Safety and Airspace Regulation Group

All NATMAC Representatives

14 August 2013

Dear Colleagues,

CAA DECISION LETTER

GATWICK RNAV 1 SIDs AIRSPACE CHANGE PROPOSAL

1. INTRODUCTION

1.1 Following the completion of consultation and submission of an Airspace Change Proposal (ACP) for 19 new RNAV 1 SIDs at Gatwick Airport, my staff undertook a detailed analysis of the ACP which included: a review of Instrument Flight Procedure design proposals, issuing regulatory approvals of the SID designs, an environmental assessment and a review of the consultation process. The purpose of this letter is to provide you with an overview of the proposal and my subsequent decision on it.

2 PROPOSAL OVERVIEW

2.1 The proposal was designed to introduce 19 new Gatwick RNAV 1 SIDs from the main Runway (Rwy 08R and Rwy 26L) to replicate the flight profiles of existing conventional SIDs. The aim was to replicate as closely as possible the existing track flown over the ground of the conventional SIDs whilst maintaining the existing vertical profiles, whilst at the same time not contravening the lateral and vertical parameters associated with Noise Preferential Route (NPR) definition. No changes of controlled airspace or NPRs were proposed (however, see detail in paragraph 3.5.5 on Route 4 implications).

2.2 As RNAV1[1] Trial SIDs for Rwy 26L CLN2X & SAM1X, and Rwy 08R SFD2Z & SAM2Z have been in use since 2007/2008, the proposal included the conversion of these Trial procedures into permanent RNAV1 SIDs. The sponsor, Gatwick Airport Ltd (GAL) plans to retain the existing conventional SIDs through a managed transition period resulting in the eventual withdrawal of all conventional SIDs by approximately 2018. The precise arrangements will be determined by GAL in due course.

2.3 The introduction of RNAV SIDs is in line with the CAA Performance Based Navigation Policy, as set out in the Future Airspace Strategy, to introduce RNAV operations in London Terminal Airspace in order to facilitate growing demand and safe operation.

[1] RNAV1 is the terminology which has now replaced P-RNAV used in the consultation.

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At the same time RNAV SIDs will contribute towards Government policy to achieve better track-keeping accuracy and concentrate traffic where possible and to reduce the number of people overflown.

2.4 A post implementation management oversight process proposed that should any RNAV1 SID be deemed to be of detrimental effect, it could be withdrawn. The CAA has asked GAL to confirm these arrangements and provide clarity on what GAL deems to be a detrimental effect.

3 STATUTORY DUTIES

3.1 My statutory duties are set out in Section 70 of the Transport Act 2000 (the Act), the CAA (Air Navigation) Directions 2001, as varied in 2004 (the Directions), and Guidance to the CAA on Environmental Objectives relating to the exercise of its air navigation functions.[2]

3.2 Safety

3.2.1 My primary duty is to maintain a high standard of safety in the provision of air traffic services and this takes primacy over all other duties.[3] In this respect, I am content that the proposed RNAV1 SID designs are appropriate and meet ICAO and CAA design requirements. All RNAV1 procedures have been examined by my IFP design specialists and regulatory approvals have been issued subject to the completion of some flyability checks for CAT D aircraft. Arrangements are in hand to publish the new charts and navigation data base coding tables in the UK AIP. Following outstanding flyability checks, if safety issues arise, NOTAM action will be taken to suspend the RNAV1 SIDs pending further evaluation.

3.3 Airspace Efficiency

3.3.1 I am required to secure the most efficient use of the airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.[4] As there is no new controlled airspace required with the RNAV SID ACP, there is no impact to Class G users. Whilst the new designs replicate existing conventional SIDs, evidence gathered from the Trial SIDs in use for 6 years indicates improved track keeping. Therefore, there should be more consistency in track adherence during the early turns immediately after departure, although it is recognised that once aircraft are clear of NPR vectoring restrictions, controllers may continue to vector aircraft to achieve a more efficient departure profile against other LTMA traffic. This situation may continue to exist until full implementation of the NATS London Airspace Management Programme (LAMP) airspace development project is fully implemented.

3.4 Airspace Users

3.4.1 I am required to satisfy the requirements of operators and owners of all classes of aircraft.[5] There is no change to existing controlled airspace and therefore Class G users are not affected by this change. As aircraft fleet equipage statistics indicates approximately 95% of operators regularly using Gatwick are RNAV1 capable, it is expected that the majority of Gatwick users will be able to take advantage of the new RNAV1 procedures. Operators not currently equipped will still be able to fly the existing conventional SIDs until such time as they are withdrawn.

