced with Option 5.

42. The CAA agreed that the trial of the erroneous Option 6 (referred to later as Option 6X) should continue alternating with Option 5 until Option 6 could be correctly coded and trialled. The delay resulted in Option 5 being flown during the summer months whilst the corrected Option 6 would now be flown in the winter months.[9]

43. The trial of Option 6 began on 13th November 2014; however, it was observed that some operators did not have the procedure coded into their systems and, therefore, could only fly Option 5 even if instructed by Birmingham Airport Control Tower to fly Option 6. It transpired that some flight plan data providers or Coding Houses had taken their own unilateral decision not to upload the trial procedure as they did not consider it justified for a period of 3 months. This accounted for approximately 30% of departures that would use the southbound SIDs from runway 15 at BHX.

44. The Coding Houses involved updated their systems for the next AIRAC date of 11th December 2014 and from that date all southbound departures that were instructed to fly Option 6 flew the correct procedure.

[9] The AIRAC cycle process requires new procedures requiring RNAV coding to be submitted with 12 weeks' notice; consequently, the earliest that the correct Option 6 could be trialled was 13th November 2014.

45. During the trial period which ended up being just over 9 months as opposed to the planned 6 months noise and radar data was recorded for aircraft departing on Option 5, 6X and 6. BAL and CAA were collating feedback from local communities affected by the departing aircraft over their respective communities.

46. After analysing all the data collected during these trials BAL decided to amend its proposal and submitted a supplemental to the original ACP to the CAA on the 27th May 2015. The amended proposal sought the CAA's approval to implement the Option 6 Southbound SIDs rather than Option 5.

47. The CAA gave consideration to whether BAL should be permitted to amend its existing ACP or whether this amendment required there to be a new ACP and associated consultation as stage 4 of that ACP process (see Annex B for more detail on the CAA's ACP process). Moreover the operational trials had enabled effected communities to experience the actual impact of each option.

48. The CAA concluded that this was not necessary. In our view, sufficient information on the likely impact of Option 6 on those potentially affected had been included in the original consultation, and the circumstances and explanation for adding Option 6 to the consultation, meant that such that those being consulted were able to participate effectively in the consultation. In our view the fact that this Option was not BAL's preferred option at the time of the consultation did not affect stakeholder's ability to participate effectively in the consultation.

49. After receipt of the supplemental ACP therefore, the CAA recommenced its assessment and decision making phase (Stage 5) of the airspace change process.

Documents considered by the CAA

50. In assessing the proposal and making this decision the CAA has taken account of:

- The final version of the Airspace Change Proposal received 14 August 2013 (at which time BAL was proposing Option 5),
- The submitted Instrument Flight Procedure designs,
- The consultation material,
- The consultation feedback,
- The consultation feedback report,
- The Addendum to the Airspace Change Proposal received on 27 May 2015 (in which BAL proposes and seeks approval for Option 6),
- Correspondence from local communities to the CAA on the options for the SIDs contained in BAL's consultation.

Analysis of the material provided

51. As a record of our analysis of this material the CAA has produced:

- An **Operational Assessment** which is designed to brief the decision maker whether the proposal is fit for purpose. This assessment contains:
- The CAA's assessment of the airspace change proposal justification and options considered.
- The CAA's assessment of the proposed airspace design and its associated operational arrangements. An assessment of the design proposal is produced to illustrate whether it meets CAA regulatory requirements regarding international and national airspace and procedure design requirements and whether any mitigations were required to overcome design issues.
- The CAA's assessment of whether adequate resource exists to deliver the change and whether adequate communications, navigation and surveillance infrastructure exists to enable the change to take place.
- The CAA's assessment of whether maps and diagrams explain clearly the nature of the proposal.

- The CAA's assessment of the operational impacts to all airspace users, airfields and on traffic levels and whether potential impacts have been mitigated appropriately.
- The CAA's conclusions are arrived at after a CAA Case Study. An Operational Assessment is completed for all airspace change proposals and forms a key part in the CAA's decision-making process as to whether a proposal is approved or rejected. The Operational Assessment will also include any recommendations for implementation such as conditions that should be attached to an approval, if given.
- An **Environmental Assessment** which reviews the Environmental Assessment provided by the sponsor requesting the change. The review assesses whether the sponsor has provided the data and information that had been agreed at the Framework Briefing or in subsequent correspondence, and must be provided as part of the proposal. The requirements are based on the guidance in CAP 725 (see Annex B). Those requirements have been designed to facilitate the assessments that the CAA must make when considering the environmental impact of the change. The CAA reviews the assessments made by the sponsor as part of the proposal to determine if they have been undertaken properly and the conclusions are reasonable. The CAA will check a sample of the sponsor's results and may, in some cases, undertake its own analysis. The CAA then prepares a report summarising the environmental impacts of the proposal outlining the anticipated impacts of the change if it were to be implemented, for consideration along with all the other material by the CAA decision maker.
- A **Consultation Assessment** designed to brief the CAA decision maker on whether the proposal has been adequately consulted upon in accordance with the CAA's regulatory requirements, the Government's guidance principles for consultation and the Secretary of State for Transport's Air Navigation Guidance. The assessment will confirm whether the change sponsor has correctly identified the issues arising from the consultation and has responded to those

issues appropriately. The assessment will rely, in part, on a comparison of the sponsor's consultation feedback report against the actual responses provided by consultees.

Conclusions on sponsor's consultation

52. The proposals of the runway 15 RNAV-1 SIDs at BHX have been the subject of discussion with BAL since the initial planning application for the runway extension in 2008. The formal stages of this airspace change proposal commenced with a Framework Briefing between the CAA and BAL on 19th July 2012. Consultation on the proposed change and options began on 11th January 2013.

53. At the Framework Briefing the CAA and BAL agreed that the Airport's Consultative Committee would be a suitable vehicle for progressing the consultation. There remained, however, an onus on the sponsor to identify any communities impacted by the proposal but not represented by the Consultative Community and ensure that those communities were adequately consulted. In addition, the CAA placed a requirement on BAL to publicise the consultation via a news release.

54. In addition, the consultation document was published on BAL's website as was the consultation feedback report in due course.

55. The CAA conducted an assessment of the consultation based on the criteria set out at the Framework Briefing. In summary, we concluded that the Consultation Report and associated material were adequate, well presented and met our requirements. Option 6 was generated by the sponsor as a direct result of feedback received during the original consultation phase and resulted in an additional period of consultation. The CAA concluded that the sponsor had properly taken the results of the consultation into account.

56. The CAA reached this conclusion by undertaking an analysis of the sponsor's consultation feedback and conclusions in comparison with the original consultation responses from stakeholders.

57. The individual responses to the consultation were forwarded to the CAA by the sponsor in unprocessed form and all items have been individually read. These individual responses comprise feedback from 14 (identified) aviation stakeholders, 30 (identified) non-aviation stakeholders and 1111 members of the public.

58. The main areas of objection surrounded the issues of flight-path concentration, the perceived lack of design options. Additionally there was greater objection from those communities more adversely affected by their varying Options: Balsall Common and Balsall Street East objected to Option 5 whilst Barston, in particular to Option 6.

