Appendix 9-1: Legislation, policy, technical guidelines and assessment criteria relevant to aircraft noise and vibration

9-1. Legislation, policy, technical guidelines and assessment criteria relevant to aircraft noise and vibration

9-1.1 Introduction

9-1.1.1 This appendix of the Environmental Impact Assessment Report (EIAR), prepared by Bickerdike Allen Partners LLP (BAP), sets out details of the legislation and planning policy considered relevant to the assessment.

9-1.1.2 Details of the strategic planning context are given in Section 9-1.2. Local planning policy is considered in Section 9-1.3, International policy, standards and guidance in Section 9-1.4, and relevant UK policy, standards and guidance are considered in Section 9-1.5.

9-1.1.3 There are various noise metrics available for the assessment of the impacts of aircraft noise and vibration. These are described in detail in Section 9-1.6.

9-1.1.4 The derivation of the effect scales used in the air noise assessment are discussed in Section 9-1.7.

9-1.1.5 The current Dublin Airport noise zones are compared in Section 9-1.8 to the relevant forecast noise contours for the 2029 Proposed Operation.

9-1.2 Strategic Planning Context

S.I. No. 549/2018 – Environmental Noise Regulations 2018

9-1.2.1 This Statutory Instrument[1] gives effect to Directive (EC) 2002/49/EC[2] of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise, as amended by Commission Directive (EU) 2015/996[3] establishing common noise assessment methods.

9-1.2.2 These regulations came into operation on the 31 December 2018. They require the production of strategic noise maps for set agglomerations, major roads, major railways, and major airports. They also require the production of subsequent action plans.

S.I. No. 663/2021 - European Communities (Environmental Noise) (Amendment) Regulations 2021

9-1.2.3 This Statutory Instrument[4] amends S.I. No 549/2018 to transpose the latest relevant EU legislation, and update agglomeration definitions in light of expansions in the urban landscape over the last 15 years.

[1] Irish Government (2018). S.I. No. 549/2018 - European Communities (Environmental Noise) Regulations 2018, online. Available at: https://www.irishstatutebook.ie/eli/2018/si/549/made/en/pdf [Checked 19/06/2026]
[2] European Commission (2002). Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise, [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0049 [Checked 19/06/2026]
[3] European Commission (2002). Commission Directive (EU) 2015/996 of 19 May 2015 establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council, [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L0996&qid=1700651886795 [Checked 19/06/2026]
[4] Government of Ireland (2021). S.I. No. 663/2021 - European Communities (Environmental Noise) (Amendment) Regulations 2021, [Online]. Available at: https://www.irishstatutebook.ie/eli/2021/si/663/ [Checked 19/06/2026]

EU Regulation 598/2014

9-1.2.4 The European Commission introduced EU Regulation 598/2014[5] in 2016 to account for developments in the aviation world. This repeals 2002/30/EC[6] which set out procedures and rules for the introduction of noise related operating restrictions to the busiest of the European airports. This previous regime for managing airport noise placed the responsibility with the airport operator. The entry into force in 2016 of EU Regulation 598/2014 represented a shift in responsibility from the airport operator to a separate, independent statutory entity or competent authority to oversee the delivery of the new, more prescriptive approach to airport noise management.

9-1.2.5 There are seven key elements of the new regulatory regime which are:

- Designation of a separate, independent statutory entity as the Competent Authority;
- Appropriate collaborative working arrangements;
- Robust consultation requirements;
- Adherence to the International Civil Aviation Organization (ICAO) Balanced Approach;
- Compliance with Environmental Impact Assessment (EIA), Habitats & Birds, and the Environmental Noise Directives;
- Establishment of an appropriate, robust appeal mechanism, and
- Ongoing monitoring and enforcement activities.

9-1.2.6 Regulation (EU) No 598/2014 under Article 5 requires that member states shall ensure that the Balanced Approach[7] is adopted in respect of aircraft noise management at those airports where a noise problem has been identified. To that end, they shall ensure that the Noise Abatement Objective (NAO) for that airport is defined. This then allows the measures available to reduce the noise impact to be identified, and the likely cost-effectiveness of the noise mitigation measures to be thoroughly evaluated.

Environmental Noise Directive 2002/49/EC

9-1.2.7 The Environmental Noise Directive[2] (END), concerning the assessment and management of environmental noise from transport, came into effect in June 2002. Its aim was to define a common approach across the European Union with the intention of avoiding, preventing or reducing on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise. This involves:

- Informing the public about environmental noise and its effects;
- Preparation of strategic noise maps for large urban areas ('agglomerations'), major roads, major railways and major airports as defined in the END; and
- Preparation of action plans based on the results of the noise mapping exercise.

EU Commission Directive 2020/367

9-1.2.8 Commission Directive (EU) 2020/367[8] of 4 March 2020 amends Annex III to Directive 2002/49/EC of the European Parliament and of the Council as regards the establishment of assessment methods for

[5] European Commission (2014). Regulation (EU) No 598/2014 of the European Parliament and of the Council of 16 April 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC, [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0598&qid=1700652640129 [Checked 19/06/2026]

[6] European Commission (2002), Directive 2002/30/EC of the European Parliament and of the Council of 26 March 2002 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0030&qid=1700652723756 [Checked 19/06/2026]

[7] https://www.icao.int/environmental-protection/Pages/noise.aspx [Checked 19/06/2026]

[8] European Commission (2020). Commission Directive (EU) 2020/367 of 4 March 2020 amending Annex III to Directive 2002/49/EC of the European Parliament and of the Council as regards the establishment of assessment methods for harmful effects of environmental noise, [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020L0367&qid=1700656648516 [Checked 19/06/2026]

harmful effects of environmental noise. The amendment is to *Annex III Assessment Methods for Harmful Effects* and includes the introduction of formulae which compute a value for the proportion of a population highly annoyed or highly sleep disturbed from noise from specific sources, including aircraft.

EU Directive 2011/92 as amended by Directive 2014/52

9-1.2.9 Commission Directive (EU) 2014/52[9] of 25 April 2014 amends Directive 2011/92/EU of the European Parliament and of the Council as regards the assessment of the effects of certain public and private projects on the environment.

9-1.2.10 Annex IV details the information needed for an Environmental Impact Assessment Report (EIAR). This includes the type and quantity of noise produced during the construction and operation phases, and a description of the likely significant effects of the project on the environment resulting from emissions of noise.

Aircraft Noise (Dublin Airport) Regulation Act, 2019

9-1.2.11 The Aircraft Noise (Dublin Airport) Regulation Act 2019[10] (The Aircraft Noise Act) implements EU Regulation 598/2014 on the establishment of rules and procedures with regard to the introduction of noise related operating restrictions at European Union Airports within the Balanced Approach.

9-1.2.12 The Aircraft Noise Act amends the Planning and Development Act 2000 as amended (PDA), to cater for the situation where development at Dublin Airport may give rise to an aircraft noise problem and where an airport wishes to apply to revoke, amend or replace operating restrictions at the airport.

