

Consultation on CAA Minimum Requirements for Noise Modelling

CAP 1875

A large, abstract graphic composed of overlapping blue and purple shapes, resembling a stylized wing or a large letter 'C', occupies the lower half of the page. It features a gradient from light blue to dark blue and purple.

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Contents

Contents	3
Introduction	4
Chapter 1: Noise modelling	6
Categories of noise modelling	7
Chapter 2: CAA duties which may require provision of noise modelling	12
i) When an airport is designated by the Secretary of State for noise	12
ii) When a sponsor wants to change the design of airspace	13
iii) When an ANSP wants to change an ATC operational procedure and the proposal meets the criteria for a 'relevant PPR'	14
iv) When there are changes to the operational use of the civil airspace around an airport	15
v) When an airport submits a planning application for a development where the CAA is a statutory consultee	16
Chapter 3: The CAA's proposals	17
Proposed minimum requirements for noise modelling	17
No decrement and No radar criteria	17
i) When an airport is designated for noise by the Secretary of State	18
ii) When a sponsor wants to change the design of airspace	19
iii) When an ANSP wants to change an ATC operational procedure and the proposal meets the criteria for a 'relevant PPR'	25
iv) When there are changes to the operational use of the civil airspace around an airport	26
v) When an airport submits a planning application for a development where the CAA is a statutory consultee	26
Transition arrangements	27
Chapter 4: How to respond and next steps	29
How to respond to this consultation	29
Next steps	29

Introduction

1. In order to carry out certain of its regulatory duties, the CAA requires stakeholders (usually from airports) to provide us with outputs from noise modelling. Such outputs are typically in the form of sets of 'noise contours'¹, along with the area they cover and/or the number of residents living within them. Currently, different stakeholders use different levels of sophistication in this modelling, which is as expected since they have different numbers of residents affected by aviation noise, and may respond to the CAA in regard to different of our duties. Up until now, it has been the responsibility of each stakeholder to decide on the level of sophistication of noise modelling appropriate for its circumstances.
2. The CAA now believes that it is appropriate to specify the minimum acceptable level of sophistication of noise modelling required for us to carry out our duties, to provide clarity to sponsors and stakeholders about the methodology they should use and therefore reduce ambiguity, and to provide consistency across different groups of airports. In general, the CAA will expect the noise analysis to be sufficient for it to carry out its duties but also proportionate to the size and likely noise effects of the airport or the proposal under consideration. In most circumstances, some form of noise analysis will be presented to the CAA. However, we appreciate that installation of noise monitoring infrastructure and modelling of results informed by noise monitoring and track data can involve some expenditure, and in some cases, this level of expense would not be proportionate.
3. In this document, the CAA defines Categories of noise modelling and puts forward its proposals for the minimum Category which different stakeholder or sponsor groups should achieve in order for the CAA to carry out its duties. We invite comments on our proposals and will consider any response we receive before publishing our final requirements. The remainder of the document consists of the following chapters:
 - The first Chapter describes the Categories of noise modelling which the CAA has identified.
 - The second Chapter describes these duties of the CAA for which we require noise modelling to be provided to us.

¹ A noise contour is an area within which the modelled average noise is greater than or equal to a particular value.

- The third Chapter describes our proposals for the appropriate Category of noise modelling which individual stakeholders or change sponsors should use for each of those duties.
- The final Chapter describes how to respond to this consultation

Chapter 1

Noise modelling

- 1.1 The purpose of estimating aircraft noise levels in the vicinity of an airport is to provide a quantitative assessment of the noise experienced by those living near an airport. The CAA's Environmental Research and Consultancy Department (ERCD) has significant expertise on aircraft noise issues and provides technical advice and support on such issues to the Department for Transport (DfT) to assist in the development of Government policy. ERCD developed the UK civil aircraft noise contour model (ANCON), which calculates noise contours from data on aircraft movements, routes, noise generation and sound propagation. Other noise models exist (for example, the FAA's Aviation Environmental Design Tool - AEDT) and these can also be used by stakeholders provided they meet the standards set out in international best practice guidance².
- 1.2 All modelling of aircraft noise is based on assessing the noise on the ground generated by each aircraft type using the airport (or airspace), then combining these in the proportions of the various different aircraft types that fly along the various different flight paths that are observed or expected, usually for an average summer³ day or night. At its most basic level, noise can be modelled using standardised reference values provided by ICAO (for noise by aircraft type), NATS (for standard flight paths), ECAC (for standard dispersion either side of those flight paths) and the airport stakeholder for the mix of aircraft types and usage of flightpaths. This approach does not require the collection of actual noise levels, flight paths or flight dispersion. A noise model such as ANCON or AEDT is then required to convert these data into noise contours within which the number of residents can be calculated from population databases.
- 1.3 The above method does not take into account certain local factors, which can make a difference to the actual noise experienced on the ground. Many airports use aircraft track keeping data in order to have a record of, and sometimes make available to residents, exactly where each aircraft flies and its height above ground. It also shows how concentrated or dispersed typical flight paths are around the standard arrival and departure routes at the airport. These data can be used to make the noise calculation much more accurate. However, such a system can cost a significant sum (likely over a hundred thousand pounds) to

² European ECAC Doc 29 4th Edition Volume 2 and international ICAO Doc 9911.

