# 9. Aircraft Noise and Vibration

## 9.1 Introduction

9.1.1 This chapter presents the Principal Assessment of the likely significant effects of the Proposed Order on aircraft noise and vibration. The Principal Assessment compares the 2029 Permitted Operation (32 mppa) and the 2029 Proposed Operation (40 mppa) operational conditions in accordance with the project-wide assessment framework described in Chapter 5: Methodology.

9.1.2 As detailed in Chapter 4: Proposed Order of the EIAR, the Proposed Order seeks to amend the existing planning restriction of 32 mppa to 40 mppa and does not involve new physical infrastructure. However, increased passenger numbers may affect aircraft noise and vibration through changes in aircraft activity. Accordingly, an assessment has been undertaken to assess the likely significant effects of the 2029 Proposed Operation on aircraft noise and vibration.

9.1.3 This assessment, EIAR chapter and associated appendices have been produced by David Charles and Nick Williams of Bickerdike Allen Partners LLP. Both David and Nick have in recent years completed a number of noise modelling and assessment projects in relation to planning applications and statutory reporting at Dublin Airport. These have all been accepted by the relevant bodies, including Fingal County Council (FCC), the Aircraft Noise Competent Authority (ANCA) and the Environmental Protection Agency (EPA).

9.1.4 David Charles has been involved in acoustics for 30 years and has been a Partner at BAP since 2019 when he took over the oversight of all the aviation projects. Much of his time in acoustics has been in relation to aviation, including almost the whole of the last decade. During this time David has worked for airports and Local Authorities, and other stakeholders. This included the Airports Commission when they reviewed UK aviation capacity, particularly that in the South-East.

9.1.5 David has and continues to be involved in a range of projects which include planning applications for airport developments, master plans, airspace changes, noise mapping and noise action plans, and regular reporting. David also sits on two airport consultative committees providing technical support.

9.1.6 Nick has over 15 years' experience in acoustics, with much of that having been spent focussing on aviation noise. Nick has worked on a number of major airport projects including many of the same projects as David Charles above.

9.1.7 The term 'aircraft noise' in this chapter is used to cover two distinct noise sources. These are 'air noise', which is the noise associated with flights into and out of Dublin Airport while the aircraft are airborne or using the runway system, including any start of roll or reverse thrust activities, and 'ground noise', which is the noise associated with aircraft activities on the ground, excluding any start of roll or reverse thrust activities. The key aircraft ground operations are aircraft taxiing and aircraft using Auxiliary Power Units (APUs) when on stands.

9.1.8 The sensitivity of the human ear is frequency dependent. Mid-frequency sound tends to be perceived as louder than very low- or high-frequency sound even when the decibel values are equal. Sound levels are therefore often frequency weighted to give an overall single figure value in dB(A) that accounts for the response of the human ear at different frequencies. All air noise and ground noise levels described in this chapter are A-weighted.

9.1.9 Non-aircraft noise sources such as road traffic noise are assessed in Chapter 8: Non-Aircraft Noise. The cumulative noise effects have been considered in Section 9.9 of this chapter.

## 9.2 Legislation, Policy and Guidance

9.2.1 The Environmental Impact Assessment (EIA) process is described in Chapter 5: Methodology. Relevant legislation and policies are listed in this section. More detail is given in Appendix 9-1.

9.2.2 The legislative and planning policy context relevant to aircraft noise assessment at Dublin Airport are set out below. Most policy with respect to aircraft noise, where detailed guidance is given, relates to the determination of significant effects, as required for an Environmental Impact Assessment Report (EIAR).

9.2.3 There is limited guidance available relating to assessing changes in noise level other than for determining the threshold for a change in noise level to be considered significant. The approach has therefore been developed based on existing guidance and practice as described in Appendix 9-1.

### *Strategic Planning Context*

9.2.4 The operator, daa, has a number of obligations to fulfil with regard to the management of Dublin Airport. The following legislation is relevant to noise:

- S.I. No. 549/2018 - Environmental Noise Regulations 2018[1];
- S.I. No. 663/2021 - European Communities (Environmental Noise) (Amendment) Regulations 2021[2];
- EU Commission Regulation 598/2014[3];
- EU Commission Directive 2020/367[4];
- EU Directive 2011/92 as amended by Directive 2014/52[5];
- Environmental Noise Directive 2002/49/EC[6];
- Aircraft Noise (Dublin Airport) Regulation Act 2019 (the Aircraft Noise Act)[7]; and
- Dublin Airport (Passenger Capacity) Act 2026[8].

9.2.5 The Aircraft Noise Act implements European Union (EU) Regulation 598/2014[9] on the establishment of rules and procedures with regard to the introduction of noise related operating restrictions at EU Airports within the International Civil Aviation Organization (ICAO) Balanced Approach[10]. Section 38 of the Dublin Airport (Passenger Capacity) Act 2026 amends the Aircraft Noise Act to specify that the passenger cap is not an operating restriction for the purposes of EU Regulation 598/2014.

### *Local Planning Policy*

9.2.6 The following local policy documents are relevant to noise.

- Fingal Development Plan 2023-2029[11];
- Dublin Airport Local Area Plan (2020)[12]; and
- Noise Action Plan for Dublin Airport (2024-2028)[13].

[1] Government of Ireland (2018). S.I. No. 549/2018 - European Communities (Environmental Noise) Regulations 2018, [Online]. Available at: http://www.irishstatutebook.ie/eli/2018/si/549/made/en/ [Checked 19/06/2026]
[2] 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]
[3] 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]
[4] 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 (Text with EEA relevance), [Online]. Available at: https://eur-lex.europa.eu/eli/dir/2020/367/oj [Checked 19/06/2026]
[5] European Commission (2014). 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/eli/dir/2014/52/oj/eng [Checked 19/06/2026]
[6] European Commission (2002). Directive 2002/49/EC Directive of the European Parliament and of the Council of 25th June 2002 relating to the assessment and management of environmental noise, [Online]. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0049&from=EN [Checked 19/06/2026]
[7] Government of Ireland (2019). Aircraft Noise (Dublin Airport) Regulation Act 2019, [Online]. Available at: http://www.irishstatutebook.ie/eli/2019/act/12/enacted/en/html [Checked 19/06/2026]
[8] 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] 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/eli/reg/2014/598/oj [Checked 19/06/2026]
[10] ICAO (2010). Doc 9829 Guidance on the Balanced Approach to Aircraft Noise Management, ICAO
[11] Fingal County Council (2023). Fingal Development Plan 2023-2029, [Online]. Available at: https://www.fingal.ie/development-plan [Checked 19/06/2026]
[12] 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]
[13] Fingal County Council (2024). Noise Action Plan for Dublin Airport 2024-2028, [Online]. Available at: https://www.fingal.ie/Noise-Action-Plan-for-Dublin-Airport-2024-2028 [Checked 19/06/2026]

9.2.7 The Aircraft Noise Competent Authority (ANCA) set a Noise Abatement Objective (NAO) for Dublin Airport in 2022, which states the following 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."*

9.2.8 ANCA have subsequently reviewed their NAO and commenced a consultation on proposed changes in May 2026. The public consultation process has concluded and a final decision by ANCA is awaited. This draft NAO proposes to amend the policy objective to:

*"Limit and reduce the long-term adverse effects of aircraft noise on health and quality of life, particularly at night, through measures that mitigate impacts and provide certainty to the communities and the airport operator as part of the sustainable development of Dublin Airport."*

9.2.9 The NAO, both from 2022 and under the draft 2026 NAO, is accompanied by measurable criteria which are based on the overall exposure to aircraft noise, rather than the effects of any change.

### *International Policy, Standards and Guidance*

9.2.10 The following international policies, standards and guidance documents are considered relevant to this assessment. These are discussed in more detail in Appendix 9-1.

- ICAO Balanced Approach[14];
- ICAO Convention on International Civil Aviation, Annex 16, Volume 1[15];
- EU Directive 2015/996[16];
- WHO Guidelines for Community Noise (1999)[17];
- WHO Night Noise Guidelines for Europe (2009)[18]; and
- WHO Environmental Noise Guidelines for the European Region (2018)[19].

### *Relevant UK Policy, Standards and Guidance*

9.2.11 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.

9.2.12 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)[20];
- UK Aviation Policy Framework (2013)[21];

[14] ICAO (2010). Doc 9829 Guidance on the Balanced Approach to Aircraft Noise Management, ICAO
[15] ICAO 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]
[16] 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]
[17] 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]
[18] World Health Organisation Europe (2009). Night Noise Guidelines for Europe, [Online]. Available at: https://apps.who.int/iris/bitstream/handle/10665/326486/9789289041737-eng.pdf?sequence=1&isAllowed=y [Checked 19/06/2026]
[19] World Health Organization Regional Office for Europe (2018). Environmental Noise Guidelines for the European Region, [Online]. Available at: https://www.who.int/europe/publications [Checked 19/06/2026]
[20] 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]
[21] UK Department for Transport (2013). Aviation Policy Framework, [Online]. Available at: https://www.gov.uk/government/publications/aviation-policy-framework [Checked 19/06/2026]

- UK Airspace Policy: A framework for balanced decisions on the design and use of airspace 2017 consultation[22];
- BS 8233:2014 Sound insulation and noise reduction in buildings – code of practice[23];
- Department of Education - Acoustic design of schools: performance standards BB93 (2015)[24];
- Department of Health - Specialist Services, Health Technical Memorandum 08-01: Acoustics (2013)[25];
- CAP1616i: Environmental Assessment Requirements and Guidance for Airspace Change Proposals[26]; and
- BS7445-1:2003 Description and measurement of environmental noise[27].

## 9.3 Assessment Methodology

9.3.1 This section describes the approach to the assessment of the air noise effects, covering the following:

- The key sources of information that have been consulted throughout the preparation of this chapter;
- The methodology behind the assessment of air noise effects;
- An explanation as to how the identification and assessment of air noise effects has been reached; and
- The significance criteria and terminology for the assessment of air noise.

9.3.2 Key sources of information which have been utilised for this assessment are as follows:

- The physical location of the runway system;
- Flight paths, in particular for departures as these disperse more than arrivals. This information was taken from a combination of the Aeronautical Information Publication (AIP) for Ireland[28] and analysis of actual aircraft flight paths for the calendar year of 2025 using the airport's Noise and Flight Track Monitoring System (NFTMS);
- The number of flights in 2025, including their aircraft type, operation, and destination, the details of which have been supplied by daa. This information is used to model the aircraft noise levels; and
- Similar information for the forecast schedules of flights for 2029, which have been supplied by Mott MacDonald.

### *Air Noise Modelling Methodology*

9.3.3 The assessment of air noise relies heavily on the modelling of noise levels. This has been carried out using the noise modelling software produced by the Federal Aviation Administration (FAA), the Aviation Environmental Design Tool (AEDT). This industry standard software evaluates aircraft noise in the vicinity of airports based on aircraft type, operation, route, and flight profile, as well as taking into account local terrain and meteorological information. This software is used to produce noise contours and to predict noise levels at specific locations. The assessment also takes account of the measurements recorded by Dublin Airport's Noise and Flight Track Monitoring System (NFTMS) in 2025.

[22] 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]
[23] British Standards Institution (2014). BS 8233:2014 Sound insulation and noise reduction for buildings – Code of practice, [Online]. Available at: https://shop.bsigroup.com/ProductDetail/?pid=000000000030241579 [Checked 19/06/2026]
[24] UK Department of Education (2015). BB93: acoustic design of schools – performance standards, [Online]. Available at: https://www.gov.uk/government/publications/bb93-acoustic-design-of-schools-performance-standards [Checked 19/06/2026]
[25] UK 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]
[26] Civil Aviation Authority (2023). CAP1616i: Environmental Assessment Requirements and Guidance for Airspace Change Proposals, [Online]. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap1616i/ [Checked 19/06/2026]
[27] British Standards Institution (2003). BS 7445:2003 Description and measurement of environmental noise [Online]. Available at: https://shop.bsigroup.com/ProductDetail?pid=000000000030098820 [Checked 19/06/2026]
[28] AirNav Ireland (2026). Integrated Aeronautical Information Package, [Online]. Available at: https://www.airnav.ie/air-traffic-management/aeronautical-information-management [Checked 23/08/2026]

9.3.4 The aircraft movements assessed as part of the air noise assessment include all aircraft taking off from or landing at Dublin Airport, except for helicopter and military aircraft. This is in accordance with best practice and is consistent with EU Directive 2015/996 which states:

> *"Where noise generating activities associated with airport operations do not contribute materially to the overall population exposure to aircraft noise and associated noise contours, they may be excluded."*

9.3.5 Helicopters are also cited in EU Directive 2015/996 as an example of something which may be excluded. This is the standard approach used for the modelling of airport noise and reflects that operations by helicopter and military aircraft often make up a very small proportion (<1%) of the total and are not able to be assessed to the same level of accuracy. As a result, their inclusion would have a negligible effect on the findings of any assessment.

### *Air Noise Assessment Metrics*

9.3.6 The primary assessment metrics used are those that have been used previously to rate air noise around Dublin Airport. They are also the same as those used around Europe for strategic noise mapping purposes and in noise action plans, specifically:

- $L_{den}$, which takes into account the annual activity throughout the 24-hour period, with a 5 dB penalty applied to noise in the evening (19:00-23:00) period and a 10 dB penalty applied to noise in the night (23:00-07:00) period. The key effect linked with this metric is annoyance; and
- $L_{night}$, which takes into account the annual activity during the night (23:00-07:00) period. The key effect linked with this metric is sleep disturbance.

9.3.7 The $L_{den}$ and $L_{night}$ results have also been used to predict the number of people 'highly sleep disturbed' and 'highly annoyed' in accordance with the method set out in the World Health Organisation's Environmental Noise Guidelines 2018 as endorsed by the European Commission through Directive 2020/367. These two parameters, in addition to the number of people exposed to the specific noise levels of 65 dB $L_{den}$ and 55 dB $L_{night}$, form the 4 measurable criteria set out in the 2022 NAO.

9.3.8 ANCA have subsequently reviewed their NAO and commenced a consultation on proposed changes in May 2026. The public consultation process has concluded and a final decision by ANCA is awaited. In this draft NAO the number of people 'highly sleep disturbed' and 'highly annoyed' remain key metrics. Exposure to the specific noise levels of 65 dB $L_{den}$ and 55 dB $L_{night}$ is also proposed to be tracked, along with the size of the 55 dB $L_{den}$ and 50 dB $L_{night}$ contours.

9.3.9 Significance has not been assigned to the results for the measurable criteria as there is not published guidance regarding significance thresholds for a collective community-level assessment. On an individual level however, people being highly annoyed or highly sleep disturbed is considered harmful to health, as outlined in EU Directive 2020/367.

9.3.10 Supplementary air noise metrics can be useful in reflecting how air noise is experienced in the locality around an airport, although the research into correlation with community response is generally limited and therefore they do not form part of the assessment of significant effects. The following supplementary noise metrics have been presented to contextualise the noise around Dublin Airport associated with the Proposed Operation:

- The summer $L_{Aeq,16h}$ and $L_{Aeq,8h}$ metrics. These describe the average noise level during a summer day (07:00-22:59) and summer night (23:00-06:59) respectively. They were used for the application that led to the North Runway Planning Permission and the former is used for the eligibility of the current Residential Sound Insulation Schemes;
- The annual $L_{day}$ and $L_{evening}$ metrics which are optional under EU Regulation 598/2014. These describe the average noise level during an annual average day (07:00-18:59) and evening (19:00-22:59) respectively. They provide information on the variation in noise across the day and evening;
- N65 and N60 indices. N65 indicates the number of times a threshold level of 65 dB $L_{ASmax}$ is exceeded between 07:00 and 22:59 on average in the 92-day summer period. N60 indicates the number of times a threshold level of 60 dB $L_{ASmax}$ is exceeded between 23:00 and 06:59 on average in the 92-day summer period. These metrics have been included as they are considered to aid public understanding by providing distributions of noise events;

- Awakenings. Using the formula presented in WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep[17], the number of additional awakenings due to aircraft noise have been estimated;
- Hourly noise levels have been presented for representative locations to illustrate how noise is likely to change over the course of the day; and
- Noise levels of individual flights by key aircraft types have been presented.

9.3.11 Noise levels have also been presented at a number of representative locations which are shown on Plate 9-1 and are listed in Table 9-1. These have been chosen to represent communities in the vicinity of the airport and/or close to flight paths.

