



An tÚdarás Inniúil um
Thorann Aerárthaí

Aircraft Noise
Competent Authority

Noise Abatement Objective

Report for Dublin Airport

20th June 2022



The services of Noise Consultants Ltd were retained by ANCA to support the work of the authority by undertaking technical assessments and providing expert advice in the areas of acoustics, aviation, and environmental assessments.



This report was prepared with the assistance of Noise Consultants Ltd., working with:



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01

Executive Summary

1 Executive Summary

This report details the policy and legislative background supporting the defining of a Noise Abatement Objective (NAO) for Dublin Airport. It establishes the principles and expected outcomes associated with the management of noise at Dublin Airport. This is achieved in the context of the sustainable development of Dublin Airport and the protection of the environment, to manage the aircraft noise of permitted growth at Dublin Airport.

The report establishes:

- **The Policy Objective.**
- **Explains the Objective.**
- **Details how the objectives will be measured.**
- **Defines the outcomes to be delivered.**

1.1 Policy Objective

Limit and reduce the long-term adverse effects of aircraft noise on health and quality of life, particularly at night, as part of the sustainable development of Dublin Airport.

1.2 Explaining the Objective

Noise from Dublin Airport should be limited and reduced in line with principles of sustainable development. As Dublin Airport grows, the long-term adverse effects on human health and quality of life should progressively reduce over the lifetime of this NAO. The Balanced Approach will be used to ensure that cost-effective, practicable and sustainable measures are implemented to achieve this objective.

1.3 Measuring the Objective

The NAO will be primarily measured through the number of people highly sleep disturbed and highly annoyed in accordance with the approach recommended by the World Health Organisation's Environmental Noise Guidelines 2018 as endorsed by the European Commission through Directive 2020/367, taking into account noise exposure from 45 dB L_{den} and 40 dB L_{night} . These measures describe those chronically disturbed by aircraft noise.

These metrics help articulate the effect of aircraft noise on health and quality of life. Further to these metrics, the following will also be used to help identify priorities i.e., where noise exposure results in the populations experiencing the harmful effects. These are the number of people exposed to aircraft noise above:

- 55 dB L_{night} (a level of night-time noise exposure described by the WHO as representing a clear risk to health)
- 65 dB L_{den} (where a large proportion of those living around Dublin Airport can be considered highly annoyed)

In order to measure performance, these metrics shall be completed using a noise model prepared in accordance with the methodology described in Directive 2015/996 (European Civil Aviation Conference (ECAC) Doc.29 4th Edition or as amended). The noise model shall be validated using local noise and track keeping performance data from Dublin Airport's systems.

1 Executive Summary (Continued)

1.4 Defining the Outcomes

In the context of its recovery from the global pandemic, noise exposure from Dublin Airport is expected to increase up to 2025. Whilst the resultant health effects are expected to be lower than those which occurred prior to the pandemic and in the years 2018 and 2019, these effects should then reduce over the medium to long-term, to improve the noise situation at Dublin Airport whilst allowing for sustainable growth. ANCA therefore expects the following outcomes to be achieved through this NAO as set against the measures described in Part 3.

The number of people highly sleep disturbed and highly annoyed shall reduce so that:

- The number of people highly sleep disturbed and highly annoyed in 2030 shall reduce by 30% compared to 2019.
- The number of people highly sleep disturbed and highly annoyed in 2035 shall reduce by 40% compared to 2019.
- The number of people highly sleep disturbed and highly annoyed in 2040 shall reduce by 50% compared to 2019.
- The number of people exposed to aircraft noise above 55 dB L_{night} and 65 dB L_{den} shall be reduced compared to 2019.

1.5 Monitoring the NAO

Monitoring of the NAO will be informed by annual reports which will be reviewed by ANCA as part of its obligations under the Aircraft Noise (Dublin Airport) Regulation 2019.

02

Introduction

A Noise Abatement Objective (NAO) is a policy objective for managing the effects of aircraft noise emissions on the surrounding communities and environment at an airport where a noise problem has been identified. It is a plan to ensure that development at Dublin Airport occurs in the most sustainable manner possible to minimise the impact of aircraft noise.

A noise problem was identified at Dublin Airport following assessment of planning application F20A/0668. ANCA proceeded to define an NAO to address the problem and carry out a detailed noise assessment.

An NAO is used to guide decisions that are needed to manage the aircraft noise aspects of future aircraft operations at an airport.

This report presents the development of an NAO for Dublin Airport in the context of relevant policy and legislation.

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Policy and Legislative Background

3 Policy and Legislative Background

3.1 Policy Context

Aviation policy is coordinated at an international level by the International Civil Aviation Organization (ICAO). ICAO is a specialist division of the United Nations that guides the planning and development of the international air transport system. The recommendations of ICAO are given legislative effect at European and national level.

ICAO policy supports the need for an NAO for the following purposes:

1. To identify and determine the extent of a noise problem at an airport.
2. To facilitate transparent consideration of measures to alleviate a noise problem.
3. To support the assessment of the cost-effectiveness analysis of noise reduction and mitigation measures and operating restrictions; and
4. To understand the acceptability or otherwise of the noise climate as it evolves.