³ Summer is often used, since, in the UK, airports are likely to be busier in the summer season than in the winter season, and because residents are more likely to be outside or with windows open in the summer than in the winter, and so will be more affected by any aviation noise. Summer is defined here as the 92-day period between 16 June and 15 September inclusive.

install and incurs annual costs to run and maintain. It also requires a level of radar infrastructure to be in place at the airport. It is therefore only proportionate for airports above a certain size or whose noise effects on residents are sufficiently widespread to have such a system.

- 1.4 Some airports also use a Noise and Track-Keeping (NTK) system, which includes noise monitors to measure the actual noise experienced on the ground when aircraft fly overhead. Aircraft noise can be affected by factors such as the amount of power delivered by the engines (which can depend on the load of the aircraft or the flight path being followed), whether the undercarriage is lowered, or particular qualities and configurations of the airframe. Combining noise monitoring and track keeping data (the latter is needed to determine the position of the aircraft relative to the noise monitor when it is measured) allows a noise model to be adjusted to reflect noise from aircraft more accurately at a given airport. Noise monitors typically cost tens of thousands of pounds and need to be sited appropriately and regularly maintained in accordance with ISO standards to be of greatest use.
- 1.5 Airports for which the increased accuracy in modelling offered by the installation and use of an NTK system does not justify the expense can still improve their noise modelling through comparison to similar airports which have made such investments. Clearly such 'similar' airports are likely to be bigger, but if they use similar aircraft or are served by similar airlines, then factors such as the variation of flight paths around the standard are likely to be more accurately estimated from comparison to them than simply using standard international databases.

Categories of noise modelling

- 1.6 From reviewing the different methods used to model airport noise currently, the CAA has identified the following noise modelling Categories of sophistication, with Category A as the most sophisticated and Category E as the least. All the different methodologies provide valid representations of noise if applied correctly,
- 1.7 **Category A.** The noise model is adapted based on noise monitoring and track-keeping data provided by the airport. The noise monitors are sufficient in number and appropriately positioned such that track-keeping data can be used to identify noise caused by specific types of aircraft and used to make amendments to data from the ICAO sponsored Aircraft Noise and Performance (ANP) database⁴ to reflect these local effects. Where possible, noise monitors should be located to confirm with guidance provided in ISO 20906⁵ and SAE-ARP-4721⁶. The track-

⁴ <https://www.aircraftnoisemodel.org/>

⁵ ISO 20906:2009, Amended 2013. Unattended monitoring of aircraft sound in the vicinity of airports.

⁶ SAE-ARP-4721:2006. Part 1: Monitoring Aircraft Noise and Operations in the Vicinity of Airports: System

keeping data is used to calculate the mix of aircraft traffic on each departure and arrival route, the actual tracks flown along each route, the dispersion of aircraft either side of the mean track and vertical flight profiles at the airport. The model uses this local data and the known or expected flight schedule to calculate noise exposure (and therefore noise contours) or other metrics.

- 1.8 **Category B.** The noise model is adapted based on data from noise monitors and track-keeping radar provided by the airport. Aircraft flight profiles are adapted from the standard ICAO dataset and verified against local noise measurements for the main noise dominant aircraft types, which will typically cover more than 75 percent of the total noise energy produced by aircraft at that airport⁷. Limiting the use of local noise measurements is likely to mean that fewer noise monitors are required than for Category A. The track-keeping data is used to calculate the mix of aircraft traffic on arrival and departure routes, the actual tracks used for each route, the dispersion of aircraft either side of the mean track and the flight profiles at the airport. The model uses this local data and the known or expected flight schedule to calculate noise exposure (and therefore noise contours) or other metrics.
- 1.9 **Category C.** The noise model is adapted based on track-keeping data provided by the airport. Aircraft flight profiles are adapted from the standard ICAO dataset for the main noise dominant aircraft types, which will typically cover more than 75 percent⁸ of the total noise energy. The track-keeping data is used to calculate the mix of aircraft traffic on each arrival and departure route, the actual tracks used for each route, the dispersion of aircraft either side of the mean track and the flight profiles at the airport. The model uses this local data and the known or expected flight schedule to calculate noise exposure (and therefore noise contours) or other metrics.
- 1.10 **Category D.** The noise model is adapted based on data from other, similar (in terms of fleet mix, size or range of destinations) airports which meet the Category B or Category A standard (or Category C where applicable – i.e. where sufficient appropriate data exists). Data on flight profiles, noise data and dispersion from these other airports is used, whilst data reported from the Category D airport (rather than track-keeping data) is used to identify the arrival and departure routes and their usage for a typical day.

Description, Acquisition, and Operation. Part 2: Monitoring Aircraft Noise and Operations in the Vicinity of Airports: System Validation.

⁷ The loudness of sound is generally measured in terms of decibels (dB). Long term average A-weighted decibels (dB L_{Aeq}) take account of the frequencies people are most sensitive to, and are often used in measurements of aviation noise.

⁸ Adapting flight profiles can be a labour-intensive process and so limiting the number of aircraft types covered keeps costs down.

- 1.11 **Category E.** There is no adaptation of the noise model and standardised reference values only are used. The standard ICAO dataset is used (flight profiles, noise data), with no amendments for local effects. Data reported from the modelled airport (rather than track-keeping data) is used to identify the usage of arrival and departure routes for a typical day. The track over the ground for each arrival and departure route is derived from the published coordinates in the UK AIP or as advised by the airport. Dispersion around the nominal track of each such route is based on the dispersion guidance contained in ECAC Doc. 29 4th Edition 2015⁹.
- 1.12 A summary of the Categories is shown in Table 2.1. We would consider that a stakeholder's noise modelling can only be declared to be in a particular Category if it meets **all** the criteria in the table for that Category.

