

# Dublin Airport

## Development of Proposed Noise Measures.

Document: 3870-Development of Proposed Noise Measures  
Date: September 2021  
Version: vF2



# Document Structure

- This document has been developed to provide a overview of the approach that daa has taken to developing noise measures to support the Application along with a high level summary of the selected noise measures.
  - **Section 0: Introduction**
  - **Section 1: An overview of the overall framework for managing noise** including the relationship between the components of the Environmental Impact Assessment, the application of the ICAO Balanced Approach and the associated processes of EU598/2014 including cost-effectiveness analysis and daa's noise goals.
  - **Section 2: ICAO Balanced Approach** Summarises how the measures associated with each of the aspects of the ICAO Balanced Approach contributes to meeting the Noise Abatement Objective and the Noise Goals.
  - **Section 3:** Summarises the **noise monitoring framework** that brings performance of all the measures together.
  - **Section 4: Summarises all of the noise measures** included in the assessment of effects including those already in place, those already planned as part of the existing noise action plan and the proposed new measures.
  - **Section 5: Considers the impacts beyond 2025** under two scenarios - the first associated with the continuation of the existing 32million passengers per annum cap in place beyond 2025; the second considers growth with this cap removed beyond 2025.
  - **Section 6: Summarises the proposed new measures and the application.**
- Detailed assessment and analysis of the proposed noise measures can be found in the following documents:
  - Dublin Airport North Runway, Regulation 598/2014 (Aircraft Noise Regulation) Cost Effectiveness Analysis Report' (Revision 2 – September 2021). Ricondo and Associates Inc. September 2021.
  - Dublin Airport North Runway Relevant Action Application – Revised Environmental Impact Assessment Report (EIAR), prepared by AECOM. September 2021
  - Dublin Airport Operating Restrictions, Quantification of Impacts on Future Growth, Updated analysis in response to the ANCA RFI, Mott MacDonald, June 2021
  - Dublin Airport Proposed Night Quota System RFI Final. Anderson Acoustics. August 2021



# 0: Introduction

- Following grant of North Runway Planning Permission in 2007, Dublin Airport experienced strong sustained growth, with the current runway system at capacity during peak times in 2018 and 2019.
- The geographical location of Dublin Airport and the 1hr time difference between it and mainland Europe, means that flights need to leave Dublin before 7am to arrive at their destination for the start of the working day.
- In 2019, driven by short haul services operated by aircraft based at Dublin Airport, demand for night flights (23:00-07:00) was over 100/night, with 113/night associated with regularly scheduled services on a typical busy Summer day (aligns with the 92-day summer referenced in North Runway Condition 5).
- In December 2020 daa submitted a planning application to Fingal County Council (FCC) to modify planning conditions contained in the North Parallel Runway Planning Permission (FCC Reg. Ref.: F04A/1755; ABP Ref: PL06.217429) that restrict use of the airport at night once North Runway becomes operational.
- The Application seeks to amend and replace Condition 3(d) that restricts the use of the North Runway between 23:00 and 07:00; and Condition 5 that restricts the average number of night-time aircraft movements at the airport overall to 65 movement/night once the North Runway becomes operational.
- In addition to already planned measures (outlined in the Dublin Airport Noise Plan 2018-23) and noise measures already required under the parent planning permission, daa proposed a package of mitigation measures consistent with the ICAO Balanced Approach including:
  - A preferential runway use scheme for night-time runway operations (amendment to Condition 3(d));
  - An Annual Night Quota (ANQ) (replace Condition 5);
  - a Residential Sound Insulation Grant Scheme for those dwellings where there is potential for significant adverse effect arising from the proposed changes (additional to Condition 7).
  - A comprehensive noise performance monitoring framework consistent with Aircraft Noise Regulations 2019 (additional to Condition 10).
- These measures were assessed in accordance with EU598 and considered to enable cost-effective compliance with a candidate Noise Abatement Objective (cNAO) proposed by daa, and daa's key noise goals.
- Across 2020-21, with the Covid-19 Pandemic and as per all other international airports, Dublin Airport saw a significant drop in air traffic movements and passenger numbers. Sustained growth is expected to return post pandemic.
- Since the December 2020 application, forecasts for post-pandemic recovery have been revised. To sustain the airport's recovery, Mott McDonald, on behalf of daa, forecast that air traffic will rise to 116/night in the 'busy day' when the airport returns to 32m annual passenger traffic levels ~ 2025.
- The operating restrictions introduced by Conditions 3(d) and 5 will have a significant impact on short haul services operated by aircraft based at Dublin airport. The reassessed impact of these restrictions is a loss of around 1.6m passengers per year and a cumulative loss of 6.3 million passengers over the 4-year period 2022-25.
- **daa's proposed package of measures will facilitate recovery whilst managing impacts of associated growth such that the overall effects of noise will remain better than 2018 into the future.**
- Following review of the December 2020 Application, FCC and the Airport Noise Competent Authority (ANCA) issued a Request for Information (RFI) which, amongst other things, sought clarification on the noise management measures.
- Based on the revised forecasts and the ANCA RFI, a revised Environmental Impact Assessment and Cost Effectiveness Analysis have been undertaken. This document presents a summary of the outcome of these assessments with the revised forecasts and provides a summary overview of the package of measures.



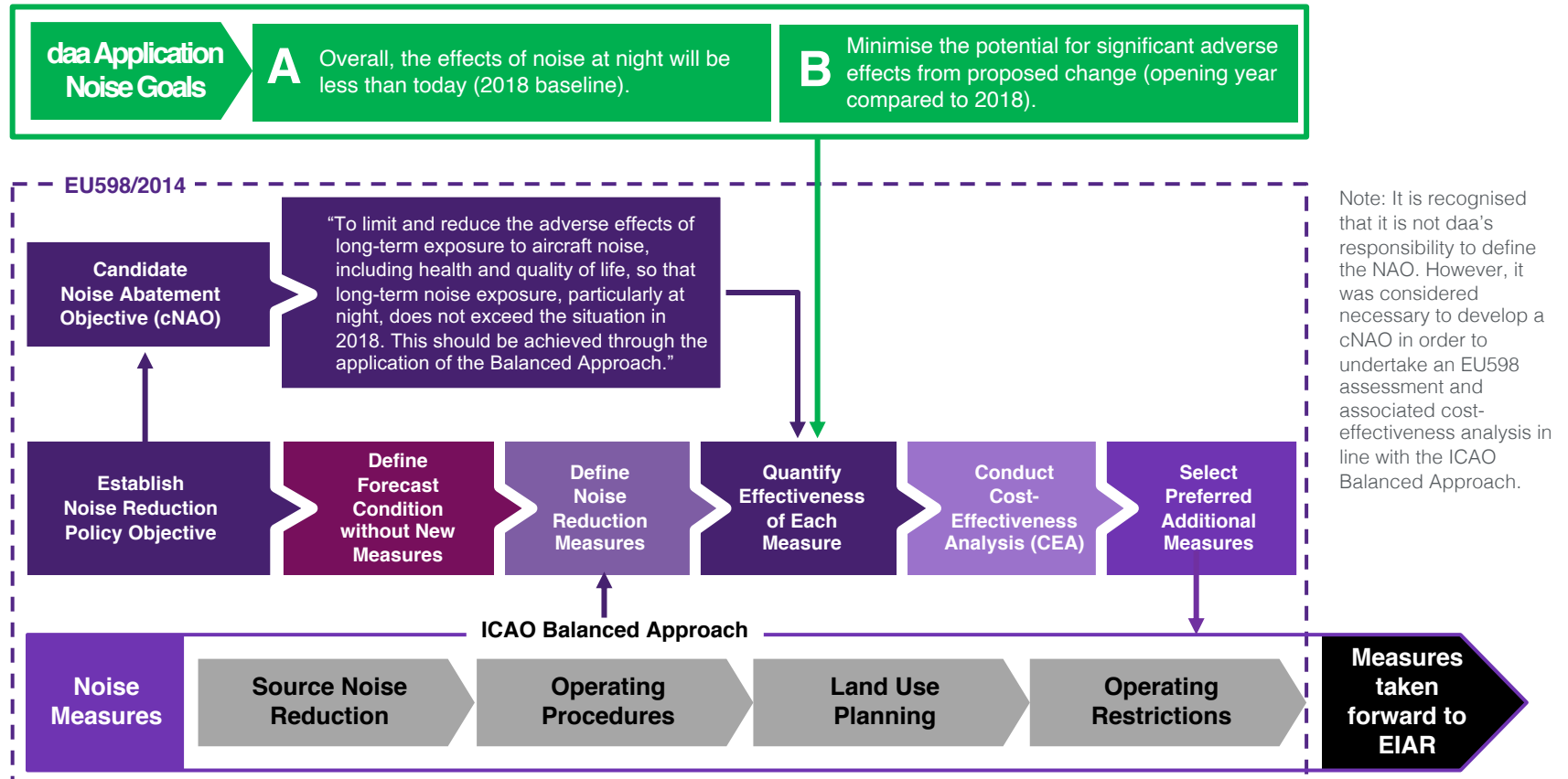
# Section 1: Overall framework

An overview of the overall framework and the relationship between the components of the Environmental Impact Assessment, the application of the ICAO Balanced Approach and the associated processes of EU598/2014 including cost-effectiveness analysis and daa's noise goals.



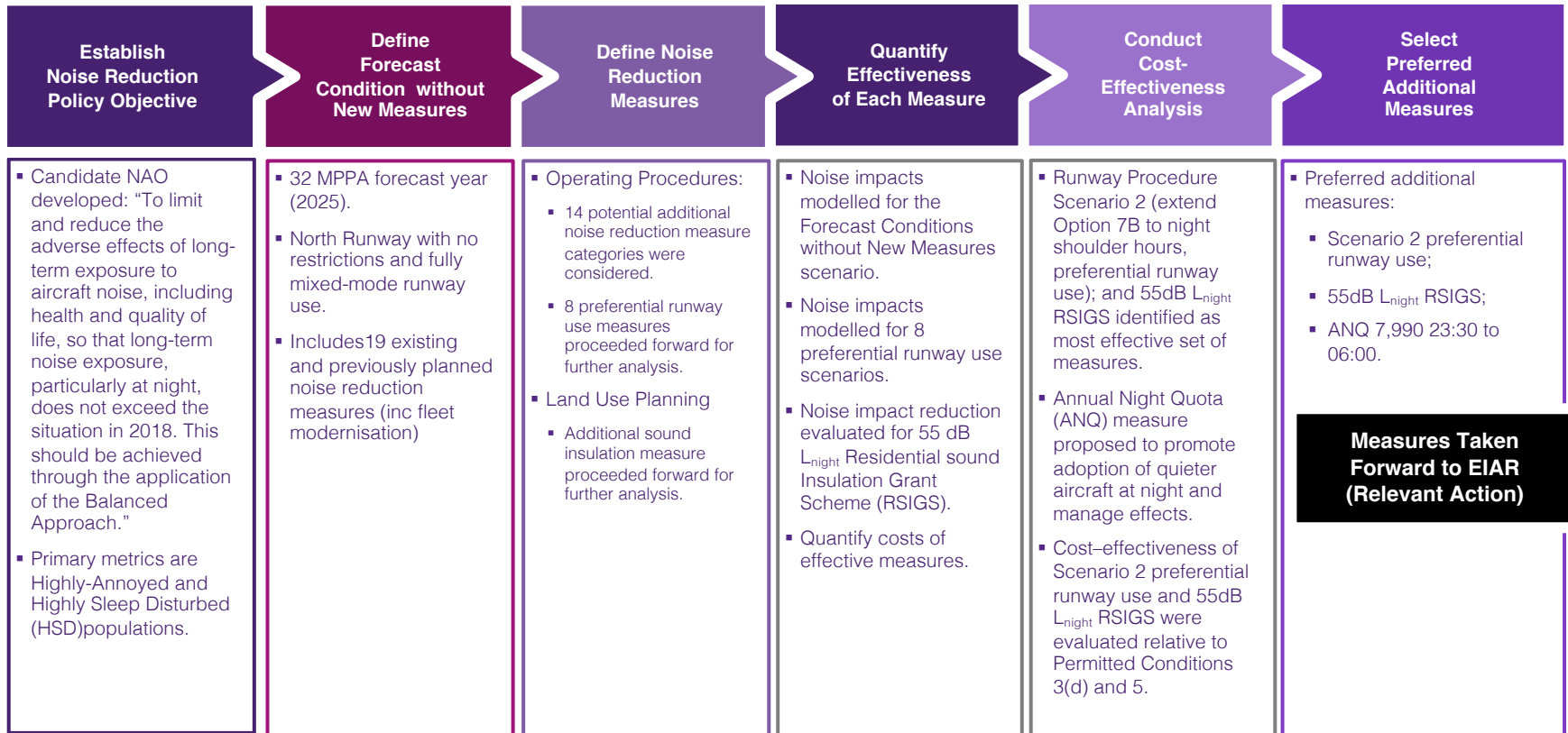
# daa overall approach to developing new noise measures.

