Birmingham Airport Airspace Change Proposal

Proposed changes to the Runway 15 Standard Instrument Departure routes (SIDs)

Report of the Sponsor Consultation

EXECUTIVE SUMMARY

On 2 November 2009 Birmingham Airport Limited (BAL) was granted planning approval for an extension to its runway which will enable the operation of aircraft to destinations much further afield than at present. The Planning Application was subject to the full Local Planning Authority Planning Process, including a comprehensive Environmental Impact Assessment.

Work on the scheme and the new infrastructure necessary to support its operation is now well under way and it is intended that the runway extension will come into full operation in the of Spring 2014.

As a consequence of the runway extension a new Departure End of Runway (DER) will exist. It is therefore necessary, due to International criteria for the design of Instrument Flight Procedures (IFPs) and Civil Aviation Authority (CAA) regulations, to introduce new Standard Instrument Departure (SID) Procedures and Noise Preferential Routes (NPRs) for Runway 15.

Furthermore as a consequence of the UK Future Airspace Strategy (FAS) and Performance Based Navigation (PBN) Policy the CAA has specified that all new SID procedures must be established as Area Navigation (RNAV) procedures with a navigation standard of RNAV-1.

All changes to SID procedures or NPRs are subject to the Airspace Change Process (ACP) established by the CAA and detailed in the Civil Aviation Publication (CAP) 7251. CAP725 requires that the Sponsor of the change, in this case BAL, must carry out a comprehensive consultation with both the aviation industry and the representatives of communities with the area that may be affected by the proposed change.

This document is the Report of the Sponsor Consultation carried out by BAL. The consultation ran from 11 January 2013 and closed on 17 May 2013[2]. This report has been compiled with the assistance of Cyrrus Ltd.

The consultation covered three aspects of proposed new departure procedures from Runway 15, namely;

- RNAV Standard Instrument Departure procedures (SIDs) for aircraft turning left to northerly routes – **Option 4**
- RNAV Standard Instrument Departure procedures (SIDs) for aircraft routing via southerly routes – **Option 5**
- Two conventional departure procedures (one for northerly routes, one for southerly routes) for non RNAV equipped aircraft

[1] CAP725 CAA Guidance on the Application of the Airspace Change Process
[2] The consultation was originally planned to end on 12 April 2013. However as a consequence of an additional option being put forward the consultation was extended to 17 May 2013.

During the consultation period, it was clear that whilst there was some support for the proposals, there was opposition from some communities to some aspects of the proposals. BAL therefore took steps to determine whether an alternative procedure design option could be developed which would mitigate, as far as practicable, the community concerns whilst retaining compliance with the ICAO procedure design criteria and the CAA's regulatory requirements.

In particular BAL was repeatedly asked to clarify the earliest point at which aircraft can make a turn on departure for southbound routes. In direct response to this question, BAL commissioned further design work and developed a further option, namely Option 6 for southbound departures. Option 6 was put forward on 12th April 2013, giving an opportunity for stakeholders to comment on two options for southbound departures. The consultation closed on 17th May 2013.

BAL re-stated that they were unable to replicate the 20 degree turn on departure (known as the 'Hampton turn').

183 stakeholder consultee organisations or individuals were consulted.

In total 44 responses were received from consultees. The majority of responses did not specifically differentiate between the individual procedures; however some did, with reference only to the southbound procedures. Some consultees submitted a single response and some submitted a second specific response following the introduction of Option 6.

Of the 44 responses, 22 supported or had no objection to the proposed procedures, either individually or as a whole. 12 consultees stated that they had no comment to make, or made general comments on the consultation rather than the procedures. 10 consultees objected to the consultation, either in principle or specifically to the proposed procedures.

In addition to the responses from formal consultees, BAL received 457 submissions from members of the public. Some were supportive of, and some opposed the original procedures. Following the introduction of Option 6, a further 654 submissions were received. Most were opposed to the original procedures Option 5 and supportive of Option 6.

The issues raised by all stakeholders objecting to aspects of the proposals including those from the wider community, have been carefully considered by BAL throughout the consultation period to ensure that all points raised have been considered and addressed prior to submitting the formal proposal to the CAA.

Referring back to the formal consultees, whilst objections were received for all procedures options, no specific objections were raised for northbound proposals.

For the two southbound options, there was both support and objections raised, with marginally greater support for the original proposal Option 5 (formal consultees).

BAL is satisfied that the consultation process undertaken met the requirements of CAP725 and has provided it, together with operational and environmental considerations, a useful input into the decision making process between Option 5 and 6.

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Abbreviations

BAL	Birmingham Airport Limited
CAA	Civil Aviation Authority
Conventional SID	A SID procedure defined by ground-based navigation aids, e.g. VOR radials, NDB bearings, DME distance, Dead Reckoning tracks, etc.
DME	Distance Measuring Equipment
FAS	CAA Future Airspace Strategy
ICAO	International Civil Aviation Organisation
NM	Nautical Mile (1NM = 6076.12ft = 1.5820km; 1km = 0.54NM))
NDB	Non-Directional Beacon
NPR	Noise Preferential Route
PANS-OPS	Procedures for Air Navigation Services (ICAO Document 8168)
	(Volume 2: Construction of Visual and Instrument Flight Procedures)
PBN	Performance Based Navigation
SID	Standard Instrument Departure Procedure
RNAV	Area Navigation
RNAV SID	A SID procedure defined by RNAV waypoints
RNAV-1	Area Navigation with a Performance Standard of ±1NM
VOR	VHF Omni-Directional Radio Range
dBA	Decibel A-weighted
SEL	Sound Exposure Level
$L_{(eq)}$	Noise Level (Equivalent)

References

Birmingham Airport Airspace Change Proposal: Proposed Changes to the Runway 15 Standard Instrument Departure procedures: Sponsor Consultation Document.

CAP725: CAA Guidance on the Application of the Airspace Change Process.

CAP778: Policy and Guidance for the Design and Operation of Departure Procedures in UK Airspace.

CAP785: Approval Requirements for Instrument Flight Procedures for Use in UK Airspace.

ICAO PANS-OPS Volume 2: Construction of Visual and Instrument Flight Procedures.

CAA Future Airspace Strategy (FAS). www.caa.co.uk/fas

CAA Policy for the Application of Performance-Based Navigation (PBN) in UK and Irish Airspace. http://www.caa.co.uk/default.aspx?catid=7&pagetype=90&pageid=13334

Introduction

On 2 November 2009 Birmingham Airport Limited (BAL) was granted planning approval for an extension to its runway which will enable the operation of aircraft to destinations much further afield than at present. The Planning Application was subject to the full Local Planning Authority Planning Process, including a comprehensive Environmental Impact Assessment.

Following the submission of the Planning Application for the Runway Extension in 2008, a Community Focus Group was established in order to deal with the ACP, in line with the recommendations for best practice within CAP725. However, this work was halted in 2010 due to uncertainty around the construction of the Runway Extension.

Following BAL's decision to go ahead with construction of the Runway Extension, the Community Focus Group was re-established in 2012, with its first meeting taking place in May 2012 in advance of the framework briefing with the CAA in July 2012. The Airport Company engaged with the Community Focus Group prior to the launch of this ACP consultation.

Work on the runway extension scheme and the new infrastructure necessary to support its operation is now well under way and it is intended that runway extension will come into full operation in the of Spring 2014.

As a consequence of the runway extension a new Departure End of Runway (DER) will exist. It is therefore necessary, due to International criteria for the design of Instrument Flight Procedures (IFPs) and Civil Aviation Authority (CAA) regulations, to introduce new Standard Instrument Departure (SID) Procedures and Noise Preferential Routes (NPRs) for Runway 15.

Furthermore as a consequence of the UK Future Airspace Strategy (FAS) and Performance Based Navigation (PBN) Policy the CAA has specified that all new SID procedures must be established as Area Navigation (RNAV) procedures with a navigation standard of RNAV-1.

All changes to SID procedures or NPRs are subject to the Airspace Change Process (ACP) established by the CAA and detailed in the Civil Aviation Publication (CAP) 725[3]. CAP725 requires that the Sponsor of the change, in this case BAL, must carry out a comprehensive consultation with both the aviation industry and the representatives of communities with the area that may be affected by the proposed change.

Accordingly, as the third stage of the Airspace Change Process detailed in CAP725, a Sponsor Consultation was carried out by BAL between 11 January 2013 and 17 May 2013. The Consultation was originally planned to end on 12 April 2013 but, as a consequence of a further procedure design option being put forward by BAL for southbound departure procedures being put forward by BAL the consultation period was extended by 1 month.

This document is the Report of the Sponsor Consultation and, as such, will form part of the ACP to be submitted to CAA.

A background to the consultation and the methodology used is given at Appendix A.

A list of stakeholder consultees is given at Appendix B.

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[3] CAP725 CAA Guidance on the Application of the Airspace Change Process

Notwithstanding that the consultation was targeted primarily at the listed stakeholder consultees, BAL has given widespread community publicity to this consultation as well as to a separate consultation concerning approach procedures to Runway 33. 23 Community "Roadshows" were held so that members of the public could find out about both of the consultations (which were, in part, running concurrently) and the effects that the proposals would have on local communities.

