

CAA Environmental Statement

Airspace Trial

Title of airspace change proposal	Reduced Night Noise Trial
Change sponsor	Gatwick Airport Limited
Project reference	ACP-2018-62
Account Manager	[REDACTED]

Instructions

In providing a response for each question, please ensure that the 'status' column is completed using the following options:

- YES
- NO
- PARTIALLY
- N/A

To aid the decision maker, highlight each question accordingly to illustrate what is:

resolved YES not resolved PARTIALLY not compliant NO

1. Introduction

This Airspace Change Proposal (ACP) is for a trial airspace design to allow Gatwick Airport Limited ('the sponsor') to explore the extent to which Performance Based Navigation (PBN) procedures and flight path management based on Required Navigation Performance (RNP) 1 with radius-to-fix (RF) legs for night-time arrivals at the airport can deliver a reduction in aircraft noise impacts. The trial is supported by the Gatwick Airport Noise Management Board (NMB) and is based on research conducted by the University of Sussex which suggests that a disproportionate noise impact on communities is caused by 'outlier' aircraft, i.e., either those flying significantly lower or those louder than the mean.

The sponsor's objective is therefore to use these trial PBN arrival procedures to reduce the number of outlier aircraft and thereby assess the extent to which night-time noise impacts on communities overflown may be improved. Outlier aircraft are defined as either the loudest 5% of aircraft (within the aircraft category), or the lowest flying 5% of aircraft, with the trial objective being the reduction of their numbers by 90%. The trial PBN arrival

procedures will be implemented within the existing night-time arrival swathe at the airport and therefore will not result in overflight of any new areas. Noise levels pre-trial (baseline) and during the trial environment will be compared using Mobile Noise Monitor Terminals (NMT) deployed at various locations within a range of 20 nm from the airport which will allow an analysis of the benefits achieved through PBN. Track and altitude data will also be recorded for all flights.

The trial ACP will also facilitate data collection on the operational performance of PBN routes and noise impacts, including any advantages, disadvantages, unintended consequences, challenges associated with planning, implementation and operation of PBN arrival transitions, along with evaluation of new community engagement initiatives and processes, all which may then be used to inform future airspace design change proposals.

However, the sponsor states that this trial ACP does not seek to identify routes for use in such future airspace design change proposals, nor evaluate mechanisms for higher-density sequencing, Fair and Equitable Distribution (FED), respite or other concepts, nor optimise airport capacity and efficiency. All current night-time noise abatement procedures will be maintained and the minimum night-time Instrument Landing System (ILS) joining point at 10 nm will remain unchanged.

The trial is expected to last for 6 months, from 28th December 2023 to 30th June 2024, operating between 0130 to 0500 (local time) and will include both easterly and westerly arrivals at the airport, to the southern runway only.

2. Statement of Need		Yes/No
2.1	Does the Statement of Need include any environmental factors?	Yes
	Yes, the Statement of Need (SoN) clearly indicates that the objective of this trial ACP is to explore benefits of using trial PBN arrival procedures to reduce the number of outlier aircraft and thereby assess the extent to which night-time noise impacts on communities overflown may be improved.	

3. Information to be conveyed to those affected		Status
3.1	Has the change sponsor adequately provided a justification for the change?	Yes
	Yes, the sponsor has provided a justification for the change stating that the implementation of trial PBN arrival procedures will determine the extent to which PBN technology is capable of removing outliers and thereby reducing noise impacts. Further, the objectives of this trial	