⁹ <https://www.ecac-ceac.org/ecac-docs>

Table 2.1: Summary of Noise Modelling Categories

Category	Aircraft noise		Aircraft tracks (arrival and departure routes)		
	Noise data	Flight profiles	Centreline (mean track)	Dispersion (variation around centreline)	Usage (allocation of traffic to routes)
A	ICAO dataset modified for local noise monitor data for all aircraft types.	Local track-keeping data	Local track-keeping data	Local track-keeping data	Local track-keeping data
B	ICAO dataset validated by local noise monitor data for major aircraft types	Local track-keeping data	Local track-keeping data	Local track-keeping data	Local track-keeping data
C	Based on similar Category A or B airport	Local track-keeping data for major aircraft types – otherwise based on similar Category A or B airport	Local track-keeping data	Local track-keeping data	Local track-keeping data
D	Based on similar Category A or B airport	Based on similar Category A, B or C airport	Local data from airport	Based on similar Category A, B or C airport	Local data from airport
E	ICAO dataset	ICAO dataset	Local data from airport	ECAC guidance or data from airport	Local data from airport

- 1.13 The CAA believes that, for each of the categories above, there are airports whose noise modelling meets most, if not all, of the criteria. In cases where an airport has the noise and track-keeping infrastructure in place but does not use this data for all of the criteria in the table, we consider there is potential to produce more accurate noise modelling, at relatively little extra expense.
- 1.14 The Categories defined above differentiate between use of physical infrastructure and the data which it can provide to improve the accuracy of noise modelling. There are many other aspects to noise modelling which can be regarded as best practice, such as considerations of the terrain around an airport, placing of noise microphones correctly, using appropriate population data for converting the area of noise contours into a count of population affected, and identification of noise-sensitive buildings such as hospitals or schools. A more comprehensive list of such considerations, as well as general advice on noise modelling can be found in ECAC Document 29 4th Edition. We expect stakeholders to follow such best practice where it is appropriate to their noise modelling, but do not propose to make them part of our minimum requirements set out here.

Chapter 2

CAA duties which may require provision of noise modelling

- 2.1 In this section, we give the details of those instances where the CAA requires a stakeholder (airport, ANSP or other) to provide us with noise modelling output and the types of output which we need.
- 2.2 Note that, in the case of airports, unless there is the need to provide noise data to the CAA to allow it to fulfil one of these duties, then it is up to the airport to decide (likely in conjunction with its users and local community representatives) if and how they calculate and publish noise data.

i) When an airport is designated by the Secretary of State for noise

- 2.3 Under Section 78 of the Civil Aviation Act 1982, (CAA82) the Secretary of State can designate airports for noise purposes. Once designated, the following duty on the designated airport applies:

(8) The Secretary of State may, after consultation with the person managing a designated aerodrome, by order require him at his own expense—

(a) to provide in an area and within a period specified in the order, and to maintain and operate in accordance with any instructions so specified, such equipment for measuring noise in the vicinity of the aerodrome as is so specified; and

(b) to make to the Secretary of State such reports as are so specified with respect to the noise measured by the equipment and to permit any person authorised by the Secretary of State for the purpose to inspect the equipment on demand at any time;

and it shall be the duty of the person for the time being managing the aerodrome to comply with the requirements of the order.

- 2.4 In the 1990s, the government adopted L_{Aeq}^{10} as its measure for aviation noise experienced by communities, and the CAA developed the ANCON model to

¹⁰ L_{Aeq} is based on an aggregation of the Sound Exposure Level (SEL) of individual aircraft overflights occurring within a given time period, and takes account of event noise level, duration and how many events occur in that time period. The most typically used aggregations include the average summer day indicator ($L_{Aeq,16h}$), calculated from the SELs occurring within an average summer day period from 0700 to 2300 or the average summer night ($L_{Aeq,8h}$), calculated from the SELs occurring within an average summer night period from 2300 to 0700.

calculate this measure from readily available data. The ANCON model has been through improvements and refinements since its inception, but it is not the only noise model available. Most western nations with noise problems developed their own national calculation methods, but ANCON has since played a leading role in the development of international standards.

- 2.5 At the time of writing, only three airports are (or have ever been) designated by the Secretary of State for noise purposes. These are Heathrow, Gatwick and Stansted airports where, using this mechanism, the government sets noise controls. As part of these controls, ERCD produces annual reports on noise exposure contours for each of the three airports. The airports must therefore provide the CAA with the necessary data to undertake this work.

ii) When a sponsor wants to change the design of airspace

- 2.6 The Secretary of State for transport (SoS) has given the CAA the function to approve changes to the design of airspace in the Civil Aviation Authority (Air Navigation) Directions 2017, as amended by The Civil Aviation Authority (Air Navigation) (Amendment) Directions 2018 and The Civil Aviation Authority (Air Navigation) (Amendment) Directions 2019. Section 70 of the Transport Act 2000 (TA00) places the CAA under a general duty in relation to its air navigation functions to exercise those functions so as to maintain a high standard of safety in the provision of air traffic services. With safety as its priority, TA00 also requires the CAA to consider efficiency, the interests of all those affected, environmental guidance, national security and the UK's international obligations.
- 2.7 Therefore, whenever low level¹¹ airspace is going to be changed, then there is a need to understand what the effect of the change in noise distribution will be on residents¹². The CAA's process for requesting an airspace change is contained in CAP1616¹³.
- 2.8 Typically, as part of this process, the airspace change sponsor must produce an assessment of the expected noise effects of the airspace change. This is required for the following purposes:

¹¹ In this case, this means changes to the design of airspace below 7,000ft above mean sea level. Airspace changes which only affect flights above this level produce negligible noise effects on the ground.