The main overarching ICAO policy on aircraft noise is the Balanced Approach. This policy provides an internationally agreed approach to the management of aircraft noise. The application of the Balanced Approach follows the identification of a noise problem at an airport, providing the basis for assessing noise mitigating measures as required to the extent necessary to achieve an NAO.

A fundamental element of the Balanced Approach is an assessment of the evolution of the noise climate at an airport and the surrounding community to determine appropriate measures to address a noise problem.

ICAO guidance¹ seeks to ensure that the Balanced Approach is applied to address noise problems on an airport specific basis, identifying the noise-related measures that achieve the maximum environmental benefit most cost-effectively, using objective and measurable criteria.

3.2 Legislative Context

The following legislation provides for a Noise Abatement Objective for Dublin Airport:

- EU Regulation 598/2014 (the Aircraft Noise Regulation), implements the International Civil Aviation Organization (ICAO) 'Balanced Approach to Aircraft Noise Management' into European law.
- Aircraft Noise (Dublin Airport) Regulation Act 2019 (the Act of 2019), gives further effect to the Aircraft Noise Regulation with respect to Dublin Airport.
- EU Directive 2002/49/EC – known as the Environmental Noise Directive (END).
- European Communities (Environmental Noise) Regulations 2018 (ENR), which transposes the END into Irish law and revokes the Environmental Noise Regulations 2006.

The Aircraft Noise Regulation and the Act of 2019

The ICAO Balanced Approach is given legal direct legal effect in Ireland through the Aircraft Noise Regulation and the Act of 2019. These concern the establishment of rules and procedures with regard to the introduction of noise related operating restrictions at European Union Airports (including in the context of planning applications being considered under the Planning and Development Act 2000 as amended (the Act of 2000)).

¹ Doc 9829 AN/451 – Guidance on the Balanced Approach to Aircraft Noise Management 2nd edition- 2008 International Civil Aviation Organization.

The objective of the Balanced Approach is to address noise problems on an individual airport basis and to identify the noise related measures that achieve the maximum environmental benefit most cost-efficiently using objective and measurable criteria.

Under the Balanced Approach, the measures available to reduce noise are classified into four principal elements:

- Reduction of noise at source
- Land use planning and management
- Noise abatement operating procedures
- Operating restrictions

An NAO is required for the application of the Balanced Approach. The legislation provides for an NAO to be defined where a noise problem has been identified.

The Act of 2019 gives further effect to the Aircraft Noise Regulation to make provision for the regulation of aircraft noise at Dublin Airport. This legislation also amends the Planning and Development Act of 2000 to cater for a situation where development at Dublin Airport may give rise to an aircraft noise problem and related matters.

The legislation requires that any measures or a combination of measures that are to be adopted for an airport are no more restrictive than necessary in order to achieve the noise abatement objectives set for that Airport.

The END and the ENR

The Act of 2019 requires ANCA to ensure that the NAO is defined, restated, or amended as appropriate having regard to Article 8 and Annex V of the END.

This requirement links the defining of an NAO to the Noise Action Plan planning process. Context for consideration of the Noise Action Plan for Dublin Airport is therefore provided where the competent authority considers it appropriate to do so.

The minimum requirements set out by Annex V of the END are presented in Table 1 below.

Table 1: Annex V of the Environmental Noise Directive

1 An action plan must at least include the following elements:

- A description of the agglomeration, the major roads, the major railways or major airports and other noise sources taken into account,
- The authority responsible,
- The legal context,
- Any limit values in place in accordance with Article 5,
- An evaluation of the estimated number of people exposed to noise, identification of problems and situations that need to be improved,
- A record of the public consultations organised in accordance with Article 8(7),
- A summary of the results of noise mapping,
- Any noise-reduction measures already in force and any projects in preparation,
- Actions which the competent authorities intend to take in the next 5 years, including any measures to preserve quiet areas,
- Long-term strategy,
- Financial information (if available): budgets, cost-effectiveness assessment, cost-benefit assessment,
- Provisions envisaged for evaluating the implementation and the results of the action plan.

2 The actions which the competent authorities intend to take in the fields within their competence may for example include:

- Traffic planning,
- Land-use planning,
- Technical measures at noise-sources,
- Selection of quieter sources,
- Reduction of sound transmission,
- Regulatory and economic measures or incentives.

3 Each action plan should contain estimates in terms of the reduction of the number of people affected (annoyed, sleep disturbed, or other).

4 The commission may develop guidelines providing further guidelines on the action plans in accordance with Article 13(2).

04.

Overarching Policy

4 Overarching Policy

4.1 Sustainable Development

The Aircraft Noise Regulation identifies sustainable development as a key objective of the common European transport policy. One of the objectives of the Balanced Approach under the Aircraft Noise Regulation is to manage aircraft noise in the context of sustainable development. The United Nations (UN) defines sustainable development as:

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

The guiding principles of sustainable development recognise the interdependence of environmental, social, and economic systems, and the need for social capital by promoting equality and justice. Developments which are foreseeable should not result in problems for future generations and should ideally improve over time.

