Reduced Night Noise Trial Proposal

NMB/11 - Working Paper

Date: 18 June 2018

1. Introduction

Work has continued on the proposed RNN trial since NMB/10 to take into account the remarks, guidance and feedback provided by NMB members. This paper:

- gives a recap of the trial plans,
- summarises the activity since NMB/10,
- presents the response to community requests at NMB/10 – also presented at the meeting on 23 May,
- describes the noise modelling undertaken,
- presents the proposed trial routes taking account of recent feedback,
- proposes a way forwards to continue the trial.

Communities have also asked for information on whether outliers could be removed without the use of RNAV. There is a separate presentation on the activities of GAL in dealing with outliers, the removal of which has been identified as a priority by the NMB. In addition, Annex A contains a summary of the NMB activities that are contributing to elimination of outliers.

2. Recap of the trial plans

The trial aim is to demonstrate the noise benefits of RNAV, and its other impacts, for arriving aircraft through a fixed term 6 month trial. The trial is expected to operate between 01:30 – 05:00 local for the first 6 months of 2019. The objectives are to:

- Demonstrate that RNAV can reduce the peak noise levels generated per arrival per aircraft type
- Compare the ‘with RNAV’ and ‘without RNAV’ noise situation by placing RNAV routes inside the existing arrival swathes
- Inform future planning and gather operational data on RNAV use at Gatwick
- Evaluate new community engagement initiatives and processes

The trial will:

- Demonstrate the noise benefits of RNAV – compare with and without RNAV
- Inform future planning as to the impacts of RNAV
- Gather data on RNAV operational performance and noise impacts
- Further develop the NMB’s understanding of arrivals RNAV
- Evaluate new community engagement initiatives and processes

The trial will not:

- Identify routes for use in future airspace design
- Overfly people currently outside of the night time arrivals swathe
- Move the minimum night-time ILS joining point from 10NM
- Optimise routes for capacity improvements or efficiency

- Evaluate future mechanisms for higher-density sequencing, FED, respite or other concepts
- Introduce an airspace change without consultation

3. Summary of activity since NMB/10

Several community concerns were raised at NMB/10 and a response to these was given in a presentation on 23 May before the departures workshop. The response is provided in the following section.

In addition, noise modelling has been undertaken to quantify the expected benefits of RNAV in terms of outliers. The results are presented in Section 5.

Technical discussions have also been held with NATS and Trax. The outcomes of these discussions are:

- There are practical procedure design constraints regarding the route placements, for example the minimum spacing of RNAV waypoints. More design work is required on the routes, but the results of these constraints could be one of:
    - Final approach joining points would need to be widely spaced. In this paper, routes are assumed to join the final approach with about 1 NM – 1.5 NM spacing. The spacing may need to be larger.
    - The procedure would be confined to the ILS approach on the southern (main) runway. This means it may not be used on nights when the northern runway is active or if the ILS on the southern runway is unavailable.
    - The procedure will use advanced RNAV functionality, potentially reducing the number of aircraft that participate in the trial.
- NATS may suspend the trial on nights when in their view the traffic volume becomes too high.
- There is no constraint foreseen by NATS for easterly arrivals (as had been a concern earlier). However, if there was a conflicting traffic risk, the RNAV procedure would be terminated for that arrival and it would revert to vectoring.
- Commencing the RNAV arrival at 7,000 ft (FL 70), below which Government regards noise considerations to be relevant, may not be ideal from an operational perspective (6,000 ft may be better).
- More design work is required on the routes and the planned trial start date could be at risk.

4. Response to community feedback

During NMB/10, CNGs requested that further work be conducted to address the trial's quantifiable objectives, safeguards and communications plan. These concerns were addressed during an RNN briefing on 23 May and are provided below:

a. Quantifiable objectives

The following figures have been proposed by GAL, however further analysis is required before confirmation of the presented figures:

- Objective 1: The loudest outliers reduced by 90%
- Objective 2: The lowest outliers reduced by 90%

The objectives above will be measured using recorded noise data at noise monitor locations and will be calculated for each aircraft type. For the trial, outliers are those in the 'worst performing' 5% of aircraft, i.e. the loudest 5% or the lowest 5%.

b. Safeguarding

The following reassurances have been provided by GAL to address CNG concerns about safeguarding:

- The trial will not proceed if the noise impact assessment does not present the expected reduction in N60 events.
- The trial will be suspended if, once an initial sample of data is analysed, it is found that the objectives are unlikely to be met.
- The trial will be suspended to evaluate any safety concerns that are raised by operational staff.