¹² Except when an ACP is sponsored by the Ministry of Defence, in which case the CAA is required by Government to disregard the environmental impact of the military operations when making its decision.

¹³ www.caa.co.uk/cap1616

- The CAA is required to take noise impact into account when it makes its decision. Sponsors are expected to review a number of options for change ('do nothing'¹⁴ must be an option) and assess them for their suitability. One such assessment should be environmental and include an analysis of likely changes to noise experienced by local communities and an estimate of the impacts of noise on health and quality of life.
- Sponsors are also expected to consult residents and users on the options for the airspace change, and the CAA expects that part of the consultation material should concern the expected changes in noise and their associated impacts.
- Although the CAA is usually the decision-making body for airspace changes, the SoS can 'call in' the decision instead. Anyone can request the SoS to call in the decision, in which case the CAA must undertake an assessment of whether the airspace change meets the call in criteria. One of these criteria concerns the increase in number of residents affected by a particular level of noise due to the proposed change and so the sponsor must provide sufficient noise analysis for the CAA to be able to judge whether this criterion has been met.

iii) When an ANSP wants to change an ATC operational procedure and the proposal meets the criteria for a 'relevant PPR'

- 2.9 In 2017, the Government recognised that, while changes to airspace design are subject to the airspace change process, changes to air traffic control (ATC) operational procedures (which could have similar noise effects) could be implemented without consultation. Consequently, the CAA was given a decision-making role for such planned and permanent redistributions of air traffic through changes in air traffic control operational procedure (or PPRs). Essentially, a PPR concerns changes in the way existing airspace is used, rather than changes in the airspace design itself. ATC operational procedures are the responsibility of Air Navigation Service Providers (ANSPs).
- 2.10 Only certain PPR proposals (known as 'relevant PPRs') will need to go through the approval process. These are the PPRs most likely to have a potential noise impact on the ground, although they are defined by how they change where aircraft fly and so this categorisation does not require aircraft noise modelling. The CAA recently consulted¹⁵ on the decision-making process it will use for

¹⁴ Here, 'do nothing' is defined to largely reflect the current-day scenario, although taking due consideration of known or anticipated factors that might affect that baseline, for example a planned housing development close to an airport, forecast growth in air traffic, or expected changes in airlines' fleet mix

¹⁵ <https://consultations.caa.co.uk/policy-development/ppr-decision-making-process/>

PPRs, with the aim of having it in place by 1 February 2020. The CAA's proposal is to use a process similar to that in CAP 1616 for ACPs and, in particular, this may require some form of proportionate noise modelling to assess the environmental effects of a relevant PPR.

iv) When there are changes to the operational use of the civil airspace around an airport

- 2.11 Direction 15 of the Airspace Directions given to the CAA concerns changes to airspace not covered by directions 4 to 8, (i.e. where there is no change to the notified airspace design or air traffic control operational procedure). It states that:
- (1) The CAA must prepare and publish guidance on transparency and engagement for operational changes to airspace usage by aircraft (not covered by directions 4 to 8) which might have affected the noise impact on other persons*
 - (2) The CAA must establish and maintain a process to receive, classify and respond to complaints received by it in relation to the environmental impact (including noise) of the use by civil aircraft (including general aviation and helicopters) of UK airspace.*
 - (3) On a request from the Secretary of State, the CAA must provide the Secretary of State with a summary of complaints received by it during a specific period, or of complaints relating to a particular issue.*
- 2.12 Airports and ANSPs are expected to inform and engage overflown communities about aircraft operational change and change to aircraft movements when changes could have a noise impact on communities. As these changes may impact noise on the ground, there is a need for airports to ensure that their local communities have sufficient information to understand the nature and causes of the change.
- 2.13 The CAA's guidance, as required in clause (1) above, is described in detail from page 97 of CAP 1616. In October 2019, the CAA collected information from 10 airports and one ANSP across the UK and provided details on which elements of the guidance they are currently fulfilling¹⁶. This information will be updated roughly every six months.
- 2.14 The CAA has no decision-making role in regard to these operational changes in airspace usage, and therefore does not require airports or ANSPs to provide us with noise modelling data. However, in this document we intend to recommend

¹⁶ <https://www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Airspace-information--transparency-about-airspace-use-and-aircraft-movements/>

the appropriate minimum Category of noise modelling an airport or ANSP should use when engaging with communities in this regard.

v) When an airport submits a planning application for a development where the CAA is a statutory consultee