In order to be deemed sustainable, an outcome should demonstrate that it is equitable and viable from a social, environmental, and economic perspective. Decisions should be made based on a series of balanced judgments taking into consideration the trade-offs between these factors having regard not just as they are now but how they are likely to evolve over time. Sustainability of a development is a matter which is ongoing rather than something which is to be considered at a point in time.

Many of the themes of sustainable development are evident within the objectives of the Aircraft Noise Regulation.

4.2 Review of Relevant Policies

A noise assessment must include a review of relevant policy to consider forecast developments in relation to Dublin Airport and how this may need to be taken into consideration as part of defining an NAO for Dublin Airport.

A review of relevant policies included:

- National Aviation Policy for Ireland. 2015, The Department of Transport, Tourism and Sport.
- Ireland’s Action Plan for Aviation Emissions Reduction 2019, The Department of Transport, Tourism and Sport.
- Review of Future Capacity Needs at Ireland’s State Airports. 2018, Oxford Economics for The Department of Transport, Tourism and Sport.
- National Policy Statement on Airport Charges Regulation 2017, The Department of Transport, Tourism and Sport.
- Project Ireland 2040 - National Planning Framework. 2018, Government of Ireland.
- National Development Plan 2018-2027. 2018, Government of Ireland.
- Climate Action Plan 2019 and the Interim Climate Actions 2021, The Department of the Environment, Climate and Communications.
- Regional Spatial and Economic Strategy for the Eastern and Midland Region 2019-2031, 2019, Eastern and Midland Regional Assembly.
- Transport Strategy for the Greater Dublin Area 2016-2035, 2016, The National Transport Authority.

4 Overarching Policy (Continued)

- South Fingal Transport Study 2019, Fingal County Council.
- Fingal Development Plan 2017-2023, March 2017, Fingal County Council.
- Variation No. 1 of the Fingal Development Plan 2017 – 2023, September 2019, Fingal County Council.
- Dublin City Development Plan 2016-2022, 2016, Dublin City Council.
- Meath County Development Plan 2013-2019, 2013, Meath County Council.
- South Dublin County Council Development Plan 2016-2022, 2016, South Dublin County Council.
- Fingal Climate Change Action Plan 2019-2024, 2019, Fingal County Council.
- Fingal County Council Climate Action Plan 2019-2024, 2019, Fingal County Council.
- Dublin City Council Climate Action Plan 2019-2024, 2019, Dublin City Council.
- Dún Laoghaire-Rathdown County Council Climate Change Action Plan 2019-2024, 2019, Dún Laoghaire-Rathdown County
- South Dublin County Council Climate Action Plan 2019-2024, 2019, South Dublin County Council.
- Dublin Airport Local Area Plan 2020, Fingal County Council.
- Dublin Airport Central Masterplan 2016, Fingal County Council.
- Dublin Airport Capital Investment Programme 2020+2019, daa.
- Dublin Airport Noise Action Plan 2019-2023, 2018, Fingal County Council.
- Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil', 2021 European Commission.

4.3 Themes Identified from the Policy Review

A review of the policies presented in Section 4.2 identified the following themes with respect to development at Dublin Airport:

Consideration of Future Development

The majority of the policies reviewed discuss the sustainable growth of Dublin Airport, supporting:

- The construction of the second runway and the development of Dublin Airport as a secondary hub airport.
- The continued development of Dublin Airport in the national interest.
- Realising the potential from the significant investment on the new runway.

Local and national policy discusses future development in the context of:

- Reviewing capacity constraints.
- Incremental terminal expansion to 40 million passengers per annum (mppa) (by 2030) and a third terminal beyond that.
- Capacity constraints being expected beyond 400,000 Air Traffic Movements (ATMs).
- Growth of Dublin Airport to 55mppa by 2040 as part of Dublin Airport's masterplan through third terminal (from 2031 target).
- A baseline scenario of Dublin Airport reaching 54mppa alongside 365,000 ATMs in 2050.
- Dublin Airport operating at its maximum sustainable potential.

4 Overarching Policy (Continued)

The Dublin Airport Local Area Plan (LAP) indicates that:

- The strategic aims of the LAP include supporting the continued sustainable growth of Dublin Airport, as well as the timely delivery of required infrastructure to facilitate airport growth.
- Achieving the 40mppa threshold is dependent on the following key infrastructure:
- Improved surface access.
- Expanded terminal capacity by way of reconfiguration and augmentation of existing facilities (at Terminal 1 and Terminal 2).
- Completion of the North Runway; and
- Additional aircraft parking stands supported by accompanying boarding gate and aircraft piers, particularly in the context of growing the hub function of Dublin Airport.

A summary of the growth aspirations cited in relevant policy is presented in Table 2.