9-1.2.13 The Aircraft Noise Act was enacted on 22nd May 2019. It was subsequently amended on 1st September 2019, following the removal of Airport infrastructure from the Seventh Schedule of the PDA and thus the strategic infrastructure development planning process is no longer applicable to it.

9-1.2.14 Fingal County Council has been designated as the competent authority for the purposes of aircraft noise regulation at Dublin Airport by section 3(1) of the Aircraft Noise (Dublin Airport) Regulation Act 2019.

9-1.2.15 The Aircraft Noise Act amends the PDA by inserting a number of new sections in Part 3 of the PDA, which deals with control of development. These sections introduce a number of new measures for planning applications at Dublin Airport that may necessitate noise-related actions or that may require a new operating restriction.

Dublin Airport (Passenger Capacity) Act 2026

9-1.2.16 The Dublin Airport (Passenger Capacity) Act 2026[11] gives the Minister for Transport the power to make the Proposed Order described in Chapter 4: Proposed Order.

9-1.2.17 Section 38 of this Act also amends the Aircraft Noise Act to specify that a relevant condition is only considered to be an operating restriction if it is a noise-related operating restriction.

[9] Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment Text with EEA relevance, online. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0052&qid=1781867931390 [Checked 19/06/26]
[10] Irish Government (2019). Aircraft Noise (Dublin Airport) Regulation Act 2019, online. Available at: https://www.irishstatutebook.ie/eli/2019/act/12/enacted/en/pdf [Checked 19/06/2026]
[11] Government of Ireland (2026). Dublin Airport (Passenger Capacity) Act 2026, [Online]. Available at: https://www.irishstatutebook.ie/eli/2026/act/25/enacted/en/html [Checked 23/08/2026]

9-1.3 Local Planning Policy

Fingal Development Plan 2023-2029

9-1.3.1 The Fingal Development Plan 2023-2029[12] sets out the framework to guide future development within Fingal. Chapter 8 of the Plan considers Dublin Airport which

"is of vital importance to the Irish economy and acts as the principal international gateway for trade, inward investment and tourism."

9-1.3.2 Policies and objectives are included, including Objective DAO1 – Safeguarding Dublin Airport:

"Facilitate the operation and future development of Dublin Airport, in line with Government policy and the Dublin Airport Local Area Plan 2020, or any subsequent LAP or extension of same, recognising its role in the provision of air transport, both passenger and freight."

9-1.3.3 An overriding theme of the Plan is the need to protect the environment throughout the County. In response to this the Plan includes noise zones to aid land use planning. The noise zones indicate varying levels of potential noise exposure during airport operations. For Zone A which corresponds to the highest levels of noise the objective is:

"to resist new provision for residential development and other noise sensitive uses."

9-1.3.4 For Zones B and C where noise levels are lower the objective is:

"to manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure, where appropriate, noise insulation is incorporated within the development."

9-1.3.5 The noise zones have been updated over time, allowing for potential activity at Dublin Airport. In Section 9-1.8 the current noise zones are compared to the relevant forecast noise contours for the 2029 Proposed Operation.

Dublin Airport Local Area Plan (2020)

9-1.3.6 The Dublin Airport Local Area Plan (2020)[13] presents an opportunity to provide an updated strategy for the continued growth of Dublin Airport in line with relevant aviation, planning and environmental policy within the context of a sustainable growth framework. It provides a detailed planning framework to:

- Facilitate the capacity enhancements and operational improvements that are required within the short to medium term for Dublin Airport to:
  - Continue to operate safely and efficiently;
  - Keep pace with the anticipated growth in demand; and
  - Develop as a secondary European hub;
- Outlines the community, environmental and supporting infrastructure and surface access measures necessary to support the Airport's growth, consistent with:
  - Sustainable development principles;
  - Appropriate noise and environmental measures designed to protect public health; and
  - Ensuring high quality surface transport access to the Airport.

[12] Fingal County Council (2023). Fingal Development Plan 2023-2029, [Online]. Available at: https://www.fingal.ie/development-plan [Checked 19/06/2026]
[13] Fingal County Council (2020). Dublin Airport Local Area Plan, [Online]. Available at: https://www.fingal.ie/dublin-airport-local-area-plan-2020 [Checked 19/06/2026]

9-1.3.7 Section 9.1 of the local area plan is dedicated to noise. It includes the latest Dublin Airport Noise Zones.

Noise Action Plan for Dublin Airport (2024-2028)

9-1.3.8 The purpose of the Noise Action Plan for Dublin Airport (2024-2028)[14] is to provide:

"an overview of the Regulations with a review of the results of the latest strategic noise maps for Dublin Airport and sets out an approach for the strategic management and control of environmental noise associated with aircraft activity at Dublin Airport over the period 2024 to 2028 having regard to the existing noise management framework."

9-1.3.9 It includes proposed actions to be taken in relation to noise and the approach to their monitoring and reporting on the delivery of the action plan.

9-1.4 International Policy, Standards and Guidance

ICAO Balanced Approach

9-1.4.1 The International Civil Aviation Organisation (ICAO) is the inter-governmental body that oversees the worldwide civil aviation industry. ICAO has adopted a set of principles and guidance, constituting the 'balanced approach' to aircraft noise management, which encourages ICAO member states to address the following points:

- Mitigate aviation noise through selection at a local level of the optimum combination of four key measures;
  - Reducing noise at source (from use of quieter aircraft);
  - Making best use of land (plan and manage the land surrounding airports);
  - Introducing operational noise abatement procedures (by using specific runways, routes or procedures);
  - Imposing noise-related operating restrictions (such as a night time operating ban or phasing out of noisier aircraft);
- Select the most cost-effective range of measures; and
- Not introduce noise-related operating restrictions unless the authority is in a position, on the basis of studies and consultations, to determine whether a noise problem exists and having determined that an operating restriction is a cost-effective way of dealing with the problem.

9-1.4.2 As stated by the Aircraft Noise Competent Authority (ANCA)[15], the Balanced Approach to aircraft noise management is an internationally agreed approach to managing noise at large airports. Noise reduction is explored through four principal elements with the objective to address noise problems in the most cost-effective manner, and only apply operating restrictions as a last resort measure.

ICAO Convention on International Civil Aviation, Annex 16, Volume 1

9-1.4.3 ICAO has set a number of standards for aircraft noise certification which are contained in Volume 1 of Annex 16 to the Convention on International Civil Aviation[16]. This document sets maximum acceptable noise levels for different aircraft during take-off and landing, categorised for subsonic jet aeroplanes as Chapter 2, 3, 4 and 14.