Submissions from individuals who were not listed stakeholder consultees were welcome and have been considered by BAL.

The consultation process requires that BAL takes a balanced judgement on any key issues raised by the consultees and, if practicable within the regulations and the criteria for the safe design of IFPs, adapt the proposal to incorporate appropriate aspects of the issues raised.

In this context BAL took due regard of early concerns raised by community representatives and the general public in respect of the proposed southbound departure route and took steps to investigate whether a further Option could be developed which would alleviate those concerns to the maximum extent practicable. A further option was developed, and, following discussions with the CAA, the consultation period was extended by one month to allow consultees to consider and respond to the new Option. Further "Roadshows" were undertaken to explain the additional procedure Option put forward in the extended consultation period.

Subsequently, in reviewing the complete response to the consultation as a whole, BAL has continued to take a balanced judgement on the key issues raised by the consultee stakeholders and others, whilst taking due regard of the criteria for the safe design of IFPs and the CAAs regulatory requirements.

In doing so, and in the light of the competing arguments in respect of southbound procedures, BAL has developed a methodology for comparative evaluation of the two options submitted and decision making.

BAL would like to extend its thanks to all stakeholder consultees and members of the public who have taken the time to respond to the consultation. We take the concerns and views of our local stakeholders very seriously, we try to maintain a constant dialogue with our neighbours that is characterised by a straightforward, open and honest approach, aimed at building understanding, trust and mutual respect.

Confidentiality

The CAA Safety and Airspace Regulation Group (SARG), formally the Directorate of Airspace Policy (DAP) requires that all consultation material, including copies of responses from consultees and others, is included in any formal submission to the CAA of an ACP.

BAL undertakes that, apart from the necessary submission of material to the CAA and essential use by our consultants for analysis purposes in developing this Report and subsequent ACP material, BAL will not disclose the personal details or content of responses and submissions to any third parties. Our consultants are signatories to confidentiality agreements in this respect.

Statistics

A total of 183 Consultation invitations were sent to stakeholder consultee organisations or individuals detailed in Appendix A comprising airlines and other local airspace users, members of the National aviation organisations represented on the CAAs National Air Traffic Management Advisory Committee (NATMAC), members of the Airport Consultative Committee (ACC), Councillors and Officials of County, District, City and Metropolitan Borough Councils, Parish Councils and other representative organisations of communities which may be affected by the changes to the departure procedures. Certain environmental organisations were included and Members of Parliament. The consultee Groups are detailed in Figure 1 below.

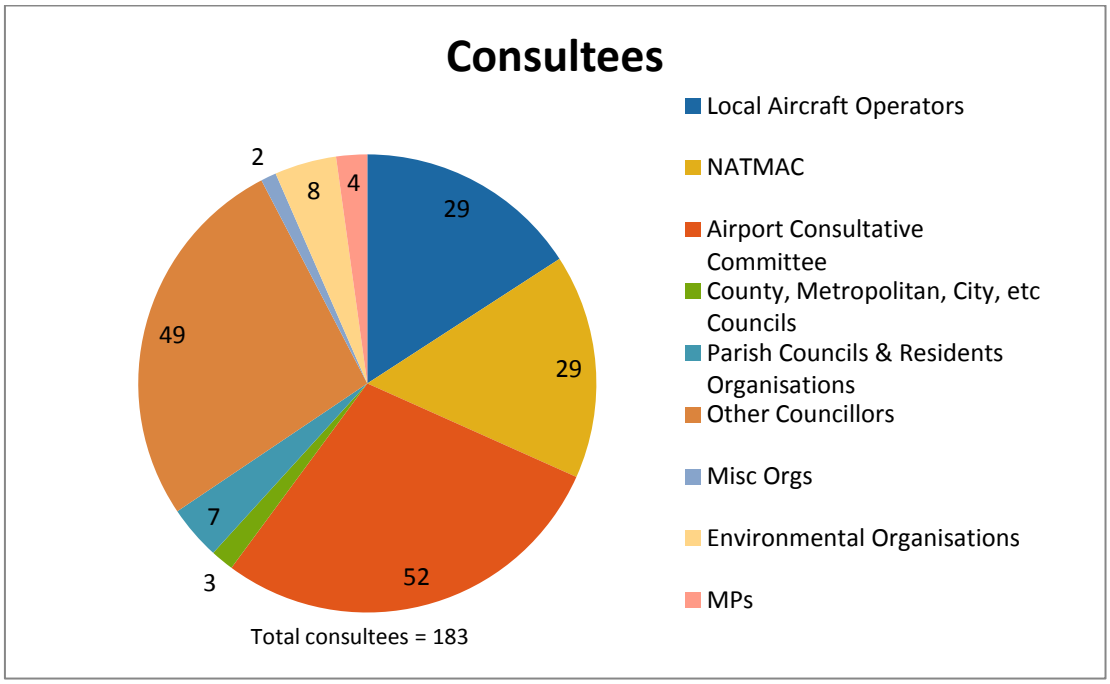

Figure 1. Distribution of Consultees

Note: Aviation "National Organisations" comprises those organisations who are members of the CAA's National Air Traffic Management Advisory Committee (NATMAC) and includes the military members of NATMAC.

Inevitably, with such an extensive list of stakeholder organisations and individuals there is some overlap with some individuals serving more than one stakeholder group and some stakeholder organisations having more than one nominated consultee. In some cases the organisation representation changed during the consultation period. The responses received have been carefully reviewed to ensure that duplication or double counting of responses has been avoided.

The Sponsor Consultation Documentation was distributed via a dedicated link on the Birmingham Airport Website. A number of hard copy documents were also distributed to local libraries. Publicity to the consultation was given in the local media.

In addition, during the original consultation period a total of 20 “Roadshow” presentations were carried out at 10 community venues so that members of the public or community organisations could discuss with Airport representatives the proposed changes for this and the separate consultation on Runway 33 approach Procedures. Approximately 750 people attended the Roadshow presentations. Subsequently, during the extended consultation period a further 3 Roadshow presentations were held so that the further route Option for southerly departures could be explained. Approximately 280 people attended the additional Roadshows.

A number of consultees and members of the public experienced difficulty in accessing the information on the Birmingham Airport website. In such cases the relevant documents were sent individually by e-mail or by a repaired link to the website or by hard copy as necessary.

Numerous requests for additional information, in some cases beyond that required for procedure design or consultation, were made by consultees and by members of the general public. In some cases this was provided, in other cases the requests could not be met.

During the total period of the consultation the “airspace” section of the BAL website was visited over 15000 times. The specific website pages related to the departure procedures consultation were visited almost 5000 times.

Responses to the consultation were received from 44 (24%) of the consultees. Some consultees submitted a single response and some submitted a second response specifically in consideration of the alternative procedure design submitted to the extended consultation. 139 (76%) consultees did not respond to the consultation.

The breakdown of consultee responses is shown at Table 1 and in Figure 2.

	Listed Consultee Groups	Number Consulted	Responses	No Response
1	Local Aircraft Operators	29	1 (3%)	28 (97%)
2	NATMAC	29[1]	13 (45%)	16 (55%)
3	Airport Consultative Committee	52[2]	14[9] (27%)	38 (73%)
4	County, Metropolitan, City, etc, Councils	3[3]	1 (33%)	2 (66%)
5	Parish Councils & Residents Organisations	7[4]	4 (57%)	3 (43%)
6	Other Councillors	49[5]	6 (12%)	43 (88%)
7	Miscellaneous Organisations	2[6]	1 (50%)	1 (50%)
8	Environmental Organisations	8[7]	4 (50%)	4 (50%)
9	Members of Parliament	4[8,9]	0 (0%)	0 100%)
	Totals	**183**	**44** (24%)	**139** (76%)

Notes:

1. 47 consultees representing 29 NATMAC organisations; (8 military departments counted as 1 consultee) (1 NATMAC organisation is not permitted to respond to consultations)
2. 67 Members reduced to 52 Consultees due to duplication of individuals in this and other consultee groups
3. Other Councils represented on ACC
4. Others represented on ACC
5. Other Councillors on ACC
6. Other miscellaneous organisations on ACC
7. One additional consultee also on ACC
8. Two additional MPs on ACC
9. 1 MP member of the ACC was involved in discussions with BAL on behalf of constituents

Table 1: Responses from Consultees

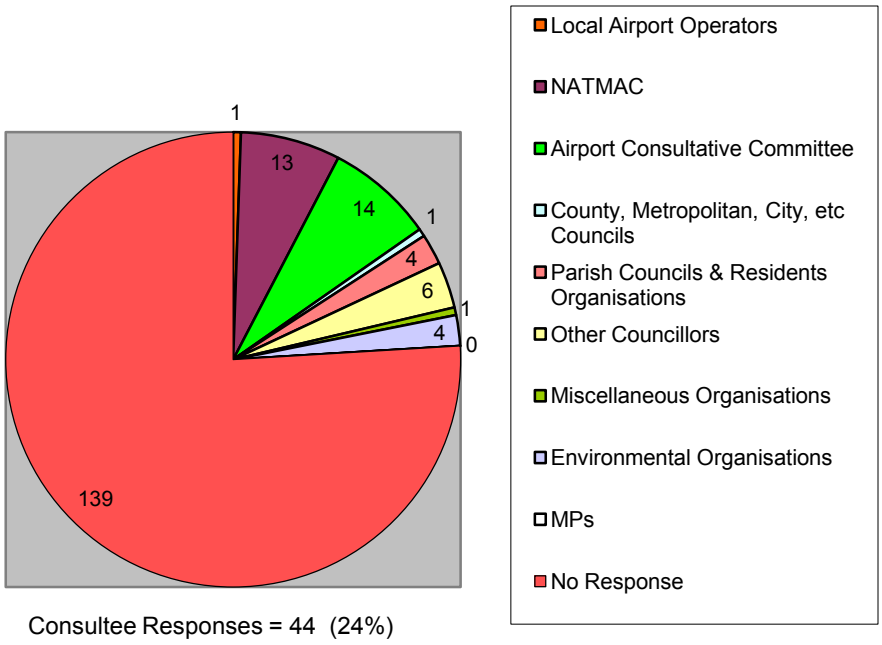

Figure 2 Responses from Consultees

In addition to the responses from the listed consultees shown in Table 2, a further 457 submissions were received from members of the public or other individuals or groups prior to the inclusion of an additional procedure option southbound flights (up to the originally intended closure date). These are detailed in Section 6.