**Plate 9-1: Representative Location Points – Air Noise**

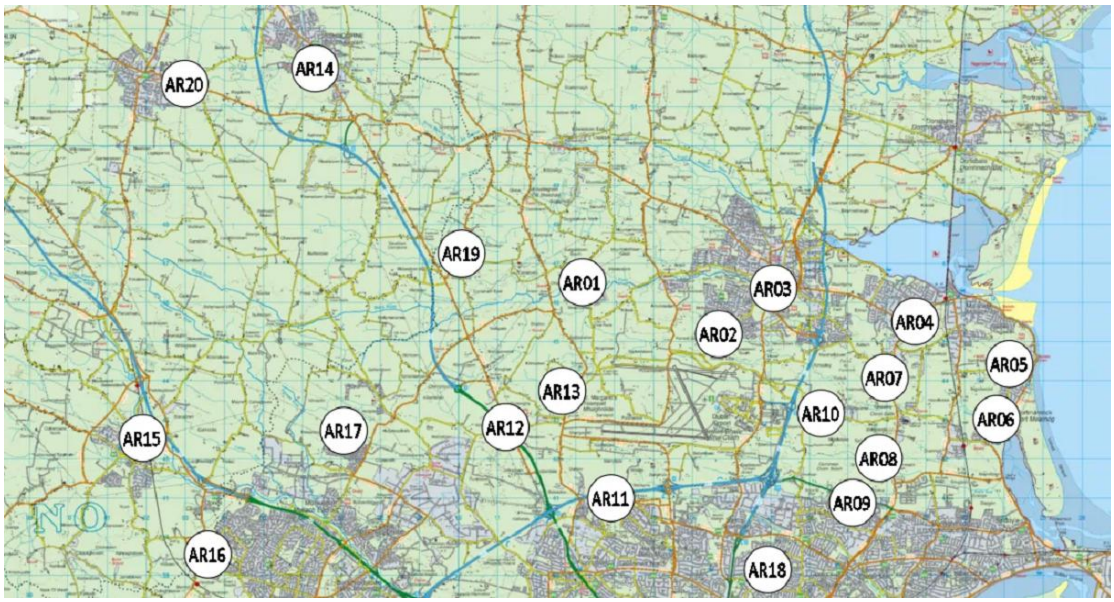



**Table 9-1: Representative Location Points – Air Noise**

| Plate 9-1 Representative Location | Reference No. |
|---|---|
| Tyrellstown, Toberburr | AR01 |
| Ridgewood | AR02 |
| Swords | AR03 |
| Malahide Castle | AR04 |
| Portmarnock N | AR05 |
| Portmarnock S | AR06 |
| Malahide S | AR07 |
| St Doolaghs | AR08 |
| Darndale Park | AR09 |
| The Baskins | AR10 |
| Mayeston Hall | AR11 |
| Kilshane Cross | AR12 |
| St Margaret's | AR13 |
| Ashbourne | AR14 |
| Dunboyne | AR15 |
| Ongar | AR16 |
| Mount Garrett | AR17 |
| Beaumont | AR18 |

| Plate 9-1 Representative Location | Reference No. |
|---|---|
| Kilcoskan | AR19 |
| Ratoath | AR20 |

### *Ground Noise Modelling Methodology*

9.3.12 For ground noise, the CadnaA noise modelling software produced by Datakustik has been used. This software uses the methodology set out in ISO 9613-2:1996 to produce noise contours and to predict noise levels at specific locations which is the standard approach.

9.3.13 The aircraft movements assessed as part of the ground noise assessment include all aircraft, except for helicopter and military aircraft. This is the standard approach used for the modelling of airport noise and reflects that operations by helicopter and military aircraft often make up a very small proportion (<1%) of the total and are not able to be assessed to the same level of accuracy. As a result, their inclusion would have a negligible effect on the findings of any assessment.

### *Ground Noise Assessment Metrics*

9.3.14 The standard approach for assessing ground noise varies depending on the application. Aircraft ground noise at busy airports such as Dublin Airport is commonly assessed using a metric based on $L_{Aeq}$ (such as $L_{den}$ and $L_{night}$), i.e. one that averages the noise energy over a defined time period and that accounts for the number, duration and noise level of aircraft ground operations over a typical day. For example, many assessments at UK airports in recent years have used the $L_{Aeq}$ metric, such as London Heathrow, London Gatwick, London Stansted, and Luton. Adopted ground noise thresholds are typically similar or identical to those used for air noise, and therefore the primary metrics used here mirror those that have been used for the air noise assessment, i.e. $L_{den}$ and $L_{night}$.

9.3.15 The calculation of the number of people highly annoyed and highly sleep disturbed is not applied to ground noise, as this is a materially different noise source to air noise and therefore the method for calculating the parameters based on air noise is not considered appropriate.

9.3.16 In some other jurisdictions, particularly the UK, ground noise is often assessed in terms of the $L_{Aeq,16h}$ and $L_{Aeq,8h}$ metrics as for air noise. Noise contours and population assessments have also been carried out using these metrics although these are considered supplementary metrics.

9.3.17 For air noise it is common to utilise additional supplementary metrics to fully describe the nature of the noise and its effects on the community. Compared to noise produced by airborne aircraft, ground noise is characterised by steady noise at a lower level but with a longer duration and, as a result, the metrics based on $L_{Aeq}$ (such as $L_{den}$ and $L_{night}$) are considered sufficient for ground noise. Single noise events are not typically a concern for ground noise as the maximum noise levels are significantly lower than for air noise.

9.3.18 The exception to this is when high power engine running is carried out for testing and maintenance. When engines are run at high power, this can cause very high noise levels near the test location. However, typically at Dublin Airport this occurs no more than 1-2 times per day on average, only during daytime hours and is only permitted at a designated location, away from populated neighbouring areas. Engine testing noise is therefore considered negligible in the context of overall airport ground noise, and this will not materially change as a result of the Proposed Order. Therefore, it is not included as part of the assessment.

9.3.19 Ground noise levels have also been presented at a number of representative locations which are shown on Plate 9-2 and are listed in Table 9-2.

**Plate 9-2: Representative Location Points – Ground Noise**

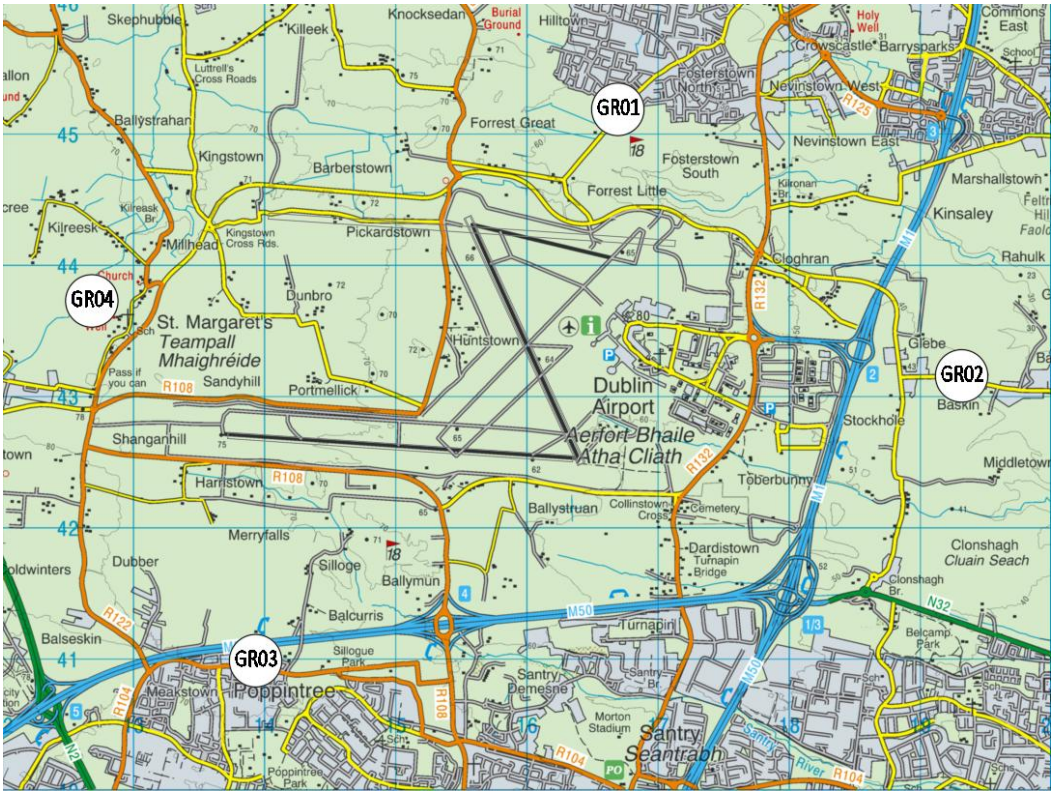



**Table 9-2: Representative Location Points – Ground Noise**

| Plate 9-2 Representative Location | Reference No. |
|---|---|
| Ridgewood | GR01 |
| The Baskins | GR02 |
| Mayeston Hall | GR03 |
| St Margaret's | GR04 |

### *Vibration Assessment Metrics*

9.3.20 Low frequency noise from airborne aircraft has the potential to cause perceptible vibration levels within dwellings. The most appropriate noise metric to assess the likelihood of these effects is the maximum C-weighted noise levels, denoted $L_{CSmax}$. C-weighting gives more weight to low frequency noise rather than the more commonly used A-weighting, which approximates the average human hearing response to different frequencies of noise. The $L_{CSmax}$ metric is an additional output from the air noise model.

9.3.21 Any vibration effects are most obviously characterised by responses such as windows rattling. As discussed in a Historic England report[29], aircraft passbys that produce a maximum noise level above 97 dB $L_{CSmax}$ are likely to produce an audible rattle of windows. While it is appreciated that low frequency noise from aircraft can induce perceptible vibration levels in lightweight structures and loose-fitting components, the vibration levels are below those at which even minor cosmetic damage would be likely to occur.

9.3.22 Vibration effects due to airborne aircraft can vary depending on the specific details of the building, for example, the room dimensions which can cause resonance effects at certain frequencies. Resonances increase the sound level in parts of the room and decrease it in others which can influence any consequential vibration.

9.3.23 The other potential effect from airborne aircraft vibration is vortex damage to buildings. Aircraft in flight create vortices, circulating currents of air that are shed from the aircraft wings. For the most part, these vortices are

[29] Historic England (2014). Aviation Noise Metric – Research on the Potential Noise Impacts on the Historic Environment by Proposals for Airport Expansion in England, [Online]. Available at: https://research.historicengland.org.uk/Report.aspx?i=15740 [Checked 12/08/2021]

dissipated by the effects of the wind and atmospheric turbulence before they reach the ground and, whilst they may more often be heard after an aircraft has passed, they seldom have any physical impact at ground level. Occasionally, however, vortices may persist long enough to make contact with buildings underneath the flight path. In extreme cases, the variation in pressure within these vortices can cause some damage to roofs if tiles or slates are not sufficiently firmly secured. In practice, such events may be encountered due to the passage of larger wide bodied jets which create the largest vortices and during landing when aircraft are relatively close to the ground. Modern aircraft designs often incorporate technologies such as winglets and sharklets, which optimise wingtip airflow and can reduce the impact of wake vortices.

9.3.24 The issue of wake vortex damage was considered in some detail in the 2004 Environmental Impact Statement (EIS)[30] that supported the application for the permitted North Runway. The 2004 EIS was based on an assumption of 348,358 movements per annum, substantially higher than the 278,991 movements per annum now envisaged in the busiest scenario considered in this Chapter, the 2029 Proposed Operation (40 mppa). In granting permission for the North Runway under those assumptions, the wake vortex impacts of that number of operations was evidently considered acceptable by the planning authorities. Additionally, the Proposed Order does not affect which aircraft types are able to use Dublin Airport or the routes flown. On that basis, the wake vortex impacts associated with the Proposed Order can be expected similarly to be considered acceptable. There have been no confirmed cases of wake vortex damage at Dublin.

9.3.25 Aircraft ground operations do not typically produce any significant vibration effects at sensitive receptors outside of the airport site, and therefore do not require detailed assessment.

### *Methodology for Determining Study Area and Sensitive Receptors*

9.3.26 The study area for each noise source is based on the largest extent of potential impacts, i.e. encompassing an envelope formed by the lowest value noise contours assessed for each metric detailed above. This is consistent with industry best practice. The extents of the study area for air noise are contained within a rectangle that extends 30 km to the west, 35 km to the east, 20 km to the north and 15 km to the south of the centre of the South Runway (10R/28L) at Dublin Airport.

9.3.27 The following were considered as potential receptors of high sensitivity for the assessment:

- Dwellings;
- Schools;
- Residential healthcare facilities; and
- Places of worship.

9.3.28 Receptors with a lower sensitivity to noise, such as offices and hotels, were not considered as part of the assessment, on the basis that any impacts would be lower than for the receptors included.

9.3.29 The assessment of dwellings firstly includes only those currently in existence, with results separately presented which include those which are consented but not yet constructed and anticipated development in land zoned for residential development.

### *Methodology for Determining Effects*

9.3.30 The effects of the Proposed Order have been determined by comparing the Proposed Operation with the Permitted Operation in 2029, thereby isolating the effects attributable to the Proposed Order from those that would arise in the absence of the Proposed Order.

9.3.31 The general assessment methodology involves the following:

- Derivation of assessment criteria;
- Computation of noise levels for each scenario;
- Assessment of magnitude of impacts (absolute) on sensitive receptors, for each scenario;
- Determination of the change in noise levels, and associated impacts (relative) as a result of the Proposed Order;

[30] Dublin Airport Northern Parallel Runway Environmental Impact Statement, Part 2 - Text. Mouchel Parkman, December 2004

- Consideration of the likely significant effects of the Proposed Order, based on both the absolute and relative noise levels;
- Description of the potential effects (beneficial and adverse) associated with the Proposed Order; and
- Description of any mitigation measures, where appropriate, in relation to the Proposed Order and a description of any residual effects.

### *Significance Criteria – Air Noise*

9.3.32 The air noise effects have been considered in terms of both the absolute noise level and the change in noise level due to the Proposed Order in order to determine the significance of the effects. Both need to be considered to determine whether a significant effect arises from the Proposed Order in an EIA context; for example, if a receptor experiences a high absolute noise level but no change due to the Proposed Order then this is not a significant effect. Equally if a receptor experiences a large change in noise level due to the Proposed Order but the resulting level is still very low then this receptor is not considered to be significantly affected.

#### *Residential Receptors*

9.3.33 Absolute air noise impacts at residential receptors have been determined by reference to the noise exposure criteria presented in Table 9-3. 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.

**Table 9-3 - Air Noise Impact Criteria (absolute)**

| 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 |

9.3.34 The effect scale used to assess the change in noise level is given in Table 9-4. 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 9-4 - Air Noise Impact Criteria (absolute)**

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

9.3.35 The magnitude of 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.

9.3.36 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 but from 55 dB to 60 dB $L_{night}$.

9.3.37 There is no single prescribed methodology for determining the magnitude of effect arising from the combination of the absolute air noise level and the associated change in noise level. Relevant guidance is, however, provided in the UK Planning Practice Guidance (PPG) [31], 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."*

9.3.38 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 as:

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

9.3.40 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 Lden or 50 dB Lnight). 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.

9.3.41 Table 9-6 sets out how the absolute and relative noise 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 EIAR 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 North Runway Relevant Action application (NRRA), by ACP.

**Table 9-5 - Air Noise Magnitude of Effect**

| 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 |
| High | Slight | Moderate | Significant | Significant | Very Significant | Profound |
| Very High | Moderate | Significant | Significant | Very Significant | Profound | Profound |

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

*Non-Residential Receptors*

9.3.43 For receptors other than dwellings, absolute levels rated as medium are given in Table 9-6. These have been derived from the relevant guidance documents as described in Appendix 9-1. The impact on each non-residential receptor is considered significant if the absolute noise level is above this threshold and the change in noise level is at least 3 dB, i.e. it is rated medium or higher.

[31] Ministry of Housing, Communities and Local Government, Planning practice guidance Noise (2019) https://www.gov.uk/guidance/noise--2 [Checked 23/08/2026]

**Table 9-6: 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 $L_{den}$ |

### *Significance Criteria – Ground Noise*

9.3.44 The same significance criteria have been adopted for ground noise as for air noise.

### *Significance Criteria – Vibration*

9.3.45 The noise level of 97 dB $L_{CSmax}$ occurring on average at least once per 24-hour day over the year has been taken as a threshold for potential significance of vibration effects due to airborne aircraft events. Whether a significant effect occurs between the 2029 Permitted Operation and the 2029 Proposed Operation depends on the number of dwellings affected and the frequency of the events.

## Application of the Assessment Framework

9.3.46 As set out in Chapter 5: Methodology, the Principal Assessment has been undertaken to identify the likely significant effects of the Proposed Order by comparing the 2029 Permitted Operation (32 mppa) with the 2029 Proposed Operation (40 mppa). By holding all other future baseline assumptions constant, the Principal Assessment isolates the environmental effects attributable to the Proposed Order, providing the basis for identifying likely significant effects, determining mitigation requirements and reporting residual effects.

9.3.47 It is assumed that, in 2029, the operating parameters for the runway system will reflect the ACP decision on the North Runway Relevant Action, including North Runway operating hours of 06:00–23:59 and an NQS of 16,260 QC points but without the movement limit which was included in that decision having regard to the decision of the European Commission dated 10 February 2026.

9.3.48 Metrics for both the 2029 Permitted Operation and the 2029 Proposed Operation utilise the forecasts prepared by Mott MacDonald.

9.3.49 Supporting Assessments have not been undertaken because the Principal Assessment provides a sufficient basis for identifying the environmental effects of the Proposed Order and determining likely significant effects. Any comparison of the noise effects between 2023 or 2025 and the 2029 Proposed Operation would include the effects of the change in use of the North Runway due to the NRRA and therefore would not provide useful information in assessing the effects of the Proposed Order.

9.3.50 Noise exposure information has also been presented for 2025 in Section 9.4, based on the actual flights which occurred in that year. During 2025 the North Runway was only available for use between 07:00 and 22:59, with occasional exceptions, for example during periods of regular maintenance. This 2025 information is provided for context only to show how the noise environment is expected to change between the Current Receiving Environment and the 2029 Permitted Operation, and does not form part of the assessment of likely significance which focuses on the difference between the 2029 Permitted Operation and the 2029 Proposed Operation.