Proposed noise measures based on the ICAO Balanced Approach – evaluated consistent with the requirements of EU598/2014 to meet a candidate NAO and daa noise goals. Selected new measures are take forward into the EIAR.



# EU Regulation 598/2014 Process Summary Findings

The proposed package of measures is a more cost-effective mechanism for managing the impacts of noise compared with the permitted operation

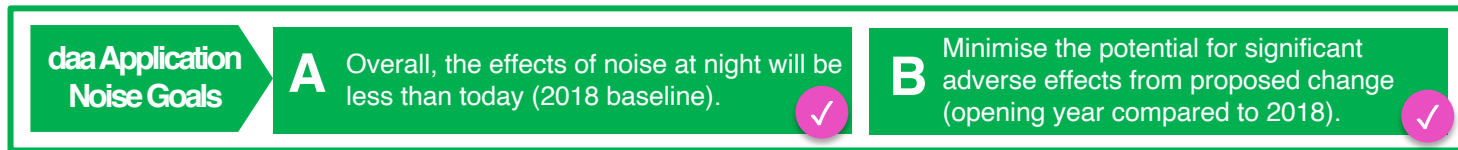


For further details description and analysis of this process see :

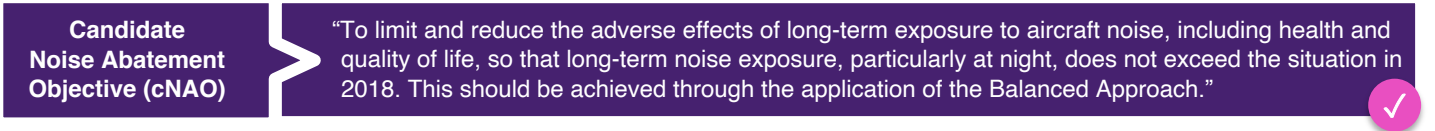
- Dublin Airport North Runway, Regulation 598/2014 (Aircraft Noise Regulation) Cost Effectiveness Analysis Report' (Revision 2 – September 2021). Ricondo and Associates Inc. September 2021.



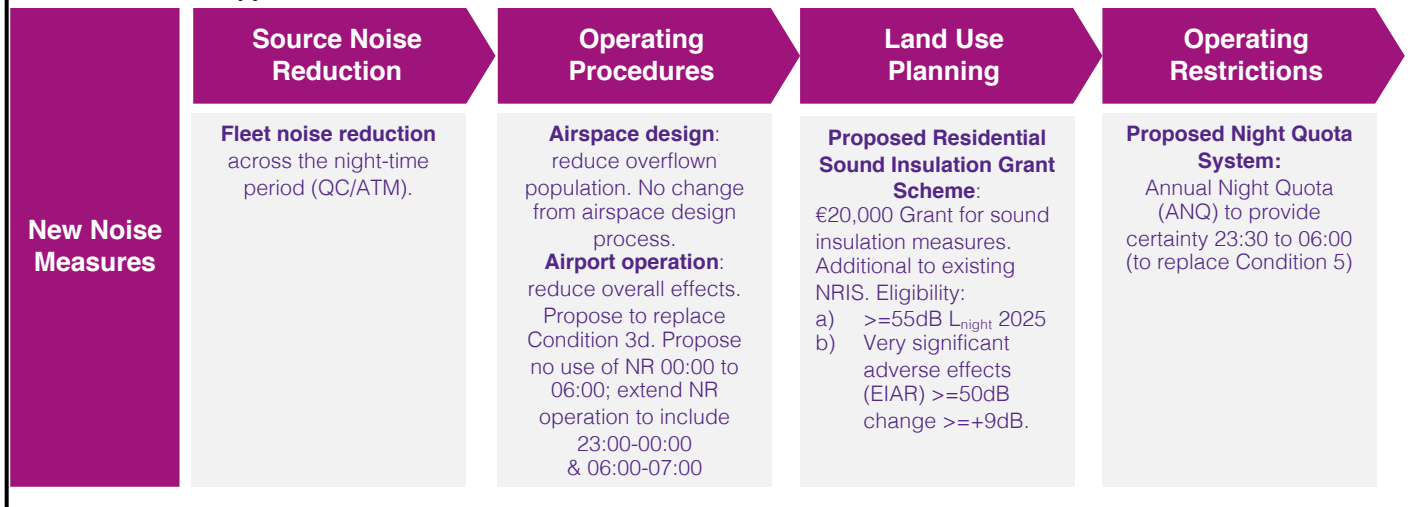
The proposed measures are more cost-effective for managing the impacts of noise consistent with the cNAO and daa noise goals than the permitted operation.



EU598/2014

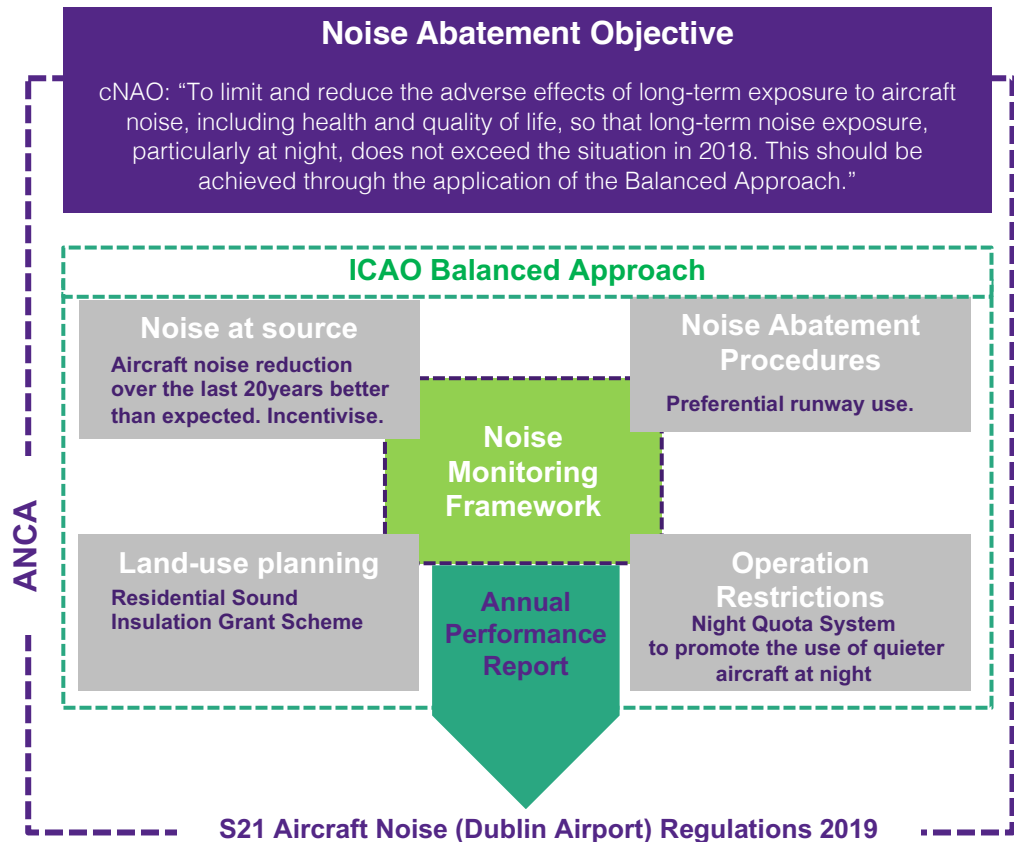


ICAO Balanced Approach



# Together with the proposed Noise Monitoring Framework the proposed package of measures will manage impacts of recovery such that the overall effects of noise will remain better than 2018 into the future.

- The proposed new measures are held together by the proposed NAO Monitoring Framework (NMF). They are a package of cost-effective developed to operate together – no one measure is developed to reduce effects alone.
- The proposals for a NMF include the production and submission to ANCA of an Annual Performance Report consistent with s19 of the Aircraft Noise (Dublin Airport) Regulations 2019 (further details of reporting proposals are presented in Section 3) and community noise monitoring and reporting. Compliance metrics are proposed.
- Where reported performance indicates concerns with respect to the NAO, appropriate modifications and actions would be considered through consultation between ANCA and daa consistent with the Aircraft Noise (Dublin Airport) Regulations 2019.
- It is noted that the cNAO upon which the analysis was based may not be the final NAO. Each of the elements of the ICAO Balanced Approach are summarised in Section 2.

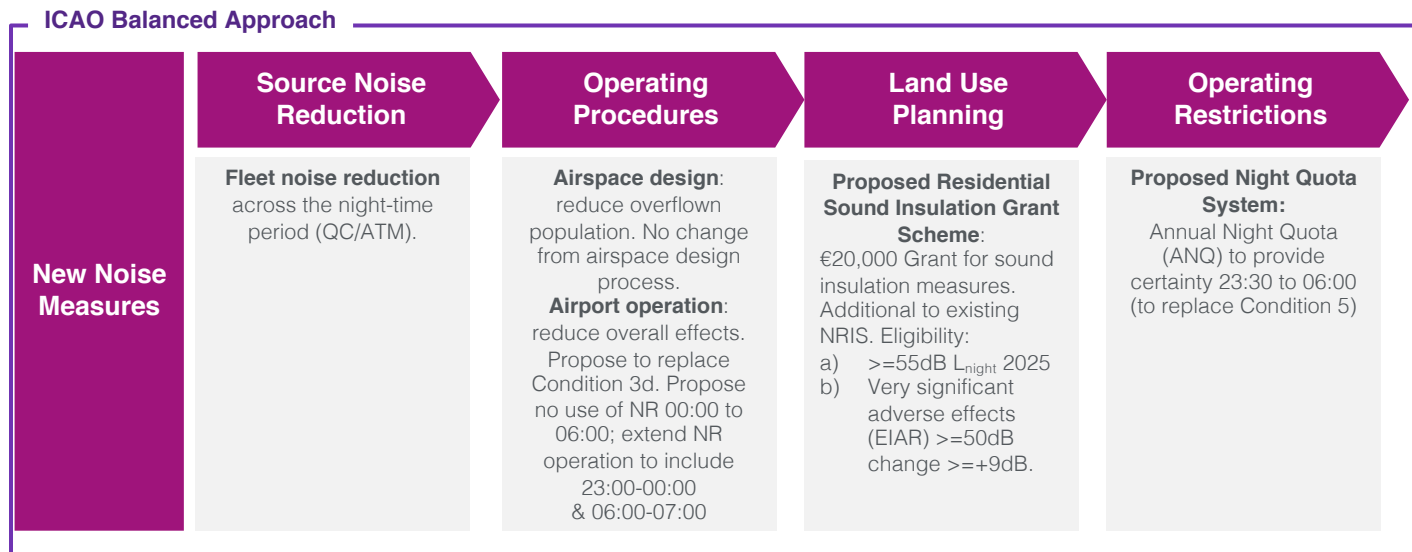




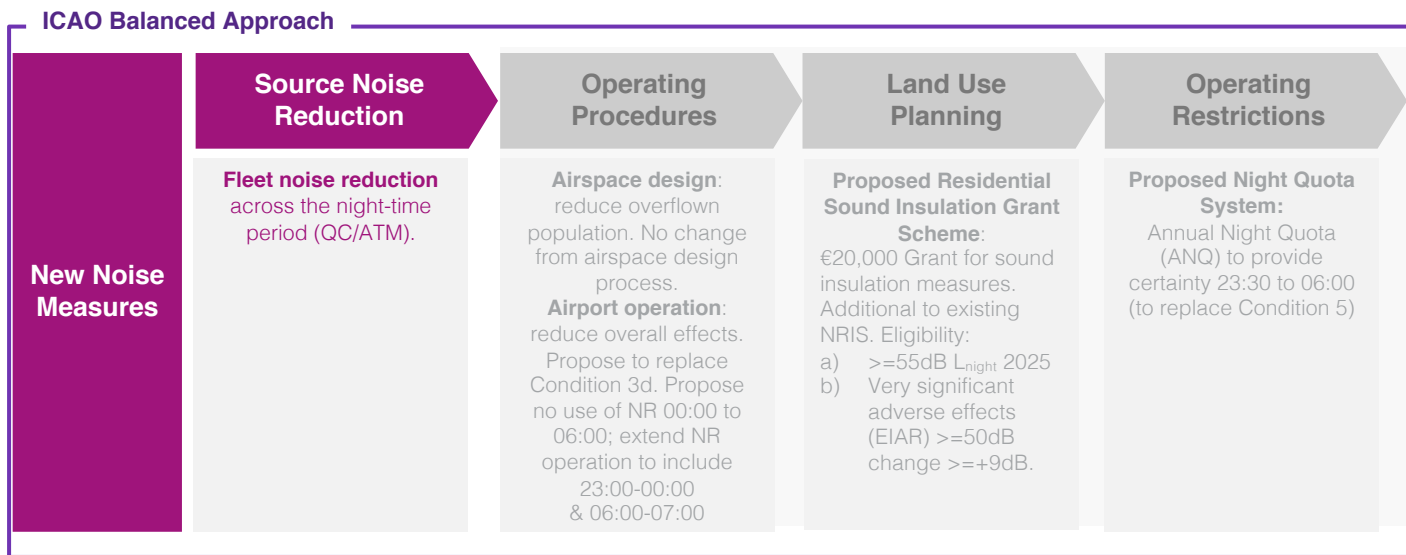
# Section 2:

## ICAO Balanced Approach

The following sections provide an overview of the new noise measures proposed for each of the aspects of the ICAO Balanced Approach.