[14] Fingal County Council (2024). Noise Action Plan for Dublin Airport 2024-2028, [Online]. Available at: Noise Action Plan for Dublin Airport 2024 -2028 | Fingal County Council [Checked 19/06/2026]
[15] Aircraft Noise Competent Authority (2023), p.10. A review of the effectiveness of noise mitigation measures at Dublin Airport for the year 2022 on achieving the noise abatement objective, online. Available at: https://www.fingal.ie/sites/default/files/2023-08/Noise%20mitigation%20effectiveness%20review%20report%20for%202022.pdf [Checked 19/06/2026]
[16] International Civil Aviation Organisation (2017), Annex 16 to the Convention on International Civil Aviation, Volume 1 8th Edition. ICAO. [Online]. Available at: https://www.iacm.gov.mz/app/uploads/2018/12/an_16_V1_Environmental-Protection_8ed_2017_rev.-12_01.07.17.pdf [Checked: 19/06/2026]

9-1.4.4 Chapter 2 aircraft have been prevented from operating within the EU since 2002, unless they are granted specific exemption, and therefore the vast majority of aircraft fall within Chapter 3, 4 and 14 parameters. These aircraft are quieter than Chapter 2 aircraft.

9-1.4.5 Chapter 4 standards have applied to all new aircraft manufactured since 2006. These aircraft must meet a standard of being cumulatively 10 dB quieter than Chapter 3 aircraft.

9-1.4.6 Chapter 14 was adopted by the ICAO in 2014. It represents an increase in stringency of 7 dB compared with Chapter 4 and applies to new aircraft submitted for certification after 31st December 2017.

EU Directive 2015/996

9-1.4.7 EU Commission Directive 2015/996[17] sets out common noise assessment methods for the purpose of the Environmental Noise Directive, including for aircraft noise.

WHO Guidelines for community noise (1999)

9-1.4.8 WHO Guidelines for Community Noise[18] provide a range of aspirational noise targets aimed at protecting the health and well-being of the community. They therefore set out noise targets which represent goals for minimising the adverse effects of noise on health as opposed to setting absolute noise limits for planning purposes.

9-1.4.9 For outside areas of dwellings, the WHO Guidelines state that to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB L_{Aeq}. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development. The WHO guidance cites a 16 hour period as applicable to the above limits.

9-1.4.10 Although the attainment of these steady noise target values is not always achievable in practice, particularly where a dwelling is located close to a busy road or railway, controlling the daytime noise level to 55 dB $L_{Aeq,16h}$ or below in some gardens and amenity areas can sometimes be achieved for developments near roads and railways by the use of screening achieved using other buildings, fences or purpose made noise barriers.

WHO Night Noise Guidelines for Europe (2009)

9-1.4.11 Guidance on absolute noise levels at night are given in by the WHO Night Noise Guidelines (NNG)[19]. These report findings from the WHO concerning night noise from transportation sources and its effects on health and sleep. These guidelines acknowledge that the effect of noise on people at night depends not just on the magnitude of noise of a single event but also the number of events. It considers that in the long term, over a year, these effects can be described using the $L_{night,outside}$ index. This is essentially equivalent to the $L_{Aeq,8h}$ index commonly used in the UK, but instead of being based on aircraft activities during the average summer night, is based on the average annual night.

9-1.4.12 These guidelines were prepared by a working group set up to provide scientific advice to the Member States for the development of future legislation and policy action in the area of assessment and control of night noise exposure. The working group reviewed available scientific evidence on the health effects of night noise, and derived health-based guideline values. Although this provides guidance to the European Community in general and has no policy status, it provided a description of then recent research into the health effects of noise and provided guidance on noise targets.

[17] EU Commission (2015). Commission Directive (EU) 2015/996 of 19 May 2015 establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council, [Online]. Available at: https://eur-lex.europa.eu/eli/dir/2015/996/oj/eng [Checked 23/08/2026]
[18] Berglund, B. et al (1999). Guidelines for community noise. [Online]. Available at: http://apps.who.int/iris/bitstream/handle/10665/66217/a68672.pdf?sequence=1&isAllowed=y [Checked: 19/06/2026]
[19] World Health Organisation Europe (2009). Night Noise Guidelines for Europe, [Online]. Available at: https://www.researchgate.net/publication/44602136_Night_Noise_Guidelines_for_Europe [Checked 19/06/2026]

9-1.4.13 The following night noise guideline values are recommended by the working group for the protection of public health from night noise:

- Night noise guideline (NNG) $L_{night,outside}$ equal to 40 dB
- Interim target (IT) $L_{night,outside}$ equal to 55 dB

9-1.4.14 The NNG is a health based limit to aspire towards whereas the IT represents a feasibility based intermediate target. This is borne out to some extent by the Strategic Noise Mapping work undertaken across European Member States in compliance with the Environmental Noise Directive. For night noise, Member States are required to produce noise maps in terms of the $L_{night,outside}$ index no lower than 50 dB for strategic planning purposes.

9-1.4.15 The relationship between night noise exposure and health effects as defined by these WHO guidelines can be summarised as shown in Table 9-1-1.

Table 9-1-1: WHO guidance on the relationship between night noise exposure and health effects

$L_{night,outside}$	Relationship between night noise exposure and health effects
<30	No effects on sleep are observed except for a slight increase in the frequency of body movements during sleep due to night noise
30 – 40	There is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{night,outside}$ are harmful to health
40 – 50	Adverse health effects are observed at the level above 40 dB $L_{night,outside}$, such as self-reported sleep disturbance, environmental insomnia, and increased use of somnifacient drugs and sedatives
>55	Cardiovascular effects become the major public health concern, which are likely to be less dependent on the nature of the noise

WHO Environmental Noise Guidelines for the European Region (2018)

9-1.4.16 In October 2018 the WHO published their updated Environmental Noise Guidelines[20] which contain the following recommendations:

9-1.4.17 For average noise exposure, the GDG (Guideline Development Group) strongly recommends reducing noise levels produced by aircraft below 45 dB L_{den}, as aircraft noise above this level is associated with adverse health effects.

9-1.4.18 For night noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft during night-time below 40 dB L_{night}, as night-time aircraft noise above this level is associated with adverse effects on sleep.

9-1.4.19 These WHO guidelines could not be adopted as thresholds without imposing very significant restrictions on the current permitted operations of most major airports. As an example, even a single Airbus A320 or Boeing 737-800 aircraft operating once per night could expose hundreds of people to noise levels in excess of the guideline 40 dB L_{night} value at an airport in a relatively rural location. 10 aircraft events during the daytime (07:00-19:00) period (or smaller numbers in the evening and night periods) could expose a similar number of people to noise levels in excess of the 45 dB L_{den} parameter.

9-1.4.20 These guidelines have not yet been adopted as Irish policy, and there is no current indication that they will be.

[20] World Health Organization Regional Office for Europe (2018). Environmental Noise Guidelines for the European Region. [Online]. Available at: https://www.who.int/europe/publications/i/item/9789289053563 http://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf[Checked: 19/06/2026]

Relevant UK Policy, Standards and Guidance

9-1.4.21 The Policy, Standards and Guidance described above set out the overall approach to assessing the significance or otherwise of aircraft noise and vibration, and much of the technical detail required to carry out such an assessment. There are however some areas where additional information is considered beneficial, such as in relation to the significance of particular noise levels and criteria for particular types of buildings. This is not available at an EU wide level.