## Limitations and Assumptions

9.3.51 Ongoing fleet renewal is expected to result in a progressive reduction in aircraft noise emissions over time. Some aircraft in the forecasts either have not yet entered service or have limited noise data available. Assumptions over the future air noise performance of these types have been made using the data available. This is detailed in Appendix 9-2.

9.3.52 Although there are some data that suggest the ground noise performance of newer aircraft types will be similar or slightly better than those they replace, a conservative assumption of no improvement over current aircraft types has been made.

9.3.53 Although a number of aircraft using Dublin Airport use Fixed Electrical Ground Power (FEGP) rather than the noisier Auxiliary Power Units (APUs), robust data on the extent of FEGP use in place of APUs was not available. This ground noise assessment has assumed conservatively that all aircraft use APUs rather than FEGP. In practice there is use of FEGP at some stands in all assessment years which will lead to lower ground noise levels than assessed here.

9.3.54 In addition to 'high annoyance' and 'high sleep disturbance' EU Environmental Noise Directive 2020/367 lists ischaemic heart disease (IHD) as a harmful effect that should be considered. However, it also states that in the case of aircraft noise:

> *"the population exposed above adequate $L_{den}$ levels is estimated as subject to an increased risk of IHD, while the exact number N of cases of IHD cannot be calculated."*

9.3.55 It has therefore not been possible to assess the effects of the Proposed Development on the number of cases of IHD.

## 9.4 Current Receiving Environment

9.4.1 This section describes the current receiving environment in the vicinity of Dublin Airport .In view of the location of the airport, the primary noise sources affecting the surrounding community are airport operations and road traffic using the local road network.

9.4.2 As the primary metrics ($L_{den}$ and $L_{night}$) relate to a calendar year of activity, it is common practice when considering aircraft noise to use the most recently completed calendar year to represent the Current Receiving Environment. Therefore, the Current Receiving Environment year is 2025.

9.4.3 Air noise and ground noise levels have been modelled for 2025. The primary assessment metrics are presented later in this section, and the supplementary metrics are presented in Appendix 9-4 for air noise and Appendix 9-5 for ground noise.

9.4.4 In order to inform the vibration assessment, airborne aircraft noise has also been modelled for 2025 terms of the $L_{CSmax}$ metric.

### *Current Receiving Environment Noise Modelling $L_{den}$ Metric – Air Noise*

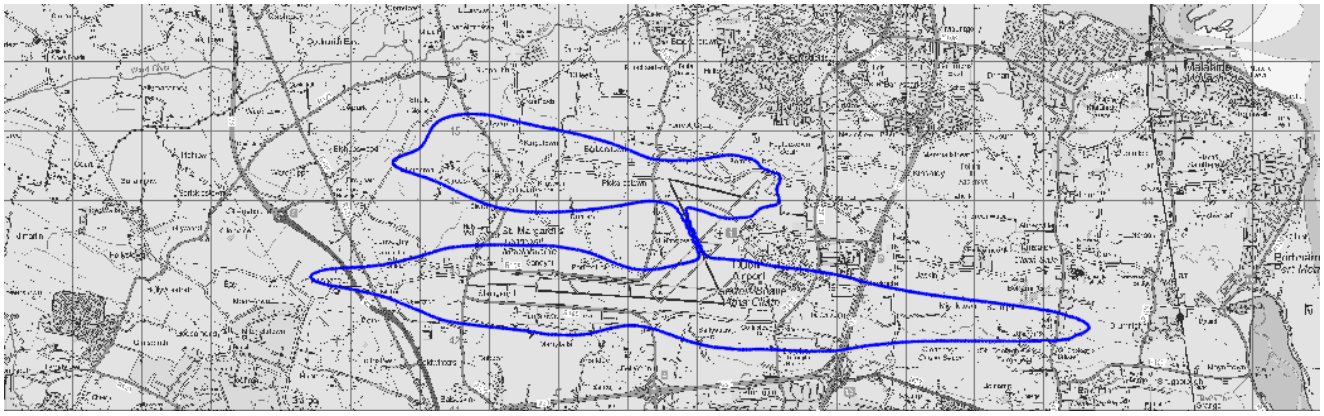
9.4.5 Aircraft activity in 2025 primarily used the South Runway for all night flights (23:00 to 06:59), and in the daytime for departures to the east (Runway 10R) and arrivals from the east (Runway 28L). The North Runway was primarily used in the daytime for departures to the west (Runway 28R) and arrivals from the west (Runway 10L). There were occasional exceptions, for example the North Runway was used at night during periods of regular maintenance. Whether the airport operates in an easterly or westerly direction is dependent on the wind direction.

9.4.6 Noise contours have been produced for the primary assessment metric of $L_{den}$ using the methodology described in Section 9.3. These are based on the actual aircraft movements in the period 1st January 2025 to 31st December 2025 inclusive.

9.4.7 The results are detailed below and presented in Appendix 9-4 along with noise contours and the results for the supplementary noise metrics.

9.4.8 Appendix 9-4 presents the full set of noise contours for each scenario. Plate 9-3 shows the noise contours representing a high impact, 65 dB $L_{den}$, for 2025.

**Plate 9-3: 65 dB $L_{den}$ Air Noise Contours, Current Receiving Environment**



9.4.9 The 2025 65 dB $L_{den}$ contour extends westwards from the South Runway to Killshane and eastwards to a point short of Drumnigh. From the North Runway, the contour extends westwards to Kilmacree and only marginally beyond the airport boundary to the east.

9.4.10 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-1. The results of these predictions for 2025 for the $L_{den}$ metric are provided in Table 9-7.

**Table 9-7: Air Noise Levels at Representative Locations ($L_{den}$) – Current Receiving Environment**

| Representative Location | Reference No. | Air Noise Level, dB ($L_{den}$) |
|---|---|---|
| Tyrellstown, Toberburr | AR01 | 55.6 |
| Ridgewood | AR02 | 56.2 |
| Swords | AR03 | 48.1 |
| Malahide Castle | AR04 | 46.1 |
| Portmarnock N | AR05 | 49.9 |
| Portmarnock S | AR06 | 57.1 |
| Malahide S | AR07 | 54.0 |
| St Doolaghs | AR08 | 65.3 |
| Darndale Park | AR09 | 55.4 |
| The Baskins | AR10 | 59.8 |
| Mayeston Hall | AR11 | 54.4 |
| Kilshane Cross | AR12 | 66.4 |
| St Margaret's | AR13 | 63.6 |
| Ashbourne | AR14 | 48.5 |
| Dunboyne | AR15 | 52.6 |
| Ongar | AR16 | 47.6 |
| Mount Garrett | AR17 | 58.8 |
| Beaumont | AR18 | 48.3 |
| Kilcoskan | AR19 | 59.1 |
| Ratoath | AR20 | 49.6 |

Note – noise levels rounded to nearest 1 decimal place.

9.4.11 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-2. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.4.12 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.4.13 The dwelling and population results for 2025 are given by contour in Table 9-8 along with the areas of the contours.

**Table 9-8: Areas, dwellings and population in Annual $L_{den}$ contours – Air Noise Current Receiving Environment**

| Contour $L_{den}$ (dB) | Area ($km^2$) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|---|
| | | **Dwellings** | **Population** | **Dwellings** | **Population** |
| ≥45 | 631.0 | 149,580 | 440,608 | 155,916 | 458,430 |
| ≥50 | 250.7 | 54,149 | 160,321 | 58,184 | 171,679 |
| ≥55 | 111.6 | 17,054 | 51,564 | 19,951 | 59,803 |
| ≥60 | 42.2 | 4,236 | 13,068 | 5,433 | 16,677 |
| ≥65 | 14.6 | 117 | 310 | 117 | 310 |
| ≥70 | 4.8 | 7 | 13 | 7 | 13 |
| ≥75 | 1.8 | 0 | 0 | 0 | 0 |

9.4.14 The number of people assessed to be highly annoyed in 2025 is given in Table 9-9.

**Table 9-9: Number of people highly annoyed – Current Receiving Environment**

| Scenario | No. People Highly Annoyed | |
|---|---|---|
| | **Excluding Consented Developments** | **Including Consented Developments** |
| Current Receiving Environment | 77,387 | 81,850 |

9.4.15 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship. The numbers of each of these above the $L_{den}$ thresholds given in Table 9-6 for 2025 are given in Table 9-10.

**Table 9-10: Schools, residential healthcare facilities and places of worship in $L_{den}$ contours – Air Noise Current Receiving Environment**

| Scenario | No. Receptors Above Threshold for Medium Absolute Effect | | |
|---|---|---|---|
| | **Schools** | **Residential Healthcare Facilities** | **Places of Worship** |
| Current Receiving Environment | 8 | 5 | 6 |

### *Current Receiving Environment Noise Modelling $L_{night}$ Metric – Air Noise*

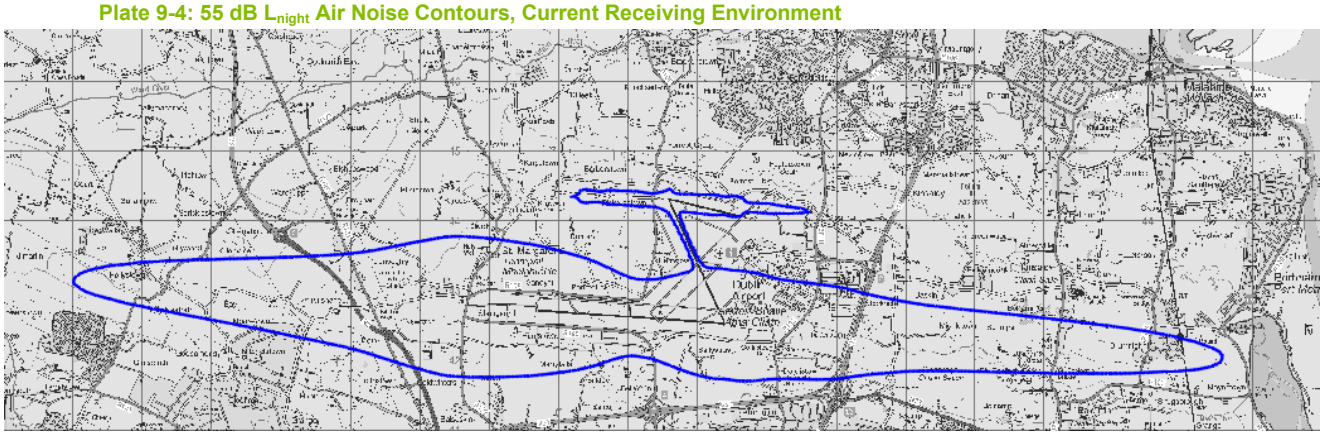
9.4.16 Aircraft activity in 2025 primarily used the South Runway for all night flights (23:00 to 06:59). There were occasional exceptions, for example the North Runway was used at night during periods of regular maintenance. Whether the airport operates in an easterly or westerly direction is dependent on the wind direction.

9.4.17 Noise contours have been produced for the primary assessment metric of $L_{night}$ using the methodology described in Section 9.3. These are based on the actual aircraft movements in the period 1st January 2025 to 31st December 2025 inclusive.

9.4.18 The results are detailed below and presented in Appendix 9-4 along with noise contours and the results for the supplementary noise metrics.

9.4.19 Appendix 9-4 presents the full set of noise contours for each scenario. Plate 9-4 shows the noise contours representing a high impact, 55 dB $L_{night}$, for 2025.

**Plate 9-4: 55 dB $L_{night}$ Air Noise Contours, Current Receiving Environment**



9.4.20 The 2025 55 dB $L_{night}$ contour extends to the west in line with the South Runway to Hollystown and to the east to Portmarnock Bridge. In line with the North Runway, the contour does not leave the airport site.

9.4.21 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-1. The results of these predictions for 2025 in terms of the $L_{night}$ metric are given in Table 9-11.

**Table 9-11: Air Noise Levels at Representative Locations ($L_{night}$) – Current Receiving Environment**

| Representative Location | Reference No. | Air Noise Level, dB ($L_{night}$) |
|---|---|---|
| Tyrellstown, Toberburr | AR01 | 40.5 |
| Ridgewood | AR02 | 42.6 |
| Swords | AR03 | 38.2 |
| Malahide Castle | AR04 | 38.1 |
| Portmarnock N | AR05 | 42.1 |
| Portmarnock S | AR06 | 48.9 |
| Malahide S | AR07 | 47.0 |
| St Doolaghs | AR08 | 57.4 |
| Darndale Park | AR09 | 46.8 |
| The Baskins | AR10 | 51.2 |
| Mayeston Hall | AR11 | 47.9 |
| Kilshane Cross | AR12 | 61.0 |
| St Margaret's | AR13 | 55.3 |
| Ashbourne | AR14 | 39.1 |
| Dunboyne | AR15 | 46.9 |
| Ongar | AR16 | 41.7 |
| Mount Garrett | AR17 | 53.4 |
| Beaumont | AR18 | 40.1 |
| Kilcoskan | AR19 | 40.4 |
| Ratoath | AR20 | 38.7 |

Note – noise levels rounded to nearest 1 decimal place.

9.4.22 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-2. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.4.23 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.4.24 The dwelling and population results for 2025 are given by contour in Table 9-12 along with the areas of the contours.

**Table 9-12: Areas, dwellings and population in Annual $L_{night}$ contours – Air Noise Current Receiving Environment**

| Contour $L_{night}$ (dB) | Area ($km^2$) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|---|
| | | **Dwellings** | **Population** | **Dwellings** | **Population** |
| ≥40 | 303.1 | 87,798 | 260,830 | 92,637 | 274,445 |
| ≥45 | 132.8 | 29,652 | 88,814 | 33,055 | 98,378 |
| ≥50 | 58.2 | 8,769 | 27,721 | 10,643 | 33,322 |
| ≥55 | 19.7 | 2,272 | 7,537 | 2,372 | 7,837 |
| ≥60 | 6.5 | 59 | 150 | 59 | 150 |
| ≥65 | 2.1 | 2 | 2 | 2 | 2 |
| ≥70 | 0.8 | 0 | 0 | 0 | 0 |

9.4.25 The number of people assessed to be highly sleep disturbed in 2025 is given in Table 9-13.

**Table 9-13: Number of people highly sleep disturbed – Current Receiving Environment**

| Scenario | No. People Highly Sleep Disturbed | |
|---|---|---|
| | **Excluding Consented Developments** | **Including Consented Developments** |
| Current Receiving Environment | 38,698 | 41,160 |

9.4.26 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship. Of these, only residential healthcare facilities are highly sensitive to noise at night. The numbers of these above the $L_{night}$ threshold given in Table 9-6 for 2025 are given in Table 9-14.

**Table 9-14: Residential healthcare facilities in $L_{night}$ contours – Air Noise Current Receiving Environment**

| Scenario | No. Residential Healthcare Facilities Above Threshold for Medium Absolute Effect |
|---|---|
| Current Receiving Environment | 3 |

### *Current Receiving Environment Noise Modelling $L_{den}$ Metric – Ground Noise*

9.4.27 Noise contours have been produced for the primary assessment metric of $L_{den}$ using the methodology described in Section 9.3. These are based on the actual aircraft movements in the period 1st January 2025 to 31st December 2025 inclusive.

9.4.28 The results are detailed below and presented in Appendix 9-5 along with noise contours and the results for the supplementary noise metrics.

9.4.29 The noise contours representing a high impact, 65 dB $L_{den}$, do not extend farther than the airport site except at Portmellick and as a result contain no noise sensitive receptors. The noise contours representing a medium impact, 55 dB $L_{den}$, extend west towards Shanganhill, north past Naul Road and south to the Old Airport Road and Harristown. The contours do not extend east beyond the airport site. The noise contours representing a very low impact, 45 dB $L_{den}$, extend farther west to Shanganhill, north into Forrest Great and south to the M50.

9.4.30 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-2. The results of these predictions for 2025 for the $L_{den}$ metric are provided in Table 9-15.

**Table 9-15: Ground Noise Levels at Representative Locations (Lden) – Current Receiving Environment**

| Representative Location | Reference No. | Ground Noise Level, dB ($L_{den}$) |
|---|---|---|
| Ridgewood | GR01 | 45.2 |
| The Baskins | GR02 | 36.5 |
| Mayeston Hall | GR03 | 41.1 |
| St Margaret's | GR04 | 39.3 |

Note – noise levels rounded to nearest 1 decimal place.

9.4.31 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-3. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.4.32 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.4.33 The dwelling and population results for 2025 are given by contour in Table 9-16.

**Table 9-16: Dwellings and Population in $L_{den}$ Ground Noise Contours – Current Receiving Environment**

| Contour $L_{den}$ (dB) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | **Dwellings** | **Population** | **Dwellings** | **Population** |
| ≥45 | 276 | 803 | 276 | 803 |
| ≥50 | 33 | 73 | 33 | 73 |
| ≥55 | 15 | 26 | 15 | 26 |
| ≥60 | 1 | 3 | 1 | 3 |
| ≥65 | 0 | 0 | 0 | 0 |
| ≥70 | 0 | 0 | 0 | 0 |
| ≥75 | 0 | 0 | 0 | 0 |

9.4.34 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship.