# 2.1: ICAO Balanced Approach: Source Noise Reduction.



# ICAO Balanced Approach: Source Noise Reduction.

Fleet modernisation is a principal driver of noise reduction.

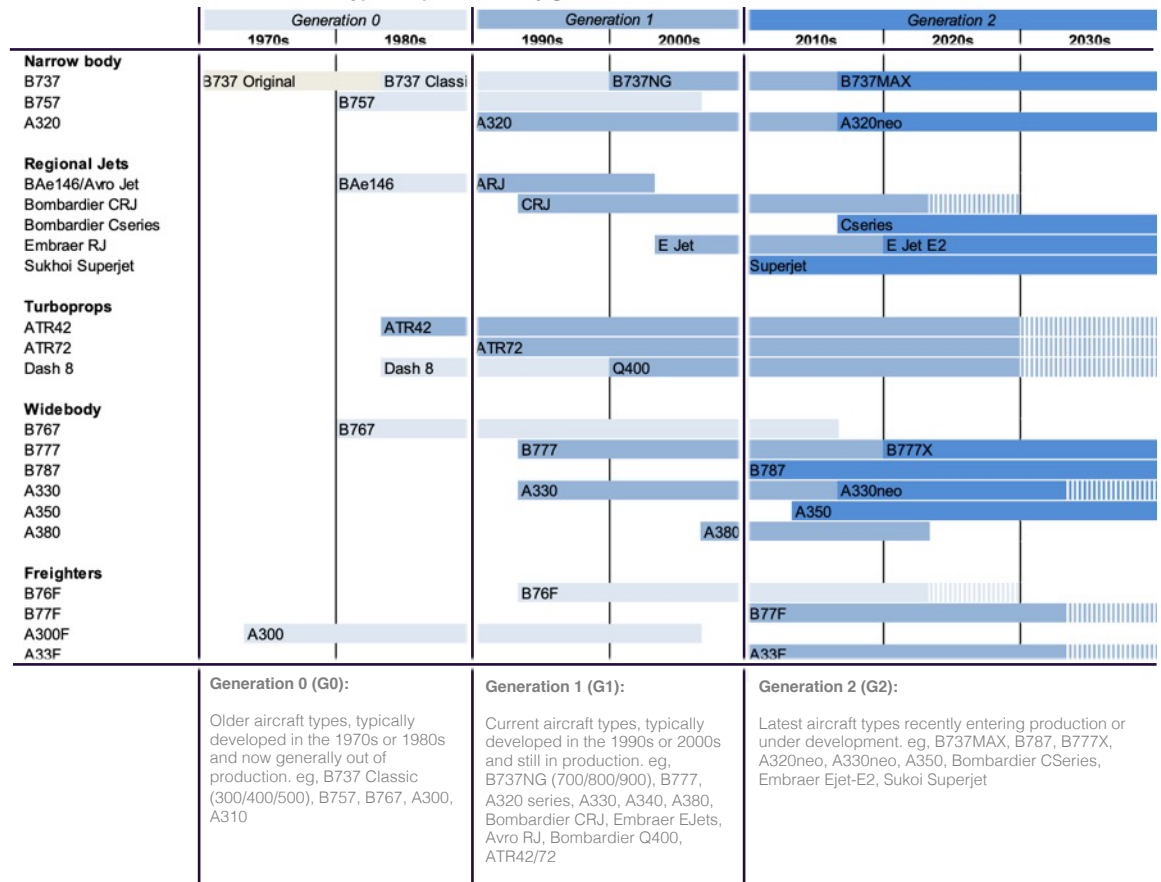
Aircraft noise reduction technology has significantly advanced in the last 30 years. There is typically a 20-30 year cycle between aircraft generations - the pace of development being largely influenced by the rate of improvement in technology (efficiency is the primary driver).

Once in service, an aircraft may have a life of around 20-25 in commercial operation. Consequently, an aircraft type may have an active service life of around 50 years. The 2010s marked the start of G2 aircraft entering service (with aircraft like the 787 and the A320neo) – increased adoption is expected across the 2020s (see figure to the right).

Fleet modernisation is a significant investment for an airline. It happens over time and as economics allow, to introduce more efficient aircraft to meet business needs.

## Commercial Aircraft Production Cycle

Dates of aircraft types in production by generation



Source: Dublin Airport Operating Restrictions, Quantification of Impacts on Future Growth, Updated analysis in response to the ANCA RFI, Mott MacDonald, June 2021.



# ICAO Balanced Approach: Source Noise Reduction.

## Forecast fleet modernisation and source noise reduction offsets effects of recovery growth.

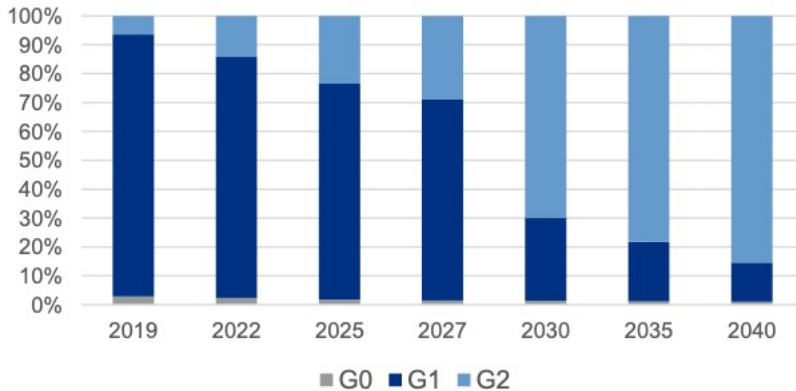
### Fleet Modernisation

The COVID-19 pandemic is having two types of impact on airline fleets. Firstly, some airlines are accelerating the retirement of older aircraft, which tend to be less fuel efficient and noisier; and secondly, some airlines are deferring the ordering and delivery of new aircraft types which tend to have better environmental performance.

Compared with pre-COVID-19 projections, there is likely to be a short-term improvement in average environmental performance of global airline fleets due to early retirement of older aircraft, but slower medium-term (next 5 years) improvement due to fewer G2 deliveries.

Based on analysis undertaken for daa by Mott MacDonald, the fleet operating at Dublin Airport is expected to comprise increasing proportions of G2 aircraft (figure to the right). By 2025 it is expected that 20-25% would be G2 (driven by early-retirement and life-expired aircraft types). The bulk of the modernisation is expected to occur after 2025, increasing the G2 share to ~70% by 2030.

**DUB Fleet Evolution 2019 - 2040**



### Noise reduction with G2 Replacements

The table to the right presents some examples of G1 aircraft and their replacement G2 aircraft with their respective QC values. It is noted that all the G2 replacements are known aircraft types and the respective arrival and departures QC values are reduced compared to the G1 equivalent.

As a result of the forecast fleet modernisation and source noise reductions for G2 aircraft, the annual QC/ATM between 2018 and 2025 across the period 11pm to 7am reduces from 0.52 to 0.48 (~8% reduction).

### Typical Aircraft QC Values

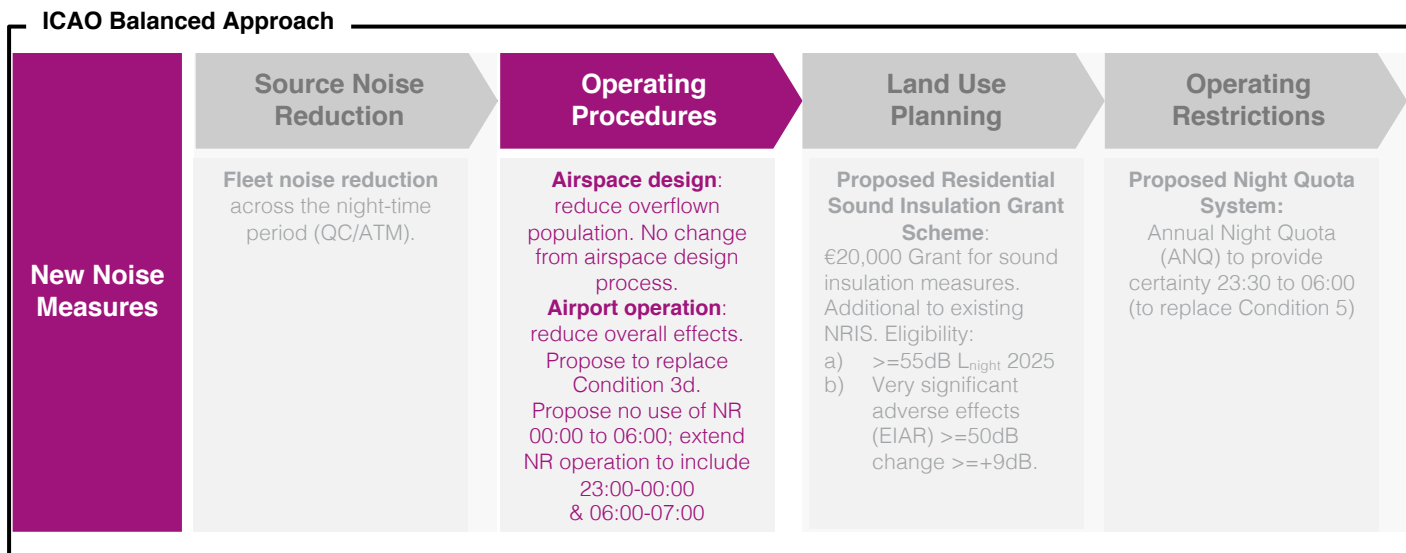
G1 Current type		G2 Replacement type	
<b>A320CEO</b>	QC	<b>A320NEO</b>	QC
Arrival:	0.25	Arrival:	0.125
Departure:	0.5	Departure:	0.25
<b>737-800</b>		<b>737-800 Max</b>	
Arrival:	0.5	Arrival:	0.25
Departure:	0.5	Departure:	0.25
<b>A330-300</b>		<b>A350-900</b>	
Arrival:	0.5	Arrival:	0.5
Departure:	2	Departure:	0.5
<b>B767-300</b>		<b>B787-900</b>	
Arrival:	1	Arrival:	0.5
Departure:	2	Departure:	1

Source:

- Dublin Airport Operating Restrictions, Quantification of Impacts on Future Growth, Updated analysis in response to the ANCA RFI, Mott MacDonald, June 2021
- Dublin Airport Proposed Night Quota System RFI Final. Anderson Acoustics. August 2021



## 2.2: ICAO Balanced Approach: Runway Operating Procedures.



# Summary of feasible runway operating procedure measures considered

## 8 Runway Operating Procedures Assessed and Considered in CEA - Scenario 2 preferred.

SCENARIO	TITLE	DESCRIPTION
Scenario 2	Option 7b and South Runway Only between 00:00 and 05:59	<p><b>06:00 to 23:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>00:00 to 05:59:</b> Movements preferred on the South Runway only (single runway).</p>
Scenario 3	Option 7b for 24-Hours	<p><b>24 hours:</b> When winds are westerly, 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. When winds are easterly, 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.</p>
Scenario 4	Option 7b and Reverse Option 7b between 23:00 and 06:59	<p><b>07:00 to 22:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>23:00 to 06:59:</b> When winds are westerly, Runway 28R shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. When winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10L shall be preferred for departing aircraft.</p>
Scenario 5	Option 7b and Alternate Option 7b and Reverse Option 7b between 23:00 and 06:59	<p><b>07:00 to 22:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>23:00 to 06:59:</b> Preferred arrival runway will alternate between North and South Runways while either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control in westerly and preferred departure runway will alternate between North and South Runways while either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft in easterly wind conditions each day.</p>
Scenario 7	Option 7b and Semi-Mixed Mode – Mixed Mode for Departures and Option 7b for Arrivals between 23:00 and 06:59	<p><b>07:00 to 22:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>23:00 to 06:59:</b> Both North and South Runways available for departures (runway used depends on whether turn to the north or south is required based on destination); prefer arrivals landing on the South Runway in westerly conditions and the North Runway in easterly conditions unless this exceeds the single-runway capacity for a given hour. If single-runway capacity is exceeded, then arrivals are moved to the other runway.</p>
Scenario 8	Option 7b and Semi-Mixed Mode – Mixed Mode for Arrivals and Option 7b for Departures between 23:00 and 06:59	<p><b>07:00 to 22:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>23:00 to 06:59:</b> Both North and South Runways available for arrivals (assumed 50/50 split); prefer departures take off on the North Runway in westerly conditions and the South Runway in easterly conditions.</p>
Scenario 9	Option 7b and North Runway Only between 00:00 and 05:59	<p><b>06:00 to 23:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>00:00 to 05:59:</b> Movements preferred on the North Runway only (single runway).</p>
Scenario 10	Option 7b and Alternate Use of North and South Runway between 00:00 and 05:59	<p><b>06:00 to 23:59:</b> When winds are westerly, 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. When winds are easterly, 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.</p> <p><b>00:00 to 05:59:</b> Alternate each night between movements on the North Runway only and the South Runway only.</p>

For further details description and analysis of these options see :

- Dublin Airport North Runway, Regulation 598/2014 (Aircraft Noise Regulation) Cost Effectiveness Analysis Report' (Revision 2 – September 2021). Ricondo and Associates Inc. September 2021.