9-1.4.22 In these cases, information has been taken from the following UK policies, standards and guidance documents considered relevant to this assessment. This UK-based information is used to supplement those mentioned above rather than to replace them.

Noise Policy Statement for England (2010)

9-1.4.23 The Noise Policy Statement for England (NPSE)[21] provides the framework for noise management decisions to be made that ensure noise levels do not place an unacceptable burden on society. The stated aims of the Noise Policy Statement for England are to:

"Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development;

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development, and

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

9-1.4.24 The NPSE introduces the concepts of NOEL (No Observed Effect Level), LOAEL (Lowest Observed Adverse Effect Level) and SOAEL (Significant Observed Adverse Effect Level). The definition of these is as follows:

- NOEL – No observed effect level. This is the level below which no effect can be detected;
- LOAEL – Lowest observed adverse effect level. This is the level above which adverse effects on health and quality of life can be detected, and
- SOAEL – Significant observed adverse effect level. This is the level above which significant adverse effects on health and quality of life occur.

9-1.4.25 NPSE states that it is not possible to give a single objective noise-based measure that defines a SOAEL that is applicable to all sources of noise for all situations. It acknowledges that the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It also acknowledges that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise.

9-1.4.26 Where any adverse noise effects are predicted, these are identified and if these cannot be avoided, mitigation measures are recommended to ensure no significant residual effects on health and quality of life arise. This approach is considered consistent with the principal aims of the NPSE. It is important to note that findings against the LOAEL and SOAEL are measures of the effect of noise on health and quality of life, and not environmental impact assessment findings.

[21] Defra (2010). Noise Policy Statement for England, [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf [Checked 19/06/2026]

UK Aviation Policy Framework (2013)

9-1.4.27 The UK Aviation Policy Framework (APF) was published in March 2013[22] by the Department for Transport (DfT). The APF defines the Government's objectives and policies on the impacts of aviation in the UK.

9-1.4.28 On managing aviation's environmental impacts, and specifically noise, it states in paragraph 3.12 that the Government's overall objective on noise is to *"Limit and where possible reduce the number of people in the UK significantly affected by aircraft noise"*.

9-1.4.29 It goes on in paragraph 3.13 to state that

"This is consistent with the Government's Noise Policy, as set out in the Noise Policy Statement for England (NPSE) which aims to avoid significant adverse impact on health and quality of life."

9-1.4.30 Guidance is provided on the noise metric used to rate airborne noise in paragraph 3.13 where it states

"To provide historic continuity, the Government will continue to ensure that noise exposure maps are produced for the noise-designated airports on an annual basis providing results down to a level of 57 dB LAeq,16hour".

9-1.4.31 The noise index is described in a footnote as

"the A-weighted average sound level over the 16 hour period of 07:00-23:00. This is based on an average summer day when producing noise contour maps at the designated airports."

9-1.4.32 In paragraph 3.17 the interpretation of the contour is given as

"We will continue to treat the 57 dB LAeq,16h contour as an average level of day time aircraft noise marking the approximate onset of significant community annoyance. However, this does not mean that all people within this contour will experience significant adverse effects from aircraft noise. Nor does it mean that no-one outside of this contour will consider themselves annoyed by aircraft noise."

9-1.4.33 Under the heading "Noise insulation and compensation" the APF states that:

"The Government continues to expect airport operators to offer households exposed to levels of noise of 69 dB LAeq,16h or more, assistance with the cost of moving.

The Government also expects airport operators to offer acoustic insulation to noise sensitive buildings, such as schools and hospitals, exposed to levels of noise of 63 dB LAeq,16h or more. Where acoustic insulation cannot provide an appropriate or cost-effective solution, alternative mitigation measures should be offered."

UK Airspace Policy: A framework for balanced decisions on the design and use of airspace 2017 consultation

9-1.4.34 Although the APF remains the current national aviation policy document, in 2017 the Department for Transport reported on the outcome of consultations regarding changes to UK airspace[23] (Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace) which included a review of criteria and metrics for assessing aircraft noise. This states in paragraph 9:

"The Government's current aviation policy is set out in the Aviation Policy Framework (APF). The policies set out within this document provide an update to some of the policies on aviation noise contained within the APF, and should be viewed as the current government policy. The government also intends to develop aviation noise policy further through the Aviation Strategy consultation process. As part of the

[22] Department for Transport (2013). Aviation Policy Framework. [online]. Available at: https://www.gov.uk/government/publications/aviation-policy-framework [Checked 19/06/2026]
[23] Department for Transport (2017). Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace. [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/653801/consultation-response-on-uk-airspace-policy-web-version.pdf [Checked 19/06/2026]

Aviation Strategy consultation on sustainable growth planned for 2018 the Government intends to consider the roles, structures and powers that currently exist and what, if any, new ones will be necessary to bring about the network wide, co-ordinated and complex changes needed for airspace modernisation".

9-1.4.35 Based on this report, the Government will implement a range of proposals of which the key points are:

- The creation of an Independent Commission on Civil Aviation Noise (ICCAN) as an advisory non-departmental public body;
- A level of 54 dB $L_{Aeq,16h}$ is now acknowledged to correspond to the onset of significant community annoyance and replaces the 57 dB $L_{Aeq,16h}$ level in the APF,
- Some adverse effects of annoyance can now be seen to occur down to 51 dB $L_{Aeq,16h}$. A LOAEL of 51 dB $L_{Aeq,16h}$ and 45 dB L_{night}, for daytime and night-time noise respectively, are to be used in assessing and comparing noise impacts of airspace changes (N.B. Following consultation with the CAA, the Government consider it appropriate to use 45 dB $L_{Aeq,8h}$ as the LOAEL for air space change assessment, for consistency with daytime noise).

9-1.4.36 As part of this consultation the Department for Transport published their draft Air navigation guidance on airspace and noise management and environmental objectives[24]. This proposes that rather than limiting the number of people exposed to any level of aircraft noise, the number of people experiencing significant adverse effects should be limited.

BS 8233:2014 Sound insulation and noise reduction in buildings – code of practice

9-1.4.37 The British Standard BS 8233:2014 Sound insulation and noise reduction for buildings – Code of practice[25] provides guidance on the control of external noise. The standard presents a number of design ranges for indoor noise levels for different types of space.

9-1.4.38 The internal ambient noise guideline levels for dwellings are given in Table 9-1-2.

Table 9-1-2: Dwelling noise exposure hierarchy based on the likely average response

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

9-1.4.39 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax}, depending on the character and number of events per night. Sporadic noise events could require separate values.

9-1.4.40 These guideline noise levels can be used for rooms for residential purposes including hotels, hostels, halls of residence, school boarding houses, hospices and residential care homes.