- 2.15 The CAA is prescribed as a statutory consultee under planning law¹⁷ and must be consulted on all proposed applications for Development Consent relating to an airport or which are likely to affect an airport or its current or future operation.
- 2.16 As a statutory consultee, we will need to consider whether we see any impediments to the proposed development proceeding insofar as they relate to our regulatory roles and statutory functions¹⁸. If we do identify any impediments, we need to consider whether these can be appropriately managed and advise the Planning Inspectorate and SoS accordingly. In order to provide a no impediments statement, we must be satisfied that there are no unacceptable safety, economic or airspace consequences arising from the planning proposals that will prevent us giving our relevant regulatory approvals later on.
- 2.17 This will require the applicant to engage with us on its proposals with sufficiently detailed and mature information so that we can provide meaningful advice and commentary, and ultimately be satisfied that the 'no impediments' threshold has been met insofar as they relate to our regulatory roles and statutory functions. All applications are required to consult on and provide an Environmental Impact Assessment, and in most circumstances, this will need to include an assessment of aviation noise

¹⁷ Infrastructure Planning (Applications: Prescribed Forms & Procedure) Regulations 2009

¹⁸ Likely to be those concerning safety, economic regulation and airspace change.

Chapter 3

The CAA's proposals

- 3.1 In this section, we consider each of the cases above and outline the CAA's proposals for proportionate minimum sophistication of noise modelling required to be submitted to us by sponsors and stakeholders.
- 3.2 A proportionate noise analysis should consider the purpose of the noise calculation, and should be sufficient for the CAA to achieve that purpose. For example, if the CAA is required to estimate the effect of a proposed change, we will need to know the likely noise exposure with and without the change for a particular time after the change is proposed to be made.
- 3.3 Or sometimes, we only need to ensure that noise (or the numbers of residents exposed to it) is or is not beyond a certain threshold. In this case, it may not be necessary to know exactly what the noise levels around the airport are or exactly how many residents are affected, only that it is clear that the threshold is or is not met.
- 3.4 As far as possible, our proposals aim to reflect established modelling procedures, since we are not aware of any evidence of substantive gaps or shortcomings for the majority of airports. There may be a few airports which find the sophistication of their noise modelling is currently behind where our minimum proposals indicate they should be. However, this will only be the case if they are significantly lagging behind their peers (that is, there are other airports affecting similar numbers of residents which currently exhibit that extra level of sophistication) or there are improvements which they could easily make using the data which is already available to them.
- 3.5 Note that it is only airports designated for noise by the Secretary of State that have an *ongoing* requirement to provide us with noise measurement data. In all other cases, we require data only for the length of time needed for a particular process or application to be completed. However, airports may choose to continue to produce noise measurement data as part of their ongoing community engagement and information provision.

Proposed minimum requirements for noise modelling

No decrement and No radar criteria

- 3.6 The following proposals are for minimum requirements for noise modelling. Some airports may already be providing noise modelling at a higher Category than the minimum recommended here. For example, it may be that airports (and

their communities) may have historically agreed or come to expect more sophisticated noise modelling than required here due to good local reasons. We would expect these arrangements to persist and so no airport (or other stakeholder) should do less in terms of its noise modelling than it did on or before January 2020 as a result of these minimum requirements (no decrement criterion).

- 3.7 If an airport does not have the radar infrastructure to provide track-keeping data, then it will only be able to calculate noise to Category D or E standard. In this case, the CAA would not generally consider it proportionate for the airport to have to incur the expense involved in installation of radar infrastructure, as well as track-keeping and/or noise monitors, even if the proposals below indicate that it should provide noise modelling at Category C, B or A (no radar criterion). However, the airport and its community should be aware that its noise modelling is likely to be of a lower sophistication than its peers (in terms of calculating noise effects) and it should consider under what circumstances that would justify the expense required to adopt the standards for a higher Category. In particular, should alternative technologies become readily available that allow track-keeping without the need for radar infrastructure, the CAA may review this criterion. At all times, it will be for the airport to justify its decision not to meet the relevant Category.

Question 1: What are your views on the CAA's proposed No decrement and No radar criteria for noise modelling?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

i) When an airport is designated for noise by the Secretary of State

- 3.8 Airports designated for noise purposes by the Secretary of State are required to produce a range of noise contours for both the average summer day and the average summer night on an annual basis. Until 2015, these contours were then published by the DfT on its website; since 2015, they have been published by each designated airport on its website. Additionally, every five years, the designated airports are required to calculate annual average day, evening, night, and L_{den} noise contours.

- 3.9 Where ERCD undertakes the noise modelling, the CAA would expect any such designated airport to model noise at the Category A standard, which is the methodology followed by the airports currently so designated. Further, as with those airports now, we would expect direct access to be provided to the CAA (or other noise modelling organisation) to the system on which the track-keeping and noise monitor data is kept, rather than for them to be provided with data snapshots. This is to ensure that the data being used in the noise modelling has not been altered in any way before being passed on to the noise model.

