Department for Transport

Air Navigation Guidance:

Guidance on airspace & noise management and environmental objectives

The Department for Transport has actively considered the needs of blind and partially sighted people in accessing this document. The text will be made available in full on the Department's website. The text may be freely downloaded and translated by individuals or organisations for conversion into other accessible formats. If you have other needs in this regard please contact the Department.

Department for Transport
Great Minster House
33 Horseferry Road
London SW1P 4DR
Telephone 0300 330 3000
General enquiries https://forms.dft.gov.uk
Website www.gov.uk/dft

Contents

Introduction

Section 70(2) of the Transport Act 2000[1] requires the Civil Aviation Authority (CAA[2]) to take account of any guidance on environmental objectives given to it by the Secretary of State when carrying out its air navigation functions which are set out in the Secretary of State's Air Navigation Directions[3] made under section 66(1) of the Transport Act 2000. These directions also set out the circumstances when the CAA should also seek the approval of the Secretary of State before making changes to the airspace structure which might have a significant effect on the level or distribution of noise and emissions. This was followed in January 2002 when the then Department for Transport, Local Government and the Regions issued specific guidance to the CAA which has subsequently formed the basis of how the CAA interprets its environmental duties in respect of carrying out its air navigation functions including approving changes to the UK's airspace structure. It has become known as the Air Navigation Guidance.

In January 2014, the Department for Transport published a revision to the Air Navigation Guidance which took account of the latest developments on UK airspace, including the creation of the CAA led Future Airspace Strategy (FAS). However, this document did not reflect a significant reappraisal of the Government's airspace and noise policies. Soon after publication, a number of operational trials across the UK and changes to procedures used by air traffic controllers, led to various calls for a significant reappraisal of the Government's airspace and noise policies and this resulted in the UK Airspace Policy consultation which the Department published on [TBC].

This revised Air Navigation Guidance is therefore the result of a review of the Government's airspace and noise policy. It builds on the 2014 Air Navigation Guidance to the CAA. In addition to being statutory guidance to the CAA on its environmental duty in respect of its air navigation functions, this document goes wider and also includes details on the role of the Secretary of the State in the airspace change process. Unlike the 2014 Air Navigation Guidance to the CAA which this version of the Guidance now replaces, the new guidance is aimed not just at the CAA but we also expect that it will be noted and taken into consideration by the aviation industry. It therefore has a wider audience, and also acknowledges the important role which local communities have in the airspace change process.

[1] Section 70(2) of the Transport Act 2000 can be found at Annex C of this Guidance (to be added).
[2] A Glossary of the terms used in this document can be found at Annex B of this Guidance.
[3] The relevant sections of the Directions can be found at Annex D of this Guidance (to be added).

Objectives of the Guidance

Underpinning this new Guidance are a number of key overall objectives. These include to:

- provide guidance to the CAA under section 70(2) of the Transport Act 2000 and which the aviation industry should take account of;
- ensure that aviation can continue to make its important contribution to the UK economy and at the same time seek to improve the efficiency of our airspace network;
- strengthen the UK's airspace change process and its transparency, particularly with respect to how local communities are involved within it; and
- emphasise the need that the environmental impact of aviation must be mitigated as much as is practicable and realistic to do so, within the context of a balanced decision-making framework.

The Government recognises the degree of challenge which exists to balance the interests of local communities and relevant stakeholders with those of the aviation industry's desire to further develop the efficiency of the UK airspace network. However, we are confident that by following this revised guidance the aviation industry and the CAA will ensure that a better and more appropriate balance is achieved as the UK embarks on a major programme of airspace modernisation. This guidance aims to help set the overall expectations on stakeholders in this respect whilst providing transparency as to the basis upon which airspace change decisions, particularly those relating to low-level airspace, are made and how the Government's airspace and noise policies should be followed.

Purpose and applicability of the Guidance

The purpose of this Guidance is to provide the CAA with environmental objectives and guidance on them, as well as guidance to other stakeholders. The guidance is not just concerned about the process of making formal airspace changes in the UK, but also extends to all the CAA's air navigation functions. However, we note that when considering airspace changes and day to day air operations, there are other legitimate operational objectives, such as the overriding need to maintain a high standard of safety, the desire for sustainable development,[4] or to enhance the overall efficiency of the UK airspace network, which the CAA and others are required to take into account and which need to be considered alongside these environmental objectives. Where relevant, we look to the CAA to determine the most appropriate balance between these competing characteristics as set out in section 70 of the Transport Act 2000.

This document, excluding Section 6, is statutory guidance to the CAA on environmental objectives relating to CAA's air navigation functions in accordance

[4] Sustainable development has both environmental and economic connotations, the need to enable aviation to grow sustainably if the UK economy is to remain competitive and achieve the objective for growth and employment.

with section 70(2) of the Transport Act 2000 and the Air Navigation Directions issued under section 66(1) of that Act. This information should also be noted and taken into consideration by the aviation industry.

Section 6 of this document is general guidance to the CAA and the aviation industry and relates to the role of the Secretary of State in the UK's airspace change process.

1. Air Navigation Guidance to the CAA on the Government's environmental objectives

Introduction

1.1 The Secretary of State issues the following guidance on environmental objectives relating to air navigation to the Civil Aviation Authority (CAA) in accordance with section 70(2) of the Transport Act 2000 and on the call-in roll of the Secretary of State for the purposes of the Air Navigation Directions issued under section 66(1) of that Act. This information should also be noted and taken into consideration by the aviation industry.

The Government's key environmental objectives

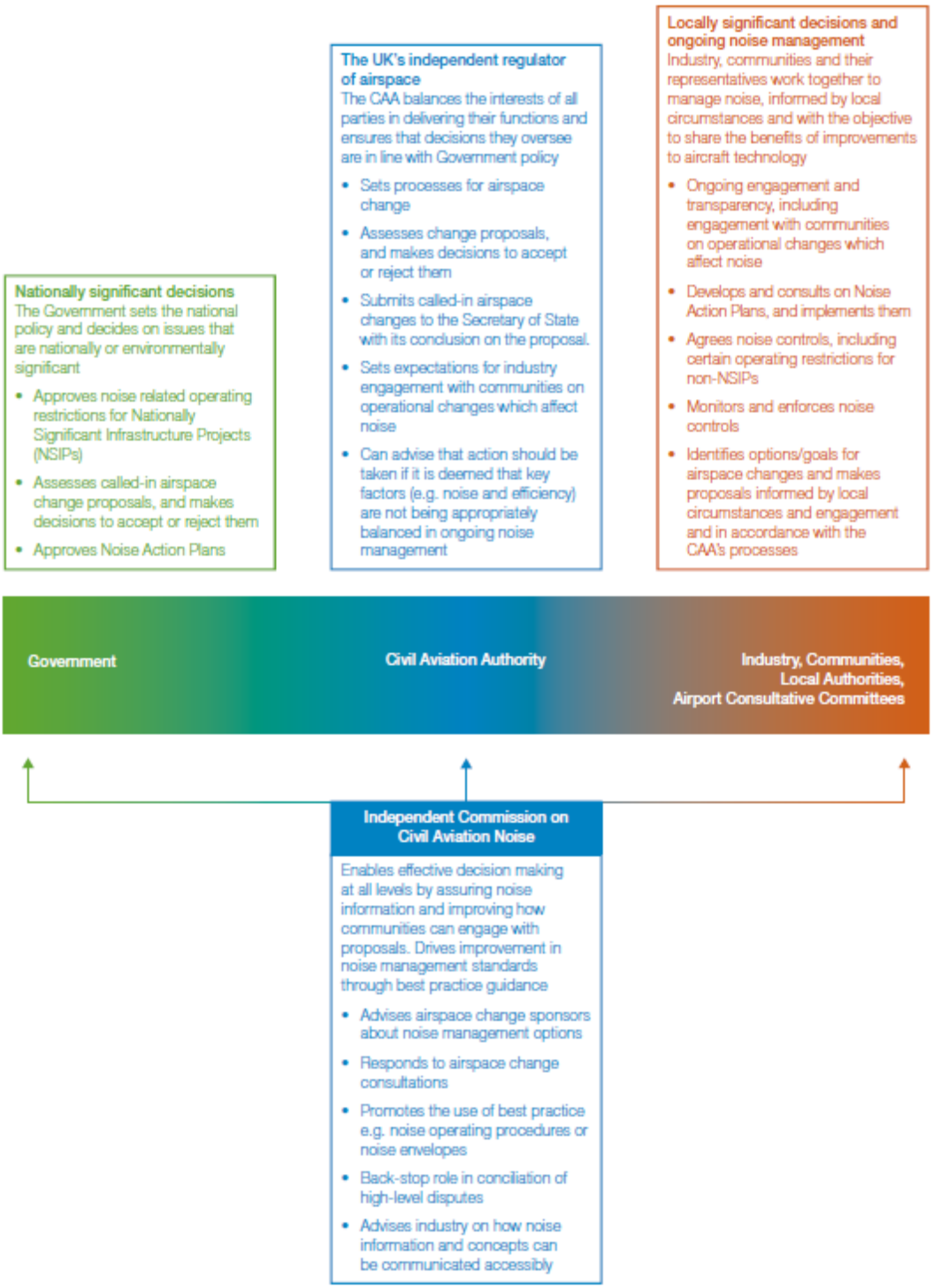
1.2 The environmental objectives with respect to air navigation are chosen to facilitate the Government's overall environmental policies. These environmental objectives are designed to minimise the environmental impact of aviation within the context of supporting a strong and sustainable aviation sector. These objectives are to:

- limit and, where possible, reduce the number of people in the UK significantly affected by aircraft noise as part of a policy of sharing benefits of noise reduction between communities and industry in support of sustainable development;
- reduce aviation fuel use and carbon emissions through encouraging the aviation industry to come forward with more innovative ways to deliver enhanced efficiencies; and
- minimise local air quality emissions and in particular ensure that the UK complies with its international obligations on air quality.

