YOUR LONDON AIRPORT Gatwick

Reduced Night Noise Trial Submission Pack

Gatwick Airport Limited

Prepared by Egis

27 July 2022

Version 2.0

CAA Trial Reference number ACP-2018-62

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Revision history

Version 1.0 published on CAA Portal in September 2019

Version 2.0 published on CAA Portal in July 2022. The latest version incorporates the following:

Section	Update
Introduction	Updated wording to address the length of the trial and possible trial extension which might result under extenuating circumstances (i.e. low traffic resulting from a pandemic lock-down).
Introduction	Updated wording to better define the quantitative objectives.
Section 1	Reference to the RNN Trial Industry Briefing held in May 2022, and inclusion of the briefing minutes as Annex F.
Section 3	Updated Gatwick STAR designators, speed restrictions applied to each approach transition, and the IFP Validation section.
Section 3	Updated wording to acknowledge the new Low Noise Arrivals Metric.
Section 4	Updated analysis to show the expected frequency and timing of flights during the proposed trial period, and inclusion of additional data. Additional data included in supporting Annex K.
Section 4	Updated wording to address the change in traffic levels since the pandemic, and what this means for the trial.
Section 5	Updated section to include further details of NATS safety assessment and training requirements.
Section 6	Updated wording to better clarify when ATC will commence the trial each night.
Section 6	Updated wording to better reflect conditions under which the trial might be suspended.
Section 7	Updated wording to reflect the trial delay, supported by an updated activity Gantt Chart.
Section 7	Additional section to acknowledge timescales.

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Annexes

References

1 CAA CAP 1616 UK Airspace Change Process, March 2021
2 CAA CAP 1498 Definition of Overflight, Edition 2, April 2017
3 CAA CAP 2302 A Low Noise Arrival Metric, January 2022

YOUR LONDON AIRPORT Gatwick

Introduction

Purpose

Gatwick Airport is planning a trial to assess the extent to which PBN (Performance Based Navigation) can deliver noise benefits to local stakeholders by changes to the flight-path management of aircraft arriving during the night.

This document is the Trial Submission Pack for the Reduced Night Noise (RNN) trial, comprising 7 sections and 16 annexes which address the requirements of CAA document CAP1616[1] (Part 1b) for airspace trials:

1. Industry Consultation
2. Engagement
3. IFP Design
4. Environmental Assessment
5. Safety Assessment
6. Trial Procedures
7. Activities Undertaken

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 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.

This document supersedes RNN Trial Submission Pack (Version 1.0) submitted to the CAA in Q3 2019[2]. Only minor changes have been made to Version 2.0 – these are listed at the front of this document.

Description of the trial

In April 2017, Gatwick Airport's Noise Management Board (NMB)[3] agreed that opportunities for night noise respite should be explored to endeavour to reduce the impacts and the number of people disturbed by night arrivals. Subsequently, independent research conducted by the University of Sussex for Gatwick indicated that 'outlier' noise events, defined as aircraft which are significantly lower or noisier than the mean, are responsible for a disproportionate impact on communities.

PBN is a means of modern aircraft navigation that allows the vertical profile of arriving aircraft to be controlled in a more accurate manner, which could remove outliers.

[1] CAP1616 Airspace Change: Guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information, March 2021.

[2] Reduced Night Noise Trial Submission Pack, Version 1.0, 27th September 2019.

[3] NMB members include Gatwick Airport Consultative Committee (GATCOM), County Councils, Community Noise Groups, Gatwick Airport, CAA, DfT, NATS, ANS, Airlines.

Gatwick is therefore proposing a trial to assess the extent to which PBN technology can deliver noise benefits for arriving aircraft during the night period, by reducing the number of noisy 'outliers' that are significantly lower or noisier than most aircraft.

The following principles have been presented to and agreed at the NMB, and have been used in the trial design:

The trial will:	The trial will not:
✓ Compare environmental performance of 'with PBN' and 'without PBN' scenarios by placing the new procedures in the existing airport night-time arrivals swathe.	× Identify routes for use in future airspace design.
✓ Identify and address the planning, implementation and operational challenges associated with multiple PBN arrival transitions to inform future planning.	× Overfly people currently outside of the night-time arrivals swathe.
✓ Gather data on PBN operational performance and noise impacts.	× Move the minimum night-time ILS joining point from the existing10NM.
✓ Further develop the NMB's understanding of PBN for arrivals.	× Optimise routes for capacity improvements or efficiency.
✓ Evaluate new community engagement initiatives and processes.	× Evaluate future mechanisms for higher-density sequencing, Fair and Equitable Distribution (FED), respite or other concepts.
	× Introduce a permanent airspace change without consultation.

The trial is planned as follows:

- Length of trial: 6 months in total, planned to start on 26 January 2023 (see note below).
- Timings[4]: 01:30 – 05:00 (local time).
- Runway: Transitions will intercept the ILS on runway 26L & 08R / GNSS approach on 26R & 08L.
- Routes: Based on RNP-1 with RF legs[5].
- Participation: PBN routes to be flown by capable aircraft, with others being vectored as at present.
- Number of Flights: Based on 2017-2019 data of the number of flights. A summary of the data used to generate a baseline for the trial can be found in **Annex K.**

[4] 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. Aircraft will land at the airport approximately 7 minutes later.

[5] RNP-1 is a high standard of PBN navigation performance; the RF (radius-to-fix) leg capability means that aircraft follow a strictly defined radius of turn and hence there is minimal variation in the tracks over the ground including turning segments.

- Data capture: Mobile Noise Monitor Terminals (NMTs) will capture the baseline and trial data environments. Track and altitude profile data will be recorded for all flights during the trial period.
- Suspension: Trial may be suspended for operational reasons (e.g. high levels of traffic, weather avoidance) or if the trial is not meeting its objectives.

Due to the novel nature of the PBN trial procedures they are best managed in low volumes of traffic, and as such, the trial will run during the night between 01:30-05:00 (rather than for the whole night-time period (23:00-07:00)). The trial period was selected based on an assessment of night-time traffic volumes in 2017-2019. If traffic volumes are too high, NATS would suspend the trial and revert to radar vectoring for arrivals.

The trial is intended to last for a period of 6 months, however, under extenuating circumstances (i.e. low traffic resulting from a pandemic lock-down) Gatwick may consider extending the trial following guidance set out in CAP1616. The purpose of this extension would be to allow for additional data capture from which sensible conclusions can be drawn, and will only be considered necessary if it has not been possible to collect the data that was identified in the trial plan to fulfil the objective of the trial. Any extension would be communicated in plenty of time with all stakeholders.

Why an operational trial?

Noise models can be used to predict the noise impact of aircraft, however the accuracy of noise models is reduced for aircraft at higher altitudes. The PBN procedures are expected to have a positive noise impact in the region of 10-20NM from touchdown. By running a trial, more accurate data can be collected and residents can evaluate first-hand whether the changes have any significant benefit/impact.

The trial will allow data to be recorded on mobile NMTs which are placed around the airport at ranges out to 20NM. Noise from aircraft before and during the trial will be recorded and analysed.

Quantitative objectives

The following metrics were agreed with communities in 2017/2018, and are proposed as 'success criteria' to determine if PBN is successful in removing outliers. They will be measured using recorded data at noise monitor locations and will be calculated for each aircraft type participating in the trial:

- Objective 1: Reduce the loudest outliers[6] by 90%.
- Objective 2: Reduce the lowest outliers by 90%.

How this is calculated is illustrated below for Objective 1:

- Pre-trial at each noise monitor, calculate the loudest 5th percentile – i.e. the noise level above which are the loudest 5% of aircraft (e.g. 70dB).
- During the trial count how many noise events are above that limit (in this case, 70dB) and see if the proportion of events has reduced by 90%.

Note:

Objective 1 & 2: Following initial assessment of baseline noise data, it will not be possible to reliably calculate thresholds for the loudest or lowest outliers per aircraft type due to the low data capture

[6] For the purpose of the trial, outliers are defined as those in the 'worst performing' 5% of aircraft, i.e. the loudest 5% or the lowest 5%.

rate for each type. Instead, we will identify the threshold above which the worst performing 5% of all aircraft fall and will aim to reduce these outliers by 90%.

Objective 2: This is not a direct noise objective, but instead will be monitored to assess whether the more accurate descent profiles using PBN technology remove low flying aircraft. This will be treated as a secondary objective that is a measure of PBN performance.

In earlier engagement with industry and communities, the additional objective "*A reduction in X% of N60 events*" was also proposed, where X would have to be calculated for each noise monitor location. This is difficult to calculate reliably due to the reduced accuracy of noise models for aircraft at higher altitudes. This reinforces the need for the trial since it will analyse recorded noise data to determine the impact of the PBN procedures.

Of the aircraft types usually operating during the trial period (see Section 4), the following aircraft (as a proportion of post-COVID traffic) typically have the loudest noise footprint:

1. B777 (5%)
2. A330 (0.5%)
3. B787 (5%)

Baseline data collection will resume in Q3 2022 and will be used to help determine which aircraft are operated sub-optimally during the trial period, i.e. the worst performing. Noise and altitude thresholds will be determined for each NMT using this data. This information will be available one month before the planned trial start date to allow maximum baseline data capture.

Section 1: Engagement

Introduction

Significant engagement with the NMB and with industry[7] has taken place since July 2017 on all aspects of the trial. This section summarises the key engagement activities undertaken to date and those planned for the future, including pre-trial, implementation and post-trial engagement activities.

NMB engagement activity undertaken to date

This section is concerned with NMB engagement through meetings and workshops which has primarily focussed on environmental concerns, trial hours, safeguarding, route placement and other topics. The RNN trial has been discussed as a priority topic at 7 NMB meetings and workshops to date.

For the engagement listed below, input papers, meeting slides and meeting minutes/summaries have been produced to capture inputs and outputs of each meeting. This documentation is stored on a remote server and can be accessed by members of the NMB. The NMB meeting minutes are also published on Gatwick's website.

Community concerns raised through the NMB have been addressed through this engagement, and changes to the trial plan have resulted from the feedback received. For example, the design of multiple routes to both runway ends to aid the dispersal of traffic and reduce concentration.

Engagement with the NMB has taken place through the following meetings and workshops:

1. Initial discussion at NMB-6 in June 2017, including a discussion of a previous night-time RNAV trial (see paper: NMB-6 IP08).
2. An NMB discussion at NMB/7 in September 2017 on the Reduced Night Noise initiative, originally known as 'Quiet Night Arrivals'
   (see papers: NMB-7 IP07, NMB-7 IP08, NMB-7 IP09, NMB-7 IP10 and NMB-7 WP08).
3. Discussion at NMB/8 in November 2017, including a review of Community Noise Group (CNG) pre-conditions (see paper: NMB-9 WP02).
4. A review of RNN trial next steps at NMB/9 in January in 2018 (see papers: NMB-9 IP26, NMB-9 WP03).
5. An NMB RNN workshop in March 2018 to discuss the proposed RNN initiative, including an overview of the trial, the concept of RNAV operations, and the design considerations (see paper: NMB-10 IP26).
6. An update of RNN trial discussions and next steps was provided to NMB/10 in April 2018 (see papers: NMB-10 IP25, NMB-10 IP27, NMB-10 IP30, NMB-10 IP33, NMB-10 WP03).
7. Another update was provided to NMB/11 in June 2018 (see papers: NMB-11 IP07, NMB-11 IP30 and NMB-11 WP03).
8. An NMB RNN ad-hoc meeting was held in July 2018 to resolve outstanding items raised at NMB/11 (see paper: NMB-12 IP12).