59. The CAA also received direct feedback from individuals who considered that the use of the Airspace Stakeholder Forum as a vehicle for consultation was not appropriate in these circumstances. The CAA considered, however, that membership of the Consultative Committee was a fair representation of the communities that could potentially be impacted by the proposals and that the use of the committee was appropriate in the circumstances.

60. However, the CAA has taken into account the fact that the consultation was brought to the attention of appropriate representative organisations and has concluded that our requirements for publicity of the fact the consultation was ongoing via those organisations was proportionate and appropriate given the extent of the anticipated impact of the proposed change (which is discussed in more detail below). The CAA has also taken into account that the consultation was published on BAL's website.

61. The CAA has decided that the consultation provided sufficient and clear information on the expected impacts of the proposed change that would enable someone reading the consultation to understand the impact of the changes on them.

62. The CAA has concluded that the consultation was in accordance with the requirements of CAA policy and guidance contained in CAPs 724 and 725.[10]

63. In summary the CAA has decided that the consultation was adequate. The CAA sets out its requirements in respect of a consultation carried out prior to the submission of an airspace change proposal in CAPs 724 and 725. The CAA takes into account the Cabinet Office Consultation Principles (2013 update) when assessing the adequacy of an airspace change proposal consultation.[11] The CAA provides information on the necessary characteristics of the consultation at the Framework Briefing carried out at Stage 1 of the airspace change proposal process as set out in CAP 725.

64. Once the CAA has received the airspace change proposal, and in addition to the guidance and requirements the CAA had communicated to the airspace sponsor earlier in the airspace change proposal process, when assessing the adequacy of the consultation as part of the decision making process, the CAA takes into account a number of factors.

- We note that the airspace change process in CAPs 724 and 725 ensures that consultation takes place at a formative stage, before the airspace change has been put forward to the CAA as decision maker. It is our view that the consultation takes place at a stage that is early enough to ensure that any feedback received can be taken into account by the airspace change sponsor and help to finalise the airspace change proposal presented to the CAA.
- We recognise that the sponsor will have considered many different technical possibilities to achieve the objective, taking into account the technical constraints of the airspace the airspace designer is working within.
- Nonetheless the CAA will assess whether the consultation adequately explained the options open to the sponsor (including the

10 CAP 724 https://www.caa.co.uk/CAP724 and CAP 725 https://www.caa.co.uk/CAP725.

11 https://www.gov.uk/government/publications/consultation-principles-guidance.

'do nothing' option) and why the airspace change sponsor is minded at that stage to pursue the option which it has.

- In the case of the RNAV-1 SIDs from runway 15 at BHX there was not a 'donothing' option as the runway, for all intents and purposes had been moved south-east by 391 meters and new SIDs **had** to be designed.
- We assess whether in our view the consultation adequately explained the anticipated impact of the change proposed in order that anyone participating in the consultation could properly be expected to understand the anticipated impact of the proposed change on them.
- Finally we assess whether the airspace change sponsor has demonstrated that it has taken into account the feedback it received during the consultation.

65. The CAA's full assessment of the consultation is contained in the CAA's Consultation Assessment referred to above and published on the CAA's website.[12] In summary the CAA has concluded that the quality of BAL's consultation and response to consultation feedback was sufficient for the CAA to proceed to consider whether to approve the change requested.

Considerations under Section 70 of the Transport Act 2000

Statutory duties

66. It is one of the CAA's air navigation functions given to it by the Secretary of State to approve changes to the structure of UK airspace. The CAA's statutory duties and functions are contained in Section 70 of the Transport Act 2000 (the Transport Act), the CAA (Air Navigation) Directions 2001, as varied in 2004 (the 2001 Directions), and the 2014 Guidance to the CAA

[12] www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Decisions/Birmingham-Airport-Runway-15-departure-routes/

on Environmental Objectives relating to the exercise of its air navigation functions (the 2014 Guidance).[13]

67. These functions, the law and policy framework in which they are carried out are set out in more detail in Annexe B. In summary, the CAA's primary duty under Section 70(1) of the Transport Act requires that the CAA exercises its air navigation functions so as to maintain a high standard of safety in the provision of air traffic services. This duty takes priority over the material considerations set out in Section 70(2).

68. Where an airspace change proposal satisfies all of the material considerations identified in Section 70(2) and where there is no conflict between those material considerations, the CAA will, subject to exceptional circumstances, approve the airspace change proposal.

69. Where an airspace change proposal satisfies some of the material considerations in Section 70(2) but not others, this is referred to as a conflict within the meaning of Section 70(3).

70. In the event of a conflict, the CAA will apply the material considerations in the manner it thinks is reasonable having regard to them as a whole. The CAA will give greater weight to material considerations that require it to "secure" something than to those that require it to "satisfy" or "facilitate".

71. The CAA regards the term to "take account of" as meaning that the material considerations in question may or may not be applicable in a particular case and the weight the CAA will place on such material considerations will depend heavily on the circumstances of the individual case. The analysis of the application of the CAA's statutory duties in this airspace change proposal is set out below.

Conclusions in respect of safety

72. The CAA's primary duty is to maintain a high standard of safety in the provision of air traffic services and this takes priority over all other

[13] Revised in 2014 by the Department for Transport https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf

duties.[14] In this respect, with due regard to safety in the provision of air traffic services, the CAA is satisfied that the proposals maintain a high standard of safety for the following reasons:

73. CAA's Safety and Airspace Regulation Group's Instrument Flight Procedure (SARG IFP) regulators' analysis reached the view that all designs, in the final form proposed, were compliant with extant regulations.

74. The CAA has therefore concluded that the 2Y (Option 6) RNAV-1 SIDs have been designed in accordance with the International Civil Aviation Organisation (ICAO) procedure design criteria, have been subjected to appropriate flyability checks, and that the new RNAV-1 procedures have been assessed for compliance with the design criteria and subsequently approved for operational use by the SARG IFP regulator.

75. The introduction of RNAV-1 procedures at Birmingham International Airport will enable BAL to conform to European legal requirements and proposed CAA mandates (set out in detail in Annex C). As set out above, BAL's objective was to meet these requirements with the minimum impact to local communities; hence BAL endeavoured to design Options that replicated as close as was possible the nominal tracks of the Conventional SIDs that existed before the extension of the runway by 391 meters.

76. Accordingly, the CAA is satisfied that a high standard of safety can be maintained as a result of this proposal.

77. The CAA has concluded that the 2Y (Option 6) SIDs from runway 15 at Birmingham International Airport have all been designed to the appropriate ICAO criteria, are flyable and are safe to be implemented. More detail on the CAA's reasons for reaching this conclusion are set out in the CAA's Operational Assessment referred to above which is published on the CAA's website.

[14] Transport Act 2000, Section 70(1).

Conclusions in respect of securing the most efficient use of airspace

78. The CAA is required to secure the most efficient use of the airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.[15]

79. The CAA considers that the most efficient use of airspace means the use of airspace that secures the greatest number of movements of aircraft through a specific volume of airspace over a period of time so that the best use is made of the limited resource of UK airspace. It is therefore concerned with the operation of the airspace system as a whole.