Following the addition of the alternative option for southbound traffic a further 654 submissions were received from members of the public, other individuals or groups. These are also detailed in Section 6.

Some responses included comment on issues which were not part of the airspace change proposal. The Sponsor Consultation Document clearly indicated that these issues would not be covered by the consultation and such comments have been noted by BAL but have not been included in the analysis. Some responses commented on issues that were addressed at the Planning Application Stage and were not specifically relevant to this Airspace Change Proposal. These have been noted by BAL and included in Appendix C and D as appropriate.

Consultee Responses

The consultation covered three distinct subject areas, namely:

- Proposed RNAV departure procedures for northbound departing aircraft;
- Proposed RNAV departure procedures for southbound departing aircraft;
- Proposed departure procedures for departing aircraft, northbound and southbound, which are not approved by their State of Registry for RNAV-1 operations in terminal airspace.

In total, responses were received from 44 consultees (24%). Whilst most responses did not specifically differentiate between the individual procedures under consideration, some responded specifically with reference only to the proposed southbound departure routes and made no comment on the other aspects of the consultation.

Some consultees submitted a single response and some submitted a second response specifically referenced to the extended consultation which included an alternative southbound procedure option.

Of the 44 consultees who responded to the consultation, 22 (50%) supported or had no objection to the proposed procedures either individually or as a whole.

12 consultees (27%) either stated that they had no comment to make or made general comments on the consultation rather than the procedures.

10 consultees (23%) objected to the consultation either in principle or specifically to the originally proposed southbound procedures.

In addition a number of face-to-face meetings were held with particular members of the ACC who had expressed concerns on behalf of the organisations or constituent groups they represented. In particular meetings were held with Mrs Caroline Spelman MP, within whose Parliamentary Constituency all departure procedures from Runway 15 lie[4]. These meetings were frank and constructive and included detailed technical discussions of the concerns raised.

Key themes or issues raised by the consultee responses have been identified and are detailed within the relevant section (page 17) and the associated Appendices C and D.

At an early stage in the consultation period it was apparent to BAL from the volume of submissions received from the general public (see Section 6) that there was widespread public opposition to the proposed departure routes for aircraft departing toward the south. This was unsurprising since a misleading orchestrated campaign was identified within the area of Balsall Common.

[4] Mrs Spelman MP also met separately with representatives of the CAA DAP.

The particular issues of concern were the loss of the 20 degree turn on departure (known locally as the 'Hampton Turn') and, for the southbound procedures, the lack of any turn for noise abatement purposes to reduce the perceived noise impact on Balsall Common. There was concern that the new regulatory regime precluded, what were considered as much more capable, modern aircraft from manoeuvring after take-off as they had been doing for many years.

BAL therefore took steps to determine whether an alternative procedure design option could be developed which would mitigate, as far as practicable, the community concerns whilst, at the same time, retaining compliance with the ICAO procedure design criteria and the CAA's regulatory requirements.

BAL asked the procedure design specialists to investigate in detail the very earliest geographical position at which a turn could be specified taking due regard of the procedure design safety criteria and the CAA regulatory requirements. An alternative procedure design option was developed in which the nominal ground track would lie between the existing departure procedure (which cannot be replicated) and the procedure proposed in the consultation document.

It was therefore decided that this further Option, known as Option 6, should be included in the consultation. Following discussion with the CAA it was agreed that the consultation period should be extended by 5 weeks, to 17 May 2013, to allow consultees and other interested parties to consider and comment on the further option.

The additional option was added to the BAL consultation link on the Birmingham Airport website and a letter/e-mail was sent to consultees.

A further 3 Roadshows were held so that members of the public and other interested parties could discuss the additional option with BAL staff. Approximately 280 people attended these roadshows.

In the 5 week period between 12 April 2013 and 17 May 2013, 14 consultees submitted a second response specifically in respect of the extended consultation.

Of the 5 aviation consultees who made a second response, 3 expressed no preference either way on the additional procedure design submitted. 1 consultee preferred Option 6 for the RNAV procedure whilst favouring Option 5 for the non-RNAV procedure (on the basis that Option 5 would be easier to fly in non-RNAV aircraft). One aviation consultee continued to object in principle because of the same climb gradient and airspace concerns raised previously.

Of the 9 non-aviation consultees who made a second response, 4 specifically favoured the originally proposed Option 5 whilst 3 specifically favoured Option 6 or a modification of it. One consultee expressed no preference either way. 1 consultee organisation continued to object to the procedure design criteria used. Additionally, one consultee made a first response specifically supporting the originally proposed Option 5 and one made a first response favouring Option 6 or a modification of it.

Other Submissions to the Consultation

Notwithstanding that the consultation was targeted primarily at the listed stakeholder consultees, BAL gave widespread community publicity to this consultation as well as to a separate consultation concerning approach procedures to Runway 33. Community "Roadshow" presentations were held so that members of the public could find out about both of the consultations and the effects that the runway extension would have on local communities. Further "Roadshows" were undertaken to explain the further SID/NPR procedure Option put forward in the extended consultation period.

Submissions from individuals who were not listed stakeholder consultees were welcome and have been considered by BAL.

Within the original consultation period (to 12 April 2013) 457 submissions were received from members of the public or other organisations that were not consultee stakeholders. However, it should be noted that in a number of cases multiple submissions were received from the same "names" from different e-mail addresses and in other cases submissions were received from a number of different names using the same e-mail address. Therefore a simple "numbers count" does not necessarily provide a valid analysis.

49 of the submissions were requests for information or hard copy of documents. (In some cases individuals had encountered difficulty in accessing the website information.) 13 submissions were queries about specific aspects of the procedures. Responses were sent where appropriate and these are addressed in the analysis.

Almost all of the other submissions received reflected all or part of "specimen statements" prepared by pressure group individuals or organisations which were either opposed to or in favour of the proposed departure procedures to the south. Submissions received from Balsall Common, Barston and Hampton-in-Arden residents were almost wholly opposed to the proposed departure route, whilst submissions from Knowle and Catherine de Barnes residents were almost wholly in favour of the proposed departure route.

Specifically, 36 submissions supported the proposals as a whole whilst 359 objected to the proposals as a whole or to specific aspects of the proposal for southbound traffic.

In general, these submissions raised very few issues that had not been addressed in the responses from the formal consultee stakeholders. However, where concerns or questions were identified which had not been raised by the consultees these have been included in the appropriate chapter.

Following the development and addition of a further procedure design option (Option 6) to the consultation, between 13 April 2013 and 17 May 2013 a further 654 submissions were received from members of the public and others. Again, there were numerous multiple submissions from the same individuals and different names from the same e-mail address. BAL has endeavoured, as far as is practicable, to avoid "double counting" these submissions.

Most of the submissions were framed around prepared texts provided by the Balsall Common Action Group. BAL became aware of a vociferous orchestrated campaign in one locality which was promoting some misleading information.

Some submissions merely sought clarification of certain aspects of the procedures or further information without expressing an opinion; this was provided wherever possible.

Specifically, of these additional submissions, adjusted against double-counting, 492 were in favour of the new Option 6 or a modification 5 of it, whilst 92 were in favour of the original Option 5. Opinions were again divided between residents of Balsall Common and Hampton in Arden (generally in favour of Option 6 or modified Option 6) and those of Knowle and Catherine de Barnes (generally in favour of Option 5).

However, a substantial body of opinion against the new Option 6 arose from the village of Barston, as the centreline of the route would directly overfly the village whereas Option 5 would not. With respect to these concerns, and following discussion with the CAA, BAL committed some effort towards investigating a further option lying between Option 5 and Option 6. However, it was quickly established that this option would affect a greater number of households than Option 6 so it was not developed further or submitted to consultation.

Following the inclusion of Option 6 to the consultation, further meetings were held with particular members of the ACC to explain the technical aspects of the Option 6 procedure design. Again, the discussions were frank and constructive.