1.3 In order to deliver this policy, decisions on how aircraft noise is best distributed should be informed by local circumstances and consideration of different options. Consideration should include the pros and cons of concentrating traffic on single routes which normally reduce the number of people overflown, versus the use of multiple routes which can provide relief or respite from noise.

1.4 The Altitude-Based Priorities discussed in Section 3 sets out how these different factors should be balanced against one another.

Roles and Responsibilities



The decision making system

1.5 The various roles and responsibilities of relevance to the way that airspace is managed and updated are:

Department for Transport – is the lead Government department for civil aviation and sets the UK's overall policy on aviation. The Secretary of State gives the CAA its air navigation functions in Air Navigation Directions. The Secretary of State also gives the CAA guidance on its environmental objectives in relation to the CAA's air navigation functions;

Civil Aviation Authority – acts as the UK's independent airspace and safety regulator and national supervisory authority responsible for the planning and regulation of national airspace. It sets the UK's airspace change processes, including how environmental impacts are taken into account, and analyses proposals made by sponsors to change the notified UK airspace structure and to certain procedures used by air navigation service providers. It also oversees the implementation of the Future Airspace Strategy and provides technical advice to the DfT on noise and other aviation-related matters;

UK airports – these are responsible for providing air navigation services in the airspace closest to the airport and for their standard instrument departure and arrival routes. Airports therefore often act as the sponsor of an airspace change which is directly linked to their own airport operations. They are also responsible for ensuring compliance by airlines with any noise abatement procedures at the airport, as well as for active engagement with their local communities and for ensuring that they mitigate noise disturbance as much as is practicable, for example, through noise penalty schemes;

NATS – is the UK's national en-route provider of air traffic services. It is responsible for ensuring the safety and efficiency of much of the UK's controlled airspace and acts as the principal sponsor for airspace change proposals in both the upper airspace as well as lower airspace down to c7,000 feet. It also carries out airport approach services at a number of UK airports;

Airlines – these are responsible for considering the environmental performance of aircraft when deciding their fleet mix, setting certain operating procedures for their pilots to follow when taking-off and arriving e.g. ascent profile, and for ensuring that their pilots follow the relevant noise abatement procedures at airports;

Local authorities - these set local planning policies and ensure that noise impacts are properly considered during the planning process and that unacceptable adverse impacts are avoided. They can also require conditions through planning agreements to set noise controls and operating restrictions. Local authorities are also responsible for land-use planning and ensure that inappropriate development does not occur near airports and that development meets certain standards of noise insulation where appropriate.

Independent Commission on Civil Aviation Noise (ICCAN) – this is responsible for (to be determined in light of the consultation on airspace and noise)

Definition of altitude in this Guidance

1.6 Throughout this Guidance, all altitude figures in feet are expressed in feet above mean sea level (amsl) in order to provide a common datum. However, the CAA should ensure that the aviation industry takes account of the elevation (height) of the specific surface level involved when developing its airspace proposals or seeking to amend its operational procedures. This is particularly the case when such proposals may affect airspace at an altitude lower than 7,000 feet (amsl) and in circumstances where the actual height of the land directly beneath may be hundreds of feet or higher above sea level.

Performance-Based Navigation

1.7 Perhaps the most significant change to airspace arrangements in the past 50 years has been the onset of the implementation of performance-based navigation (PBN), a process which is likely to take many years to complete. As PBN is mentioned in a number of places in the text, more details can be found at Annex A.

2. Airspace Change

Introduction

2.1 A key function of the CAA is to act as the UK's independent airspace regulator and to oversee the UK's airspace change process. To assist the CAA in the exercise of its duties, the Government has established the following three-tier approach to airspace in the UK which the CAA should respect:

a. **Tier 1 - Changes to the notified structure of UK airspace**. Permanent changes to this structure are already covered by the CAA's formal airspace change process. We expect the consideration of noise within this process to be further strengthened by the introduction of ICCAN, and guidance on how to assess noise impacts. Within this tier, are also temporary airspace amendments and operational trials of potential airspace arrangements which although they involve amendments to the structure of UK airspace are for a limited period of time. In such cases, the CAA is able to offer a flexible approach to the process that will be followed before the CAA decides whether to agree to the temporary arrangements, including the amount of consultation which is required before they are implemented.

b. **Tier 2 - Changes to air traffic control procedures by air navigation service providers**. As these procedural changes can have a very similar effect to changes in the permanent structure of UK airspace, since they can result in the planned and permanent redistribution (PPR) of aircraft traffic,[5] we expect to see a suitable and proportionate change process in place for them.

c. **Tier 3 - Changes to air operations**. This could include, for example, noticeable shifts in the distribution of flights on particular routes over a period of time which may be the result of, for instance, various airline and/or airport operational factors or year on year increase in traffic volumes.

[5] A PPR of air traffic is when a change in air traffic control (ATC) procedures results in the redistribution of air traffic which has a noticeable impact on noise. This could be, for instance, a procedural change in the instrument landing system joining point or if there was a decision by an airport to amend its runway alternation arrangements with a consequent change in ATC procedures.

Tier 1a - Permanent changes to the notified airspace structure

2.2 Where changes, other than temporary arrangements or short-duration operational trials, are proposed to the design or use of controlled airspace, the CAA should ensure that the full airspace change process is followed, including the use of WebTAG for assessment purposes. In addition, thorough consultation should be carried out in accordance with the Directions given under section 66(1) of the 2000 Act prior to approving any change. The level of consultation required by the CAA should take account of the scale and impact of the change, and the potential stakeholders who may have a legitimate interest as well as their ability to contribute either directly or through a representative body.

2.3 Where consultation with local people is required, the minimum consultation requirements to be placed on airspace change sponsors should meet the standards set out in the Cabinet Office Guidance on Consultation principles.[6] The method, form and extent of the consultation will vary depending on the circumstances and expected impacts of each case taking account of the altitude-based priorities presented in Section 3.2 to 3.3 of this Guidance. Some airspace changes are of a technical nature and have no significant environmental impact, such as a change to airspace classifications which does not affect airspace usage, and therefore might require little or no consultation with stakeholders. In all cases, however, the CAA should determine the appropriate level of consultation required for a given change, and scale its processes accordingly. The expectation is that where there is potential for a considerable impact on the likely level of noise disturbance, for example a proposal to move a low-level route and its associated impacts to a different geographical location, the consultation process should be extensive and include:

- the manager of the relevant aerodrome and its principle users (where the changes relate to a particular aerodrome);
- other principal users of the airspace (which may be done through representative bodies);
- ICCAN;
- local authorities[7] in the neighbourhood of the aerodrome or directly underneath the flight path swathe up to 7,000 feet[8] to which the proposed airspace change relates (changes above 7,000 feet have little or no significant local impact and therefore local consultation is not usually going to be necessary);
- other organisations and individuals (if any) of which the CAA is aware who may represent the interests of people living in the immediate vicinity of the aerodrome or directly underneath the flight path swathe up to 7,000 feet to which the proposed airspace change relate;

[6] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492132/20160111_Consultation_principles_final.pdf
[7] For these purposes, county, district or borough and unitary authorities only should be consulted. However, airspace change sponsors should be encouraged to consult also with parish or town councils, particularly if they have made their interest known in airspace matters previously.
[8] The CAA has published CAP 1378 "Performance-Based Navigation – Airspace Design Guidance", March 2016. Annex B provides a discussion on overflight which sponsors are encouraged to consider. https://publicapps.caa.co.uk/docs/33/CAP%201378%20APR16.pdf

- any national or local environmental bodies that are considered to have a specific interest in the impacts of the proposed airspace change;
- the relevant airport consultative committee where one exists; and
- it should be considered as best practice that the sponsor consults and informs the communities which it may be affecting through the use of such means as social media, newspaper adverts, leaflets etc as the CAA considers appropriate.

2.4 Consultation with environmental stakeholders will usually only be necessary where the proposed changes concern controlled airspace at or below an altitude of 7,000 feet or could have considerable knock-on effects on how traffic uses adjoining uncontrolled airspace at or below the same altitude. However, the CAA should exercise its judgement when considering the need or scope of the consultation where proposed change(s) would result in an overall improvement in noise levels for all those affected since consultation may not be necessary in such cases.

2.5 If the need for a consultation is deemed appropriate, the CAA should ensure that the airspace change consultation is robust and sufficient in order to enable it to make an independent assessment of the proposal.

2.6 Where the proposed changes may have a significant effect on the level and distribution of noise in the vicinity of an aerodrome, or would be expected to alter the size or shape of the standard day or night time noise contours in use at the aerodrome, the CAA should check to ensure that the consultation includes assessments of those effects. This assessment should be based on both the traffic levels expected at the time of implementation and forecast traffic levels for future periods where these are considered appropriate. We expect that the ICCAN will play an important role in helping to ensure that the assessments are appropriate and accessible to local communities.

Tier 1b - Temporary changes to the notified airspace structure

2.7 A temporary change to the notified airspace structure is one that may, at the CAA's discretion, introduce new controlled airspace arrangements or modifications to existing structures/routes in order to provide temporary arrangements to cover specific events or operating conditions.[9]

2.8 The temporary airspace arrangement will usually apply for a period of no longer than 90 days and the airspace will then revert back to its original state at the end of the designated period. Under extraordinary circumstances this may be extended but only with the express authorisation of the CAA.

2.9 The Government recognises that it is not proportionate for an airspace change sponsor wishing to implement a temporary airspace arrangement to be required to follow the full consultation requirements as set out in Section 2.3 to 2.4 above. However, in circumstances where a temporary airspace arrangement would affect the distribution of traffic below 7,000 feet, it is vital that the communities that may be affected are informed prior to the change being implemented. The CAA should

[9] The 2012 Olympics was a good example of when such a temporary arrangement was used.

therefore ensure that an appropriate level of engagement has been carried out by the temporary airspace arrangement sponsor prior to giving approval for its implementation. The CAA should also monitor the level of complaints associated with any temporary airspace arrangement once it has been implemented. If the basis of the complaints, and not just how many have been made, suggests that the operational use of the temporary airspace has not been in keeping with its original design, the CAA should investigate urgently.