80. The CAA considers the expeditious flow of air traffic to involve each aircraft taking the shortest amount of time for its flight. It is concerned with individual flights.

81. It is the CAA's view that the introduction of RNAV-1 procedures and technology is necessary in order to ensure the most efficient use of UK airspace. This is reflected in more detail in the CAA's Future Airspace Strategy.[16] The CAA's Future Airspace Strategy reflects the UK's relevant international obligations in this area. These are set out in detail in Annex C.

82. The CAA acknowledges that the overriding objective behind the runway 15 RNAV-1 SIDs at BHX is to provide connectivity from the airport to the UK en-route network using RNAV-1 technology in line with FAS and the European requirements detailed within this document. The CAA also acknowledges that this proposal, when implemented, will in the short term neither better nor worsen the efficiency of the airspace around BHX. However the CAA recognises that in the medium to longer term having RNAV-1 SIDs in place will facilitate future improvements to the efficiency of the use of airspace in the UK.

15 Transport Act 2000, Section 70(2)(a).

16 http://www.caa.co.uk/Commercial-industry/Airspace/Future-airspace-strategy/Future-airspace-strategy/.

83. In this respect, the CAA is content that the permanent implementation of the 2Y (Option 6) RNAV-1 SIDs proposal from runway 15 at BHX will neither improve nor worsen the efficiency of integrating traffic through the controlled airspace to the south of Birmingham.

Conclusions in respect of taking into account the Secretary of State's guidance to the CAA on environmental objectives

84. As set out in more detail on Annexe B, the CAA has a duty to consider a number of material considerations when deciding whether or not to approve a change to the structure of UK airspace including the anticipated impact of the change proposed on the environment. We do so for two reasons:

85. Firstly, we needed to form an opinion on whether the change will have the significant environmental impacts identified in paragraph 9 of the 2001 Directions from the Secretary of State to the CAA in order to decide whether the Secretary of State's consent would be needed to promulgate the change should the CAA agree to the airspace change proposal, or whether the decision was solely a matter for the CAA.

86. In our opinion the proposed change is not anticipated to have the significant environmental impacts identified in paragraph 9 of the 2001 Directions. This is because the overall exposure of any individual or community to noise on the ground is not anticipated to increase to a level that exceeds 57dB $LA_{eq16\ hour}$, where the increase in the level of exposure to noise in itself exceeds 3dB as a result of the proposed change. (The relevant CAA policy on this test is set out in Annex B). As set out in the CAA's ERCD's Environmental Assessment this is because it is anticipated that the proposed changes to departure routes will have no impact upon the airport's L_{EQ} noise contours.[17]

87. Secondly, we need to assess the anticipated environmental impact of the proposed change that we have been asked to decide on, in order to take it

[17] Noise contours are used to represent on a map the location of places affected by different average noise levels.

into account together with the other material considerations, such as making the most efficient use of airspace, the requirements of operators and owners or the interests of others in relation to the use of airspace and so on.

88. With regard to this second reason for an environmental assessment, the CAA sets out its analysis of the environmental impact of the proposed change below (and in more detail in the Environmental Assessment Report). The CAA has reached the following conclusions with respect to the anticipated environmental impact of the proposal:

89. The CAA does not anticipate any reduction in CO_2 emissions (fuel burn) resulting solely from the changes proposed because this proposal largely reflects where possible as close a replication to the tracks flown previously below 4000ft amsl, with no significant changes to track mileage or vertical profile. Since this proposal requires no changes to ground infrastructure, we anticipate that there will be no effects on land-take and biodiversity specifically as a result of the introduction of RNAV-1 SIDs from runway 15 at BHX.

90. Since the proposed change does not alter operations below 1000ft amsl the CAA anticipates there will be no effect on local air quality and nor do we anticipate there will be any effects on Areas of Outstanding Natural Beauty or National Parks.

91. The CAA's ERCD has assessed the anticipated impact of aircraft noise that results from the changes proposed and in so doing had regard to the altitude-based priorities as given to the CAA by the Secretary of State in the 2014 Air Navigation Guidance to CAA on Environmental Objectives (set out in Annex B to this decision) and also the guidance in respect of the environmental impact of new technology of the type that is the subject of this proposal as follows:

"*With PBN, the overall level of aircraft track-keeping is greatly improved for both approach and departure tracks, meaning aircraft will be more concentrated around the published route. This will mean noise impacts*

are concentrated on a smaller area, thereby exposing fewer people to noise than occurs with equivalent conventional procedures.

…Concentration as a result of PBN is likely to minimise the number of people overflown, but is also likely to increase the noise impact for those directly beneath the track as they will be overflown with greater frequency than if the aircraft were more dispersed.

…The move to PBN will require the updating of existing route structures such as Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Initial Approach Procedures (IAPs). Updating individual routes in terminal areas can fall into one of two categories: "replication" where the existing route alignment is preserved as much as possible whilst catering for the greater navigational accuracy of PBN, or "redesign" where seeking to optimise the introduction of PBN will require consideration of a different alignment."

92. The proposal submitted by BAL is effectively a hybrid of replication and re-design being as it is a new design but that design has, as far as technically possible within the specified design criteria, attempted to achieve aircraft tracks that follow the nominal tracks of the conventional SIDs from the previous position of the DER on the previous, shorter, runway.

93. The CAA acknowledges and concludes that there is likely to be a change in noise dispersion from Options 6, and that will adversely impact some local communities. Similarly the CAA concluded that there would be a change in noise dispersion from Option 5, which was not ultimately put forward by BAL for approval by the CAA. Our analysis in this decision compares the 2 options as a means to explain why from a position of assessing the anticipated environmental impact of the change the CAA anticipates the overall environmental impact of Option 6 (the SIDs proposed by BAL) to be less than the impact of Option 5 (the SIDs ultimately not proposed by BAL).

94. Experience of implementation of RNAV-1 departures at other airports leads us to conclude that departing aircraft from Birmingham International will more accurately fly the nominal track of the RNAV-1 route and will, consequently, produce a concentration of tracks over the ground than aircraft flying the existing conventional departures. The trials of the two options carried out by BAL between May 2014 and February 2015 verified this and we have taken this into account in our assessment of the environmental impact of the SIDs proposed.

95. Prior to the runway extension, the existing conventional SIDs from runway 15 had a small right then left turn specifically to take aircraft away from village of Hampton-in–Arden, known as the Hampton Turn. RNAV-1 procedures have a different design criteria compared to Conventional SIDs. As a consequence, the Hampton Turn could not be replicated using RNAV-1 design criteria (that is the Hampton turn was not technically possible) with the earliest possible turn for a RNAV-1 SID being at 2.2 nm from the DER.

96. BAL's view, which the CAA accepts, is that it is not possible to design a SID from runway 15 using R-NAV design criteria that replicates the Hampton Turn. We have therefore taken into account the environmental impact in noise terms of implementing any R-NAV 1 SID from Runway 15 albeit noting that environmental impact would be the same whether BAL requested and CAA approved the Option 5 SIDs rather than the Option 6 SIDs which are the subject of this request and decision.