The comments and issues identified in the extended consultation period, with respect both to Option 6 and to the original proposal are detailed in Appendix D, together with BAL comment.

Key themes arising from the Consultation

It should be noted that the consultation carried out by BAL is the third stage in the overall process leading to the submission of a formal ACP to the CAA.

By the time the third stage, involving widespread Industry and Community consultation, is reached there should be few areas of contention that have not already been identified and been subjected to detailed evaluation. Any issues or objections arising from the consultation would normally be expected to fall into categories that have already been considered. This was, indeed, the case.

In analysing the responses from the listed consultees, BAL has identified the key themes in those responses which objected to the proposed SID/NPR procedures from runway 15, particularly with respect to the proposed southbound departure route. In addition to the key themes there were a number of specific comments which are addressed.

BAL has also considered each of the submissions received from members of the public or other individuals or groups both in the initial stage of the consultation as detailed in earlier sections 6. In general, there were very few additional issues identified which had not already been identified in the responses from the consultees or, alternatively, were outside the scope of the consultation. Where additional valid issues were identified in the extended consultation, these have been added to the analysis.

In responding to these issues, BAL has at all times taken a balanced approach in considering and responding to each issue. However, it must be borne in mind that in developing instrument departure procedures the international procedure design criteria are established to ensure the safe operation of aircraft under all conditions. The design criteria therefore sometimes allow little flexibility in the design and configuration of the departure procedures. This is particularly the case with RNAV procedures which aim to achieve a much more stringent navigation performance in order to facilitate the CAAs Future Airspace Strategy and more efficient use of the available airspace. The CAA's regulatory requirements for the approval of instrument departure procedures require adherence to the international procedure design criteria.

It must be noted that when the SID procedures were initially established for Birmingham Airport, and also when the 1990 changes to the procedures were introduced, the procedure design regime was less demanding than the current CAA regulatory regime. Procedure design was undertaken by ATS experts within the combined CAA/NATS organisation in discussion with the Airport Operator and Aircraft Operators. Neither ICAO PANS-OPS nor any other formal procedure design criteria were applied to the design of the procedures and obstacle clearance (to the PANS-OPS criteria) was assessed only with reference to the resulting procedure designs. The recent changes to the CAAs procedure design and regulation regime have had a major impact on the ability for BAL to design replacement procedures which meet the aspirations of communities in close proximity to the Airport.

A number of responses and submissions objected in principle to the airport expansion and the growth of air traffic. These issues were covered in detail at the Planning Application stage and are not a factor in this consultation.

The key themes identified in the consultee and other responses in respect of the initial period of the consultation, together with the BAL consideration of the issues raised, is given at Appendix C. The further key themes identified in responses received during the extended consultation period, together with the BAL consideration of the issues raised, is given at Appendix D.

Feedback to Consultees

Where appropriate, a letter or e-mail was sent to consultees in response to specific queries or requests for information. Acknowledgements were sent when requested.

In some cases meetings and discussions were held with interested parties to explain the intricate details of procedure design and development.

In accordance with normal consultation practice, individual detailed responses were not sent to each consultee response in order that a consolidated overview of the key themes and issues arising from the consultation could be established.

With respect to submissions from individuals or organisations who were not consultee stakeholders, in general a standard automatically generated electronic acknowledgement was sent. Again, individual responses were not sent but all submissions received were considered.

This Report of the consultation provides the BAL analysis of the consultation and the BAL consolidated feedback on the key issues and themes identified in the responses from consultees and other submissions to the consultation.

This Report is sent to all consultees as the accepted methodology of ensuring feedback to consultees.

As such, this Report will form part of the formal submission to the CAA of an ACP for the introduction of SID procedures and NPRs for the extended runway configuration.

Post Consultation Review

BAL remains committed to mitigate, as far as is practicable, the principle concerns of stakeholder consultees and other individuals who objected to both the originally proposed southbound departure procedure and to the alternative procedure subsequently developed.

In doing so, BAL is mindful of the need to take a balanced approach between the competing concerns of the residents and representatives of different communities in proximity to the Airport but also to the requirement to comply with the regulatory and safety requirements specified by the CAA for the design of SID and NPR procedures.

Accordingly, therefore, and accepting that the existing procedures cannot be sustained, BAL has developed safe procedures which meet, in all cases, the requirements of the CAA for procedure design and, to the maximum extent practicable, minimise the impact of departing air traffic on the communities in the vicinity of Birmingham Airport.

Following completion of the consultation, BAL has taken due regard of the public concerns expressed against the proposals for departing aircraft routing to the south. As a consequence BAL has conducted a further detailed comparative environmental review of each option.

BAL has considered the results together with the environmental and operational assessment in determining the end result between two procedure design options for southbound aircraft. The methodology for decision making used in the environmental review and the conclusions reached by BAL are detailed in a separate document produced by the BAL Environment & Community Team which is accessible through the Birmingham Airport website Airspace Change link.

Conclusions

The CAA requires BAL to apply the ACP process specified in CAP725 because the extension to the take-off distance for Runway 15 results in a new DER and, as a consequence, a new starting point for the construction of SID procedures.

In addition, the CAA specifies that new or altered SID procedures are to be designed as RNAV SID procedures with a navigation standard of RNAV 1. Furthermore, whilst the CAA does not intend to mandate the carriage of RNAV1 equipment in aircraft for the time being, provision must continue to be made for those (few) aircraft that are not capable of RNAV 1 operations and these procedures must, in turn take due regard of NATS plans to progressively withdraw the ground-based conventional navigation infrastructure.

It must be noted that the recent changes to the CAA's procedure design and regulatory policies have had a major impact on the ability for BAL to design replacement procedures which meet the aspirations of communities in close proximity to the Airport.

Within the process specified in CAP725, BAL has conducted a Sponsor Consultation with the aviation industry and with representatives of communities who may be affected by the change. The consultation has been conducted in accordance with the CAA requirements and the Cabinet Office Guidance on Consultations. Where necessary, the advice of the CAA has been sought.

44 responses to the consultation were received from 183 consultees.

22 (50%) of the responses from consultees supported or had no objections to the proposals, either individually or as a whole.

Where consultees made a second response specifically referenced to the options arising from the supplementary consultation, or where their single response referenced the options, then 5 consultees preferred the original proposal whilst 4 favoured Option 6 or a modification of it.

Whilst BAL is disappointed at the low response rate from the formal consultees, it is content that the consultation has been carried out correctly and that the conclusions reached are sound.

BAL has considered the results together with the environmental and operational assessment in determining the end result between two procedure design options for southbound aircraft

Accordingly, therefore, BAL intends to submit to the CAA a formal ACP to enable the introduction of RNAV and non-RNAV SID procedures and NPRs from the new DER of Runway 15. Individual procedure designs will be submitted to the CAA in accordance with the requirements of CAP785.

The procedures to be submitted are those specified in the initial consultation document as offering the best balance between the competing needs of communities in close proximity to the Airport whilst, at the same time, ensuring compliance with the CAA procedure design regulatory and policy requirements.

Appendix A

Background to the Consultation

Introduction

The CAA sets out its regulatory requirements and process for applications to change the status of airspace or associated arrangements in CAP724 "The Airspace Charter" and CAP725 "CAA Guidance on the Application of the Airspace Change Process". An essential element of the airspace development process is for the Change Sponsor to carry out an extensive consultation with the airspace users who may be directly or indirectly affected by the change and, moreover, with organisations representing those who may be affected on the ground by the environmental impact of the change.

One of the criteria specified in the CAP725 as requiring a proposed change to be conducted under the CAP725 process is *"The introduction of, or changes to, Standard Instrument Departure routes (SIDs), Standard Arrival Routes (STARs) or Noise Preferential Routes (NPRs) within controlled airspace."*

In this case, the extension of runway 15 resulting in the relocation of the Departure End of the Runway to the south-east by 391 metres requires that new SID procedures and, as a consequence NPRs, must be constructed in accordance with the International safety criteria for the construction of Instrument Flight Procedures (IFPs).

In addition, the CAA Future Airspace Strategy (FAS) and the associated Policy for the Application of Performance-based Navigation (PBN) in UK and Irish Airspace, requires that any new or modified SID procedures should be constructed and published as Area navigation (RNAV) procedures with a navigation standard of RNAV1.

The CAA requires as a Regulatory Requirement specified in CAP785 "Approval Requirements for Instrument Flight Procedures for Use in UK Airspace" that procedure design must be compliant with the criteria specified in ICAO Doc 8168 PANS-OPS Volume 2 "Construction of Visual and Instrument Flight Procedures". JAA Temporary Guidance Leaflet 10 Rev1 "Airworthiness and Operational Approval for Precision-RNAV[6] operations in Designated European Airspace" also specifies as a basic assumption that all terminal RNAV procedures are consistent with the relevant parts of ICAO Doc 8168 as a pre-requisite to enabling the aircraft navigation equipment to meet the navigation performance standards. Furthermore, in CAP778 " Policy and Guidance for the Design and Operation off Departure Procedures in UK Airspace" the CAA expands on the UK application of certain aspect of the ICAO PANS-OPS criteria, together with other aspects of departure procedure application.

Thus, following discussion with the CAA, the necessary procedure design and consultation has been conducted in accordance with the CAA requirements.

