**Birmingham Airport Noise Assessment**

## Introduction

Rupert Thornely-Taylor's note of 25 January 2017 has explained how misapplication of a minimum noise-change criterion 3dB and neglect of the consideration of absolute noise levels has led to a flawed decision in deciding between Options 5 and 6.

This note considers the decision making process used by BAL in selecting the Options to submit to the CAA for formal assessment, specifically, the omission of option 6X[1].

## Summary

The CAA's report SARG/ERCD/AG/Birmingham SIDs ACP identifies deficiencies in BAL's process for consulting on and selecting route Options to submit to the CAA for formal assessment, specifically the exclusion of Option 6X.

The CAA highlights the shortcomings in the decision making process but nevertheless affirms that the noise impact has been adequately presented in the consultation and the submitted proposal.

The CAA describes the inadequacies of the two criteria used by BAL that led to the exclusion of Option 6X from full consideration. Nevertheless the CAA appears to use them to justify that decision.

The CAA identifies that Option 6X would be a 'compromise' route between Options 5 and 6 for the two communities (Barston and Balsall Street East) closest to those SIDs. However, because it adopts the criterion of a minimum noise level change of 3dB and does not consider absolute levels it concurs with BAL that Option 6 should be selected because it would result in a larger noise level reduction for a greater number of households than Option 5 would.

Thus despite having identified deficiencies with the selection methodology used by BAL that led to the exclusion of Option 6X, and identifying its potential as a compromise route, the CAA supports the decision not to properly consider Option 6X.

These points are explained more fully below; page references are to the CAA report SARG/ERCD/AG/Birmingham SIDs ACP, except where indicated otherwise.

## 1 Routes selected for submission to CAA

BAL proposed two Options (5 and 6) to the CAA for assessment. After explaining that Option 5 was proposed by BAL in the initial consultation, the CAA report provides the following background to the BAL submission of Option 6[p6].

> "Option 6 was subsequently developed as a result of consultation feedback and then consulted upon ... . A modified option ("6X") was subsequently developed as a result of further consultation feedback but was discounted because BAL concluded that it would bring in a larger number of properties beneath the centreline than Option 5 or 6."

[1] Based on discussions with residents of Barston and the descriptions in the CAA Report SARG/ERCD/AG/Birmingham SIDs ACP (Airspace Change Proposal Environmental Assessment, Annex E, Version: 1/2012) and CAA Report CAP 1398 an approximate description of Option 6X is that initially it follows the same line as Option 5 as far as Barston but thereafter its route turns to the south-west. In essence it delays the right turn of Option 6 till after passing Barston and so passes to the east of Barston and closer to Balsall Street East than Option 5 does though not as close as Option 6 does. No map showing this route has been seen.

Section 5.2 (p9) of the CAA report explains in more detail BAL's decision methodology thus:

*In relation to consultation on different Options the CAA report states that:*

- Option 6X was not consulted upon and so the impact of that option was not portrayed in the consultation material
- The impacts of Options 5 & 6 were not portrayed in the consultation by the measures that were used to discount Option 6X (see below)

*The report describes the two approaches that formed BAL's decision methodology:*

- The households beneath a 200m wide swathe that it felt represented the centreline of the new SIDs;
- The households beneath a 2km wide swathe that represented the boundary of the proposed new NPR swathe.

*The ranking of Options 5, 6, and 6X by these two tests is summarised in Appendix 2 of the CAA report (p21, footnotes 4 and 5):*

- 200m centreline: Option 5 overflies the least number of households. There is negligible difference between Options 6 and 6X
- 2km NPR swathe: Option 5 is worse than Option 6 or 6X. Option 6 affects the least number of households.

*The CAA also reports* (p9):

"On the first of these criteria, Option 5 had the least households. On the second criteria, Option 6 had the least households. Therefore on neither of these two criteria did Option 6X offer a greater environmental benefit than Options 5 or 6. On that basis BAL discounted Option 6X as an option and did not consult upon it."

*The CAA report also notes that (p9)*:

*"*The methodology for eliminating Option 6X was not used for making this second decision [ie, between Options 5 and 6]".

## 2 CAA's assessment of the above selection process

*The CAA report comments on the methodology thus:*

[p6] "The dismissal of this Option [ie 6X] was based on a count of properties (not headcount) within two swathes (200m wide to represent the centreline, and 2km wide to represent the new NPR swathe) yet with no weighting for those properties closer to the airport."

"<u>The new 2km wide NPR swathe</u> [p19]
Undertaking a count of households within the new NPR swathe (2km wide rather than the existing 3km wide, and ending at 3,000ft) is not an approach that is suggested in CAP725, but arguably it presents a way of portraying the number of households (and by implication, the number of people) that have the potential to be overflown. However, as a measure, it gives no indication of the noise impact – it assumes that all households are equally affected no matter how far they are from the airport or how far from the centreline."