9-1.4.41 BS 8233:2014 also gives guideline ambient noise levels in non-domestic buildings. These are given in Table 9-1-3.

[24] Department for Transport (2017). Air navigation guidance on airspace and noise management and environmental objectives. [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/587669/air-navigation-guidance-on-airspace-and-noise-management-and-environmental-objectives.pdf [Checked 19/06/2026]

[25] British Standards Institution (2014). BS 8233:2014 Sound insulation and noise reduction for buildings – Code of practice. [Online]. Available at: https://knowledge.bsigroup.com/products/guidance-on-sound-insulation-and-noise-reduction-for-buildings [Checked 19/06/2026]

Table 9-1-3: Non=domestic noise exposure hierarchy based on the likely average response

Activity	Location	Design range $L_{Aeq,T}$ (dB)
Speech or telephone communications	Department store, cafeteria, canteen, kitchen	50 to 55
	Concourse, corridor, circulation space	45 to 55
Study and work requiring concentration	Library, gallery, museum	40 to 50
	Staff/meeting room, training room	35 to 45
	Executive office	35 to 40
Listening	Place of worship, counselling, meditation, relaxation	30 to 35

UK Department of Education - Acoustic design of schools: performance standards BB93 (2015)

9-1.4.42 The UK Department of Education's BB93[26] gives upper limits for indoor ambient noise level in terms of $L_{Aeq,30min}$ for new and refurbished schools, and schools formed by a material change of use, are as follows:

- Classroom and general teaching area - 35 dB $L_{Aeq,30min}$; and
- Teaching space (special communication needs) - 30 dB $L_{Aeq,30min}$.

9-1.4.43 For classrooms and teaching spaces with natural ventilation, these levels can be achieved if the external noise level does not exceed 55 dB $L_{Aeq,30min}$.

9-1.4.44 These standards, while not required by legislation to be achieved within those existing schools built prior to their introduction, provide a guide to determine potential impacts on existing schools.

UK Department of Health - Specialist Services, Health Technical Memorandum 08-01: Acoustics (2013)

9-1.4.45 Guidance on recommended internal noise levels for healthcare facilities is given in the UK Department of Health's HTM 08-01[27]. This recommends internal noise levels for healthcare facilities as follows:

- Hospital wards, daytime - 40 dB $L_{Aeq,1h}$;
- Hospital wards, night - 35 dB $L_{Aeq,1h}$;
- Hospital wards, night - 45 dB $L_{Amax,F}$;
- Operating theatres, night - 40 dB $L_{Aeq,1h}$; and
- Operating theatres, night - 50 dB $L_{Amax,F}$.

9-1.4.46 The L_{Amax} limit is applicable to events that occur several times during the night (for example passing trains) rather than sporadic events.

9-1.4.47 These criteria would be relaxed for emergency situations and sporadic events subject to agreement by the local authority or other relevant body.

[26] Department of Education (2015). Acoustic design of schools: performance standards Building bulletin 93, [Online]. Available at: https://www.gov.uk/government/publications/bb93-acoustic-design-of-schools-performance-standards [Checked 19/06/2026]
[27] Department of Health (2013). Specialist Services, Health Technical Memorandum 08-01: Acoustics, [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/144248/HTM_08-01.pdf [Checked 19/06/2026]

9-1.4.48 For hospital wards with natural ventilation, these levels can be achieved if the external noise level does not exceed 55 dB $L_{Aeq,1h}$ and 50 dB $L_{Aeq,1h}$ during the day and night respectively.

CAP1616i Environmental Assessment Requirements and Guidance for Airspace Change Proposals

9-1.4.49 This guidance document[28] produced in 2023 by the Civil Aviation Authority provides requirements and guidance on performing environmental assessments that must be undertaken for all airspace change proposals. This includes guidance on noise modelling and noise metrics.

BS 7445 Description and measurement of environmental noise

9-1.4.50 The aim of this British Standard is to provide authorities with material for the description of noise in community environments. The first part of the standard, BS 7445-1:2003[29], defines the basic quantities to be used and describes basic procedures for the determination of these quantities. The second part, BS 7445-2:1991[30], concerns the acquisition of data pertinent to land use, and the third part, BS 7445-3:1991[31], is a guide to application to noise limits.

9-1.5 Noise Metrics for Assessment of Impacts of Aircraft Noise

9-1.5.1 In the UK, the Independent Commission on Civil Aviation Noise (ICCAN) was a body created to act as an independent, impartial voice on civil aviation noise and how it affects communities. They undertook a review of aviation noise metrics[32].

9-1.5.2 The review notes that metrics aim to quantify noise in a meaningful way and that in terms of trying to determine the effect caused by noise there are two ways to look at noise measurements, the absolute value and the relative change.

"Absolute levels are important from a regulatory point of view, whereas the relative change in noise might be more informative for assessing annoyance, because of the way the human ear perceives sound."

9-1.5.3 The background section reports that

"since the early 1970s, research found that the L_{Aeq} metric was most closely associated with subjective response. The $L_{Aeq,T}$ is a notional continuous A-weighted sound level over a given time period, T, that contains the same sound energy as the actual time varying signal over the same time period". Both L_{den} and L_{night} are L_{Aeq} based metrics in addition to others such as $L_{Aeq,16h}$ and $L_{Aeq,8h}$.

"Most of these metrics are well-established within the aviation sector, with an extensive existing knowledge base. This makes them useful for research into annoyance, as well as other health and social issues (WHO, Environmental Noise Guidelines for the European Region, 2018)."

9-1.5.4 The review classifies these metrics as giving averaged results as they relate to a period of time during which a number of events may occur and return a value based on the noise across the period. In the case of L_{den} the metric also includes weighting with noise during the evening and at night treated as more significant when the overall level is determined. Table 1 of the review summarises some of the exposure noise metrics. The entries for metrics used in this assessment are included in Table 9-1-4.