[7] Industry stakeholders include Gatwick Airport, CAA, NATS, ANS, Airlines.

9. An update on RNN activities was provided to NMB/12 in January 2019 (see papers: NMB-12 IP13, NMB-12 IP13).
10. An update on RNN activities was provided to NMB/13 in January 2019 (see paper: NMB-13 IP19).
11. An update was provided to NMB/14 in May 2019 (see paper: NMB-14-IP09).

All of the documents listed above are available on the NMB "Box" folder so have not been provided as annexes.

The trial was also presented at the Gatwick airspace and NMB public meetings in December 2017 and December 2018.

Industry engagement activity undertaken to date

This section is concerned with engagement relating to the consultation objectives (safety and operational viability of the trial). As with NMB engagement, input papers, meeting slides and meeting minutes/summaries have been produced where applicable to capture inputs and outputs of each meeting and any changes to the trial plan and proposed routes as a result of these discussions. Engagement with industry stakeholders relating to these aspects has been primarily through the following activities:

1. An industry workshop (Jul 2017) to explore potential options for night noise reduction. This included representatives from Helios, Gatwick, ANS, Airlines, CAA, NATS, Trax and DfT.
2. An industry workshop (Feb 2018) to assess the feasibility of the proposed trial and to identify any potential constraints. This included representatives from Helios, Gatwick, ANS, Airlines, CAA, NATS, Trax and DfT. Minutes from this workshop were circulated to the NMB and are provided in **Annex A**.
3. An industry workshop (Mar 2018) to further discuss possible concepts of operation and the Instrument Flight Procedure (IFP) design process. This included representatives from Gatwick, ANS, Airlines, BALPA, Helios and Trax. Minutes from this workshop were circulated to the NMB and are available as **Annex B**.
4. An industry workshop (Sep 2018) to review indicative trial routes and potential airspace issues and constraints, discuss the IFP design process, and to consider ATC and airline trial procedures. This included representatives from Gatwick, Airlines, NATS, Helios and Trax. Minutes from this workshop were circulated to the NMB and are available as **Annex C**.
5. An airline survey was circulated (Apr 2019) to members of Gatwick's Flight Operations and Performance Safety Committee (FLOPSC) to capture airline operational and procedural requirements to support the planning and development of the trial PBN routes. Feedback from the survey is summarised in **Annex D**.
6. A Technical Workshop (May 2019) to further engage on the trial and to discuss activity timescales, airline survey responses, proposed trial routes, operational procedures, trial constraints, IFP validation, and training and system requirements. This included representatives from Gatwick, EasyJet, Virgin Atlantic, TUI, Norwegian, ANS, Trax and NATS. Minutes from this workshop are available as **Annex E**.
7. More recently, an RNN Trial Industry briefing (May 2022) to reintroduce the trial and to discuss a range of technical aspects including the Instrument Flight Procedure (IFP) designs.

This included representatives from Gatwick, NATS, CAA, ANS, Trax, Mitchell Environmental, and EasyJet. Minutes from this briefing are available as **Annex F**.

Other engagement

As well as at NMB and industry meetings, the trial has been discussed at meetings with the Noise and Track Monitoring Advisory Group (NaTMAG), FLOPSC, Gatwick Airport Consultative Committee (GATCOM), and wider community groups/representatives at public meetings over a period of two years.

Details of the trial have been also publicised on Gatwick's website.

Future engagement

We propose to engage through the following existing groups as we progress with the design, development, implementation and post-trial activities. However, we will also be including a much wider audience for engagement nearer the trial start date and will continue this engagement during and after the trial:

- NMB
- NaTMAG
- Airlines, through FLOPSC and the Airline Operators Committee (AOC)
- GATCOM

Presentations and information papers will be produced and circulated to representatives of each of the groups listed above.

A short 'easy to read' description of the trial will be uploaded to Gatwick's website with Frequently Asked Questions. Regular updates will also be promulgated through the website with links to the CAA Portal.

Section 2: Industry Consultation

Overview

The objective of our consultation was to establish whether the trial is 'safe and operationally viable' to meet the requirements of CAP1616 Stage 3: 'Consult Gateway', and specifically paragraph 317:

'*Before the CAA will agree to a trial, the sponsor must demonstrate to the CAA that it has consulted with aviation stakeholders (specifically, that is airspace users, air navigation service providers and airports only) to establish that the trial will be safe and operationally viable.'*

Our consultation targeted industry stakeholders only, to satisfy the requirement above. However, extensive engagement with communities through the NMB and other platforms, as indicated in Section 1 of this submission pack, has been undertaken and will continue.

Approach

Significant consultation with industry stakeholders has taken place since July 2017. A number of technical workshops have been undertaken, and an airline survey circulated, to understand the operational, procedural, training and system requirements, and any constraints of the trial. The trial plan and proposed routes have evolved over time as a result of the discussions undertaken with both industry stakeholders and the NMB.

Following on from the Technical Workshop held on 3rd May 2019, Gatwick prepared an Industry Consultation Document (available as **Annex G**), aimed at aviation stakeholders impacted by the trial, i.e. airlines, air navigation service providers, and airports. The consultation document provided an overview of the trial including the trial objectives and principles, parameters, operations and proposed routes. In addition, responses to the airline survey were captured in the document as a supporting Annex.

Aviation stakeholders were invited to review the Consultation Document and to provide feedback to Gatwick Airport on whether the trial is safe and operationally viable. A feedback form was provided along with a dedicated email address, set up to receive the RNN trial responses.

Audience

The Consultation Document was disseminated to industry stakeholders only, including members of Gatwick's FLOPSC[8] and the National Air Traffic Management Advisory Committee (NATMAC[9]).

Consultation Period

Industry consultation was formally launched at the FLOPSC meeting on 29th May 2019. Members were informed that the consultation would run for 4 weeks and would end on Friday 28th June at 23:59. Consultation with NATMAC commenced 1 week later than that with FLOPSC, lasting also for 4 weeks.

The consultation period of 4 weeks was considered proportionate and was agreed for the following reasons:

[8] The FLOPSC Committee includes representatives of Gatwick Airport, Air Traffic Control service providers and airlines operating at the Airport.

[9] NATMAC constitution can be found here.

- the consultation population was limited to relevant aviation stakeholders directly targetable through FLOPSC and NATMAC;
- the scope of consultation was limited;
- there had been considerable pre-consultation engagement with industry stakeholders.

Industry feedback

Feedback was received via a dedicated email address and is summarised in **Annex H**. In total, 9 responses were received from a range of stakeholders, including Airlines, an ANSP, Aviation representatives from NATMAC, and the Ministry of Defence (MOD). A detailed review of the feedback received through consultation was undertaken to determine its impact, if any, on the trial, and how this feedback has been taken account of in the trial (see **Annex H**).

Based on the feedback received, no changes to the proposed trial procedures or proposed IFP designs, presented as part of the consultation, were necessary. However, several questions were identified and later addressed in the flight procedure ground validation simulator sessions.

Section 3: Instrument Flight Procedure (IFP) Design

Introduction

RNN trial routes have been discussed over the past 2 years with members of the NMB and industry stakeholders. The routes have evolved over time as a result of this engagement, ultimately resulting in the designs which are presented in this pack. Trax International (IFP Design Ltd), the procedure designers for the trial, have designed 16 routes split between both runway ends, including routes to both the Northern Runway (26R/08L) and Southern Runway (26L/08R).

This section of the Trial Submission document provides a summary of the IFP designs and validation. A detailed overview of the procedure designs and validation results will be captured in the IFP Submission, which will be submitted to the CAA as a separate document. Due to the technical nature of this section, a list of acronyms has been compiled in **Annex I**.

Evolution of IFP Designs

Trial conditions and objectives were discussed with the NMB in the early stages of trial planning to address community concerns. Communities were concerned about an increase in traffic concentration. The trial sponsors were keen to avoid newly overflown communities as a result of the trial since this would make it impossible to gather noise statistics before and during the trial from the same noise monitors. To meet these requirements, the following conditions were agreed at the NMB:

- The trial would propose multiple routes for both westerly and easterly arrivals, with the intention of minimising concentration and dispersing arrivals whilst not creating newly overflown.
- The proposed routes would be placed inside of the existing arrivals swathes and where the existing traffic density is highest. The pre-trial traffic distribution is shown in **Annex J**.
- The proposed routes would not overlap or cross before joining the extended centreline to avoid concentration of traffic.
- The proposed routes would be adequately spaced to reduce overlap of 'overflight'[10] areas.
- The trial would not move the minimum night-time joining point from 10NM.

The conditions above have been met by the IFP designs for this trial.

Initial designs focused on routes to the Southern Runway only. As planning and preparations progressed, a number of airport operating constraints were identified which limited the availability of the Southern Runway during the trial period, i.e. runway refurbishment and works. As a result, it was agreed to design routes to both the Northern and Southern Runway to alleviate this potential constraint. In total, 16 routes have been designed - 4 to each runway end.

[10] CAA CAP 1498 Definition of Overflight, Edition 2, April 2017

PBN Specification

An airline survey was circulated to members of Gatwick's Flight Operations and Performance Safety Committee (FLOPSC) on 18th April to capture airline operational and procedural requirements to support the planning and development of the trial (see **Annex D**).

Airlines were asked if their fleet, operating into Gatwick Airport, is currently equipped and approved by the State for RNAV-1 and RNP-1 operations in Terminal Airspace, and if they have RF capability.

Responses, received from EasyJet, Virgin Atlantic Navigation Service, TUI Airways, Norwegian UK, British Airways & BALPA, were as follows:

- RNAV-1 – 100%
- RNP-1 – 100%
- RNP-1 with RF capability – 67% (2 of the 6 airlines only have partial fleet capability)

Designing to RNAV-1/RNP-1 specification with fly-by and/or flyover turns would ensure 100% participation in the trial based on airline equipage. Use of RF legs could form part of a longer-term solution if they deliver noise/ flight efficiency benefits. To better understand this, RNP-1 with RF legs is the preferred PBN specification for this trial.

Number of Approach Transitions

To effectively accommodate all traffic, four transitions to each runway end were designed; one from the West via the MID 1X, BEDEK 1G, DISIT 1G, KIDLI 1G and OTMET 1G Standard Arrivals (STARS), one from the South West via the ABSAV 1G, NEVIL 1G and VASUX 1G STARS, one from the East via the BARMI 1G, TEBRA 2G and KONAN 2G STARS and one from the South East via the KUNAV 1G STAR.

Location of Approach Transitions

Analysis of radar data from Jan 2017 – Jun 2017 (between 01:30 - 05:00 local) determined the lateral distribution of night-time traffic below 7000ft and showed where the existing traffic density is the highest. From this, four Easterly arrival swathes and four Westerly arrival swathes were identified.