2.10 If an airspace change sponsor wishes to extend a temporary airspace arrangement beyond a period of 90 days, the CAA should assess whether the rationale for doing so is appropriate. If so, the CAA should also assess whether the initial engagement by the sponsor remains valid and whether it should be augmented. In all cases, an extension beyond the initial agreed period will need careful consideration by the CAA and should not be granted simply to minimise the amount of effort required by the sponsor when pursuing the full airspace change approval process.

Tier 1c - Approved operational airspace trials

2.11 Additionally, there are operational trials of new airspace structures which need the approval of the CAA. These trials are designed to validate proposals for new structures and routes, the use of new technologies, as well as to develop the evidence base of their impact on the environment. As a consequence, they make a valuable contribution to the efficiency and effectiveness of the UK airspace network, they also form a key component of the successful implementation of the Future Airspace Strategy and the Single European Sky, and they can act as a means of informing a future consultation. The Government therefore considers that operational trials are useful, but that specific care should be taken by airspace change sponsors and the CAA before they are approved. In all cases, the sponsor of the trial should assess whether a non-operational trial, for example the use of simulators, might be more appropriate and be prepared to set out the rationale why this is not the case. If a live operational trial is considered necessary, the sponsor must consider the noise impact of its proposal and this information should help inform the level of engagement required. As with temporary airspace arrangements, the level of engagement needs to be proportionate. The CAA should assess what is appropriate, but particular emphasis should be given to informing communities and their representatives of any changes that might affect the routes flown by aircraft below 7,000 feet.

2.12 All airspace trials should need prior approval from the CAA and have a defined objective and a confirmed start and end date, although the CAA may extend the period of the trial if it considers this appropriate.

2.13 If the airspace change sponsor wishes to make an operational airspace trial permanent, it will need to complete the full airspace change process. Normally, the airspace should revert back to its original state until such time as the full airspace change process can be completed. However, it is not always practical or prudent to disestablish a trial procedure. In such instances, the CAA may consider extending temporary arrangements whilst the airspace change process is being completed. Any extension to the operational trial should be closely monitored by the CAA, and action

taken to swiftly revert the airspace concerned to its original state if and when it becomes clear that the CAA is not going to approve the permanent change requested.

2.14 Operational airspace trials should not be seen by airspace change sponsors as a means to avoid following the airspace change process. It is imperative that sufficient engagement is carried out before implementation and that noise complaints are monitored carefully during the trial. If the basis of the noise complaints, and not just their number, suggests to the CAA that the airspace change sponsor has failed to engage properly or that the trial is proving unsuccessful, it should seek to end the trial as soon as it is safe and practicable to do so.

Tier 2 - Changes to ATC procedures which result in Permanent and Planned Redistribution of air traffic (PPR)

2.15 Under the provisions of the Standardise European Rules of the Air (SERA), and the Rules of the Air and the Air Navigation Order, air traffic controllers are free to give instructions to pilots on the exact route they should take. This practice is called "vectoring"[10] and usually happens at the beginning and the end of a flight, to get aircraft going in the right direction, or to bring them in to land. The Government recognises that vectoring by controllers is essential for the operation of the aviation sector, and will need to continue unless and until systemisation can offer viable alternatives. However, the Government considers that it is also right that Air Navigation Service Providers (ANSPs) need to assess whether a proposal to amend operational practices in their Manual of Air Traffic Services Part II (MATS Pt II) might lead to a permanent and planned redistribution of aircraft (PPR). If so, we want to ensure that the potential environmental impact of the PPR is considered before it is implemented. When changes to MATS Pt II are likely to cause a PPR and create a certain level of noise impact to be determined by the CAA, ANSPs will need to consult their communities as appropriate on the proposal before the CAA gives its approval for the change to procedures to be implemented.

2.16 The Government recognises that there is an issue of proportionality here and that it is not appropriate that ANSPs should engage widely on all possible changes to vectoring practices or that they should be required to follow the full requirements of the CAA's airspace change process. Nevertheless, we expect that the CAA should ensure that the ANSP has assessed the expected noise impact of their proposed procedural change and carried out sufficient engagement activities before a PPR change can be implemented.

2.17 We therefore look to the CAA to require ANSPs to consult their local communities on all planned and permanent changes to their air traffic procedures which, due to anticipated redistribution of aircraft tracks, have a defined noise impact below 7,000 feet.

2.18 As we recognise the need to be proportionate, the CAA should determine what it considers to be an appropriate change process for PPRs, in line with their duties to

[10] More details on vectoring can be found in Chapter 1 of "Description of Today's ATC Route Structure and Operational Techniques", CAP 1379, CAA, March 2016. https://publicapps.caa.co.uk/docs/33/CAP%201379%20final%20March%202016.pdf.

be consistent with better regulation principles and practices and with the overriding need to maintain a high level of safety, to enable purely short-term operational airspace requirements, and for military air activities to continue. This should include the use of WebTAG by ANSPs for all anticipated PPRs below 4,000 feet.

2.19 In the interests of proportionality and national defence, the CAA's process for handling PPR should take into account the following exclusions from the expectations/requirements for PPRs:

- military air traffic control units and any civilian ANSPs working exclusively for the military;[11]
- ANSPs based at airports which handle less than 50,000 movements a year;[12]
- changes which are anticipated to last for a period of less than 90 days duration with at least a 12 month break period thereafter before being reused;[13]
- the existing vectoring arrangements as set out in the noise abatement procedures for the designated airports of Heathrow, Gatwick and Stansted would continue until amended; and
- any procedural change linked solely to the maintenance of a high standard of air safety.

Tier 3 – Changes to air operations

2.20 There are numerous reasons why over time the distribution of aircraft may change. These include the introduction of new destinations, airline operators updating their fleets with aircraft that have different operational characteristics, increasing demand by airspace users, and the introduction of new technology. Such developments do not require the specific approval of the CAA. The CAA should put in place a suitable policy for industry to follow with respect of Tier 3 airspace changes. This should include setting out expectations on transparency and engagement with communities, including on potential ways to mitigate adverse impacts. The CAA should take a light-touch approach, working in conjunction with the new Independent Commission on Civil Aviation Noise to disseminate best practice and improve transparency where necessary. The objective of the policy which CAA establishes should be that local communities are kept informed of relevant changes which are likely to lead to a noticeable change in impacts, where practicable, and that suitable mitigations are considered. The CAA should ensure that its policy does not inhibit Tier 3 changes, as this could affect the development of new markets. Rather, the focus should be on enabling sustainable development.

[11] Due to the nature of their air operations military aerodromes make extensive use of vectoring practices which they consider to be essential to their activities. It is therefore considered that they should not be included within these new requirements.
[12] It is considered appropriate that small airports and their ANSPs should not fall within the scope of these requirements although we would encourage them to adopt the proposed new arrangements on a voluntary basis. The airports, based on 2015 airport data produced by the CAA, which would be included within requirements are Heathrow, Gatwick, Stansted, Manchester, Edinburgh, Glasgow, Birmingham, Bristol, Aberdeen, London City, Luton, and East Midlands. These airports handled a total of 1.7million flights in 2015.
[13] This is to avoid including special arrangements for events such as the Olympics or changes anticipated to be of short duration. We would still expect communities to be informed on a voluntary basis of such changes.

Replication of flightpaths with new procedures

2.21 When considering the introduction of new PBN-based procedures intended to replicate existing conventional procedures, the CAA should ensure that the airspace change proposal contains options and uses options analysis and WebTAG (see Section 3 of this Guidance). This will help the sponsor to determine whether a replication is the right approach or if the best solution to meet the Government's airspace and noise objectives is to introduce multiple routes in which case the change would not be a replication. If, following the options analysis, the airspace change sponsor considers that the best approach to be taken is to replicate the current conventional flightpath with the use of the new procedures, the overall objective should be to preserve the existing route alignments as far as possible. However, in such circumstances, the CAA should make the airspace change sponsor aware that experience has shown that modern aircraft and their on-board flight systems cannot always provide an exact replication of conventional-based flightpaths. So the sponsor will need to be able to convince the CAA that the desired replication can be achieved successfully and the effects of aircraft concentration taken into account.

2.22 The Government expects that the full CAA airspace change process will be followed by airspace change sponsors wishing to update their conventional flightpaths to PBN standards.

2.23 In cases where airports wish to enhance the standard used on PBN flightpaths, for example from "RNAV1" to "RNP1", the Government recognises that such changes are less likely to cause significant redistribution of air traffic. Consequently, in such cases the Government still expects that the airspace change sponsor to consider using options analysis, as per Section 3 of this Guidance. The CAA is also able to determine the precise airspace change process which sponsors need to follow, providing that any noise impacts have been assessed and there is full transparency with communities that may be affected.

3. Development and assessment of airspace change options

Introduction

3.1 When decisions on permanent airspace changes (Tier 1 as set out in Section 2 of this Guidance) are being made by the CAA, it is required to balance the various factors listed within section 70 of the Transport Act 2000. To ensure this is done correctly, sponsors should be required to demonstrate how they have assessed the different impacts and taken on board the views of different parties when developing options for airspace changes. This section details the requirements for engaging communities in the change process and assessing the impacts associated with different options.

Altitude Based Priorities

3.2 To assist the CAA and airspace change sponsors, the Government has assigned the altitude-based priorities which should be followed when considering airspace changes. These priorities are intended solely to inform those responsible for considering and implementing changes to the structure of airspace under the CAA's airspace change process and to make decisions to implement Permanent and Planned Redistribution (PPR) of air traffic (Tier 1 and Tier 2 airspace changes), and not for day to day air operations.