[2] Issued in 2002 by the DfT (then called the Department of Transport, Local Government and the Regions) (the Guidance).
[3] Transport Act 2000, Section 70(1).
[4] Transport Act 2000, Section 70(2)(a).
[5] Transport Act 2000, Section 70(2)(b).

3.5 Interests of Other Parties

3.5.1 I am required to take account of the interests of any person (other than an owner or operator of an aircraft) in relation to the use of any particular airspace or the use of airspace generally. My staff examined a number of impacts, some of which attracted feedback during consultation. As RNAV SIDs will replicate as closely as possible the existing conventional SID designs, departure swathes will become more concentrated, thus reducing the number of people being overflown; this is in line with Government policy.

3.5.2 Due to the nature of 2 departure profiles, tracks over the ground may move a very small amount within the existing NPR swathes in Route 2 and Route 4[6]. In all but the Rwy 26 procedures with a right turn (Route 4 in Consultation), RNAV1 SIDs will be wholly contained within the existing NPR swathes. More detail on impacts is highlighted below. A more detailed explanation of the impacts of the Route 4 RNAV SID (which has a slight impact on the NPR alignment) is at paragraph 3.5.5.

3.5.3. Route 5 (Rwy 08 to the east).

In consultation feedback, some residents in the Dormansland area (5 in total), believed track dispersion would be further south than at present. We initially believed this view may have been formed by respondents misinterpreting the Route 5 track distribution diagram and mistaking the relevant NPR centreline and the conventional and RNAV nominal tracks as shown in the consultation diagram. The Route 1 (Rwy 26 straight ahead departure) conventional and RNAV1 track distribution diagrams show a fairly condensed track dispersion because the procedure is a straight ahead departure, without turns of significance, compared with the wider dispersion often seen with conventional SIDs on turning departures.

There is no reason to doubt that the Route 5 RNAV dispersion will be any different to that shown for the conventional departures as is evident on Route 1 track dispersion plots shown in consultation which depart from Rwy 26; as soon as 3000ft (day) and 4000ft (night) is reached, aircraft may be vectored. It has been determined that there is only a difference of 16 metres between the nominal tracks of the conventional and RNAV SIDs in the vicinity of Dormansland. This was therefore not deemed to be a significant issue, although the CAA has advised Gatwick to monitor departure tracks accordingly.

3.5.4 Route 2 (Rwy 08 SFD 2Z as flown during the trial).

In consultation feedback, some residents in the East Grinstead Area complained that aircraft would be closer to East Grinstead on the eastern side of the NPR after the first turn) as opposed to following the existing conventional track dispersion which is either on the conventional centre-line or just to the west of it as portrayed in consultation. Whilst there is an apparent wider dispersion of conventional aircraft, from the Trial results, the RNAV dispersion is slightly further east than the conventional main flow of departures but it is reduced in width. Given the width of the NPR swathe is 1.5km either side of the NPR centreline, it can be seen that the RNAV dispersion does move the main concentration further east by up to approximately 0.75km (0.5NM).

Some East Grinstead residents believed that there had been some effort by residents in the Copthorne area (Domewood) to persuade operators to fly further away from their location, an assertion which was given some publicity in a local newspaper

[6] Route Numbers refer to route designation in the GAL Consultation.

article. From the outset, this was not the case. From feedback provided from Gatwick, there does appear to have been some co-incident adjustment to the conventional SID tracks flown by one operator, during the consultation period but this was apparently due to some adjustments in their FMS conventional procedures when magnetic variation changes were made. **Note: there has been no change to the alignment of the SFD conventional or RNAV Trial SID.** Therefore, given that this adjustment has taken place, and the fact that the Trial SFD2Z SID had been suspended since November 2011 until it was vertically re-profiled and became effective on 7 March 2013[7], it is a possibility that some residents may have thought the changes made by one operator were connected with the Trial SID. At the time of the consultation the trial SID was not in use, so any changes made by the operator may have 'blurred' the perceived impacts of the RNAV SIDs; consequently, the impact of the RNAV SID may be less than the diagrams in the consultation portrayed.

In consideration of the consultation feedback, Gatwick was asked if any action was taken to examine if there were any other options for designing the SFD RNAV SID to better replicate the conventional SID. Whilst options were examined, it was not possible to design the procedure with an earlier turn due to strict RNAV design criteria and impact for ATC operational reasons which could affect flow of easterly departures. The prevailing wind is westerly, and Rwy 08 is only in use approximately 30-35% of the year. Therefore, the RNAV design as trialled was the proposal that Gatwick submitted with the ACP. It should be noted that there is now a safety requirement for aircraft to reach 2000ft by the first waypoint before the turn to SFD due to revised obstacle clearance (this did not come to light until after consultation and ACP evaluation).