9.4.35 There are no schools, residential healthcare facilities or places of worship above the $L_{den}$ thresholds given in Table 9-6 for 2025.

### *Current Receiving Environment Noise Modelling $L_{night}$ Metric – Ground Noise*

9.4.36 Noise contours have been produced for the primary assessment metric of $L_{night}$ using the methodology described in Section 9.3. These are based on the actual aircraft movements in the period 1st January 2025 to 31st December 2025 inclusive.

9.4.37 The results are detailed below and presented in Appendix 9-5 along with noise contours and the results for the supplementary noise metrics.

9.4.38 The noise contours representing a high impact, 55 dB $L_{night}$, do not extend farther than the airport site except at Portmellick and as a result contain no noise sensitive receptors. The noise contours representing a medium impact, 50 dB $L_{night}$, extend west towards Shanganhill, north towards Naul Road and south towards the Old Airport Road and Harristown. The contours do not extend east or north beyond the airport site. The noise contours representing a very low impact, 40 dB $L_{night}$, extend farther west to Shanganhill, north into Forrest Little and south into Collinstown Cross and Silloge.

9.4.39 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-2. The results of these predictions for 2025 in terms of the $L_{night}$ metric are given in Table 9-17.

**Table 9-17: Ground Noise Levels at Representative Locations ($L_{night}$) – Current Receiving Environment**

| Representative Location | Reference No. | Ground Noise Level, dB ($L_{night}$) |
|---|---|---|
| Ridgewood | GR01 | 35.2 |
| The Baskins | GR02 | 28.0 |
| Mayeston Hall | GR03 | 33.1 |
| St Margaret's | GR04 | 31.0 |

Note – noise levels rounded to nearest 1 decimal place.

9.4.40 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-3. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.4.41 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.4.42 The dwelling and population results for 2025 are given by contour in Table 9-18.

**Table 9-18: Dwellings and Population in Annual $L_{night}$ Contours – Ground Noise Current Receiving Environment**

| Contour $L_{night}$ (dB) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | Dwellings | Population | Dwellings | Population |
| ≥40 | 42 | 96 | 42 | 96 |
| ≥45 | 13 | 22 | 13 | 22 |
| ≥50 | 5 | 10 | 5 | 10 |
| ≥55 | 0 | 0 | 0 | 0 |
| ≥60 | 0 | 0 | 0 | 0 |
| ≥65 | 0 | 0 | 0 | 0 |
| ≥70 | 0 | 0 | 0 | 0 |

9.4.43 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship.

9.4.44 Of these, only residential healthcare facilities are highly sensitive to noise at night and there are none above the $L_{night}$ threshold given in Table 9-6 for 2025.

### *Current Receiving Environment Noise Modelling to Inform Vibration Effects*

9.4.45 No dwellings were found to exceed the threshold for potential vibration effects due to airborne aircraft for 2025, based on experiencing noise levels of at least 97 dB $L_{CSmax}$ at least once per 24-hour day. The assessment therefore identifies no significant vibration effects in 2025.

## Current Design and Management Measures

9.4.46 There are a number of measures already in place at Dublin Airport that reduce or mitigate the noise effects of aircraft operations. These are described in this section.

### *Reduction of Noise at Source*

9.4.47 Over the past 20 years, the aircraft fleet operating at Dublin Airport has evolved, with technological improvements resulting in progressively quieter aircraft. This is illustrated in Figure 7 of the approved Dublin Airport Noise Action Plan 2019-2023[32].

9.4.48 The ICAO Noise 'Chapter'[33] defines specific noise performance criteria to which aircraft must be certificated. Since 2002, Chapter 2 aircraft have been banned from use in Europe and the vast majority of aircraft operating in the skies above the EU are now Chapter 4 compliant, with an increasing number of quieter Chapter 14 aircraft entering the fleet as airlines take delivery of newer aircraft.

9.4.49 This trend is expected to continue in the future as airlines renew their fleets, and increase the use of new aircraft such as the Airbus A320neo/A321neo and Boeing 737 MAX 8, which both meet the ICAO Chapter 14 requirements and are quieter than the equivalent types they will be replacing.

9.4.50 Fleet renewal plans for airlines at Dublin Airport were considered when preparing the future forecast scenarios and details of the expected fleet evolution are presented in the Mott MacDonald report provided in Appendix 4-1.

9.4.51 daa promotes quieter aircraft particularly at night through incentives such as Fly Quiet programmes. Since 2022 higher charges have been in place for louder aircraft. This has contributed to an increase in the proportion of new aircraft, for example the proportion of Airbus A319/A320/A321 and Boeing 737 flights which were carried out by new aircraft (i.e. neo and MAX versions) increased from 20% in 2022 to 32% in 2025.

### *Land Use Planning and Management*

Noise Zones

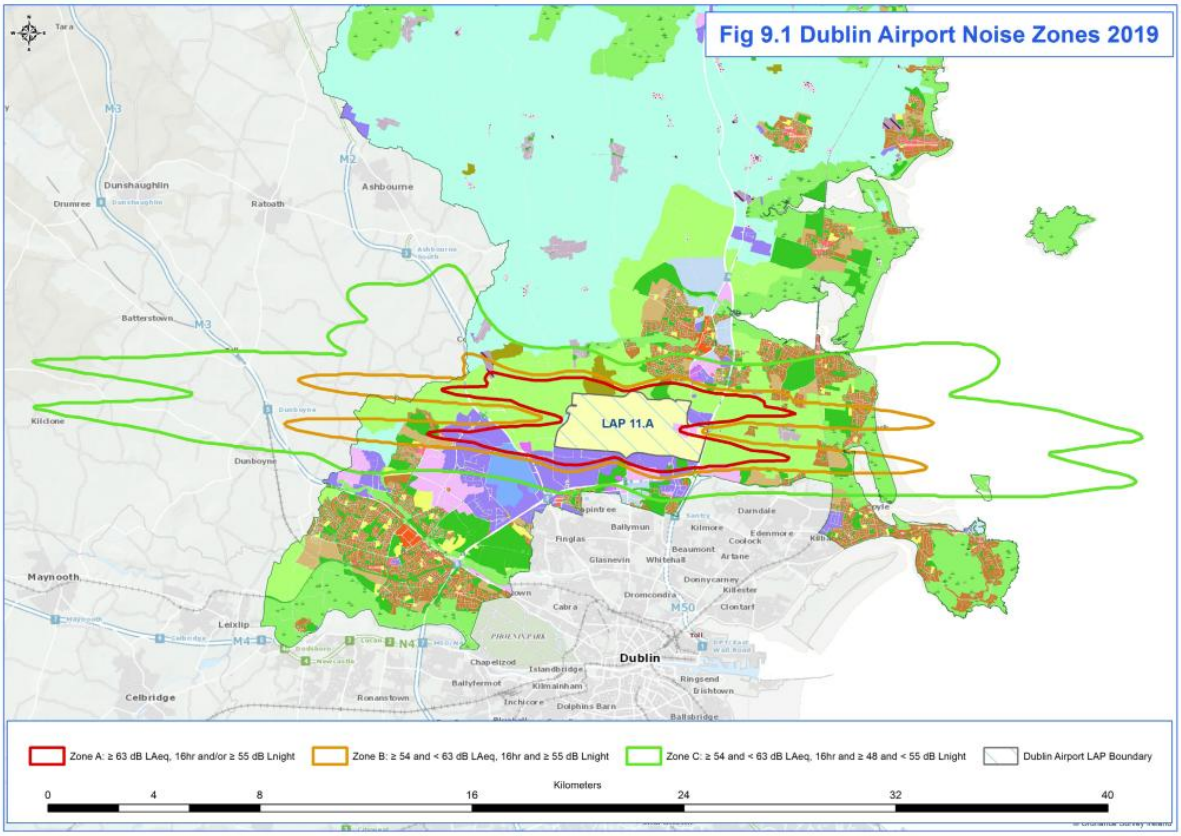
9.4.52 Noise Zones have been in use for over 20 years in the Fingal Development Plan. Most recently they were updated in the 2020 Dublin Airport Local Area Plan (LAP) which has been extended to cover up to 2030. The LAP dedicates an entire Section (section 9.1) to noise. In that section it notes the following:

> *"The Dublin Airport LAP is a land use plan for the purposes of effective land-use planning and safeguarding the use of the Airport. Noise zones relating to Dublin Airport have been in place for many years to aid land use planning. Since the publication of previous noise zones in 2005, and over the last decade, further evidence has emerged that has updated understanding of how aircraft noise can affect health and quality of life. With the north runway set to become operational in 2022, updated information is available relating to aircraft noise performance and flight paths. For these reasons, it was considered appropriate to update the noise zones for Dublin Airport to allow for more effective land use planning for development within airport noise zones.*
>
> *The updated noise zones are set out in Fig. 9.1. Dublin Airport Noise Zones and policies relating to development in Noise Zones are set out in Variation No. 1 to the Fingal Development Plan 2017 – 2023."*

9.4.53 This figure is reproduced as Plate 9-5.

[32] Fingal County Council Noise Action Plan for Dublin Airport 2019 – 2023, [Online].Available at: https://www.fingal.ie/sites/default/files/2019-04/NAP%20Final.pdf [Checked 23/08/2026]
[33] https://www.icao.int/environmental-protection/pages/reduction-of-noise-at-source.aspx Checked 23/08/2026]

**Plate 9-5: Extract of Figure 9.1 from Dublin Airport Local Area Plan**




9.4.54 The actions to restrict inappropriate development in the noise zones are described in the Fingal Development Plan 2023-2029, which states:

*"Three noise zones are shown in the Development Plan maps, Zones B and C within which the Council will continue to restrict inappropriate development, and Zone A within which new provisions for residential development and other noise sensitive uses will be actively resisted. An additional assessment zone, Zone D exists to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment."*

9.4.55 Table 8.1 of the Fingal Development Plan 2023-2029 is reproduced below for reference as Table 9-19. The table considers two noise metrics, $L_{night}$ which is one of the primary metrics used in this chapter, and $L_{Aeq,16hr}$ which is one of the supplementary noise metrics. Due to the distribution of flights across the day, evening and night periods at larger airports, the noise exposure expressed using the $L_{Aeq,16hr}$ metric is typically 2 dB lower than if it is expressed using the $L_{den}$ metric, the other primary metric used in this chapter.

**Table 9-19: Extract from Fingal Development Plan 2023-2029 (Table 8.1)**

| Zone | Indication of Potential Noise Exposure during Airport Operations | Objective |
|---|---|---|
| D | ≥ 50 and < 54 dB $L_{Aeq,16hr}$<br>and<br>≥ 40 and < 48 dB $L_{night}$ | To identify noise sensitive developments which could potentially be affected by aircraft noise and to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment. All noise sensitive development within this zone is likely to be acceptable from a noise perspective. An associated application would not normally be refused on noise grounds, however where the development is residential-led and comprises non-residential noise sensitive uses, or comprises 50 residential units or more, it may be necessary for the applicant to demonstrate that a good acoustic design has been followed. Applicants are advised to seek expert advice. |
| C | ≥ 54 and < 63 dB $L_{Aeq,16hr}$ | 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 |

| | | |
|---|---|---|
| | and<br><br>≥ 48 and < 55 dB $L_{night}$ | is incorporated within the development Noise sensitive development in this zone is less suitable from a noise perspective than in Zone D. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed.<br><br>The noise assessment must demonstrate that relevant internal noise guidelines will be met. This may require noise insulation measures. An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels. Applicants are strongly advised to seek expert advice. |
| B | ≥ 54 and < 63 dB $L_{Aeq,16hr}$<br><br>and<br><br>≥ 55 dB $L_{night}$ | To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure noise insulation is incorporated within the development. Noise sensitive development in this zone is less suitable from a noise perspective than in Zone C. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed. Appropriate well-designed noise insulation measures must be incorporated into the development in order to meet relevant internal noise guidelines. An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the developments design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels. Applicants must seek expert advice. |
| A | ≥ 63 dB $L_{Aeq,16hr}$<br><br>and/or<br><br>≥ 55 dB $L_{night}$ | To resist new provision for residential development and other noise sensitive uses. All noise sensitive developments within this zone may potentially be exposed to high levels of aircraft noise, which may be harmful to health or otherwise unacceptable. The provision of new noise sensitive developments will be resisted. |

Notes:

- 'Good Acoustic Design' means following the principles of assessment and design as described in ProPG: Planning and Noise – New Residential Development, May 2017;
- Internal and External Amenity and the design of noise insulation measures should follow the guidance provided in British Standard BS8233:2014 "*Guidance on sound insulation and noise reduction for buildings*"

9.4.56 Noise contours relating to the Proposed Operation at the relevant values are presented in Appendix 9-1, where they are compared with Noise Zones A, B and C as shown in Plate 9-5.

Residential Sound Insulation Schemes

9.4.57 daa operates an insulation scheme for dwellings exposed to 63 dB $L_{Aeq,16h}$ or greater. There are two separate schemes which use this threshold; a one-off voluntary scheme based on 2016 exposure, and a scheme required by the North Runway Planning Permission based on the forecast traffic in 2022. The latter scheme is reviewed every two years following the opening of the North Runway as required by the planning conditions. Following the 2026 review, 230 local residences are currently eligible for insulation under the two schemes, of which 210 have accepted offers and 205 have had works completed.

9.4.58 daa is responsible for the full implementation of the insulation programmes, from initial survey through to quality assessment after installation works. As part of the voluntary Residential Noise Insulation Scheme, which was assessed and approved in 2016 by Fingal County Council under Condition 7 of the North Runway Planning Permission, daa commissioned an assessment in 2020 to understand the internal acoustic reduction offered by the prescribed scheme's works of:

- Replacement of existing windows with acoustic windows;
- Installation of acoustic vents to allow adequate background ventilation;
- Acoustic insulation laid in roof/attic space; and
- Chimney dampers, where necessary.

9.4.59 Prescribed representative sample properties were acoustically surveyed before insulation works commenced, and those which were completed in time were assessed to establish the sound insulation improvement achieved.

9.4.60 Two recognised methods set out in BS EN ISO 16283-3:2016 Acoustics – Field measurements of sound insulation in buildings and of building elements. Part 3 – Façade sound insulation were followed to measure façade sound insulation performance.

9.4.61 The results showed that all dwellings surveyed in the Residential Noise Insulation Scheme benefited from an improvement in airborne sound insulation. Across the 20 examples the average improvement was 7.7 dB as a result of mitigation works conducted under the scheme. In six of the samples, a larger improvement of ≥10 dB was achieved.

9.4.62 Although the eligibility criteria for the schemes are based on the air noise levels, many of the properties with the highest ground noise levels are eligible for insulation works through these schemes.

Schools Sound Insulation Scheme

9.4.63 A voluntary insulation scheme is on offer for all schools and registered pre-schools which fall within the predicted 60 dB $L_{Aeq,16h}$ contour. The scheme is designed to ensure that noise levels within classrooms and school buildings do not exceed 45 dB $L_{Aeq}$ over 8 hours (a typical school day) after insulation measures are undertaken.

9.4.64 The following schools and pre-schools were specified in the North Runway Planning Permission and were contacted in relation to the insulation scheme:

- Mary Queen of Ireland National School, Rivermeade;
- Little Moo Moo's Pre-School, Skephubble;
- St. Margaret's National School, St. Margaret's;
- Nzone Creche and Pre-School, Kinsealy;
- St Nicholas of Myra National School, Kinsealy; and
- Portmarnock Community School, Portmarnock.

9.4.65 Following acoustic testing it was determined that two of these schools (Portmarnock Community School and Mary Queen of Ireland National School) did not exceed the 45 dB threshold and no works were therefore required at these schools.

9.4.66 Of the four remaining eligible schools, three (Little Moo Moo's Pre-School, St. Margaret's National School and St Nicholas of Myra National School) opted to have the recommended insulation measures installed and these works were undertaken in 2020 and 2021. Nzone Creche and Pre-School did not initially wish to have any of the proposed noise insulation installed.In 2024 Nzone accepted an offer for partial works and ventilations units were installed in 2025.

9.4.67 The 2024 review added one new school and one new pre-school to the scheme:

- Kilcoskan National School, which accepted an offer and had works carried out in 2025
- Tippy Toes Preschool, which was assessed and determined it was below the threshold for works to be required

Dwelling Purchase Scheme

9.4.68 Following extensive engagement with eligible dwelling owners, their representatives, and the Planning Authority and its advisors, several enhancements were made to the draft Voluntary Dwelling Purchase Scheme, and it received approval in 2016. Eligibility for the Scheme was based on the predicted 69 dB $L_{Aeq,16h}$ contour.

9.4.69 Although just five dwellings were originally located in this contour, daa voluntarily extended participation in the Scheme to a further 33 dwellings, thus honouring earlier commitments and having regard to the contours used in the original planning application. A further 3 dwellings became eligible as part of the 2024 review. As of August 2026, 14 purchases had been completed as part of the VDPS with a further 5 in process.

9.4.70 The Scheme is completely voluntary and places no obligation on any resident to participate. Offers to purchase include a 30% premium on the current market value of the residence. Property valuations are based on operations at Dublin Airport and prior to the North Runway being in place.

9.4.71 Eligible homeowners can have their property independently valued at daa's cost, and daa also provide allowances in relation to conveyancing fees, stamp duty, tax advice and moving costs.