Table 2: Growth Summary obtained from policy review

Year	ATMS	MPPA	Related Infrastructure
2030	265,000 (baseline)	40mppa (baseline)	T1 and T2 augmentation
2040	-	55mppa	Above + Third Terminal
2050	365,000 (baseline) 409,000 (upside)	54mppa (baseline) 61 mppa (upside)	Above + Third Terminal

Environmental Considerations

Whilst national and local policies support growth at Dublin Airport, they also highlight the need for environmental performance at Dublin Airport. In this context, the application of the Aircraft Noise Regulation supports:

- The need for sustainable development.
- The promotion of new technology in aircraft and engine design to address noise and emissions.
- The consideration of impacts on local residential areas; and
- The development of measures to reduce noise.

The European Commission's '*Pathway to a Healthy Planet for All*', is an action plan that sets clear targets with respect to reducing the number of people chronically disturbed by transport noise. Target 2 of this action plan states that

By 2030 the EU should reduce by 30% the share of people chronically disturbed by transport noise.

This target is presented against a 2017 reference year and follows a publication by the European Environment Agency² and an EC published report assessing the potential health benefits of noise abatement measures in the EU³.

05

Need for the Noise Abatement Objective

5 Need for the Noise Abatement Objective

5.1 Introduction

Legislation and guidance require that an NAO is defined to facilitate and execute the ICAO Balanced Approach at an airport where a noise problem has been identified.

An NAO for Dublin Airport has been prepared having regard to the objectives of relevant policies, legislation, and guidance. This is to facilitate the development of tailored objectives specific to the circumstances pertaining at Dublin Airport.

A noise problem was declared at Dublin Airport on 10th February 2021 arising from a preliminary assessment of planning application F20A/0668. This identified three specific aspects. These all relate to changes in, and exposure to aircraft noise and the potential implications on human health. The NAO must therefore have regard for the impact of aircraft noise on health whilst balancing the wider policy context with respect to sustainable development.

5.2 Objectives of the relevant legislation

Having regard to relevant legislation, policies and guidance, the NAO aims to address the following:

- Help improve the noise climate in the vicinity of Dublin Airport.
- Have consideration for the impact of aircraft noise on human health.
- Limit or reduce the number of people significantly affected by potentially harmful effects of aircraft noise.
- Achieve the sustainable development of Dublin Airport .
- Maintain or increase the quality of life of those living around airports.
- Foster compatibility between aviation activity and residential areas.
- Identify priorities.
- Use objective and measurable criteria.
- Support stakeholder representation and accessibility.
- Support the identification of a noise problem.
- Be quantifiable and relate to human exposure.

The Aircraft Noise Regulation states:

1. This Regulation lays down, where a noise problem has been identified, rules on the process to be followed for the introduction of noise-related operating restrictions in a consistent manner on an airport-by-airport basis, so as to help improve the noise climate and to limit or reduce the number of people significantly affected by potentially harmful effects of aircraft noise, in accordance with the Balanced Approach.

2. The objectives of this Regulation are:

(a) "to facilitate the achievement of specific noise abatement objectives, including health aspects, at the level of individual airports, while respecting relevant Union rules, in particular those laid down in Directive 2002/49/EC, and the legislation within each Member State;"

(b) "to enable the use of operating restrictions in accordance with the Balanced Approach so as to achieve the sustainable development of the airport and air traffic management network capacity from a gate-to-gate perspective."

5 Need for the Noise Abatement Objective (Continued)

Considering the requirements of the legislation, an NAO should therefore:

- Help improve the noise climate in the vicinity of an airport.
- Limit or reduce the number of the number of people significantly affected by potentially harmful effects of aircraft noise.
- Have consideration for the impact of aircraft noise on human health.
- Achieve the sustainable development of Dublin Airport.

Airport noise in the context of the sustainable development of European Union airports is a matter which is specially addressed within the Aircraft Noise Regulation. The Regulation states:

“Sustainable development of air transport requires the introduction of measures aimed at reducing the noise impact from aircraft at Union airports. Those measures should improve the noise environment around Union airports in order to maintain or increase the quality of life of neighbouring citizens and foster compatibility between aviation activities and residential areas, in particular where night flights are concerned.”

An NAO should therefore:

- Maintain or increase the quality of life of those living around airports.
- Foster compatibility between aviation activity and residential areas.

Noise action plans set under the END are relevant to the setting of a NAO under The Aircraft Noise Regulation and the Act of 2019. The objective of the END is:

“to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise”

Considering the objective of the END, an NAO should therefore:

- Identify priorities to avoid, prevent or reduce the harmful effects, including annoyance, due to exposure to aircraft noise.

ICAO guidance on the Balanced Approach to Aircraft Noise contains a number of themes in the context of a noise objective beyond those covered by the legislation.

The guidance references requirements that noise problems should be addressed using objective and measurable criteria. For example,

“although noise annoyance generally is a subjective matter, the ICAO Assembly urges that for the purposes of the Balanced Approach, noise surrounding an airport should be assessed based on objective and measurable criteria.”

The guidance discusses the use of criteria such as the number of people which fall within a certain noise contour. The reference within the Aircraft Noise Regulation to airport Noise Action Plans supports this approach, as the plans must contain information relating to aircraft noise exposure based on the results of strategic noise mapping.