97. When assessing BAL's proposal that the CAA approve Option 6 the CAA's ERCD analysed the actual noise and track data obtained from the trials and compared this to ERCD's original assessment in 2013 which was based on noise modelling not actual data. This analysis concluded that the evidence confirmed the results of the noise modelling that the impact on the community of Barston was the same (or indiscernibly different) whether Option 5 or 6 was pursued, but the impact on the communities of Balsall Common and Balsall Street East was measurably less if Option 6 rather than 5 was pursued.

98. As part of this analysis however the CAA considered the possible utilisation of the Option 5 SIDs as additional SIDs either for some aircraft types, and/or specific routes, in order to determine if there was a scenario for using Option 5 which would alleviate the impact of the new routes on the community of Barston. Specifically the CAA considered:

- Utilising Option 6 for all southbound departures from runway 15 (the sponsor's preferred and submitted option);
- Utilising Option 5 for all departures via DTY (and Option 6 for departures via WCO, CPT & COWLY);
- Utilising Option 5 for all 'heavy' and 'jumbo' category aircraft types eg. B777/A380 types (or similar) regardless of routeing;
- Utilising Option 5 for all turbo-propeller aircraft regardless of routeing.

99. However, having considered carefully the actual noise and track data obtained from the trials, the comments from the consultation and the many letters received post-consultation, the CAA has concluded that there would be no discernible noise benefit to the community of Barston from any aircraft flying any of the above options. Furthermore, there would be a discernible noise benefit to the communities of Balsall Common and Balsall Street East of utilising 2Y (Option 6) SIDs instead of Option 5 for all southbound departures from runway 15.

100. Whilst recognising the concerns of the residents of Barston, the results of both the trial and the noise modelling indicate that none of the four variations detailed in above would result in a genuine noise benefit for that community.

101. However, conscious of the concerns of the residents of Barston, and in attempt to reduce the impact of aircraft being overhead the community, the CAA are making it a condition of our approval that BAL trial the use of Option 5 for all southbound Turbo-Prop aircraft from runway 15. These aircraft types were shown to have the lowest noise impact on the communities of Balsall Common and Balsall Street East.

102. The exact objectives of the trial will be agreed with the CAA however we recognise that there will be no discernible noise alleviation associated with this initiative but are keen to understand the qualitative (as opposed to quantitative) aspects of these aircraft using Option 5 SIDs as well as any potential operational impact of 'mixed' options.

103. In summary, the purpose behind this proposal is to design RNAV-1 SIDs from the 'displaced' DER following the extension to runway 15/33 at BHX. Whilst these new SIDs are not RNAV replications of existing conventional SIDs, in line with the Air Navigation Guidance they have been designed to be as close a replication as possible of the procedures in place before the runway was extended, whilst attempting to minimise the number of people affected by noise and especially communities that hitherto had experienced lower levels of aviation noise.The closer proximity of Barston to the DER means that aircraft on departure will be lower over that community than either Balsall Street East or Balsall Common. Based on both the noise data obtained during the trials (including the wrongly coded Option 6X) and the noise modelling results (which are consistent with the noise monitoring data collected during the trial). Option 5 would have a perceptibly greater noise impact upon Balsall Street East and Balsall Common than Option 6 whilst neither Option 5 nor 6 offers a discernible benefit to the community of Barston. This evidence supports the expectation that whilst initially BAL believed Option 5 would offer a benefit to the community closer to the airport (Barston) the results of the trial show that, consistent with noise-modelling results, Option 5 does not offer a noise benefit for that community.

104. In line with Air Navigation Guidance 2014 and using the data obtained from the noise monitors and actual flight tracks from the airport's radar system during the trials as detailed in paragraph 94 above, the CAA has considered a number of potential 'respite' options that had not been considered as potentially viable by the change sponsor which could potentially alleviate the impact on the community of Barston.

105. The CAA assessed the potential of traffic that was routeing to the east via DTY and ATS Route P155 using Option 5 whilst traffic to the south/south-west would use Option 6 and the 'benefit' that it could provide Barston; we also explored the possibility of 'Heavy' aircraft regardless of their routeing/destination using Option 5 and whether this could provide a 'benefit' to Barston. BHX has around 10 'Heavy' departures per day and whilst this is few in number it may reduce the impact on the community of Barston; and finally we explored the possibility of all non-jet aircraft using Option 5 whilst jet aircraft would be required to use Option 6 which would involve the quieter turbo-prop aircraft routeing over Balsall Street East and Balsall Common which again could provide a short gap between traffic routeing over Barston.

106. Based on the noise data obtained from the trials and the results of noise modelling based on track data from the trials, none of these potential options would have any discernible noise benefit to Barston whilst all would impact Balsall Street East and Balsall Common to varying degrees.

Conclusions in respect of environmental impact

107. For the reasons set out in this decision, the CAA acknowledges the anticipated environmental impact of the proposed change and has taken this into account when weighing the factors that the CAA is required by statute to consider when making its decision whether to agree to the change proposed.

Requirements of aircraft operators and owners

108. The CAA is required to satisfy the requirements of operators and owners of all classes of aircraft.[18]

109. In this respect, as the proposal will not change the size and shape of controlled airspace the CAA is content that there will be no impact to Class G airspace users.

[18] Transport Act 2000, Section 70(2)(b).

110. Implementation of the proposed RNAV-1 procedures provides the benefits of performance-based navigation to those operators whose crews and aircraft are approved and certified to fly RNAV-1 procedures at the airport; currently it is estimated that this equates to 95% of all aircraft using BHX.

111. However, until the CAA mandate for RNAV-1 operations becomes effective such that all operators will need to be equipped to fly RNAV-1 procedures (currently November 2017)[19], we have taken into account the fact that non-RNAV-1 operators will be able to fly a re-designed Conventional SID from runway 15 via DTY with flight planning options appropriate to the flight route/destination available so will not be disadvantaged by the approval of these changes in the medium term.

112. As this proposal largely reflects where possible as close a replication to the tracks flown previously below 4000ft amsl, with no significant changes to track mileage or vertical profile, there is no expected material impact upon either fuel burn (or therefore on CO_2 emissions).

113. The CAA also notes that the difficulty in flying the old Hampton Turn with any degree of accuracy has been removed and this helps to reduce flight deck workload at a critical stage of flight (ie immediately after take-off).

Conclusions in respect of the interests of any other person

114. The CAA considers the words “any person (other than an operator or owner of an aircraft)” to include airport operators, air navigation service providers, members of the public on the ground, owners of cargo being transported by air, and anyone else potentially affected by an airspace change proposal.

115. The CAA is required to take account of the interests of any person (other than an owner or operator of an aircraft) in relation to the use of any particular airspace or the use of airspace generally. The CAA examined a number of anticipated impacts, some of which attracted feedback during the consultation process outlined above.

[19] See also Annex E.