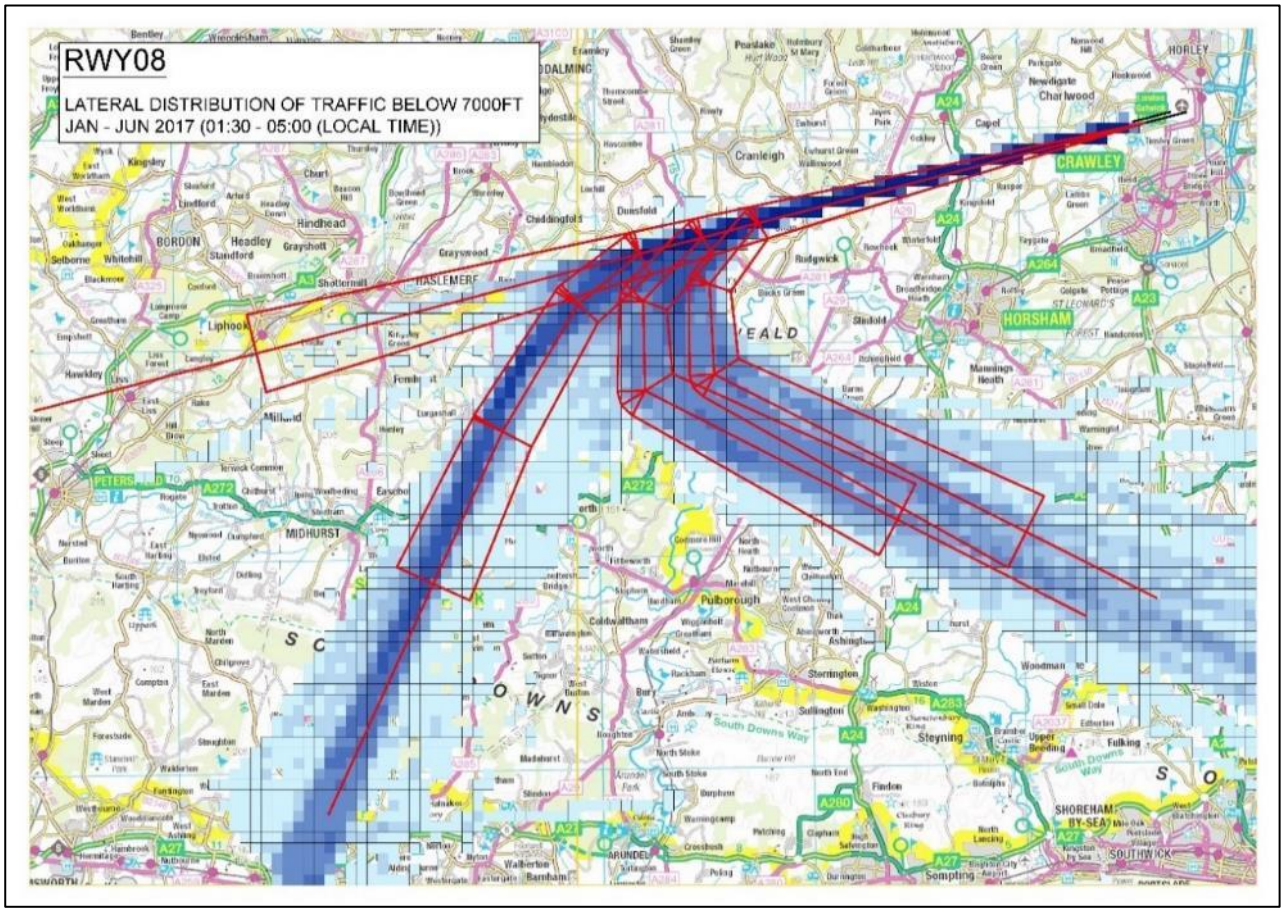

Figure 1: Arrival Swathes - Easterlies

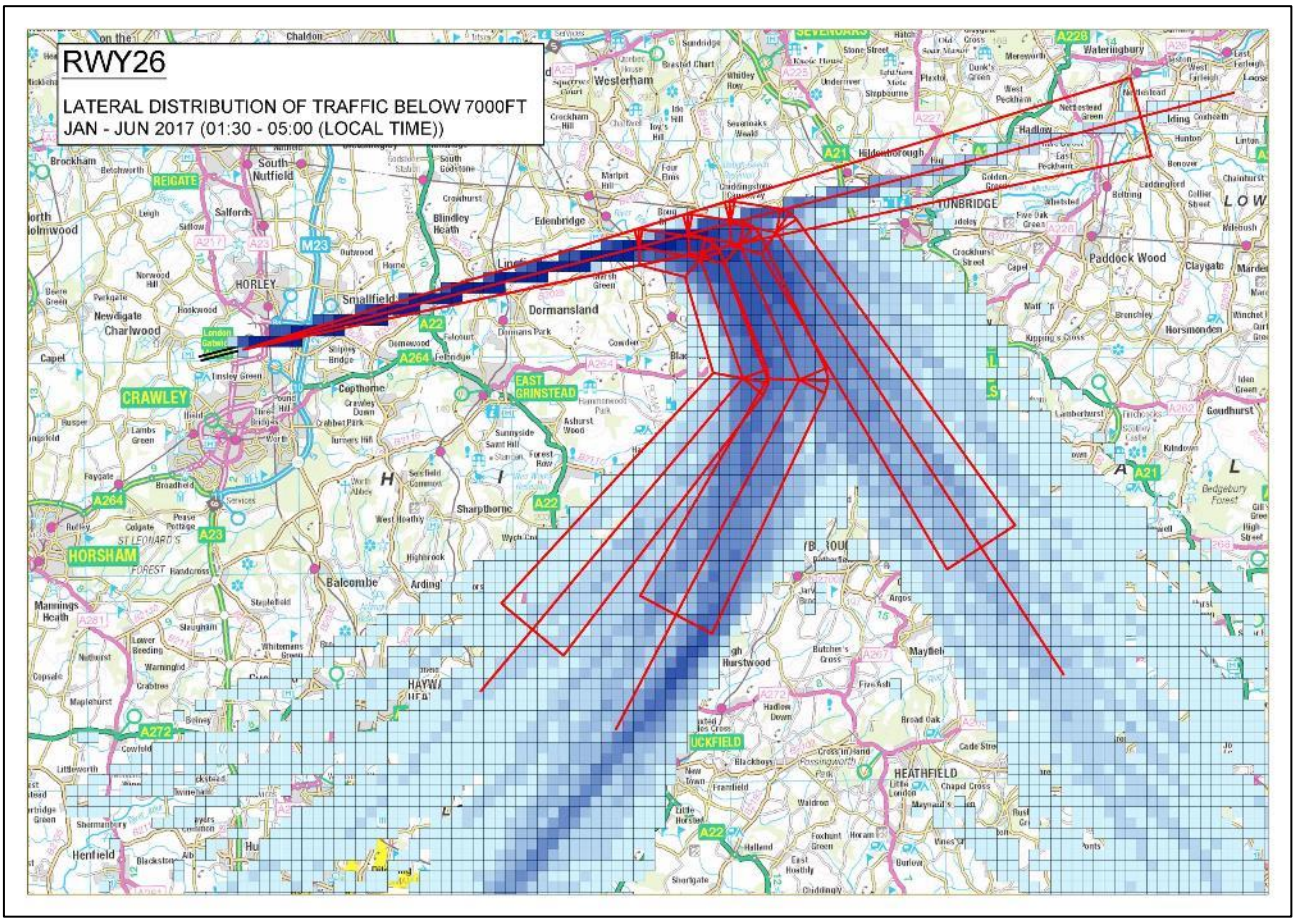

Figure 2: Arrival Swathes - Westerlies

Following discussion with ATC, two of the Easterly arrival swathes, shown in Figure 1, were considered too close and could be re-aligned to better support the different axes of arrival. It was therefore agreed to create an alternative option for traffic approaching Gatwick from the East via the BARMI 1G, TEBRA 2G and KONAN 2G STARS, as shown in Figure 3.

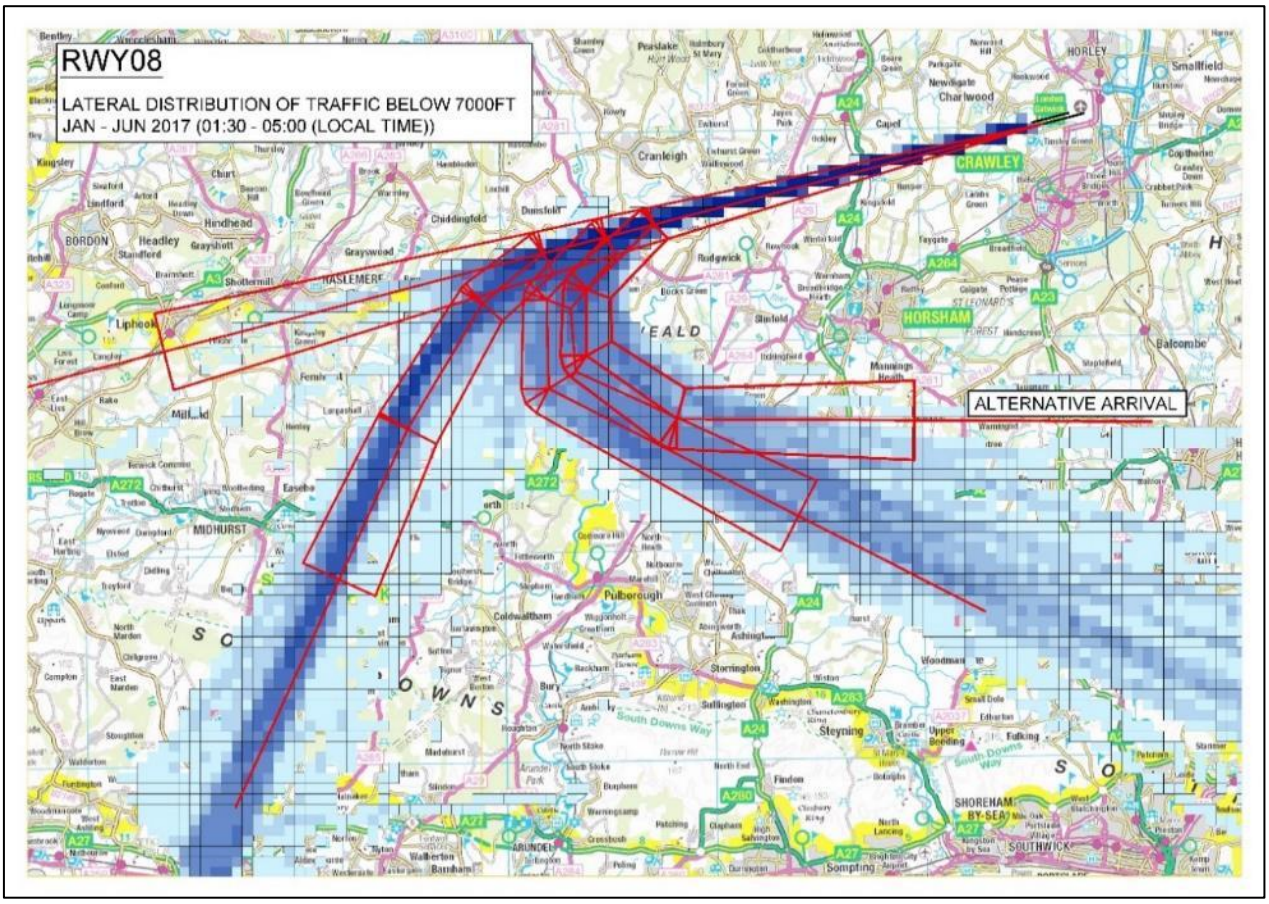

Figure 3: Alternative Arrival Swathe - Easterlies

The approach transitions have been designed to lie wholly within these arrival swathes.