[6] Precision-RNAV (PRNAV) is now known as RNAV-1.

BAL carried out the Sponsor Consultation between **11 January 2013 and 17 May 2013** in accordance with the principles set out in the Cabinet Office Code of Practice on Consultation and having extended the consultation by an additional month to allow consultees to consider and respond to an additional procedure option out forward in response to consultee concerns.

Consultation methodology

A comprehensive Sponsor Consultation Document was prepared by BAL with the assistance of Cyrrus Ltd, a specialist airspace management consultancy company with extensive experience of managing Airspace Change Proposals and conducting consultation to meet the CAA requirements.

The Sponsor Consultation Document was posted at a discrete link on the Birmingham Airport website (www.birminghamairport.co.uk). Notifying letters were sent to stakeholder consultees by e-mail wherever practical, or by post where e-mail was not practicable, detailing the consultation and how to access the consultation document[7]. Limited paper copies of the Consultation Document were made available to consultees on request.

In addition, the proposed changes to the approach procedures to Runway 33, in conjunction with proposed changes to departure procedures from Runway 15 (which is the subject of a separate consultation) were given widespread media publicity and community engagement was carried out by BAL through a series of some 20 community "road shows" at 10 community locations and other briefing meetings.

The Cabinet Office Code of Practice on Consultation and the CAA requirements specify a minimum period of 12 weeks for consultation. In order to allow for the Easter holiday period BAL extended the consultation period to 13 weeks. Thus the Consultation began on 11 January 2013 and was initially intended to close 12 April 2013.

However, as a consequence of concerns identified during the consultation period, BAL commissioned a further detailed study to determine whether an alternative procedure design could be accomplished which would address the concerns raised. Consequently, therefore, an additional procedure option was submitted to the consultation and, following discussion with the CAA, the consultation period was extended by a further 5 weeks to 17 May 2013.

Notwithstanding that the consultation was targeted primarily at the listed stakeholder consultees, BAL gave widespread community publicity to this consultation as well as to a separate consultation concerning approach procedures from Runway 33. A series of 20 "Roadshows" presentations were held at 10 Community venues was held so that members of the public could find out about both of the consultations (which were, in part, running concurrently) and the effects that the runway extension would have on local communities. Submissions from individuals who were not listed stakeholder consultees were welcome and have been considered by BAL. A further 3 "Roadshows" were undertaken to explain the additional procedure Option put forward in the extended consultation period.

Within the consultation period consultees, and any other individuals who wished to participate, were asked to consider the proposal and submit a response to BAL, either through a discrete link on the Birmingham Airport website or in writing. In addition, consultees were given the

[7] This is the normal method of consultation notification accepted by the CAA Directorate of Airspace Policy.

opportunity to seek clarification of the terminology used or any other aspects of the consultation or the proposed airspace design. Where consultees had difficulty in accessing the consultation material this was provided individually by e-mail or through a repaired website link or by hard copy.

A number of consultees and members of the public sought additional information or clarification of the consultation material and this was provided where appropriate. However, in some cases the information sought was beyond that required for the design of the procedures or that required for consultation; in these cases the requests could not be met.

In order to promote maximum response, BAL was proactive throughout the consultation process. A review of responses received was undertaken 1 month prior to the end of the consultation and, for those who had not responded, 2 reminder communications were sent.

Consultees

At the start of the consultation Birmingham Airport sent out a notification to 183 stakeholder consultees, comprising:

The Airport Consultative Committee (ACC) Members (67 members were reduced to 52 Consultees due to duplication of individuals or organisations in other consultee groups);

29 Local airline operators and other airspace users and adjacent Airport ATC Units;

29 member organisations of the CAA's National Air Traffic Management Committee (NATMAC) represented by 47 individuals (including 8 military airspace user groups);

3 County, Metropolitan Borough, District and City Councils (other Councils were represented though the ACC);

7 Parish Councils and residents organisations (others were represented on the ACC);

49 individual councillors in addition to those sitting on the ACC;

2 Miscellaneous Organisations;

8 National or Local Environmental Organisations (an additional environmental consultee was represented on the ACC);

4 Members of Parliament (in addition to the 2 Members of Parliament who are members of the ACC).

A full list of Consultees is detailed at Appendix A of this document.

In addition, the local press featured reports about the consultation and copies of the consultation documents were distributed to local libraries.

Access to the Sponsor Consultation Document was not limited in any way. Members of the public as well as listed consultees had access to the documentation through the Birmingham Airport website and through the "Road Shows". Submissions received from individuals or organisations which were not included in the formal list of consultees have been included in the analysis and taken into account by BAL.

Appendix B

List of Consultees

A.1. Birmingham Airport Consultative Committee

(67 members; reduced to 54 consultees due to duplication of members or organisations with other consultee groups.)

A.2. Local Airport Operators

Aer Arran
Aer Lingus
Air France
Blue City Aviation
Brussels Airlines
Cello Aviation
Continental Airlines
Eastern Airways
easyJet
Emirates Airlines
Eurojet
Fedex
Flairjet
Flybe
KLM
Loganair
Lufthansa
Monarch Airlines
Ryanair
SAS
Swiss
Thomas Cook
TUI
Turkish Airlines
West Atlantic Airlines
West Midlands Police Air Support Unit
Mr P Bentley
Coventry Airport Air Traffic Control
East Midlands Airport Air Traffic Control

A.3. "National" Aviation Organisations (CAA NATMAC List)

Airport Operators Association (AOA)
Aircraft Owners and Pilots Association (AOPA)
Aviation Environment Federation (AEF)
British Airways (BA)
BAA plc
BAe Systems
British Airline Pilots Association (BALPA)
British Air Transport Association (BATA)
British Balloon and Airship Club (BBAC)
British Business and General Aviation Association (BBGAA)
British Gliding Association (BGA)
British Hang Gliding and Paragliding Association (BHPA)
British Helicopter Association (BHA)
British Microlight Aircraft Association (BMAA)
British Model Flying Association (BMFA)
British Parachute Association (BPA)
Guild of Air Pilots and Navigators (GAPAN)
General Aviation Safety Council (GASCo)
Guild of Air Traffic Controllers (GATCO)
Hovercraft Club of Great Britain (HCGB)
"Heavy Airlines"
Light Aircraft Association (LAA)
"Light Airlines"
"Low Fares Airlines"
NATS
Private Pilots License / Instruments Rating Europe (PPL/IR)
Unmanned Aerial Vehicles Systems Association (UAVS)
UK Airprox Board (UKAB)
UK Flight Safety Committee (UKFSC)
Aviation Division NC HQ
HQ 3rd AF USAF
HQ Directorate of Army Aviation
Military Aviation Authority
Ministry of Defence
MoD Flight Test Regulator

A.4. Local Planning Authorities

Birmingham City Council Operations Manager, Environmental Protection
Solihull Metropolitan Borough Council Officers
Warwickshire County Council

(These and other Councils are also represented on the ACC by different individuals)

A.5. Parish Councils, Residents Associations and other local organisations

Bickenhill PC
Balsall Common PC
Barston PC
Castle Bromwich PC
Hampton in Arden PC
Balsall Common Residents Association
Catherine de Barnes Residents Association
Hampton Society
Marston Green Residents Association
Sheldon Residents Association

(A further 7 Residents Associations and Community Organisations were consultees within the ACC)

A.6. Other Councillors

Hodge Hill Ward
Sheldon Ward
Shard End Ward
Stetchford & Yardley North Ward
Castle Bromwich Ward
All Solihull MBC Councillors

(64 Councillors individually; others were consultees through their role in the ACC)

A.7. Miscellaneous Organisations & Individuals

ABTA
Birmingham Chamber of Commerce
Solihull Chamber of Commerce
Solihull Ratepayers Association

A.8. Environmental Organisations

Birmingham Against Noise Group
CPRE Warwickshire
English Heritage
Environment Agency
Friends of the Earth (Birmingham)
National Trust
Natural England
Warwickshire Wildlife Trust

A.9. Members of Parliament

Birmingham Hodge Hill
Warwick & Leamington
Kenilworth & Southam
Birmingham Yardley

(in addition, Members for Meriden and Solihull sit on the ACC)

A.10. Additional Distribution

Copies of documents distributed to:
- Birmingham City Library
- Solihull Library
- Warwick Library

Appendix C

IDENTIFICATION OF KEY THEMES AND ISSUES ARISING IN THE INITIAL PHASE OF THE SPONSOR CONSULTATION

Serial	Issue	BAL Comment
1	Climb gradients on the proposed SIDs should be increased to enable the release of controlled airspace so that Glider operations can regain airspace lost to them with the change to the Transition Altitude in the Daventry CTA.	This ACP is solely concerned with developing new SID and NPR arrangements “close-in” to the Airport to fit the new runway configuration. There is no change to the vertical profile of the “far out” elements of the SIDs, which are contained within stepped bases of the controlled airspace. The CAA does not require BAL to consider anything other than the “close-in” aspects associated with the runway extension and the consequential requirement to implement the revised procedures as RNAV procedures. It is suggested that the British Gliding Association initiate discussions with NATS and the CAA regarding the configuration of the airspace boundaries or, alternatively, initiate an Airspace Change Proposal in accordance with the provisions of CAP725.
2	The northbound RNAV SID needs an additional waypoint before the first turning waypoint.	This will be checked by the accredited procedure designer before submission of the procedures to the CAA.
3	What height will departing aircraft on the northbound departure route pass over the residents of Millison’s Wood, Meriden.	On that portion of the northbound SID procedure the aircraft are climbing unrestricted up to 6000ft. The performance of individual aircraft varies from day-to-day but all aircraft would be expected to be above 3000ft by the time they pass the Millison’s Wood area. Indeed, most will be substantially higher than 3000ft and some will be above 6000ft. Once aircraft have passed 3000ft then ATC may take them off the prescribed track and give more direct routings into the airways system, depending on the traffic situation at the time. By way of comparison, aircraft would be expected to be at approximately the same height as they are on the current SID procedure passing Meriden.