This is further supported by the Aircraft Noise Regulation requiring the noise situation at Dublin Airport to be assessed. The assessment, as supported by Annex I of the Aircraft Noise Regulation requires that the noise indicators used to describe airport noise impacts are presented in accordance with the requirements of the END. It states:

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.

Additional noise indicators which have an objective basis may be used.

5 Need for the Noise Abatement Objective (Continued)

These metrics themselves are objective and measurable. The use of objective and measurable criteria confirms that the process, underpinned by the NAO, can be informed by information. This is further supported by the Act of 2019, which describes the requirements for ANCA in stating reasons for a decision to be supported by associated information and data.

In order to comply with ICAO guidance, an NAO should therefore ensure:

- Use of objective and measurable criteria to assess noise surrounding the airport.

Representing stakeholder views is an important aspect of the ICAO guidance. This is evident with regards to consultation requirements. The Act of 2019 supports this provision.

Section 2.4 of the ICAO guidance discusses the range of stakeholders who may be affected by the ICAO Balanced Approach. This passage of the guidance highlights the need for the process to be able to communicate to all stakeholders.

This guidance discusses the definition of a noise objective to assist in determining the extent of a noise problem. The guidance provides a basis to examine how the noise climate will evolve against the objective to assist in the determination of a noise problem.

The establishment of an NAO is essential because once it is set, it can be used to assist in the determination of the extent of a noise problem. An NAO can also play an important role in order to monitor and review the performance of noise mitigation measures and operating restrictions.

In accordance with the Act of 2019 and ICAO guidance, an NAO should therefore:

- Monitor and review the performance of noise mitigation measures and operating restrictions.
- Facilitate the identification of a noise problem.

ANCA has determined a noise problem at Dublin Airport following a preliminary assessment. This assessment had regard to how aircraft noise exposure may affect human health. Such considerations are a cornerstone of the regulatory and policy context. It follows that an NAO must be defined so that the outcomes which are to be achieved are linked to human health.

- The NAO must be quantified and relate to human health.

06

Establishing Principles for an NAO

6 Establishing Principles for the NAO

6.1 Setting for the NAO

The requirement for a NAO for Dublin Airport arises in response to the potential noise problem resulting from Planning Application F20A/0668. The NAO must ensure the sustainable development of Dublin Airport with regard to aircraft noise. An initial technical review of the impact of the planning application identified the following potential noise impacts to be addressed by the NAO:

1. Planning application F20A/0668 proposed an increase in aircraft activity at night, when referenced against the situation that would otherwise pertain, which may result in higher levels of human exposure to aircraft noise.
2. The application proposes a situation where some people will experience elevated levels of night-time noise exposure for the first time which may be considered harmful to human health.
3. The Environmental Impact Assessment Report (EIAR) accompanying The Application indicated that the proposed Relevant Action will give rise to significant adverse night-time noise effects. This indicates that the noise effects of the proposed development must be considered. Mitigation in the form of a night-time noise insulation scheme is proposed by the application for a Relevant Action. The provision of such mitigation is an indicator that the proposed development may give rise to a noise problem.

Following a technical review, ANCA determined a noise problem at Dublin Airport in the context of the Act of 2019 and the Aircraft Noise Regulation arising from the application, and made the following recommendations:

- The establishment of a Noise Abatement Objective for Dublin Airport.
- The commencement of the process of aircraft noise regulation prescribed by Section 34C of the Planning and Development Act of 2000 including the application of the ICAO Balanced Approach.

6.2 Purpose of the NAO

Having regard for the relevant legislation and guidance outlined in Section 4, it is ANCA's view that the purpose of an NAO is to set the level of ambition for the noise management regime and the outcomes achieved through this, which secures both long-term environmental improvement and a sustainable transport network. It follows that the NAO must secure this balance having regard for the policy landscape as discussed in Section 4.

An NAO may therefore be considered the enabling plan that provides the focus for the Balanced Approach and, potentially, the noise action planning processes required under the END.

The NAO should also attempt to address multiple stakeholder interests, ideally around a common purpose.

6.3 NAO Core Principles

ANCA identified core principles which should form the basis of an NAO. These principles have been developed to ensure that the NAO for Dublin Airport can achieve broad stakeholder support. If an NAO is to successfully gain such stakeholder support, it must reflect many of the aspects highlighted in Section 5.

An NAO should therefore:

- Provide opportunities for sustainable growth whilst protecting the health of those affected.
- Provide a level of certainty by setting realistic outcomes and expectations of change.
- Ensure the desired outcomes are measurable, and the metrics used are evidence based and credible with stakeholders.
- Recognise the balance between the needs of different stakeholder groups.
- Use clear accessible language.