Whilst some RNAV departures may be slightly closer to East Grinstead than flown using the conventional procedure, the RNAV Trial clearly shows RNAV departures are achieving a reduced departure swathe and track dispersion around the first turn. The RNAV Trial SID fully complies with all NPR parameters and complies with Government guidance in concentrating traffic. Furthermore, there are no other options to commence the turn of the RNAV SID earlier, therefore it is not possible to change the design of this SID.

3.5.5 Route 4 (Rwy 26 CLN 2X as flown during the trial).

A particular issue exists with the existing conventional Rwy 26 SID to the east (Route 4 in consultation), whereby approximately 4% of departures fly outside the lateral boundaries of the NPR swathe for a small period during the initial right turn before they reach 4000ft amsl, after which they may be vectored by Air Traffic Control for separation against other traffic and for expedient climb. Track data presented by Gatwick indicates existing traffic is also well dispersed beyond the NPR swathe north of Gatwick, after the initial turn, as the majority of aircraft are above 4000ft amsl.

Historical Situation

With the introduction of Noise and Track Keeping (NTK) Systems in 1993, an NPR swathe was defined in order that adherence to track keeping could be monitored in a quantified manner. The NPR swathe was defined as a corridor widening from the departing end of the runway to a maximum of 1.5km either side of the NPR centreline. Historical data indicates a discrepancy has existed for quite some years - the ground track of the 'Route 4' SID in 1989 does not appear to correlate with the NPR centreline as shown on the DfT NPR diagram of 1993. The CAA is unable to find archive data to explain this discrepancy (the DfT rather than the CAA is

[7] A requirement as controlled airspace was raised in 2011.

responsible for NPR promulgation). We believe this could be due to a number of factors, such as magnetic variation changes not being incorporated over the intervening years. In addition, analysis of archive Flight Data Recorder (FDR) information shows that where historic ground tracks were closer to the NPR centreline, pilots were manually flying aircraft at higher angles of bank and slower speeds than would be considered acceptable today, and not compatible with current automated Flight Management Systems (FMS).

Route 4 Feedback from Consultation

Feedback from the consultation for this route was extremely low; one member of the public from Leigh objected due to the prospect of additional noise resulting from concentration of more aircraft overflying his village; Capel Parish Council[8] also objected on the grounds of increased noise and concentration arising from the overflight of a greater number of aircraft.

Future Position with Route 4 RNAV SID Design

Whilst the Rwy 08 Trial SID was very successful in correlating with the NPR parameters, the Rwy 26 RNAV SID cannot be designed to fly completely within the existing NPR lateral swathe. This is due to the RNAV design criteria that determines the radius of the turn, the speed and the angle of bank all of which is pre-coded into the FMS and enables the SID to be flown automatically. Additionally, all departures must fly straight ahead to 500ft before turning and the SID designs must also take into account all obstacles. Departures therefore have to follow a prescribed flight path in accordance with the SID design, which takes into account all these requirements; this effectively means that aircraft using the Route 4 RNAV SIDs cannot turn any earlier than has been demonstrated with the designs of the Trial SID. Hence the proposal to implement the RNAV SID design as flown during the Trial.

The impact of the new RNAV SID will mean that, whilst all RNAV departures will eventually fly outside of the NPR swathe, 95% of these are above 4000ft amsl, and thus may be vectored for traffic separation and further climb (as is the case with the conventional SID today), or continue on the track of the SID as designed. Where aircraft will leave the existing NPR swathe during the first turn, (in the vicinity of Beare Green), the slower climbing aircraft are likely to be marginally below 4000ft amsl for a short period of time of up to approximately 20 seconds depending on climb performance. As a result, the trial has demonstrated a similar level of track-keeping as for the conventional SID, with around 5% of operations flying outside the NPR swathe below 4000ft amsl on the first turn in this same area. As a consequence, the CAA considers that the introduction of RNAV on Route 4 will have no significant impact on dispersion of traffic in relation to the existing NPR.

On review of the proposal, the Safety and Airspace Regulation Group (SARG) concluded that the impact of the introduction of the RNAV SID on Route 4 was not significant for the following reasons:

- There is no impact on Leq 16 noise contours and SEL footprints as the effects are beyond existing Leq noise contours and SEL footprints.