	are as follows: • Objective 1: The loudest outliers reduced by 90% • Objective 2: The lowest outliers reduced by 90% For Objective 1, the sponsor states that noise levels pre-trial (baseline) at each noise monitor will be recorded, and the loudest 5th percentile of aircraft identified. During the trial, the number of noise events above this loudest 5th percentile will be recorded to check whether their proportion has reduced by 90%. For Objective 2, while not being a direct noise assessment objective, will be used to determine the efficiency of the PBN arrival procedures in terms of implementing more accurate descent profiles and therefore removing low flying aircraft. Previously, an objective to reduce N60 events at NMT locations by a certain percentage was also discussed with stakeholders however not progressed due to the limitation of reliably determining change in impacts.	
3.2	Has the change sponsor adequately confirmed the effective period of the change?	Yes
	The sponsor proposes for this trial to operate during a few night-time hours as PBN procedures are best implemented for low traffic volumes. The trial is expected to operate between 0130 to 0500 (local time) for a duration of 6 months, from 11th January 2024 to 12th July 2024, and will include both easterly and westerly arrivals at the airport, to the southern runway only. The sponsor notes that the trial may be suspended for operational reasons (e.g., high levels of traffic, weather avoidance), if the northern runway is in use, or if the trial is not deemed to be meeting its objectives. Conversely, the sponsor also notes that the trial may be extended (subject to CAA approval) if the volume of traffic participating in the trial is too low and thereby due to insufficient data, an assessment of the trial's results against its objectives is inconclusive. This may occur due to lingering effects of Covid-19 or closure of the southern runway. Any such extension and its duration permitting the collection of additional data would be communicated in advance to all stakeholders.	
3.3	Has the change sponsor provided sufficient details on the expected frequency of flights participating in the trial?	Partially
	<i>For trials longer than 90 days yet shorter than 12 months, sufficient details on the expected frequency (both absolute and as a percentage of total traffic during the trial period) of flights participating in the trial must be provided.</i> The sponsor has collected the following data from the airport's operational management system database, IDAHO, and Airport Noise & Operations System (ANOMS), for night-time arrivals between 0130 and 0500 for 2023 (January to June), while data for	

other years has also been provided. The sponsor states that similar traffic levels are to be expected during the trial as recovery from Covid-19 is well underway.

- Total number of arrivals per month
- Average number of arrivals per night per month
- Maximum number of arrivals in any one night per month
- Percentage of easterly and westerly arrivals per month
- Total and average number of flights within each hour each month
- Total nights with more than 15 and 20 arrivals each month

Month	2023			
	Total		Average	Max
Jan	71	4%	2.4	5
Feb	54	3%	2.2	4
Mar	126	7%	4.3	14
Apr	340	19%	11.3	20
May	477	27%	15.4	28
Jun	699	40%	23.3	31
Total:	1767*	100%	-	-

Figure 1: Total, average and maximum (in any one night) number of arrivals between 0130 and 0500 per month from January to June 2023

The sponsor states that the trial will only be conducted for arrivals to the airport's southern runway. All aircraft capable of flying the sponsor's preferred PBN specification which is RNP-1 with RF legs will participate in the trial, while others will remain vectored. Based on Figure 1 above, during the intended trial period, the expected average number of flights participating in the trial is therefore, 10 flights per night across the whole 6 months. Analysis of airline fleet equipage suggests that TUI Airways' entire aircraft fleet may not be capable of flying these procedures, based on historic statistics¹, these are about 2-3 arrivals per night on average. However, the sponsor has not confirmed how many flights these are likely to be over the course of the trial period and

¹ [Gatwick Airport Flights](#)