116. This decision document deals above with consideration of the anticipated environmental impact on the public on the ground in the paragraphs relating to the environmental impact of the proposed change below.

117. The CAA concluded that the proposed change is likely to have a minimal benefit to air navigation service providers as it is anticipated that air traffic control workload will remain largely unchanged reduce as a consequence of this change.

118. The CAA notes that this proposal benefits the owners and operators of BHX, BAL in allowing the airport to utilise the additional runway length permitted under the planning consent granted in November 2009.

Integrated operation of ATS

119. The CAA is required to facilitate the integrated operation of air traffic services provided by or on behalf of the armed forces of the Crown and other air traffic services.[20]

120. In this respect, there is no impact on other ATS providers.

Interests of national security

121. The CAA is required to take into account the impact any airspace change may have upon matters of national security.[21] There are no impacts for national security.

International obligations

122. The CAA is required to take into account any international obligations entered into by the UK and notified by the Secretary of State.[22] The UK's international obligations that relate to the introduction of RNAV-1 or performance-based navigation are set out in Annex C. With regard to replication procedures, all foreign operators will be able to fly the new procedures providing the crews and aircraft are certified and approved to

[20] Transport Act 2000, Section 70(2)(e).

[21] Transport Act 2000, Section 70(2)(f).

[22] Transport Act 2000, Section 70(2)(g).

fly RNAV-1 procedures in accordance with their own States' national regulations.

Chapter 2

Regulatory decision

123. Birmingham has received planning approval for and has built an extension to runway15/33. The extended runway requires associated airspace procedures to operate it. The CAA has decided that the proposed SIDs (known as Option 6) are safe, which satisfies the CAA's primary statutory duty. It is also the CAA's duty to consider the anticipated impact on each of the other material considerations identified in Section 70(2) of the Transport Act. In accordance with Section 70(3) of the Transport Act, and the CAA published policy, the CAA is required to consider whether the airspace change proposal produces any conflicts between the material considerations identified in Section 70(2).

124. As set out above the CAA acknowledges the adverse environmental noise impact on some local communities resulting from the concentration of aircraft tracks and the change in nominal track of the SIDs that we anticipate will result from the introduction of RNAV-1 technology and procedures. However, taking into account our primary duty to maintain a high level of safety, and our own policy and UK obligations to introduce PBN technology (of which RNAV is one type) and acknowledging and accepting that the overall environmental noise impact is minimised so far as possible by the SID designs proposed, the CAA has decided to approve the change requested.

125. The CAA has decided to approve the permanent implementation of the Option 6 southbound departures from runway 15 at BHX currently known as DTY 2Y, WCO 2Y, CPT 2Y and COWLY 2Y Standard Instrument Departures (see Annexes D-H) – this designation will be reviewed post implementation.

126. However, we have also taken into account all the data obtained from the trials that took place in 2014/15 and have determined that BAL should

conduct a further trial to identify whether it is possible to alleviate the impact of the runway extension on the community of Barston.[23]

127. Therefore, it is a condition of this approval that BAL initiate a trial for the use of Option 5 for all turbo-prop departures to the east, south and south-east with a view to accurately assessing the impact to the communities of Balsall Common & Balsall Street East and impact to the community of Barston. The terms of this condition are set out in Annex A. However, we require that this trial should take place as soon as possible to try and capture data during the summer months when more people are likely to be outside and/or have windows of their properties open.

128. When making this decision we have also taken into account the following two confirmations from BAL:

129. BAL will investigate further possibilities for noise reduction including the potential implementation of a 3.2° glide slope to runway 33 (and runway 15) which could potentially take aircraft closer to the height they were on approach prior to the runway extension over the communities of Balsall Common and Balsall Street East.

130. BAL will review the airport's Noise Abatement Procedures to identify and implement the most appropriate procedure to minimise the noise impact on the community of Barston.

131. We also note that BAL has suspended its request for the CAA's approval for the northbound SIDs (referred to as Option 4) and will resolve to address the problems with those SID designs before re-commencing this part of the proposal (which is otherwise the subject of this decision).

132. With regard to the change the revised airspace will become permanently effective from 26th May 2016 (AIRAC06/16) and the current temporary

[23] Respite is planned and predictable alleviation from aircraft noise. One example of respite is having SIDs taking different routes to the same UK exit point which are used at different times. Respite can be designed into airspace structures more easily once aircraft tracks are predictably concentrated on to safely separated routings, enabling the use of them to be alternated or varied. There is currently no agreed minimum distance between routes such that alternating their use would result in acceptable respite.

procedure published on an AIP Supplement which will be cancelled at midnight 25th May 2016. In addition, an Aeronautical Information Circular (AIC) will be published detailing the changes and any new designation of the SIDs.

133. Due to the condition of our decision relating to a trial to assess whether the use of Option 5 SIDs for Turbo-Prop aircraft could alleviate the impact of the new routes on the community of Barston (as set out above) there is no requirement to remove the Option 5 (1L) SIDs from the UK AIP.

Civil Aviation Authority

4th April 2016

Annex A

Conditions attached to the CAA's decision

The following condition is attached to the CAA's Decision:

1. BAL is to initiate a Trial for the use of Option 5 for all non-jet aircraft departing runway 15 at Birmingham International Airport departing via DTY, WCO, CPT or COWLY.

   Within 28 days of the date of this decision BAL is to have agreed with the CAA the scope, start date and duration of the Trial. The Trial should commence as soon as practicable (and in any event in the next 6 months).

   The aim of the Trial will be to assess the impact on all the communities close to Birmingham International Airport as well as any impacts on the ATC operation re capacity and safety.

   BAL shall engage with communities when designing the trial.

   BAL will agree the objectives of the Trial with the CAA within 28 days taking into account of CAA Policy pertaining airspace trials.

   BAL is to report to the CAA on the outcome of the trial.

The CAA has noted the following confirmations from BAL when making its decision:

2. BAL is to fully investigate the possibility of 3.2° glide slope to runway 33 (and ideally runway 15) which could potentially take aircraft closer to the height they were on approach prior to the runway extension over the communities of Balsall Common and Balsall Street East.

3. BAL is to review its Noise Abatement Procedures to identify and implement the most appropriate procedure to minimise the noise impact on the community of Barston and also other communities impacted by departing aircraft from both runway 15 and runway 33.

4. BAL is to re-design the originally submitted northbound SIDs from runway 15 (Option 4) to resolve the track keeping performance such that traffic tracks closer to the nominal track and away from the north side of Balsall Common (as originally proposed and consulted upon).

Once the designs have been completed the CAA will assess whether the re designs require a new consultation. The CAA will then consider whether to approve that element of this airspace change proposal that relates to the northbound SIDs.

Annex B

The CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations

B1. The Secretary of State has given the CAA functions that relate to the structure and design of airspace in the Air Navigation Directions dated 2001 (amended in2004).[24] In particular these Directions require the CAA to develop and enforce a policy for the sustainable use of UK airspace. By virtue of this function the CAA has developed its Future Airspace Strategy (known as FAS)[25] which is an initiative started by the CAA to create a joined-up UK airspace and air traffic management (ATM) modernisation programme across the many different stakeholder groups involved. The goal of FAS is to modernise the UK airspace and ATM infrastructure through significant technological improvements by 2030, to make a more efficient use of airspace (thereby providing airspace capacity benefits), as well as secure environmental (noise and emissions) and safety benefits.