In order to achieve these principles ANCA has sought to develop an NAO in a manner which:

- Aligns with wider regional and national Noise, Sustainability and Economic policies.
- Provides flexibility in how the desired outcomes are to be achieved and does not seek to prescribe the approach.
- Is consistent with the requirements of the Aircraft Noise Regulation and the Act of 2019.
- Includes measurable and achievable outcomes, having regard for human and environmental health, against which progress can be assessed, and provides expectations and opportunities for all stakeholders. The NAO therefore needs to be 'data-driven' and informed not just by the noise situation today but how the noise climate may evolve into the future.
- Incentivises the development and uptake of new technology at Dublin Airport.
- Allows for consistency in undertaking the requirements of the Aircraft Noise Regulation and Noise Action Planning processes, particularly where there are multiple authorities involved.
- Allows for measurable criteria to be used to assess progress.

It will be necessary for Dublin Airport to demonstrate its compliance with the NAO. This will need to be informed and presented in a manner that allows ANCA and any other interested stakeholder to understand whether Dublin Airport is complying with the NAO.

The noise situation at Dublin Airport must be subject to review against the NAO.

Having regard for the above, ANCA's approach to developing the NAO has been to consider it as a plan to guide noise management at Dublin Airport.

As a plan, the NAO must describe a set of outcomes having regard to wider European, national, and regional policies relating to aircraft noise at Dublin Airport and its environs. In this context, the NAO can be used to ensure effective aircraft noise management.

07

The Noise Abatement Objective for Dublin Airport

7 The Noise Abatement Objective for Dublin Airport

7.1 NAO Policy Objective

Having regard for the legislative and policy context at Dublin Airport ANCA has set the high-level objective for the NAO at Dublin Airport Airport as:

“Limit and reduce the long-term adverse effects of aircraft noise on health and quality of life, particularly at night, as part of the sustainable development of Dublin Airport”

A key objective of the Aircraft Noise Regulation is to “limit or reduce the number of people significantly affected by potentially harmful effects of aircraft noise”. ANCA determined that adverse noise effects, particularly those which are harmful to human health arising from aircraft noise on the population should be reduced.

As Dublin Airport recovers from the pandemic and commences use of the North Runway, this objective may not be achievable in the short-term compared with today. Taking this into account and having regard to expected development at Dublin Airport, it is considered appropriate that such effects should be reduced over the long-term.

Reference is made to “health and quality of life” to recognise the type of effects experienced by those exposed to the long-term effects of aircraft noise.

The effects of night-time aircraft noise are highlighted by the objective. The impacts of aircraft noise at night are widely recognised as the least acceptable consequence of aviation. Legislation highlights night-flights as an area requiring specific attention.

The sustainable development of Dublin Airport shall be achieved in a manner which is equitable and viable from a social, environmental, and economic perspective. Noise must therefore be addressed and managed as part of future development in order to achieve this balance.

7.2 Explaining the Objective

The following explanatory text for the objective has been set by ANCA:

Noise from Dublin Airport should be limited and reduced in line with principles of sustainable development. As Dublin Airport grows, the long-term adverse effects on human health and quality of life should progressively reduce over the lifetime of this NAO. The Balanced Approach will be used to ensure that cost-effective, practicable and sustainable measures are implemented to achieve this objective.

A clear theme from both legislation and policy is that aircraft noise should be reduced, and the noise situation improved. The NAO sets clear objectives as to what should be achieved.

7.3 Measurable Criteria

ANCA has set the following measurable criteria within the NAO as follows:

The NAO will be primarily measured through the number of people highly sleep disturbed and highly annoyed in accordance with the approach recommended by the World Health Organisation's Environmental Noise Guidelines 2018 as endorsed by the European Commission through Directive 2020/367, taking into account noise exposure from 45 dB L_{den} and 40 dB L_{night} . These metrics describe those chronically disturbed by aircraft noise.

These metrics help articulate the effect of aircraft noise on health and quality of life. The following will also be used to help identify where noise exposure results in the populations experiencing the harmful effects. These are the number of people exposed to aircraft noise above:

- 55 dB L_{night} (a level of night-time noise exposure described by the WHO as representing a clear risk to health)
- 65 dB L_{den} (where a large proportion of those living around Dublin Airport can be considered 'highly annoyed')

In order to measure performance, these metrics shall be completed using a noise model prepared in accordance with the methodology described in Directive 2015/996 (ECAC Doc.29 4th Edition or as amended). The noise model shall be validated using local noise and track keeping performance data from Dublin Airport's systems.

The calculation of the number of people exposed to aircraft noise shall have regard for the most recent population data available and assessed against the population exposed to aircraft noise in 2019.

The Aircraft Noise Regulation requires that the noise situation at an airport is assessed in accordance with the END.

Commission Directive (EU) 2020/367 amends Annex III of the Environmental Noise Directive, establishing assessment methods for the harmful effects of environmental noise. Directive 2020/367 adopts the Exposure Response Functions (ERF) published within the World Health Organisation (WHO) Environmental Noise Guidelines for the European Region 2018 (ENG18).

Directive 2020/367 reproduces the ERFs for the number of people 'highly annoyed' and 'highly sleep disturbed' from aircraft noise.

Annex II of the Aircraft Noise Regulation provides a statement foreseeing the update of Annex III of the END, stating *"Based on work the WHO is currently undertaking regarding the methodology to assess health implications of the noise impact, the Commission intends to revise Annex III to Directive 2002/49/ EC (estimation of health impact, dose response curves)"*.