c. Communications Plan

GAL will ensure that trial planning and implementation updates are regularly provided to the NMB as follows:

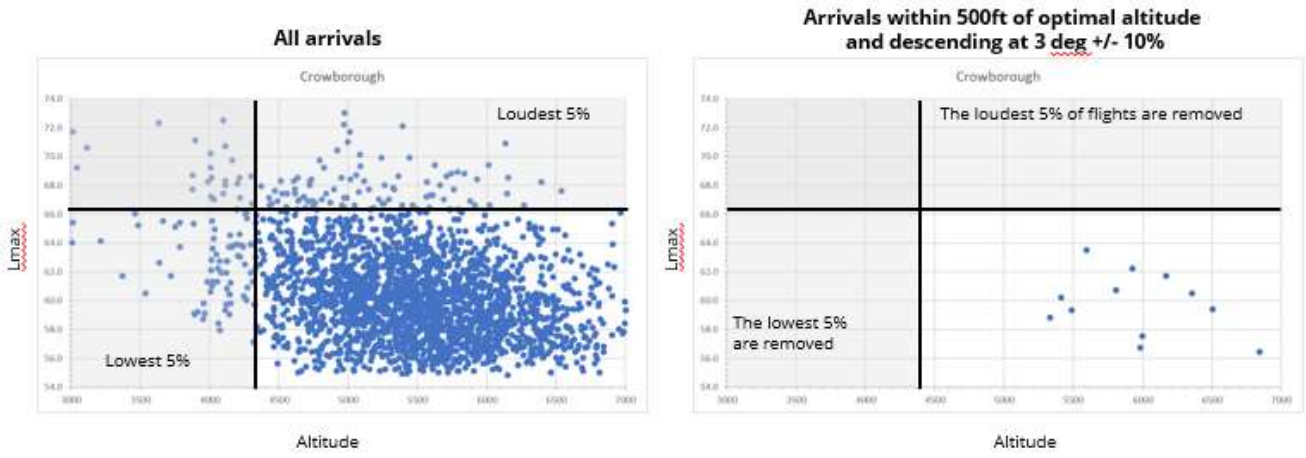
- The NMB will prepare a dedicated website page on the RNN trial including:
  - a “community friendly” description of the trial that can be easily accessed and circulated to members; and
  - frequent updates on trial progress, including the results of the trial once it has completed.
- Progress updates will be provided through the NMB Chair’s blog.
- Regular updates will be reported to NMB meetings.
- A briefing will be provided at the public NMB/Airspace meeting in December 2018.
- Email updates will be circulated to those who have registered on the Gatwick website for information on noise-related topics.

Further to the above, CNGs will be asked for details of how they plan to communicate the trial.

5. Noise modelling

The noise modelling presented here is based on the noise data recorded in August – October 2017 as part of the University of Sussex Perceptions of Noise study (Imm-15).

The figures show the noise from arrivals as measured at Penshurst and Crowborough. The aircraft flying loudest and lowest are reported. The loudest 5% and the lowest 5% are shaded. The left hand figure shows all arrivals. The right hand figure shows those arrivals that are within 500ft of the optimum altitude and descending at 3 degrees +/- 10% - similar to what would be expected from RNAV. The actual RNAV procedure may not necessarily use a 3 degree descent. The modelling does not reflect all the constraints of RNAV, for example, the arrival speed may be controlled differently within the RNAV procedure.