- The excursion outside the NPR swathe below 4000ft is for a very short duration (approximately 20 secs) by a small percentage of all departures on this route and whilst below 4000ft amsl. Therefore aircraft are highly unlikely to be further away

[8] (Capel is situated directly below both conventional and RNAV flight paths in the centre of the first turn and comprises 3 village communities – Capel, Coldharbour and bear Greene)

than approximately 500m from the NPR swathe extremity on the northwest side of the NPR as they complete the first turn – resulting in a noise change of less than 0.5dBA SEL. Thereafter, aircraft will have reached 4000ft amsl, after which there is no restriction on the flight paths air traffic control may direct aircraft to follow.

- Approximately 4% of departures using the conventional SIDs currently leave the NPR swathe below 4000ft amsl during the first turn. Above 4000ft amsl there is widespread dispersion beyond the NPR swathe. Approximately 24% of departures using the conventional SID today are outside the NPR swathe above 4000ft amsl on completion of this first turn. We consider that it is extremely difficult for residents to determine the precise altitude of a departure, and hence persons outside the NPR swathe, to the west and to the north, may consider that they are already frequently over-flown, albeit at altitudes above the NPR vectoring limits.

- Given existing track dispersion, it is evident that the NPR no longer appropriately reflects where aircraft have been historically flying. As SID charts from 1989 indicate they would have flown onto a radial outside the NPR swathes at that time, this is an historical issue which might have been corrected some time ago. Consequently, the RNAV SID proposal has highlighted the issue which has become more apparent in that modern aircraft performance is such that flight profiles flown some 25 years ago are no longer achievable by the majority of current operators. This is due to modern avionics, advances in technology and the FMS used by current aircraft operators. As such, Gatwick Route 4 is a clear example to illustrate that some conventional SID designs cannot be precisely replicated.

- With due consideration of the Transport Act and the powers devolved to Director SARG, in line with the extant Environmental Guidance to the CAA I have considered the interests of all parties, and the consultation feedback. As the impact of the new 'Route 4' RNAV SID NPR swathe excursion is for such a short duration, is broadly consistent with existing traffic patterns, and is only for a very small distance away from the NPR swathe, I consider this not to be significant. This view is supported by the DfT.

3.6 Environmental Objectives

3.6.1 In performing my statutory duties, I am obliged to take account of the extant Guidance provided by the Secretary of State[9]. My detailed considerations of the environmental aspects of this proposal are detailed in paragraph 4.

3.7 Integrated Operation of ATS

3.7.1 I am required to facilitate the integrated operation of air traffic services provided by or on behalf of the armed forces of the Crown and other air traffic services.[10] There is no impact on other ATS providers.

3.8 National Security

3.8.1 I am required to take into account the impact any airspace change may have upon matters of national security.[11] There are no impacts for national security.

[9] Transport Act 2000, Section 70(2)(d)
[10] Transport Act 2000, Section 70(2)(e).
[11] Transport Act 2000, Section 70(2)(f).

3.9 International Obligations

3.9.1 I am required to take into account any international obligations entered into by the UK and notified by the Secretary of State.[12] Other than meeting national certification requirements for RNAV1 operations from operators' respective regulatory authorities, there are no international obligations to be met. Once conventional SIDs are completely withdrawn, all foreign operators will require RNAV1 certification to operate into Gatwick.

4. ENVIRONMENTAL CONSIDERATIONS

4.1 The Environmental Research and Consultancy Department has undertaken an assessment of the environmental impact of this change, the findings of which are summarised at Annex A.

The ERCD report concluded that whilst an overall environmental benefit cannot be demonstrated, standard noise metrics required under CAP725 (L_{eq} contours, 90 dBA SEL footprint) would be unlikely to show any change as a result of this proposal. Equally, any impact on CO_2 emissions would in all likelihood be negligible, and there is not likely to be any impact upon LAQ.

In line with current Government guidance, the introduction of RNAV will generally result in fewer people being overflown. Of the four trialled SIDs, the distributions (below 4,000ft) on Routes 1 and 3 show that traffic is concentrated along a path similar to that of traffic on the conventional SID. However, on Routes 2 and 4, the portrayed distribution (below 4,000ft) of traffic on the RNAV SID is different to the traffic on the conventional SID, although it is wholly contained within the NPR swathe on Route 2.