Question 2: What are your views on the CAA's proposals for noise modelling at airports designated for noise by the Secretary of State?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

ii) When a sponsor wants to change the design of airspace

- 3.10 The CAA's process for requesting an airspace change is contained in CAP1616. Only certain airspace change proposals (ACPs) affecting civil airspace under 7,000 ft (known as Level 1 ACPs) require noise modelling to be submitted to the CAA, and the extent of noise modelling required will depend on the nature of the airspace change.
- 3.11 For all those Level 1 ACPs for which some noise modelling will be required, then the CAA proposes that the minimum sophistication of the modelling process should depend on the size of the current or proposed noise effect of the airport on its local community. In line with current Government policies for noise, daytime noise annoyance is assumed to start at 51dB $L_{Aeq,16h}$ and night time noise at 45dB $L_{Aeq,8h}$. These are called the Lowest Observed Adverse Effect Levels (LOAELs). The minimum assessment required by a sponsor is to see whether the options for change will make a difference to the numbers of residents affected at these levels and the distribution of residents affected by higher levels¹⁹. Note that, if a call in of the decision by the SoS is requested, then the CAA will be required to assess whether the change in the number of

¹⁹ For example, if the same number of residents are inside the 51dB $L_{Aeq,16h}$ contour for both the 'do nothing' and 'do something' options, but the numbers inside the 60dB $L_{Aeq,16h}$ contour are different, there will still be a need to undertake some noise modelling to estimate this effect.

residents exposed to at least 54dB $L_{Aeq,16h}$ is greater than 10,000, and so this also will need to be clear from the analysis which is presented.

- 3.12 In some circumstances, the airspace change sponsor may believe that no significant change in noise will arise as a result of the options for change, or that the changes will affect few or no residents. However, the sponsor will have to demonstrate this to the CAA's satisfaction. It is not possible to list all the ways which would be acceptable, since it will depend on the circumstances of the sponsor and airspace change.
- 3.13 However, to give an example, at the most basic, noise contours for a variety of airports are already published showing the size and shape of each contour. If using such contours from a different airport would clearly overestimate the effect of an ACP (this would have to be demonstrated somehow rather than simply asserted) and showed that sufficiently few residents were affected by the proposed change to meet the call in criterion, then that might be enough for the CAA's purposes.

Assessment of options and public consultation

- 3.14 In most circumstances, some form of noise modelling will need to be undertaken by the airspace change sponsor. The CAA believes that the Category of noise modelling that will be appropriate should be based on the number of residents in the 51dB $L_{Aeq,16h}$ day or 45dB $L_{Aeq,8h}$ night contours (either before or after the proposed change whichever is greater²⁰).
- 3.15 Since the transition from one Category of noise modelling to another can involve time and money from an airspace change sponsor, and since noise contours can grow and shrink through changes in factors such as fleet mix, flight paths, or traffic volumes, we propose to set minimum recommended and minimum mandated thresholds for each Category of noise modelling. That is, once the likely number of residents in the 51dB $L_{Aeq,16h}$ or 45dB $L_{Aeq,8h}$ contours reaches the minimum recommended threshold, a stakeholder should consider upgrading its noise modelling to that Category, particularly if these numbers are likely to keep growing. However, it will be allowed to keep using the lower Category until the number of residents reaches the minimum mandated threshold. Note that the CAA will never require a stakeholder to move to a lower noise modelling Category and so the lower threshold for all of the proposed noise Categories is set at zero residents. Tables 4.1 and 4.2 shows the thresholds proposed by the CAA for each Category.

²⁰ Even if the number of residents in these noise contours reduces as a result of the change, the numbers in other contours may increase (for example, if flights are concentrated on fewer flight paths) and so noise measurement will still be appropriate.

Table 4.1: Proposed thresholds for noise modelling Categories, average summer day, population exposed to 51dB $L_{Aeq,16h}$ or above.

Category	Lower threshold	Recommended minimum threshold	Mandated minimum threshold	Maximum threshold
A	0	400,000	500,000	none
B	0	160,000	200,000	500,000
C	0	20,000	25,000	200,000
D	0	1,600	2,000	25,000
E	0	0	0	2,000

Table 4.2: Proposed thresholds for noise modelling Categories, average night, population exposed to 45dB $L_{Aeq,8h}$ or above.

Category	Lower threshold	Recommended minimum threshold	Mandated minimum threshold	Maximum threshold
A	0	400,000	500,000	none
B	0	160,000	200,000	500,000
C	0	20,000	25,000	200,000
D	0	1,600	2,000	25,000
E	0	0	0	2,000

- 3.16 As can be seen from Table 4.1 and 4.2, we propose to set the same thresholds for population in the day and night contours for each of the noise Categories. This is because the different LOAELs for day and night already capture the difference in noise perception between day and night noise. However, we may review both day and night thresholds at a later date in the light of future evidence should our proposals be taken forward.
- 3.17 CAP 1616 requires an airspace sponsor to provide traffic forecasts for a period of at least 10 years from the intended year of implementation for all permanent ACPs. We propose that an airspace sponsor uses at least the highest Category

of noise modelling of those indicated for their day or night noise contours for each year in this forecast period. In other words, the sponsor should assess the Category indicated in the Tables 4.1 and 4.2 for each year in the forecast period and for both day and night contours, and then should use highest Category from that set as the minimum standard for all noise modelling in the ACP.

- 3.18 However, as indicated above, if an airport does not have the radar infrastructure to provide track-keeping data, then it will only be able to calculate noise to Category D or E standard. In this case, even if the tables above indicate otherwise, the CAA would only expect noise calculations to be undertaken at Category D or E standard.

Question 3a: What are your views on the CAA's proposals for the noise modelling Category required for assessment of options and consultations for Airspace Change Proposals?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

Call in assessment

- 3.19 When a stakeholder requests that the Secretary of State calls in an airspace change request, the CAA is usually asked to assess the call in request against criteria published in directions to the CAA. The latest such directions, The Civil Aviation Authority (Air Navigation) Directions 2017²¹, include one criterion relevant to noise modelling, namely that the proposed change:

could both lead to a change in noise distribution resulting in a 10,000 net increase in the number of people subjected to a noise level of at least 54dB LAeq,16h and have an identified adverse impact on health and quality of life.