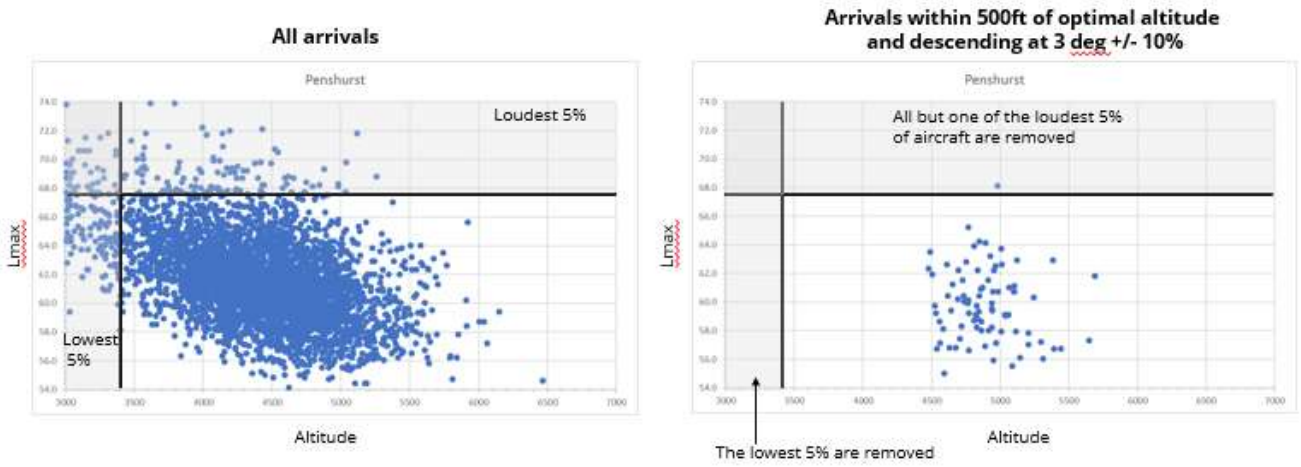


Figure 1: Noise data recorded from Penshurst and Crowborough

Of the "RNAV-like" arrivals, almost none are in the 5% outlier areas of the other arrivals. This has been used to estimate the quantitative objectives of the trial, which are:

- Objective 1: The loudest outliers reduced by 90%
- Objective 2: The lowest outliers reduced by 90%

Notes:

- "Noisiest outliers" are the 5% noisiest arrivals (by aircraft type)
- Lowest flying aircraft are the 5% lowest flying aircraft (by aircraft type)
- The data will be measured over a sample of at least 1000 aircraft
- Measured at each noise monitor location

6. Proposed routes for the trial

Feedback has been received from NMB members and others on the possible trial objectives, processes and possible route designs. This includes discussions at NMB meetings, the NMB RNN Workshop, and RNN meetings, where the following points have been raised:

- A request to move runway 26 arrival routes west away from current swathe and use an 8NM join in place of 10nm during the night. This suggestion has been rejected for the trial because the RNAV routes need to be in the areas of the current swathe, so that it is possible to usefully compare the 'before' and 'after' situations, and also to meet the objective of avoiding newly overflown.
- CNG also proposed that concentration be avoided as much as possible. An extra route has been added to each direction (so there are 4 instead of 3 as previously proposed) which can potentially spread traffic more effectively. The proposed routes do not merge or cross to create concentration points before joining the ILS. The proposed routes are spaced to minimise duplication of overflight areas.

The proposed routes are illustrated in the following figure. The routes are preliminary indications rather than confirmed locations as they may need to be adapted during the procedure design process to meet the obligations of technical and safety criteria (see section 3, for example).

Figure 2: Proposed preferred trial routes (subject to procedure design)

7. Discussion and recommendation

The NMB is invited to note the contents of this paper for discussion at NMB/11.

Appendix. Activities to reduce outliers

The table below details completed and ongoing NMB-requested activities to reduce the number of outliers.

Activity	Description	Status
Briefing Pack	Development of an operator briefing pack for all existing and new airlines which operate at Gatwick. This pack provides guidance on required, and in some cases recommended, operations at GAL, and draws attention to the requirement for CDO on approach and noise abatement procedures which must be adhered to.	Complete
Review of Commercial Flight Plan procedures	A gap analysis was conducted on the information provided to airlines by commercial flight plan service providers compared with the regulated information contained in the UK AIP. The review identified several improvements to the level of clarity of information provided (i.e. CDO operation) which was subsequently updated by commercial information providers.	Complete
Noise League Table	Development and publication of a league table to track airline noise performance. The league table will measure airline performance against specific noise metrics, highlighting any poor performers. GAL will subsequently engage with the poor performers to discuss options for improving their operation.	Ongoing
Low Noise Arrivals Metric	Development of a low noise approach metric to improve upon the current CDO definition. Although this study was initiated by GAL, it is not GAL specific and therefore Sustainable Aviation (SA) are leading the initiative with support from the CAA and NATS. The study is investigating and developing a refined assessment methodology for the operation and measurement of low-noise arrivals that accommodates Low Power/Low Drag (LPLD) operations.	Ongoing
Reduced Night Noise Trial	The Reduced Night Noise (RNN) trial will introduce RNAV routes in the night period to measure the noise benefit. RNAV arrival routes enable aircraft to fly continuous descent profiles with reduced level flight, thus keeping aircraft higher for longer and reducing the noise impact on the ground.	Ongoing
Standardisation of Noise Abatement Departure Procedures	GAL are seeking to identify an optimal Noise Abatement Departure Procedure (either NADP 1 or NADP 2) with the intention of this procedure becoming recommended practice at GAL.	Ongoing