9.4.72 The Scheme is subject to review every two years as stipulated in Conditions 7 and 10 of the North Runway Planning Permission.

### *Operational Procedures*

9.4.73 Along with airport stakeholders, daa have implemented a range of operational procedures to minimise noise. These include:

- Noise Preferential Runway usage: aircraft must use the preferred runway under specific conditions and time of day/night. These are selected for noise abatement purposes, the intent being to utilise whenever possible the runways which enable aircraft to avoid noise-sensitive areas during the initial departure and final approach phases of flight;
- Environmental Noise Corridors: aircraft must stay within designated noise corridors on departure to minimise noise impact;
- Noise Abatement Procedures: these are specific rules on how aircraft should perform take-off climbs to ensure that noise is minimised;
- Continuous Descent Approach: this reduces the noise experienced on the ground by reducing the overall thrust required during the initial descent and keeping aircraft at higher altitudes for longer;
- Reverse thrust is not permitted at night, unless required for safety reasons;
- There are limitations on the use of the Crosswind Runway;
- Now the North Runway is operational, Dublin Airport is being operated using "Option 7b" during the daytime (07:00-23:00);
- Engine test runs are only permitted at certain times, to minimise aircraft ground noise;
- The engine test site which was located at the northern end of the airfield has been relocated to the centre of the airfield, away from populated neighbouring areas; and
- FEGP is a ground power system that allows aircraft to plug directly into a fixed, electrical power source while they are parked on the airfield. This has noise (and other environmental) benefits when compared to aircraft using APUs or engine-driven Ground Power Units (GPUs). FEGP is available at a large number of stands at Dublin Airport, and aircraft are required to use it where available, in preference to APUs or GPUs.

9.4.74 These measures have been incorporated into the assessment where relevant. For FEGP, a conservative assumption of no use has been adopted.

9.4.75 Mode of operation 7b provides that:

- The parallel runways - 10R-28L (South Runway) and 10L-28R (North Runway) - shall be used in preference to the Crosswind Runway 16-34;
- In westerly operations, when winds are westerly, approximately 70% of the time, Runway 28L shall be preferred for arriving aircraft; either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control; and
- In easterly operations, when winds are easterly, approximately 30% of the time, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft.

### *Noise Abatement Objective – 2022 NAO*

9.4.76 In 2022 ANCA set an NAO for Dublin Airport ("2022 NAO"), which states the following 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."*

9.4.77 ANCA have also specified expected outcomes for this NAO, which are as follows:

- 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 ; and
- The number of people exposed to aircraft noise above 55 dB $L_{night}$ and 65 dB $L_{den}$ shall be reduced compared to 2019.

9.4.78 When reporting against this NAO, it is required to present results on the basis of the population which existed in 2019 as well as for the current year.

### *Draft Noise Abatement Objective – 2026 NAO*

9.4.79 ANCA have reviewed their NAO and commenced a consultation on proposed changes in May 2026. The public consultation process has concluded and a final decision by ANCA is awaited. This draft NAO ("2026 NAO") proposes to amend the policy objective to:

*"Limit and reduce the long-term adverse effects of aircraft noise on health and quality of life, particularly at night, through measures that mitigate impacts and provide certainty to the communities and the airport operator as part of the sustainable development of Dublin Airport."*

9.4.80 In the draft NAO the number of people 'highly sleep disturbed' and 'highly annoyed' remain key metrics with more stringent criteria. Specifically, the reference year is updated from 2019 to 2023, and the expected outcomes are now to achieve a reduction of 20%, 25% and 30% compared to the reference year by the years 2031, 2036 and 2041. Exposure to the specific noise levels of 65 dB $L_{den}$ and 55 dB $L_{night}$ is now proposed to be tracked, with the following wording replacing an expected outcome of being no worse than 2019:

*"…expectation that measures will be used to mitigate and/or limit the number of dwellings, schools and hospitals in each relevant year under the ENR"*

9.4.81 The size of the 55 dB $L_{den}$ and 50 dB $L_{night}$ contours is also proposed to be tracked with the expectation that these will reduce compared to 2023.

### *NAO Compliance*

9.4.82 The expected outcomes for the 2022 NAO and the draft 2026 NAO are summarised in Table 9-20, alongside the actual outcomes for the reference years of 2019 and 2023.

**Table 9-20: NAO Expected Outcomes**

| Outcome type | Year | Metric | | | |
|---|---|---|---|---|---|
| | | Number of people highly annoyed | Number of people highly sleep disturbed | Number of people ≥ 65 dB $L_{den}$ | Number of people ≥ 55 dB $L_{night}$ |
| Actual | 2019 | 115,740 | 47,044 | 285 | 1,533 |
| Actual | 2023 | 71,387 | 32,563 | 323 | 4,465 |
| 2022 NAO Expected Outcome | 2030 | 81,018 | 32,931 | 285 | 1,533 |
| | 2035 | 69,444 | 28,226 | 285 | 1,533 |
| | 2040 | 57,870 | 23,522 | 285 | 1,533 |
| 2026 NAO Expected Outcome | 2031 | 57,110 | 26,050 | Tracked | Tracked |
| | 2036 | 53,540 | 24,422 | Tracked | Tracked |
| | 2041 | 49,971 | 22,794 | Tracked | Tracked |

9.4.83 Results for the NAO metrics are presented in Appendix 9-4 for the Current Receiving Environment (2025), the 2029 Permitted Operation and the 2029 Proposed Operation. For each scenario, results are separately presented based on population datasets for 2019, 2023 and 2026, in addition to a 2026 with consented development dataset, which can be used as an estimate for the 2029 or 2031 population for the purposes of comparison with the NAO.

9.4.84 Considering the 2022 NAO, the results for the 2029 Proposed Operation based on the 2026 population dataset with consented development meet the expected outcomes for the number of people highly annoyed and the number of people highly sleep disturbed. The expected outcome for the number of people exposed to a level of at least 65 dB $L_{den}$ is also met in the 2029 Proposed Operation. The expected outcome for the number of people exposed to a level of at least 55 dB $L_{night}$ is not met in the 2029 Proposed Operation or any other scenario. This is due to significant residential development within the current 55 dB $L_{night}$ contour since 2019. For example, when considering the 2029 Proposed Operation, based on the 2019 population dataset there are 1,428 people in the 55 dB $L_{night}$ contour which would meet the expected outcome, however this increases to 5,409 people based on the 2026 population dataset with consented development.

9.4.85 Considering the 2026 NAO, the associated NAO Report produced by ANCA acknowledges that the number of people exposed to the specific levels of 65 dB $L_{den}$ and 55 dB $L_{night}$ is:

> *"affected by both airport operations (affecting the size and shape of the noise contour areas), and land use management and planning (affecting the number of consented residential dwellings)."*

9.4.86 This residential development has been consented on the basis that appropriate internal noise levels can be achieved and maintained, with noise mitigation measures such as insulation required for some developments. This is one of the reasons why ANCA have considered it appropriate to track these metrics rather than apply a specific expected outcome.

9.4.87 Based on the 2026 NAO, the expected outcome for the number of people highly annoyed is not forecast to be met when considering the 2026 population dataset with consented development, for either the 2029 Proposed Operation or the 2029 Permitted Operation. This is due to the continued residential development within the contours, both since 2023 and forecast future development. The expected outcome would almost be met (exceeded by 1%) in the 2029 Proposed Operation based on the 2023 population dataset, i.e. that used for the reference year against which reductions are sought. As the expected outcome applies to 2031 and noise exposure is forecast to reduce over time, this outcome would likely be met in 2031, based on the 2023 population dataset.

9.4.88 A similar situation occurs for the number of people highly sleep disturbed, although the results are closer to the expected outcome when forecast future residential development is allowed for.

9.4.89 In their response to ANCA's draft 2026 NAO, daa have requested the inclusion of a reporting provision such that changes are presented in a manner that distinguishes between the contributions of airport operations and those of planning-led population growth and residential encroachment.

#### *Measures Dependent on NRRA*

9.4.90 It is assumed that, in 2029, the operating parameters for the runway system will reflect the ACP decision on the North Runway Relevant Action, including North Runway operating hours of 06:00–23:59 and an NQS of 16,260 QC points but without the movement limit which was included in that decision having regard to the decision of the European Commission dated 10 February 2026.

- it is also assumed that the new night noise insulation scheme will be in place, which will provide a grant of €30,000 to fund sound insulation improvement works for eligible properties.

## 9.5 Future Receiving Environment

9.5.1 This section considers the 2029 Permitted Operation. The results are compared with the Current Receiving Environment for context.

9.5.2 With regard to aircraft noise it is assumed that under the NRRA by 2029 the North Runway will be available for use between 06:00 and 23:59, with a Night Quota Scheme being in place.

### Changes to Aircraft Noise Emissions

9.5.3 The renewal of airline aircraft fleets is an ongoing process as new aircraft types are brought to market and replace those that were previously available. This is driven by a range of factors, including technological developments and increasingly stringent regulation, such as the ICAO noise standards for new aircraft. The process is ongoing at Dublin Airport with examples being the introduction of the A320neo/A321neo by Aer

Lingus and the Boeing 737-MAX 8 by Ryanair in recent years and based on the forecasts provided by Mott MacDonald, the proportion of flights by these aircraft will continue to increase in the future irrespective of the Proposed Order.

9.5.4 New aircraft types produce lower levels of air noise, continuing the trend observed in recent decades, and this has been accounted for in the assessment. For ground noise the conservative assumption has been made that newer aircraft produce the same noise levels as those they replace, as the relatively limited data available suggests the ground noise performance of newer aircraft types will be similar or slightly better than those they replace.

## 2029 Permitted Operation (32mppa)

9.5.5 Air noise and ground noise levels have been modelled for the 2029 Permitted Operation. The primary assessment metrics are presented later in this section, and the supplementary metrics are presented in Appendix 9-4 for air noise and Appendix 9-5 for ground noise.

9.5.6 In order to inform the vibration assessment, airborne aircraft noise has also been modelled in terms of the $L_{CSmax}$ metric.

9.5.7 The assumption in this scenario is that aircraft activity between 06:00 and 23:59 primarily uses the North Runway for arrivals from the west and departures to the west, and the South Runway for arrivals from the east and departures to the east. There is very limited use of the Crosswind Runway, and between 00:00 and 05:59 there is no use of the North Runway other than when the South Runway is closed during periods of regular maintenance.

9.5.8 The distribution of the aircraft noise reflects this, particularly for locations closer to the airport. Further from the airport the proximity of locations to the departure routes and aircraft stands also influences the air noise and ground noise levels respectively.

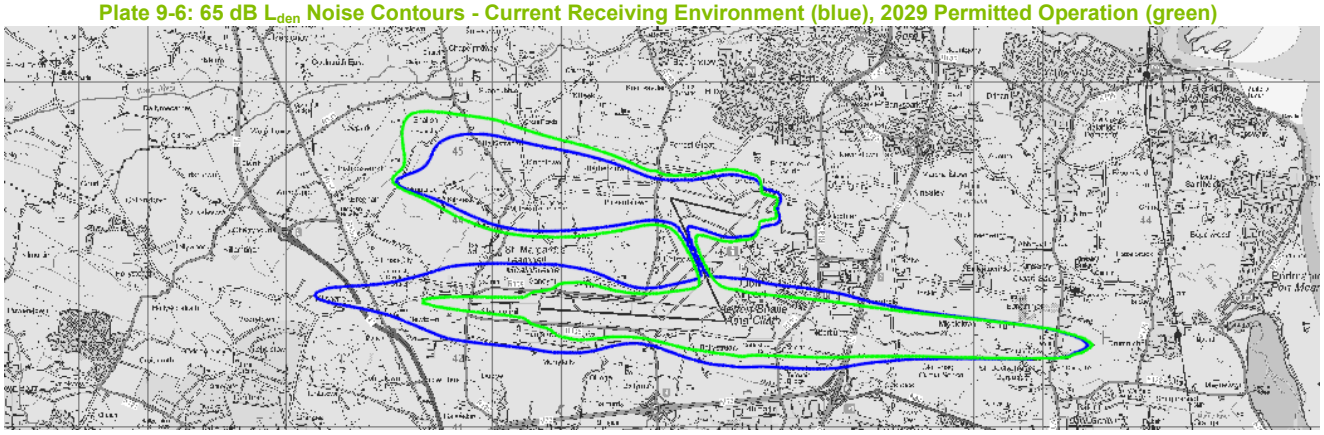
### *2029 Permitted Operation Noise Modelling $L_{den}$ Metric – Air Noise*

9.5.9 Noise contours have been produced for the primary assessment metric of $L_{den}$ using the methodology described in Section 9.3. For 2029 these are based on forecast aircraft movements.

9.5.10 The results are detailed below and presented in Appendix 9-4 along with noise contours and the results for the supplementary noise metrics.

9.5.11 Appendix 9-4 presents the full set of noise contours for each scenario assessed. Plate 9-6 shows the noise contour representing a high impact, 65 dB $L_{den}$. The equivalent contour for 2025 as presented in Plate 9-3 is also included for comparison.

**Plate 9-6: 65 dB $L_{den}$ Noise Contours - Current Receiving Environment (blue), 2029 Permitted Operation (green)**



9.5.12 The 2025 65 dB $L_{den}$ contour (blue) extends westwards from the South Runway to Killshane and eastwards to a point short of Drumnigh. For the North Runway, the contour extends westwards to Kilmacree and only marginally beyond the airport boundary to the east.

9.5.13 For the 2029 Permitted Operation, to the east of the airport, the 65 dB $L_{den}$ contour (green) is similar to that for 2025. To the west of the airport, the 2029 Permitted Operation contour does not extend as far as the 2025 equivalent in line with the South Runway, but larger in line with the North Runway. The overall area is smaller

due to fleet renewal and the reduction in flights, however the higher noise levels in line with the North Runway are due to it being used for the first and last hours of the night in accordance with the NRRA.

9.5.14 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations shown on Plate 9-1. The results of these predictions for the 2029 Permitted Operation are given in Table 9-21. The 2025 data is also included for comparison.

**Table 9-21: Air Noise levels at Representative Locations ($L_{den}$) –Current Receiving Environment and 2029 Permitted Operation**

| Representative Location | Reference No. | Air Noise Level, dB ($L_{den}$) | |
|---|---|---|---|
| | | Current Receiving Environment | 2029 Permitted Operation |
| Tyrellstown, Toberburr | AR01 | 55.6 | 57.2 |
| Ridgewood | AR02 | 56.2 | 57.2 |
| Swords | AR03 | 48.1 | 47.7 |
| Malahide Castle | AR04 | 46.1 | 44.7 |
| Portmarnock N | AR05 | 49.9 | 48.6 |
| Portmarnock S | AR06 | 57.1 | 56.4 |
| Malahide S | AR07 | 54.0 | 52.7 |
| St Doolaghs | AR08 | 65.3 | 65.3 |
| Darndale Park | AR09 | 55.4 | 53.9 |
| The Baskins | AR10 | 59.8 | 58.4 |
| Mayeston Hall | AR11 | 54.4 | 50.9 |
| Kilshane Cross | AR12 | 66.4 | 62.5 |
| St Margaret's | AR13 | 63.6 | 63.0 |
| Ashbourne | AR14 | 48.5 | 48.9 |
| Dunboyne | AR15 | 52.6 | 48.5 |
| Ongar | AR16 | 47.6 | 43.5 |
| Mount Garrett | AR17 | 58.8 | 54.1 |
| Beaumont | AR18 | 48.3 | 49.1 |
| Kilcoskan | AR19 | 59.1 | 61.4 |
| Ratoath | AR20 | 49.6 | 51.1 |

Note – noise levels rounded to nearest 1 decimal place.

9.5.15 In the 2029 Permitted Operation, noise levels to the west of the airport in line with the South Runway, for example Kilshane Cross (AR12) or Mount Garrett (AR17), are forecast to reduce from the Current Receiving Environment by 3 to 5 dB. Most other receptors are forecast to reduce by smaller magnitudes, however receptors to the north and west of the airport and close to flight paths from the North Runway, for example Ridgewood (AR02) and Kilcoskan (AR19) see no change or an increase of 0 to 3 dB.

9.5.16 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-2. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.5.17 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.5.18 The dwelling and population results for the 2029 Permitted Operation are given by contour in Table 9-22 along with the areas of the contours.

**Table 9-22: Areas, dwellings and population in Annual $L_{den}$ contours – Air Noise 2029 Permitted Operation**

| Contour $L_{den}$ (dB) | Area ($km^2$) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|---|
| | | **Dwellings** | **Population** | **Dwellings** | **Population** |
| ≥45 | 606.2 | 114,736 | 334,665 | 119,954 | 349,336 |
| ≥50 | 228.6 | 41,125 | 123,062 | 45,222 | 134,605 |
| ≥55 | 94.2 | 10,671 | 31,756 | 13,283 | 39,352 |
| ≥60 | 37.1 | 2,250 | 6,472 | 3,002 | 8,739 |
| ≥65 | 12.4 | 78 | 215 | 78 | 215 |
| ≥70 | 4.4 | 6 | 13 | 6 | 13 |
| ≥75 | 1.6 | 0 | 0 | 0 | 0 |

9.5.19 The number of people assessed to be highly annoyed in the 2029 Permitted Operation is provided in Table 9-23. The 2025 data is included for comparison.