[28] Civil Aviation Authority (2023). CAP1616i Environmental Assessment Requirements and Guidance for Airspace Change Proposals, [online]. Available at: https://www.caa.co.uk/publication/download/20867 [Checked 19/06/2026]
[29] British Standards Institution (2003). BS 7445-1:2003 Description and measurement of environmental noise - Guide to quantities and procedures. [Online]. Available at: https://knowledge.bsigroup.com/products/description-and-measurement-of-environmental-noise-guide-to-quantities-and-procedures [Checked 18/09/2026]
[30] British Standards Institution (1991). BS 7445-2:1991 Description and measurement of environmental noise - Guide to the acquisition of data pertinent to land use. [Online]. Available at: https://knowledge.bsigroup.com/products/description-and-measurement-of-environmental-noise-guide-to-the-acquisition-of-data-pertinent-to-land-use [Checked 18/09/2026]
[31] British Standards Institution (1991). BS 7445-3:1991 Description and measurement of environmental noise - Guide to application to noise limits. [Online]. Available at: https://knowledge.bsigroup.com/products/description-and-measurement-of-environmental-noise-guide-to-application-to-noise-limits [Checked 18/09/2026]
[32] ICCAN (2020). A review of aviation noise metrics and measurement. Available at: https://gat04-live-1517c8a4486c41609369c68f30c8-aa81074.divio-media.org/filer_public/23/ad/23adc11f-e586-4b44-8f11-5cf91456ae64/1047_2020_08_11_iccan_review_of_aviation_noise_metrics_and_measurement.pdf [Checked 19/06/2026]

Table 9-1-4: Exposure noise metrics based on L_{Aeq}

Metric	What it is	What if does	Weighting	Presence in UK Legislation, Policy and Standards	Links to effects on annoyance and other health issues
$L_{Aeq,T}$	The L_{eq} with the A indicating that the frequencies in the sound have been adjusted using the A weighting curve.	Provides an average value of the A weighted sound energy contained in the sound measured over a period, T.	Yes. The frequencies in the sound have been weighted using the A weighting curve.	Appears in various legislation, policy and standards associated with different time periods (T).	Generally felt to be a good indicator of likely annoyance and other health effects. Values can be influenced by a few very noisy events which could give a similar score to a large number of quieter events.
$L_{Aeq,16h}$	The $L_{Aeq,T}$ averaged over a 16 hour period. Conventionally that time period is 07:00 hours to 23:00 hours local time.	When determined for an average summer's day between the 16 June and 15 September, it is the main measure of aircraft noise impact	Yes. The frequencies in the sound have been weighted using the A weighting curve.	Appears in British Standards, such as BS 8233:2014. The summer average day value appears in Government policy on aviation noise management. This metric has been used by the UK for examining aircraft noise since 1990.	An Exposure Response Function (ERF) exists between this metric and annoyance. This is thought to have changed over time. Also, some ERFs exist for other health effects.
$L_{Aeq,8h}$	The $L_{Aeq,T}$ averaged over an 8 hour period. Conventionally that time period is 23:00 hours to 07:00 hours local time (i.e. the night period).	When determined for an average summer's night between the 16 June and 15 September, it is one of the measures of aircraft noise impact at night	Yes. The frequencies in the sound have been weighted using the A weighting curve	Appears in British Standards, such as BS 8233:2014. The summer average night value appears in Government policy on aviation noise management	The summer average night value is used to determine the percentage of people expressing self reported sleep disturbance – although strictly, the correct measure to use is L_{night}.
L_{night}	The $L_{Aeq,8h}$ averaged over the period of one year	Provides a measure of the annual average night noise impact, measured outside.	Yes. The frequencies in the sound have been weighted using the A weighting curve.	Appears in the regulations that transpose EC Directive 2002/49/EC, the Environmental Noise Directive	There is an ERF between this measure and determining the percentage of people expressing self reported sleep disturbance for aircraft noise (and road and rail noise).
L_{den}	The annual average $L_{Aeq,T}$, combining L_{day}, $L_{evening}$, and L_{night} but with the $L_{evening}$ value weighted by the addition of 5 dB and the L_{night} value weighted by the addition of 10 dB.	Provides a single measure of the overall annual average noise impact.	Yes. The frequencies in the sound have been weighted using the A weighting curve. $L_{evening}$ has been weighted by the addition of 5 dB. L_{night} has been weighted by the addition of 10 dB	Appears in the regulations that transpose EC Directive 2002/49/EC; The Environmental Noise Directive (END) which is translated into English legislation: The Environmental Noise (England) Regulations 2006 (UK) Statutory Instruments, The Environmental Noise (England) Regulations, 2006, as well as for the devolved nations.	There is an ERF between this measure and annoyance for aircraft noise (and road and rail noise). Also, some ERFs with other health effects.

Metric	What it is	What if does	Weighting	Presence in UK Legislation, Policy and Standards	Links to effects on annoyance and other health issues
$L_{Aeq,30mins}$	The $L_{Aeq,T}$ averaged over a 30 minute period.	Provides a measure of the average noise impact in a 30-minute period.	Yes. The frequencies in the sound have been weighted using the A weighting curve.	Appears in Building Bulletin 93 – Acoustic design of schools: performance standards.	Some links with the impact of noise on teaching and learning.
$L_{Aeq,1h}$	The $L_{Aeq,T}$ averaged over a 1 hour period	Provides a measure of the average noise impact in a 1-hour period. For aircraft noise, sometimes used to describe the impact during the period 06:00 – 07:00.	Yes. The frequencies in the sound have been weighted using the A weighting curve.	Can be found in BS 4142:2014+A1:2019 and BS 8233:2014. The value in the period 06:00 – 07:00 is sometimes used a control metric at some airports	No formal relationships exist.

9-1.5.5 The report also considers a different class of metrics, those related to single events. These describe the noise impact of a single aircraft movement or over-flight in terms of its intrusiveness, loudness, or noisiness. These can be simpler to present and understand but are not suitable for assessing the overall effects from multiple movements. Table 3 of the review summarises some of the single event metrics. The entries for metrics used in this assessment are included in Table 9-1-5.

Table 9-1-5: Single event noise metrics

Metric	What it is	What if does	Weighting	Presence in UK Legislation, Policy and Standards	Links to effects on annoyance and other health issues
L_{Amax}	The maximum A-weighted sound level of an aircraft event. It is derived from the root mean square of the varying sound pressure. To be meaningful, a response time has to be defined.	Gives the value of the maximum sound level from an event.	Yes. The various frequencies in the sound have been weighted using the A weighting curve.	Does not appear on its own as it requires information about the response time to be meaningful.	Frequently used in noise disturbance research. Some correlation found with sleep disturbance and speech interference. Strength of correlation unclear. Can be modified to the maximum noise experienced in the bedroom ($L_{Amax,inside}$) (CAA, 2009).
$L_{Amax,S}$	The L_{Amax} measured with a slow response time.	Gives the value of the maximum sound level from an event.	Yes. The various frequencies in the sound have been weighted using the A weighting curve.	Is used to define the maximum level from aircraft noise events.	Research tends not to differentiate between fast or slow response times
Nx	The number of events (flyovers or movements) that cause the maximum noise to be X dB or higher. It needs to have a time period associated with it, but at present	Provides an indication of the number of events likely to cause disturbance. The extent of the impact depends on the value chosen for X.	Yes, insofar as X is usually defined as the $L_{Amax,S}$.	Does not appear on its own as it requires information about the time period over which the value applies to be meaningful.	Depending on the value of X, there is some implied relationship with annoyance.