3.3 The long standing view, with which the Government continues to agree, is that noise from aircraft flying at or above 4,000 feet is much less likely to affect the key noise metrics used for determining what in the past has been considered to be a "significant" community impact and as aircraft continue to climb above this altitude their noise impact reduces. Set against this, there is also a need to ensure that aircraft operations are efficient and that their emissions are minimised. So when considering requests to change the airspace change structure and/or to agree to PPRs, the CAA should keep in mind all of the following altitude-based priorities of the Government:

- in the airspace from the ground to 4,000 feet the Government's environmental priority is to minimise the noise impact of aircraft and the number of people on the ground affected by it, particularly with regard to noise disturbance above 51dB LAeq16hr or 45dB Lnight;

- where options for route design below 4,000 feet are similar in terms of impact on populated areas, consideration should be given as to whether it continues to be appropriate to maintain long-standing airspace arrangements;
- in the airspace from 4,000 feet to 7,000 feet, the focus should continue to be minimising the impact of aviation noise on populated areas – particularly with regard to noise disturbance above 51 dB LAeq16hr, but the CAA may also balance this requirement by taking into account the need for an efficient use of airspace and expeditious flow of traffic that minimises emissions;
- in the airspace at or above 7,000 feet, the CAA should promote the most efficient use of airspace with a view to minimising overall aircraft emissions meaning that mitigating the impact of noise is no longer a priority;
- where practicable, it is desirable that airspace routes below 7,000 feet should seek to avoid flying over Areas of Outstanding Natural Beauty (AONB) and National Parks; and
- all changes below 7,000 feet should take into account local circumstances in the development of airspace structures, including the actual height of the ground level being overflown, and should not be agreed to by the CAA before an appropriate community consultation/engagement has been conducted by the airspace change sponsor.

The need for options appraisal by airspace change sponsors

3.4 When considering airspace changes, the aviation industry should proportionately appraise the expected impacts of the airspace change options under consideration. It is therefore expected that an airspace change sponsor should carry out the appraisal and the CAA, as regulator, ensures the options appraisal is undertaken appropriately before allowing the sponsor to move on to the next stage of the process. To ensure a consistent and transparent assessment of the options within and across proposals, it is advised that a single appraisal methodology is followed. Transport appraisal within the DfT is expected to follow WebTAG, a series of guides and spreadsheet tools based on up-to-date evidence following the principles of HM Treasury's Green Book appraisal.[14] WebTAG can also serve as a best practice guide for transport appraisal outside of Government.

3.5 The purpose of using a consistent methodology to appraise the expected impact of a proposal is to aid objective decision making. It is not intended, nor is it possible that all impacts are monetised; some will be quantified and some will be qualitatively described. This 'level' of analysis should be proportionate to the impacts and available evidence. This approach should help to make and communicate decisions effectively where there are trade-offs to be made in pursuit of the overarching objectives to maintain a safe and efficient airspace in the UK. There is a growing need for this approach as UK airspace becomes increasingly scarce and so decisions on the use of airspace become increasingly important.

[14] Further information on the Green Book can be found at: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent.

3.6 It is recognised that the Green Book has not been developed specifically for airspace change decisions and therefore may not capture all airspace change impacts. Where the preferred option is not the dominant choice according to the appraisal metrics, as there may be compelling local community, operational or safety requirements, the reason for this should be clearly stated by the sponsor.

Considering the noise implications of proposed airspace changes

3.7 As stated in Section 1 of this Guidance, the Government's environmental objective related to noise is to limit and, where possible, reduce the number of people in the UK significantly affected by aircraft noise.

3.8 Rather than limiting the number of people exposed to any level of aircraft noise, this policy is concerned with limiting the number of people experiencing significant adverse effects. There is no one threshold at which all individuals are considered to be adversely affected by noise but it is possible to set a Lowest Observed Adverse Effect Level (LOAEL) that is regarded as the point at which adverse effects begin to be seen on a community basis. As noise exposure increases above this level, so will the likelihood of experiencing an adverse effect. For the purposes of assessing and comparing the noise impacts of airspace changes, the Government has set a LOAEL of 51dB LAeq for daytime noise and 45dB Lnight for night time noise.[15]

3.9 It is also possible to calculate the likelihood of an individual experiencing an adverse effect at a given level of noise exposure. The Department for Transport's WebTAG includes a module for assessing the impacts of noise, including specifically from airspace changes, on health and quality of life and gives a monetised value for change in sleep disturbance, amenity (annoyance), acute myocardial infarction (heart attack, and stroke and dementia. This allows decisions on transport schemes to take account of the costs and benefits of different options with regards to noise.

3.10 Up to 4,000 feet, there is a strong likelihood that aircraft could create levels of noise exposure above the LOAELs identified above. Reducing the significant adverse effects that can occur at these levels of noise exposure is therefore the primary environmental aim of an airspace change involving airspace up to a height of 4,000 feet.

3.11 There may also be options which perform comparatively better in terms of reducing significant impacts such as cardio vascular disease or stroke and dementia than annoyance, or certain options may be better for day noise than night noise, or vice versa. In these instances, the CAA should verify that sponsors have considered the relative trade-offs and taken into account community views on which aspects of noise should be prioritised.

3.12 Above 4,000 feet, aircraft are unlikely to result in noise exposure above 51dB LAeq16hr for day time noise and 45dB Lnight for night time noise, but where this does occur the CAA should ensure that the focus remains on reducing these impacts. Generally however, between 4,000 and 7,000 feet, the Government expects

[15] Subject to the outcome of the airspace and noise consultation.

the CAA to balance noise impacts with the need for ensuring an expeditious flow of traffic which minimises aircraft CO_2 emissions.

3.13 As well as overall impacts, the CAA should also verify that sponsors have adequately taken into account how communities will be differently affected as a result of change, including the number of people in different noise contours and the change in noise exposure different communities will experience.

3.14 For communities further away from airports that will not be affected by noise above these levels, it is important that other aspects of noise are also taken into account. Metrics that should be considered for these purposes include the overall number of overflights[16] and N65 for daytime noise and N60 for night time noise. These latter metrics should be used as supplementary metrics to consider any impacts on annoyance and sleep disturbance effects respectively, that can on occasion be experienced by those experiencing average noise levels beneath the LOAELs outlined above. These supplementary metrics should also be used to inform communities about the likely impact of proposed changes.

3.15 The increased concentration from airspace modernisation can be more profound above 4,000 feet due to more accurate navigation and less need for vectoring which has typically begun at this height. It is therefore important that the frequency of occurrence of aircraft is factored into decisions that affect airspace between 4,000-7,000 feet. The CAA should therefore verify that where it is practical to do so, and in balance with other factors, that sponsors have taken measures to limit the impact of increases in the number of aircraft experienced by communities.

Single and multiple routes

3.16 Single and multiple routes both have costs and benefits associated with them. In terms of noise, generally, a single route will tend to affect fewer people overall compared to multiple routes. It may mean however that more people are exposed to higher levels of noise where there is a greater risk of adverse effects, than if noise was more dispersed.

3.17 As stated in Section 1, decisions on how aircraft noise is best shared should be informed by local circumstances and consideration of different options. Consideration should include the pros and cons of concentrating traffic on single routes which normally reduce the number of people overflown, versus the use of multiple routes which provide relief or respite from noise

3.18 This means there will be situations when multiple routes, that expose more people overall to noise but to a lesser extent, may be better from a noise perspective. Taking account of consultation, preferred options should normally be based on those which result in fewer people significantly affected as measured by the approach outlined above.

3.19 For airspace changes where noise levels are lower and there are fewer impacts on health and quality of life, greater consideration should be given to how the number of overflights is distributed, and consideration of how the current situation for those

[16] reference CAA paper- www.caa.co.uk/CAP1498

overflown will differ for any future options. However, it is important that all decisions are made in line with the altitude-based priorities and that impacts on wider airspace use are also considered.

3.20 Decisions on single and multiple routes should be explained clearly and transparently.

Greenhouse Gases

3.21 The Aviation Policy Framework[17] sets out the priorities for action on climate change at global, EU and national levels in the aviation context. The focus is expected to remain on actions to target CO_2 emissions in the near future but as scientific evidence of the effects of non-CO_2 emissions becomes clearer it is likely that the approach taken will be revised. The CAA should therefore ensure that it continues to be informed about the Government's climate change strategy and priorities.

3.22 The CAA has the opportunity to contribute to the Government's aim of reducing CO_2 emissions by seeking to promote the most efficient use of airspace including procedures that enable aircraft to climb efficiently, allow direct routings, reduce holding times and facilitate the consistent use of continuous descent and low power/low drag procedures. This is referred to as flight efficiency and has the potential to reduce CO_2 emissions. The potential to maximise flight efficiency is primarily above 7,000 feet where local community impacts are not a priority. Flight efficiency is also possible below 7,000 feet, although between 4,000-7,000 feet it should be balanced with noise environmental impacts. More information on the altitude-based priorities which the CAA should follow is given in Section 3.2 to 3.3 of this Guidance.

3.23 Initiatives to enhance efficiency in the airspace across the UK, such as the Single European Sky and introduction of the UK-Ireland Functional Airspace Block (FAB), have led to a reduction of 116,000 tonnes of fuel and 370,000 tonnes of CO_2 between 2012 and 2015.[18] Although this also includes savings in Irish airspace, it demonstrates the important contribution which a more efficient use of airspace can make to reduce the impact of aviation on the environment. The CAA should therefore encourage the aviation industry to come forward with more innovative ways to deliver enhanced efficiencies that can reduce aviation fuel use and emission production.

Local air quality

3.24 Aircraft engines, airport related traffic on local roads and surface vehicles all contribute to air pollution around airports. Oxides of nitrogen (NOx) and particulate matter are the two most important emissions affecting the air quality around airports. Studies have shown that NOx emissions from aviation related operations reduce

[17] Aviation Policy Framework, Department for Transport, March 2015. This is expected to be replaced by a new aviation strategy in 2018.
[18] UK-Ireland FAB annual report 2011, jointly published by Irish Aviation Authority and NATS, May 2012. http://www.nats.co.uk/wp-content/uploads/2012/07/UK-Ireland-FAB-Report-2011.pdf.

rapidly beyond the immediate area around the runway. Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet are unlikely to have a significant impact on local air quality. Therefore the impact of airspace design on local air quality is generally negligible compared to changes in the volume of air traffic, and local transport infrastructures feeding the airport. However, the CAA should include consideration of whether local air quality could be impacted when assessing airspace change proposals.