Whilst this is discussed in the context of establishing the cost-effectiveness of noise-related operating restrictions, the references to noise and health within the Aircraft Noise Regulation mean that having regard for health outcomes as part of achieving noise abatement objectives requires that harmful effects of aircraft noise should be measurable criteria.

The calculation of the number of people highly annoyed and highly sleep disturbed from aircraft noise occurs from exposure to noise at levels at or exceeding 45 dB L_{den} and 40 dB L_{night} . The consideration of these thresholds aligns with the WHO recommendations made within the ENG18.

The use of the L_{den} and L_{night} metrics aligns with the requirements of the END. The inclusion of the L_{night} metric as a measurable criterion also provides specific consideration of night-time noise and night-flights, which is an aspect singled out by the legislation.

7 The Noise Abatement Objective for Dublin Airport (Continued)

The END provides for the need to consider priorities with regards to noise management. To support this, four additional metrics have been selected:

- 55 dB L_{night} - a level of night-time noise exposure representing a clear risk to health

The WHO Night Noise Guidelines for Europe 2009 (NNG09) state that where noise exposure is above 55 dB L_{night} , the situation is “considered increasingly dangerous for public health”.

The value of 55 dB L_{night} is described by the WHO within the NNG09 as an ‘Interim Target’ in the context of the protection of public health from night noise.

- 65 dB L_{den} - where a large proportion of those living around Dublin Airport can be considered ‘highly annoyed’

At 65 dB L_{den} , the Environmental Noise Guidelines for the European Region 2018 (ENG18) reports that approaching a half of those exposed to aircraft noise (45.5%) are considered highly annoyed. At this level of noise exposure, it is reasonable to expect that aircraft noise is intrusive and may affect people’s behaviour or attitudes thus reducing their quality of life.

The Aircraft Noise Regulation requires that the noise situation at an airport is assessed in accordance with the END. The calculation of these metrics should therefore be carried out using the latest version of the common noise assessment methods described in Commission Directive (EU) 2015/996 which replaced Annex II of the END. Directive 2015/996 sets out the appropriate methodology for calculation of aircraft noise exposure contours for application under both the END and the Aircraft Noise Regulation. The latest version is equivalent to the method described by European Civil Aviation Conference (ECAC) Doc 29 4th Edition. In order to increase the accuracy of these calculations, ANCA considers it appropriate for all aircraft noise modelling to be validated using the data obtained by Dublin Airport’s Noise and Track Keeping (NTK) system. To this end, all modelling to support the monitoring of the NAO must:

- Use flight profile and aircraft noise data specific to Dublin Airport.⁴
- Utilise aircraft ground tracks measured by the NTK system to model centreline and dispersion of aircraft on the various flight paths to and from Dublin Airport.

As the direction of prevailing winds are not in the control of Dublin Airport, modelling for the purpose of measuring performance against the NAO shall be based on standardised modal splits described as a 10-year average.

The measures shall be calculated using population estimates representative of the current year or year of interest as well as against a baseline population representative of the year 2019. This shall be undertaken having regard for guidance published by the Environmental Protection Agency (EPA)⁵.

For example, when measuring the NAO in 2030, a population dataset should be used which is representative of the population in 2030. If the current year is 2030 then the population dataset for the current year shall be adopted.

If a forecast is being prepared for the year 2030, then a forecast population dataset for 2030 shall be adopted when measuring the NAO.

The inclusion of population growth data in the measurement of the NAO will ensure that land-use planning is considered. Whilst Dublin Airport will need to make efforts to reduce its noise impacts, by accounting for population growth, this will also ensure that land-use planning is effective.

⁴ This may include the use of noise monitoring and track keeping data to amend the flight profile and aircraft noise performance data held in both Directive 2015/996 and the ICAO sponsored Aircraft Noise and Performance Database.

⁵ <https://www.epa.ie/publications/monitoring--assessment/noise/epa-guidance-note-for-strategic-noise-mapping-for-the-environmental-noise-regulations-2006-version-2--august-2011.php>

7.4 Required Outcomes

ANCA has determined that the following outcomes are expected to be achieved through the NAO:

In the context of its recovery from the global pandemic, noise exposure from Dublin Airport is expected to increase up to 2025. Whilst the resultant health effects are expected to be lower than those which occurred prior to the pandemic and in the years 2018 and 2019, these effects should then reduce over the medium to long-term, to improve the noise situation at Dublin Airport whilst allowing for sustainable growth. ANCA therefore expects the following outcomes to be achieved through this NAO as set against the measures described in Part 3.

The number of people highly sleep disturbed and highly annoyed shall reduce so that:

- The number of people highly sleep disturbed and highly annoyed in 2030 shall reduce by 30% compared to 2019.
- The number of people highly sleep disturbed and highly annoyed in 2035 shall reduce by 40% compared to 2019.
- The number of people highly sleep disturbed and highly annoyed in 2040 shall reduce by 50% compared to 2019.
- The number of people exposed to aircraft noise above 55 dB L_{night} and 65 dB L_{den} shall be reduced compared to 2019.