# Preferred Night-time Runway Operation - Scenario 2 Summary

## Option 7b and South Runway Only between 0000 and 0600

### Daytime

#### 0700 to 2359:

When winds are westerly, 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.

When winds are easterly, 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.

### Night-time

#### 2300 to 2359:

When winds are westerly, 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.

When winds are easterly, 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.

#### 0000 to 0559:

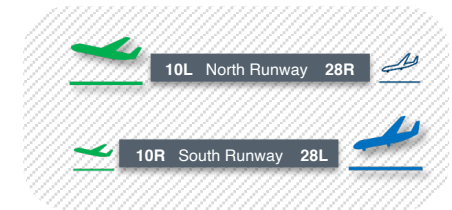
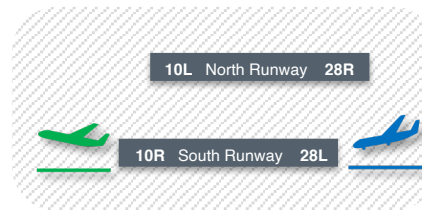
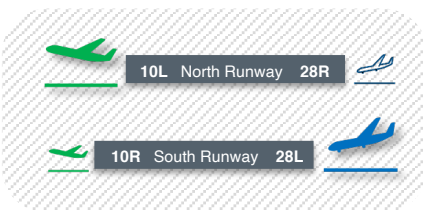
Runway 10L-28R shall not be used for take-off or landing except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10L-28R length is required for a specific aircraft type.'

#### 0600 to 0659:

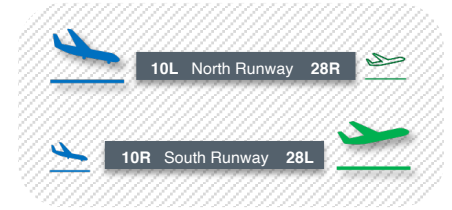
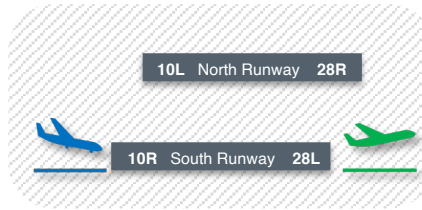
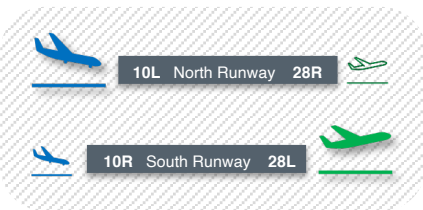
When winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control.

When winds are easterly, 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.

### Westerly wind → ← Westerly Operations



### Easterly Operations ← → Easterly wind



Source: Dublin Airport North Runway, Regulation 598/2014 (Aircraft Noise Regulation) Cost Effectiveness Analysis Report' (Revision 2 – September 2021). Ricondo and Associates Inc. September 2021.



# Runway Operating Scenario 2

Overall effects of noise at night are predicted to be better than 2018 and will remain so into the future.

Night-noise Goal A was to ensure that, with the north runway operating at night (11pm-7am), the overall effects of noise as measured by the population exposed >40dB  $L_{night}$  and population highly sleep disturbed (HSD) will not exceed the overall noise effects of 2018 (applying consistent baseline population).

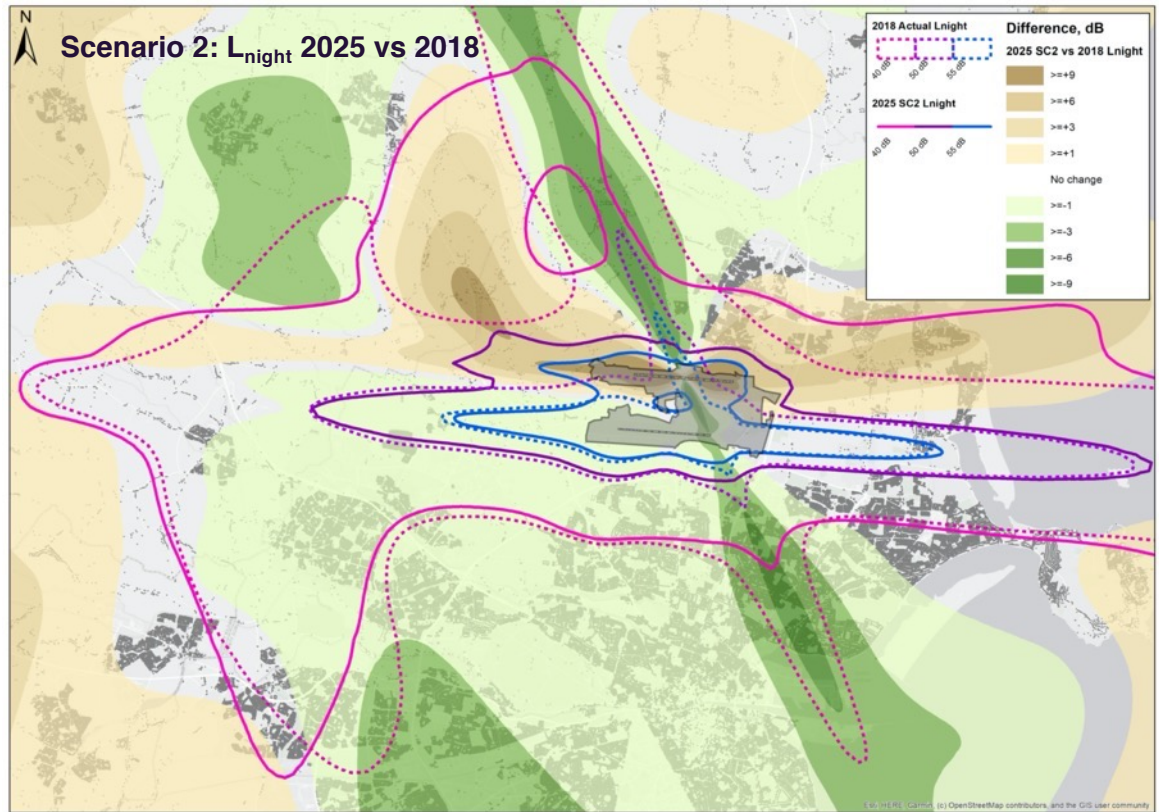
The figure presents the 40dB, 50dB and 55dB  $L_{night}$  contours for 2018 and 2025 for Scenario 2.

Analysis of the population and effects indicates that with Scenario 2 Runway Operating procedure:

- the population exposed to noise levels greater than 40dB  $L_{night}$  reduces by 10-15% when compared with 2018; and
- the number of people highly sleep disturbed reduces by 10-15% when scenario 2 is compared with 2018.

These improvements arise from a combination of fleet modernisation; the preferred NR airspace design; and the preferred runway operating scenario (scenario 2).

The population exposed to “high” noise levels increases compared to 2018. A Residential Sound Insulation Grant Scheme (RSIGS) has been proposed to reduce the potential for significant adverse effects associated with population exposed to noise levels >55dB.



Case	Population		
	>40dB $L_{night}$	>55dB $L_{night}$	Highly Sleep Disturbed
2018	307,460	755	42,260
<b>Scenario 2 2025 (Relevant action)</b>	<b>268,500</b>	<b>1,060</b>	<b>37,080</b>

All population and effects statistics are based on existing population data, populations from consented developments are not included in the above analysis.

For noise ratings and detailed assessment see: Chapter 13. Dublin Airport North Runway Relevant Action Application – Revised Environmental Impact Assessment Report (EIAR), prepared by AECOM, September 2021





## 2.3 ICAO Balanced Approach: Land Use Planning. Residential Sound Insulation Grant Scheme



# Land Use Planning. Residential Sound Insulation Grant Scheme.

## Minimising the potential for significant adverse effects arising from Scenario 2.

- Consistent with the application of the ICAO Balanced Approach, daa is proposing a Residential Sound Insulation Grant Scheme (RSIGS) as part of the package of measures submitted in support of the planning application and associated EIA (Relevant Action) to amend Condition 3(d) and replace Condition 5 of the existing planning permission for the North Runway.
- The RSIGS will make available a grant of up to €20,000 for the installation of noise insulation measures for eligible dwellings.
- Dwellings are considered eligible if they meet either of the following noise related criteria:
  1. Dwellings forecast to be exposed to “high” night-time noise levels in 2025 - at least 55dB  $L_{night}$ .
  2. Dwellings with a “very significant” rating arising from forecast noise levels of at least 50dB  $L_{night}$  in the first full year when the Relevant Action comes into operation, with a change of at least +9dB when compared with the current permitted operation in the same equivalent year.
- The North Runway Insulation Scheme (NRIS) from Condition 7 of the North Runway Planning Permission will continue to be in place.
- Properties that have received noise insulation measures through the existing HSIP scheme would not be eligible for the RSIGS. Upon operation of the Relevant Action the current HSIP scheme will come to an end - the NRIS and the RSIGS will form the noise insulation scheme offers for Dublin Airport.
- It is also proposed that dwellings approved for construction after the December 2020 Relevant Action Application that fall within any of the noise insulation areas would not be eligible for either scheme.
- Initial Criteria 1 eligibility for the grant scheme will be based on the 2025  $L_{night}$  forecast presented in the revised EIAR.
- Bi-annual, retrospective reviews that align with the reviews of the existing North Runway scheme are proposed. At each review, the actual historic contours will be compared with the forecast for 2025.
- Criteria 2 eligibility is based on forecasts for the first year of operation of the Relevant Action. For the purposes of the application and the assessment this has been assumed to be 2022. However, if that year is later than 2022, the +9dB area will be reviewed for the revised first year and adjusted accordingly. It is proposed that the area of eligibility will be reviewed in the year after the Relevant Action comes into operation by comparing the actual +9dB change area with that included as part of the application and will be adjusted accordingly. As this area is only applicable to the change in the first year, this review will happen once.
- Final details of the scheme will be finalised and agreed with the Competent Authority in due course, but the approach will utilise the experiences gained on the existing insulation scheme in terms of products and specifications that would be recommended for installation.
- The following slides presents the areas of eligibility for each of the criteria.
- Consistent with the Environmental Impact Assessment for the Relevant Action Planning Application all analysis is based on GeoDirectory data for 2019 Q2. It is recognised that there maybe some dwellings that have been built since that data was compiled. Prior to finalisation of the scheme details the eligible dwellings will be reviewed to ensure all that all those eligible are included.



# Land Use Planning. Residential Sound Insulation Grant Scheme.

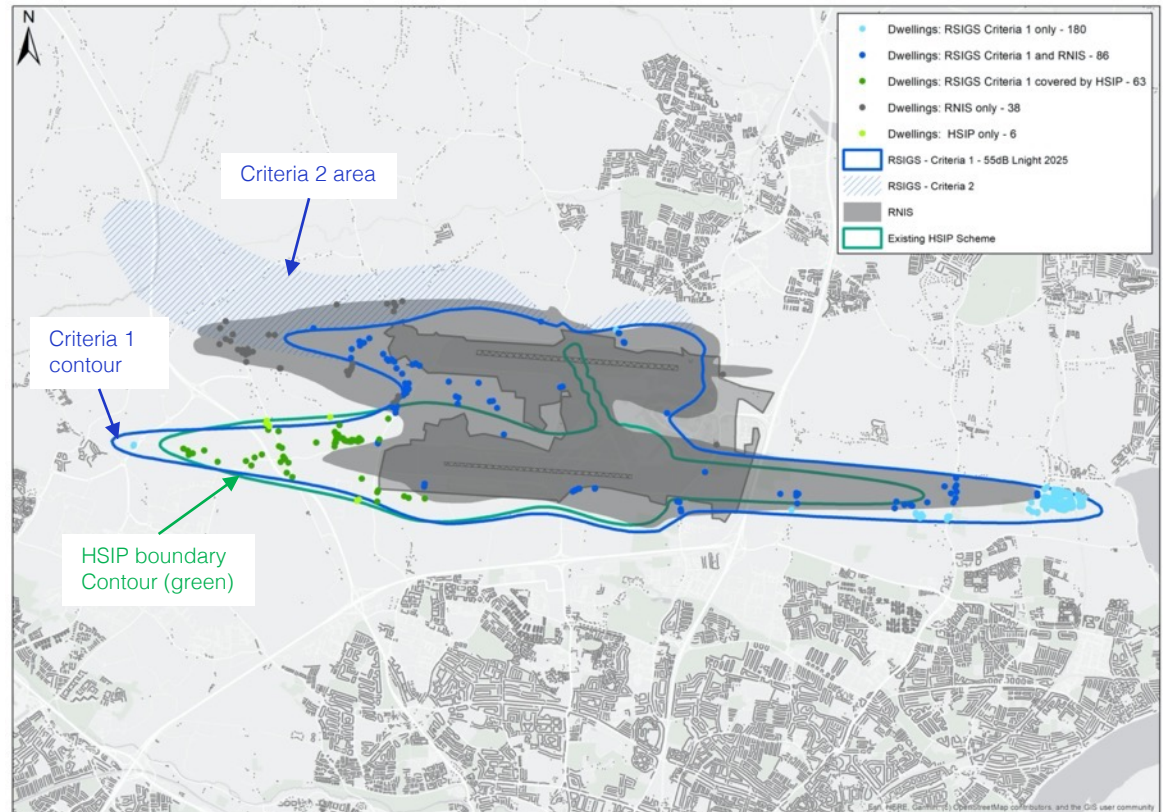
## Minimising the potential for significant adverse effects arising from Scenario 2.