Metric	What it is	What if does	Weighting	Presence in UK Legislation, Policy and Standards	Links to effects on annoyance and other health issues
	does not regularly have that in the way it is described.				
N65	This is Nx with X = 65 dB(A)	Provides an indication of the number of events likely to cause disturbance.	Yes, insofar as the 65 dB is expressed in terms of the $L_{Amax,S}$.	None	Some limited evidence linking to annoyance
N60	This is Nx with X = 60 dB(A)		Yes, insofar as the 65 dB is expressed in terms of the $L_{Amax,S}$.	None	Assuming 15 dB(A) sound reduction through a partially open window, it can be related to advice in the WHO Community Noise Guidelines (1999/2000).

9-1.6 Derivation of Effect Scales Used

Aircraft Noise – Residential Receptors

9-1.6.1 Regulation (EU) No 598/2014 under Annex I requires that air traffic noise impact will be described, at least, in terms of noise indicators L_{den} and L_{night} which are defined and calculated in accordance with Annex I to Directive 2002/49/EC.

9-1.6.2 The consideration of effects has involved the determination of the number of people 'highly sleep disturbed' and 'highly annoyed'. The latter has been done in accordance with the approach recommended by the World Health Organisation Environmental Guidelines 2018 (WHO 2018) as endorsed by the European Commission through Directive 2020/367, and has taken into account the noise exposure from 45 dB L_{den} and 40 dB L_{night} as appropriate. It is aircraft noise above these levels that WHO 2018 states are associated with adverse health effects.

9-1.6.3 In addition to considering the overall effect, consideration has also been given to the significance of the change under the various options considered from the baseline. This considers both the resulting noise levels and the changes in noise levels. A consequence of this approach is that it puts emphasis on those newly affected, as they will experience the greatest changes, when considering the overall number significantly adversely affected.

9-1.6.4 The classification and significance of effects is evaluated with reference to definitive standards, accepted criteria and legislation where available. This is supplemented by professional opinion and professional judgement.

9-1.6.5 For the L_{den} and L_{night} noise indicators the significance of effect has been determined by separately rating both the absolute noise levels and the change in noise level as set out below. The individual ratings are then combined to determine the significance of any effects.

9-1.6.6 Absolute noise impacts at residential receptors have been determined by reference to the noise exposure criteria presented in Table 9-1-6. These criteria assign an impact category based on the predicted annual L_{den} and L_{night} noise levels and are consistent with those used for recent planning applications at Dublin Airport and accepted by ANCA. They commence with a negligible band which applies to noise levels that lie below a low threshold, specifically 45 dB L_{den} and 40 dB L_{night}, as WHO 2018 states that aircraft noise above these levels is associated with adverse health effects. The subsequent bands are defined by values that are required to be reported under Directive 2002/49/EC.

Table 9-1-6: Noise Impact Criteria (absolute) – residential

Scale Description	Annual dB L_{den}	Annual dB L_{night}
Negligible	<45	<40
Very Low	45 – 49.9	40 – 44.9
Low	50 – 54.9	45 – 49.9
Medium	55 – 64.9	50 – 54.9
High	65 – 69.9	55 – 59.9
Very High	≥70	≥60

9-1.6.7 Taking L_{den}, the value of 55 dB is where WHO 2018 reports evidence of an effect on reading skills and oral comprehension in children. This value is also comparable to the level of 54 dB $L_{Aeq,16h}$ which is now used in the UK as marking the approximate onset of significant community annoyance. The value of 55 dB L_{den} has therefore been assigned to medium impact, as it relates to the start of these effects.

9-1.6.8 Taking the value of 65 dB L_{den}, this is where WHO 2018 reports an association between those exposed and those considering themselves highly annoyed of 45.5%. Such a noise level is also comparable with the level of 63 dB $L_{Aeq,16h}$ which is currently used as the daytime threshold for eligibility for acoustic insulation at Dublin Airport. This threshold has also been widely used in the UK for a similar purpose, more recently for schemes where the airport is responsible for the full value of the works. The value of 65 dB L_{den} has therefore been assigned to the start of a high impact.

9-1.6.9 For the night period the value of 45 dB L_{night} has been assigned to low impact. This follows from the approach in the UK where the Government proposed the value as the Lowest Observed Adverse Effect Level, and this received broad support.

9-1.6.10 Exposure to a level of 50 dB L_{night} is described as representing the locations most affected by aircraft noise and where adverse health outcomes are more likely to present in ANCA's May 2026 Noise Abatement Objective for Dublin Airport. This value has therefore been assigned to the level above which medium impact arises.

9-1.6.11 The higher level of 55 dB L_{night} has been assigned to the level above which high impact arises. This follows from the WHO Night Noise Guidelines 2009 (NNG 2009)[12] which describe it as the threshold at which

"Adverse health effects occur frequently, a sizeable proportion of the population is highly annoyed and sleep-disturbed".

9-1.6.12 This noise level also matches the eligibility threshold for the Residential Sound Insulation Grant Scheme (RSIGS) at Dublin Airport and is comparable with the level of 55 dB $L_{Aeq,8h}$ commonly used at airports in the UK for eligibility for sound insulation schemes.

9-1.6.13 The effect scale used to assess the change in noise level is given in Table 9-1-7. The thresholds are derived from the difference contour bands recommended in CAP1616i, which is UK CAA guidance developed for assessments of airspace change proposals. This scale matches those which have been used for recent planning applications at Dublin Airport and accepted by ANCA.

Table 9-1-7: Noise Impact Criteria (relative)

Scale Description	Change in noise level, dB(A)
Negligible	0 – 0.9
Very Low	1 – 1-9
Low	2 – 2.9
Medium	3 – 5.9
High	6 – 8.9

Scale Description	Change in noise level, dB(A)
Very High	≥9

9-1.6.14 The magnitude of an effect associated with the change from the Permitted Operation to the Proposed Operation has been determined by considering both the absolute noise level in the higher-noise scenario and the change in noise level between the two scenarios at each receptor.

9-1.6.15 The effect of a change in noise level tends to increase with the absolute level of noise experienced at a receptor. If, for example, the night-time noise level at a dwelling were to change from 45 dB to 50 dB L_{night}, the overall effect for the occupants would be less than if the night-time noise level were to increase by the same amount from 55 dB to 60 dB L_{night}.

9-1.6.16 The EPA Guidelines[33] advises that a systematic approach, standard descriptive methods and the use of replicable assessment techniques and standardised effect descriptions must be adopted to ensure that all likely significant effects are adequately considered and clearly communicated.

9-1.6.17 There is no clearly accepted method of how to rate the magnitude of the effect of a change in the absolute air noise level and the associated change in noise level. Some guidance however has been provided in the UK's National Planning Practice Guidance (NPPG) which states:

"In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise may result in a significant adverse effect occurring even though little or no change in behaviour would be likely to occur."

9-1.6.18 The threshold for significance is often based on where there is a policy expectation for mitigation to be provided, which in the case of aircraft noise normally takes the form of providing acoustic insulation. The UK APF references a 3 dB change as a threshold for requiring insulation, above a certain noise level. A change of 3 dB is also described by the UK CAA[34] as:

"generally considered the minimum perceptible difference under normal listening conditions, although smaller changes may be noticeable in certain contexts"

9-1.6.19 Therefore the threshold for a significant effect has been taken to be a change of 3 dB (rated as medium), with an absolute noise level rated as medium (i.e. 55 dB L_{den} or 50 dB L_{night}). This has been extended to other descriptors based on the concept that people are more sensitive to changes when the absolute noise level is higher.