Starting Altitude

As part of the planning for the RNN Trial, several technical workshops were held to review the proposed approach transitions, discuss potential airspace issues and constraints and better understand ATC and Airline trial procedures. At the first technical workshop there was a discussion about the starting altitude of the approach transitions. It was agreed that although it may be possible to commence from a higher altitude in some directions, it would be impracticable due to airspace constraints and would complicate the operation considerably.

FL070 was initially chosen as the preferred starting altitude however, in low pressure conditions, FL070 is not an available level, as it is not separated from 6000ft. It was therefore agreed that the procedure should start from 6000ft but the first waypoint will be defined as not below 6000ft to allow aircraft to maintain a higher altitude than 6000ft and descend gradually. This will ensure that aircraft can fly the optimum vertical profile into the procedure.

The starting altitude of the straight-in approach transitions has been designed at 5000ft as this reflects where aircraft currently establish on the inbound track to the landing runway at night.

Connection to Existing Procedures

A starting altitude of 6000ft/5000ft means that the approach transitions will begin at a point in space and will not connect to the Gatwick STARS. The disconnect between the STARS and the approach transitions will be clearly identified in the AIP Supplement and ATC have agreed that they will provide

clearance as early as possible. The supplement will also advise which approach transition aircrews are to expect based on their STAR. This methodology was agreed with airline and flight planning representatives at the technical workshops.

It is expected that ATC will clear aircraft to the start of the relevant approach transition well in advance of the end of the STAR. In the event that ATC cannot provide sufficient notice to the crews, they will be vectored onto final approach as per current operations, therefore not participating in the trial.

RWY08L/RWY26R

The approach transitions to RWY08L/RWY26R will connect to the RNAV (GNSS) approach procedures and will terminate at the existing Intermediate Fixes (IF) (MEBIG (RWY08L) and ARPIT (RWY26R)).

RWY08R/RWY26L

The approach transitions to RWY08R/RWY26L will position aircraft onto the Localiser course for the ILS/DME approach procedures. The current ILS/DME approach procedures do not have an intermediate segment as aircraft are currently vectored onto the Localiser course. To ensure the aircraft have sufficient distance to decelerate and carry out any configuration changes necessary before the final approach segment, the approach transitions will terminate at a point 1.5NM before the Final Approach Fix (FAF).

Length of Approach Transitions

A 2006 Industry Code of Practise report states: "*During the night quota period (2330-0600) all inbounds to Heathrow, Gatwick and Stansted, irrespective of weight or type of approach, are to be given descent clearance from Minimum Stack level at a distance from touchdown which ensures that inbounds are no lower than 6000ft when 20 track miles from touchdown*".

20NM/6000ft results in a descent gradient of 2.8° (4.9%) based on a threshold crossing height (TCH) of 50ft. The length of the straight-in approach transitions that have a starting procedure altitude of 5000ft have been calculated using this descent gradient. 5000ft was chosen for the straight-in transitions as a 6000ft point would have resulted in a re-distribution of traffic.

In addition, a length of 1.5NM has been added to the 20NM to allow operators to fly a level segment prior to the FAF, if required.

Note: CAP2302[11], published in Q1 2022, defines criteria for a new Low Noise Arrival Metric (LNAM). The document indicates that *'for modern aircraft types and current operational speed constraints, optimum noise is achieved for intermediate approach angles around 2.5°'*. The only aircraft with an ideal descent profile from a noise perspective significantly below 2.8° is the B787, however it is anticipated that few B787's will be flying during the trial period. It was agreed with industry (see **Annex F**) that for a fair assessment against current procedures, the trial descent gradient should remain at 2.8°. The trial will inform LNAM performance.

Speed Restrictions

The approach transitions were designed to accommodate 250kts Indicated Airspeed (IAS) where possible. Aircraft joining the approach transitions at this speed may have to utilise speed brakes and/or level flight segments to aid energy management, thus impacting the trial results. It was agreed by Industry that the most effective way to manage aircraft speed and configuration would be to

[11] CAA CAP 2302 A Low Noise Arrival Metric

update the approach transitions to start with a maximum 220kts IAS (reduced from 250kts), with a maximum speed of between 180kts and 200kts IAS during the RF turn to remove the requirement for crews to routinely manage the speed.

All speed limits are clearly marked on the approach transition charts and in the coding tables.

RF Radius

PANS-OPS states that the minimum RF turn radius shall not be smaller than:

a) 2 x RNP value of the inbound and outbound segments.

b) ½ AW of the inbound and outbound segments.

The ½ AW for RNP-1 in arrival or departure phase of flight (<30NM from the ARP) is 2.5NM. This is greater than 2 x RNP (2NM) and has been used as the minimum turn radius for all approach transitions.

Waypoint Names

5LNC waypoints have been allocated to the starting and finishing waypoints of each approach transition. All waypoints were allocated using the ICARD system and have been approved by ICAO for use in the trial.

All other waypoints have been assigned tactical waypoint names. The naming convention of these is AAXNN where:

- AA - The last 2 letters of the aerodrome ICAO Location Indicator.
- X - T (Trial)
- NN - A numeric code from 00 to 99.

The numeric codes 08 and 26 have not been used.

Approach Transition Naming Convention

Currently there is no criteria in 'ICAO Annex 11 – Air Traffic Services' governing the identification of approach transitions. The naming convention to be used was discussed at a number of Technical Workshops and the agreed format was:

- AAAAA - A basic indicator which will be the starting waypoint.
- N - A numeric code signifying the validity of the approach transition. 1 as it is the first iteration.
- X - A runway indicator. The indicators used are the same indicators used as per the Gatwick SIDs. Z for RWY08R and X for RWY26L. As there are no RNAV SIDs from RWY08L and RWY26R, the letters Y (RWY08L) and W (RWY26R) were chosen.

Route Separation

ATC are responsible for streaming arrivals onto the start of the relevant approach transition with adequate longitudinal spacing between arriving pairs. Arrivals will not be established on adjacent approach transitions at the same time and therefore the transitions do not require lateral separation from each other.

IFP Validation

The Gatwick RNN Trial Approach Procedures were ground validated in Sep and Oct 2019 in accordance with 'ICAO Doc 9906 – Quality Assurance Manual for Flight Procedure Design – Volume 5 – Validation of Instrument Flight Procedures and DAP Policy Statement - Validation of Instrument Flight Procedures (June 2009)'.

The purpose of the ground validation activities was to:

1) Evaluate flyability.
2) Evaluate database coding and accuracy.
3) Verify that waivers/mitigations for deviations from design criteria do not compromise safety.
4) Where permitted by the simulator, evaluate any other factors (such as wind, temperature and barometric pressure) that may be pertinent to the safety of the procedure.

The IFP validation process, including pre-flight validation, simulator evaluation and the production of the validation report, was undertaken by Trax. The coding tables and charts at that time were provided by Cyrrus Ltd.

In order to accurately evaluate the flyability and database coding of the procedures, two separate ground validations were conducted; an initial validation in an Airbus A320 simulator and a final validation in a Boeing B787 simulator.

Validation Plan

The validation of each procedure began at approximately FL80+ and continued until approaching the Final Approach Fix (FAF). One procedure was flown in its entirety from the start of the Approach Transition through to the end of the Missed Approach. In addition, we assessed the ability for the crew and FMC to manage the disconnect between the end of the STAR and the start of the Approach Transitions to ensure acceptability to the Airbus and Boeing aircraft.

In total, 12 of the 16 procedures were flown once in normal meteorological conditions. Four procedures, one to each runway end, were flown in more challenging meteorological conditions to test the flyability of the procedure, particularly the RF leg. The procedure chosen for this was the one with the tightest turn onto the final approach track.

The following table details the conditions in which the procedures were flown:

Temperature	Reference Weight	Wind Speed & Direction	Comment
20°C QNH 1013	61,000kg	30kt tailwinds at 5000ft 10kt surface headwind	12 procedures
05°C QNH 999	61,000kg	60kt crosswinds at 5000ft 20kt surface headwind	4 procedures (1 to each runway end)

Each draft chart showed a graphical layout and textual description of the procedure, waypoint location, waypoint type, speed constraints and altitude constraints. As part of the ground validation, the charts were assessed to determine the accuracy of the content and ensure the crews could interpret the content correctly. In addition, the proposed names of each ICARD waypoint were assessed as to their suitability.

Simulator Database Coding

All 16 procedures were coded into a customised navigation database using ARINC 424 path terminators to define the specific nominal tracks, which were defined by waypoint location, waypoint type, path terminator, speed constraint, altitude constraint and course.

The navigation database for the Airbus simulator was supplied by LIDO. The navigation database for the Boeing simulator was supplied by Honeywell Data Services.

Simulations and Reporting

The Primary Flight and Navigation Displays were filmed to provide detailed validation evidence. In addition to this, photographs of the FMS display were taken during each session for further evidence and a simulator validation report was completed and signed by the validating pilot.

The Initial Validation

The Airbus A320 initial validation, supported by easyJet, took place at their training facility on 13th September 2019. This initial validation was aimed to test the overall flyability of the procedures and to assess the ability for the crew and FMC to manage the disconnect between the end of the STAR and the start of the Approach Transitions. No issues were found but several minor recommendations were made by the validation pilot. These recommendations were incorporated into the designs and carried forward into the final ground validation.

The Final Validation

The Boeing B787 final validation, supported by Norwegian, took place on the 11th October 2019. The purpose of the final validation was to test the overall flyability of the procedures and to assess the ability for the crew and FMC to manage the disconnect between the end of the STAR and the start of the Approach Transitions. Final coding tables and draft charts were supplied by Cyrrus Ltd. These incorporated the recommendations from the initial validation.

The lateral profiles of each transition were accurately flown, even in challenging meteorological conditions. The pilot reported the overall workload to be low and the disconnect between the approach transitions and the STARS was easy to manage.

UPDATE: The approach transitions were coded with speeds needed to achieve the desired radius of turn and those speeds did not necessarily reflect the operational speed appropriate for that phase of flight. For this reason, the pilot was required to manage the speed to achieve a stabilised approach. The CAA have confirmed that the procedures should be coded as such that manual intervention is not required. For this reason, coupled with the speed restriction changes for each procedure, it is expected that ground validation activities will have to be repeated in both the Airbus and Boeing simulators. This will be confirmed once the CAA have reviewed the updated IFP submission. If ground validation is required, we would plan to undertake the simulator activities, collate the evidence and submit the ground validation report to the CAA by the end of Nov 2022. The Approved Procedure Design Organisation (APDO) will now be Trax (IFP Design Ltd).

Section 4: Environmental Assessment

Introduction

This section contains an environmental assessment to show the expected impact of the trial in accordance with the requirements of CAP 1616.

For a trial longer than 90 days yet shorter than 12 months that affects traffic distribution below 7,000ft, CAP 1616 states certain information must be prepared by the change sponsor and used to engage with those affected. These requirements are outlined below.

- For noise from night flights (2300 to 0700), prepare 60 dBA L_{max} footprints that illustrate the loudest and most frequent types of aircraft that will be participating in the trial.
- Develop equivalent footprints that illustrate where the trial traffic would otherwise have flown (this assumes that any aircraft that partakes in the trial would have flown on an alternate route that reflects current operations).
- Include information on the expected frequency (both absolute and as a percentage of total traffic during the trial period) and timing of flights participating in the trial.
- Prepare operational diagrams that illustrate the estimated overflight swathe of trial traffic, up to 7,000ft.