The setting of a health-based outcome which requires a reduction of the number of people chronically affected and exposed to the harmful effects of aircraft noise aligns with the objectives of the overarching legislation and EU, national, and regional policy.

The European Commission in its Action Plan 'Pathway to a Healthy Planet' has recently set a target to reduce the number of people chronically affected by transportation noise by 30% by 2030. This target is based on conditions as reported in 2017, which were based on 2016 data. Information provided in the Application has shown that noise continued to increase after 2016 and peaked in 2019. ANCA is therefore of the view that in the context of Dublin Airport, reduction outcomes should be set against the 2019 aircraft noise level.

Whilst the European Commission's target is set at 30%, ANCA considers it appropriate that the outcomes expected through this NAO reflect the period for which relevant policy is in place for Dublin Airport. As such, ANCA determined that it is appropriate to require Dublin Airport to continue a reduction in its noise impacts beyond 2030.

By 2040 the required outcome is a 50% reduction in number of people chronically affected compared to 2019, with an interim outcome of 40% by 2035. This level of reduction goes beyond the rate expected by the European Commission over the period 2017 to 2030 and will incentivise further initiatives and measures to reduce noise at Dublin Airport.

7.5 Monitoring

Monitoring of the NAO will be informed by annual reports which will be reviewed by ANCA as part of its obligations under the Act of 2019.

A functioning NAO requires effective monitoring, reporting and assessment. The performance of the NAO shall be determined by assessment of a detailed annual report.

Dublin Airport's performance against the NAO will be monitored by ANCA, informed by annual reports, in line with ANCA's obligations under the Act of 2019.

ANCA will set out the requirements of these reports as part of a regulatory decision. These reports will include information regarding the noise management measures in place at Dublin Airport as well as information relating to the NAO.

08

Environmental Assessments

8 Environmental Assessments

8.1 Appropriate Assessment

The NAO is a plan for the purposes of the Habitats Directive/Birds and Natural Habitats Regulations 2011 and accordingly is subject to AA. The purpose of an NAO is to set the level of ambition for a noise management regime that secures both environmental improvement and a sustainable transport network.

ANCA has prepared a Natura Impact Assessment (NIS) for the purposes of carrying out Appropriate Assessment of the Draft Regulatory Decision and, relevant to this report, the Noise Abatement Objective, in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 (the Regulations of 2011).

Undertaking this assessment has also allowed the AA process to influence the NAO proposals themselves. A number of pathways were identified, but it was concluded that the NAO would not have an adverse effect on the integrity of any Natura 2000 site. The full assessment is detailed in the NIS attached to this consultation.

8.2 Strategic Environmental Assessment

NAO is also a plan for the purposes of the SEA Directive and the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004, and accordingly the NAO has been subject to SEA.

ANCA has prepared an Environmental Report for the purposes of Strategic Environmental Assessment (SEA) of the Draft Regulatory Decision (DRD) and, most relevant to this Report, the Noise Abatement Objective NAO in accordance with the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (the "Regulations of 2004") following notice to the prescribed environmental authorities as required under Article 11 of the Regulations of 2004.

The SEA process has fed into the development and selection of alternatives for the NAO, ensuring that each alternative put forward for assessment is reasonable and realistic. The SEA alternatives assessment itself has enabled ANCA to understand the implications of the different noise measures for each of the environmental aspects (including particularly air quality, biodiversity, climate change, cultural heritage and landscape), ensuring that these are taken into account alongside noise, health and cost considerations.

The key environmental changes which would occur as a result of having the airport operate with amended night restrictions associated with the NAO are reported in the Environmental Report.

The SEA assessed a total of five different alternatives for the NAO (detailed in the Environmental Report). The best NAO alternative in SEA terms is therefore also the preferred alternative identified by ANCA through application of the balanced approach.

Appendix A – Glossary of Terms

In this report:

Act of 2019 means the Aircraft Noise (Dublin Airport) Regulation Act 2019

Aircraft Noise Regulation means Regulation (EU) No 598/2014 of the European Parliament.

ANCA means Aircraft Noise Competent Authority

The Applicant means Dublin Airport Authority

ATM means Air Traffic Movement

dB means decibels

ECAC means the European Civil Aviation Conference

ENG18 means WHO Environmental Noise Guidelines 2018

Environmental Noise Directive (END) means Directive 2002/49/EC of the European Parliament.

ICAO means the International Civil Aviation Organization

L_{night} means annual averaged night time noise level in dB

L_{den} means annual averaged day-evening-night noise level in dB

MPPA means Millions of Passengers per Annum

NAO means Noise Abatement Objective

Night time means 2300hrs – 0700hrs as defined by the Environmental Noise Directive

NNG09 means WHO Night Noise Guidelines 2009

NTK means Noise and Track Keeping System

WHO means World Health Organisation



An tÚdarás Inniúil um
Thorann Aerárthaí

Aircraft Noise
Competent Authority

Comhairle Contae
Fhine Gall
Fingal County
Council