	therefore the expected frequency (both absolute and as a percentage of total traffic during the trial period) of flights participating in the trial has not been accurately determined. The sponsor has also conducted a separate analysis of the aircraft fleet mix operating at the airport for night-time arrivals between 0130 and 0500 from 1st January to 30th June 2023. The data indicates that the most common aircraft participating in the trial are anticipated to be the A320, A321, B737 and A319. The sponsor notes that the B787 aircraft may not achieve an optimum noise profile during the trial as their ideal descent profile for noise reduction is much lower than that designed in the trial PBN arrival procedures.	
3.4	Has the change sponsor provided sufficient details on the timing of flights participating in the trial?	Yes
	Yes, the sponsor has indicated that the trial will operate between 0130 and 0500 (local time).	
3.5	Has the change sponsor provided sufficient details on the typical altitudes of flights?	Yes
	The trial PBN arrival procedures start at 6,000 ft., with the first waypoint defined as not below 6,000 ft. so that aircraft may fly an optimum vertical profile and a gradual descent thereafter. The starting altitude of the straight-in approach transitions is designed to be at 5,000 ft., aligning with the current-day baseline for night-time inbound landing tracks. The descent gradient is 2.8° based on 20 nm/6,000 ft. and a threshold crossing height of 50 ft. A level segment prior to the Final Approach Fix (FAF) is possible to be flown due to the inclusion of an extra 1.5 nm to the initial 20 nm. The sponsor states that the trial PBN arrival procedures have been designed to facilitate ideal Continuous Descent Operations (CDO). While CAP 2302: A Low Noise Arrival Metric indicates that “<i>for modern aircraft types and current operational speed constraints, optimum noise is achieved for intermediate approach angles around 2.5°</i>”, only the B787 aircraft has an ideal descent profile for reducing noise impacts significantly below 2.8°. As few B787s are expected to operate during the trial timings (average of less than 1 aircraft per night), the proposed descent angle was unchanged. Ideal descent angles for the A320 aircraft are approximately 2.7° to 2.8°. The retention of a 2.8° descent angle also permits a ‘like for like’ comparison with the current-day ideal CDO baseline where the descent angle is approximately 3°.	
3.6	Has the change sponsor adequately provided a qualitative description of changes to traffic patterns, illustrated using operational diagrams overlaid on Ordnance Survey maps or similar?	Yes
	<i>For trials longer than 90 days yet shorter than 12 months, operational diagrams that illustrate the estimated overflight swathe of trial traffic, up to 7,000 feet must be provided.</i>	

The diagrams should be of sufficient detail for those affected to identify where they live in relation of the changes in traffic pattern.

The sponsor has provided operational diagrams overlaid on maps to illustrate the current and estimated overflight of trial traffic upto 7,000 ft. The sponsor has presented radar data from January to June 2023 for night-time arrivals between 0130 and 0500 demonstrating existing flight patterns and their densities in a track density diagram. The trial PBN arrival procedures are located within the higher density regions of the existing arrival swathes so as to avoid overflight of any new communities while minimising concentration and dispersing arrivals. A total of 8 PBN arrival procedures have been designed - 4 to each end of the airport's southern runway.