B2. One means by which the CAA delivers the aims of FAS is via its statutory air navigation function to consider proposals from air navigation service providers and/or airports to change the structure of UK airspace (including the published instrument flight procedures) published in the UK's Aeronautical Information Publication (AIP).

B3. By Section 70 of the Transport Act 2000 (the Transport Act), the CAA is under a general duty in relation to air navigation to exercise its functions so as to maintain a high standard of safety in the provision of air traffic services. That duty is to have priority over the CAA's other duties in this area of work.

[24] The Civil Aviation Authority (Air Navigation) Directions 2001 (incorporating Variation Direction 2004).

[25] http://www.caa.co.uk/Commercial-Industry/Airspace/Future-airspace-strategy/Future-airspace-strategy.

B4. Noting that priority, the CAA's duties in relation to air navigation is to exercise its functions in the manner it thinks best so that:

- It secures the most efficient use of airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.
- It satisfies the requirements of operators and owners of all classes of aircraft.
- It takes account of the interests of any person (other than an operator or owner) in relation to the use of any particular airspace or airspace generally.
- It takes account of any guidance on environmental objectives given to the CAA by the Secretary of State.
- It facilitates the integrated operation of air traffic services provided by or on behalf of the armed forces and other air traffic services.
- It takes account of the interests of national security.
- It takes account of any international obligations of the UK notified to the CAA by the Secretary of State.

B5. Where there is a conflict of these material considerations (other than safety, which must always take priority), the CAA must apply them as it thinks reasonable having regard to them as a whole.

B6. The CAA must exercise its functions in this area so as to impose on providers of air traffic services the minimum restrictions consistent with the exercise of those functions.

B7. The CAA will approve an airspace change proposal that best satisfies all of the material considerations (where safety is not in issue), or all the material considerations that are engaged. Where a change would satisfy some of the material considerations, but would be contrary to the fulfilment of others, then there is a conflict within the meaning of Section 70 of the Transport Act. In reaching a decision in such circumstances, the CAA will apply its expertise to all the relevant information before it and use its judgement to strike a fair balance between the material considerations.

B8. In striking that balance the CAA relies on the wording of Section 70 which indicates the relative importance of any given factor.

B9. In the instance of conflict, the CAA will usually offer suggestions to the sponsor of a proposal as to how the conflict might be mitigated or resolved, including encouraging the sponsor to engage with affected stakeholders in determining how the desired outcome might be achieved.

B10. The CAA considers the most efficient use of airspace to be that use of airspace that secures the greatest number of movements of aircraft through a specific volume of airspace over a period of time so that the best use is made of the limited resource of UK airspace. It is therefore concerned with the operation of the airspace system as a whole.

B11. The CAA considers the expeditious flow of air traffic to involve each aircraft taking the shortest amount of time for its flight. It is concerned with individual flights.

B12. The CAA considers the words “any person (other than an operator or owner of an aircraft)” to include airport operators, air navigation service providers, members of the public on the ground, owners of cargo being transported by air, and anyone else potentially affected by an airspace proposal.

B13. The Secretary of State has given the CAA specific guidance on environmental objectives within the meaning of Section 70 of the Transport Act.[26]

B14. The 2014 Guidance includes the following:

The CAA’s primary objective is to develop a “safe, efficient airspace that has the capacity to meet reasonable demand, balances the needs of all users and mitigates the impact of aviation on the environment”.

…

[26] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf.

In December 2012, the industry-led FAS Industry Implementation Group launched its plan for delivering Phase 1 of the FAS up to c2025. A considerable component of the plan is the need to redesign UK's terminal airspace to make it more efficient by using new procedures such as Performance-Based Navigation (PBN)[27] and better queue management techniques.

B15. The 2014 Guidance states the need to balance environmental factors against other factors:

The purpose of the Guidance is to provide the CAA and the aviation community with additional clarity on the Government's environmental objectives relating to air navigation in the UK. However, when considering airspace changes, there may be other legitimate operational objectives, such as the overriding need to maintain an acceptable level of air safety, the desire for sustainable development, or to enhance the overall efficiency of the UK airspace network, which need to be considered alongside these environmental objectives. We look to the CAA to determine the most appropriate balance between these competing characteristics.

B16. The need to strike a balance specifically in relation to noise is stated as follows:

The Government has made it clear therefore that it wants to strike a fair balance between the negative impacts of noise and the economic benefits derived from the aviation industry.

B17. The 2014 Guidance also states the Government's overall policy to limit the number of people significantly affected by aircraft noise.

B18. The 2014 Guidance states that the CAA should keep in mind the following altitude-based priorities.

[27] Of which RNAV-1 is a type.

- In the airspace from the ground to 4000ft AMSL the Government's environmental priority is to minimise the noise impact of aircraft and the number of people on the ground significantly affected by it;
- where options for route design below 4000ft AMSL are similar in terms of impact on densely populated areas the value of maintaining legacy arrangements should be taken into consideration;
- in the airspace from 4000ft AMSL to 7000ft AMSL, the focus should continue to be minimising the impact of aviation noise on densely populated areas, but the CAA may also balance this requirement by taking into account the need for an efficient and expeditious flow of traffic that minimises emissions;
- in the airspace above 7000ft AMSL, the CAA should promote the most efficient use of airspace with a view to minimising aircraft emissions and mitigating the impact of noise is no longer a priority;
- where practicable, and without a significant detrimental impact on efficient aircraft operations or noise impact on populated areas, airspace routes below 7000ft AMSL should, where possible, be avoided over Areas of Outstanding Natural Beauty and National Parks as per Chapter 8.1 of the 2014 Guidance; and
- all changes below 7000ft AMSL should take into account local circumstances in the development of airspace structures:

  The concept of altitude-based priorities reflects the Government's desire that only significant environmental impacts should be taken into account when considering the overall environmental impact of airspace changes. Any environmental impacts that are not priorities based on the above altitude-based criteria do not need to be assessed since the assumption is that they would not be significant.

B19. Subject to Section 70 of the Transport Act, the CAA is directed by the Secretary of State to perform its air navigation functions in the manner that it thinks best calculated to take into account the following:

- The Secretary of State's guidance on the Government's policies on sustainable development and on reducing, controlling and mitigating

the impacts of civil aviation on the environment and the planning policy guidance it has given to local planning authorities.

- The need to reduce, control and mitigate as far as possible the environmental impacts of civil aircraft operations, and in particular the annoyance and disturbance caused to the general public arising from aircraft noise and vibration, and emissions from aircraft engines.
- At the local, national and international levels, the need for environmental impacts to be considered from the earliest possible stages of planning and designing, and revising, airspace procedures and arrangements.