3.25 While the CAA should prioritise noise below 4,000 feet, consistent with the altitude-based priorities and the Government's policy to give particular weight to the management and mitigation of noise in the immediate vicinity of airports,[19] there could be circumstances where local air quality may be a consideration because emissions from aircraft taking off, landing or whilst they are on the ground have the potential to contribute to overall pollution levels in the area. This could lead to a situation where prioritising noise creates unacceptable costs in terms of local air quality or might risk breaching legal limits. The CAA should therefore take such issues into account when it considers they are relevant, for example, when determining airspace changes affecting the initial departure or the final arrival stage of a flight. The use of WebTAG by airspace change sponsors should help this process.

3.26 Airports are also expected to consider the implications on local air quality arising from their current and future air operations and when contemplating future airspace redesign in the close vicinity of their airport. For example, we would expect that airspace change sponsors provide a comparison of local air quality as part of their submission to the CAA when submitting Tier 1 or Tier 2 change proposals that include initial climb and final descent operations below 1,000 feet.

Taking account of local circumstances

3.27 Sponsors should engage with communities and ICCAN during the early stages of an airspace change process to explore options which are considered to be operationally feasible to ascertain whether any are preferable from a community point of view. As well as consideration of single and multiple routes, other local factors to consider might include whether there are specific AONBs, National Parks, nominated quiet areas, or noise sensitive buildings that it is practical to avoid overflying.

3.28 Engagement with communities should inform which options are developed in the later stages of the process. Sponsors should demonstrate that they have taken on board the views of communities where possible when developing options. If communities cannot agree on which option is preferable from a noise perspective, then we expect consultation on options for both single and multiple routes and for these to be subject to an options appraisal as detailed in WebTAG unit A5.2.[20] If either of these options are not operationally feasible the CAA will be expected to verify the sponsor's rationale of why this is the case and this information should be communicated to the relevant local communities.

[19] Aviation Policy Framework, section 3.25, page 60, Department for Transport, March 2013.
[20] https://www.gov.uk/government/publications/webtag-tag-unit-a5-2-aviation-appraisal-december-2015.

Environmental Statement

3.29 As there is no ideal solution that will apply to every airspace change, and what is better in a particular instance will depend on local circumstances and what is possible, there is no hard formula, apart from the altitude-based priorities, for how different factors should be balanced against one another. The Government feels however that ensuring decisions on airspace changes are transparent is the best way to guaranteeing that the balance has been appropriate. The CAA is therefore required to produce an environmental statement when approving an airspace change. This should verify that all environmental factors have been considered in line with relevant Government policy and explain why the CAA agrees these have been balanced appropriately.

Assessing the noise impacts of airspace changes

3.30 When airspace changes are being made, the CAA should verify that sponsors have followed the guidance outlined in TAG unit A5.2 and made appropriate use of the associated spreadsheet tools.[21] Further, the CAA should ensure that any recommendations from ICCAN on appropriate metrics and views from communities are taken into account when noise impacts are being assessed.

The role of the Independent Commission on Civil Aviation Noise (ICCAN) in the airspace change process[22]

3.31 ICCAN's role in change processes should apply whenever a change is proposed which is subject to the CAA's approval i.e. Tier 1 and 2 airspace changes, including smaller aerodromes (for example leisure and business jet airports). Also, although it will focus on larger aerodromes for its other functions, as that is where the most severe noise impacts are felt, smaller aerodromes should consider how they could apply the best practice disseminated by ICCAN. This would mean General Aviation would also fall within their remit if they require a Noise Action Plan or they propose an airspace change that the CAA must decide upon. ICCAN should not be responsible for advising the Ministry of Defence on noise impacts from military flights.

3.32 ICCAN should work with airspace change sponsors in their engagement to develop common local design principles, as set out by the CAA in its Airspace Change Process. This gives ICCAN the opportunity to look at how the sponsor has considered noise mitigations when developing the principles behind the forthcoming proposal. Principles might include, for example, suggestions about flight paths

[21] Current noise tool available at: https://www.gov.uk/government/publications/webtag-environmental-impacts-worksheets (to be updated May 2017). The reference to TAG 5.2 refers to the unit applicable at the time of publication of this document and may change in the future. Sponsors should therefore check to ensure that they are following the current version.
[22] This is subject to the outcome of the consultation on airspace and noise.

avoiding specific populations or avoiding designated land such as Areas of Outstanding Natural Beauty (AONBs) and national parks, where possible.

3.33 The CAA will need to be mindful of best practice and research carried out by ICCAN when exercising their air navigation functions. ICCAN should provide best practice guidance on noise management, review recent research evidence and where gaps in evidence exist, undertake or commission independent research. Included in this research could be the best means of monitoring and reporting aircraft noise, as well as its association with annoyance and impacts upon human health and possible mitigations. It might also usefully produce research and publish best practice guidance on compensation as a means of encouraging industry to review compensation schemes and ensure they remain fit for purpose, as set out in the Aviation Policy Framework.

3.34 The CAA should also consider, in particular on a proposal from ICAAN, further areas where it may be beneficial for it to use the information powers set out in the Civil Aviation Act 2012 to encourage such things as publication of airline statistics, which may encourage industry to enhance their approach to noise management.

3.35 CAA should ensure that a sponsor can demonstrate ICCAN's best practice has been considered in arriving at design principles. ICCAN will not opine on the best route design option that a sponsor is considering as there would be other non-noise factors at play that ICCAN won't consider, such as safety and efficiency, and these also need to be taken into account when deciding on a best option.

3.36 ICCAN will respond to the sponsor's consultation and where the change sponsor has deviated from ICCAN advice on any noise management techniques, the sponsor should describe their reasoning behind their decision not to follow the advice. To ensure transparency on the use of ICCAN advice, the CAA should add to their guidance how they will demonstrate that they have factored the consultation response submitted by ICCAN into their final decision, including sponsor reasons for deviation from ICCAN advice within the final design.

3.37 CAA should consult with ICCAN on noise management as part of the CAA's post-implementation review. As with the CAA, where appropriate the noise commission should, for transparency purposes, assess the outcomes of any noise mitigations to consider how they are working. CAA should factor in the ICCAN assessment into its review process.

Other relevant legislation, policy and guidance

3.38 It is recommended that the CAA keep abreast of other relevant policy and guidance issued by the Government and devolved administrations, especially those regarding noise, carbon, and air pollution.

3.39 In particular the CAA should be familiar with:

- the National Planning Policy Framework[23] and associated guidance which sets out the Government's planning policies for England and how these are expected to be applied;
- Scotland's National Planning Framework which provides the context for development plans and planning decisions and the Scottish Planning Policy which contains the Scottish Government's expectations for planning;
- Planning Policy Wales which sets out the context for planning policy in Wales;
- any relevant Planning Policy Statements issued by the Northern Ireland Department of Environment;
- any guidance and advice notes issued by the Government or devolved administrations;
- National Policy Statements for major infrastructure;
- National Parks and Access to Countryside Act 1949;
- Wildlife and Countryside Act 1981;
- Countryside and Rights of Way Act 2000;
- Natural Environment and Rural Communities Act 2006;
- Noise Policy Statement for England 2010; and
- Conservation of Habitats and Species Regulations 2010.[24]

[23] National Planning Policy Framework, Department for Communities and Local Government, March 2012.
[24] SI 2010/490.

4. Management of aircraft noise

Introduction

4.1 For communities living close to airports, and some further away under arrival and departure routes, aircraft noise is one of the most important environmental impacts created by the aviation sector. The Government's long-term view, most recently expressed in the 2013 Aviation Policy Framework,[25] is that there must be a fair balance between the economic benefits derived from the aviation industry, and the negative impacts of noise for affected communities. The benefits of any future growth in aviation and/or technological development must be shared between those benefitting from a thriving aviation industry and those close to the airports that facilitate it.

4.2 The Government's policy is to limit, and where possible reduce, the number of people in the UK significantly affected by aircraft noise as part of a policy of sharing technical developments and other benefits between industry, communities and all other stakeholders.

4.3 The UK Government expects that when considering airspace changes the aviation industry should address noise from low level air traffic as a local environmental priority in line with the altitude-based priorities given to the CAA in respect of its environmental duty when carrying out its airspace functions set out in Section 3.2 to 3.3 of this Guidance.

4.4 The aviation industry should also seek to have high quality and open engagement with their local communities with respect to not just forthcoming proposals but also with regard to their day to day air operations. Moreover, the need for effective noise management should be one of the key objectives of the industry and be enshrined in its ethos. This includes having good noise complaint handling procedures as well as full transparency on its air operations and the noise impact which they create. Airspace change sponsors should also be aware of and follow the Government's advice surrounding compensation arrangements for airspace changes.

4.5 The Government fully recognises the ICAO "Balanced Approach" to aircraft noise management.[26] As the competent authority[27] for assuring the Balanced Approach has been followed for the consideration of operating restrictions outside of the planning process, the CAA has an opportunity to support the Government on the Balanced Approach's third pillar of noise management, "noise abatement operational procedures", particularly with ensuring appropriate consideration is given with

[25] Aviation Policy Framework, section 3.2, page 55, Department for Transport, March 2013.
[26] Balanced approach to aircraft noise management, International Civil Air Organization. http://legacy.icao.int/env/noise.htm.
[27] Subject to the outcome of the consultation on airspace and noise.

regards to optimising how aircraft are flown and the routes they follow to reduce the noise impacts. The CAA can also support those airports considering using the powers available to them to set their own noise controls and introduce penalty schemes.

4.6 It is expected that in due course the ICCAN will produce more detailed best practice guidance on what is to be expected from the industry in respect of noise management, including how communities should be engaged in the process, which the CAA should take into account.