Serial	Issue	BAL Comment
4	The documentation was too complex.	The assessment of aircraft noise and other nuisance are technical subjects. Similarly, the design of Instrument Flight Procedures (IFPs), including SID procedures, is a highly specialised activity which can only be carried out by qualified and accredited individuals. We endeavoured to explain the impacts as simply as possible for those who have no technical aviation knowledge whilst, at the same time, providing sufficient detail for those having a technical knowledge to form a balanced judgement. The opportunity existed, as detailed in the documents, for consultees and other bodies to seek clarification on any issues of concern or uncertainty and this was done on a number of occasions. The Roadshows provided a face-to-face opportunity to have the proposals explained.
5.	The consultation period of 3 months was too short.	The minimum consultation period recommended by the CAA in CAP725, which reflects the Cabinet Office Code of Practice on Consultation is 12 weeks. In this case, because of the Easter period, BAL chose to allow an extra week – to 13 weeks – for the consultation. This period is considered sufficient for those organisations that convene only on an occasional basis to consider the proposal and form a view. Having decided to submit the additional procedure design option to the consultation BAL consulted the CAA on how this should be addressed and it was agreed that a 5-week extension to the consultation period would be satisfactory from a regulatory viewpoint.
6.	The consultation is just a publicity exercise and won't influence the outcome.	BAL is proud of its record of openness and engagement with the community. We take the views of our local communities very seriously. Indeed, it was as a consequence of the concerns expressed by the early responses to the consultation that led us to determine whether an alternative option could be developed. Similarly, in our formal submission of our proposal to the CAA we are required to demonstrate to them, as the airspace regulator, that we have taken a balanced judgement on the issues and concerns arising from the consultation.

Serial	Issue	BAL Comment
7	No explanation of what SEL means. No noise footprints for larger aircraft.	Sound Exposure Level (SEL) footprints show the extent of noise energy generated from a single aircraft event, for example an aircraft taking off or landing. This is in contrast to the "summing" of events to determine noise exposure. The SEL footprint shows a contour of equal SEL values for each aircraft event. Thus, the 90dBA (A-weighted decibel) SEL shows the area within which SEL values are equal to or greater than 90dBA. These footprints are useful in evaluating options by identifying the relative contribution of different aircraft types, routes and operating procedures on the total noise impact. The CAA requires SEL footprints to be included when the proposed airspace arrangements include changes to the distribution of flights below 7000ft agl and within 25km of a runway at night. The particular aircraft types selected for presentation were the noisiest types (B767-200) expected to use the procedures and the most frequent types (B737 – 300/400/500 series). Larger aircraft in use tend to be more modern, and therefore much quieter than the older generation B767s. Similarly more modern smaller aircraft such as the B737-700/800 series, the A319/320 and the Embraer 135/175 family are considerably quieter than the legacy B737s whose SEL footprints were used in the consultation document. Thus our analysis has been based on the "worst case" aircraft for noise generation.
8	Confusion about future affected population numbers. How does an increase in the number of aircraft affect the noise contours?	The dB LAeq metric is the traditional method of measuring average noise levels at airports in the UK. The contours are produced for an average day time noise exposure and are based on traffic data (0700 – 2300 hours). The size of the contours are predominantly influenced by the number of Air Transport Movements (ATM) and aircraft types, generally an increase in ATMs will lead to a greater noise footprint.

Serial	Issue	BAL Comment
9	Why reduce the swathe width from the nationally recognised ±1.5km. No other airports have reduced the swathe width. (NB Some consultees welcomed the reduction in swathe width.)	The ±1.5km nominal swathe width was developed many years ago by the predecessors of the Department for Transport (DfT) for use at London Heathrow, Gatwick and Stansted Airports where the Secretary of State (SoS) is responsible for the Noise Abatement measures. The swathe width was determined from manual observation of the general spread of achieved aircraft tracks when flying along designated routes and was done many years before either accurate track monitoring facilities were available or modern aircraft navigation systems were in use. The swathe represented the area within which it was considered "reasonable" for aircraft to be contained during routine operations. The departure swathe provides an indication to the public of areas that are likely to be overflown, but it is not intended to indicate an absolute assurance that other areas will not be overflown. Indeed, the navigational tolerances applied in procedure design criteria are normally much larger than the swathe developed for track keeping assessment for noise monitoring purposes. A number of UK Airports have adopted, for convenience, the DfT swathe but there is no obligation to do so. The introduction of properly designed RNAV SID procedures with a navigation standard of RNAV1, as required by the CAA, represents a much more precise navigation standard than was achievable by previous generations of aircraft systems and navigation infrastructure and is one element in the CAAs Future Airspace Strategy to improve the utilisation and capacity of airspace. As the navigation capability and performance of aircraft, in conjunction with properly designed procedures, will be much more precise in the future then it is reasonable for Airports to provide a commensurately more appropriate indication of the areas that are likely to be overflown by aircraft more closely following the specified routes.

Serial	Issue	BAL Comment
10	The reduction in swathe width is predicated on P-RNAV but P-RNAV is not mandatory. What date will P-RNAV be made mandatory?	The term Precision RNAV (P-RNAV) has been replaced by the term RNAV-1, which is directly equivalent in terms of navigation performance and functionality, and is the international navigation standard for use in future terminal airspace RNAV operations. The CAA Policy for the Application of Performance-Based Navigation (PBN) in UK and Irish airspace is detailed in their Policy document which can be found at http://www.caa.co.uk/default.aspx?catid=7&pagetype=90&pageid=13334 It is not expected that the UK will mandate the carriage of RNAV-1 equipment ahead of a European Commission Implementing Rule (IR) expected circa 2018 – 2020. However, the UK Policy is that: *"Any new ATS Routes (including SIDs & STARs) as well as Instrument Approach Procedures based on RNAV are required to be developed consistent with specifications contained in the ICAO PBN Manual (Doc 9163) and PBN IFP design criteria published in ICAO Doc 8168 (PANS-OPS) as supplemented by any national or European Policies"* It is expected that for new route structures under development by NATS, particularly in the London area, RNAV-1 will be mandated for individual routes or airspace for ATM purposes even though it is not yet mandated for the whole of the airspace. Prior to developing the proposed RNAV departure procedures BAL carried out a survey of the aircraft operators using Birmingham Airport to determine the current level of equipage and approval. Only 2 aircraft operators, amounting to a fleet of some 16 aircraft, were found to be not approved for RNAV-1 (or better) operations in European terminal airspace. Our procedure design consultancy approached the CAA to determine whether the residual non-RNAV-1 fleet could be permitted to use their RNAV-5 capability (mandated for flight in the en route Airways System) to fly the RNAV-1 SID procedures but this has not been approved. Thus we have had to provide a limited residual conventional SID route structure to cater for these few aircraft.

Serial	Issue	BAL Comment
11	Why is the reduced swathe width not being applied to Runway 33 departures?	Under the current ACP, only the SID procedures from Runway 15 are being converted to RNAV SIDs as a direct consequence of the extension to Runway 15 and the CAAs PBN Policy. No changes are being made to Runway 33 SID procedures at this stage - they will remain as conventional navigation procedures. However, at some time in the future, in common with other airports, the Runway 33 procedures will be required to be converted to RNAV procedures and the swathe width will be reviewed at that time. This is likely to take place when NATS starts to withdraw the ground-based navigation aids which support the Birmingham conventional SID procedures.
12	Why can't reference to I-BIR D1 be retained?	RNAV IFPs are specified with reference to latitude and longitude geographical positions rather than with reference to ground based navigation facilities. The navigation systems take data from a wide range of internal and external references (e.g. Global Navigation Satellite Systems (GNSS); Inertial Reference Units (IRU) and Distance Measuring Equipment (DME) in determining the navigation solution. However, RNAV navigation systems are specifically excluded from using a DME associated with an ILS as there is no specific geographical position of DME Zero. The DME is zero referenced to both runway thresholds and thus radiates a "hemisphere" of Zero. In fact, DME Zero can be half a runway length immediately above the runway mid-point and anywhere on the arc down to ground level in any direction. Thus it cannot be used in any geographically based system. Similarly I-BIR D1 may be 7577ft above the mid-point of the runway. The geographical position of the old I-BIR D1 is too close to the new DER to be used as a turn point.