**Table 9-23: Number of people highly annoyed – Current Receiving Environment and 2029 Permitted Operation**

| Scenario | No. People Highly Annoyed | |
|---|---|---|
| | **Excluding Consented Developments** | **Including Consented Developments** |
| Current Receiving Environment | 77,387 | 81,850 |
| 2029 Permitted Operation | 57,482 | 61,323 |

9.5.20 In the 2029 Permitted Operation, the number of people exposed to aircraft noise in terms of the $L_{den}$ metric is forecast to reduce compared to 2025 for all contour levels. Consequently, the number of people assessed as highly annoyed by aircraft noise also is forecast to decrease by 26%. The number of people exposed to a high level of noise (i.e. 65 dB $L_{den}$ or above) is forecast to decrease from 310 for 2025 to 215 for the 2029 Permitted Operation.

In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship. The numbers of each of these above the $L_{den}$ thresholds provided in Table 9-6 for the 2029 Permitted Operation are provided in Table 9-24

9.5.21 . The 2025 data is also presented for comparison.

**Table 9-24: Schools, residential healthcare facilities and places of worship in $L_{den}$ contours – Air Noise Current Receiving Environment and 2029 Permitted Operation**

| Scenario | No. Receptors Above Threshold for Medium Absolute Effect | | |
|---|---|---|---|
| | **Schools** | **Residential Healthcare Facilities** | **Places of Worship** |
| Current Receiving Environment | 8 | 5 | 6 |
| 2029 Permitted Operation | 7 | 4 | 5 |

9.5.22 The overall number of non-residential receptors exposed to the thresholds given in Table 9-6 is forecast to reduce from 2025 to the 2029 Permitted Operation.

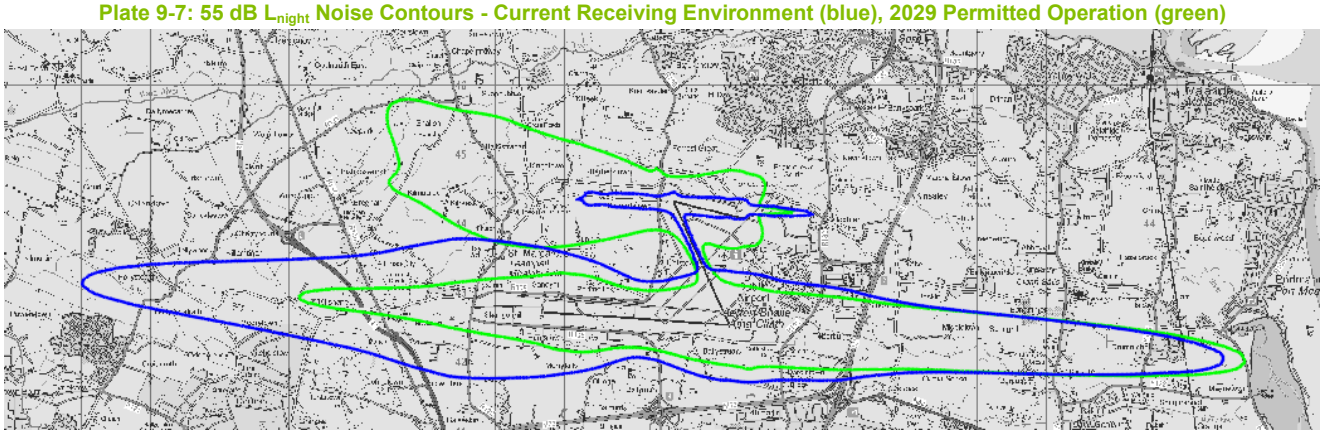
### *2029 Permitted Operation Noise Modelling $L_{night}$ Metric – Air Noise*

9.5.23 Noise contours have been produced for the primary assessment metric of $L_{night}$ using the methodology described in Section 9.3. For 2029 these are based on forecast aircraft movements.

9.5.24 The results are detailed below and presented in Appendix 9-4 along with noise contours and the results for the supplementary noise metrics.

9.5.25 Appendix 9-4 presents the full set of noise contours for each scenario assessed. Plate 9-7 shows the noise contours representing a high impact, 55 dB $L_{night}$. The equivalent contour for 2025 presented in Plate 9-4 is also included for comparison.

**Plate 9-7: 55 dB $L_{night}$ Noise Contours - Current Receiving Environment (blue), 2029 Permitted Operation (green)**



9.5.26 The 2025 55 dB $L_{night}$ contour (blue) extends to the west in line with the South Runway to Hollystown and to the east to Portmarnock Bridge. In line with the North Runway, the contour does not leave the airport site.

9.5.27 For the 2029 Permitted Operation, to the east of the airport, the 55 dB $L_{night}$ contour (green) is similar to that for 2025. To the west of the airport, the 2029 Permitted Operation contour is smaller than the 2025 equivalent in line with the South Runway, but larger in line with the North Runway. The overall area is similar, however the higher noise levels in line with the North Runway are due to it being used for the first and last hours of the night as per the NRRA.

9.5.28 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-1. The results of these predictions for the 2029 Permitted Operation are given in Table 9-25. The 2025 data is also included for comparison.

**Table 9-25: Air Noise levels at Representative Locations ($L_{night}$) – Current Receiving Environment and 2029 Permitted Operation**

| Representative Location | Reference No. | Air Noise Level, dB ($L_{night}$) | |
|---|---|---|---|
| | | Current Receiving Environment | 2029 Permitted Operation |
| Tyrellstown, Toberburr | AR01 | 40.5 | 47.9 |
| Ridgewood | AR02 | 42.6 | 48.1 |
| Swords | AR03 | 38.2 | 38.9 |
| Malahide Castle | AR04 | 38.1 | 36.8 |
| Portmarnock N | AR05 | 42.1 | 41.1 |
| Portmarnock S | AR06 | 48.9 | 48.5 |
| Malahide S | AR07 | 47.0 | 45.9 |
| St Doolaghs | AR08 | 57.4 | 57.6 |
| Darndale Park | AR09 | 46.8 | 45.5 |
| The Baskins | AR10 | 51.2 | 50.2 |
| Mayeston Hall | AR11 | 47.9 | 43.5 |
| Kilshane Cross | AR12 | 61.0 | 56.9 |
| St Margaret's | AR13 | 55.3 | 54.2 |
| Ashbourne | AR14 | 39.1 | 39.9 |
| Dunboyne | AR15 | 46.9 | 42.2 |
| Ongar | AR16 | 41.7 | 36.3 |

| Representative Location | Reference No. | Air Noise Level, dB ($L_{night}$) | |
|---|---|---|---|
| | | Current Receiving Environment | 2029 Permitted Operation |
| Mount Garrett | AR17 | 53.4 | 48.4 |
| Beaumont | AR18 | 40.1 | 40.9 |
| Kilcoskan | AR19 | 40.4 | 52.2 |
| Ratoath | AR20 | 38.7 | 41.7 |

Note – noise levels rounded to nearest 1 decimal place.

9.5.29 For the 2029 Permitted Operation, noise levels to the west of the airport in line with the South Runway, for example Kilshane Cross (AR12) or Mount Garrett (AR17), are forecast to reduce compared to 2025 by 4 to 6 dB. Receptors to the east of the airport, for example Malahide S (AR07) or The Baskins (AR10), are forecast to reduce by around 1 dB. However, receptors to the north and west of the airport and close to flight paths from the North Runway are forecast to increase as the North Runway commences night-time operations, for example Ridgewood (AR02) is forecast to increase by around 6 dB and Kilcoskan (AR19) by around 12 dB.

9.5.30 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-2. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.5.31 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.5.32 The dwelling and population results for the 2029 Permitted Operation are given by contour in Table 9-26 along with the areas of the contours.

**Table 9-26: Areas, dwellings and population in Annual $L_{night}$ contours – Air Noise 2029 Permitted Operation**

| Contour $L_{night}$ (dB) | Area ($km^2$) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|---|
| | | Dwellings | Population | Dwellings | Population |
| ≥40 | 303.0 | 60,310 | 179,886 | 64,484 | 191,672 |
| ≥45 | 132.1 | 19,005 | 56,243 | 22,059 | 64,826 |
| ≥50 | 52.7 | 5,708 | 16,937 | 6,915 | 20,566 |
| ≥55 | 18.3 | 1,114 | 3,454 | 1,614 | 4,954 |
| ≥60 | 6.2 | 18 | 47 | 18 | 47 |
| ≥65 | 2.1 | 0 | 0 | 0 | 0 |
| ≥70 | 0.9 | 0 | 0 | 0 | 0 |

9.5.33 The number of people assessed to be highly sleep disturbed in the 2029 Permitted Operation is given in Table 9-27. The 2025 data is also included for comparison.

**Table 9-27: Number of people highly sleep disturbed – Current Receiving Environment and 2029 Permitted Operation**

| Scenario | No. People Highly Sleep Disturbed | |
|---|---|---|
| | Excluding Consented Developments | Including Consented Developments |
| Current Receiving Environment | 38,698 | 41,160 |
| 2029 Permitted Operation | 26,180 | 28,370 |

9.5.34 In the 2029 Permitted Operation, the number of people exposed to aircraft noise in terms of the $L_{night}$ metric is forecast to reduce from 2025 for all contour levels, despite the contour areas being similar. This is due to the change in runway use associated with the NRRA, as more people are affected by departures to the west from

the South Runway compared to the North Runway, and these operations will occur less frequently with the NRRA, as westerly departures between 06:00 and 06:59 would instead use the North Runway. Consequently, the number of people assessed as highly sleep disturbed by aircraft noise also decreases. In the 2029 Permitted Operation, the number of people highly sleep disturbed is forecast to be 32% lower than 2025 (excluding consented developments). The number of people exposed to at least a high level of noise (i.e. 55 dB $L_{night}$ or above) is forecast to decrease from 7,537 for 2025 to 3,454 in the 2029 Permitted Operation.

9.5.35 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship. Of these, only residential healthcare facilities are highly sensitive to noise at night. The numbers of these above the $L_{night}$ threshold given in Table 9-6 for the 2029 Permitted Operation are given in Table 9-28. The 2025 data is also presented for comparison.

**Table 9-28: Residential healthcare facilities in $L_{night}$ contours – Air Noise Current Receiving Environment and 2029 Permitted Operation**

| Scenario | No. Residential Healthcare Facilities Above Threshold for Medium Absolute Effect |
|---|---|
| Current Receiving Environment | 3 |
| 2029 Permitted Operation | 4 |

9.5.36 The number of residential healthcare facilities exposed to the threshold given in Table 9-6 is forecast to increase from 3 for 2025 to 4 for the 2029 Permitted Operation.

### *2029 Permitted Operation Noise Modelling $L_{den}$ Metric – Ground Noise*

9.5.37 Noise contours have been produced for the primary assessment metric of $L_{den}$ using the methodology described in Section 9.3. These are based on forecast aircraft movements.

9.5.38 The results are detailed below and presented in Appendix 9-5 along with noise contours and the results for the supplementary noise metrics.

9.5.39 The shape and extent of the contours is similar to those for 2025.

9.5.40 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-2. The results of these predictions for the 2029 Permitted Operation in terms of the $L_{den}$ metric are given in Table 9-29. The 2025 data is also included for comparison.

**Table 9-29: Ground Noise Levels at Representative Locations ($L_{den}$) – Current Receiving Environment and 2029 Permitted Operation**

| Representative Location | Reference No. | Ground Noise Level, dB ($L_{den}$) | |
|---|---|---|---|
| | | Current Receiving Environment | 2029 Permitted Operation |
| Ridgewood | GR01 | 45.2 | 46.3 |
| The Baskins | GR02 | 36.5 | 36.8 |
| Mayeston Hall | GR03 | 41.1 | 41.2 |
| St 'Margaret's | GR04 | 39.3 | 39.2 |

Note – noise levels rounded to nearest 1 decimal place.

9.5.41 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-3. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.5.42 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.5.43 The dwelling and population results for the 2029 Permitted Operation are given by contour in Table 9-30.

**Table 9-30: Dwellings and Population in $L_{den}$ Ground Noise Contours – 2029 Permitted Operation**

| Contour $L_{den}$ (dB) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | **Dwellings** | **Population** | **Dwellings** | **Population** |
| ≥45 | 478 | 1,392 | 478 | 1,392 |
| ≥50 | 33 | 73 | 33 | 73 |
| ≥55 | 16 | 29 | 16 | 29 |
| ≥60 | 1 | 3 | 1 | 3 |
| ≥65 | 0 | 0 | 0 | 0 |
| ≥70 | 0 | 0 | 0 | 0 |
| ≥75 | 0 | 0 | 0 | 0 |

9.5.44 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship.

9.5.45 There are no schools, residential healthcare facilities or places of worship above the $L_{den}$ thresholds given in Table 9-6 for the 2029 Permitted Operation.

### *2029 Permitted Operation Noise Modelling $L_{night}$ Metric – Ground Noise*

9.5.46 Noise contours have been produced for the primary assessment metric of $L_{night}$ using the methodology described in Section 9.3. These are based on forecast aircraft movements.

9.5.47 The results are detailed below and presented in Appendix 9-5 along with noise contours and the results for the supplementary noise metrics.

9.5.48 The shape and extent of the contours is similar to those for 2025.

9.5.49 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-2. The results of these predictions for the 2029 Permitted Operation in terms of the $L_{night}$ metric are given in Table 9-31. The 2025 data is also included for comparison.

**Table 9-31: Ground Noise Levels at Representative Locations ($L_{night}$) – Current Receiving Environment and 2029 Permitted Operation**

| Representative Location | **Reference No.** | **Ground Noise Level, dB ($L_{night}$)** | |
|---|---|---|---|
| | | **Current Receiving Environment** | **2029 Permitted Operation** |
| Ridgewood | GR01 | 35.2 | 37.6 |
| The Baskins | GR02 | 28.0 | 28.5 |
| Mayeston Hall | GR03 | 33.1 | 33.2 |
| St 'Margaret's | GR04 | 31.0 | 31.2 |

Note – noise levels rounded to nearest 1 decimal place.

9.5.50 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-3. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.5.51 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.5.52 The dwelling and population results for the 2029 Permitted Operation are given by contour in Table 9-32.

**Table 9-32: Dwellings and Population in $L_{night}$ Ground Noise Contours – 2029 Permitted Operation**

| Contour $L_{night}$ (dB) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | **Dwellings** | **Population** | **Dwellings** | **Population** |
| ≥40 | 46 | 108 | 46 | 108 |
| ≥45 | 18 | 34 | 18 | 34 |
| ≥50 | 6 | 13 | 6 | 13 |
| ≥55 | 1 | 3 | 1 | 3 |
| ≥60 | 0 | 0 | 0 | 0 |
| ≥65 | 0 | 0 | 0 | 0 |
| ≥70 | 0 | 0 | 0 | 0 |

9.5.53 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship.

9.5.54 Of these, only residential healthcare facilities are highly sensitive to noise at night and there are none above the $L_{night}$ threshold given in Table 9-6 for the 2029 Permitted Operation.

#### *2029 Permitted Operation Noise Modelling to Inform Vibration Effects*

9.5.55 No dwellings were found to exceed the threshold for potential vibration effects due to airborne aircraft, based on experiencing noise levels of at least 97 dB $L_{Csmax}$ at least once per 24 hour day, for the 2029 Permitted Operation. The assessment therefore identifies no significant vibration effects.

## 9.6 Assessment of Likely Significant Effects

9.6.1 This section presents the findings of the Principal Assessment which compares the 2029 Permitted Operation (32mppa) to the 2029 Proposed Operation (40mppa)). This section forms the basis for identifying likely significant effects and any additional mitigation measures.

### 2029 Proposed Operation (40mppa)

9.6.2 Air noise and ground noise levels have been modelled for the 2029 Proposed Operation. The primary assessment metrics are presented later in this section, and the supplementary metrics are presented in Appendix 9-4 for air noise and Appendix 9-5 for ground noise.

9.6.3 In order to inform the vibration assessment, airborne aircraft noise has also been modelled in terms of the $L_{CSmax}$ metric.

9.6.4 Other than the aircraft movements, all the assumptions are the same as for the Permitted Operation.

#### *2029 Proposed Operation Noise Modelling $L_{den}$ Metric – Air Noise*

9.6.5 Noise contours have been produced for the primary assessment metric of $L_{den}$ using the methodology described in Section 9.3. These are based on forecast aircraft movements

9.6.6 The results are detailed below and presented in Appendix 9-4 along with noise contours and the results for the supplementary noise metrics.

9.6.7 Appendix 9-4 presents the full set of noise contours. Plate 9-8 shows the noise contours representing a high impact, 65 dB $L_{den}$, for the 2029 Proposed Operation, where it is compared with the equivalent contour for the 2029 Permitted Operation.

**Plate 9-8: 65 dB $L_{den}$ Noise Contours, 2029 Permitted Operation (green) and 2029 Proposed Operation (red)**



9.6.8 The 2029 Proposed Operation 65 dB $L_{den}$ contour (red) is a little larger than the equivalent contour for the 2029 Permitted Operation (green). This is due to the increase in movements to accommodate the increase in passengers from 32 mppa to 40 mppa.

9.6.9 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-1. The results of these predictions for the 2029 Proposed Operation are given in Table 9-33, where they are compared with those for the 2029 Permitted Operation.