Airspace design

4.7 Improvements in aircraft track-keeping also offers the potential for aircraft to be concentrated within a specific location, if desired, as well as providing the potential for tracks to be alternated to introduce an element of limited respite for those under the tracks. More details on the possibilities of using PBN for noise mitigation can be found in the CAA's Civil Aviation Publication 1378, published in March 2016, which airspace change sponsors are encouraged to consider when putting together their airspace design proposals.[28]

4.8 The altitude-based priorities reflect the Government's desire to balance the needs of the aviation industry for an efficient airspace structure and those of communities that require noise impacts of aircraft movements at low level to be minimised. The aviation industry and airspace designers should take these into account when developing their proposals for airspace changes.

4.9 The Government expects the CAA to encourage the use of new and innovative approaches to managing aviation noise through airspace design such as the provision of respite for communities already significantly affected by aircraft noise.

Use of airspace

4.10 Airspace users, for example, helicopter and light aircraft operators, are urged to ensure that when operating over built up areas they do so with consideration for the people who may live there. In addition, airspace users should also give similar consideration when they operate over AONBs and National Parks to take account of the people who live there or who are enjoying the amenity that these areas provide.

4.11 We would also encourage pilots to follow the guidance that is available, such as that produced by the British Helicopter Association for its members which includes a section on environmental matters and a Pilot's Code of Conduct.[29]

[28] https://publicapps.caa.co.uk/docs/33/CAP%201378%20APR16.pdf.

[29] http://www.britishhelicopterassociation.org/wp-content/uploads/Civil-Helicopter-in-the-Community.pdf.

Control of airspace

4.12 It is desirable to try to balance what are clear economic and leisure benefits on the one hand against any noise impacts on the other. We therefore strongly urge all airports and aerodromes across the UK to work with their local communities to establish local solutions which can work for both parties. These could include, for example, such measures as establishing local community meeting groups where both sides can meet and discuss any ongoing concerns, encouraging pilots to avoid overflying built up areas at low level unless they really need to, and greater thought being put into the effect of noise from intensive operations such as take off and landing training exercises. In all cases, the need is for a local solution.

4.13 Airports, and their air navigation service providers, should be aware of the noise impact of aircraft operating into and out of their airport, and they are encouraged to take them into due consideration in operational planning, using structures such as Airport Consultative Committees and other relevant consultative groups to engage and inform their communities as appropriate. The Government recognises whilst avoiding excessive bureaucracy, we expect airport and air navigation service providers to engage, and act transparently regarding any changes in air traffic operations which could have an impact on the level of noise disturbance (Tier 3 changes to air operations).

4.14 Airports and ANSPs should also be aware that over time it is possible that the distribution pattern of air traffic can change and that this can affect its noise impact. The aviation industry is therefore to be encouraged, where this is practicable, to analyse how its use of airspace changes over time, and to be open and transparent in their dealings with relevant local communities about such changes when they relate to airspace up to at least 7,000 feet. This includes the desirability of publication of regular arrival and departure track keeping and performance data which can then be compared over the longer term. It is also expected that the ICCAN should have a role in determining the type and frequency of information that airports will be encouraged to publish. ICCAN could also provide details on the level of engagement that should be undertaken by the airport once a change in distribution of traffic has been identified.

National Parks & Areas of Outstanding Natural Beauty (AONBs)

4.15 National Parks and AONBs are designated areas with specific statutory purposes to ensure their continued protection in relation to landscape and scenic beauty.[30] The statutory purpose of National Parks is to conserve and enhance their natural beauty, wildlife, and cultural heritage and to promote opportunities for the understanding and enjoyment of their special qualities by the public. The statutory purpose of AONBs is to conserve and enhance the natural beauty of their area. In exercising or performing any air navigation functions in relation to, or so as to affect, land in National Parks and AONBs, the CAA is required to have regard to these statutory purposes when considering proposals for airspace changes (under section

[30] A list of designated National Parks in the UK can be found at www.nationalparks.gov.uk. A list of designated AONB can be found at www.landscapesforlife.org.uk.

11A of the National Parks and Access to Countryside Act 1949, as read with section 19 and schedule 2 of the Civil Aviation Act 1982, and section 85(1) of the Countryside and Rights of Way Act 2000).[31]

4.16 Given the finite amount of airspace available, it will not always be possible to avoid overflying National Parks or AONBs, and there are no legislative requirements to do so as this would be impractical. The Government's policy continues to focus on limiting and, where possible, reducing the number of people in the UK significantly affected by aircraft noise and the health impacts it brings. As a consequence, this is likely to mean that one of the key principles involved in airspace design will require avoiding over-flight of more densely populated areas below 7,000 feet. However, when airspace changes and implementation of PPRs are being considered, it is important that local circumstances, including community views on specific areas that should be avoided, are taken into account where possible. Therefore, in line with the altitude-based priorities as set out in Section 3.2 to 3.3 of this Guidance, where it is practical to avoid over-flight of National Parks or AONBs below 7,000 feet, the CAA should encourage this to be considered by airspace change sponsors and ANSPs considering PPRs. More information on options analysis can be found in Section 3 of this Guidance.

Helicopter and light aircraft-related noise

4.17 The CAA should take into account the unique noise characteristics of helicopters, which can hover for a period of time at low level over the same area, and their consequent environmental impact. This should occur when a change to airspace is proposed under the CAA's Airspace Change Process, and where significant helicopter activity is involved. In such cases, where either the proposal concerns the amendment to formally established helicopter routes within controlled airspace, or where helicopters movements are a predominant factor, the CAA should encourage change sponsors, where operationally practicable, to consider options that minimise the environmental impact of helicopter activity and take account of that impact when assessing proposals.

4.18 Where the CAA is aware that airport/aircraft operators are considering local changes to helicopter routeings and procedures that fall outside of the Airspace Change Process, the CAA is encouraged to promote the use of voluntary local noise abatement procedures which are designed to minimise noise disturbance.

Noise Sensitive Buildings

4.19 The CAA should also, where practicable, take into account the desirability of minimising noise impacts for noise sensitive buildings, such as hospitals and places of religious worship. This should occur when a change to airspace is proposed under the CAA's Airspace Change Process.

[31] DEFRA, Duties on relevant authorities to have regard to the purposes of National Parks, Areas of Outstanding Natural Beauty (AONB) and the Norfolk and Suffolk Broads Guidance Note, 2005.

5. Specific navigational guidance

Introduction

5.1 The environmental impact from air operations can be mitigated by a number of factors. The following section of the Guidance provides some best practice guidance which the CAA and the aviation industry should take account of when considering Tier 1 airspace changes or even how day to day air operations are implemented (Tier 3). It is expected that this guidance may be supplemented in the future by the ICCAN.

Departure procedures

5.2 Departure procedures should be designed to enable aircraft to operate efficiently and to limit, and where possible reduce, the number of people significantly affected by aircraft noise as part of a policy of sharing technical developments and other benefits between industry, communities and all other stakeholders, whilst taking into account the overriding need to maintain acceptable high level of safety. Additionally, departure procedures should be achievable within the prevailing technological constraints without a detriment to air safety, and comply with international regulations.

5.3 Steeper climb gradients can have environmental advantages and disadvantages depending on the local circumstances of the airport. Where steeper climb gradients immediately after take-off are considered necessary for air traffic control (ATC) purposes, consideration should be given to the effect this may have on the use of noise reduction take-off procedures (including the use of “cut-back”). Maximum permitted noise limits for aircraft taking off have also been set by the Secretary of State at Heathrow, Gatwick and Stansted, and by airport operators elsewhere (in some cases in compliance with planning conditions).

5.4 There is a finite number of departure flightpaths from an airport due to the complexity of airspace, ease of flight operation, and the capabilities of onboard aircraft systems. It is therefore desirable for the CAA to encourage airline operators, airports, and air navigation service providers to consider what can be done to increase safely the number of departure flightpath possibilities which could then be discussed and consulted on with local communities.

Continuous Climb Operations

5.5 The use of Continuous Climb Operations (CCO) has implications for both noise and CO_2/fuel efficiency. CCO is considered to have an overall neutral impact on noise, but it does involve the redistribution of some noise.[32] A CCO does, however, have the potential to reduce fuel burn as aircraft reach efficient cruising levels earlier thus leading to fuel savings and a reduction in the amount of emissions, including CO_2. CCO also means aircraft get above some of the most complex and congested low level airspace more quickly. Once clear of these areas there is generally more opportunity for aircraft to be routed directly onto their chosen path, and thus save flying time, track miles, and creating more efficient aircraft operations.

5.6 CCO forms a significant component of the FAS and the Government would like to see it introduced across the UK over the coming years as part of the overall modernisation of the UK airspace network. The CAA is encouraged therefore to continue to work with the aviation community to introduce CCO more widely in the coming years.

Arrival Procedures

5.7 Where airports are close to populated areas, landing noise is often seen as a more serious problem than departure noise. This is in part because of recent technological advances in modern jet aircraft, as well as the dispersal of departures between several routes. Arrival aircraft, by contrast, should follow a straight final approach track at comparatively lower altitudes (for a given range from the airport) and this reduces the opportunities to minimise aircraft noise disturbance.

5.8 A number of factors determine the level and distribution of noise from landing aircraft, such as the alignment of the runway, the location of the runway threshold, the angle of the glide path, the position of holding areas in relation to the final approach tracks, and the associated procedures for integrating landing traffic in the initial and intermediate approach phases. For the foreseeable future, measures targeted at the last of these factors are likely to offer the greatest potential for reducing noise from landing aircraft.

Continuous Descent Operations

5.9 Continuous Descent Operations (CDO) relate to continuous descent from cruising altitude. In the UK, CDO is often known as Continuous Descent Approach (CDA), which typically starts from an altitude of 6,000 feet. The Government's desire is that radar manoeuvring areas and the positions of holding stacks are designed and managed in ways that will assist and promote the consistent use of CDO and "low power/low drag" (LP/LD) techniques used by pilots.