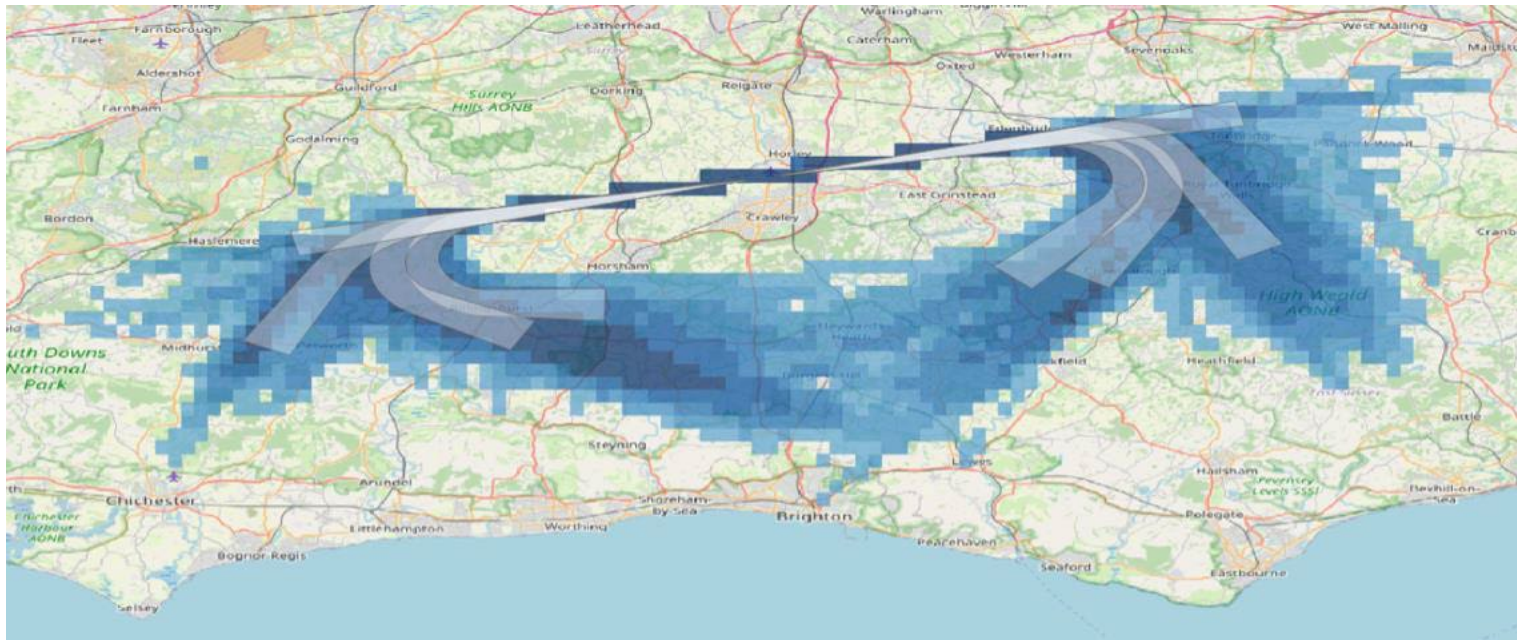


Figure 2: Arrivals heatmap for January – June 2023 between 0130 – 0500 (local time) representing traffic below 7,000 ft., overlaid with overflight cones of trial PBN arrival routes

The sponsor states that the historic shape of the arrival traffic swathes into the airport has remained unchanged since 2017, when the trial PBN arrival procedures were first designed. Updates to the design or location of these routes is therefore not necessary. The CAA agrees with this reasoning as the 2023 arrival swathes are largely coincident with those in 2023 and the proposed trial PBN arrival procedures are coincident with this area already overflown during the trial timings.

3.7	Has the change sponsor adequately provided an assessment of noise impacts? <i>For trials of 90 days or less, typical noise levels at key locations must be provided.</i> <i>For trials longer than 90 days yet shorter than 12 months, L_{max} footprints illustrating the loudest and most frequent types of aircraft that will be participating in the trial must be provided:</i> • 65 dBA L_{max} footprints for noise from day flights (0700 to 2300) • 60 dBA L_{max} footprints for noise from night flights (2300 to 0700) <i>For trials longer than 90 days yet shorter than 12 months, 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)</i> <i>For trials extending beyond 12 months, noise assessments using annualised noise metrics must be provided.</i>	Partially
	The sponsor has assessed the loudest and most frequent types of aircraft that will be participating in the trial. The most frequent aircraft are A320, A321 and B737 while the loudest aircraft are B777, A330 and B787. The sponsor has presented 60 dB L_{max} footprints using the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) and Volans to create the standard vertical profile of the trial procedure. The footprints have been presented for: • An 'outlier' arrival (an actual, recorded arrival) flying an unduly noisier or lower profile than other aircraft • A 'trial like' arrival (an actual, recorded arrival) flying a similar profile to a trial aircraft • An expected arrival of a hypothetical trial arrival Six comparisons were made for A320, B787-9, B737-800 with winglets and B767 flying to different runways. An extract is presented below, and more details can be found in Annex L of the sponsor's submission.	