**Table 9-33: Air Noise levels at Representative Locations ($L_{den}$) – 2029 Proposed Operation**

| Representative Location | Reference No. | Air Noise Level, dB ($L_{den}$) | |
|---|---|---|---|
| | | 2029 Proposed Operation | Difference from 2029 Permitted Operation |
| Tyrellstown, Toberburr | AR01 | 57.6 | +0.5 |
| Ridgewood | AR02 | 57.6 | +0.4 |
| Swords | AR03 | 48.1 | +0.4 |
| Malahide Castle | AR04 | 45.1 | +0.4 |
| Portmarnock N | AR05 | 49.0 | +0.4 |
| Portmarnock S | AR06 | 56.9 | +0.5 |
| Malahide S | AR07 | 53.1 | +0.4 |
| St Doolaghs | AR08 | 65.9 | +0.5 |
| Darndale Park | AR09 | 54.3 | +0.5 |
| The Baskins | AR10 | 58.9 | +0.5 |
| Mayeston Hall | AR11 | 51.2 | +0.3 |
| Kilshane Cross | AR12 | 62.8 | +0.3 |
| St Margaret's | AR13 | 63.4 | +0.4 |
| Ashbourne | AR14 | 49.4 | +0.5 |
| Dunboyne | AR15 | 48.8 | +0.3 |
| Ongar | AR16 | 43.8 | +0.3 |
| Mount Garrett | AR17 | 54.3 | +0.2 |
| Beaumont | AR18 | 49.6 | +0.5 |
| Kilcoskan | AR19 | 61.9 | +0.6 |
| Ratoath | AR20 | 51.7 | +0.7 |

Note – noise levels and differences rounded to nearest 1 decimal place. Differences based on unrounded values.

9.6.10 Comparing the 2029 Proposed Operation to the 2029 Permitted Operation; all receptors have higher noise levels in the 2029 Proposed Operation by between 0 and 1 dB, which is associated with a negligible impact.

9.6.11 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-2. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.6.12 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

**Table 9-34: Areas, dwellings and population in Annual $L_{den}$ contours – Air Noise 2029 Proposed Operation**

| Contour $L_{den}$ (dB) | Area ($km^2$) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|---|
| | | **Dwellings** | **Population.** | **Dwellings** | **Population** |
| ≥45 | 677.9 | 124,949 | 363,719 | 130,167 | 378,390 |
| ≥50 | 248.3 | 45,939 | 137,829 | 50,037 | 149,375 |
| ≥55 | 103.2 | 12,024 | 35,761 | 14,854 | 43,871 |
| ≥60 | 40.6 | 2,562 | 7,315 | 3,422 | 9,906 |
| ≥65 | 13.7 | 94 | 265 | 94 | 265 |
| ≥70 | 4.9 | 7 | 13 | 7 | 13 |
| ≥75 | 1.8 | 0 | 0 | 0 | 0 |

9.6.13 The number of people assessed to be highly annoyed for the 2029 Proposed Operation compared to the 2029 Permitted Operation is provided in Table 9-35.

**Table 9-35: Number of people highly annoyed – 2029 Proposed Operation**

| Scenario | **No. People Highly Annoyed** | |
|---|---|---|
| | **Excluding Consented Developments** | **Including Consented Developments** |
| 2029 Proposed Operation | 62,874 | 66,841 |
| 2029 Permitted Operation | 57,482 | 61,323 |

9.6.14 Comparing the 2029 Proposed Operation with the 2029 Permitted Operation, the number of people exposed to aircraft noise is forecast to be higher under the 2029 Proposed Operation at all contour levels. The number of people assessed as highly annoyed by aircraft noise is higher by 9% (excluding consented developments). The number of people exposed to at least a high level of noise (i.e. 65 dB $L_{den}$ or above) is 265 compared to 215 under the 2029 Permitted Operation.

9.6.15 The change in noise level has also been considered to determine significant changes between 2029 Proposed Operation and 2029 Permitted Operation. Section 9.3 and Table 9-5 set out the method for interpreting the absolute noise level and change in noise level into a magnitude of effect. The 2029 Proposed Operation is compared with the 2029 Permitted Operation in Table 9-36. The table includes all people in existing residential receptors who are exposed to at least 45 dB $L_{den}$ in at least one of the scenarios. People who are exposed to negligible absolute noise levels for both the 2029 Permitted Operation and the 2029 Proposed Operation are assessed as not being subject to significant effects and so have not been included.

**Table 9-36: Air Noise ($L_{den}$) People by Magnitude of effect – 2029 Proposed Operation**

| Magnitude of effect | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | No. people with Beneficial Effect | No. people with Adverse Effect | No. people with Beneficial Effect | No. people with Adverse Effect |
| Imperceptible | 0 | 327,958 | 0 | 334,519 |
| Not Significant | 0 | 35,496 | 0 | 43,606 |

| Magnitude of effect | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | No. people with Beneficial Effect | No. people with Adverse Effect | No. people with Beneficial Effect | No. people with Adverse Effect |
| Slight | 0 | 252 | 0 | 252 |
| Moderate | 0 | 13 | 0 | 13 |
| Significant | 0 | 0 | 0 | 0 |
| Very Significant | 0 | 0 | 0 | 0 |
| Profound | 0 | 0 | 0 | 0 |

9.6.16 Comparing the 2029 Proposed Operation to the 2029 Permitted Operation, no people are assessed as being subject to a significant effect using the criteria detailed in Table 9-5.

9.6.17 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship. The numbers of each of these above the thresholds given in Table 9-6 for the 2029 Proposed Operation are given in Table 9-37, where they are compared with the numbers for the 2029 Permitted Operation.

**Table 9-37: Schools, residential healthcare facilities and places of worship in $L_{den}$ contours – Air Noise 2029 Proposed Operation**

| Scenario | No. Receptors Above Threshold for Medium Absolute Effect | | |
|---|---|---|---|
| | Schools | Residential Healthcare Facilities | Places of Worship |
| 2029 Proposed Operation | 8 | 4 | 5 |
| 2029 Permitted Operation | 7 | 4 | 5 |

9.6.18 The number of non-residential receptors exposed to the thresholds given in Table 9-6 is forecast to increase from 16 to 17 when comparing the 2029 Proposed Operation with the 2029 Permitted Operation. The increases for the individual receptors are all less than 3 dB and so are not rated as significant.

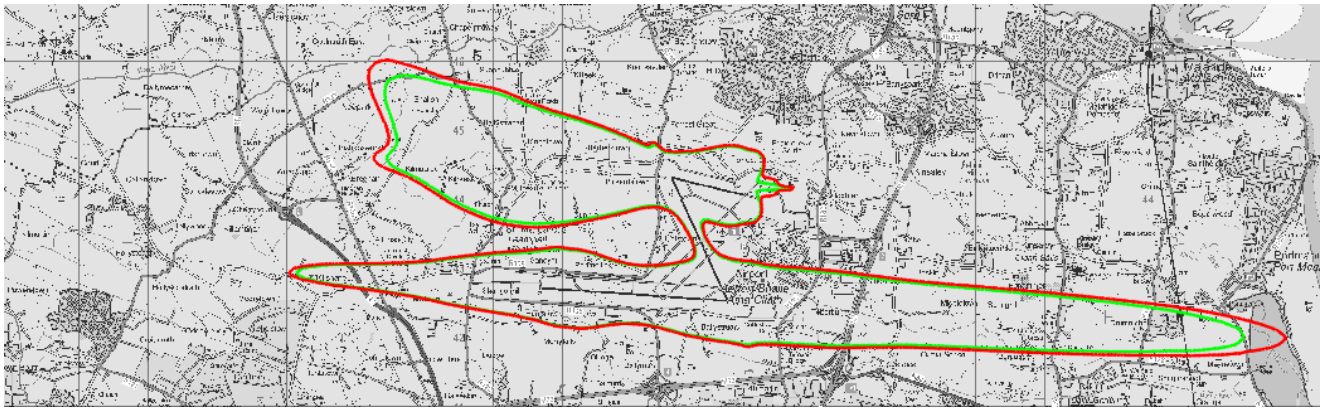
### *2029 Proposed Operation Noise Modelling $L_{night}$ Metric – Air Noise*

9.6.19 Noise contours have been produced for the primary assessment metric of $L_{night}$ using the methodology described in Section 9.3. For 2029 these are based on forecast aircraft movements.

9.6.20 The results are detailed below and presented in Appendix 9-4 along with noise contours and the results for the supplementary noise metrics.

9.6.21 Appendix 9-4 presents the full set of noise contours. Plate 9-9 shows the noise contours representing a high impact, 55 dB $L_{night}$, for the 2029 Proposed Operation, where it is compared with the equivalent contour for the 2029 Permitted Operation.

**Plate 9-9: 55 dB $L_{night}$ Noise Contours, 2029 Permitted Operation (green) and 2029 Proposed Operation (red)**



9.6.22 The 2029 Proposed Operation 55 dB $L_{night}$ contour (red) is a little larger than the equivalent contour for the 2029 Permitted Operation at all locations. This is due to the increase in movements to accommodate the increase in passengers from 32 mppa to 40 mppa.

9.6.23 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-1. The results of these predictions for the 2029 Proposed Operation are given in Table 9-38, where they are compared with the 2029 Permitted Operation.

**Table 9-38: Air Noise levels at Representative Locations ($L_{night}$) – 2029 Proposed Operation**

| Representative Location | Reference No. | Air Noise Level, dB ($L_{night}$) | |
|---|---|---|---|
| | | 2029 Proposed Operation | Difference from 2029 Permitted Operation |
| Tyrellstown, Toberburr | AR01 | 48.3 | +0.4 |
| Ridgewood | AR02 | 48.4 | +0.3 |
| Swords | AR03 | 39.2 | +0.3 |
| Malahide Castle | AR04 | 37.1 | +0.3 |
| Portmarnock N | AR05 | 41.4 | +0.4 |
| Portmarnock S | AR06 | 49.0 | +0.5 |
| Malahide S | AR07 | 46.2 | +0.3 |
| St Doolaghs | AR08 | 58.1 | +0.5 |
| Darndale Park | AR09 | 46.0 | +0.4 |
| The Baskins | AR10 | 50.6 | +0.4 |
| Mayeston Hall | AR11 | 43.7 | +0.2 |
| Kilshane Cross | AR12 | 57.1 | +0.2 |
| St Margaret's | AR13 | 54.6 | +0.3 |
| Ashbourne | AR14 | 40.3 | +0.4 |
| Dunboyne | AR15 | 42.4 | +0.2 |
| Ongar | AR16 | 36.5 | +0.3 |
| Mount Garrett | AR17 | 48.6 | +0.2 |
| Beaumont | AR18 | 41.3 | +0.4 |
| Kilcoskan | AR19 | 52.7 | +0.6 |
| Ratoath | AR20 | 42.1 | +0.5 |

Note – noise levels and differences rounded to nearest 1 decimal place. Differences based on unrounded values.

9.6.24 Comparing the 2029 Proposed Operation with the 2029 Permitted Operation, all receptors see an increase of between 0 and 1 dB associated with a negligible impact.

9.6.25 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-2. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.6.26 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

**Table 9-39: Areas, dwellings and population in Annual $L_{night}$ contours – Air Noise 2029 Proposed Operation**

| Contour $L_{night}$ (dB) | Area ($km^2$) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|---|
| | | **Dwellings** | **Population.** | **Dwellings** | **Population** |
| ≥40 | 326.4 | 64,810 | 192,793 | 69,015 | 204,681 |
| ≥45 | 141.8 | 20,190 | 59,801 | 23,257 | 68,428 |
| ≥50 | 57.1 | 6,292 | 18,698 | 8,006 | 23,848 |
| ≥55 | 20.2 | 1,235 | 3,819 | 1,761 | 5,409 |
| ≥60 | 6.8 | 24 | 65 | 24 | 65 |
| ≥65 | 2.3 | 0 | 0 | 0 | 0 |
| ≥70 | 0.9 | 0 | 0 | 0 | 0 |

9.6.27 The number of people assessed to be highly sleep disturbed under the 2029 Proposed Operation compared to the 2029 Permitted Operation is given in Table 9-40.

**Table 9-40: Number of people highly sleep disturbed – 2029 Proposed Operation**

| Scenario | **No. People Highly Sleep Disturbed** | |
|---|---|---|
| | **Excluding Consented Developments** | **Including Consented Developments** |
| 2029 Proposed Operation | 28,192 | 30,448 |
| 2029 Permitted Operation | 26,180 | 28,370 |

9.6.28 Comparing the 2029 Proposed Operation with the 2029 Permitted Operation, the number of people exposed to aircraft noise is forecast to be higher under the 2029 Proposed Operation at all contour levels. The number of people assessed as highly sleep disturbed by aircraft noise is higher by 8% (excluding consented developments). The number of people exposed to at least a high level of noise (i.e. 55 dB $L_{night}$ or above) is 3,819 compared to 3,454 under the 2029 Permitted Operation.

9.6.29 The change in noise level has also been considered to determine significant changes between 2029 Proposed Operation and 2029 Permitted Operation. Section 9.3 and Table 9-5 set out the method for interpreting the absolute noise level and change in noise level into a magnitude of effect. The 2029 Proposed Operation is compared with the 2029 Permitted Operation in Table 9-41. The table includes all people in existing residential receptors who are exposed to at least 40 dB $L_{night}$ in at least one of the scenarios. People who are exposed to negligible absolute noise levels for both the 2029 Permitted Operation and the 2029 Proposed Operation are assessed as not being subject to significant effects and so have not been included.

**Table 9-41: Air Noise ($L_{night}$) People by Magnitude of effect – 2029 Proposed Operation**

| Magnitude of effect | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | No. people with Beneficial Effect | No. people with Adverse Effect | No. people with Beneficial Effect | No. people with Adverse Effect |
| Imperceptible | 0 | 174,094 | 0 | 180,832 |
| Not Significant | 0 | 14,879 | 0 | 18,439 |
| Slight | 0 | 3,755 | 0 | 5,345 |
| Moderate | 0 | 65 | 0 | 65 |
| Significant | 0 | 0 | 0 | 0 |
| Very Significant | 0 | 0 | 0 | 0 |
| Profound | 0 | 0 | 0 | 0 |

9.6.30 Comparing the 2029 Proposed Operation with the 2029 Permitted Operation, no people are assessed as being subject to a significant effect using the criteria detailed in Table 9-5.

9.6.31 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship. Of these, only residential healthcare facilities are highly sensitive to noise at night. The number of each of these above the $L_{night}$ threshold given in Table 9-6 for the 2029 Proposed Operation compared to the 2029 Permitted Operation is given in Table 9-42.

**Table 9-42: Residential healthcare facilities in $L_{night}$ contours – Air Noise 2029 Proposed Operation**

| Scenario | No. Residential Healthcare Facilities Above Threshold for Medium Absolute Effect |
|---|---|
| 2029 Proposed Operation | 4 |
| 2029 Permitted Operation | 4 |

9.6.32 The number of residential healthcare facilities exposed to the threshold given in Table 9-6 is forecast to remain at 4 when comparing the 2029 Proposed Operation with the 2029 Permitted Operation. The increases for the individual receptors are all less than 3 dB and so are not rated as significant.

### *2029 Proposed Operation Noise Modelling $L_{den}$ Metric – Ground Noise*

9.6.33 Noise contours have been produced for the primary assessment metric of $L_{den}$ using the methodology described in Section 9.3. For 2029 these are based on forecast aircraft movements.

9.6.34 The results are detailed below and presented in Appendix 9-5 along with noise contours and the results for the supplementary noise metrics.

9.6.35 The noise contours representing a high impact, 65 dB $L_{den}$, do not extend farther than the airport site except at Portmellick and as a result contain no noise sensitive receptors. The noise contours representing a medium impact, 55 dB $L_{den}$, extend west towards Shanganhill, north past Naul Road and south to the Old Airport Road and Harristown. The contours do not extend east beyond the airport site. The noise contours representing a low impact, 50 dB $L_{den}$, extend farther west to Shanganhill, north into Forrest Little and south into Collinstown Cross and Silloge.

To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-2. The results of these predictions for the 2029 Proposed Operation in terms of the $L_{den}$ metric are given in Table 9-43, where they are compared with the 2029 Permitted Operation.

**Table 9-43: Ground Noise Levels at Representative Locations ($L_{den}$) – 2029 Proposed Operation**

| Representative Location | Reference No. | Ground Noise Level, dB ($L_{den}$) | |
|---|---|---|---|
| | | 2029 Proposed Operation | Difference to 2029 Permitted Operation |
| Ridgewood | GR01 | 46.9 | +0.6 |
| The Baskins | GR02 | 37.5 | +0.7 |
| Mayeston Hall | GR03 | 41.8 | +0.6 |
| St Margaret's | GR04 | 39.8 | +0.6 |

Note – noise levels and differences rounded to nearest 1 decimal place. Differences based on unrounded values.

9.6.36 $L_{den}$ noise levels at representative locations close to the airport site in all directions are forecast to increase in the 2029 Proposed Operation by 0 to 1 dB compared to the 2029 Permitted Operation.

9.6.37 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-3. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.6.38 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.6.39 The dwelling and population results for the 2029 Proposed Operation are given by contour in Table 9-44.