Dwellings are eligible for RSIGS if they are not eligible for insulation under the existing HSIP and RNIS schemes, and satisfy either of the following noise-based criteria:

- **Criteria 1:** Dwellings forecast to be exposed to “high” night-time noise levels in 2025 - at least 55dB  $L_{night}$  (dark blue contour line in figure); **OR**
- **Criteria 2:** Dwellings with a “very significant” rating arising from forecast noise levels of at least 50dB  $L_{night}$  and a change of at least +9dB in the first full year when the Relevant Action comes into operation when compared with the permitted operation in the same equivalent year (area indicated by blue hatched area in the figure).

Analysis indicates the following dimensions of the proposed RSIGS.

- **Criteria 1:** Approximately 335 dwellings in total are forecast to be exposed to noise levels greater than 55 dB  $L_{night}$ . Approximately 90 of these are already included as part of the RNIS (dark blue dots in the grey shaded area) and 63 as part of the HSIP (green contour and dots) which leaves approximately 180 dwellings eligible as a result of Criteria 1 only (bright blue dots).
- **Criteria 2:** Approximately 67 dwellings in total meet this criteria - located predominantly to the north-west of the airport (blue hatched area). Of these, approximately 13 are already included as part of the RNIS (overlap of grey and blue hatched area) and none included in the HSIP. This leaves approximately 54 dwellings in the area identified for RSIGS criteria 2.



# Land Use Planning. Residential Sound Insulation Grant Scheme.

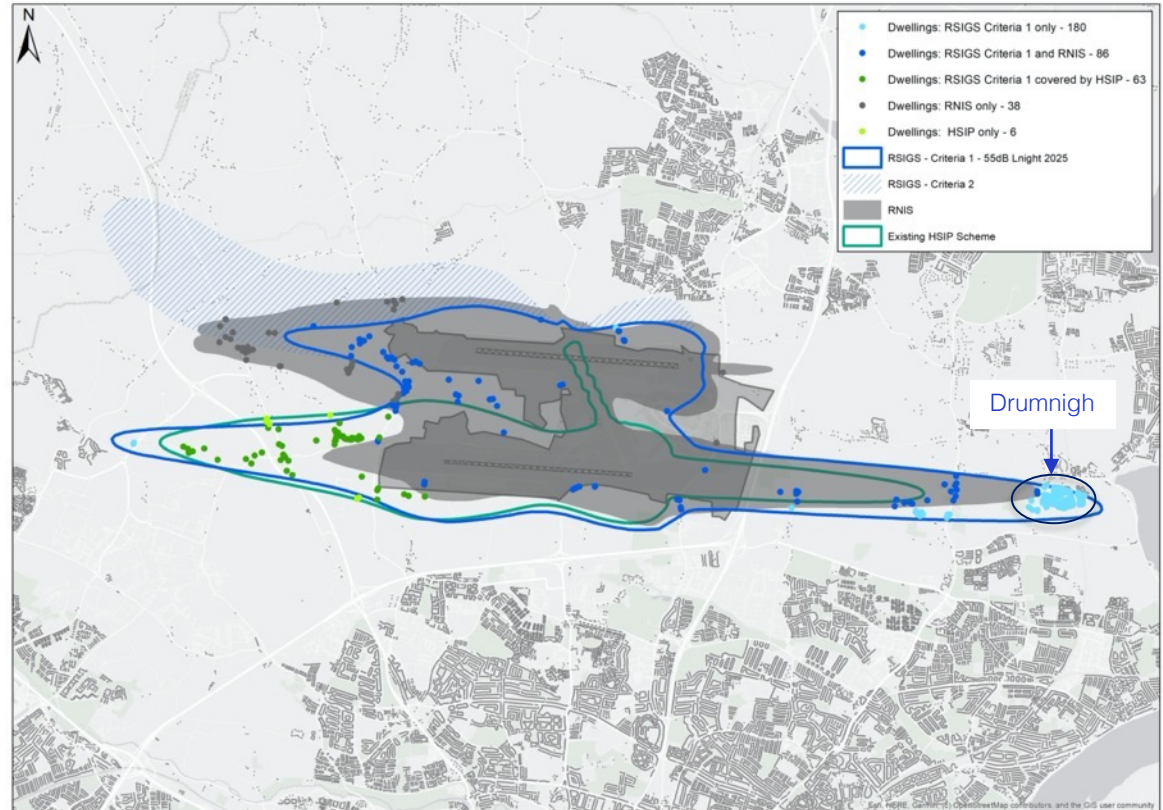
## Consideration of Drumnigh

Of the dwellings eligible through Criteria 1, around 160 (88%) are in the Drumnigh area (indicated in the figure to the right). These dwellings are forecast to experience a change of 0-1 dB compared to 2018 - which could be considered as no change.

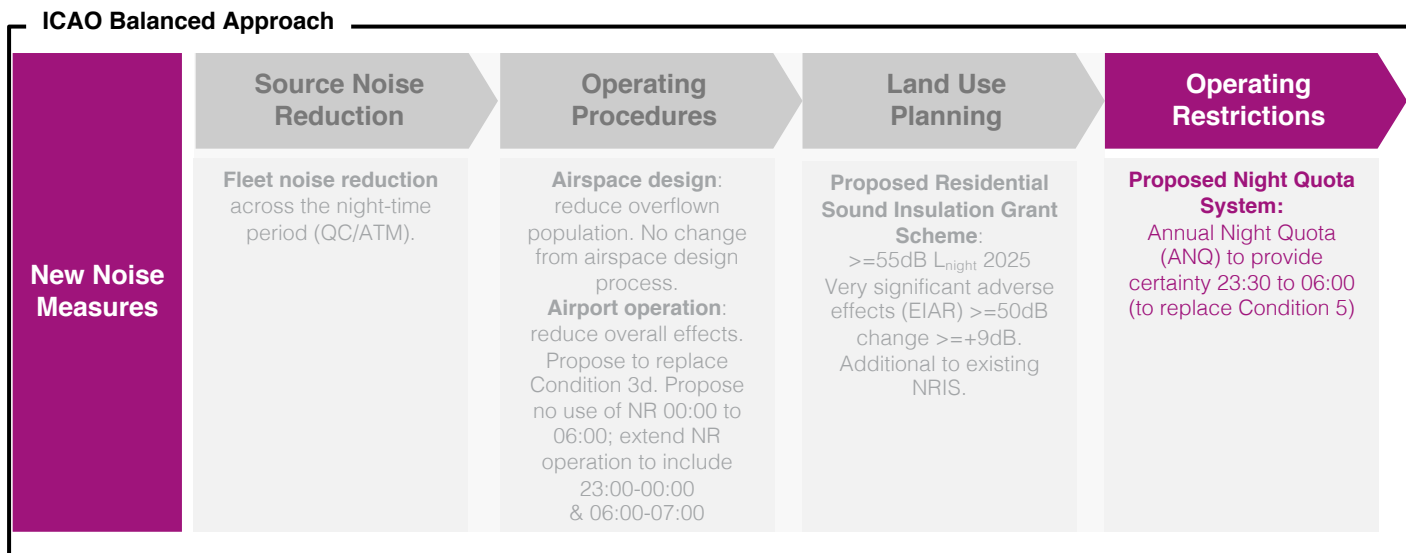
Most of these properties were constructed after the introduction of the Dublin Airport Noise Zones within the Fingal County Development Plans and Dublin Airport Local Area Plans. As such, their grant of planning permission by Fingal County Council would have included a condition for appropriate sound insulation. It can be reasonably assumed that these dwellings would therefore already be insulated to a high standard. It is also possible that residents of these dwellings are unlikely to want to consider disruption to, what are, new dwellings, for what is likely to be of minimal if any benefit.

Installation of new sound insulation measures would not give the same level of benefit to those properties compared to dwellings exposed to night-noise levels >55 dB which were built before the introduction of noise zones and FCC's associated planning requirements.

ANCA may wish to consider eligibility of dwellings to the proposed scheme for newly developed areas within the Dublin Airport Noise Zones, such as Drumnigh, where a high standard of noise insulation would already have been required as part of planning approvals, and where little change is forecast compared to their planning application. This could provide an opportunity to focus grant scheme funding on properties which do not currently benefit from high standards of sound insulation.