- On Route 4, supplementary analysis has been conducted to quantify the effect of changes in flight track distribution within the NPR swathe. Both Gatwick Airport's and our own analysis has shown that the RNAV trial SIDs have not affected the departure climb profile, thus changes in noise exposure are entirely related to the lateral disposition of flight tracks within the swathe. Noise exposure on the ground is dependent on both the shift in track over the ground and the altitude of an aircraft – noise impact of a shift in ground track lessens with increasing aircraft altitude. At 4000ft amsl, a shift in ground track of 750m causes a change in single event SEL of 0.8dBA. A 500m shift causes a change in SEL of 0.3dBA. These changes related to comparisons between two flights. As indicated above, safety requirements of including altitude constraints at some waypoints during the early turns are beyond the scope for completing an environmental assessment as these changes are safety orientated and cannot be changed.

- On Route 4, taking into account the overall changes in track distribution, noting there is little change in ground tracks for one-third of departures on Route 4, the overall change in noise exposure at any location below 4000ft amsl is likely to be no more than 0.5dB., Changes in noise exposure that do occur are at noise exposure levels far below those normally considered in assessing aircraft noise impact.

4.2 As such I am content that the change is unlikely to be significant in environmental terms.

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

5. CONSULTATION

5.1 The Sponsor undertook a consultation through the Airport Consultative Committee (the GATCOM) between 19 July and 19 October 2012 with responses accepted up to 12 November 2012; the consultation was in accordance with the requirements of CAPs 724 and 725.

5.2 The consultation was completed in accordance with the SARG (then DAP) requirements. It was apparent that there was close liaison between GAL and GATCOM during the consultation and the public events were instrumental in raising the profile of the consultation.

5.3 The actions of the sponsor in conducting the consultation were adequate although there was some criticism from some local authorities, members of the public and some campaign groups that quality and readability of maps presented in the consultation was less than satisfactory. This was rectified and detailed diagrams were published on the Gatwick Airport website in the latter half of the consultation.

5.4 Given the environmental sensitivity of proposals such as these in the vicinity of airports, it was unsurprising that some respondents chose to challenge the application of the process rather than commenting on the proposals themselves. The use of the consultative committee has however, proved to be a suitable vehicle for consultation.

5.5 A process objection was lodged by GATCAN concerning the conduct of the consultation, mainly based on the requirements of CAP 725 (CAP 725 is guidance rather than mandatory requirements). At the initial Framework Briefing, the SARG considered that departure from the guidance was reasonable given the nature of the proposal. Specifically, the use of the Airport's Consultative Committee as a vehicle for consultation was agreed as an acceptable way of reducing the consultation burden for SID replication and the associated environmental considerations. Whilst GATCAN considered that other organisations should have been consulted, the result would have been a wide consultation that was not required due to the nature of the proposal. Hence, the stakeholder list agreed at the Framework Briefing was considered adequate. The overall assessment of the consultation process by the CAA was that it was satisfactory and I am content that it met my requirements.

6. REGULATORY DECISION

6.1 I am content that the proposed airspace design is safe, which satisfies my primary statutory duty. Thereafter, when considering the competing demands of my remaining duties, together with the extant Directions and Guidance, I am satisfied that the implementation of RNAV SIDs is fully justified, consultation has been appropriate, and whilst the environmental analysis indicates that an overall environmental benefit cannot be demonstrated, standard noise metrics under CAP 725 guidelines would be unlikely to show any change, and equally, there is unlikely to be any adverse impact on CO_2 emissions and LAQ. The implementation is in line with Government guidance to concentrate traffic, and whilst some people will experience more concentration, others will see less overflight. In due course, it may be possible to design alternating respite procedures within existing NPR swathes, but this will be very much dependant on strict RNAV design criteria and the plans of GAL. I have therefore decided to approve this change proposal.

6.2 With regard to Route 4, on 25 June 2013, the Department for Transport issued a consultation on its proposed new environmental guidance from the Secretary of State to the CAA on its environmental objectives. Following SARG discussions with the DfT, the DfT has advised that the approval on Route 4 is subject to the condition that

Continued (8 of 11 pages)

the airspace change relating to Route 4 will take into account the new guidance from the Secretary of State when this is issued, and in particular ensure that there is an appropriate match between the Standard Instrument Departure Procedure and the Noise Preferential Route. GAL will need therefore to review and assess whether Route 4 meets the parameters of Noise Preferential Routes as defined within the new guidance and consult within a 12 month period, commencing from the publication date of the new guidance, (which is expected to be before the end of 2013), on any changes necessary to ensure that Route 4 meets the parameters of Noise Preferential Routes as defined there.