Serial	Issue	BAL Comment
13	What action is being taken to improve track keeping on existing tracks?	It is acknowledged that all aircraft entering the Airways System are mandated to navigate with reference to RNAV Systems with a navigation standard of RNAV-5. (This navigation standard is roughly equivalent to the historic navigation standards for conventional navigation referenced to radio navigation beacons on the ground.) Similarly it is acknowledged that these aircraft fly the terminal airspace procedures using their RNAV Systems as though they were RNAV procedures rather than by reference to the navigational facilities which define the procedure. The "conventional" procedures are "interpreted" by navigation database coders into RNAV "overlay" procedures. However, because the historic conventional navigation procedures are not necessarily compatible with the procedure design requirements for RNAV procedures, and the interpretation of the procedure may vary between database coders, they may have to adapt the coding to "force" the aircraft along a track that is outside the intended capability of the navigation system. Thus, because the procedures themselves do not meet the present day procedure design requirements, there is inevitably some greater dispersion of aircraft away from the originally intended conventional navigation routes. Although BAL continues a dialogue with aircraft operators to try and improve track keeping it is likely that until the procedures are designed to current standards, there will be a greater level of dispersion than could be expected when aircraft navigation systems and procedure design qualities are aligned with each other.
14	No explanation of the changes to the navigation infrastructure.	The UKs Future Airspace Strategy (FAS) is aligned with the European Single European Skies (SES) programme and the ICAO Resolution A37-11. The progressive move towards a Performance-Based Navigation (PBN) regime based on RNAV and, primarily Global Navigation Satellite Systems (GNSS), means that much of the historic ground-based navigation infrastructure (VORs and NDBs) will become redundant and will be withdrawn. NATS, with the agreement of the CAA, proposes that some VORs will be withdrawn ahead of any mandate for the carriage of RNAV-1 equipment by aircraft operators. We have been advised that one of those to be withdrawn within a year or so of the introduction of the new SID procedures will be Honiley (HON) VOR, which currently supports the initial legs of all conventional SIDs from runway 15. Thus, whilst needing to provide instrument departure procedures in the interim for the reducing number of non-RNAV-1 aircraft, the availability of navigation aids on which to design those procedures is reducing. On aerodrome navigation infrastructure will remain as it is today in terms of its provision, although the actual locations of some navigation aids, e.g. the Runway 15 ILS Localiser, Runway 33 ILS Glide Path Arial and the DME will change as a consequence of the runway extension project.

Serial	Issue	BAL Comment
15	What are the obstacles that prevent an early right turn?	It is necessary here to briefly explain the various aspects of aircraft climb performance that come into play in the design of instrument departure procedures. Firstly there is the day-to-day performance and capability of individual aircraft. This will vary from aircraft to aircraft, even within a single aircraft type, dependent upon a myriad of factors including aircraft weight, wind speed, air temperature, airline operating techniques etc. Clearly a "standard" Instrument Departure Procedure, as an ATC Clearance, must be suitable for use by all of the aircraft that are required to use it under all normally expected conditions. Thus, for airspace management purposes the SID procedure vertical profile would be based on the "worst case" of what would normally be expected on a day-to-day basis across the aircraft fleet. In that case, studies by the CAA have shown that all aircraft can be expected to achieve 500ft or more within 1nm of the departure end of the runway. A climb gradient of around 5% (304ft/nm) to 7% (425ft/nm) is normally used for the design of the ATC and controlled airspace requirements of the SID procedure, particularly in a complex terminal airspace where SID procedures from different airports cross each other. However, when considering the safety requirements for obstacle clearance immediately after take-off, different figures come into play. The criteria specified by ICAO which must be used in the obstacle clearance assessment assume a far lower "worst case" climb performance of 3.3% (200ft/nm). Additionally, the ICAO criteria specifies that the climb gradient of 3.3% must have achieved a Minimum Obstacle Clearance (MOC) of 90m (295ft) at the beginning of any turn. Unfortunately, in the departure area to the south of the extended runway there are obstacles high enough that a climb gradient of 200ft/nm would not have achieved 295ft above the obstacles before reaching the obstacles - thus a turn cannot be initiated. Conversely, the obstacles are not high enough to impact on the MOC where a turn is not to be initiated. Thus, although the ATM element of the procedure design places the aircraft above 500ft aal, it is the obstacle assessment at 3.3% gradient which brings the obstacles into play and prevents a turn from being designed in the procedure.
16	Why are the obstacles not an issue for the northerly SIDs turning left.	The turn initiation point for the left turn to place the nominal track of the SID between the conurbations of Hampton-in-Arden and Balsall Common is after the point at which 295ft MOC is achieved on a 3.3% climb gradient

Serial	Issue	BAL Comment
17	Why is PANS-OPS being used for procedure design when it doesn't reflect aircraft performance?	PANS-OPS is the international standard document used worldwide for the design of all types of Instrument Flight Procedures. The CAA, in CAP785, specifies that it is to be used for the design of IFPs in the UK. The CAA also publishes CAP778 which concerns, specifically, departure procedures and which amplifies certain aspects of PANS-OPS and how a more pragmatic approach can be applied in some areas. PANS-OPS also covers specific aspects of the construction of RNAV procedures including, amongst other things, the types of "Path Terminators" that can be used for coding procedures into navigation databases and the minimum segment lengths between successive waypoints. Many of the traditional procedure design processes were found to be not suitable for RNAV applications. This is because of the way that data is processed within the RNAV systems and the different capabilities of different RNAV systems. As a result, some historic conventional procedures proved to be incompatible with RNAV systems and some could not be coded or led to inconsistent routing by aircraft with different RNAV systems. Nowadays, however, the Airworthiness Requirements necessary for aircraft systems to follow the specified path through the sky with the required (and much more precise) level of navigation accuracy are tightly defined. But the principle assumption throughout is that the procedures themselves have been correctly designed in accordance with the PANS-OPS principles. If the procedure itself has been incorrectly designed there is no assurance that the aircraft can achieve the required navigation performance or fly the route safely.

Serial	Issue	BAL Comment
18	The CAA says that SID procedures can be designed with a turn at 500ft. Why has BAL not adopted this in order to avoid overflying communities.	Yes, a turn at an altitude (at or above 500ft aal) can be specified as the turning point. However, the climbing performance of each individual aircraft is different and varies from day-to-day. Thus departing aircraft, collectively, would not fly along any specific or consistent path across the ground. On a cold day with a strong headwind a lightly loaded aircraft may turn before the end of the runway. Other aircraft would turn directly over Hampton-in Arden, others beyond Hampton-in Arden as an example. On a hot day with no wind the same aircraft would turn much later. The preferred noise abatement policy at most airports, including Birmingham, is for the concentration of aircraft along specific ground tracks. This is also the preference detailed in Government guidance. Because of the wide variation in aircraft climb performance, and thus the tracks across the ground, the swathe indicating the likelihood of overflight would be significantly wider than 3km if the turn was specified at 500ft aal or any other altitude. An added disbenefit of “turn at an altitude” and the consequent variation in turn point with differing aircraft performance is that ATC would not be able to predict where each individual aircraft would turn and so the time interval needed to ensure safe separation between successive aircraft could not be standardised. A fast climbing following aircraft may turn inside a slow climbing leader aircraft, leading to a dangerous situation. Thus the departure clearance of each aircraft would depend on the radar controller’s individual observed assessment of the departure performance of the aircraft ahead before the subsequent aircraft could be allowed to depart. Maximising the runway capacity depends on having standard time intervals applied between departing aircraft following the same tracks across the ground and no controller-to-controller co-ordination (ie “freeflow”). Additionally, it is not possible in RNAV operations to specify an “either/or whichever is later” instruction, for example “climb straight ahead to 500ft or DME1 whichever is the later”. Although these instructions have traditionally been used in the past they are not compatible with navigation database coding and cannot be used. It must be either turn at a specified altitude, or turn at a specified position, but not a conditional application of both.

Serial	Issue	BAL Comment
19	Why can't existing aircraft use the current runway length and the current procedures and only the new long-haul flights use the longer runway and new procedures?	Unfortunately it is not possible to notify two different runway end points for different types of aircraft. There can only be one Departure End of Runway (DER) and, under the procedure design criteria that is the point from which Instrument Departure Procedures are constructed. The new DER dictates that new procedures must be designed for all aircraft using the runway and the existing historic procedures are not compatible with the procedure design requirements for RNAV SIDs. There are some airports that publish different SID procedures for Jet and non-jet aircraft (e.g. Glasgow and Edinburgh) but in these cases the different routings are further away from the aerodrome because of the differing ATC requirements. The NPR elements of the procedures are the same in each case and the procedures are all designed from the single DER.
20	Having departures climbing straight ahead from runway 15 coincident with the approach track for arriving aircraft to runway 33 is incompatible with the Government guidance that arrival and departure tracks should not be coincident	Government guidance is that it is desirable (not mandatory) to design departure procedures so that they do not replicate the final approach tracks of landing aircraft where the final approach track passes over built up areas. However, in all cases the safety requirements are paramount and in some cases it may not be possible to achieve the desired aim within the procedure design constraints.