- 3.20 Although the Directions do not give a particular time period over which to make this assessment, the CAA proposes that it should consider the largest such increase expected in the 10 years following the introduction of the proposed airspace change. This is in line with the requirement for traffic and noise forecasts in CAP 1616.

²¹ As amended by The Civil Aviation Authority (Air Navigation) (Amendment) Directions 2018 and The Civil Aviation Authority (Air Navigation) (Amendment) Directions 2019.

Question 3b: What are your views on the CAA's proposals for the forecast period over which this aspect of the call in criterion is assessed?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

- 3.21 In order for the CAA to assess this criterion, the airspace change sponsor must have provided sufficient noise modelling that i) the number of people subjected to a noise level of at least 54dB $L_{Aeq,16h}$ can be assessed for the 'do nothing' and 'do something' scenarios and ii) if it seems likely that there may be a net increase of 10,000 people in this contour, the necessary data to assess the adverse impact on health and quality of life, in accordance with the latest webTAG guidance²².
- 3.22 In some circumstances, the sponsor may have provided evidence other than calculated noise contours to the CAA showing that the proposed airspace change clearly affects significantly fewer than 10,000 residents. If the CAA accepts this evidence, then it is a consequence that the call in criterion will not have been met, and no further noise modelling will be required.
- 3.23 Otherwise, the airspace change sponsor should have estimated the population within the 51dB $L_{Aeq,16h}$ noise contour (for the purposes of establishing what minimum Category of noise modelling is required) and this may be enough to demonstrate that the call in criterion has not been met. This would be the case if it has already been established that fewer than 10,000 people are exposed to a noise level of at least 51dB $L_{Aeq,16h}$ in the 'do something' scenarios. Therefore, it would be impossible that the proposed change will result in a net increase of 10,000 people in the 54dB $L_{Aeq,16h}$ contour.
- 3.24 However, if there is a need for any further noise modelling, the CAA proposes that the appropriate Category of noise modelling for the purposes of call in assessment is the same as that required for the airspace change options analysis.

²² See DfT's 2017 publication 'Guide to WebTAG Noise Appraisal for non-experts' for details (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669423/webtag-for-non-experts.pdf)

Question 3c: What are your views on the CAA's proposals for the noise modelling Category required for call in assessment?

Strongly agree

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

- 3.25 If it seems likely that the airspace change may meet the first sub-clause of the call in criterion (that is, the proposed change may lead to a change in noise distribution resulting in a 10,000 net increase in the number of people subjected to a noise level of at least 54dB $L_{Aeq,16h}$), then the sponsor will have to provide the CAA with noise modelling data to allow us to evaluate the second sub-clause (whether the proposed change will have an identified adverse impact on health and quality of life).
- 3.26 Current webTAG guidance for assessing adverse impacts on health and quality of life requires every resident's change in noise level in 1dB bands to be identified. For $L_{Aeq,16h}$, this requires the number of residents exposed to 51-52dB, 52-53dB, 53-54dB, etc to be calculated and supplied to the CAA; for $L_{Aeq,8h}$, the categories need to begin at 45dB. We consider that the noise modelling Category already required of the sponsor in these circumstances will be of a sufficient level for undertaking this work.
- 3.27 We would expect the sponsor of the airspace change to have provided the CAA with the necessary noise contour data and the webTAG calculation of the change in health and quality of life for residents. We propose that any worsening of health and quality of life measurement arising as a result of the airspace change be treated as 'an identified adverse impact' for the purposes of interpreting the Directions. Further, we propose that we will also consider the criterion met should the sponsor not provide us with the necessary data and calculations to assess this aspect of the ACP, and we have identified that there is a greater than 10,000 net increase in the number of people subjected to a noise level of at least 54dB $L_{Aeq,16h}$ ²³.

²³ It is possible that an increase in the numbers of people exposed to 54dB $L_{Aeq,16h}$ could come alongside a decrease in the numbers exposed to higher noise levels (if, for example, concentrated flight paths were being dispersed) and/or with a decrease in numbers exposed to lower levels of noise (if, for example, flight paths were being concentrated more). Therefore, whilst it may be likely that a change which

Question 3d: What are your views on the CAA's proposals for assessing whether a proposed change has an identified adverse impact on health and quality of life for the purposes of assessing criteria for call in by the Secretary of State?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

iii) When an ANSP wants to change an ATC operational procedure and the proposal meets the criteria for a 'relevant PPR'

- 3.28 The CAA recently consulted on its decision-making process for PPRs, which would require a sponsor to follow some, although not necessarily all, of the airspace change process contained in CAP1616. We intend to have this process in place by 1 February 2020.
- 3.29 Irrespective of the outcome of this earlier consultation, for reasons of proportionality, we propose that the noise modelling expectations for PPRs are the same as those for airspace changes as described in the section above. That is, the Category of noise modelling which describes the minimum requirements for a PPR can be found by using Tables 4.1 and 4.2 above.