# 2.4: ICAO Balanced Approach: Operating Restrictions. Night Quota System

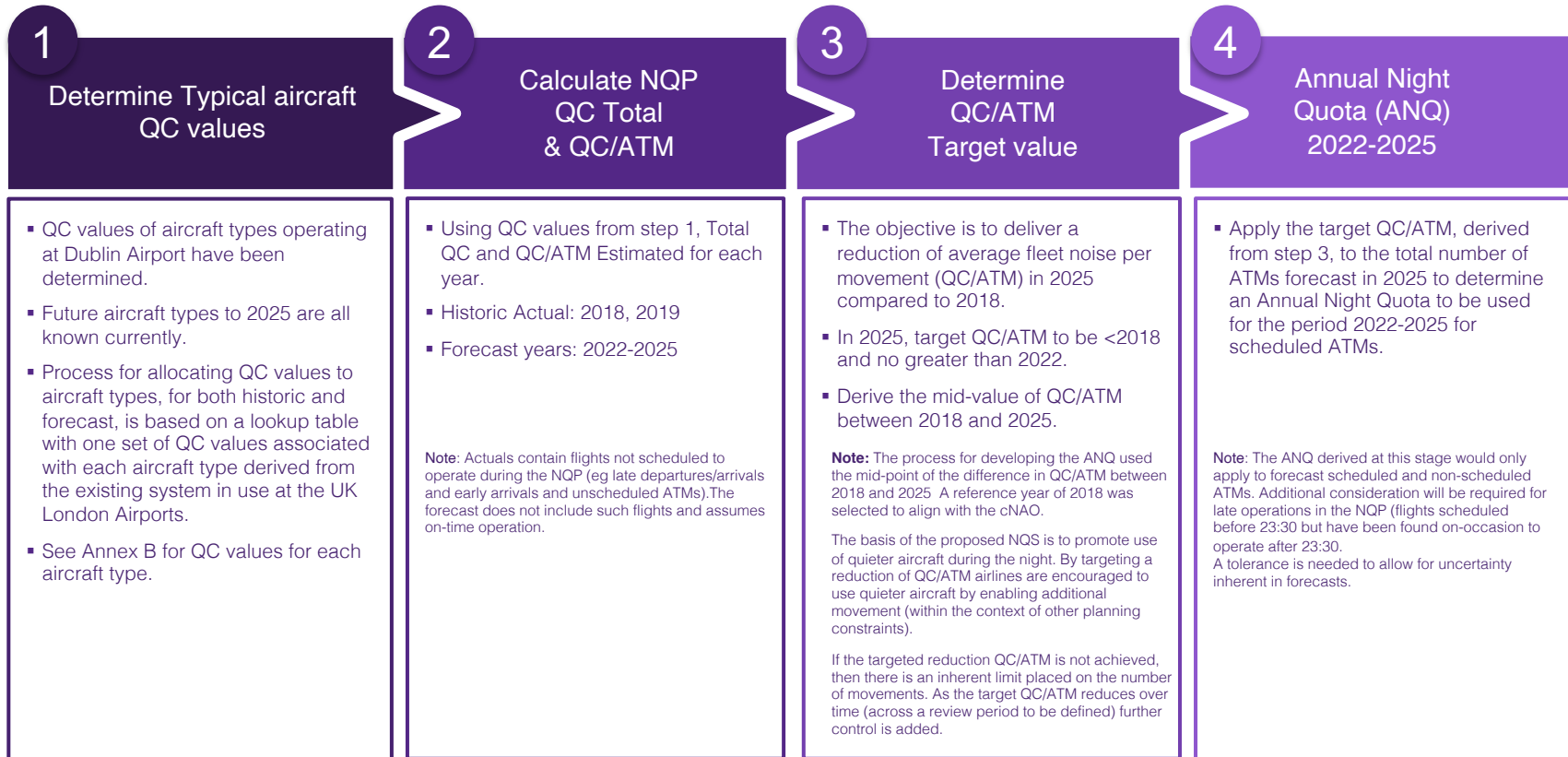


# Overview of the Night Quota System and key considerations

- A **Night Quota System** is designed to limit the overall amount of noise produced by aircraft using an airport based on a Night Quota allowance for a given time period. daa proposals are based on the system currently in operation at the UK London Airports.
- A **QC** (Quota Count) value is assigned to each individual aircraft movement based on noise levels provided on the aircraft's Noise Certificate. Current QC bands are 0.125, 0.25, 0.5, 1, 2, 4, 8 and 16 – a lower QC for aircraft with lower noise levels, higher QC for noisier aircraft. Aircraft have separate QC values for arrival and departure.
- The QC for each aircraft movement accumulates against an **Annual Noise Quota** across a chosen time period across the night (the **Night Quota Period**, NQP). The NQP in this proposal is defined as **23:30-06:00** which is consistent with the UK London Airports. As such, a greater number of quieter aircraft movements could operate within a given quota, thereby encouraging the use of quieter aircraft at the airport, whilst keeping overall noise levels consistent.
- **The proposals for a Night Quota System are for an Annual Night Quota (ANQ) of 7,990 applied to a 6.5h Night Quota Period (23:30 to 05:59).** Draft implementation proposals are provided and are based on those in place currently at Stansted Airport. These will be finalised in advance of the ANQ coming into place should the Relevant Action application be granted permission.
- daa consider that a **movements-based constraint would not promote the use of quieter aircraft during the night consistent with achieving the effects-based outcomes of the cNAO**. The use of Quota based approach incentivises airlines to continue to modernise. The overall 8h effects-based outcomes of the cNAO provide an inherent constraint on movements.
- **EU598** considers an NQS measure to be an operating restriction. Analysis indicates that proposals for replacement of Condition 3d and 5 with Scenario 2 (and other measures) are sufficient for cNAO compliance and therefore, consistent with the application of EU598, operating restriction measures are not necessary. However, daa is proposing an NQS to provide further assurances around the control of noise at night and to encourage the continued update of the fleet operating at Dublin Airport to comprise more, quieter aircraft (consistent with noise at source considerations as per the ICAO Balanced Approach).
- Draft implementation proposals propose the **ANQ be split across winter and summer seasons** for effective management and seasonal scheduling requirements. Analysis of historic QC use (with QC applied retrospectively as no similar system is currently in place) indicates that the annual quota would be split approximately 70%/30% between summer and winter seasons respectively.
- An Annual Night Quota (ANQ) is proposed for a **6.5h Night Quota Period** (NQP) of 23:30 to 06:00. This period has been selected to be consistent with airports operating similar QC based systems. This protects the periods of the night-time considered to be most sensitive to local communities, whilst balancing growth in the 06:00 to 07:00 period that is essential for the development of European short-haul connectivity (time difference constraints) and will accommodate the forecasted growth in the night period.
- At this time, given the need to enable recovery post-pandemic and the uncertainties inherent in forecasting, **reductions in ANQ are not proposed**. Future ANQ reductions could be considered in line with reviews above.
- For detailed analysis and presentation of the Night Quota System Proposals please see:
  - Dublin Airport Proposed Night Quota System RFI Final. Anderson Acoustics. August 2021

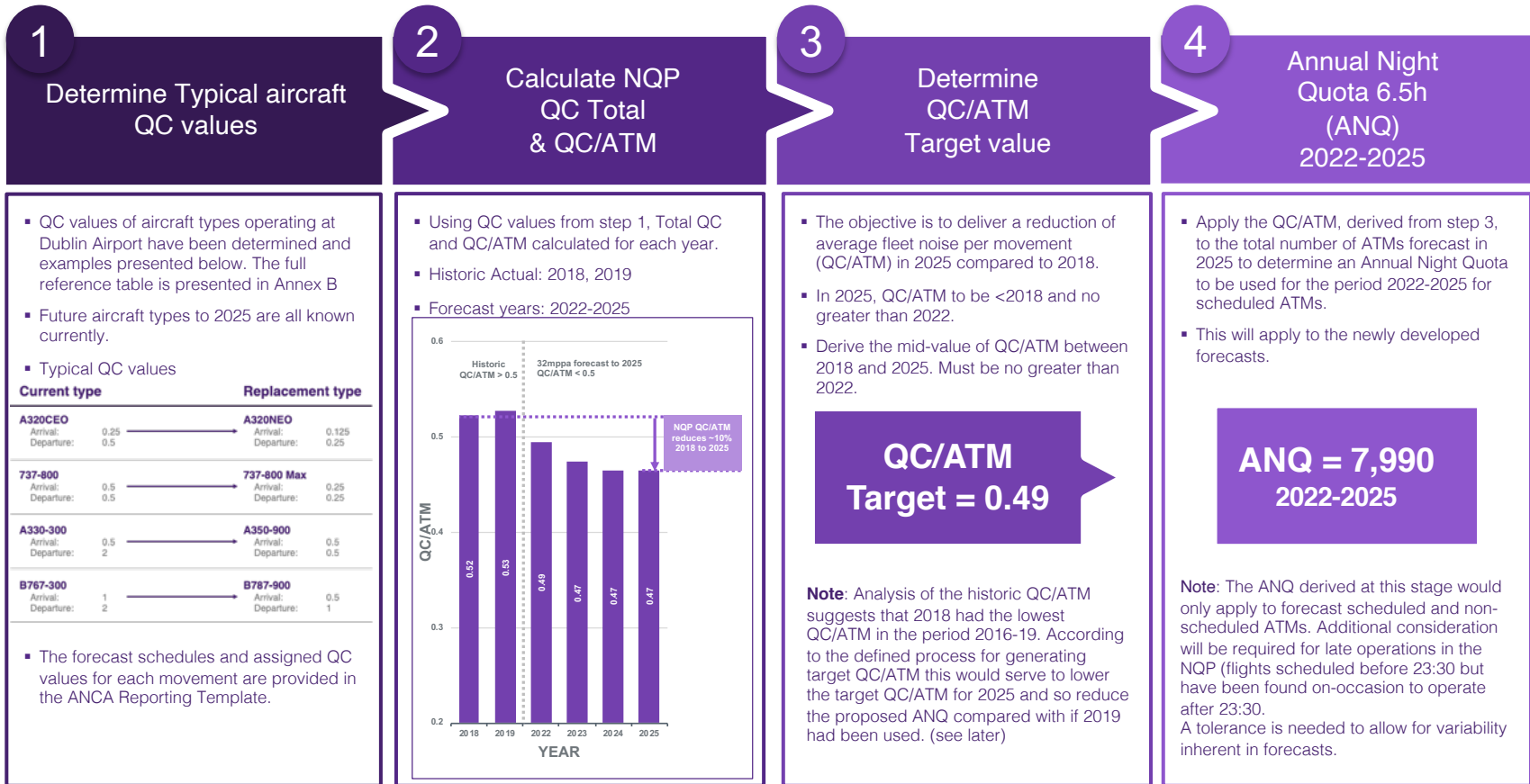


# Proposed 4 step process for calculating the Annual Night Quota



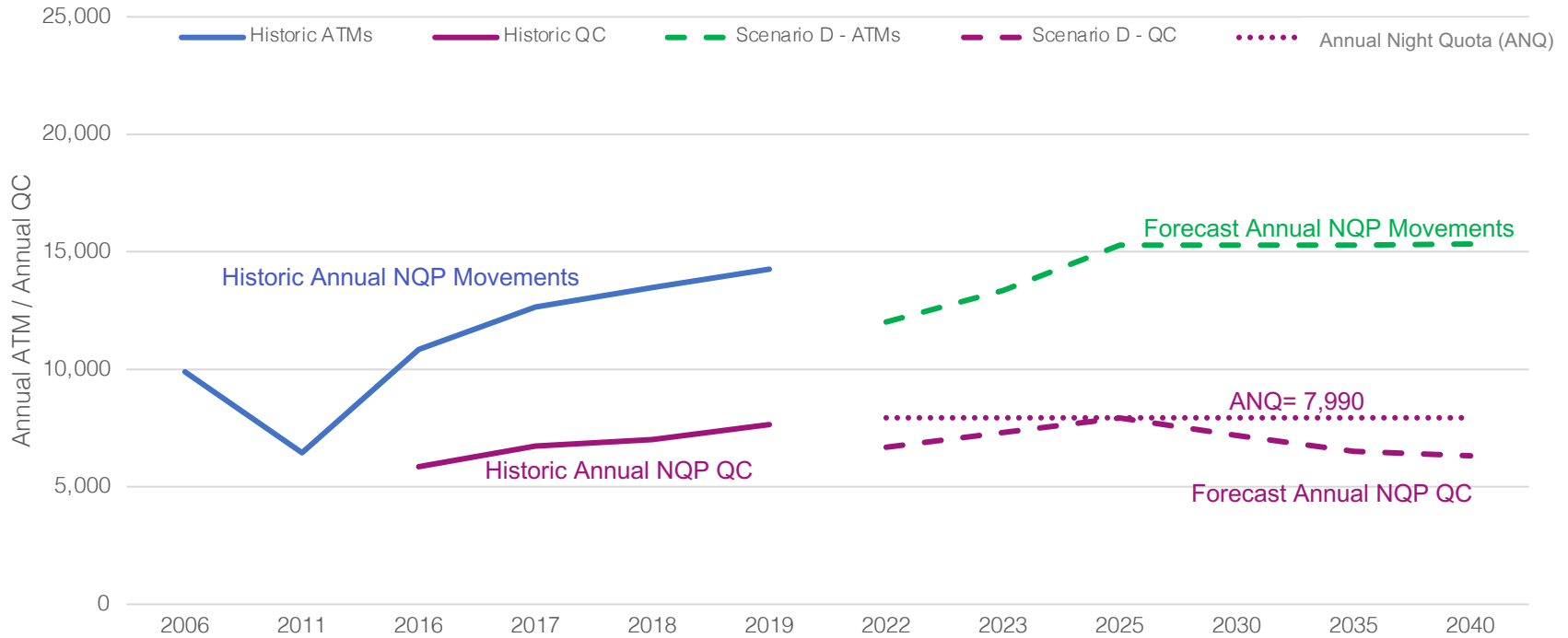
# Proposed Annual Night Quota for 6.5h Night Quota Period = 7,990

The calculations for the proposed ANQ using the proposed 4 step process are based on the forecasts used for the December 2020 Application and are unchanged with revised forecasts.





# 6.5h Night Quota Period Annual Night Quota – Movements and QC Relevant Action (32 million passengers cap in place beyond 2025)



Year	Actuals						Forecast – 32mppa cap					
	2006	2011	2016	2017	2018	2019	2022	2023	2025	2030	2035	2040
ATMs	9,892	6,450	10,850	12,641	13,479	14,263	12,016	13,362	15,292	15,292	15,292	15,334
QC			5,857	6,741	7,004	7,650	6,684	7,302	7,931	7,198	6,507	6,321
ANQ							7,990					
QC headroom							-16%	-8%	<1%	-9%	-18%	-20%



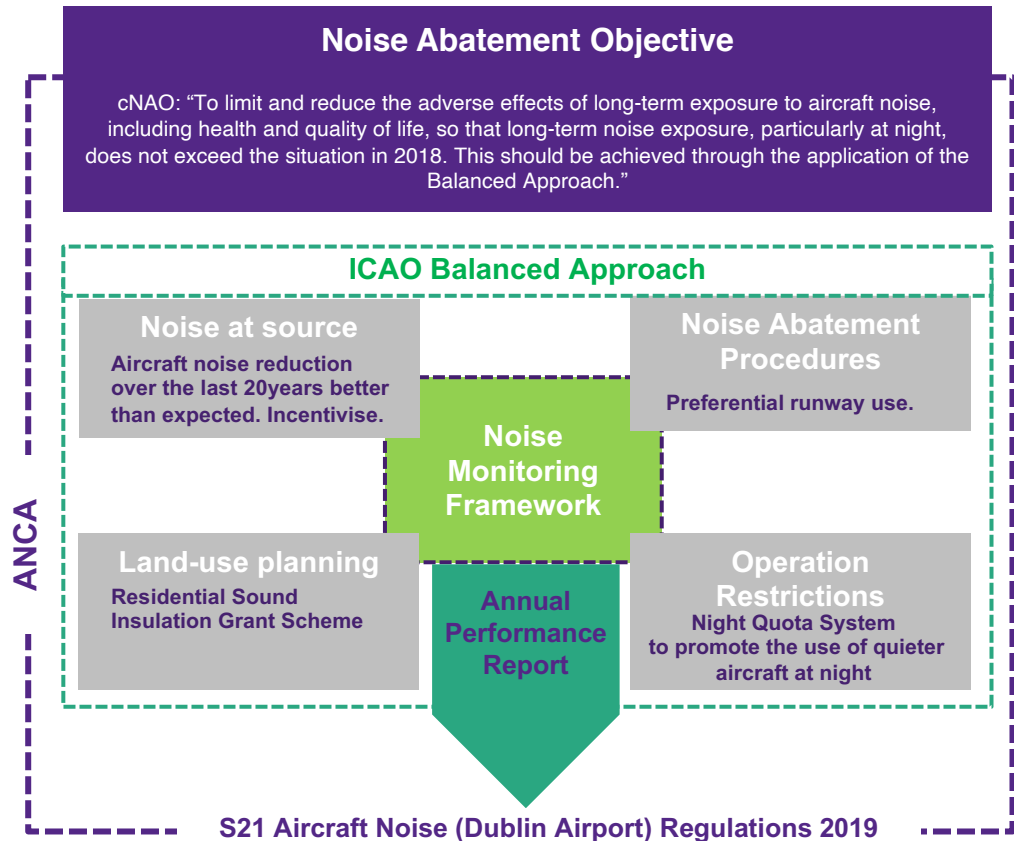
# Section 3: Noise Performance Reporting

Noise performance will be reported annually alongside other areas of NAO reporting consistent with the requirements of s19 Aircraft Noise (Dublin Airport) Regulations 2019.