6.3 The revised airspace will become effective from 14 November 2013 (AIRAC 12/2013 and will be promulgated via a double AIRAC cycle. If you have any queries, the SARG Project Leader, Mr D W Raine, may be contacted on 020 7453 6518, or via e mail: dave.raine@caa.co.uk .

6.4 In line with our standard procedures the implications of the change will be reviewed after one full year of operation, at which point, my staff will engage with interested parties to obtain feedback and data to contribute to the analysis.

Mark Swan
Director

Annex A: Summary of ERCD Report.

ANNEX A TO
GATWICK RNAV SIDs DECISION LETTER
DATED 14 AUGUST 2013

SUMMARY OF ERCD REPORT

INTRODUCTION

This is a summary of the Annex E report prepared by ERCD titled 'Gatwick PRNAV SID Replications' for DAP (dated 18 January 2013). The report described the environmental considerations relevant to the proposed introduction of RNAV SIDs at Gatwick Airport.

POINTS OF NOTE

Due to increased accuracy of aircraft adhering to the RNAV SID centreline, traffic dispersion is reduced thereby reducing the populations over flown, all other things being equal. This should reduce the number of people affected by the noise from departing aircraft, but is likely to result in some people being overflown more often. Additionally, if the route is actually moving because the RNAV SID cannot replicate the conventional SID exactly, it may not necessarily be true that in all cases fewer people will be affected.

For this proposal, the dispersion of traffic is likely to change on some of these Routes even though that dispersion may be contained within the NPR swathe. For example, some of the Routes (particularly those with turns after departure) will experience a more concentrated dispersion once RNAV SIDs are implemented.

Based on the evidence presented by the sponsor, it was concluded that the changes would be unlikely to have an impact on the L_{eq} noise contours or the 90dBA SEL footprints. This was either because the expected traffic dispersion resulting from the new RNAV SID was comparable to the existing traffic dispersion; or any difference in dispersion occurs beyond the 57dBA contour and the 90dBA SEL footprint.

As introducing RNAV SIDs is not expected to increase traffic numbers or to change vertical profiles[13], to a large extent the noise impact therefore represents a redistribution of noise. As noted, this will generally mean some people experiencing an increase in overflights due to the nature of RNAV and its improved track-keeping, and others that are currently beneath the wider dispersion experiencing fewer overflights. However, on two of the Routes (2 & 4) there appears likely that there will be a shift in concentration that is not entirely due to traffic becoming more concentrated around the existing traffic pattern.

- On Route 2 conventional traffic is on a wider dispersion and is concentrated to the west of the NPR centreline whilst the RNAV traffic is concentrated on a path to the east of the NPR centreline.

- On Route 4 conventional traffic has a wider dispersion, mostly to the west of the NPR centreline after the right-hand turn but largely within the NPR swathe. The RNAV traffic is more focused and initially has a similar path to the conventional traffic, but a small percentage of traffic is shown to exceed the limit of the NPR swathe, for a brief duration before they reach 4000ft.

The CAA considered the need for undertaking an emissions assessment on the assumption that the RNAV SIDs would replicate the existing conventional SIDs, with no changes to fleet mix, traffic volumes or vertical profiles. It was concluded that a CO_2 assessment would not

[13] Unless the safety requirement to include altitude constraints at a number of waypoints due to revised 2012 obstacle data causes a slight increase in vertical profiles.

be required as any increase or decrease in fuel burn and CO_2 emissions would be minimal, and that the likelihood would be no change overall.

The CAA considered the need for undertaking an LAQ assessment on the assumption that the RNAV SIDs would replicate the existing conventional SIDs, with no changes to fleet mix, traffic volumes or vertical profiles. It was concluded that a LAQ assessment would not be required as there would be no impact on LAQ as a result of this proposal.

CONCLUSIONS

An overall environmental benefit cannot be demonstrated. Standard noise metrics required under CAP725 (L_{eq} contours, 90 dBA SEL footprint) would be unlikely to show any change as a result of this proposal. Equally, any impact on CO_2 emissions is likely to be negligible, and there is not likely to be any impact upon LAQ.

However, in line with current Government guidance, the introduction of RNAV will generally result in fewer people being overflown, assuming all other things being equal. Of the four trialled SIDs, the distributions (below 4,000ft) on Routes 1 and 3 show that traffic is concentrated along a path similar to that of traffic on the conventional SID. On Routes 2 and 4, the portrayed distribution (below 4,000ft) of traffic on the RNAV SID differs to that on the conventional SID, as outlined above.