[32] Reducing the Environmental Impacts of Ground Operations and Departing Aircraft: An Industry Code of Practice, http://www.heathrowairport.com/static/Heathrow/Downloads/PDF/Departures_code_of_practice- LHR.pdf, page 21.

5.10 A code of practice for arriving aircraft was established to address the noise from approaching aircraft in 2001 (revised in 2006) and this includes advice on measures to reduce noise from arriving aircraft, including CDO and LP/LD.[33]

5.11 When a CDO procedure is flown the aircraft stays higher for longer (in comparison to a conventional approach), descending continuously from the bottom of the stack (or higher if possible). Being higher for longer and using less engine thrust means the noise impact on the ground is reduced (up to 5 decibels) in locations 10– 25nm from the airport and directly under the approach path. The use of CDO procedures can also mean significant fuel savings and reduced emissions since less engine power is required.

5.12 Consideration should therefore be given to how the use of CDO and LP/LD procedures can be promoted in the course of developing new procedures and when considering proposals for changes to existing airspace arrangements. Both procedures should be regarded as "best practice" for use at all airports where local circumstances (such as terrain clearance) do not preclude it.

Navigational accuracy

5.13 Navigation has been identified as one of the five components of the overall airspace system as part of the FAS.[34] At present, much of the UK airspace route network in the UK is going through an important change from a reliance based on "conventional navigation" whereby required routes are aligned to ground based navigation aids, to the use of Performance-Based Navigation (PBN) technology which is based on satellite navigation. Most aircraft in the UK have modern PBN technology that does not require ground based navigation aids, but there is little standardisation of how they interpret the conventional route structure. Consequently, different aircraft/operators on the same route can often be seen to overfly different areas. The FAS includes the objective that UK airspace will be redesigned to a common set of Performance-Based Navigation (PBN)[35] standards by 2025.

Noise Preferential Routes (NPRs)

5.14 NPRs have their origins in the 1960s when the Government suggested routes that aircraft should try to follow in order to minimise the number of people overflown by departing aircraft from airports which it owned and operated. In the early 1990s, a 1.5km swathe was added to either side of these NPRs to enable track keeping performance to be assessed. Following the Government's lead, over the years a number of other airports have also established NPRs and monitored track-keeping performance. Some of these were set voluntarily by the airport whilst others were created following local planning (section 106 of the Town and Country Planning Act 1990[36]) agreements with local authorities as has been undertaken, for example, at

[33] Noise From Arriving Aircraft: An Industry Code of Practice, 2006, second edition.
[34] http://www.caa.co.uk/WorkArea/DownloadAsset.aspx?id=4294978317.
[35] Annex B of this document has more details on PBN.
[36] This Act applies to England and Wales. Separate arrangements exist in Scotland and Northern Ireland.

Luton and Manchester airports. Although NPRs are currently published in the Aeronautical Information Publication, their ownership and enforcement does not rest with the CAA, but can rest with DfT[37] or local authorities. Moreover, today's aircraft fly using standard instrument departure procedures which are not always identical to an NPR.

5.15 The Government recognises that at the local level, NPRs can serve a useful purpose to help understand the track-keeping performance of departing aircraft and also as a means to assist in mitigating the impact of aircraft noise. However, whilst existing NPRs can continue and be updated if agreed at the local level, the Government considers that the implementation or retention of NPRs may not always be the most appropriate solution. Regardless of whether an NPR approach is taken, the Government considers that a transparent information-based approach is the most suitable means to assist local communities in understanding the likely noise impacts they can expect to receive and to know where aircraft are actually flying. This approach also enables the communities to be given information about arriving aircraft which in many circumstances can be more of a concern.

Publication of route information

5.16 In order to provide communities with transparency on the numbers of aircraft flown near them, Heathrow, Gatwick and Stansted airports should publish details of where the aircraft are actually flying and the amount of noise created. These airports can determine the precise information they wish to publish but should include:

- the average distance of how close to the standard instrument departure route the aircraft have flown up to an altitude of 4,000 feet or higher if the airport wishes; and
- the areas, and the specific number of departing aircraft, where 80%, 90%, 95% and 99% of air traffic has flown up to an altitude of 4,000 feet and the noise level in each of these areas; and
- they should also provide details on the areas overflown by arriving aircraft from an altitude of 4,000 feet to when they reach the runway.

5.17 We would encourage other airports to publish similar information as required by Heathrow, Gatwick and Stansted where this is practicable.

5.18 The information required in Section 5.16 should ideally be made available on the airport's website and also provided to their respective consultative committees if they have one. It will need to be updated on a regular basis, although the airport can determine the precise frequency of this subject to consultation with their local communities. Airports are also encouraged to provide annual information returns which will enable communities to see whether there have been any changes in traffic patterns over previous years.

5.19 The Government expects that the new ICCAN will consider the information requirements on airports and promulgate detailed best practice advice on what it should cover.

[37] Currently the NPRs at Heathrow, Gatwick and Stansted airports.

6. The role of Government in the Airspace Change Process

In addition to the above Guidance issued to the CAA under section 70(2) of the Transport Act, the Department for Transport wishes to provide some guidance on its own role in the airspace change process which the CAA should also note and take account of.

Introduction

6.1 The starting assumption for the role of the SofS in the airspace change process is that the role should be proportionate, transparent, predictable (as far as possible), and reserved for cases that are considered to be of strategic national importance. It is also considered that the CAA, acting as the UK's independent airspace regulator, is generally best placed to make decisions on airspace changes. The Government considers that a "call-in" approach similar to that which exists in the planning system creates the right balance between retaining the SofS's role in deciding on nationally important proposals while making sure that it is clear when and how that involvement could take place. However, the Government also considers that decisions made by the SofS in the planning process should not be reopened when considering airspace changes. The CAA should ensure that its processes takes account of the SofS call-in function on airspace change.

Criteria for call-in

6.2 There is no obligation on the SofS to agree to call-in a specific airspace change proposal and there is also a need to avoid duplication with decisions already made in the planning system.

6.3 Any party can ask for the SofS to call-in a proposal. If an airspace change proposal met the call-in criteria, the SofS will have a discretion whether or not to call it in. The criteria for the SofS to "call-in" an airspace change proposal is that it was not linked to a planning decision which had already been determined by the SofS; and

a. it is considered to be of strategic national importance; or

b. the proposal could have a significant impact (positive or negative) on UK economic growth; or

c. it could 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 54 dB[38] as well as having an identified adverse impact on health and quality of life.[39]

6.4 In all cases, the CAA should ensure that the proposer has considered the noise impact of its proposals and provided an assessment to enable the expected noise and overall value criteria in Section 6.3 above to be checked and determined quickly.

6.5 If a proposal was called in, the SofS will be supported in his decision-making by a senior DfT official who was not involved in any of the discussions with the CAA or sponsor of relevance to the proposal. The SofS will then make the decision to approve or reject the change proposal instead of the CAA. The CAA should therefore ensure that its airspace change process includes provision for the possibility of a call-in being exercised. A called-in proposal will not be subject to a full public enquiry after being called in. This is because the proposal would already have been subject to the requirements of the CAA's airspace change process, which includes detailed requirements to consult widely and appropriately.

Coming into Force and transition arrangements

6.6 SofS call-in process will commence from the publication date of the revised Air Navigation Directions.[40] It will form part of the UK's airspace change process for any new proposals submitted to the CAA. However, the existing arrangements would apply to any change proposal which had already been consulted on at the time of publication of this guidance.

6.7 The CAA is encouraged to consult the SofS if it considers there is any doubt as regards whether the call in function may be exercised for an ongoing airspace change proposal.

Handling of the call-in process[41]

6.8 The CAA should inform the DfT when it has received a proposal for an airspace change which it has begun to consider. The CAA will need to provide the DfT with information on the proposal's noise and economic benefit in a form that can be assessed quickly.

6.9 Each request for the SofS to call-in an airspace change proposal will be considered by the DfT in the light of the criteria set out in Section 6.3 above. The call-in request should be submitted in writing to the DfT within 28 days of the proposal being

[38] 100% mode LAeq 16h noise exposure.
[39] The assessment of the numbers of people affected and the associated adverse impacts on health and quality of life of the airspace change proposal should be carried out by the sponsor in accordance with the requirements set out in this Guidance.
[40] This may be the same time as this document is published or at a later date.
[41] As the CAA is developing its portal for handling airspace changes, it is expected that in due course the various notification requirements in the call in process will be done automatically through this mechanism.

submitted to the CAA otherwise it will not be considered.[42] If the DfT receives a call in request we will inform the CAA within 7 days. Once a request has been made, we will seek to advise the CAA and the requestor within 8 weeks of the proposal being submitted as to whether the call-in function is to be exercised. The CAA should make allowance for these timings in its airspace change process.

6.10 If the SofS decides not to exercise the call-in function, the CAA can continue to determine the case without any further involvement of the SofS. If the SofS decides to exercise the call-in function, the process outlined in Section 6.11 to 6.12 below will be followed.

DfT process for handling an agreed call-in proposal for an airspace change

6.11 Once it has been agreed that an airspace change proposal should be called-in by the DfT, the following process, which the CAA should ensure that its airspace change process includes provision for, will be exercised:

a. CAA will continue its consideration up to the point that it is able to give an informed opinion on the airspace change proposal;

b. once the CAA has reached its opinion on the proposal, it should inform the DfT what this is;

c. a senior DfT official will then be tasked with considering the proposal and making a recommendation to the SofS whether it should be approved or not. The person appointed would consider the evidence presented by the sponsor, including the WebTAG information and seek to take account of the views of other relevant parties, including ICCAN, as well as the professional technical advice and opinion of the CAA on the proposal;

d. after considering the relevant information, the senior DfT official would make a recommendation to the SofS on whether the proposal should be: approved, rejected; or subject to further work such as additional consultation requirements;

e. the SofS then makes the decision on the airspace change proposal taking into account the recommendation of the senior official, but he is not obliged to follow it;

f. the DfT then advised the CAA, the airspace change sponsor, and the initial requestor of the call-in, of the decision reached by the SofS;

g. if the decision is to reject or approve the proposal then that is the end of the process, but if further work is required from the sponsor then the process would return to (c) above and flow from there once the additional requirements have been met; and

[42] The CAA's airspace change process is transparent and so it will be possible for an interested party to determine that a proposal has made to it.

h. if further work is considered necessary, the CAA would be asked to review its opinion on the airspace change proposal and also for its views on the desired additional work programme.