Serial	Issue	BAL Comment
21	When did the regulatory requirements change? What processes are in place to ensure that the criteria keep up with aircraft technology?	The current procedures in use at Birmingham Airport were designed more than 30 years ago for older generations of aircraft and navigation technologies and to the less stringent procedure design regime that was then in place. The incompatibilities of historic procedure designs, particularly the "close-in" NPR elements, at airports around the UK with the requirements for RNAV have been known about for at least 15 years but there has been no retrospective implementation by the CAA of the new requirements as they have developed. However, now that RNAV procedures are being implemented around the UK as a matter of UK Policy, then all of the "incompatible" NPRs will need to be adapted to become compatible with the procedure design criteria. Until 2010 all IFP design was done "in-house" by the CAA. From 2010 that responsibility has been devolved to the individual airports and an extensive regulatory regime has been established. The CAA now only regulates (through the Airspace Change Process and the Requirements for the Approval of IFPs) what the airport does to ensure that the regulations have been complied with. Additionally, the regulatory regime requires that all IFPs must be reviewed every 5 years and compliance with the requirements demonstrated. The CAA published its PBN Policy in 2011, which requires all new SID procedures to be constructed as RNAV SIDs. The ICAO PANS-OPS document which details the procedure design criteria to be used worldwide is in the remit of the ICAO Instrument Flight Procedure Panel (IFPP) who routinely consider the procedure design implications associated with new navigation technologies and publish regular amendments to the document. The ICAO PBN Manual (Doc 9613) was radically overhauled and republished in 2008.
22	Concerns over the increased numbers of aircraft.	Birmingham Airport is a Strategic National Asset and makes a significant contribution to the Midlands economy. The growth of air travel and the demand for additional air services from the Midlands area as the economy emerges from the recession years is undeniable. BAL has been given planning permission to play its part in meeting that demand. The configuration of the departure procedures is not, in itself, a factor in the growth of air traffic at the airport and thus is not a factor in this consultation.

Serial	Issue	BAL Comment
23	Concern about the greater individual noise level of larger aircraft	The modern generations of larger aircraft such as the A380, B777 and newer B747 are much quieter than the earlier generations of large aircraft which they replace. The airlines which are likely to use Birmingham Airport for long-haul flights are all equipped with modern aircraft.
24	Need reassurance that monitoring of aircraft noise will continue. What arrangements are made for publication of this data.	BAL has a longstanding noise monitoring and reporting regime and this will continue. Details can be found on the Birmingham Airport website.

Appendix D

IDENTIFICATION OF KEY THEMES AND ISSUES ARISING IN THE EXTENDED SPONSOR CONSULTATION

Serial	Issue	BAL Comment
1	Climb gradients do not reflect modern aircraft performance and do not take account of the needs of other airspace users. Steeper climb gradients should be incorporated to facilitate the release of controlled airspace.	BAL response remains the same as detailed in Appendix C.
2	For Conventional Procedures, note NATS timetable for withdrawal of Trent (TNT) VOR is 2016-2018.	From the outset of the procedure development BAL has worked closely with NATS in respect of the proposed VOR withdrawal timetable and its impact on the ability to design conventional procedures for Non-RNAV-1 approved aircraft. The advice received was that, in order to provide Airways access for such Birmingham northbound departures, the withdrawal of Trent (TNT) VOR had been rescheduled and Honiley (HON) VOR would be withdrawn earlier. In the event that TNT VOR is withdrawn before an RNAV-1 mandate is implemented then NATS will need to determine how it requires Non-RNAV-1 departures from Birmingham to access the Airways System. We are, of course, aware that aircraft operators will use their RNAV-5 capability to fly RNAV Overlay procedures rather than using conventional navigation. However the CAA will not permit RNAV-5 terminal airspace procedures to be established.

Serial	Issue	BAL Comment
3	Whilst Option 6 may be preferable, environmentally, for RNAV procedures, Option 5 is a less complex procedure for non-RNAV aircraft.	BAL aims that the non-RNAV procedures should replicate, as closely as practicable within the criteria for the safe design of instrument flight procedures and within the available navigation infrastructure, the procedures developed for RNAV departures. It is BAL's understanding, from information provided by NATS, that Honiley (HON) VOR will be withdrawn in the initial phase of VOR withdrawals by NATS.
4	Straight flight is safer - no turns at low altitude; Straight flight uses less power – therefore quieter Straight flight allows faster climb – less noise from higher aircraft Straight flight uses less fuel - reduced carbon footprint.	All of the procedures, whether straight or turning, will meet the safety requirements for instrument flight procedure design. The track changes detailed in Option 6 are small enough to be inconsequential in the aspects listed.

Serial	Issue	BAL Comment
5	Turn at 2.2nm from DER is not accepted. Turn at Altitude (500ft aal) is permitted and would allow turn before 2.2nm	BAL acknowledges that "Turn at an altitude/height" is acceptable for procedure design but it does contradict the Future Airspace Strategy, which requires all new SIDs to be designed to RNAV-1 standards. A Turn at an altitude/height" design is not RNAV-1 compliant. As well as given regard to CAA's policy with respect to RNAV 1, BAL, in common with most UK Airports, operates a noise abatement policy of concentration of departing aircraft along as few ground tracks as possible, in line with Government Policy. Conversely, "Turn at an altitude/height" results in a wide dispersion of departing aircraft across random tracks as the point at which each aircraft reaches a particular altitude/height is different. "Turn at an altitude/height" results in a wide dispersion of departing aircraft across random tracks as the point at which each aircraft reaches a particular altitude/height is different. A major operational disadvantage of "turn at an altitude/height" is that the differing tracks between successive aircraft would not allow ATC to apply a standard "time interval" separation between successive aircraft as there is the possibility that a following aircraft would turn "inside" the previous departing aircraft, resulting in an unsafe situation. Thus runway capacity would be seriously affected by a change in Birmingham's Noise Abatement Policy - that would be a major consideration for a busy, and developing, Airport.
6	Discrepancy between the Track Density Plot and SEL Noise Contour Charts. A clear explanation must be provided before any decision can be made on route options.	The two outputs are not directly comparable as both outputs are different and are for different years. The SEL Noise Footprints were generated for one individual ATM of each of the proposed routings and relate to the footprint of noise energy for one particular ATM. These were produced by the CAA and were based upon the mean departure tracks previously calculated for the Birmingham 2010 Night LAeq contours. The Track Density Plot shows the radar position of all aircraft movements operating on all routes during the summer 2012 and are based upon flow tracks taken from the Airport Noise and Operations monitoring System (ANOMS).

Serial	Issue	BAL Comment
7	Option 6 would result in increased noise disturbance for Barston. A turn at 500ft aal with a smaller track change would be a better option.	Following representations from Barston residents, and following discussions with the CAA, BAL has committed some effort towards investigating a further route option lying between Barston and Hampton-in-Arden (between the original proposal and Option 6). However, it was quickly established that this option would affect a greater number of households than Option 6 and so it was not developed further.
8	BAL must specify full length departures only so that aircraft are higher when overflying departure end communities.	Most airlines operate a reduced power take-off policy wherever practicable in order to reduce fuel burn and carbon footprint and in doing so will choose to take advantage of the overall increased runway length to facilitate this. Full length departures may not be appropriate or necessary for all aircraft types and the ability for ATC to sequence departures with those aircraft capable of utilising a shorter runway length may be of operational value at times. Therefore whilst the majority of departures will use the full runway length, BAL will not mandate the use of the whole runway for departures.
9	P-RNAV is not mandatory so there is no assurance of improved track keeping.	See BAL comment on this previously raised issue in Appendix C.
10	The late addition of Option 6 confused the consultation process.	Option 6 was added as a consequence of community concerns raised by the consultation. The addition of Option 6 and extension of the consultation period was discussed and agreed with the CAA.
11	The additional Public Meetings did not include Knowle, which would be most affected by Option 6.	Following the publication of Option 6, it was decided to undertake three additional community road-shows in areas most affected by Options 5 and 6. These communities are Hampton-in-Arden, Barston and Balsall Common. Knowle lies outside of the Noise Preferential Route and the Noise Contours for Option 6. As with all of the events, the roadshows were not community-specific and residents of all communities were most welcome to attend any of the events.

Serial	Issue	BAL Comment
12	Option 5 crosses open fields; Option 6 crosses villages and farms.	BAL is required to consider the whole of the noise footprint and the full extent of the areas likely to overflown from day-to-day, not just the nominal ground track of the proposed procedures. The varying atmospheric conditions from day-to-day and the varying performance of individual aircraft means that there will always inevitably be a measure of potential dispersion, albeit fairly small, away from the nominal ground track.
13	Too much notice has been taken of the Balsall Common Campaign	BAL has taken due regard of responses from all consultees and the submissions from members of the public who were not consultees and has taken a balanced approach to all concerns identified.
14	Proposals unsound. Aarhus Convention and EC Regulation 1367/2006. No EIA submitted. Inadequate details of how procedures were designed; procedure design criteria; CAA involvement; unable to judge whether criteria have been correctly applied.	The consultation process followed in BAL's opinion met the requirements of CAP725. Any concerns that the CAP725 process does not meet the requirements of the Aarhus convention , EC Regulation 1367/2006 or include for the production of an EIA, or are deficient in any other way are for the CAA to consider.