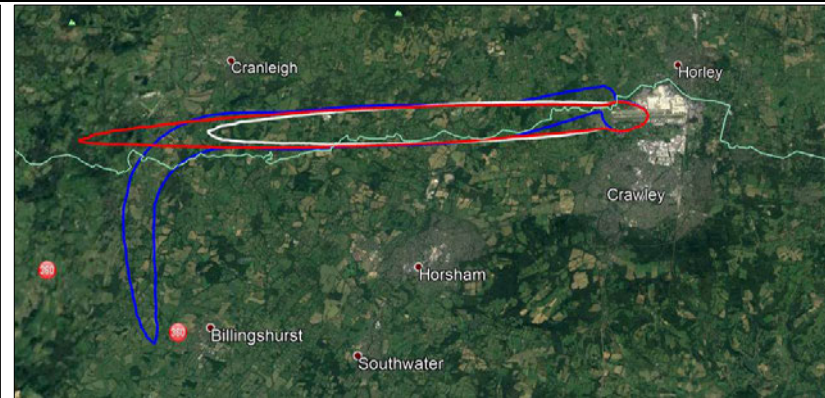
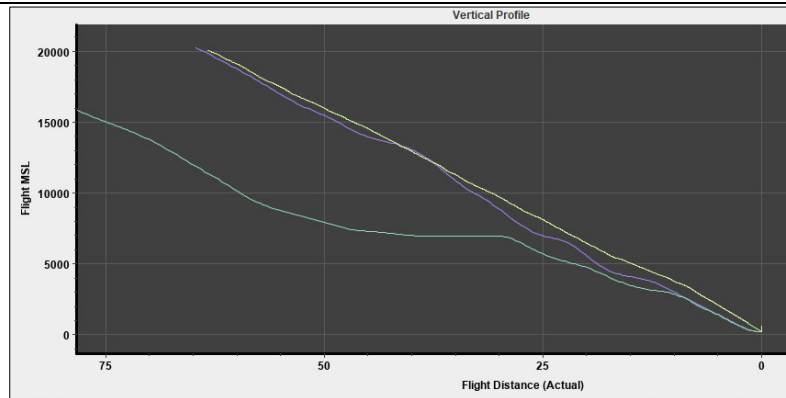


Figure 6 (left): Vertical profile of A320 arrivals (outlier in green, trial like in purple and hypothetical trial in yellow)

Figure 7 (right): 60 dB LMax footprints for A320 arrivals (outlier in blue, trial like in red and hypothetical trial in white)

The sponsor has not presented 60 dB LMax footprints for each of the trial PBN arrival procedures, nor presented a robust rationale with appropriate supporting evidence as justification where footprints are anticipated to be similar between the trial PBN arrival procedures (e.g., in terms of areas and locations). The noise footprints are also required to identify any communities that may be affected by the trial. However, the sponsor states that extensive engagement has already been undertaken through the Gatwick Airport Noise Management Board (NMB), including for communities in all areas under the proposed trial routes. It is therefore considered that this requirement is partially met.

It is also important to note that the noise modelling performed does not comply with CAP 2091, CAA Policy on Minimum Standards for Noise Modelling Category A standards which apply to Gatwick Airport.

4. Assessment of noise impacts		Status
4.1	Has the assessment of noise impacts identified in Question 3.7 been adequately assessed and presented in the final submission to the CAA?	Partially
	The sponsor has only partially assessed and presented an assessment of noise impacts due to the following reasons: The sponsor has not presented 60 dB LMax footprints for each of the trial PBN arrival procedures, nor presented a robust	

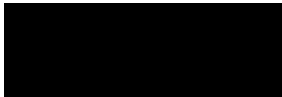
	rationale with appropriate supporting evidence as justification where footprints are anticipated to be similar between the trial PBN arrival procedures (e.g., in terms of areas and locations). The noise footprints are also required to identify any communities that may be affected by the trial. However, the sponsor states that extensive engagement has already been undertaken through the Gatwick Airport Noise Management Board (NMB), including for communities in all areas under the proposed trial routes. It is therefore considered that this requirement is partially met. The noise modelling performed does not comply with CAP 2091, CAA Policy on Minimum Standards for Noise Modelling Category A standards which apply to Gatwick Airport.
4.2	Summary of anticipated noise impacts from the final proposed airspace trial.
	The sponsor has presented an assessment of anticipated noise impacts resulting from the final proposed airspace trial covering the following: trial objectives, effective period of the change, expected frequency and timing of flights participating in the trial, typical altitudes, operational diagrams for both the baseline and the trial PBN arrival procedures overlaid on maps with sufficient detail and 60 dB LAmax footprints for the representative loudest and most frequent aircraft participating in the trial for some of the trial PBN arrival procedures. A number of recommendations and conditions have been proposed in Question 6 to address shortcomings where it is considered that the sponsor's assessment of anticipated noise impacts from the final proposed airspace trial has only partially met the CAP 1616 process requirements. The sponsor notes that communities and industry have been actively involved in the trial design process through groups such as NMB, Noise and Track Monitoring Advisory Group (NaTMAG) and Gatwick Airport Community Group (GATCOM) and will continue to be engaged so as to provide feedback on the airspace trial during its effective period.