B20. The CAA is also specifically directed, where changes are proposed to the design or the provision of airspace arrangements, or to the use made of them, to:

- Where the changes might have a significantly detrimental effect on the environment, advise the Secretary of State of the likely impact and of plans to keep it to a minimum.
- Where such changes might have a significant effect on the level or distribution of noise and emissions in the vicinity of an airport, ensure that the manager of the airport, users of it, any local authority and any organisation representing the interests of person in the locality have been consulted.
- Where such changes might have a significant effect on the level or distribution of noise and emissions under the arrival tracks and departure routes followed by aircraft using an airport but not in its immediate vicinity, or under a holding area set aside for aircraft waiting to land at an airport, ensure the manager of the airport and each local authority in the areas likely to be significantly affected by the changes have been consulted.

B21. Further, the CAA is specifically directed where such changes might have one or more of these effects the CAA shall refrain from promulgating a change without first securing the approval of the Secretary of State. The

Secretary of State has given no further direction nor guidance on the interpretation of these directions. Therefore the CAA proceeds on the basis that (a) the overall exposure to noise must increase to a level that exceeds 57dB LA_{eq}16 hour as a result of the changes proposed; and (b) the increase in the level of exposure to noise must in itself exceed 3dB. The 57dB figure is drawn from the Government's own Aviation Policy Framework[28] (paragraphs 3.12 to 3.19 of the APF), in which it is stated that the Secretary of State would continue to treat the 57dB LAeq 16 hour contour as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance. The 3dB figure is one that has been used in the Government's APF in relation noise policy (i.e. as a trigger for acoustic insulation).

B22. Any airspace change that a sponsor asks the CAA to approve follows a seven stage process known as the CAA's airspace change process.[29] A summary of that process is available on the CAA's website[30] and is also shown here.

The seven-stage process of an airspace change

Stage 1 – framework briefing

We meet with the organisation that is considering proposing an airspace change to discuss their plans, the operational, environmental and consultation requirements for proposing a change and set out the how the CAA process will run.

Stage 2 – proposal development

The organisation that is considering proposing the airspace change begins to develop design options and researches who needs to be consulted. They will also conduct an initial environmental assessment of the proposals which will need to be more detailed if, and by the time, the organisation proceeds with its proposal and prepares for consultation. It is recommended that the organisation invites a cross-

[28] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/153776/aviation-policy-framework.pdf.

[29] Published in CAP 724 https://www.caa.co.uk/CAP724 and CAP 725 https://www.caa.co.uk/CAP725

[30] http://www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Airspace-Change/.

section of parties who may be affected by the change to form a Focus Group to help with the development of the design options.

Stage 3 – preparing for consultation

The organisation that is considering proposing the airspace change decides on the most appropriate consultation method needed to reach all consultees. This could include a written consultation, questionnaires or surveys, using representative groups and open/public meetings. We will provide advice to the organisation on the scope and conduct of the consultation but it remains their responsibility to ensure that the appropriate level of consultation is undertaken. Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible. Consultation documents should be clear about the objectives of the proposal, what is being proposed, how the change would affect various stakeholders, the expected advantages and disadvantages of the proposals to all stakeholders, the consultation process and the scope to influence. If a single design option is being consulted upon, the document should state what other options were considered and why these were discarded.

Stage 4 – consultation and formal proposal submission

When the consultation is launched the organisation that is considering proposing the airspace change should make every effort to bring it to the attention of all interested parties. The organisation must ensure that accurate and complete records of all responses are kept. Following the consultation, the organisation collates and analyses all responses to identify the key issues and themes. There may be airspace design modifications in light of the consultation responses which results in the need for further consultation. The organisation is required to publish feedback to consultees. If the organisation decides it will submit a formal airspace change proposal to us to then its feedback document must include information on how the final decision on the option selected was reached. In addition to publishing the feedback report the organisation sends all the consultation responses to the CAA within its formal proposal submission.

Stage 5 – our decision

We undertake a detailed assessment of the proposal and may ask for clarification or supplementary information from the organisation requesting the change. Our assessment covers:

1. the operational need for, objectives and feasibility of the changes proposed;
2. our analysis of the anticipated environmental benefits and impacts if the change were made; and
3. an assessment of the consultation carried out by the organisation proposing the change and of the responses received to that consultation.

Our conclusions in these three areas inform our decision whether to approve or reject the proposal. When making our decision the law requires us to give priority to safety but then to balance the need for the most efficient use of airspace with the needs of operators of aircraft and the environmental effect of aviation (including noise and CO_2 emissions). The means by which we assess and balance the environmental impact within our decision making process is set out in government policy which we implement. We normally aim to make our decision within 16 weeks of having all the information we need.

Stage 6 – implementation

If a change is approved then changes to airspace procedures and structures are timed to start on internationally specified dates which occur every 28 days on so called AIRAC-dates.[31] This ensures that the aviation community, as a whole, is aware of the changes and can prepare. In addition, the organisation that proposed the change should publicise the airspace change to members of the local community and other stakeholder groups who were consulted earlier in the process.

Stage 7 – operational review

Around 12 months after a change is implemented we will start a review of the change to assess whether the anticipated impacts and benefits, set out in the original airspace change proposal and decision, have been delivered and if not to

[31] An internationally agreed system for the regulated co-ordination of aeronautical information updates and publication that occurs every 28-days on specified dates which apply globally.

ascertain why and to determine the most appropriate course of action. Once complete we will publish the review on our website.

Annex C

UK’s international obligations relating to performance-based navigation

C1. In 2010, the International Civil Aviation Organisation (ICAO) Assembly agreed Resolution A37-11 on PBN Global Goals. The Assembly Resolution requires States to complete a PBN implementation plan to achieve:

- the implementation of RNAV-1 and RNP operations (where required) for en-route and terminal areas according to established timelines and intermediate milestones; and
- the implementation of approach procedures with vertical guidance for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016.

C2. The Assembly Resolution is not a mandate and the UK has agreed with the ICAO that whilst making every effort to meet the 2016 date, the implementation of approach procedures at all instrument runway ends may take longer.

C3. The European Commission Implementing Regulation (EU) No 716/2014 on the Establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan sets out six air traffic management functionalities to be deployed in pursuance of the Single European Air Traffic Management Research programme. In the UK, the RNP 1 PBN specification is mandated for terminal airspace and the RNP APCH PBN specification for approaches at Heathrow, Gatwick, Stansted and Manchester Airports from 1 January 2024. This implementation must be co-ordinated and synchronised to ensure that the international performance objectives are met.