Each criteria are addressed in the following sections. In addition, we have provided details on the following:

- NMT noise analysis – an additional analysis we have undertaken.
- Noise monitor placement.

60 dBA L_{max} footprints

CAP 1616 specifies the use of 65 dBA L_{max} contours for day flights (0700 to 2300) and 60 dBA L_{max} contours for night flights. The 60 dBA L_{max} footprint was assessed for the trial – modelling results can be found in **Annex L**.

Aircraft types operating during the trial period in a pre-COVID environment (see Table 3) were modelled. The modelling shows that trial aircraft should deliver a significantly smaller 60dB L_{max} footprint than outlier aircraft. The reduction in footprint size between a trial-like and outlier aircraft ranged from 4% to 41%. This analysis is based on tracks of real aircraft that were input into a noise model[12]. The noise model also calculated footprints for 'hypothetical' trial arrivals. These were based on standard profiles in the model and were between 10% and 38% smaller than the outlier arrivals.

The analysis illustrates that a noise benefit may be achievable from the trial, and the trial is intended to provide evidence in order to validate this.

Of the aircraft types operating during the trial period in a post-COVID environment, the following aircraft (as a proportion of post-COVID traffic) typically have the loudest noise footprint:

[12]Aviation Environmental Design Tool (AEDT) is a software system that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality.

1. B777 (5%)
2. A330 (0.5%)
3. B787 (5%)

Baseline data collection will resume in Q3 2022 and will be used to help determine which aircraft are operated sub-optimally during the trial period, i.e. the worst performing. Noise and altitude thresholds will be determined for each NMT using this data. This information will be available one month before the planned trial start date to allow maximum baseline data capture.

Equivalent footprints that illustrate where the trial traffic would otherwise have flown

The pre-trial traffic distribution is shown in **Annex J** and repeated below in Figure 4. The map shows where trial traffic would otherwise have flown if the trial did not proceed. Note that the lateral distribution will vary as traffic patterns change (e.g. more flights from Europe compared to Africa).

Figure 4: Arrivals heatmap for Jan-Jun 2017 01:30-05:00 (local time), traffic below 7,000 ft

Regarding the vertical profile, flights descending at higher altitude and flying routes close to those planned for the trial were compared to flights descending at lower altitude and representing outliers in current traffic patterns. The results of this analysis can be found in **Annex L.**

Information on the expected frequency and timing of flights participating in the trial

Nightly averages derived from arrivals data[13] from 2017-2019 were analysed to determine the expected frequency and timing of fights during the trial period (01:30-05:00[14]). Table 1 below shows the total number (absolute and % of total traffic) and average number of arrivals between 01:30-05:00 per month between Jan 2017 - Aug 2019, as well as the maximum number of arrivals seen in any one night during each month. A full data summary is available in **Annex K**. Note: data was acquired up to the time of submission of Version 1.0 of the Trial Pack (Sep 2019).

	2017				2018				2019			
Month	**Total**		**Average**	**Max**	**Total**		**Average**	**Max**	**Total**		**Average**	**Max**
Jan	55	2%	1.8	6	51	1%	1.6	4	71	3%	2.3	5
Feb	62	2%	2.2	7	49	1%	1.8	9	95	3%	3.4	6
Mar	60	2%	1.9	6	106	3%	3.4	18	107	4%	3.5	7
Apr	179	6%	6.0	13	182	5%	6.1	11	200	7%	6.7	13
May	337	11%	10.9	22	432	12%	13.9	34	397	14%	12.8	24
Jun	453	14%	15.1	26	552	15%	18.4	40	542	19%	18.1	29
Jul	567	18%	18.3	33	664	18%	21.3	41	735	26%	23.7	44
Aug	542	17%	17.5	33	658	18%	21.3	43	675	24%	21.8	40
Sep	502	16%	16.7	38	487	13%	16.2	26	N/A	N/A	N/A	N/A
Oct	294	9%	9.5	21	334	9%	10.7	20	N/A	N/A	N/A	N/A
Nov	44	1%	1.5	8	78	2%	2.6	5	N/A	N/A	N/A	N/A
Dec	61	2%	2.0	5	114	3%	3.7	9	N/A	N/A	N/A	N/A
Total:	**3156**	**100%**	**-**	**-**	**3707**	**100%**	**-**	**-**	**2822**	**100%**	-	-

Table 1: Total, average and maximum (in any one night) number of arrivals between 01:30-05:00 per month between Jan 2017 - Aug 2019

The trial is currently planned to commence on 26 January 2023, and run for 6 months in total. Table 2 shows the total number of arrivals between 01:30-05:00 from Feb to Jul, 2017 to 2019, to allow comparison against the same time period in previous years.

	2017	2018	2019
Feb - Jul	1658	1985	2076

Table 2: Total number of flights (01:30 – 05:00) Feb-Jul 2017-2019

It is important to note that night time traffic levels have seen a significant reduction since 2019 as a result of the pandemic. It is expected that traffic will increase through 2022/2023, and is accepted that a smaller sample size would still be valid to draw sensible conclusions should traffic volumes equivalent to those observed in 2017, 2018 and 2019 not be achieved[15].

[13] Data taken from the airport database 'IDAHO'.
[14] Aircraft that overfly the first waypoint between 01:30 and 05:00 will be instructed to fly the PBN procedure. Aircraft will land at the airport approximately 7 minutes later. Given that different aircraft will fly different speeds within the defined constraints on descent, we have analysed arrivals data based on a landing time of 01:30-05:00 for consistency.
[15] Note: At time of preparing this submission (June 2022), Gatwick reported to be at 100% of their pre-COVID night flight traffic levels.

The distribution of total arrivals across the 01:30-05:00 period was assessed as demonstrated for Feb-Jul 2019 below (Figure 5).

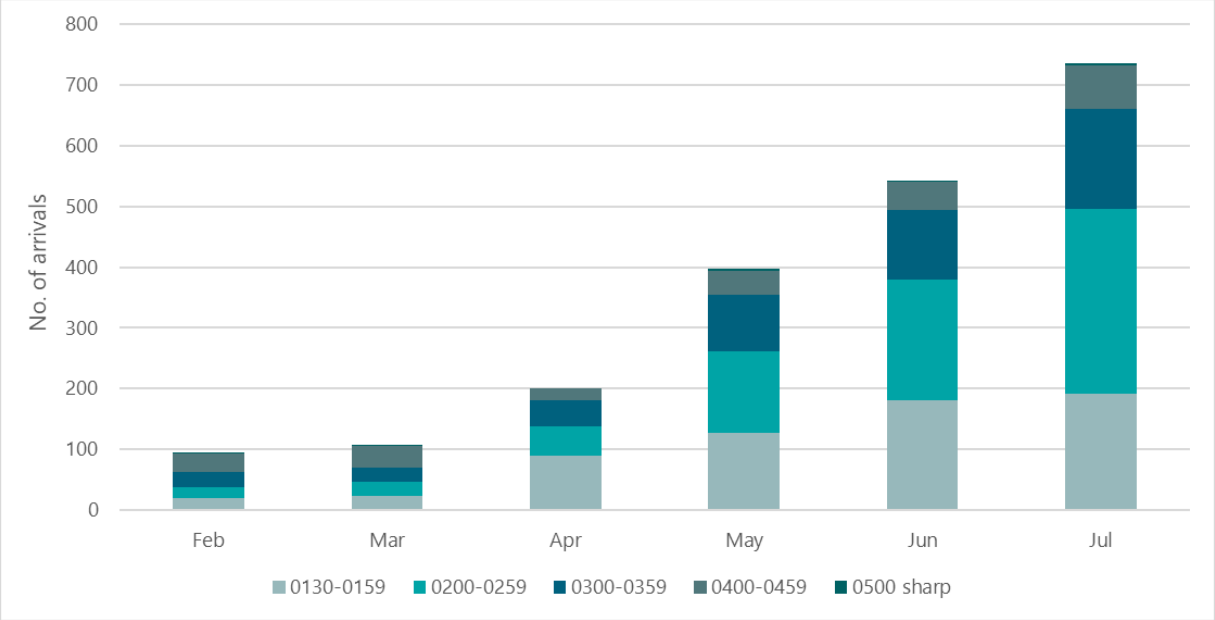

Figure 5: Number of flights per month within each 30 mins / hour / sharp time range (01:30-05:00, Feb-Jul 2019)

All flights that are appropriately equipped and approved will participate in the trial. Most flights arriving at Gatwick are capable of flying RNP-1 with RF Legs. The airline survey (**Annex D**) showed that:

- Of the six airlines responding, four have the capability to fly the PBN transitions across their entire fleets.
- Two airlines have a mixed capability with some aircraft capable and others not. The only aircraft specifically identified in the survey that is not capable of flying the transitions is the Boeing 747.

Furthermore, and as mentioned in Section 3 of this submission, the B787 is the only aircraft type with an ideal descent profile from a noise perspective below 2.8° (i.e. 2.5°). This aircraft is capable of flying the transitions, however the optimum noise profile may not be achieved during the trial. Noise performance of the B787 will be monitored during the trial.

Aircraft fleet mix for the following time periods have been analysed:

- Feb-Jul 2019 (01:30-05:00) – to allow comparison against the same time period in a previous (pre-COVID) year.
- Nov-Apr 2021/22 (01:30-05:00) – to review the most recent arrivals data at Gatwick Airport to understand the current traffic mix.

In total, 212 and 22 B787s arrived at Gatwick Airport during the trial hours in 2019 and 2021/22 respectively. No B747s arrived during the trial hours in 2019 or 2021/22 - see Table 3.

A/C Family	1st Feb - 31st Jul 2019	1st Nov 2021 - 30th Apr 2022
A319	269	18
A320	566	151
A321	434	118
A330	20	2
A340	1	0
AT72	0	1
B737	289	70
B757	79	0
B767	5	0
B777	0	20
B787	212	22
Other	1	2
Total:	**1876**	**404**

Table 3. Total number of arrivals by aircraft family between 01:30-05:00, Feb-Jul 2019 and Nov-Apr 2021/22

In summary, it is expected that most aircraft will be able to participate in the trial. Aircraft that cannot participate in the trial will fly conventional procedures. They will be identified and treated separately in the recorded data.

To further show the range of arrivals per night across the month, Table 4 shows the number of busier nights (i.e. nights with greater than 15 or 20 arrivals during the trial hours) in February to July, 2017-2019.

	Feb	Mar	Apr	May	Jun	Jul	Total
2017 'busier' nights							
More than 15 arrivals	0	0	0	4	16	22	**42**
More than 20 arrivals	0	0	0	1	5	9	**15**
2018 'busier' nights							
More than 15 arrivals	0	1	0	9	20	24	**54**
More than 20 arrivals	0	0	0	7	8	12	**27**
2019 'busier nights'							
More than 15 arrivals	0	0	0	7	20	28	**55**
More than 20 arrivals	0	0	0	1	10	21	**32**

Table 4: Number of nights where there were more than 15 or 20 arrivals during Feb-Jul 2017-2019

Night time traffic volumes tend to increase during the summer months, and other external influences such as poor weather can lead to increased traffic as a result of delays. During busier nights, NATS may suspend the trial if the arriving volume of traffic is not compatible with the safe conduct of the trial. Note that the tactical presentation of arriving traffic will also determine whether or not the trial should be suspended, for example, if arriving aircraft are bunched together.