6.12 There is no fixed timetable for handling a called-in proposal, but the DfT would aim to make the final decision within 3 months of the date the CAA has provided its opinion on the proposal or as soon as practical thereafter. The DfT will also keep the CAA informed as to the progress of the call-in proposal. The CAA should ensure that its airspace change process and associated guidance also takes into account the possibility that a further extension in the time required for the SofS call-in or for the sponsor to undertake the additional requirements may be necessary.

Revision of Guidance and enquiries

Revision/amendment of Guidance

This Guidance will be reviewed by the Department on a regular basis and may be amended or replaced as deemed necessary by the Secretary of State. Minor amendments may not need to be consulted on but any substantial changes to this Guidance could be consulted on in line with the Government policy on consultations at the time the change was proposed.

Enquiries about this Guidance

Any enquiries about this Guidance should be directed to:

Department for Transport
Great Minster House
33 Horseferry Road
LONDON SW1P 4DR
Telephone – 0300 330 3000
Website – www.gov.uk/dft
General email enquiries https://www.dft.gov.uk/about/contact/form/

Annex A: Performance Based Navigation

Performance Based Navigation (PBN)

A.1 PBN is the framework that defines the performance requirements for aircraft navigating on an air traffic service (ATS) route, terminal procedure or in a designated airspace. Its two main components are Area Navigation (RNAV) and Required Navigation Performance (RNP) specifications.

A.2 The use of PBN enhances navigational accuracy and introduces a number of key benefits. These include: the ability to reduce the amount of ground-based navigational-related infrastructure needed; a safer and more efficient ATC system requiring less controller intervention; more efficient aircraft operations leading to less cost, flying time and emissions; and the ability to allow more predicable patterns of over flight as well as stabilised arrivals and approaches. PBN has the potential to reduce the number of people affected by aircraft noise by offering the flexibility to circumnavigate densely populated areas as well as offering increased options for the establishment of noise respite/relief routes. The Government therefore considers that the use of PBN will add a significant enhancement to the overall efficiency and capacity of the UK airspace network which allows the sustainable development of the air traffic network to accommodate future traffic levels.

A.3 With PBN, the overall level of aircraft track-keeping is greatly improved for both approach and departure tracks, meaning aircraft will be more concentrated around the published route. This will mean noise impacts are concentrated on a smaller area, thereby exposing fewer people to noise than occurs with equivalent conventional procedures. However, experience at airports where PBN has been implemented demonstrates that this increased concentration of traffic can cause significant impacts on those living directly underneath the flightpath.

A.4 The use of PBN procedures to create alternation of flight paths may be appropriate in some local circumstances, but it is also likely to increase the number of people who are affected by aircraft noise (albeit in a more predictable manner) and so should always be introduced only following consultation with the relevant local communities and stakeholders.

A.5 The move to PBN requires the updating of existing route structures such as Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Initial Approach Procedures (IAPs). Updating individual routes in terminal areas can fall into one of two categories: "replication" where the existing route alignment is preserved as much as possible whilst catering for the greater navigational accuracy of PBN, or "redesign" where seeking to optimise the introduction of PBN will require consideration of a different alignment.

Annex B: Glossary

Acronym	Term	Meaning
ACP	Airspace Change Process	The CAA's airspace change process which is set out in its Civil Aviation Publication 725 (CAP 725).
AIP	Aeronautical Information Publication	A document which sets out the detailed structure of the UK's airspace and which is also intended to satisfy international requirements for the exchange of aeronautical information.
AND	Air Navigation Directions	"The CAA (Air Navigation) Directions 2001 (incorporating variation Direction 2004)". These directions set out the CAA's air navigation duties and were jointly issued by the SofS for Transport and the SofS for Defence.
ANG	Air Navigation Guidance	This document which provides guidance to the aviation industry and the CAA on air navigation.
ANSP	Air Navigation Service Provider	A public or private entity providing air navigation services for general air traffic.
ATC	Air Traffic Control	The service provided by controllers to prevent collisions between aircraft and to expedite and maintain an orderly flow of air traffic.
ATM	Air Traffic Management	The combination of the airborne and ground-based functions (air traffic services, airspace management and air traffic flow management) to ensure the safe and efficient movement of aircraft during all phases of air operations.
ATMs	Air Transport Movements	The landings or take offs of aircraft engaged in the transport of passengers or freight on commercial terms.
ATS	Air Traffic Services	The various flight information services, alerting services, air traffic advisory services and ATC services (area, approach and aerodrome control services).
	Airspace Design	The process by which airspace change sponsors develop their proposals for amending the UK's airspace structure.
	Airspace Structure	The detailed airspace layout and procedures as set out in the AIP. It is overseen by the CAA and any changes to it need to follow the CAA's airspace change process.
	Airspace Management	A planning function with the primary objective of maximising the utilisation of available airspace.
	Airspace Users	All aircraft operated as general air traffic.
CAA	Civil Aviation Authority	The statutory body which oversees and regulates all aspects of civil aviation in the United Kingdom.
CAT	Commercial Air Transport	Any aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire

	Concentration	This is where aircraft are instructed by controllers or follow procedures which mean that they fly the same route consistently with minimal dispersion.
DfT	Department for Transport	The Government Department that leads on UK aviation and the author of the Air Navigation Guidance.
	Dispersion/Dispersal	Dispersal is the consequence of either natural variation from a flight path as a result of navigational limitations, or tactical vectoring of individual aircraft by ATC.
EC	European Commission	The executive body of the European Union responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU.
ERCD	The Environmental Research and Consultancy	The team in the CAA which, as part of its activities, estimates the noise exposures around London airports (Heathrow, Gatwick and Stansted) on behalf of the Department for Transport.
EU	European Union	The union of 28 European member states.
FAS	Future Airspace Strategy	The agreed UK plan to modernise airspace by 2030.
	General Aviation	Any civil aircraft operation other than commercial air transport or aerial work.
GAT	General Air Traffic	All movements of civil aircraft, as well as all movements of State aircraft (including military, customs and police aircraft) when these movements are carried out in conformity with the procedures of the ICAO.
	Holding stacks	A fixed circling pattern in which aircraft fly whilst they wait to land. When airports are busy, there can be a build-up of aeroplanes waiting to land.
ICAO	International Civil Aviation Organisation	The international aviation body established by the 1944 Chicago Convention on International Civil Aviation.
ICCAN	Independent Commission on Civil Aviation Noise	The independent UK body responsible for creating, compiling and disseminating best practice to the aviation industry.
ILS	The Instrument Landing System	The standard system for navigation of aircraft upon the final approach for landing.
LAeq		The measure used to describe the average sound level experienced over a period of time resulting in a single decibel value. Measurements are always in decibels (dB), though these are not stated.
LAMP	London Airspace Management Programme	The NATS led project to modernise the airspace structure across southern England.
LDEN		The 24-hrLeq calculated for an annual period, but with a 5 decibel weighting for evening and a 10 decibel weighting for night to reflect people's greater sensitivity to noise within these periods.
Lnight		Lnight is the equivalent continuous noise level over the night-time period (23:00 to 07:00). It does not contain any night-time noise weighting.
	Multiple Route Options	The availability to the airspace user of more than one routing option on the ATS route network. Options for airspace design that are based on multiple flights paths. These can potentially offer relief or respite from aircraft noise.

MATS II	Manual of Air Traffic Services Part II	The document containing the ATC operational procedures used by the ANSP. It does not change the notified structure of the UK's airspace.
NATS		The UK's en-route air navigation service provider which also provides services at many UK airports.
	Navigation Services	The facilities and services that provide aircraft with positioning and timing information.
	Noise Contours	These are lines or circles on a map showing where equal levels of noise are experienced.
	Noise Respite	The principle of noise respite is to provide planned and defined periods of perceptible noise relief to people living directly under a flight path.
NPRs	Noise Preferential Routes	Noise Preferential Routes (NPRs) set the overall framework within which the flightpaths at a number of airports, including Heathrow, Gatwick and Stansted, were originally designed to mitigate noise.
PBN	Performance Based Navigation	A concept developed by ICAO that moves aviation away from the traditional use of aircraft navigating by ground based beacons to a system more reliant on airborne technologies, utilising area navigation and global navigation satellite systems.
PPR	Permanent and Planned Redistribution	This is where an ANSP makes a conscious decision to amend an air traffic control procedure which results in the permanent shift of some air traffic.
	Relief	This is when multiple routes are designed and operated far enough apart to offer a perceptible reduction in noise for communities. Respite is one form of relief, but multiple flight paths could also be operated at the same time but with an alternating pattern of operation.
	Route Network	The network of specified routes for channelling the flow of general air traffic as necessary for the provision of ATC services.
	Routing	The chosen itinerary to be followed by an aircraft during its operation.
SI	Supplementary Instruction	This is the means by which a proposed permanent change to ATC procedures is incorporated into the next MATS II edition.
SIDs	Standard Instrument Departure routes	These are the established departure routes which are published in the AIP and which should be flown by aircraft when departing airports which have SIDs.
STARS	Standard Terminal Arrival Routes	These are the established arrival routes for aircraft which are published in the AIP. They end at holding stacks.
	Swathe	A specific area and volume of airspace in which controllers are vectoring aircraft or, as in the case of NPRs, in which track keeping of aircraft is being monitored.
	Vectoring	This is where an air traffic controller directs the pilot of an aircraft to fly a specific compass heading which can be off the normal airspace route structure.

Further Annexes to be added