# Together with the proposed Noise Monitoring Framework the proposed package of measures will manage impacts of recovery such that the overall effects of noise will remain better than 2018 into the future.

- The proposed new measures are held together by the proposed NAO Monitoring Framework (NMF). They are a package of cost-effective developed to operate together – no one measure is developed to reduce effects alone.
- The proposals for a NMF include the production and submission to ANCA of an Annual Performance Report consistent with s19 of the Aircraft Noise (Dublin Airport) Regulations 2019 (further details of reporting proposals are presented in Section 3) and community noise monitoring and reporting. Compliance metrics are proposed.
- Where reported performance indicates concerns with respect to the NAO, appropriate modifications and actions would be considered through consultation between ANCA and daa consistent with the Aircraft Noise (Dublin Airport) Regulations 2019.
- It is noted that the cNAO upon which the analysis was based may not be the final NAO. Changes to the NAO from the cNAO proposed by daa could require a different set of measures and subsequent re-evaluation of those measures consistent with EU598.



# Noise Monitoring and Reporting Framework

## • Monitoring and Reporting

The following will be reported:

- **Effects of aircraft noise:**
  - The number of people highly annoyed and highly sleep disturbed. Consistent with EU Directive 2020/367 and reported for the previous calendar year and forecast 2025.
- **Aircraft noise exposure:**
  - Aircraft noise contours and associated area, population and dwellings (and other noise sensitive properties). In 5 dB bands, from 45 dB to 75 dB  $L_{den}$  and 40dB to 70 dB  $L_{night}$ . For the previous calendar year and forecast 2025.
- **Aircraft Source Noise Measures:**
  - Night Quota System - the number of ATMs and QC will be reported for the previous year, the next year NQP and out to an agreed forecast year, with a break down for each of the QC bands and the QC/ATM.
  - The same information will be reported for the full Night Period.
- **Operational Measures**
  - For the previous year calendar year, the number of arriving and departing aircraft and their associated QC totals using each runway during the periods 23:00-00:00, 00:00-06:00 and 06:00-06:59.
  - This will be averaged to indicate "per night" equivalent values. This will also be provided for a monthly breakdown.
- **Noise Insulation Scheme Reporting.**
  - The number of dwellings eligible and total grants administered under night noise insulation scheme to be reported each year.
- **Community Noise Reporting (in addition to Condition10)**
  - Noise reports will be developed working with ANCA and the local communities to present an overall picture of the airport's operation and effects which could include the information above.
  - In consultation with ANCA and local communities daa will develop a community noise monitoring programme to report specific noise related outcomes from the airport operation.
  - daa in collaboration from IAA will make available noise and flight track information to the local community.
  - The number and nature of noise complainants will be reported monthly and annually.

## • Night Quota System Performance Reporting

- Specific ANQ performance be monitored and reported annually.
- This would include reporting the actual use of the ANQ for the previous year and forecasts for future years to 2025 (or other forecast year to be agreed) and would be split by seasons (summer and winter).

## • NAO Performance Reporting

The following metrics are proposed for consideration of performance with respect to the NAO for the previous year and 2025 with respect to effects and exposure:

- The overall number of people exposed to noise  $\geq 55$ dB  $L_{den}$  compared with the equivalent value for 2018
- The overall number of people considered highly annoyed compared with the equivalent value for 2018
- The overall number of people exposed to noise  $\geq 40$ dB  $L_{night}$  compared with the equivalent value for 2018.
- The overall number of people considered highly sleep disturbed compared with the equivalent value for 2018.
- The Area of the contour outlining those exposed to significant levels of noise at night ( $>55$ dB  $L_{night}$ ).

Where NAO performance reporting raises concerns about compliance with the NAO these would be discussed and considered in consultation between ANCA and daa consistent with the ICAO Balanced Approach, EU 598 and the Aircraft Noise (Dublin Airport) Regulations 2019.

### Notes:

**NQP** – the proposed Night Quota Period - 6.5h, 23:30-05:59

**Population analysis:** Where there is a comparison of population or effects with the equivalent for 2018, the population dataset used for deriving 2018 figures will be used consistently for all calculation years.



# Section 4:

## All noise measures

All noise measures whether already in place, already planned under existing Noise Action Plan or new arising from this Application are presented in tabular form.



# Noise Measures. ICAO Balanced Approach: Noise at Source and Operating Procedures

MEASURE ID	Measure Description	Existing Measure in place in 2018	Existing measure in NAP, in place by 2025	Measure Taken forward in application	New measure with Relevant Action Application
<b>Reduction of Noise at Source (NS)</b>					
NS-1	Promote quieter aircraft through incentives such as FlyQuiet programmes. This programme is expected to be in place by 2022.	✗	✓	✓	✗
NS-2	Work with airline partners to introduce quieter aircraft, particularly at night, including consideration of incentives. Approaches to incentives under development and expected to be in place by 2022.	✗	✓	✓	✗
<b>Noise Abatement (NA) Operating Procedures</b>					
NA-1	<i>2-Runway Preferential Runway Programme</i> – Intent of measure is to utilise whenever possible the runways that enable aircraft to avoid noise-sensitive areas during the initial departure and final approach phases of flight. Runway 10 or Runway 28 is the required runway between 0600 and 2300HR local time when the crosswind component is 20KT or less. Runway 28 will be the preferential runway when the tailwind component is 10KT or less and braking action is assessed as good. Aircraft will be required to use these runways except when operational reasons dictate otherwise. If the crosswind component on Runway 10 or Runway 28 is greater than 20KT, Runway 16 or Runway 34 may become the active runway. If the forecast crosswind component on Runway 10 or 28 is greater than 20KT, Runway 16 or 34 may become the active runway. The use of Runway 16-34 will be kept to an absolute minimum subject to operational conditions. Runways will be prioritised for noise abatement purposes between 2300 and 0600HR local time, subject to the same wind calculation method and values as used between 0600 and 2300HR local time. When weather conditions and flight movements permit, runway usage will be prioritised as follows: Arrivals: #1 (Runway 10), #2 (Runway 16), #3 (Runway 28), #4 (Runway 34); Departures: #1 (Runway 28), #2 (Runway 34), #3 (Runway 10), #4 (Runway 16).	✓	✗	✗	✗
NA-2	<i>2-Runway Noise Preferential Routes (NPRs) or Environmental Noise Corridors and Track Keeping</i> – Intent is to minimise disruption by routing aircraft away from built-up areas, where possible. Unless directed otherwise by IAA-ATC, all aircraft taking off from Dublin Airport are required to follow specific NPRs. To minimise impact, NPRs are designed to avoid overflight of built-up areas, where possible. An NPR is a path or corridor (1.8 kilometres at its widest point) that aircraft follow from take-off until being directed by IAA-ATC onto their main air traffic routes, typically at 3,000 feet altitude above mean sea level. Aircraft flying inside the NPR corridor are considered to be flying on-track. departures from all runways (except easterly departures on the existing Runway 10-28 must maintain course straight out for 5 nautical miles (1 nautical mile = 1,852 metres) after take-off before commencing a turn, unless otherwise cleared by IAA-ATC. Easterly departures on the existing southern runway must maintain course straight out for 5 nautical miles before commencing a turn to the north, or to 6 nautical miles before commencing turn to the south. Once an aircraft reaches the end of the NPR, or at an altitude of 3,000 feet, IAA-ATC will turn it onto a more direct heading to its destination. IAA-ATC can turn aircraft off NPRs below 3,000 feet for safety reasons, for example to avoid storms.	✓	✗	✗	✗
NA-3	<i>Noise Abatement Departure Procedures (NADP) Climb Profile</i> – Based on noise-abatement departure climb guidance contained in the ICAO's Procedures for Air Navigation Services Aircraft Operations Document 8168 Volume 1, Flight Procedures Appendix to Chapter 3 – NADP2, with thrust cutback at 1,500 feet.	✓	✓	✓	✗
NA-4	<i>Visual Approach</i> – Jet aircraft (Cat C/D) on visual approach to Runways 28, 10, 16, and 34 must join final approach no closer than 6 nautical miles from touchdown. Aircraft must follow a descent path that will not result in being at any time lower than the approach path, which would otherwise be followed using the ILS glide path.	✓	✓	✓	✗
NA-5	<i>Continuous Descent Approach (CDA)</i> – Operates a CDA that reduces the noise experienced on the ground by reducing the overall thrust required during the initial descent and keeping aircraft at higher altitudes for a longer period of time.	✓	✓	✓	✗
NA-6	<i>Continuous Climb Operations</i> - continuous climb operation along a standard departure procedure is intended to limit interruption of the climb profile to cruise altitude and reduces the noise experienced on the ground caused by thrust levels required to keep aircraft level and increases distance from noise-sensitive areas between an aircraft and receptor as soon as possible.	✓	✓	✓	✗
NA-7	<i>Reverse Thrust</i> – Reverse thrust is used to aid the deceleration of aircraft on landing using the aircraft's engines. This should not be used at night, unless required for safety reasons.	✓	✓	✓	✗
NA-8	<i>Engine Ground Running</i> – Engine test runs are not permitted between 2000HRs and 0700HRs. All aircraft types may undertake testing between 0900 and 2000HRs, and only aircraft up to Code C may undertake engine testing between 0700 and 0900HRs.	✓	✓	✓	✗
NA-9	<i>Monitor and Report</i> – Sustain noise operating procedures through monitoring.	Partial	✓	✓	✗
NA-10	<i>3-Runway Noise Preferential Routes (NPRs) or Environmental Corridors and Track Keeping</i> – Intent is to minimise disruption by routing aircraft away from built-up areas, where possible. Unless directed otherwise by IAA-ATC, all aircraft taking off from Dublin Airport are required to follow specific NPRs. To minimise impact, NPRs are designed to avoid overflight of built-up areas, where possible. An NPR is a path or corridor (1.8 kilometres at its widest point) that aircraft follow from take-off until being directed by IAA-ATC onto their main air traffic routes, typically at 3,000 feet altitude above mean sea level. Aircraft flying inside the NPR corridor are considered to be flying on-track. The preferred departure flight path NPR is straight out on the South Runway and divergence paths of 30-degrees and 75-degrees for the North Runway for westerly flow and straight out on the South Runway and a divergent path of 15-degrees for easterly flow.	✗	✗	✓	✗
NA-11	<i>3-Runway Preferential Runway Programme</i> – Intent of measure is to utilise whenever possible the runways that enable aircraft to avoid noise-sensitive areas during the initial departure and final approach phases of flight. From 06:00 to 23:59. When winds are westerly, 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. When winds are easterly, 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. From 00:00 to 5:59: Limit take-off or landings to South Runway (Runway 10L-28R) except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10R-28L length is required for a specific aircraft type.	✗	✗	✗	✓