The easterly/westerly modal split of the airport will not be affected by the trial. Historically, it is approximately 70/30 westerly/easterly but it can change depending on weather conditions. The statistics from recent years are given in **Annex K**.

Operational diagrams that illustrate the estimated overflight swathe of trial traffic

Figure 6 shows the trial routes overlaid on the (non-trial) arrivals heatmap. Each route is shown with its overflight cone as defined by the CAA[16]. Yellow routes are to the main runway and blue routes are to the Northern runway. The edges of the overflight cones are in white. The overflight cones show that a similar area of overflight will exist for trial aircraft as for non-trial aircraft.

The current PBN routes are placed within the 2017 arrivals swathe to meet the trial principles. During the pandemic, the shape of the Gatwick arrivals swathe may have changed due to the highly unusual situation. However, now that traffic is increasing the swathe is expected to return to the historical shape. It is therefore appropriate to keep routes in the positions designed in 2017.

In Figure 9 and Figure 10, the easterly and westerly arrival routes are shown against a map background without the underlying heatmap or overflight cones.

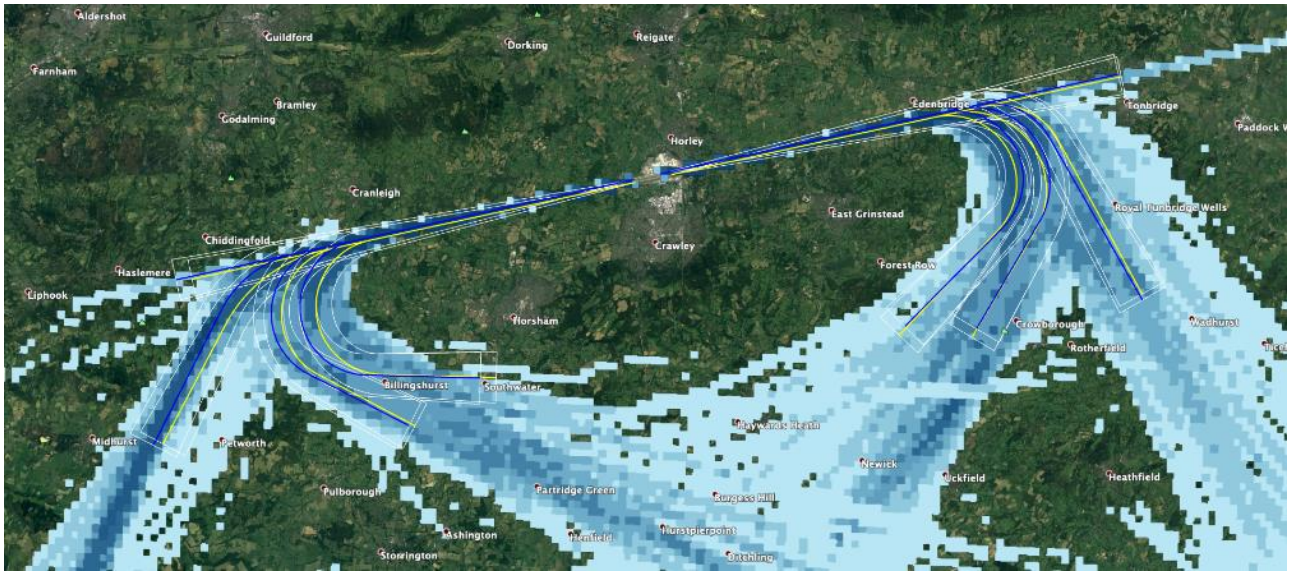

Figure 6: Trial routes with overflight cones overlaid on current traffic

[16] CAP 1498, Definition of Overflight, 2017

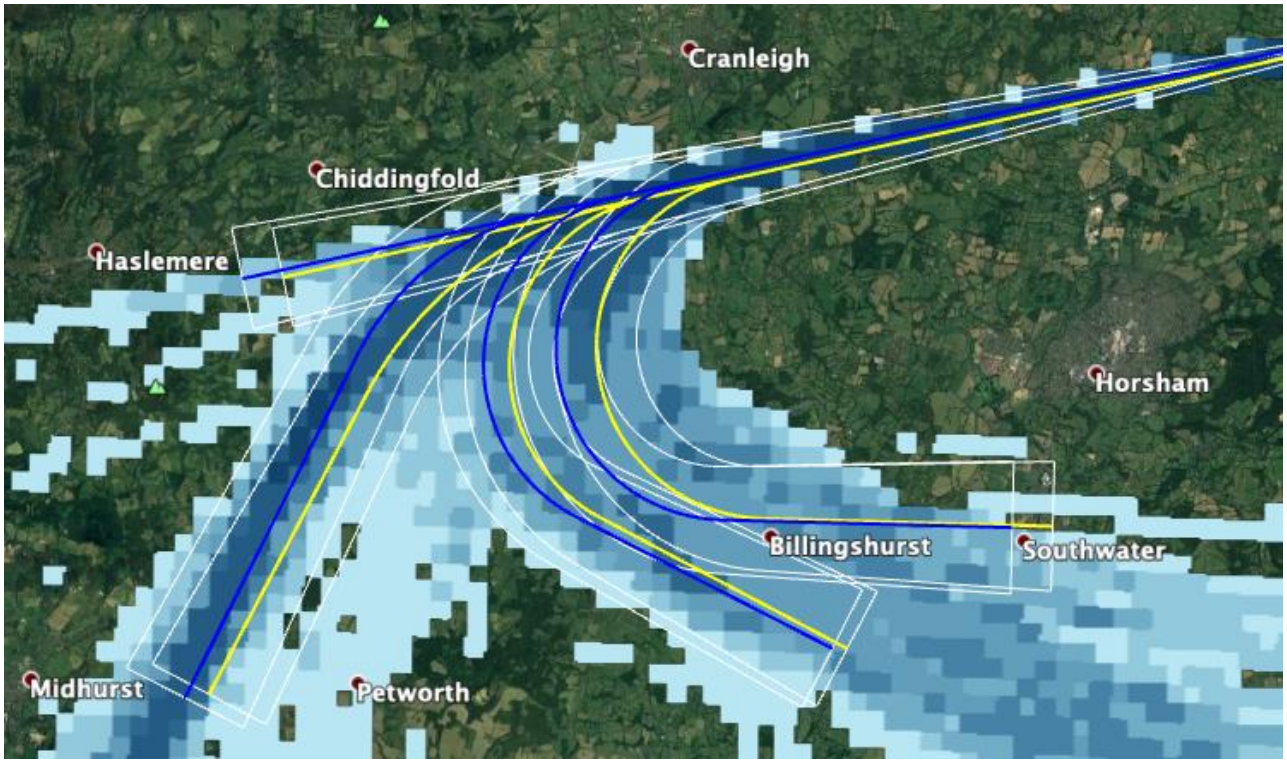

Figure 7: Trial tracks with overflight cones – Easterly arrivals detail

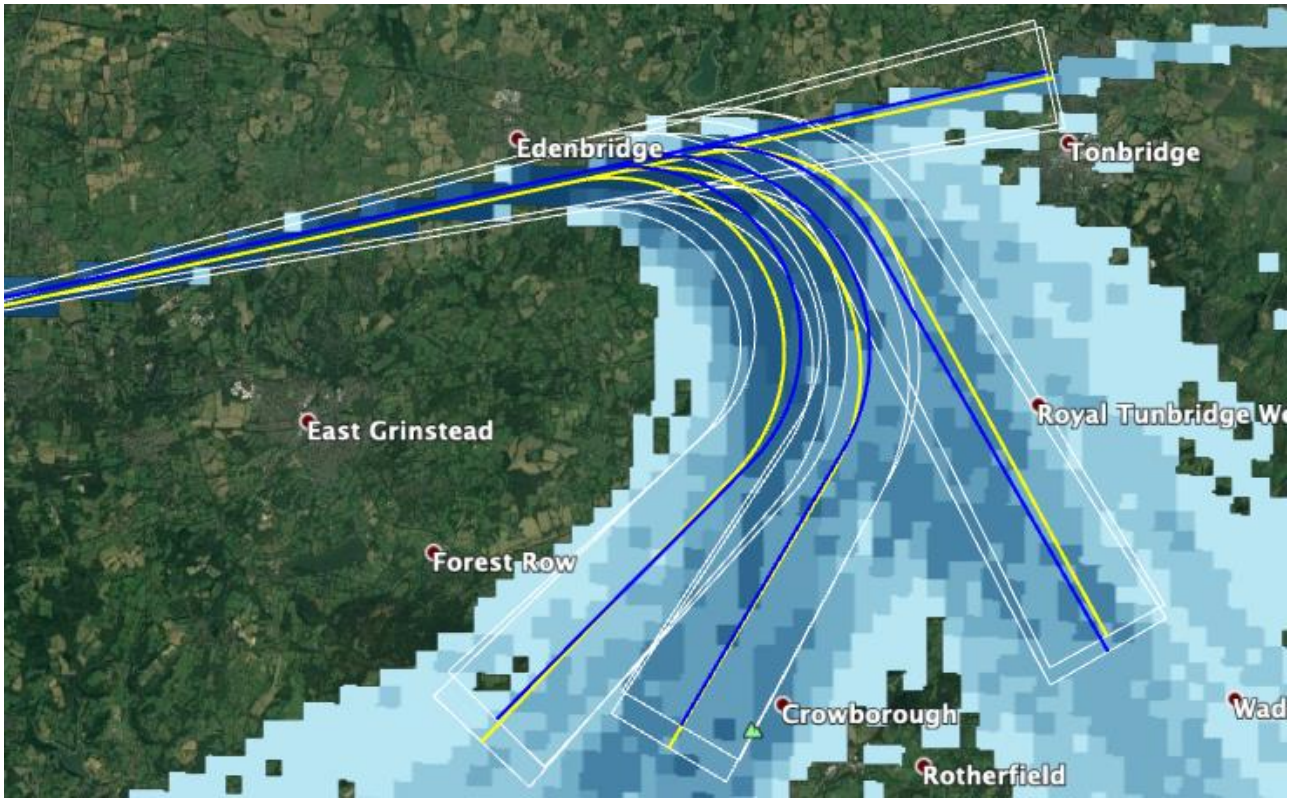

Figure 8: Trial tracks with overflight cones – Westerly arrivals detail

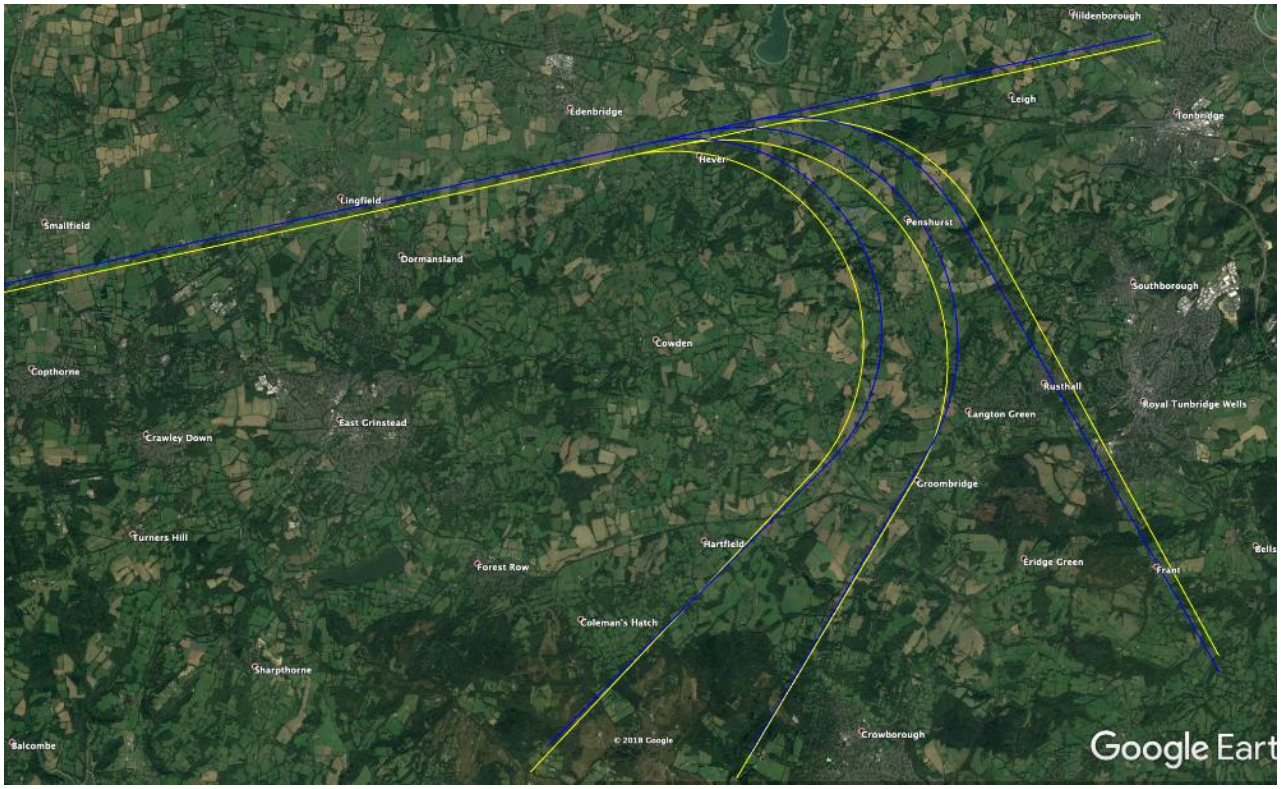

Figure 9: Westerly trial routes against a map background

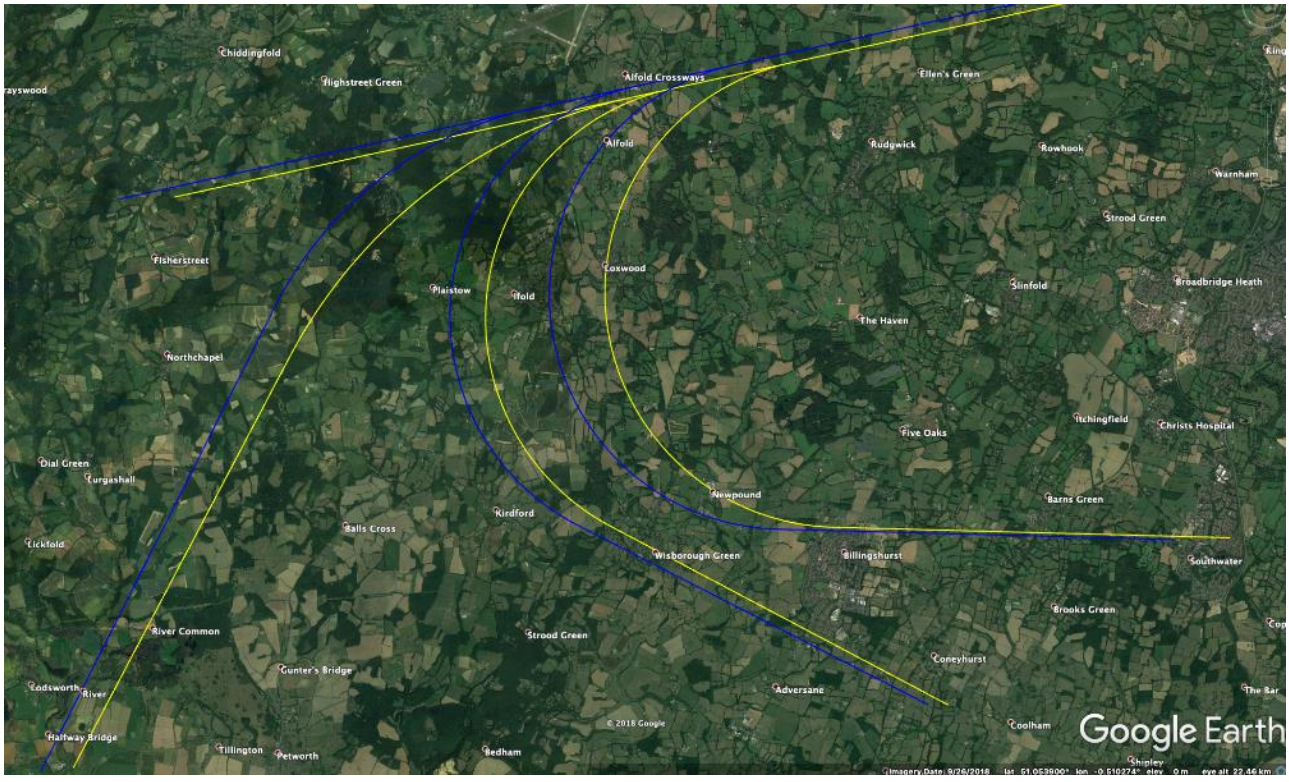

Figure 10: Easterly trial routes against a map background

NMT Noise Analysis

Analysis of recorded noise from existing noise monitors is given in **Annex M**. The purpose of the analysis is to demonstrate the potential improvement offered by PBN in removing noisy outliers. The analysis shows that, when measured at noise monitors beyond 10NM from the runway, aircraft that are flying 'trial-like' profiles can be up to 18dB quieter than similar aircraft flying outlier profiles.

A similar analysis was undertaken on data recorded in 2017 for an academic study. The results were presented to the NMB and are provided in **Annex P**. The results were used to estimate the trial success criteria and one of the graphs from **Annex P** is shown below to illustrate the analysis.

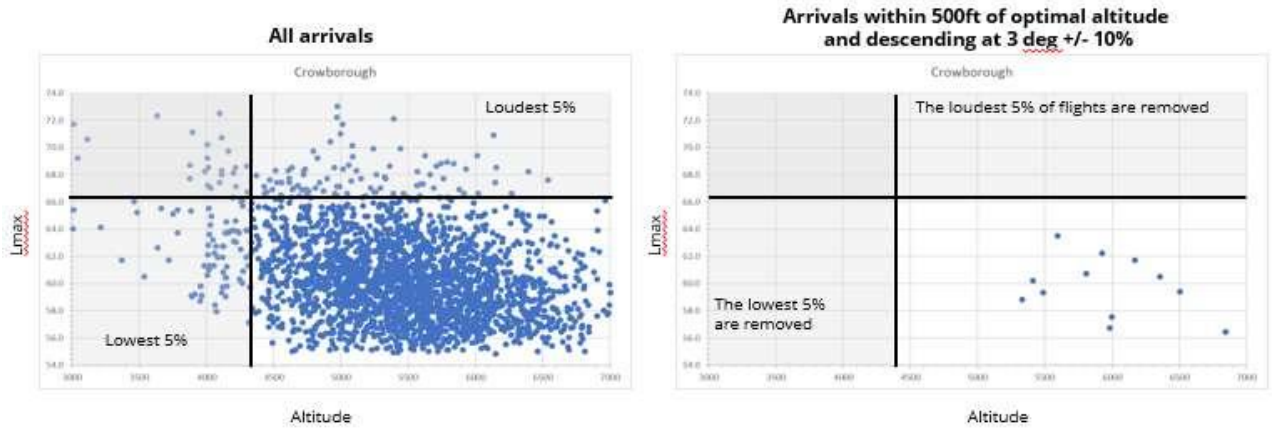

Figure 11: Example chart from Annex P showing removal of outliers

Both analyses are illustrative and not statistically significant because the 'trial-like' profile can only be estimated. Nevertheless, they show the potential benefit of PBN in removing noisy outliers.

Mobile Noise Monitor placement

Mobile Noise Monitor Terminals (NMTs) will be deployed to help gather trial data. These are in addition to Gatwick's existing NMTs.

In total, there will be 9 NMTs used for gathering RNN data; 2 NMTs are existing NMTs and will appear on the NTK system, and 7 are being placed for the trial. Mobile monitors will require manual data collection. NMT locations will range from around 12 NM to 19 NM along the arrival tracks, to gather data at the start and the end of the procedure.