9-1.6.20 Table 9-1-8 sets out how the absolute and relative impacts are combined to determine the magnitude of effect, taking account of the criteria presented above, relevant guidance and professional judgement. The terminology used to describe the magnitude of effect is consistent with the EPA Guidelines. This approach has been used in recent planning applications at Dublin Airport and has been accepted by ANCA and, in the context of the NRRA, by ACP.

Table 9-1-8: Summary of magnitude of effect – noise

Absolute Noise Level Rating	Change in Noise Level Rating					
	Negligible	Very Low	Low	Medium	High	Very High
Negligible	Imperceptible	Imperceptible	Imperceptible	Not Significant	Slight	Moderate
Very Low	Imperceptible	Imperceptible	Not Significant	Slight	Moderate	Significant
Low	Imperceptible	Not Significant	Slight	Moderate	Significant	Significant
Medium	Not Significant	Slight	Moderate	Significant	Significant	Very Significant

[33] EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022). Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf [Checked 19/06/2026]
[34] https://www.caa.co.uk/environmental-sustainability/uk-aviation-environmental-review/uk-aer-noise/noise-introduction/ [Checked 23/08/2026]

Absolute Noise Level Rating	Change in Noise Level Rating					
	Negligible	**Very Low**	**Low**	**Medium**	**High**	**Very High**
High	Slight	Moderate	Significant	Significant	Very Significant	Profound
Very High	Moderate	Significant	Significant	Very Significant	Profound	Profound

9-1.6.21 A potential significant effect (adverse or beneficial) is considered to arise if the magnitude of the effect is rated as significant or higher.

Aircraft Noise – Non-Residential Receptors

9-1.6.22 For non-residential receptors a similar, although simplified, approach has been used. Absolute levels rated as medium have been derived from the relevant guidance documents. These are given in Table 9-1-9. The impact on each non-residential receptor has been rated as significant if the absolute noise level is above this threshold and the change in noise level is at least 3 dB(A), i.e. it is rated medium or higher.

9-1.6.23 For schools the medium threshold has been based on the guidance in Building Bulletin 93, specifically that the internal noise levels for classrooms and teaching spaces that it contains can be achieved with natural ventilation if the external noise level does not exceed 55 dB $L_{Aeq,30min}$. Previous analysis of future forecast operations used the maximum hourly number of flights in the period 08:00-15:59 as a proxy for the $L_{Aeq,30m}$. This maximum number was compared with the average number of flights per hour, after the L_{den} weighting was applied (i.e. multiplying flights in the evening by 3.16 and night flights by 10). The analysis found that the correction from L_{den} to the maximum $L_{Aeq,30m}$ value would be between -0.7 and -2.5 dB, depending on the scenario (i.e. 55 dB $L_{Aeq,1h}$ would equate to between 54.3 and 52.5 dB L_{den}). A conservative assumption was made by assuming the maximum $L_{Aeq,30m}$ value would be the same as the L_{den} value. 55 dB L_{den} is also the level where WHO 2018 reports evidence of an effect on reading skills and oral comprehension in children.

9-1.6.24 For residential healthcare facilities, the medium thresholds have based on the guidance in Health Technical Memorandum 08-01, specifically that the internal noise levels for hospital wards that it contains can be achieved with natural ventilation if the external noise level does not exceed 55 dB $L_{Aeq,1h}$ and 50 dB $L_{Aeq,1h}$ during the day and night respectively.

9-1.6.25 For the daytime, the maximum hourly number of flights in the period 07:00-22:59 was calculated for each scenario. This was compared with the average number of flights per hour, after the L_{den} weighting was applied (i.e. multiplying the number of flights in the evening by 3.16 and the number of night flights by 10). This analysis found that the correction from L_{den} to the maximum $L_{Aeq,1h}$ value would be between +0.1 and -2.5 dB, depending on the scenario. A conservative assumption was made by assuming the $L_{Aeq,1h}$ value would be the same as the L_{den} value for all scenarios.

9-1.6.26 For the night-time, the maximum hourly number of flights in the period 23:00-06:59 was calculated for each scenario. This was compared with the average number of flights per hour during the night period of 23:00-06:59, as used for the L_{night} metric. This analysis found that the correction from L_{night} to the maximum $L_{Aeq,1h}$ value would be between +3.8 and +4.3 dB, depending on the scenario. A conservative assumption was made to assume the $L_{Aeq,1h}$ value would be the 5 dB higher than the L_{night} value for all scenarios.

9-1.6.27 For places of worship the medium threshold for L_{den} is the same as that for residential dwellings on the basis that the British Standard BS8233:2014 recommends comparable internal noise levels for both types of spaces. No threshold was adopted for L_{night} as these buildings are not typically used at night.

9-1.6.28 The resulting air noise impact criteria for non-residential properties are given in Table 9-1-9.

Table 9-1-9: Air Noise Impact Criteria (absolute) – non-residential

Receptor Type	Threshold for Medium Absolute Effect
Schools (08:00-15:59)	55 dB $L_{Aeq,30m}$ (approx. 55 dB L_{den})
Residential Healthcare Facilities – Day (07:00-22:59)	55 dB $L_{Aeq,1h}$ (approx. 55 dB L_{den})
Residential Healthcare Facilities – Night (23:00-06:59)	50 dB $L_{Aeq,1h}$ (approx. 45 dB L_{night})
Places of Worship	55 dB L_{den}

9-1.7 Comparison with Dublin Airport Noise Zones

9-1.7.1 The Fingal Development Plan 2023-2029 (FDP) includes noise zones to aid land use planning. Each of these zones has an associated objective relating to restrictions on future noise sensitive development. The zones are defined by combinations of the potential noise from the airport during the daytime and at night. Zone A covers the area exposed to the highest potential noise, with Zones B, C and D relating to areas of ever lower potential exposure. The current noise zones were first presented in Variation No. 1 to the Fingal County Development Plan 2017-2023 which came into effect on 9th December, 2019, prior to the Dublin Airport LAP.

9-1.7.2 Two levels of daytime noise exposure (63 dB and 54 dB $L_{Aeq,16h}$) and two levels of night-time noise exposure (55 dB and 48 dB L_{night}) defined Zones A to C based on previous forecasts of potential noise. Figures 9-1-001 to 9-1-003 have been prepared comparing the 2029 Proposed Operation to Zones A to C.

9-1.7.3 The figures show the forecast contours are generally within the corresponding noise zones, with the exception being in an area to the north west of the airport. This is due to the latest contours reflecting the actual departure routes, whereas those produced to define the zones used previous assumptions.