<u>"The 200m "Centreline" as a measure of impact</u>. [pp19-20]
Whilst the use of a 200m wide swathe around the SID is a useful indication of which properties are likely to be most directly overflown, particularly if the aircraft are using RNAV, it is not the best measure of households that will experience a noise impact. A better measure is the 2km swathe that represents the new NPR swathe because even though aircraft flying a PRNAV SID are likely to be contained well within the NPR swathe, it offers a better representation than the 200m Centreline of the area that would experience a noise impact from the departing aircraft, and it is the NPR swathe boundary that will be used for monitoring track compliance of departing aircraft."

The first of the above CAA comments highlights the limitations of the use of house counts within either 200m or 2km swathes as assessment methods.

The subsequent CAA comment on the use of a 2km swathe highlights the failure of that approach to assess noise impact because it assumes that all household are equally affected regardless of distance from the centre-line. Conversely, the CAA considers that using a 200m swathe is not the best measure as, although it is an indication of the number of households likely to be most directly overflown, it is not as good a representative of the households that will experience a noise impact as the count within a 2km is. That is because the 2km swathe represents the new NPR swathe. The CAA's preference is expressed even though it acknowledges that flying a PR-NAV SID will lead to the aircraft being constrained well within the NPR swathe (ie less than 2km width). One reason given for favouring this approach is that the NPR boundary will be used for track monitoring compliance.

Thus the use of a 2km swathe could include houses that would only be overflown infrequently (if at all) and thereby over-estimate to an even greater extent the number of houses potentially affected within this swathe compared to houses closer to the SID centre line. It seems that using either swathe width has disadvantages as an assessment method even for the purpose of ranking route options.

Despite their comments in Sections 2 and 3 above, the CAA affirms that the noise impact been adequately presented in the consultation and the submitted proposal [p9, the answer to the question posed at 5.2 is 'Yes'.]

## 3 CAA comments on the impacts of Option 6X itself

" … it should be noted that Option 6X matches the design of Option 5 at the point the SID passes Barston and therefore would have the same impact on Barston whilst offering greater relief to Balsall Common that Option 5, but less relief than Option 6." [p20]"

"Impact on Barston [p22]

- The SID for Option 5 does not pass directly over Barston, but still passes close, on the eastside of the village such that it is still within the 2km NPR swathe, and close to the 200m centreline swathe.
- The SID for Option 6 passes directly over Barston.
- The SID for Option 6X is in the same position as Option 5 at the point it passes Barston."

"Impact on Ballsall Street & Ballsall Common [p22]

Both communities are further from the airport than Barston – Ballsall Street is approximately 2km further southeast than Barston.

- The SID for Option 5 is the route that takes traffic closest to Ballsall Street & Ballsall Common. Ballsall Street is just to the east of the 200m centreline swathe, and well within the 2km NPR swathe. Properties on the westside of Ballsall Common are within the 2km swathe.
- The SID for Option 6 is the option that takes traffic furthest from Ballsall Street & Ballsall Common. Both communities would be outside a 2km NPR swathe.
- The SID for Option 6X lies between Option 5 and Option 6. The 200m centreline is further from Ballsall Street than Option 5 but not as far as Option 6. Ballsall Street is within the 2km NPR swathe, but almost all of the properties in Ballsall Common are beyond the 2km swathe."

"In basing BAL's decision on these two aspects, it is worth making the following observations [p10]:

- Based on BAL's methodology Option 6X would have offered the same degree of "relief" to Barston as Option 5, and would then have offered greater relief to Balsall Common than Option 5."

It is clear from the above information that Option 6X is a viable 'compromise' Option between Options 5 and 6, However, reliance by BAL on house counts within swathes rather than a more rigorous assessment method resulted in Option 6X being excluded before that more rigorous approach was introduced into the selection process.

## 4 Northbound SIDs

Northbound SIDs affect some flights departing on runway 15 that ultimately depart to the north. That departure route flies over parts of Balsall Common that are not directly overflown by the SIDS for Options 5 and 6. The status of those northbound routes is described in CAA Report CAP 1398 [p9, para 17] as follows:

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

It is not known whether any consultation responses that favoured Option 6 over Option 5 might have been influenced by the tracks of these Northbound SIDs. Is it is also unknown whether BAL considered that possibility and whether this factor was taken into account by BAL in their selection of Options to submit to the CAA for formal assessment.

## 5 CAA's Conclusions [p29]

- In the same way that there is no meaningful (i.e. perceptible) difference in noise levels for Barston between Option 5 and Option 6, there would also be no difference at Barston for an option that lies somewhere between the nominal track of those two options, i.e. Option 6X. Therefore none of the Options (5, 6 or 6X) provides a benefit in terms of noise for Barston.
- Option 6 would provide a meaningful noise benefit to Balsall Common and Balsall Street East over Option 5.

The above comments show that the CAA has adopted the criterion of a minimum noise level change of 3dB and has not considered absolute noise levels.

Despite the CAA's comments above on the selection methodology (in Section 2) and on Option 6X itself (in Section 3), the CAA appear to regard the exclusion of Option 6x from formal consultation or assessment as justified.