C4. The European Commission, through the European Aviation Safety Agency (EASA), is also proposing PBN-related legislation for much earlier

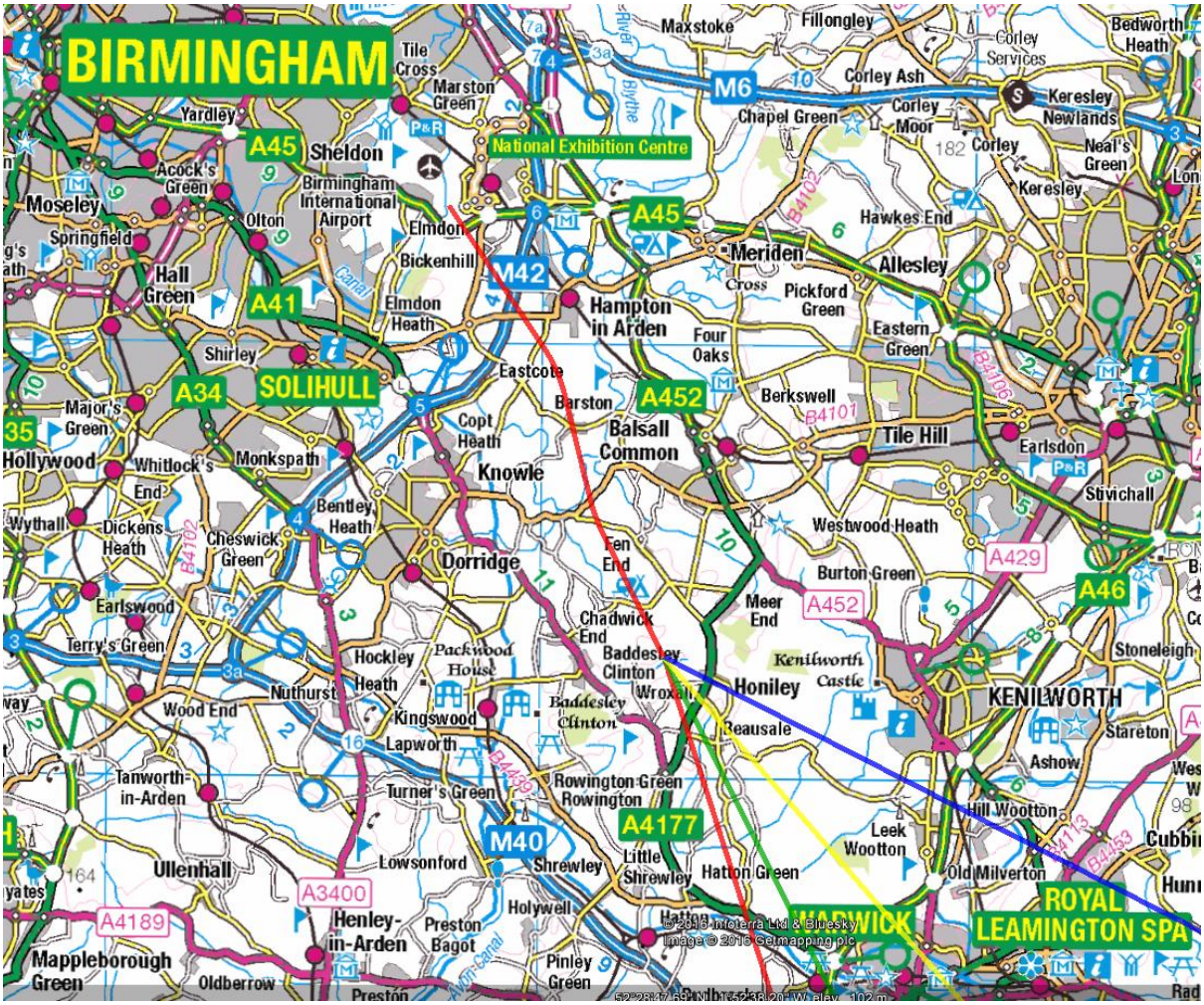
implementation. EASA Notice of Proposed Amendment 2015-01 (consulted on from January to February 2015) proposes implementation of PBN across the European Air Traffic Management Network with application in terminal airspace and en-route airspace from December 2018 and in approach operations by January 2024. The specification of PBN to be applied is RNP 1 in terminal airspace and Advanced RNP in the en-route. Any application is conditional on there being a performance objective. The instrument approach requirement is effectively a mandate for implementing the RNP APCH on all Instrument Flight Rules (IFR) runways. Publication of the Opinion from EASA is anticipated by early 2016.

C5. In order to encourage PBN equipage and use, the CAA published Aeronautical Information Circular (AIC) Y092/2014 in December 2014 requiring mandatory equipage to an RNAV-1 PBN specification by November 2017 for all aircraft operating in to and out of the five major London airports plus Southend, Farnborough and Biggin Hill.

C6. In summary, the UK is under an obligation to ICAO, the European Commission and EASA to transition to PBN-based procedures in all flight phases. Whilst the European mandate is some years away, RNAV-1 is seen as a transitory step to achieve this objective.

Annex D

Diagram showing nominal tracks of the new 2Y SIDs: DTY (Blue), WCO (Yellow), COWLY (Green) and CPT (Red)



Annex E

Diagram showing the nominal track of the new CPT 2Y SID (in red)

Annex F

Diagram showing the nominal track of the new COWLY 2Y SID (in green)

Annex G

Diagram showing the nominal track of the new DTY 2Y SID (in blue)

Annex H

Diagram showing the nominal track of the new WCO 2Y SID (in yellow)

Annex I

Glossary

#	2001 Directions	Civil Aviation Authority (Air Navigation) Directions 2001
	2002 Guidance	The Secretary of State's Guidance to the CAA on Environmental Objectives Relating to the Exercise of its Air Navigation Functions published in 2002
	2014 Guidance	The Secretary of State's Guidance to the CAA on Environmental Objectives Relating to the Exercise of its Air Navigation Functions published in 2014
A	A380	Airbus 380 aircraft
	ACP	Airspace change process
	AIP	Aeronautical Information Publication
	Alt	Altitude above mean sea level
	AMSL	Above mean sea level
	ANO	Air Navigation Order
	ANSP	Air Navigation Service Provider
	AONB	Area of Outstanding Beauty
	APD	Approved Procedure Designer
	ATC	Air Traffic Control
	ATM	Air Traffic Management
	ATS	Air Traffic Service
B	B777	Boeing 777 aircraft
	BHX	IATA code for Birmingham International Airport
C	CAA	Civil Aviation Authority
	COWLY	IC ICAO 5 letter name code (5LNC) waypoint on ATS routes L612 and UL612
	CPT	Compton VOR/DME navigational aid and waypoint
D	dB	Decibel units
	dBA	Decibel units measured on an A-weighted scale
	Dft	Department for Transport

	DER	Departure end of runway
	DTY	Daventry DVOR/DME navigational aid and waypoint
F	FAS	Future airspace strategy
	FMS	Flight management system
I	ICAO	International Civil Aviation Organisation
	IFP	Instrument flight procedure
	ILS	Instrument landing system
J	JAA	Joint Aviation Authorities
L	Leq	Equivalent continuous sound level
N	NADP	Noise abatement departure procedures
	NPR	Noise preferential route
	NMS or nms	Nautical miles
P	PANS OPS	Procedures for air navigation services operations
	PBN	Performance-based navigation
	PIR	Post implementation review
	PRNAV	Precision area navigation
R	RNAV-1	Area Navigation
	RNP	Required navigation performance
S	SEL	Sound exposure level
	SID	Standard instrument departure
W	WCO	Westcott NDB and waypoint on ATS Route Q41 and UQ41