# Noise Measures. ICAO Balanced Approach: Land use planning, Operating Restrictions and Monitoring

MEASURE ID	Measure Description	Existing Measure in place in 2018	Existing measure in NAP, in place by 2025	Measure Taken forward in application	New measure with Relevant Action Application
<b>Land Use (LU) Planning and Management</b>					
LU-1	<i>Land Use Compatibility Management Framework</i> – The land use and planning frameworks include the Fingal County Council's (FCC's) County Development Plan 2017–2023 (Variation No. 1) and the Dublin Airport 2020 Local Area Plan (LAP), which defines four airport noise zones and the associated objective of each zone along with an indication of the potential noise exposure from movements at Dublin Airport. The zones are based on potential noise exposure levels ( $L_{Aeq,15hr}$ and $L_{night}$ levels) due to the airport using either the new northern or existing southern runway for arrivals or departures. The noise zoning system has been developed with the overarching objective to balance the potential impact of aircraft noise from the Airport on both external and internal noise amenity. This allows larger development which may be brought forward in the vicinity of the Airport's flight paths to be identified and considered as part of the planning process. The focus of the noise zones is to ensure compatibility of residential development and ensuring compatibility with pertinent standards and guidance in relation to planning and noise	✓	✓	✓	✗
LU-2	<i>Land Use Compatibility Management Review</i> – Keep under review land-use policies in relation to aircraft noise through the review of existing land-use planning frameworks in so far as they relate to Dublin Airport.	✓	✓	✓	✗
LU-3	<i>Encroachment Management</i> – Monitor noise encroachment associated with Dublin Airport to ensure airport noise policy is appropriately informed through land-use planning frameworks in so far as they relate to Dublin Airport.	✓	✓	✓	✗
LU-4	<i>Sound Insulation (HSIP)</i> – Voluntary to households that qualify by being located within the 2016 63 dB $L_{Aeq,15hr}$ noise contour.	✓	✗	✗	✗
LU-5	<i>Sound Insulation (RNIS)</i> – Voluntary to households that qualify by being located within the 2022 63 dB $L_{Aeq,15hr}$ noise contour. All properties to be completed by the time North Runway is operational.	✗	✓	✓	✗
LU-6	<i>Voluntary Dwelling Purchase Scheme</i> – Approved in 2016, this measure provides voluntary acquisition of eligible dwellings. Eligibility for the scheme is based on the predicted 69 dB $L_{Aeq,15hr}$ contour. This is the noise threshold for participation in the voluntary scheme. The scheme is completely voluntary and places no obligation on any resident to participate. Offers to purchase will include a 30 percent premium on the current market value of the residence. Property valuations will be based on current movements at Dublin Airport and accordingly valuations will not be affected by the new runway. The scheme will remain available for three years after North Runway is operational (2025).	✓	✓	✓	✗
LU-7	<i>Voluntary School Sound Insulation</i> - voluntary noise insulation of schools for all schools and registered pre-schools predicted to fall within the contour of 60 dB $L_{Aeq,15hr}$ . The scheme is designed to ensure that maximum noise limits within the classrooms and school buildings generally shall not exceed 45 dB $L_{Aeq,20hr}$ (a typical school day).	✗	✓	✓	✗
LU-8	<i>Night-time Sound Insulation Grant Programme</i> – A grant programme for households that qualify by being located in areas with forecast noise exposure greater $L_{night}$ 55 dB OR exposed to a noise level of greater than Night 50dB in the first of the relevant action arising from an increase in noise of at least 9dB noise compared with the permitted operation in that same year.	✗	✗	✗	✓
<b>Operating Restrictions (OR)</b>					
OR-1	Crosswind runway (16-34) shall be restricted to essential occasional use on completion of the new runway in accordance with Objective DA03 of the Fingal County Development Plan, 2005-2011. 'Essential' use shall be interpreted as use when required by international regulations for safety reasons.	✗	✓	✗	✓
OR-2	Runway 10L-28R "No Use" Limit: This measure is intended to ensure that noise levels forecast to occur in 2025 meet the cNAO Runway 10L-28R shall not be used for take-off or landing between 00:00 hours and 05:59 hours (except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10R-28L length is required for a specific aircraft type). Due to historic and forecast low demand, this restriction is not expected to impact Dublin Airport capacity and efficiency, the European aviation system and the economy.	✗	✗	✗	✓
OR-3	Quota Count: This measure is intended to ensure that noise levels forecast to occur in 2025 meet the cNAO. The proposed quota count is based on an Annual Night Quota (ANQ) count of 7,990 between 23:30 to 06:00 (Night Quota Period) to be applied for each year from the opening of the North Runway to 2025	✗	✗	✗	✓
<b>Monitoring and Community Engagement (CE)</b>					
CE-1	<i>Stakeholder Engagement</i> – Participate in regular meetings with the Dublin Airport Environment Working Group (DAEWG) and Community Liaison Group (CLG).	✓	✓	✓	✗
CE-2	<i>Community Engagement Programme</i> – Includes newsletters and various programmes that support the local community in the form of initiatives and funds.	✓	✓	✓	✗
CE-3	<i>Noise and Flight Track Monitoring System</i> – Enables the analysis of aircraft movements to assess whether they are operating within defined corridors. The primary objective of the Noise and Flight Track Monitoring System is to gather information on aircraft approach and departure routes and resultant noise levels at several key locations. This information is used by data to respond to any complaints relating to aircraft noise. Continue to promote enhancements of the system to include near live-flight reporting and appropriate additional fixed and/or mobile noise monitoring terminals.	✓	✓	✓	✗
CE-4	<i>Noise Complaint Management Systems</i> – Process and respond to all aviation-related noise complaints in a timely manner.	✓	✓	✓	✗
CE-5	<i>Relevant Action Noise Reporting Framework</i> - noise reporting associated with compliance with NAO and measures proposed	✗	✗	✗	✓



# Section 5: 2025 to 2035

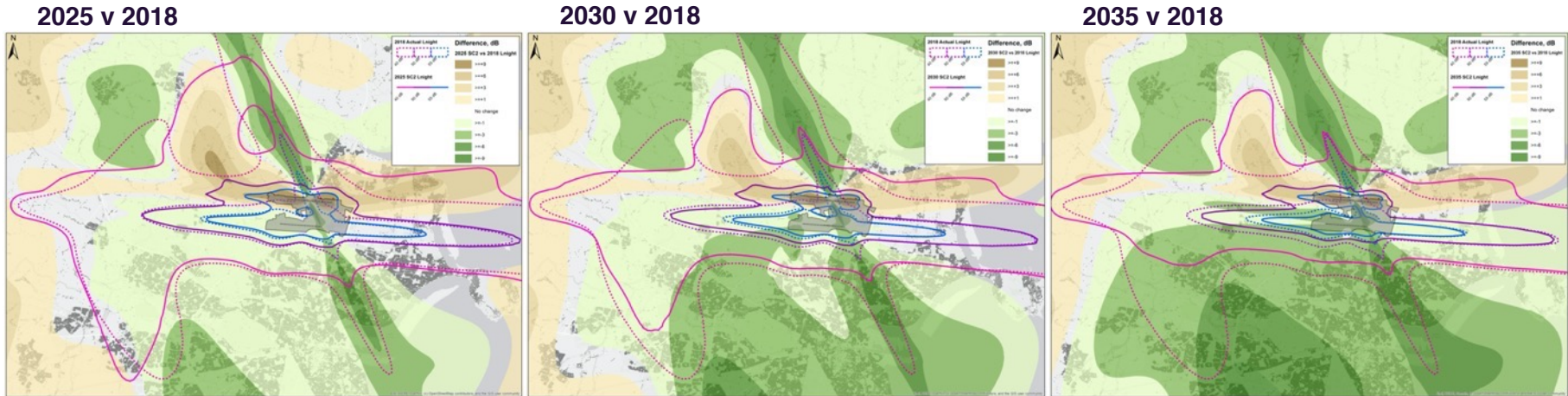
The Application is based on impacts assessed to 2025 with a 32 million passenger cap in place. Daa has also considered forecasts for 2030 and 2035 both with and without the 32mppa cap remaining in place beyond 2025. In these scenarios everything is the same to 2025. Beyond 2025 the only difference is whether the cap is in place or not.





# Scenario 2. 2025 and beyond. 32mppa cap remains.

The overall effects of noise remain better than 2018 into the future.

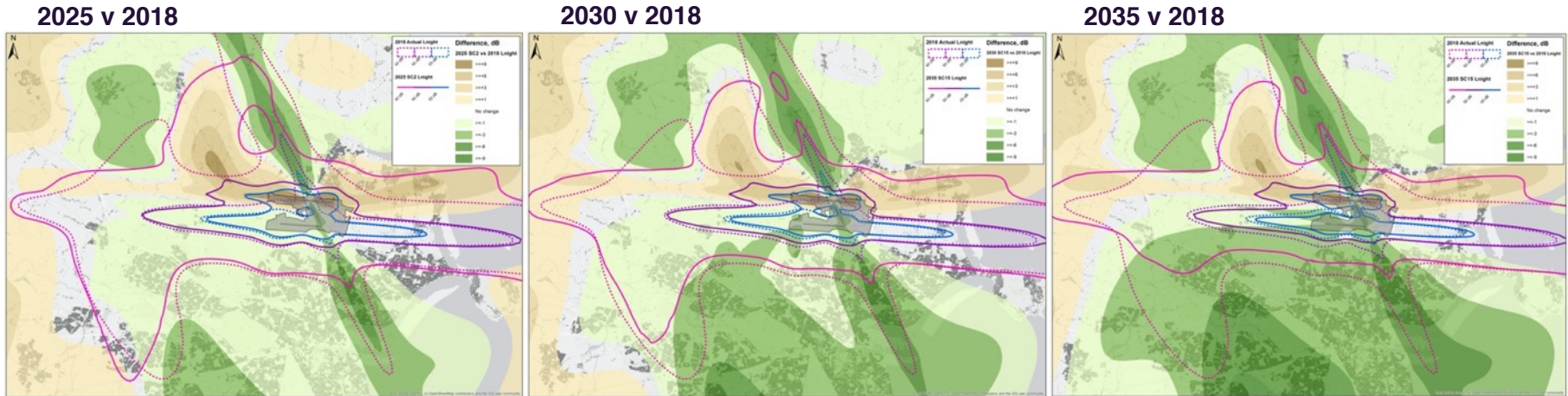


Year 32mppa cap in place	Population	
	>40dB L <sub>night</sub>	Highly Sleep Disturbed
2018 (32mppa)	307,460	42,260
2025 (32mppa)	268,500	37,080
2030 (32mppa)	195,785	26,980
2035 (32mppa)	135,695	18,715



# Scenario 2. 32mppa cap no longer in place beyond 2025.

The overall effects of noise remain better than 2018 into the future.



Same as previous

Year (and case)	Population	
	>40dB L <sub>night</sub>	Highly Sleep Disturbed
2018 (32mppa)	307,460	42,260
2025 (32mppa)	268,500	37,080
2030 (No 32mppa)	205,319	28,493
2035 (No 32mppa)	153,953	21,294



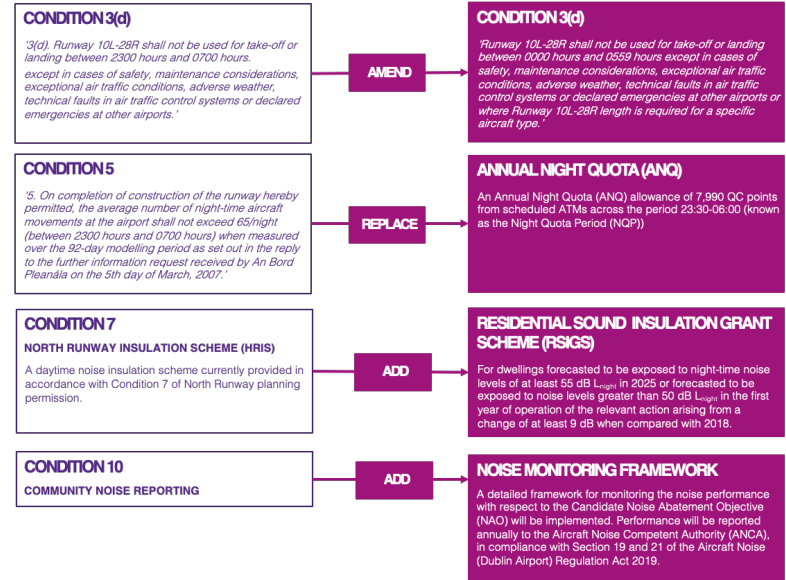
# Section 6: Summary



# Summary of proposed noise measures

A cost-effective package of measures to replace or amend existing planning conditions that ensure the overall effects of aircraft at night are less than 2018 into the future.

- A planning application has been submitted to Fingal County Council (FCC) to modify planning conditions contained in the North Parallel Runway Planning Permission that restrict use of the airport at night once North Runway becomes operational.
- The Application seeks to amend Condition 3(d) that restricts the use of the North Runway between 23:00 and 07:00; and replace Condition 5 that restricts the average number of night-time aircraft movements at the airport overall to 65 movement/night once the North Runway becomes operational.
- In addition to already planned measures (outlined in the Dublin Airport Noise Plan 2018-23) and noise measures already required under the parent planning permission, daa proposed a package of mitigation measures consistent with the ICAO Balanced Approach including:
  - A preferential runway use scheme for night-time runway operations (amendment to Condition 3(d));
  - An Annual Night Quota (ANQ) (replace Condition 5);
  - a Residential Sound Insulation Grant Scheme for those dwellings where there is potential for significant adverse effect arising from the proposed changes (additional to Condition 7).
  - A comprehensive noise performance monitoring framework consistent with Aircraft Noise Regulations 2019 (additional to Condition 10).
- Together these measures ensure that the overall effects of aircraft noise at night will remain less than those for 2018 into the future and that the potential for significant adverse effects as a result of the application have been minimised.



**daa Application Noise Goals**

**A** Overall, the effects of noise at night will be less than today (2018 baseline). ✓

**B** Minimise the potential for significant adverse effects from proposed change (opening year compared to 2018). ✓