**Table 9-44: Dwellings and Population in $L_{den}$ Ground Noise Contours – 2029 Proposed Operation**

| Contour $L_{den}$ (dB) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | Dwellings | Population. | Dwellings | Population |
| ≥45 | 734 | 2,169 | 735 | 2,173 |
| ≥50 | 37 | 82 | 37 | 82 |
| ≥55 | 18 | 34 | 18 | 34 |
| ≥60 | 1 | 3 | 1 | 3 |
| ≥65 | 0 | 0 | 0 | 0 |
| ≥70 | 0 | 0 | 0 | 0 |
| ≥75 | 0 | 0 | 0 | 0 |

9.6.40 Comparing the 2029 Proposed Operation and the 2029 Permitted Operation; the number of people exposed to at least a low level of aircraft ground noise (i.e. 50 dB $L_{den}$ or above) is forecast to be 82 compared to 73 under the 2029 Permitted Operation, excluding consented developments. The number of people exposed to at least a high level of aircraft ground noise (i.e. 65 dB $L_{den}$ or above) is forecast to remain at zero.

9.6.41 It is also important to consider the change in noise level in order to determine significant changes when comparing the 2029 Proposed Operation to the 2029 Permitted Operation. Section 9.3, and specifically Table 9-5, set out the method for interpreting the absolute noise level and change in noise level into a magnitude of effect. The 2029 Proposed Operation is compared with the 2029 Permitted Operation in Table 9-45. The table includes all people in existing residential receptors who are exposed to at least 45 dB $L_{den}$ in at least one of the operational conditions. People who are exposed to negligible absolute noise levels under both the 2029 Proposed Operation and 2029 Permitted Operation are assessed as not being subject to significant effects and so have not been included.

**Table 9-45: Ground Noise ($L_{den}$) Number of People by Magnitude of Effect – 2029 Proposed Operation**

| Magnitude of effect | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | **No. people with Beneficial Effect** | **No. people with Adverse Effect** | **No. people with Beneficial Effect** | **No. people with Adverse Effect** |
| Imperceptible | 0 | 2,117 | 0 | 2,117 |
| Not Significant | 0 | 31 | 0 | 31 |
| Slight | 0 | 3 | 0 | 3 |
| Moderate | 0 | 0 | 0 | 0 |
| Significant | 0 | 0 | 0 | 0 |
| Very Significant | 0 | 0 | 0 | 0 |
| Profound | 0 | 0 | 0 | 0 |

9.6.42 Comparing the 2029 Proposed Operation and the 2029 Permitted Operation, no people are assessed as being subject to a significant effect using the criteria detailed in Table 9-5.

9.6.43 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship.

9.6.44 There are no schools, residential healthcare facilities or places of worship above the $L_{den}$ thresholds given in Table 9-6 for the 2029 Proposed Operation.

### *2029 Proposed Operation Noise Modelling $L_{night}$ Metric – Ground Noise*

9.6.45 Noise contours have been produced for the primary assessment metric of $L_{night}$ using the methodology described in Section 9.3. For 2029 these are based on forecast aircraft movements.

9.6.46 The results are detailed below and presented in Appendix 9-5 along with noise contours and the results for the supplementary noise metrics.

9.6.47 The noise contours representing a high impact, 55 dB $L_{night}$, do not extend farther than the airport site except at Portmellick and as a result contain no noise sensitive receptors. The noise contours representing a medium impact, 50 dB $L_{night}$, extend west towards Shanganhill, north towards Naul Road and south to the Old Airport Road and Harristown. The contours do not extend east or north beyond the airport site. The noise contours representing a low impact, 45 dB $L_{night}$, extend farther west to Shanganhill, north into Forrest Little and south into Collinstown Cross and Silloge.

9.6.48 To provide further information on changes in the noise environment for specific communities, noise levels have also been calculated at a number of representative locations which are shown on Plate 9-2. The results of these predictions for the 2029 Proposed Operation compared to the 2029 Permitted Operation in terms of the $L_{night}$ metric are given in Table 9-46.

**Table 9-46: Ground Noise Levels at Representative Locations ($L_{night}$) – 2029 Proposed Operation**

| Representative Location | Reference No. | Ground Noise Level, dB ($L_{night}$) | |
|---|---|---|---|
| | | **2029 Proposed Operation** | **Difference from 2029 Permitted Operation** |
| Ridgewood | GR01 | 38.2 | +0.6 |
| The Baskins | GR02 | 29.1 | +0.6 |
| Mayeston Hall | GR03 | 33.8 | +0.6 |
| St Margaret's | GR04 | 31.7 | +0.5 |

Note – noise levels and differences rounded to nearest 1 decimal place. Differences based on unrounded values.

9.6.49 $L_{night}$ noise levels at representative locations close to the airport site in all directions are forecast to increase for the 2029 Proposed Operation by 0 to 1 dB compared to the 2029 Permitted Operation.

9.6.50 For each contour, the number of dwellings and estimated population within the contour has been determined, as detailed in Appendix 9-3. This has been undertaken both for existing dwellings and population and for a future development scenario that additionally includes consented but not yet constructed dwellings and the estimated number of dwellings within land zoned for residential development.

9.6.51 The contour results presented in this chapter are all cumulative, e.g. any dwellings inside a 55 dB contour are also included in the totals for any lower value contour.

9.6.52 The dwelling and population results for the 2029 Proposed Operation are given by contour in Table 9-47.

**Table 9-47: Dwellings and Population in $L_{night}$ Ground Noise Contours – 2029 Proposed Operation**

| Contour $L_{night}$ (dB) | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | Dwellings | Population | Dwellings | Population |
| ≥40 | 49 | 116 | 49 | 116 |
| ≥45 | 21 | 43 | 21 | 43 |
| ≥50 | 6 | 13 | 6 | 13 |
| ≥55 | 1 | 3 | 1 | 3 |
| ≥60 | 0 | 0 | 0 | 0 |
| ≥65 | 0 | 0 | 0 | 0 |
| ≥70 | 0 | 0 | 0 | 0 |

9.6.53 Comparing the 2029 Proposed Operation and the 2029 Permitted Operation, the number of people exposed to at least a low level of aircraft ground noise (i.e. 45 dB $L_{night}$ or above) and higher is forecast to be 43 compared to 34 under the 2029 Permitted Operation.

9.6.54 The change in noise level between the 2029 Proposed Operation and 2029 Permitted Operation is also considered in determining the magnitude and significance of effects. Section 9.3, and specifically Table 9-5, set out the method for interpreting the absolute noise level and change in noise level into a magnitude of effect. The 2029 Proposed Operation is compared with the 2029 Permitted Operation in Table 9-48. The table includes all people in existing residential receptors who are exposed to at least 40 dB $L_{night}$ in at least one of the scenarios. People who are exposed to negligible absolute noise levels for both the 2029 Proposed Operation and 2029 Permitted Operation are assessed as not being subject to significant effects and so have not been included.

**Table 9-48: Ground Noise ($L_{night}$) Number of People by Magnitude of Effect – 2029 Proposed Operation**

| Magnitude of effect | Excluding Consented Developments | | Including Consented Developments | |
|---|---|---|---|---|
| | **No. people with Beneficial Effect** | **No. people with Adverse Effect** | **No. people with Beneficial Effect** | **No. people with Adverse Effect** |
| Imperceptible | 0 | 100 | 0 | 100 |
| Not Significant | 0 | 13 | 0 | 13 |
| Slight | 0 | 3 | 0 | 3 |
| Moderate | 0 | 0 | 0 | 0 |
| Significant | 0 | 0 | 0 | 0 |
| Very Significant | 0 | 0 | 0 | 0 |
| Profound | 0 | 0 | 0 | 0 |

9.6.55 Comparing the 2029 Proposed Operation with the 2029 Permitted Operation; no people are assessed as being subject to a significant effect using the criteria detailed in Table 9-5.

9.6.56 In addition to the consideration of residential properties, other potential receptors of high sensitivity have been included in this assessment, specifically schools, residential healthcare facilities and places of worship.

9.6.57 Of these, only residential healthcare facilities are highly sensitive to noise at night and there are none above the $L_{night}$ threshold given in Table 9-6 for the 2029 Proposed Operation.

#### *2029 Proposed Operation Noise Modelling to Inform Vibration Effects*

9.6.58 No dwellings were found to exceed the threshold for potential vibration effects due to airborne aircraft, based on experiencing noise levels of at least 97 dB $L_{CSmax}$ at least once per 24-hour day, for the 2029 Proposed Operation. Therefore, there are no significant vibration effects predicted.

## 9.7 Mitigation

9.7.1 The assessment of the Proposed Order does not identify any significant effects, and therefore new mitigation measures are not automatically triggered. This finding is reached without reliance on any additional mitigation measures. The assessment assumes that the existing design and management measures described in Section 9.4 will remain in place, along with the mitigation measures attached to the NRRA, in particular the Noise Quota Scheme and the new night noise insulation scheme referred to at paragraph 9.4.90 above.

### Voluntary Offer

9.7.2 Notwithstanding this, daa commits to fund a Ministerial Order Residential Sound Insulation Scheme (MO SIGS) if the Proposed Order is made. This would provide a grant of up to €40,000 for eligible dwellings within the 60 dB $L_{den}$ contour and is discussed in more detail in Appendix 9-6.

9.7.3 The MO SIGS secures an insulation offer independently of other aircraft noise regulatory processes. It is intended to improve internal acoustic conditions in participating eligible homes. It does not reduce external aircraft-noise exposure or eliminate all annoyance and sleep disturbance. Its benefits are additional to, and are not relied upon in reaching, the assessment's significance conclusions.

## 9.8 Residual Effects

9.8.1 For dwellings with enhanced sound insulation, whether provided through daa's noise insulation schemes or secured through planning conditions for new development, internal noise levels, and consequently the effects experienced by occupants, would be lower than indicated by the assessment of external noise levels.

## 9.9 Cumulative Effects

### Total Noise from Aircraft and Road Traffic

9.9.1 This chapter has considered noise from two different sources, airborne aircraft (air noise) and aircraft on the ground (ground noise). Road traffic noise is separately considered in Chapter 8: Non-Aircraft Noise. The character of these noise sources differs, with air noise consisting of intermittent noise events often with a duration of less than a minute, ground noise consisting of a combination of periods of steady noise from auxiliary power units interspersed with noise from taxiing aircraft, and road traffic noise consisting of multiple vehicle passbys of only a few seconds each which result in a relatively steady noise for busy roads, such as many of those in the vicinity of Dublin Airport.

9.9.2 Consequently, it is standard practice to consider the noise from each separately. This is consistent with the statement in the European Commission Directive 2020/367 that:

> *"The exposure of the population shall be assessed independently for each noise source and harmful effect. Where the same people are simultaneously exposed to different noise sources, the harmful effects may -in general- not be cumulated. However, those effects may be compared to assess the relative importance of each noise."*

9.9.3 Furthermore, the Dublin Airport Noise Action Plan 2024-2028 stated that:

> *"Noise from aircraft is produced both on the ground and in the air. In general, these sources are considered separately and are typically described as:*
>
> *o Air noise; and*
>
> *o Ground noise"*

9.9.4 Noise levels from individual sources can be combined, subject to the selection of an appropriate noise metric. However, there are no current standards or guidance that prescribe a methodology for assessing in-combination noise effects relevant to the Proposed Order.

9.9.5 When considering combined noise levels a number of factors need to be taken into account. While the resulting noise level will be higher than for the individual sources (unless one source is much louder than the others in which case the combined noise level will be the same as that of the loudest individual source), the change in noise level will be no higher than the largest change for any of the individual sources, often being lower than this in situations where more than one source is relevant to the combined noise level or when the largest change is not by the loudest source. Consequently, the significance of a source that experiences the largest change in noise level might be under-represented if a louder source shows a smaller change.

9.9.6 Despite these limitations, to provide information on the relative contribution of the noise sources the $L_{den}$ and $L_{night}$ noise metrics have been used to represent the relative contributions of the noise sources in isolation and cumulatively under the 2029 scenarios. This has been undertaken for representative locations, with the noise levels given in Table 9-49 and Table 9-50.

**Table 9-49: 2029 Cumulative Noise Levels at Representative Locations ($L_{den}$)**

| Representative Location | Reference No. | Cumulative Noise Level, dB ($L_{den}$) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2029 Permitted Operation | | | | 2029 Proposed Operation | | | | Change |
| | | Air | Ground | Road | Total | Air | Ground | Road | Total | Total |
| Ridgewood | GR01 | 57.2 | 46.3 | 60.9 | 62.5 | 57.6 | 46.9 | 60.9 | 62.7 | +0.2 |
| The Baskins | GR02 | 58.4 | 36.8 | 64.3 | 65.3 | 58.9 | 37.5 | 64.3 | 65.4 | +0.1 |
| Mayeston Hall | GR03 | 50.9 | 41.2 | 66.4 | 66.5 | 51.2 | 41.8 | 66.4 | 66.5 | 0.0 |
| St Margaret's | GR04 | 63.0 | 39.2 | 54.3 | 63.6 | 63.4 | 39.8 | 54.3 | 63.9 | +0.3 |

Note – values rounded to nearest 1 decimal place. Differences based on unrounded values.

**Table 9-50: 2029 Cumulative Noise Levels at Representative Locations ($L_{night}$)**

| Representative Location | Reference No. | Cumulative Noise Level, dB ($L_{night}$) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2029 Permitted Operation | | | | 2029 Proposed Operation | | | | Change |
| | | Air | Ground | Road | Total | Air | Ground | Road | Total | Total |
| Ridgewood | GR01 | 48.1 | 37.6 | 49.6 | 52.1 | 48.4 | 38.2 | 49.7 | 52.3 | +0.2 |
| The Baskins | GR02 | 50.2 | 28.5 | 53.2 | 55.0 | 50.6 | 29.1 | 53.2 | 55.1 | +0.1 |
| Mayeston Hall | GR03 | 43.5 | 33.2 | 55.4 | 55.7 | 43.7 | 33.8 | 55.4 | 55.7 | 0.0 |
| St Margaret's | GR04 | 54.2 | 31.2 | 42.8 | 54.5 | 54.6 | 31.7 | 42.8 | 54.9 | +0.4 |

Note – values rounded to nearest 1 decimal place. Differences based on unrounded values.

9.9.7 For both the $L_{den}$ and the $L_{night}$ metrics, the situation is similar. The road traffic noise is the key contributor at the first three locations, and air noise is the key contributor at St Margaret's (GR04), with road traffic noise contributing a little. The change in the total noise as a result of the Proposed Order is less than 1 dB, with the half of the changes being 0 or 0.1 dB.

9.9.8 If similar criteria were used to assess the significance of the cumulative noise level as those which were used for the individual air noise and ground noise assessments presented in this chapter, none of the changes in noise levels would be considered significant. This conclusion is consistent with those of the assessments of individual noise sources.

## 9.10 Indirect, Secondary and Transboundary Effects

9.10.1 Indirect and secondary effects associated with aircraft noise and vibration resulting from the Proposed Order, including effects on non-aircraft noise are assessed in Chapter 8: Non-Aircraft Noise.

## 9.11 Conclusions

9.11.1 This chapter has assessed the likely significant effects of the Proposed Order in relation to aircraft air noise, aircraft ground noise and vibration. The Principal Assessment compares the 2029 Proposed Operation (40 mppa) with the 2029 Permitted Operation (32 mppa), thereby isolating the effects attributable to the Proposed Order.

9.11.2 For air noise, the 2029 Proposed Operation would result in higher noise levels and greater population exposure than the 2029 Permitted Operation. The number of people predicted to be highly annoyed is approximately 9% higher and the number predicted to be highly sleep disturbed approximately 8% higher under the 2029 Proposed Operation. However, when the absolute noise levels and changes in noise level attributable to the Proposed Order are considered together in accordance with the assessment methodology, no significant air noise effects are identified at any individual residential or non-residential receptors.

9.11.3 Notwithstanding the increase relative to the 2029 Permitted Operation, the number of people predicted to be highly annoyed and highly sleep disturbed under the 2029 Proposed Operation is forecast to be lower than in 2025. This reflects, amongst other factors, the continuing transition towards quieter aircraft within the fleet.

9.11.4 Aircraft ground noise associated principally with taxiing aircraft and the use of auxiliary power units would also increase under the 2029 Proposed Operation relative to the 2029 Permitted Operation. When the absolute noise levels and changes in noise level attributable to the Proposed Order are considered together in accordance with the assessment methodology, no significant ground noise effects are identified at residential or non-residential receptors.

9.11.5 No significant vibration effects are identified as a result of the Proposed Order.

9.11.6 Air noise, ground noise and road traffic noise (which is considered separately in Chapter 8: Non-Aircraft Noise) have also been considered in combination. Given the differing characteristics of these noise sources, and the absence of an established methodology for combining them for the purposes of determining significance, each source has been assessed separately. Consideration of their relative contributions to the overall noise environment does not indicate the potential for significant in-combination noise effects.

9.11.7 No new mitigation measures are therefore required as a result of the Proposed Order. The assessment assumes that the existing noise management measures at Dublin Airport will remain in place, along with the mitigation measures attached to the NRRA, in particular the Noise Quota Scheme and the new night noise insulation scheme. The Noise Abatement Objective for Dublin Airport is forecast to be met.

9.11.8 Overall, the assessment concludes that the Proposed Order would result in increases in aircraft noise and ground noise relative to the 2029 Permitted Operation, but that these changes would not give rise to significant effects. No significant residual effects in relation to aircraft noise or vibration are therefore identified.