

---

# Reduced Night Noise Trial Industry Briefing

**Date:** 05 May 2022

**Attendees:** Egis, GAL, NATS, CAA, CAA ERCD, ANS, Trax, Mitchell Environmental, EasyJet, NMB Co-Chairs

## 1. Introduction

Gatwick Airport is planning a trial to assess the extent to which PBN (Performance Based Navigation) can deliver noise benefits to arriving aircraft during the night. The Statement of Need and Trial Plan were developed and submitted to the CAA in Q3 and Q4 2018 respectively, and an Assessment Meeting was undertaken with the CAA in Q1 2019. The RNN Trial Submission Pack was finalised and submitted in Q4 2019, however progress was paused as a result of the COVID-19 pandemic.

Trial preparations recommenced in Q1 2022 following the return of air traffic to more regular levels. Trial documents can be found on the [CAA Portal](#). To support planning activities, an RNN briefing was held with industry to reintroduce the trial and to discuss a range of technical aspects including the Instrument Flight Procedure (IFP) designs. This document summarises key points and actions raised during the briefing.

## 2. Discussion

### ATC Operating Instruction

Egis provided an overview of the trial, noting that the trial is planned to run for 6 months between the hours of 01:30-05:00 (local), commencing in January 2023. ATC will log all flights that did not accept the PBN procedure and/or any time period the trial was suspended.

- NATS requested that a fixed point in space be identified, at which the trial procedure should commence. It was agreed that the trial would commence when aircraft are predicted to be over the first waypoint in the trial procedure. Any aircraft that is expected to overfly the first waypoint between 01:30 and 05:00 would be instructed to fly the PBN procedure. Aircraft would land at the airport approximately 7 minutes later. This will be taken into account when performing the data analysis.
- NATS data log will be the primary data source to determine which aircraft participate in the trial. This can be checked against GAL's NTK records. GAL confirmed that they can undertake Gate Analysis using their NTK system to help identify as close as possible which aircraft participate in the trial.

### Trial Data Capture

Egis explained that flight volumes have been determined using 2017-2019 data, however night-time traffic levels have reduced since 2019 as a result of the pandemic. It is expected that traffic will increase through 2022/2023, and it is accepted that a smaller sample size would still be valid to draw sensible conclusions.

- CAA enquired what a minimum sample size might look like. Egis clarified that it is difficult to determine as the traffic forecast for 2023 is not yet available, however based on 2017-2019 data, we would expect approximately 10 flights per night on average. As well as total flights, the trial will also assess noise impacts of different aircraft types. It is difficult to say at this time what a representative sample might look like.

### Trial Objectives

The following objectives will be monitored using recorded noise data at noise monitor locations, and will be calculated for each aircraft type participating in the trial: Objective 1 - the loudest outliers reduced by 90%; Objective 2 - the lowest outliers reduced by 90%. Outliers are defined as those in the 'worst performing' 5% of aircraft, i.e. the loudest 5% or the lowest 5%.

- CAA ERCD stated that objective 2 is not a noise objective, but is intuitively linked to objective 1.
- EasyJet observed that aircraft should be flying in a uniform way during the trial, i.e. all flying the PBN procedure. Objective 2 can be used to validate PBN performance, i.e. demonstrate that more accurate descent profiles remove low flying aircraft. It was agreed that the wording in the trial submission pack be updated to make it clear that objective 2, although not a noise objective, should be used as a secondary objective to measure PBN performance.
- The objective of the trial is to reduce the worst performing 5% of aircraft by 90%. CAA enquired if it is possible to quantify how many aircraft per night this might be. Egis and Mitchell Environmental agreed to investigate this when analysing the Noise Monitor Terminal (NMT) baseline data.

## **IFP Design**

Trax presented the IFP designs to the group, including altitude and speed restrictions and details of IFP validation.

- Approach transitions have been designed starting at 250kts max indicated airspeed (IAS) where possible. Aircraft joining the PBN procedure at this speed may have to utilise speed brakes and/or level flight segments to aid energy management, thus impacting the trial results. To prevent this, ATC must instruct the pilot in plenty of time to allow for efficient descent management. It was agreed by the group that the most effective way to manage aircraft speed and configuration would be to update the approach transitions to start at 220kts max (from 250kts), with 200kts max during the RF turn. This should be replicated for straight in approaches. CAA ERCD observed that 220kts IAS should be fine for the start of the procedure given that aircraft leave the stack at 220kts today. Trax agreed to confirm with the CAA whether they are happy to accept the ground validation (sim) completed in 2019, with a 250kts max speed limit.
- A level flight segment at 2,000ft and 3,000ft have been built into the ILS procedure for RWY08R and RWY26L respectively. For RNP-1 approach procedures, 'at or above' altitude controls have been built into the designs to enable continuous descent.
- RWY26L procedure design – The FAF is located at 2,000ft and as such, altitude restrictions at 3,200ft and 3,600ft have been built into the design to ensure that aircraft do not descend below 3,000ft at, or before, 10NM from touchdown. EasyJet requested that the profile glide path on 26L Approach Chart is extended to 3,000ft (currently extends to 2,000ft only) as most aircraft will join at 3,000ft.
- Waypoint names were approved at the time of IFP submission. Validity of these names will be checked by Trax. NATS requested that the WIZUT waypoint name be checked as it is similar to the existing WIZAD waypoint near the Airport.