Question 4: What are your views on the CAA's proposals for noise modelling at airports applying for a planned and permanent redistribution of air traffic?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

increases the population exposed to 54dB $L_{Aeq, 16h}$ by more than 10,000 will also adversely impact overall health and quality of life, it may not always be the case.

iv) When there are changes to the operational use of the civil airspace around an airport

- 3.30 In CAP 1616²⁴, the CAA has already set out its guidance for measurement and transparency in respect of both requirements to highlight and explain aircraft operational changes retrospectively through the production of information, and proactive expectations to make information available relating to aircraft movements. However, this section of CAP 1616 does not require the calculation of noise exposure of residents, and, being only guidance, the CAA has no decision-making role in this area. Therefore, there is no need for the CAA to specify an expected noise calculation Category at the present time.
- 3.31 However, in deciding how to engage with its local community on these matters, an airport may choose to use noise modelling to illustrate the extent of changes experienced by residents due to operational changes to airspace usage. In these circumstances, the CAA would strongly recommend that the airport uses the same Category of noise calculation as would be the case were it applying for an airspace change.

Question 5: What are your views on the CAA's recommendation the noise modelling at airports whose traffic has changed in line Direction 15?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

v) When an airport submits a planning application for a development where the CAA is a statutory consultee

- 3.32 The noise information provided for a planning application is likely to be associated with some past or future ACP, PPR or increase in traffic mix or volume. We would expect the noise calculations for the planning application to be undertaken at the same Category as was or would be appropriate for these associated ACPs, PPRs or in light of the change in traffic. However, in the circumstance that the effects of the development under consideration are expected to be realised over a timespan longer than 10 years, we would expect the assessment of the appropriate Category to take place over that development

²⁴ In the section beginning at page 97.

timespan rather than just the 10 year forecasts required when an ACP or PPR is assessed.

Question 6: What are your views on the CAA's proposals for noise modelling at airports applying for planning consent for a development where the CAA is a statutory consultee?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

Transition arrangements

- 3.33 The thresholds in Tables 4.1 and 4.2 have been designed to indicate to airports and stakeholders that they should consider investing in the next highest Category when they pass 75% of the minimum mandated threshold. However, if we introduce these proposals, then at the point they come into force, there may be stakeholders that find themselves needing to increase the sophistication of their noise modelling before they can progress an ACP, PPR or DCO. Also, should the SoS designate a new airport for noise, that airport may have to upgrade its noise modelling to meet the Category A requirement.
- 3.34 Proportionality suggests that in such cases, a reasonable transition period should be allowed. The size of the period will depend on the actions which need to be undertaken by the airport. At the most extreme case, an airport may have to install a track-keeping system or noise monitors, which could take 12-24 months and then collect data over a summer period to use in the noise modelling. In other cases, the data may already be available to the airport, and it may just require updating the noise modelling process to use this data more fully.
- 3.35 The CAA proposes that a one-off transition period be allowed at the point these proposals come into force, which will be tailored to the circumstances of each airport which requires it and notifies us that it needs to upgrade its noise modelling Category. Outside of this introductory allowance, we propose that further transition periods will only be allowed by exception (for example, if a new airport is designated for noise by the SoS) and it will be up to an airport or other stakeholder to request a transition period be allowed and to provide evidence to us to justify their request.

Question 7: What are your views on the CAA's proposals for transition arrangements?

Strongly agree

Agree

No strong feelings either way

Disagree

Strongly disagree

Don't know

Please explain your answer and provide any other general comments.

Chapter 4

How to respond and next steps

How to respond to this consultation

- 4.1 We have sought to make this consultation as accessible as possible by presenting the key points on our dedicated consultation website. The longer document you are reading is for stakeholders wanting more detail. The questions in each case are the same.
- 4.2 The consultation will close at 23.59 on 4 March 2020 and we cannot commit to taking into account comments received after this date. Please let us have your comments by answering the questions online: consultations.caa.co.uk/policy-development/minimum-requirements-for-noise-modelling. Our strong preference is that you complete the online consultation. We understand that some stakeholders prefer not to be constrained by the questions alone and will want to send a self-contained response. While we will accept these submissions, we ask that they are structured around our questions. Otherwise we will not be able to analyse the submissions in the same way that we analyse the online responses.
- 4.3 We will assume that all responses can be published on our website. When you complete the online consultation, there will be an option for you to hide your identity or refuse publication. (In any event, your email address will not be published.) In the interests of transparency, we hope people will not refuse publication. If you do send us a separate submission and it includes any material that you do not want us to publish, please also send us a redacted version that we can publish. You should be aware that information sent to and therefore held by the CAA is subject to legislation that may require us to disclose it, even if you have asked us not to (such as the Freedom of Information Act and Environmental Information Regulations). Therefore, if you do decide to send information to the CAA but ask that this be withheld from publication via redacted material, please explain why, as this will help us to consider our obligations to disclose or withhold this information should the need arise.
- 4.4 If you would like to discuss anything about how to respond to the consultation, please email noise@caa.co.uk.

Next steps

- 4.5 Once the deadline for consultation responses has passed, we will assess all the responses we have received and, in the light of these, make any amendments to

our proposals which seem justified. We will publish a summary of the responses we receive.

- 4.6 If the amendments to our proposals are significant, we may feel we need to re-consult on our revised proposals. Otherwise, we will publish a policy document confirming the new policy on minimum sophistication for noise modelling and the date that it will come into force. We intend to have undertaken these steps by Easter 2020. At about the same time, we intend to publish a factual document with more information about aviation noise and its measurement to inform stakeholders about some of the wider aspects of the topic.