5. Compliance with relevant policy and guidance from Government or the CAA		Status
5.1	Has the change sponsor satisfied all relevant policy and/or guidance, with regards to environmental impacts of the proposed airspace change? <i>Notably, has the change sponsor complied with the environmental requirements in:</i> <i>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;</i> <i>CAP1616a: Airspace Change: Environmental requirements technical annex;</i>	Partially

	<i>DfT Air Navigation Guidance 2017: Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management.</i> If a change sponsor has not complied with any aspect of those documents, have they provided a rationale and is it reasonable?	
	The sponsor has partially satisfied relevant policy and/or guidance, with regards to environmental impacts of the proposed airspace trial. A number of recommendations and conditions have been proposed in Question 6 to address these shortcomings.	

6. Recommendations/Conditions		Status
6.1	Are there any Recommendations which the change sponsor should try to address either before or after implementation (if approved)? If yes, please list them below. <u><i>GUIDANCE NOTE:</i></u> Recommendations are something that the change sponsor should try to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.	Yes
	Yes, the sponsor should try to fulfil the following Recommendations before the implementation of the trial (if approved). Any operational diagrams used as a means of portraying airspace proposals must be overlaid on clearly legible Ordnance Survey (or similar) maps that must be of sufficient detail to enable affected communities to identify their location in relation to the changes in traffic patterns. The sponsor should therefore use maps and charts must have a level of detail that makes them easy to interpret and use by those potentially affected.	
6.2	Are there any Condition(s) which the change sponsor must fulfil either before or after implementation (if approved)? If yes, please list them below. <u><i>GUIDANCE NOTE:</i></u> Conditions are something that the change sponsor must fulfil either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors must observe any condition(s) contained within the regulatory decision; failure to do so will usually result in the approval being revoked.	Yes
	Yes, the sponsor must fulfil the following Conditions either before or after the implementation of the trial (if approved).	

	• The sponsor should correct the '<i>RNN Trial Submission Pack (Version 2.1)</i>' and all other associated documents, removing references to the 8 trial PBN arrival procedures to the airport's northern runway. • The sponsor should provide details on the expected frequency (both absolute and as a percentage of total traffic during the trial period) of flights participating in the trial based on estimates of aircraft capability of flying the sponsor's preferred PBN specification which is RNP-1 with RF legs. • The sponsor should provide 60 dB L_{Amax} footprints illustrating the loudest and most frequent types of aircraft that will be participating in the trial for each of the 8 trial PBN arrival procedures. Alternatively, where footprints are anticipated to be similar between the trial PBN arrival procedures (e.g., in terms of areas and locations), the sponsor should provide a robust rationale with appropriate supporting evidence as justification. • The sponsor should specify that the noise modelling performed does not comply with CAP 2091, CAA Policy on Minimum Standards for Noise Modelling Category A standards which apply to Gatwick Airport. Any differences in the methodology followed must be identified and explained to ensure transparency. • The sponsor should convey the anticipated noise impacts of the trial to any communities and their representatives that may be affected <u>before</u> the trial commences (if approved). Affected communities should be identified on the basis of the noise impacts. • The sponsor should discuss and agree with the CAA on the data to be collected for the pre-trial baseline and during the trial period, including any criteria that will be used to determine whether the objectives of the trial have been met. • The sponsor should discuss and agree with the CAA on the data to be collected for any additional assessments that may be required to demonstrate the operational performance of PBN routes and noise impacts, which may then be used to inform future airspace design change proposals. • The sponsor should collate, monitor and report to the CAA on the number, location and contents of any complaints associated with the trial throughout its period of operation (if approved).
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Environmental assessment sign-off	Name	Signature	Date
Environmental assessment completed by Airspace Regulator (Environment)			20/12/2023

Environmental assessment approved by Manager Airspace Regulation (or alternative delegation of authority)			21/12/2023
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