The NMTs will be positioned to capture both the baseline (today's operation) and trial noise environment to allow a valid before/during comparison. They will be placed under 6 of the 16 PBN routes, and will be located where the overflight cones for the Southern and Northern Runway routes overlap so to capture data for both runways. Suitable locations have been identified for the placement of NMTs, intended to capture data for two routes to the East (Westerly arrivals) and one to the West (Easterly arrivals). These routes have been selected based on frequency of overflight to allow for a high rate of data capture.

Section 5: Safety Assessment

The following activities will be undertaken by NATS:

- Development of the draft ATC Procedure.
- Peer review of the ATC Procedure and performance of Haz-ID (ATC Procedure Safety Assessment (APSA)).
- Training Needs Analysis (TNA).
- ATC system updates (as necessary for NATS' systems).

NATS will develop, review and perform a safety assessment on the ATC procedure utilising the NATS SP406 safety assessment process (APSA); a Hazard identification process ratified by the Safety & Airspace Regulations Group (SARG). Once complete, the output of this will be communicated to SARG along with a copy of the draft procedure. This will be reviewed, assessed and if necessary, challenged by SARG prior to the commencement date of the trial.

NATS will undertake a TNA dip-test to determine if there is a need for an in-depth training review. If a training requirement is identified, ATCOs will undergo simulator training.

NATS have prepared draft ATC system updates which will be applied during the December 2022 AIRAC (assuming a January 2023 trial start date). This includes changes to their EXCDS system, radar maps and information systems.

Section 6: Trial Procedures

Introduction

This section describes the procedures developed for the trial.

Through RNN trial engagement, a number of safeguarding measures have been developed to mitigate concerns which were raised by community groups. In particular, procedures for trial monitoring and suspension, progress reporting and complaint handling have been developed and are described below.

Operational Procedures

The trial will be initiated each night by NATS. NATS has developed a Temporary Operating Instruction to support the trial.

All aircraft that are capable of flying the transitions that arrive between 01:30-05:00 (local) during the trial period will be expected to participate in the trial, unless otherwise instructed by ATC. Pilots must inform ATC if they are unable to fly the trial procedures.

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. Aircraft will land at the airport approximately 7 minutes later after joining the trial procedure at 6,000ft. This will be taken into consideration when performing the data analysis.

ATC will instruct pilots of which arrival route to use given the country of origin and considering any operational constraints and the runway in use. The distribution of traffic across the routes will be recorded and monitored during the trial.

Due to the novel nature of the PBN trial procedures they are best managed in low volumes of traffic. If there is a high volume of traffic on a particular night or if the traffic is bunched together, then NATS may suspend the trial and resume vectoring procedures. If NATS suspends the trial for any reason, then they will restart the trial at a later time on the same night (if time allows).