## **Low Noise Arrivals Metric (LNAM) Criteria**

The current procedures are designed to cater for a 2.8° descent (6000ft at 20NM) minimum. CAP2302 states that 'for modern aircraft types and current operational speed constraints, optimum noise is achieved for intermediate approach angles around 2.5 degrees'. The group discussed whether the current route designs should be updated to accommodate a 2.5° descent profile.

- CAA ERCD stated that the current procedure may not be the most noise efficient procedure for all aircraft types, however, to redesign the trial routes would be time consuming and delay the trial.
- CAA ERCD said that the only aircraft with an ideal descent profile from a noise perspective significantly below 2.8° is the B787. However it is anticipated that very few B787's will be flying during the trial period. Egis will confirm with GAL how many B787's arrive between 01:30 and 05:00 at the airport using the latest arrivals data. The A320 ideal descent angle is 2.7°/2.8°, which was considered close enough to the trial descent angle.
- It is important to compare 'like for like' when looking at the baseline data and the trial data. In today's operation, aircraft flying the 'ideal' CDO profile descend at a gradient of approximately 3.0°, in line with 2006 Industry Code of Practice (6,000ft at 20NM). The trial routes are designed to replicate the ideal CDO. If routes were designed to accommodate the LNAM criteria it would be difficult to determine the extent to which any noise improvements result from the removal of outlier aircraft alone. The group agreed that for a fair assessment against current procedures, the route designs should remain as they are.

- A 2.8° descent profile will inform LNAM performance, i.e. identify aircraft which require a level flight segment to aid energy management when descending at 2.8°. This would be an observation of the trial.
- The trial submission pack should be updated to acknowledge the new low noise metric.

#### Other Comments

- EasyJet asked how much notice would be given to the aircrew before joining the procedure to enable preparation on the flight deck. NATS confirmed that pilots would receive information about the trial procedure on first contact with London.
- The CAA IFP team have indicated that they have capacity to support the trial. CAA will remind the IFP team of the planned trial dates.
- ANS enquired how a missed approach will be handled during the trial. NATS confirmed that a missed approach will be vectored back to final approach as per the current procedure. They will not be directed back to the start of the PBN procedure.
- All participants were encouraged to work to ensure that planned trial dates do not slip to ensure that the results are known in good time to inform FASI-S planning.

### 3. Key Points and Actions

This section summarises the key points and actions which were discussed during the RNN briefing.

#### Key Points

| Subject                   | Description   |
|---------------------------|---|
| ATC Operating Instruction | The trial procedure will commence when an aircraft is predicted to be over the first waypoint in the trial procedure. Aircraft that overfly the first waypoint between 01:30 and 05:00 will be instructed to fly the PBN procedure. |
| Trial Objectives          | Trial Objective 2, although not a noise objective, should be used as a secondary objective to measure PBN performance.  |
| IFP Design                | Update the IFP approach transitions to start at 220kts max IAS, with 200kts max during the RF turn. This will aid energy management on descent avoiding the need for level segments or deployment of speed brakes.                  |
| Low Noise Arrivals Metric | For a fair assessment against current procedures, the trial descent angle will remain as previously planned. The trial will inform LNAM performance.  |

#### Actions

| Action  | Owner                         |
|---|-------------------------------|
| <b>Action 1:</b> Update the wording in the trial submission pack to make it clear that trial Objective 2 isn't a noise objective, but instead will be used as a secondary objective to measure PBN performance. | Egis                          |
| <b>Action 2:</b> The objective of the trial is to reduce the worst performing 5% of aircraft by 90%. Quantify how many aircraft per night this might be using NMT baseline data.                                | Egis / Mitchell Environmental |

|  |            |
|--|------------|
| <b>Action 3:</b> Update IFP designs to reflect the new speed restrictions (220kts max IAS at start, 200kts max in turns).  | Trax       |
| <b>Action 4:</b> Confirm with the CAA whether the ground validation (sim) completed in 2019, with a 250kts max speed limit is still acceptable, or whether this needs to be repeated for a 220kts max speed limit. | Trax       |
| <b>Action 5:</b> Investigate extending the profile glide path on 26L Approach Chart to 3,000ft.  | Trax       |
| <b>Action 6:</b> Check the validity of the existing trial waypoint names, and confirm acceptance of the WIZUT waypoint name, given its similarity to the existing WIZAD waypoint near Gatwick.                     | Trax       |
| <b>Action 7:</b> Confirm how many B787's arrive between 01:30 and 05:00 at the airport using the latest arrival data.  | Egis / GAL |
| <b>Action 8:</b> Update the Trial Submission Pack to acknowledge the new low noise metric.   | Egis       |
| <b>Action 9:</b> CAA to remind the IFP team of the planned trial dates.  | CAA        |

#### 4. Next Steps

Discussion points from the RNN briefing will be reflected in the trial submission pack as appropriate, and outputs of the discussion will be used to support continued trial planning and preparation.