Individual aircraft will not participate in the trial if they are not able to accept the PBN clearance or refuse the trial clearance from ATC. NATS will maintain a log of which aircraft participate in the trial.

In addition, a form has been drafted for pilots to complete after the aircraft has landed (see **Annex N**). This form is a template for airlines to use and it captures information about the pilot perception of the procedure to minimise noise. The draft has been reviewed by members of the FLOPSC. It is not expected that all airlines will complete this form as it is a voluntary procedure.

Noise Complaints

Throughout the trial period, members of the public will have access to the normal platforms for the submission of noise complaints. A noise complaints procedure has been developed to support the trial (see **Annex O**).

As stated in Annex O, there are some conditions under which the CAA will undertake an investigation.

On receipt of a complaint/enquiry, Gatwick will respond in line with its established policy. Based on the nature of the feedback received, Gatwick may provide additional information on their website as the trial progresses.

Monitoring Trial Progress

The trial will be closely monitored by Gatwick Airport and regular engagement with stakeholders through Gatwick's website and community forums, as identified in Section 1, will be undertaken.

Fortnightly meetings will be held with members of the trial team to review and analyse the data from the trial.

Gatwick will produce a monthly report which will summarise details of the trial and its progress, including, but not limited to:

- Statistics on the number of aircraft participating in the trial and any suspensions of the trial.
- Noise data and measurement of the quantitative objectives.
- Noise complaints, including number and location of complaints.
- Any operational issues or safety concerns.

Once an initial sample of data has been analysed, the trial will be suspended if it is found that there are safety concerns or if the objectives are unlikely to be met. Safeguarding requests following discussions at NMB are identified in the next section.

Monthly reports will be produced by Gatwick Airport, submitted to the CAA and published on the CAA Portal.

Safeguarding

At the request of community groups through the NMB (see **Annex P**), Gatwick agreed to the following safeguarding conditions:

- 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.
- If any safety concerns that are raised by operational staff, the trial will be suspended to evaluate these concerns..

End of Trial Report

At the end of the trial, a Trial Report will be produced. This will summarise whether the objectives have been met and any key observations and findings of the trial. The report will include statistics on the aircraft participating and an environmental assessment of the trial impact. It will also be sent to the CAA and published on the CAA Portal where it will be accessible to all stakeholders.

Section 7: Activities Undertaken

Introduction

This section summarises the activities undertaken during the planning and preparation of the trial and how they meet the CAP1616 requirements.

Note that the first version of 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.

CAP1616 requirements

Figure 12 shows the activities undertaken in 2018/2019 by Gatwick Airport, in accordance CAP1616 for an airspace trial. Note that the timescales are not defined by CAP1616 but are specific to this trial.

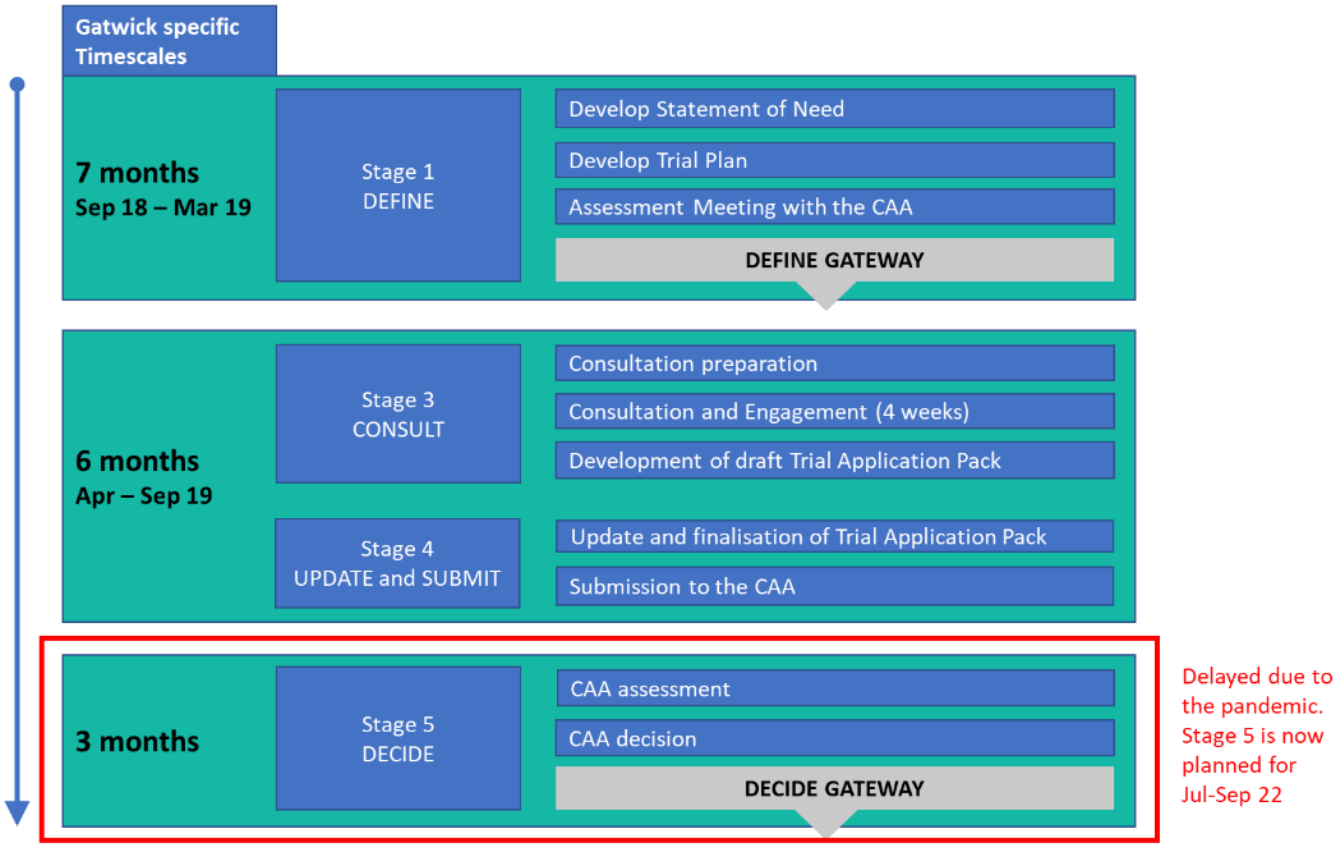

Figure 12: CAP1616 activities undertaken for the RNN trial

The following activities were also undertaken in this process:

- Engagement with the NMB and industry stakeholders through NMB meetings and Technical Workshops.
- Route and procedure design, including IFP validation, development of the IFP submission package, and CAA IFP approval.

- Noise monitor siting analysis and deployment.
- Noise monitor baseline data analysis.
- Environmental analysis to address CAP1616 requirements.
- Hazard analysis and safety assessment.
- Development of trial procedures.

Timescales

There is a requirement for the trial output to feed into Gatwick Airport's FASI-S options development and route design criteria. The output of the trial becomes less useful the further into the FASI-S ACP process Gatwick advance. Feeding outcomes of the trial into the Full Options Appraisal is key. Gatwick's FASI-S ACP Stage 3 is currently planned for Q3/Q4 2023, but is subject to change based on a number of dependent factors.

The trial is planned to commence in January 2023. In order to meet this date, we require a CAA Decision date in September 2022.

Gantt Chart

The following Gantt chart was used to monitor activity progress from Q1 2022, including trial planning and preparation activities.

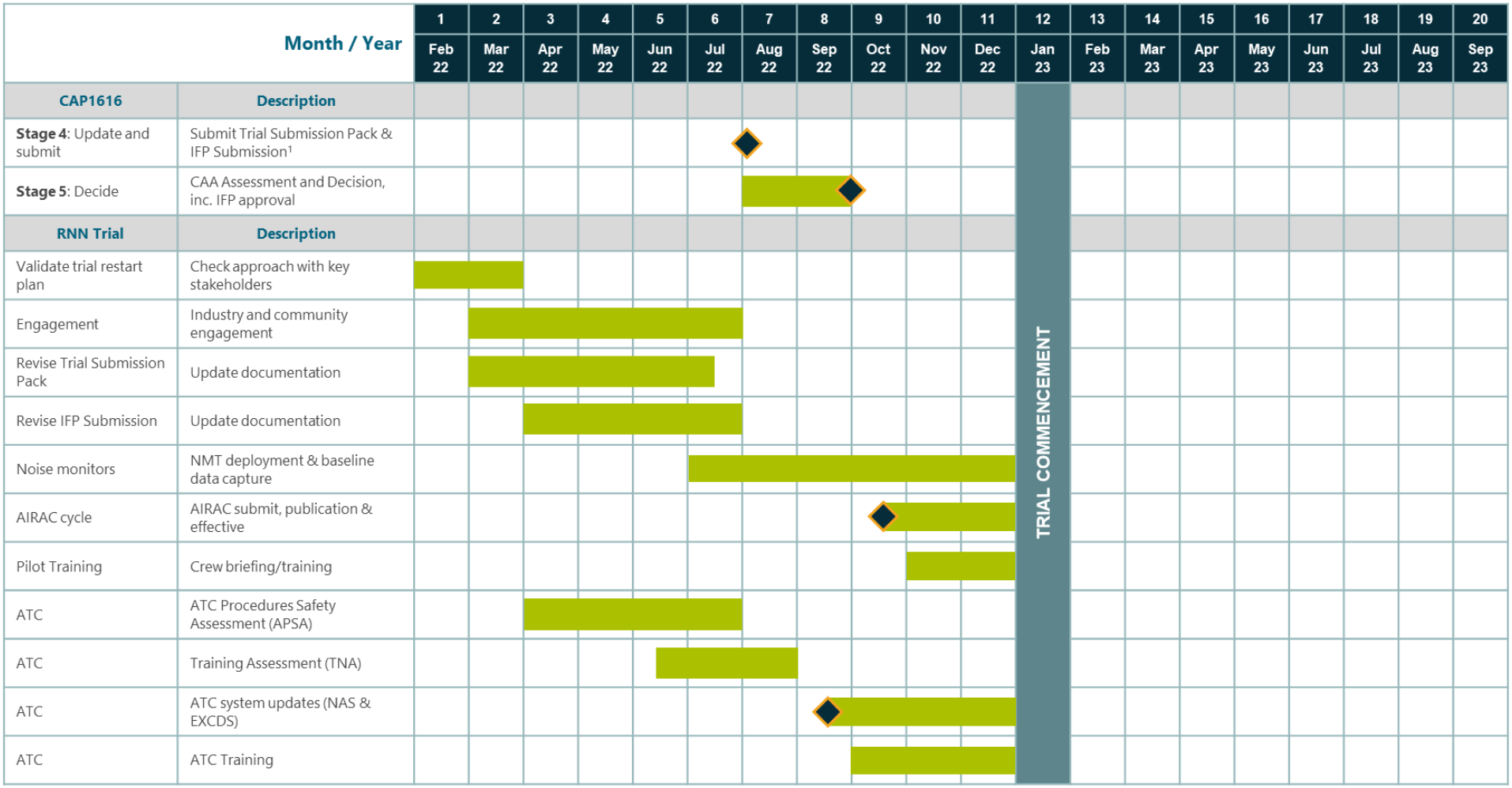

Figure 13. Trial planning Gantt chart